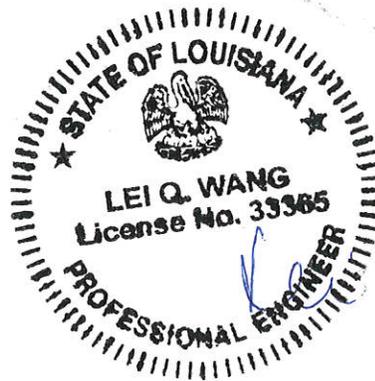


Louisiana  
Department of Transportation  
and  
Development

**Traffic Control Standard  
Number 1**

Traffic Signal Heads



3/25/2020

Revised March 25, 2020

## **TRAFFIC SIGNAL HEAD ASSEMBLIES ALUMINUM AND POLYCARBONATE**

### **ALUMINUM ASSEMBLIES FOR 12 INCH LED MODULES:**

**SAP Material Master No. 10919:** 1-Section Traffic Signal Head  
**SAP Material Master No. 10921:** 3-Section Traffic Signal Head  
**SAP Material Master No. 10922:** 4-Section Cluster Traffic Signal Head  
**SAP Material Master No. 51343:** 4-Section Vertical Traffic Signal Head  
**SAP Material Master No. 10923:** 5-Section Cluster Traffic Signal Head

### **POLYCARBONATE ASSEMBLIES FOR 12 INCH LED MODULES:**

**SAP Material Master No. 50650:** 1-Section Traffic Signal Head  
**SAP Material Master No. 50644:** 3-Section Traffic Signal Head  
**SAP Material Master No. 50645:** 4-Section Cluster Traffic Signal Head  
**SAP Material Master No. 51340:** 4-Section Vertical Traffic Signal Head  
**SAP Material Master No. 50643:** 5-Section Cluster Traffic Signal Head

### **GENERAL**

Aluminum and Polycarbonate Traffic Signal Head Assemblies for 12 Inch LED Modules shall come complete with the following:

- The Signal Head Housing(s)
- The Housing Door(s)
- A Cap Visor(s)
- A Six (6) Position Terminal Block
- Screws to Attach a Backplate

Each section of a signal assembly shall have 2 inch (+/- 0.004 inch) round openings on top and bottom. The openings shall be rain-tight without the use of sealing materials. Both openings shall have a serrated edge to provide positive locking in any direction in the horizontal plane. The serrations shall be such that any signal section will resist a torque of 20 foot-pounds (ft-lbs) when assembled in accordance with manufacturer's recommendations.

Signal head assemblies shall only contain the necessary hardware for securely fastening an LED module.

### **HOUSING AND DOOR**

Housings shall be sectional, weather tight, and securely fastened to each other. The portion of the housing adjacent to the mounting bracket shall be reinforced to prevent breakage from shock. Labyrinths shall be provided at bracket attachment points and at section joints to insure water shedding. Supporting brackets or trunnions shall be used at both the top and the bottom of each section assembly to rigidly support all faces.

Housing doors shall be hinged and held securely to the body of the housing by a stainless steel locking device that may be operated without the use of tools. Doors shall be field removable with

simple tools. The hinge pins shall prevent the door from accidentally disconnecting from the housing when opened, regardless of the signal position. All door hardware, such as hinge pins, LED module holder clips, etc., shall be stainless steel. Self-tapping screws are not allowed.

In order to prevent dust and moisture from entering the housing, a weather-resistant, mildew-proof neoprene or silicone rubber sponge gasket shall be provided between the body of the housing and the door. The housing door must be designed to accommodate the installation of any manufacturer's 12 inch LED module.

**Aluminum Housing, Door and LED Module Holder:**

Aluminum housings and doors shall be constructed of die cast aluminum that is finished, both inside and out, with a thick black powder coating or with two (2) coats of high-grade black enamel. Each coat shall be baked to resist peeling and chipping. The aluminum shall have a minimum tensile strength of 17,000 pounds per square inch (lbs/in<sup>2</sup>) and meet the requirements of ASTM B-85 or B108.

The housings and LED Module holders shall be pre-drilled and threaded for a machine screw to be used to attach the visor and a backplate; self-tapping screws will not be accepted.

**Polycarbonate Housing, Door and LED Module Holder:**

Polycarbonate housings and doors shall be constructed from one (1) piece of injection molded black polycarbonate resin.

The housings and LED Module holders shall have metal inserts threaded for a machine screw to be used to attach the visor and a backplate; self-tapping screws will not be accepted.

