

ITEM 665.9986-- 25 - NAVIGATION LIGHTS

1. DESCRIPTION:

- 1.01 Under this work the Contractor shall furnish and install navigation lights attached to the bridge structure and connected to bridge lighting circuits, as shown on the plans or as directed by the Engineer. The work shall also include removal of the existing navigation lights.

2. MATERIALS:

2.01. Channel Margin Light

1. The channel margin navigation light shall be designed for use as a marine signal light for marking channel margin, per U.S. Coast Guard Bridge Administration General Construction Requirements and Security Zone/Exclusionary Area documents as listed herein at the end of this specification.
2. The housing shall be of cast aluminum. Casting alloy used shall be suitable for marine environment. Construction shall be raintight and fully gasketed. The light assembly shall be designed for heavy duty, long life service. Design shall provide ready access for lamp service.
3. The lens shall be tempered fresnel glass. Lens section shall be 180 degrees red. Inside lens diameter shall measure 7 in. Outside lens diameter shall measure 8 in.
4. Lamp shall be 120V, medium base LED with a rated life of 100,000 hours (over 11 years of operation when burned 24 hours per day), shock and vibration resistant.
 - a. Lamp shall consist of a dense array of individual LED's, each encased in a solid clear epoxy lens per industry standards. In the event of failure of one or more individual LED's, remaining LED's shall continue to operate. Entire assembly shall be neatly potted into a molded non-metallic stem fitted to a standard medium base.
 - b. Lamp shall be designed for 120V operation and shall consume 8W.
 - c. Overall luminosity of the LED array shall be 840 candelas for both red and green arrays (similar visibility to a 75W incandescent lamp). Beam viewing angle shall be 22 degrees for red and 20 degrees for green.
 - d. Lamp color shall match the color of the fixture lens for maximum light output. Red LED's shall have a wavelength of 630 nm. Green ("marine" green or blue-green) LED's shall have a wavelength of 510-515 nm.
 - e. Medium base receptacles shall be rated for 250V, 660W and shall be porcelain with a nickel-plated brass shell to resist lamp freezing.
 - f. Lamp mounting shall center the array on the focal plane of the lens. Receptacles shall be mounted on a bracket, which shall be isolated from the navigation light fixture with rubber grommets to minimize shock and vibration. Mounting bracket shall position the center of the lamp at the focal plane of the fixture lens for optimal light transmission.
 - g. Each completely assembled lamp shall be dipped in clear silicon to provide a

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moisture barrier.

2. **MATERIALS:** (cont'd)

2.01. Channel Margin Light: (cont'd)

5. The Stem: Lamp fixture head shall be suspended from the swivel on a 1.5 in schedule 40 pipe, 1.9 in O.D. Pipe material shall be galvanized steel. Standard dimension from center of swivel to focal plane of lens shall be 48 in.
6. The swivel design shall provide for all wiring to be completely contained inside the light assembly. Gaskets and o-rings shall be used to provide a weather-tight assembly. Swivel shall be of heavy-duty construction, cast of the same material as the fixture head. Spindle shall be of stainless steel.
7. An automatic latch shall hold the light securely in normal operating and service positions.
8. Base shall be cast of the same material as the fixture head (aluminum). Light assembly shall mount via four 0.5 in diameter bolts through the base, provided by installer to suit installation.
9. A stainless steel, #25 sash type service chain shall be provided to facilitate raising and lowering light for service.
10. A cast junction box with gasketed access cover shall be provided when specified. Junction box shall be of the same material as the fixture assembly and shall match the navigation light base footprint. Orientation of junction box shall be capable of rotation in 90-degree increments.
11. Submit channel margin light shop drawing for Engineer's approval.

2.02 Center Channel Light

1. The center channel navigation light shall be designed for use as a marine signal light for marking center of channel, per U.S. Coast Guard Bridge Administration General Construction Requirements and Security Zone/Exclusionary Area documents and is similar with the Channel Margin Light described above except that the lens color is green.
2. Submit center channel margin light shop drawing for Engineer's approval.

2.03 Conduits, Wires and Supports

1. The conduits shall be galvanized steel sizes as shown on the plans.
2. The wires shall be single conductor RHH size as shown on the plans.
3. Conduit clamps and supports shall be provided for a rigid installation.

