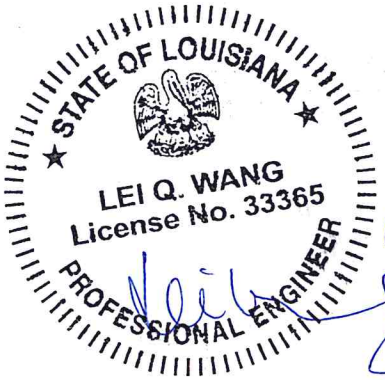
Louisiana

Department of Transportation And Development

Traffic Control Standard

Number 1

Traffic Signal Heads



10/19/2015

Revised October 19, 2015

SECTION A

Single Signal Head - Aluminum (SAP# 10919, Stock# 14-04-5104):
A signal head assembly that contains 1 signal section for 12 inch LED module.
3-Section Signal head - Aluminum (SAP# 10921, Stock# 14-04-5112):
A signal head assembly that contains 3 vertical signal sections for 12 inch LED module.
4-Section Signal head -Aluminum (SAP# 10922, Stock# 14-04-5114):
A signal head assembly that contains 4 cluster signal sections for 12 inch LED module.
5-Section Signal head - Aluminum (SAP# 10923, Stock# 14-04-5116):
A signal head assembly that contains 5 cluster signal sections for 12 inch LED module.

Single Signal Head Polycarbonate (SAP# 50650):
A signal head assembly that contains 1 signal section for 12 inch LED module.
3-Section Signal head polycarbonate (SAP# 50644):
A signal head assembly that contains 3 vertical signal sections for 12 inch LED module.
4-Section Signal head polycarbonate (SAP# 50645):
A signal head assembly that contains 4 cluster signal sections for 12 inch LED module.
5-Section Signal head polycarbonate (SAP# 50643):
A signal head assembly that contains 5 cluster signal sections for 12 inch LED module.

Tri-stud Adapter (SAP# 10952, Stock# 14-04-6025):
Tri-stud Adapter to 1 ½" Female Pipe Thread.
Tri-stud Adapter (SAP# 10953, Stock# 14-04-6034):
Tri-stud Adapter to 1 ½" Male Pipe Thread.
Bottom Clamp (SAP# 10957, Stock# 14-04-6208):
Bottom Clamp, ¼" Span, Tether, 5/16" Single Stud, Rigid Attachment with Hardware.

General

All traffic signal heads shall be constructed of identical signal sections and meet the specifications of Section A. Materials and construction of each separate signal section shall be the same. Signal heads shall be constructed to fit a 12" LED module.

Aluminum signal heads, with the exception of gaskets, terminal blocks, and wiring, shall be 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 independently baked to resist peeling and chipping

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

Visors shall be black inside and out finished in the same manner as the accompanying signal heads.

Signal heads are required to be clean, smooth, and free from flaws, cracks, and any other imperfections. The aluminum housing and lens holder shall be pre-drilled and threaded for a machine screw for backplates and visors, no self-tapping screws are permitted. The Polycarbonate housing and lens holder shall have metal inserts threaded for a machine screw for backplates and visors, no self-tapping screws are permitted.

All signal heads shall come as a complete assembly to include but not limited to:

- Signal head housing
- Housing door
- Visor
- Terminal block
- Wiring
- Screws for backplate attachments
- All miscellaneous hardware

Housing

Housings shall be constructed of die cast aluminum alloy or polycarbonate resin.

Aluminum alloy housings shall conform to ASTM specification B-85 or B-108 with a minimum tensile strength of 17,000 pounds per square inch (lbs/in^2).

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

Housings shall be sectional, rigidly and securely fastened, and weather-tight.

Each signal section shall have round openings on top and bottom measuring 2" (± 0.004") after painting. The complete assembly shall rotate about the centerline of the openings and shall be rain-tight without the use of sealing materials. A serrated edge shall be part of the section 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.

The portion of the housing adjacent to the bracket shall be properly reinforced for sufficient strength against 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 Door

Doors shall be of the same material as the housing. Each door shall be properly hinged and held securely to the body of the housing by simple non-corrosive locking devices that can be operated without the use of tools. All other door parts, such as hinge pins, lens clips, etc., shall also be of non-corrosive material or material treated to retard corrosion. Self-tapping screws are not permitted in the assembly. Door hinge pins shall be designed to prevent the door from accidentally becoming disconnected from the housing when opened, regardless of the signal position. All doors shall be field removable with simple tools.

A weather-resistant, mildew-proof neoprene, or silicone rubber sponge gasket, shall be provided between the body of the housing and the doors for excluding dust and moisture.

The housing door shall be so designed as to accommodate the installation of any manufacturer's 12" LED module.

Visors

Cap Visor - Aluminum (SAP# 10948, Stock# 14-04-5624)
Tunnel Visor - Aluminum (SAP# 10949, Stock# 14-04-5628)
Cap Visor - Polycarbonate (SAP# 50641)
Tunnel Visor - Polycarbonate (SAP# 50642)

Unless otherwise specified, cap visor shall be furnished as standard.