**VISORS**

**SAP Material Master No. 10948:** Aluminum Cap Visor

**SAP Material Master No. 10949:** Aluminum Tunnel Visor

**SAP Material Master No. 50641:** Polycarbonate Cap Visor

**SAP Material Master No. 50642:** Polycarbonate Tunnel Visor

Each section of a traffic signal head assembly shall be supplied with a cap visor made of the same material as the housing. The visor shall be installed and tilt approximately 3.5° downward from the horizontal as shown in **Figure 1**. The visor shall be 10 to 12 inches in length. The visor shall be capable of supporting the entire weight of the signal assembly and shall attach tightly to the housing door in such a manner that light filtration between the door and the visor is imperceptible. Screws used to attach the visor to the housing door shall be made of non-corrosive material.

**Aluminum Visors:**

Aluminum visors shall be made of an aluminum sheet construction with a minimum No. 18 U.S. Gauge thickness, and finished, both inside and out, with a thick black powder coating or with two (2) coats of high-grade black enamel. Each coat shall be baked to resist peeling and chipping.

**Polycarbonate Visors:**

Polycarbonate visors shall be constructed from one (1) piece of injection molded black polycarbonate resin.

**TERMINAL BLOCKS**

A six (6) position terminal block shall be provided with each traffic signal head. See **Figure 2**. The terminal blocks must be supplied with, two (2) mounting screws, and one (1) mechanical ground lug, and should include a minimum of 18 mounted quick connect tabs. See **Figure 4** for the mounting location of the terminal block for the 3-section signal head.

**HARDWARE**

1-Section and 3-Section traffic signal heads shall include all necessary hardware to connect to two (2) additional signal sections.

**BACKPLATES**

**SAP Material Master No. 10924:** 3-Section Signal Head Backplate

**\SAP Material Master No. 51341:** 4-Section Vertical Signal Head Backplate

The backplates shall be constructed of either aluminum sheeting that is No. 18 U.S. Gauge thickness or a black plastic rubber composite that will bend a minimum of 90 degrees and rebound to shape. The backplate corners shall be rounded. If aluminum sheeting is used, the backplate must be finished, both front and back, with a thick black powder coating or with two (2) coats of high-grade black enamel. Each coat shall be baked to resist peeling and chipping. The backplates shall have a width of  $5\pm 0.5$  inches with a 2 to 3-inch-wide Type VIII prismatic yellow reflective strip around the perimeter of the backplate. The reflective strip must meet the requirements of ASTM D4956. Backplates shall be able to be mounted on the main housing behind each signal face and shall not obstruct door opening and mast arm mounting assembly. They must also be capable of supporting the entire weight of the signal assembly.

The 3-section backplates and the 4-section vertical backplates shall be designed to fit the specified manufacturer's traffic signal head assemblies without the need for modification. See **Figures 4** and **5**.

## **OPTICALLY PROGRAMMED TRAFFIC SIGNAL HEAD ASSEMBLIES ALUMINUM**

- SAP Material Master No. 10928:** Optically Programmed Traffic Signal Head with 12-Inch Red Lens
- SAP Material Master No. 10929:** Optically Programmed Traffic Signal Head with 12-Inch Yellow Lens
- SAP Material Master No. 10930:** Optically Programmed Traffic Signal Head with 12-Inch Green Lens
- SAP Material Master No. 50920:** Optically Programmed Traffic Signal Head with 12-Inch Red Arrow
- SAP Material Master No. 10931:** Optically Programmed Traffic Signal Head with 12-Inch Yellow Arrow
- SAP Material Master No. 10932:** Optically Programmed Traffic Signal Head with 12-Inch Green Arrow
- SAP Material Master No. 51342:** 3-Section Optically Programmed Traffic Signal Head with 12-Inch Red, Yellow, and Green Lenses

### **GENERAL**

Optically Programmed Signal Head Assemblies shall come complete with the following:

- The Signal Head Housing
- The Housing Door
- A Cap Visor
- A Five (5) or Six (6) Position Terminal Block
- Wiring
- A Lens
- An LED Module
- A Flange/Coupler Assembly

### **HOUSING AND DOOR**

Housings shall be weather tight and able to be securely fastened to each other. The portion of the housing adjacent to the mounting bracket shall be properly reinforced to prevent breakage from shock. Labyrinths shall be provided at bracket attachment points and at section joints to insure water shedding. Supporting brackets or trunnions shall be used at both the top and the bottom of each section assembly to rigidly support all faces.