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3. CONSTRUCTION DETAILS:

- 3.01 The navigation lights shall be installed in conformance with the staging on the plans as follows:

A. Channel Margin and Center Light Temporary Installation

1. Remove the existing navigation lights, controls and all associated conduits and wiring from the bridge structure and dispose.
2. Install navigation light assemblies on mount via four 0.5 in diameter bolts through the base, provided by installer to suit installation on the metal structure of the bridge. Service position shall be 30 degrees from vertical. Fixture assembly shall be dual-handed (i.e. light may be pulled up from either side).
3. Conduit for the wiring shall be attached to the bridge structure with clamps for a rigid installation.
4. The wires shall be connected to the temporary lighting circuit on the bridge as shown on the plans and shall be operational during construction stages.
5. Protect light assemblies to prevent damage during construction stages.

B. Channel Margin and Center Light Permanent Installation

1. Connect new conduit and wire to the permanent lighting circuits and route as shown on plans.
2. Conduit for the wiring shall be attached to the bridge structure with clamps for a rigid installation.
3. Test the installation to insure proper functionality. The test shall consist of energizing the lights and insure that all the splices and wireways are properly attached to the bridge structure. If testing fails the remedy shall be done at no additional cost to the State.

Service position shall be 30 degrees from vertical. Fixture assembly shall be dual-handed (i.e. light may be pulled up from either side).

The maintenance and re-lamping shall be accomplished from an existing platform by a firm pull on the service chain, which shall automatically release the latch, allowing the fixture to pivot. As the light is raised, latch shall automatically engage to hold light in the service position.

4. METHOD OF MEASUREMENT:

- 4.01 The quantity to be paid under this item shall be the number of navigation lights satisfactorily installed in accordance with the plans, specifications and directions of the Engineer.

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5. BASIS OF PAYMENT:

- 5.01 The unit price bid for furnishing and installing navigation lights shall include the cost of the navigation lights, conduit, boxes, wire, labor and all other materials and equipment necessary to satisfactorily provide a working system for temporary and permanent conditions. The unit price bid shall also include all necessary coordination with the Bridge Program Manager of First Coast Guard District.

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U.S. Coast Guard Bridge Administration

GENERAL CONSTRUCTION REQUIREMENTS

1. All bridge closures, or bridge operating schedule changes, must be requested in writing, 60-days in advance, from the First Coast Guard District Bridge Branch Office. No channel restrictions, or vertical clearance reductions may be made without written approval from the above office. Waterway closures or safety zones must also be requested 60-days in advance.
2. All submissions to the Coast Guard for review and approval must first be approved by the *owner of the bridge or their authorized agent*. All submission of plans, scope of work, and schedules of operation must be sent to the First Coast Guard District, Bridge Branch Office.
3. At least 30-days prior to commencement of any work, we must have for our review, a copy of the construction plans, contractor' schedule, preferably depicted in a time line graphic format, and the contractor's daily hours of operation. The construction plan package must show the following: **(1)** a plan of the entire waterway area in the vicinity of the project. **(2)** The location of work barges and any anchor lines during working and off-hours. **(3)** In addition, a drawing must be included, if applicable, depicting any scaffolding or containment used indicating the location and the total vertical or horizontal channel reduction. All vertical clearance reductions below low steel or concrete under the bridge as a result of the use of scaffolding must be clearly detailed on the drawings shown in total feet. **(4)** Emergency 24 hour telephone numbers for all responsible individuals for this project must be submitted to this office before any phase of construction begins in case of an emergency situation during off-hours.
4. Scaffolding used under ANY span of the bridge must be lighted with constant burning red lights on all corners. The placement of scaffolding must not interfere with the ability of a moveable bridge to open for vessel traffic. Moveable bridges must continue to operate according to their normal schedule unless special drawbridge operation regulation changes have been requested. Warning signs must be posted on both sides of the bridge, visible for a 1-mile range, to warn mariners of the vertical clearance reduction. The signs shall face upstream and downstream so as to draw the mariner's attention to the fact that the clearance has been reduced.
5. All barges placed in the waterway must be lighted with constant burning white lights on all four corners of the barge. The contractor is required to comply with all provisions of the Navigation Rules International-Inland, regarding the use of work barges or floating equipment in the waterway. Copies are available from the U.S. Government Bookstore, Room 110, Federal Building, 26 Federal Plaza, New York, NY 10278. Telephone (212) 264-3825.
6. Placement of construction barges in the navigable channel shall be done so as to provide a minimum horizontal clearance reduction. Only one navigation channel of a swing bridge may be blocked by work equipment at anytime. Barges must be moved out of the navigable channel after working hours unless approved in writing by this office.