Each signal section shall have a visor tilting slightly downward from the horizontal and be one of the types shown in **Figure 1**. Visors shall be made of the same material as the housing. Aluminum alloy visors shall be of sheet construction having a minimum thickness of 0.05" (No. 18 U.S. Gauge). Polycarbonate visors shall be constructed from one (1) piece of injection molded polycarbonate resin. All visors shall attach tightly to each section door with non-corrosive screws preventing any perceptible filtration of light between the door and the visor. The visor shall be capable of supporting the entire weight of the signal assembly.

Optical Unit

Signal heads shall contain no lens, reflector, lamp or lamp socket. They shall only contain the necessary hardware for securely fastening an LED module.

Terminal Block

One (1) terminal block shall be provided with each signal head. The 5 position terminal for optically programmed housings or 6 position terminal block for standard traffic signal housings location and wire information for each type of signal head section is shown in **Figure 2, Figure 3**, **Figure 4,** and **Figure 5**. When a 1, 3, 4, or 5-section signal head configuration is specified, the corresponding figure shall be applied. In addition, all wires shall be long enough for the door to fully open with LED module attached without disconnecting any circuits.

Hardware

Each signal section shall include all necessary hardware to connect to two (2) other signal sections.

Backplates

3-Section Signal head backplate (SAP# 10924, Stock# 14-04-5117)
4-Section Signal head backplate (SAP# 10925, Stock# 14-04-5118)
5-Section Signal head backplate (SAP# 10926, Stock# 14-04-5119)

Backplates are to be supplied only when specified.

Backplates shall be custom made to be installed on the 3, 4 or 5-section signal heads when specified **(Figure 2, Figure 3, and Figure 4)**. They shall be constructed of aluminum alloy sheeting not less than 0.05 inches (No. 18 U.S. Gauge) in thickness and painted the same as the signal housing. Corners shall be rounded. A 3" wide, DOTD Type X prismatic yellow reflective strip shall be required around the perimeter of the backplate. The yellow strip sheeting must be an approved product on the most current Louisiana DOTD QPL 13. 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. The width of a backplate shall be a minimum of 5". The backplate shall be capable of supporting the entire weight of the signal assembly.

Plugs (Rosette Cap with neoprene gasket) **(SAP# 10968, Stock# 14-04-6326)**

All unused openings shall be closed utilizing standard 1-1/2" threaded plugs with a neoprene gasket. All openings shall have a watertight seal. The minimum length shall be 1-1/2" long and shall not interfere with any internal parts.

All plugs made of ferrous material shall be treated with paint to resist corrosion. The exposed portion of the plug shall conform to the color that is stated in the "General" header of Section A of this standard.

SECTION B

Optically Programmed Signal Head (SAP# 10928, Stock# 14-04-5160):
12-in Section with Red Lens
Optically Programmed Signal Head (SAP# 10929, Stock# 14-04-5162):
12-in Section with Yellow Lens
Optically Programmed Signal Head (SAP# 10930, Stock# 14-04-5164):
12-in Section with Green Lens
Optically Programmed Signal Head (SAP# 50920):
12-in Section with Red Arrow
Optically Programmed Signal Head (SAP# 10931, Stock# 14-04-5168):
12-in Section with Yellow Arrow
Optically Programmed Signal Head (SAP# 10932, Stock# 14-04-5170):
12-in Section with Green Arrow
Flange Assembly (SAP# 11181, Stock# 14-74-2750):
Flange / Coupler Assembly
LED Module (SAP# 50921)
Red (Optically Programmed)
LED Module (SAP# 50922)
Yellow (Optically Programmed)
LED Module (SAP# 50923)
Green (Optically Programmed)

General

The optically programmed signal head and visor shall be aluminum and with a black finish meeting the specifications in the General Section of Section A.

The signal shall permit the visibility zone of the indication to be determined optically and shall not require louvers. The projected indication may be selectively visible or veiled anywhere within 15 degrees of the optical axis. No indication shall result from external illumination nor shall one light unit illuminate a second.

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. When specified, a two-color section is to be provided to meet these specifications, but to produce two (2) sequential indications from one (1) section.

Electrical

A LED module, Red, Yellow or Green as specified, 120 volt AC, three (3) prong, and an average rated life of at least 50,000 hours.

Each signal section shall include a 5 position terminal block that utilizes a clip, or screw.

Construction

Die cast aluminum parts shall conform to ITE alloy S5 or SG3 of ASTM Specification B85 or the latest revision thereof or equal.