Housing doors shall be hinged and held securely to the body of the housing by a stainless steel locking device that may be operated without the use of tools. Doors shall be field removable with simple tools. The hinge pins shall prevent the door from accidentally disconnecting from the housing when opened, regardless of the signal position. All door hardware, such as hinge pins, LED module holder clips, etc., shall be stainless steel. Self-tapping screws are not allowed.

In order to prevent dust and moisture from entering the housing, a weather-resistant, mildew-proof neoprene or silicone rubber sponge gasket shall be provided between the body of the housing and the door(s). All access openings shall be sealed with weather resistant neoprene, or silicone rubber

gaskets.

The housings and doors shall be constructed of die cast aluminum that is finished, both inside and out, with a thick black powder coating or with two (2) coats of high-grade black enamel. Each coat shall be baked to resist peeling and chipping. The aluminum shall have a minimum tensile strength of 17,000 pounds per square inch (lbs/in<sup>2</sup>) and meet the requirements of ASTM B-85 or B108.

## **VISORS**

**SAP Material Master No. 10948:** Aluminum Cap Visor

**SAP Material Master No. 10949:** Aluminum Tunnel Visor

Each section of an optically programmed traffic signal head assembly shall be supplied with an aluminum cap visor. The visor shall be made of an aluminum sheet construction with a minimum No. 18 U.S. Gauge thickness, and finished, both inside and out, with a thick black powder coating or with two (2) coats of high-grade black enamel. Each coat shall be baked to resist peeling and chipping. The visor must be installed onto the housing door and tilt approximately 3.5° downward from the horizontal as shown in **Figure 1**. Visors shall be capable of supporting the entire weight of the signal assembly and shall attach tightly to the housing door in such a manner that light filtration between the door and the visor is imperceptible. Screws used to attach the visor to the housing door shall be made of non-corrosive material.

## **OPTICAL SYSTEM**

The optical limiter shall provide an accessible imaging surface located at the point of the optical axis for objects 900 to 1200 feet in distance, and permit an effective veiling mask to be variably applied as determined by the desired visibility zone. The optical limiter shall be provided with a positive indexing means and composed of heat resistant glass. The objective lens shall be a high-resolution, planar, incremental lens hermetically sealed within a flat lamination of weather-resistant acrylic or approved equal. The lens shall be symmetrical in outline and may be rotated to any 90-degree orientation about the optical axis without displacing the primary image.

The optical system shall accommodate projection to separate portions of the roadway such that only one indication will be simultaneously apparent to any viewer. The projected indication shall conform to ITE transmittance and chromaticity standards.

## **OPTICALLY PROGRAMED LED MODULES**

**SAP Material Master No. 50921:** Red Optically Programmed LED Module

**SAP Material Master No. 50922:** Yellow Optically Programmed LED Module

**SAP Material Master No. 50923:** Green Optically Programmed LED Module

The signal head shall come with a 120-volt AC, three (3) prong LED module with an average rated life of at least 50,000 hours.

## **TERMINAL BLOCK**

A five (5) or six (6) position terminal block shall be provided with each optically programmed traffic signal head. See **Figure 2**. Terminal blocks must be supplied with at least three (3) quick

connects per terminal), two (2) mounting screws, and one (1) mechanical ground lug. All wiring shall be long enough for the housing door to fully open, while attached to the terminal block and the optically programmed LED module, without disconnecting any circuits. See **Figures 2 and 3** for the mounting location of the terminal block for single and 3-section optically programmed traffic signal heads.