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7. Barges held in place by anchor lines must be marked by anchor buoys, which should be lighted.
8. An as built survey must be taken upon completion of this project, approved by a professional engineer or land surveyor verifying the bridge clearances.
9. The on-scene contractor must have a VHF-FM marine radio set to the bridge communication channels 16/13 or the designated channel for the bridge. Additional marine radios monitoring the above channels must also be maintained at the main control of any floating equipment or barges on station.
10. Preventive measures must be taken to prevent any hot work, debris, or construction material from entering the waterway. This includes sandblasting material, paint, and any concrete work by-products. Welding and burning must cease upon approach of a vessel and shall not start again until the vessel has passed the bridge.
11. The project manager must contact the Coast Guard Sector New York-VTS via marine radio before commencement of any and after completion of any Hot Work. A cell phone back-up may be used to contact the above Coast Guard Unit at (718) 354-4088.
12. If permanent bridge navigational lighting cannot be maintained operational during any phase of this project, temporary battery/power lights must be installed at the same locations. These temporary lights must be visible for a distance of 2,000 yards on 90% of the nights of the year. Generally, a lamp of 20 footcandles will meet these requirements. Plans for temporary lighting shall be submitted to this office for written approval. Deviations from the approved temporary lighting shall be permitted only upon written authorization from this office. **All newly constructed bridge piers, or in the process of demolition, must be lighted with red constant burning lights as well as all four corners of any cofferdams used during construction.**
13. Bridge protective fenders shall not be constructed or rebuilt with any metal surfaces on the rubbing face of the fender system. All bolts, spikes, or other metal fastening devices must be countersunk. Metal splicing plates, if used, shall be mounted on back of outer wales.
14. All piles including those previously damaged or broken that are not being used in the new or repaired fender shall be extracted rather than cut off at the mud line. Upon completion of all fender repairs a bottom sweep is required to determine if any piles or debris are present in the waterway. A wire-drag sweep or side-scan sonar is the preferred method.
15. During the progress of work should any debris or equipment enter the waterway and become a hazard to navigation, immediate notice shall be given to the Coast Guard and the object removed as soon as possible. Until removal can be effected, the obstruction shall be properly marked.
16. Spillage of oil and hazardous substances is specifically prohibited by the **Federal Water Pollution Control Act**, as amended. Approved spill containment equipment and absorbent material must be located at the project site in the event of a spill into the waterway or the shoreline. The Coast Guard must be notified immediately at (800) 424-8802.
17. The bridge owner is responsible to ensure that channel depths are not affected by this work. Any material, machinery or equipment lost, dumped, thrown into, or otherwise entering the

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waterway must be removed immediately. If immediate removal is impractical and the object entering the waterway could possibly obstruct or hazard navigation, the object must be marked immediately to protect navigation and the Coast Guard shall be notified as soon as possible. Upon request of the Coast Guard or Corps of Engineers, the bridge owner/contractor shall provide the necessary equipment and personnel to determine the presence of any suspected obstructions in the waterway.

18. This approval may be revoked and/or civil penalties imposed for failure to ensure that the above listed stipulations are adhered to or if work is determined to hazard or impair navigation.

Security Zone/Exclusionary Area

A twenty five (25) yard permanent **Security Zone/Exclusionary Area**, has been established by the U. S. Coast Guard around all bridge piers and abutments, overhead power cables, pier or tunnel ventilators in the New York/New Jersey area south of the Troy, New York Locks.

No persons, work barges or vessels of any type may enter into these security zones without advance approval from the U. S. Coast Guard Captain of the Port, New York. All bridge construction, repair or maintenance work must receive approval of the First Coast Guard District Bridge Branch (dpb) before authorization to enter these security zones will be granted by U.S Coast Guard Captain of the Port, New York.

All requests to enter into these security zones shall be made in writing to Captain of the Port New York not less than 30 days prior to the intended date of entry into the zone. Requests must be submitted to the U.S. Coast Guard Waterways Management Division at **Commanding Officer, U.S. Coast Guard Sector New York (WWM), 212 Coast Guard Drive, Staten Island, NY 10305**; PH: (718) 354-4176, FX: (718) 354-4190, or by e-mail at Jeff.M.Yunker@uscg.mil. The request must contain a copy of Coast Guard Bridge Branch construction approval along with a completed COTP NY Project Notification Form. COTP Authorization will be provided by return e-mail.

After written approval for entry into the security zone has been received from the Coast Guard, the bridge owner/contractor shall notify the Coast Guard Vessel Traffic Service at (718) 354-4088, daily: prior to entering the work site; leaving the site at any time; and upon securing at the end of the day.

Captain of the Port, New York, must authorize any changes in vessels entering the security zone. All required information identified above must be forwarded to Coast Guard Waterways Management Division not less than four (4) working days in advance of the expected change. Failure to comply with the above Safety Zone Requirements and Conditions is punishable under Federal Law by arrest, prosecution, and or civil penalties.