### **MOUNTING HARDWARE AND FLANGE ASSEMBLY**

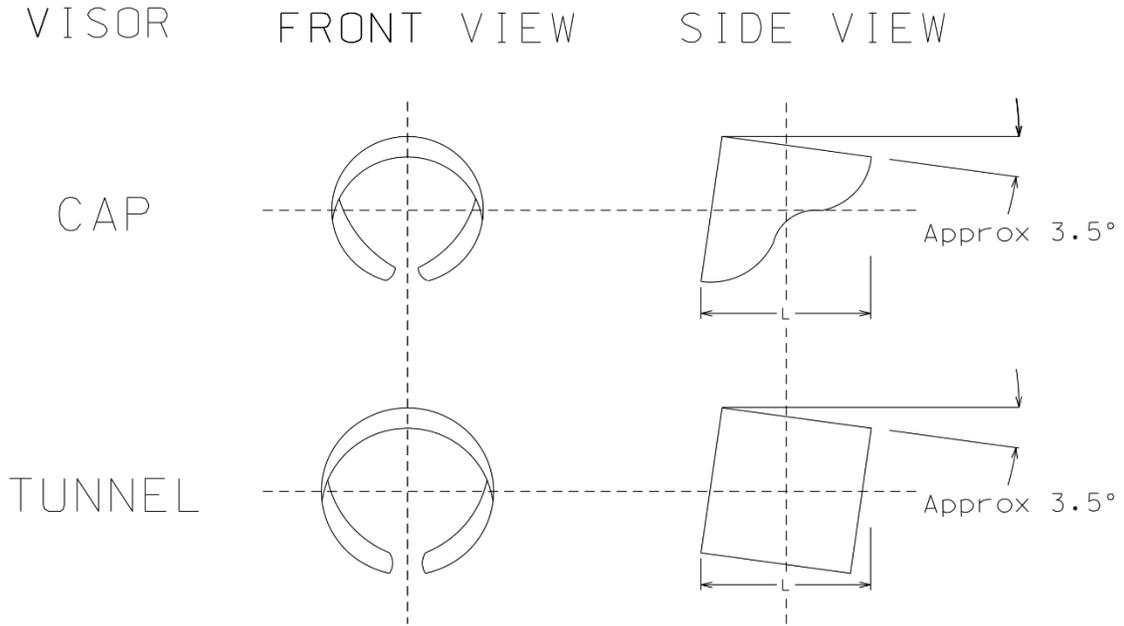
#### **SAP Material Master No. 11181: Flange Assembly**

Optically programmed traffic signal heads shall be capable of being mounted and serviced with ordinary tools.

Single optically programmed traffic signal heads shall mount to a 1-1/2 inch fitting and shall be supplied with a black flange/coupler assembly. The flange/coupler assembly will be used to connect multiple signal heads to make a 3-section optically programmed traffic signal head.

Optically programmed signal heads shall have an adjustable connection that permits incremental tilting from 0 to 10 degrees above or below the horizontal while maintaining a common vertical axis through couplers and mounting hardware. Terminal connections shall permit external adjustment about the mounting axis in 5-degree increments.

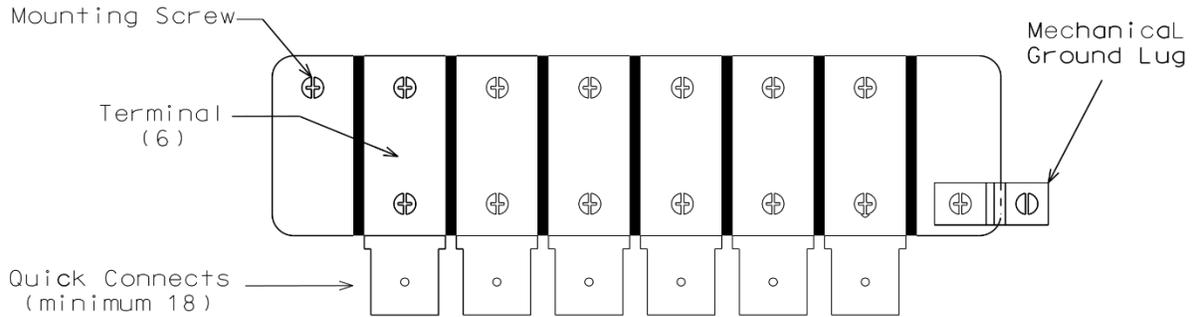
**FIGURE 1: VISORS**



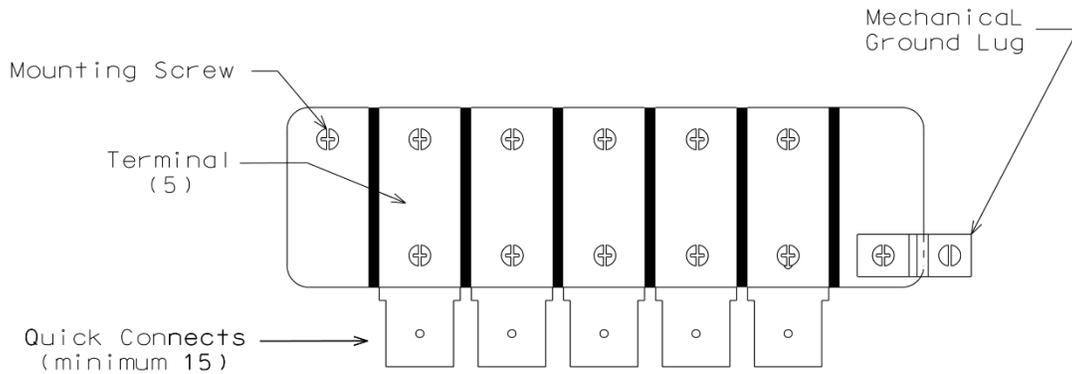
VISOR NAME	LENGTH
Cap	10" - 12"
Tunnel	10" - 12"

**FIGURE 2:** TERMINAL BLOCK

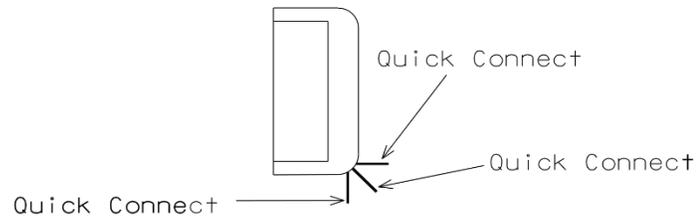
SIX (6) POSITION TERMINAL BLOCK (STANDARD SIGNAL HEADS OR OPTICALLY PROGRAMMED SIGNAL HEADS)



FIVE (5) POSITION TERMINAL BLOCK  
 (OPTICALLY PROGRAMMED SIGNAL HEAD ONLY)



TERMINAL BLOCK  
 (SIDE VIEW WITH 3 QUICK CONNECTS SHOWN)

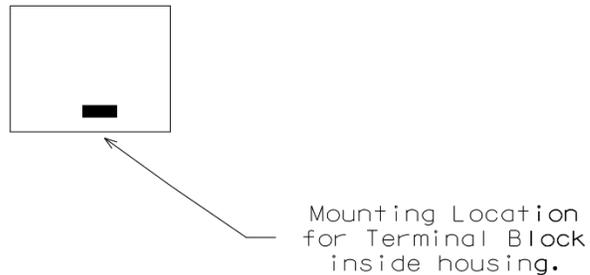


**FIGURE 3:** 1 SECTION TERMINAL BLOCK MOUNTING LOCATION FOR STANDARD SIGNAL HEADS AND OPTICAL SIGNAL HEADS

1-SECTION STANDARD SIGNAL HEAD



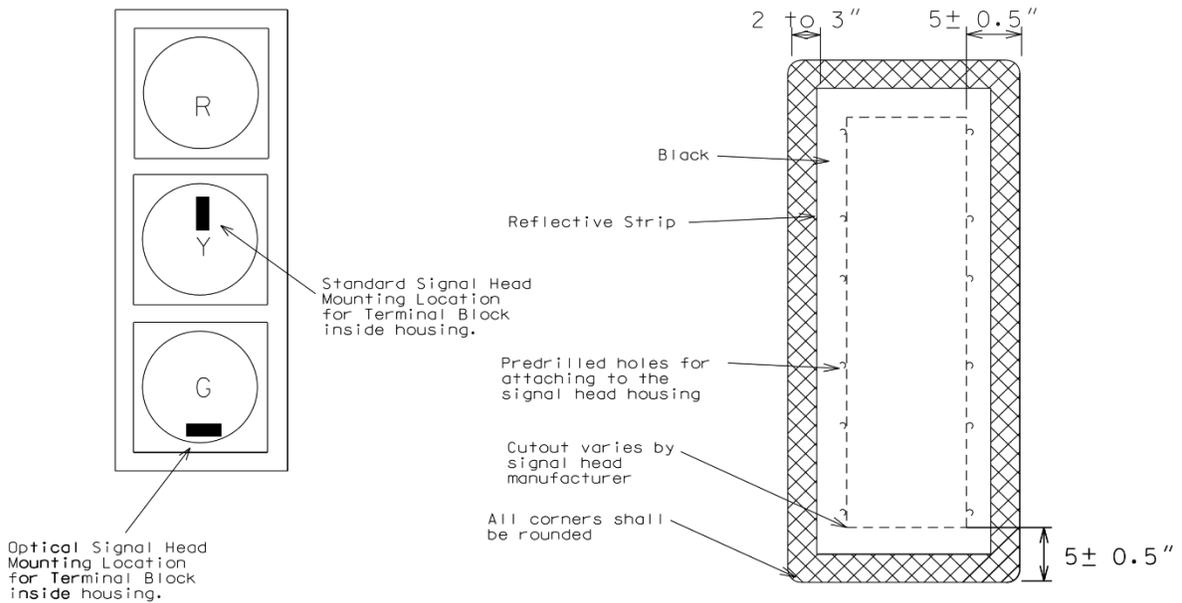
1-SECTION OPTICAL SIGNAL HEAD



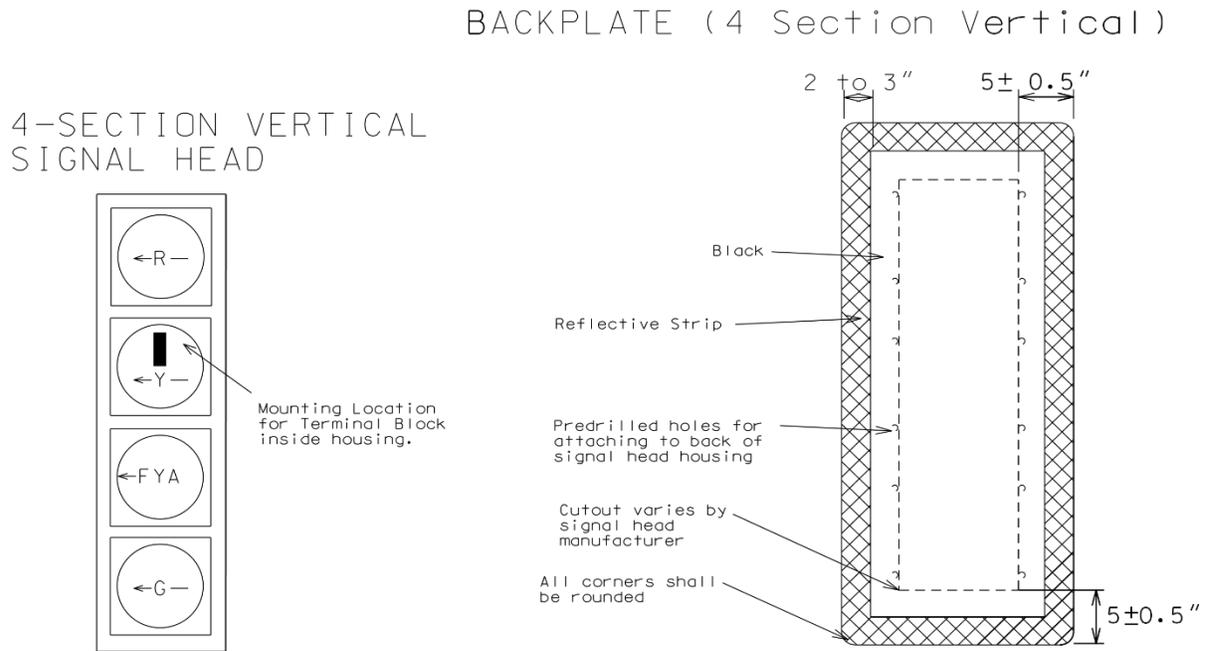
**FIGURE 4:** 3-SECTION TERMINAL BLOCK MOUNTING LOCATION FOR STANDARD SIGNAL HEADS AND OPTICAL SIGNAL HEADS

3- SECTION SIGNAL HEAD

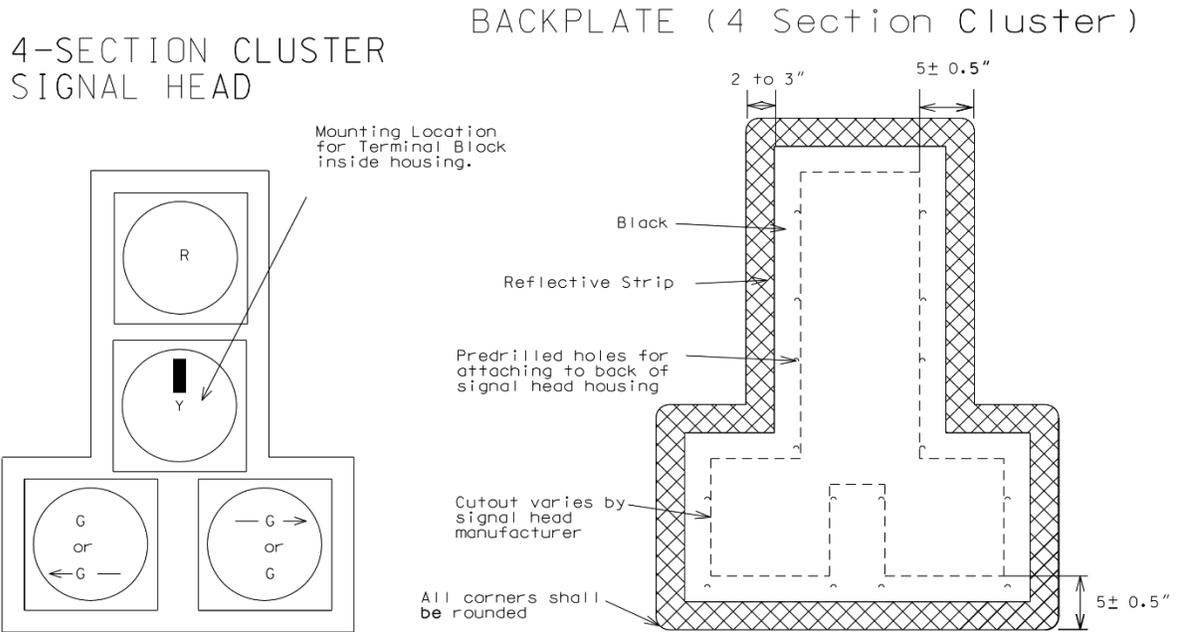
BACKPLATE (3 Section)



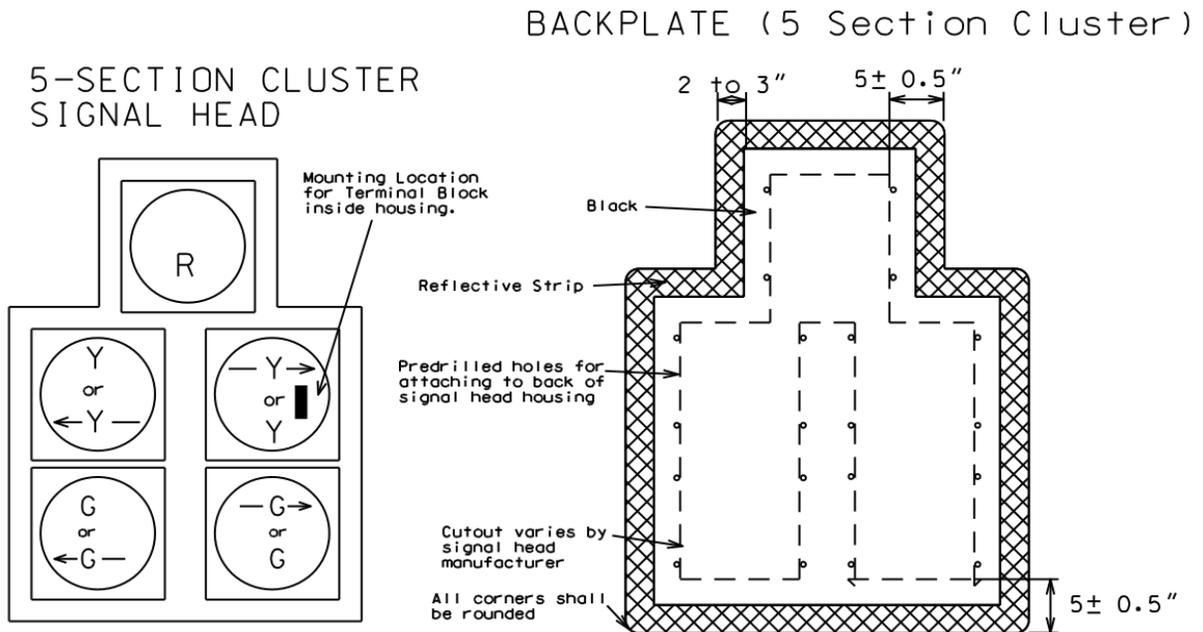
**FIGURE 5:** 4 SECTION VERTICAL STANDARD SIGNAL HEAD, TERMINAL BLOCK MOUNTING LOCATION, & BACKPLATE



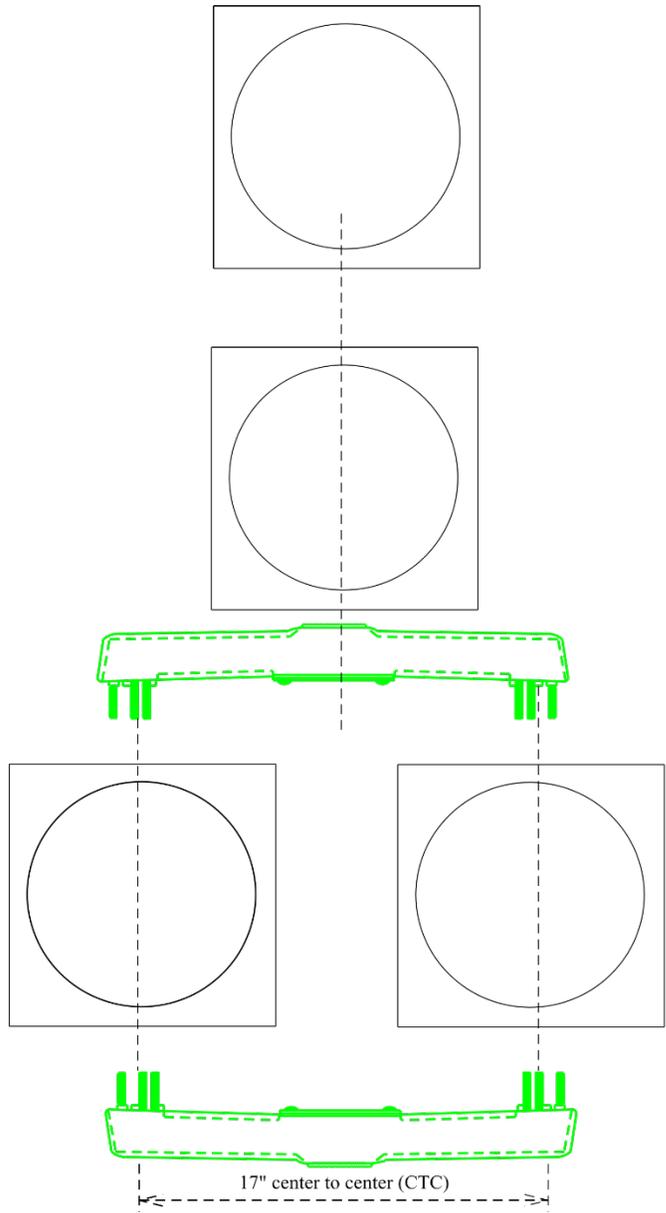
**FIGURE 6:** 4-SECTION CLUSTER STANDARD SIGNAL HEAD, TERMINAL BLOCK MOUNTING LOCATION, & BACKPLATE



**FIGURE 7: 5-SECTION CLUSTER STANDARD SIGNAL HEAD, TERMINAL BLOCK MOUNTING LOCATION, & BACKPLATE**

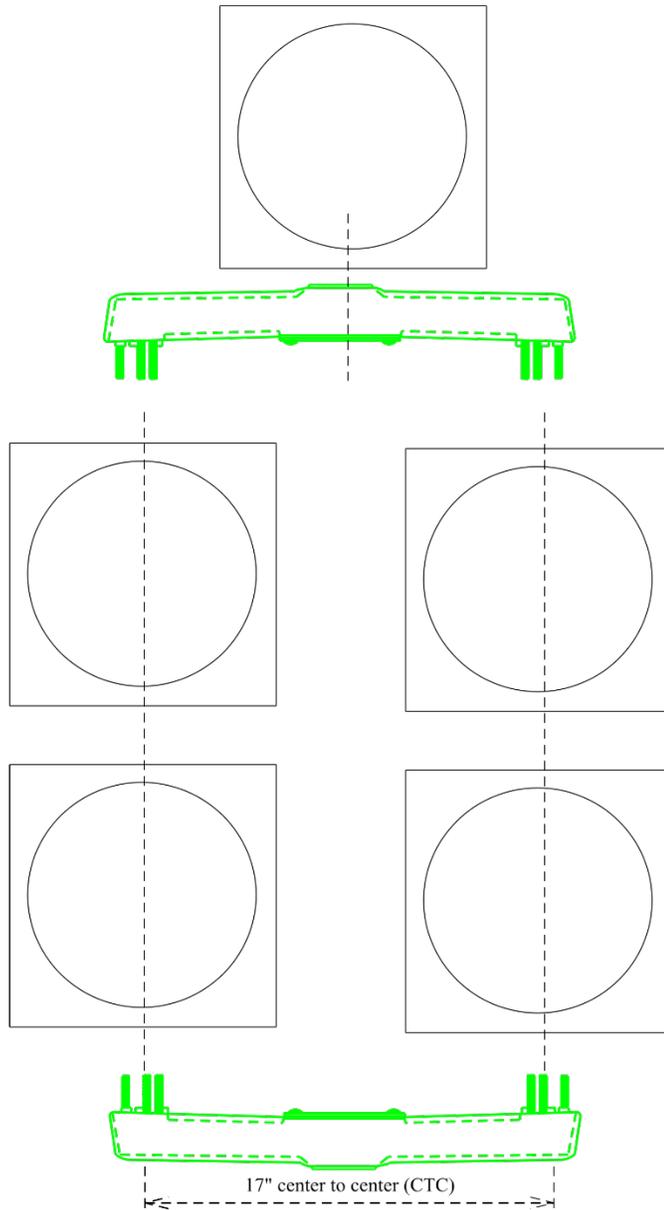


**FIGURE 8:** 4 SECTION CLUSTER ASSEMBLY



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**FIGURE 9:** 5 SECTION CLUSTER ASSEMBLY



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