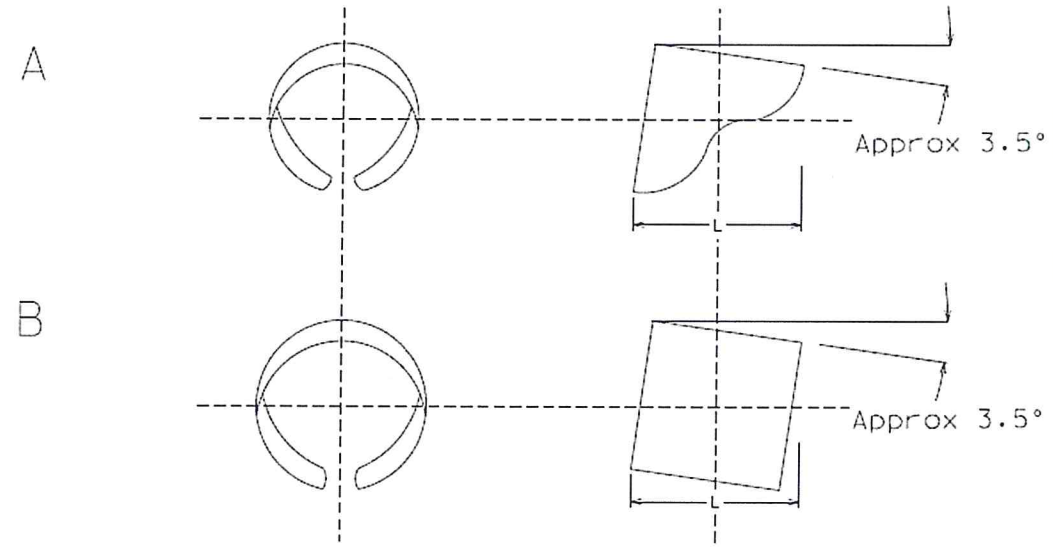
The signal case and lens holder shall be pre-drilled and threaded for a machine screw for backplates and visors, no self-tapping screws are permitted. The hinge and latch pins shall be stainless steel. All access openings shall be sealed with weather resistant neoprene, or silicone, rubber gaskets.

Mounting

The signal shall mount to a standard 1-1/2" fitting as a single section face, and come with a connection flange/coupler used when connecting multiple sections to make 3 section signals.

The signal section shall be provided with 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. The signal assembly shall be capable of being mounted and serviced with ordinary tools.

Attachments such as visors, backplates, or adapters shall conform, and readily fasten, to existing mounting surfaces without affecting water and light integrity of the signal.



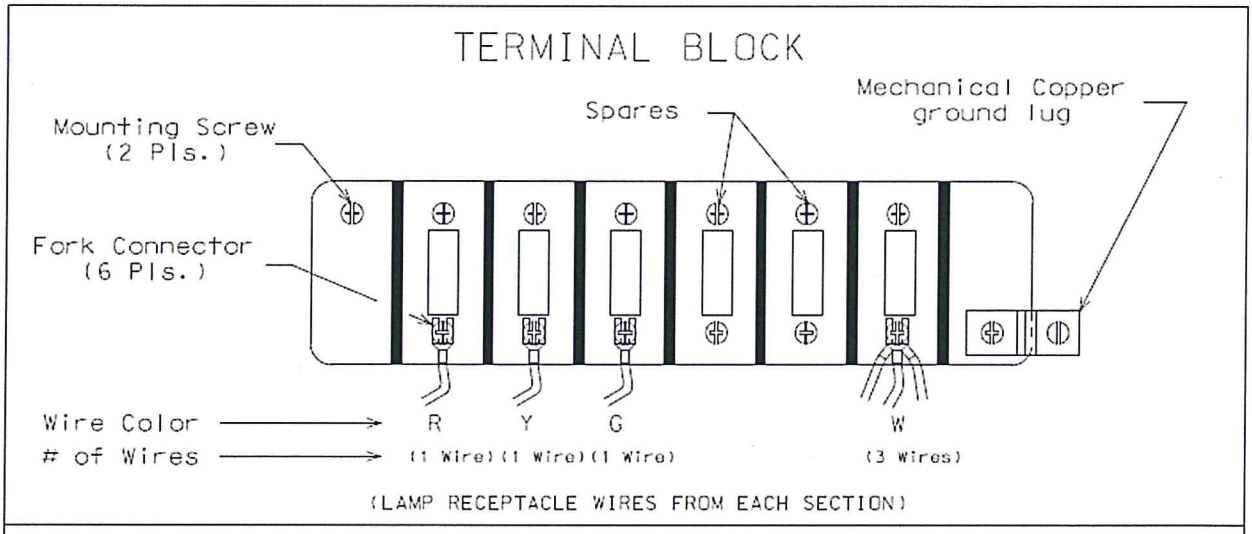
VISOR TYPE	VISOR NAME	LENGTH(12"H)
A	Cap	10"
B	Tunnel	11"

NOTES:

1. Unless otherwise specified, Type A visor shall be furnished as standard.
2. All visor edges shall be deburred and smooth.
3. SEE TCS #1 written specifications for more information.

FIGURE 1 VISOR

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT
TRAFFIC CONTROL STANDARD NO. 1
DRAWN BY: SDM DATE: 03/25/2013



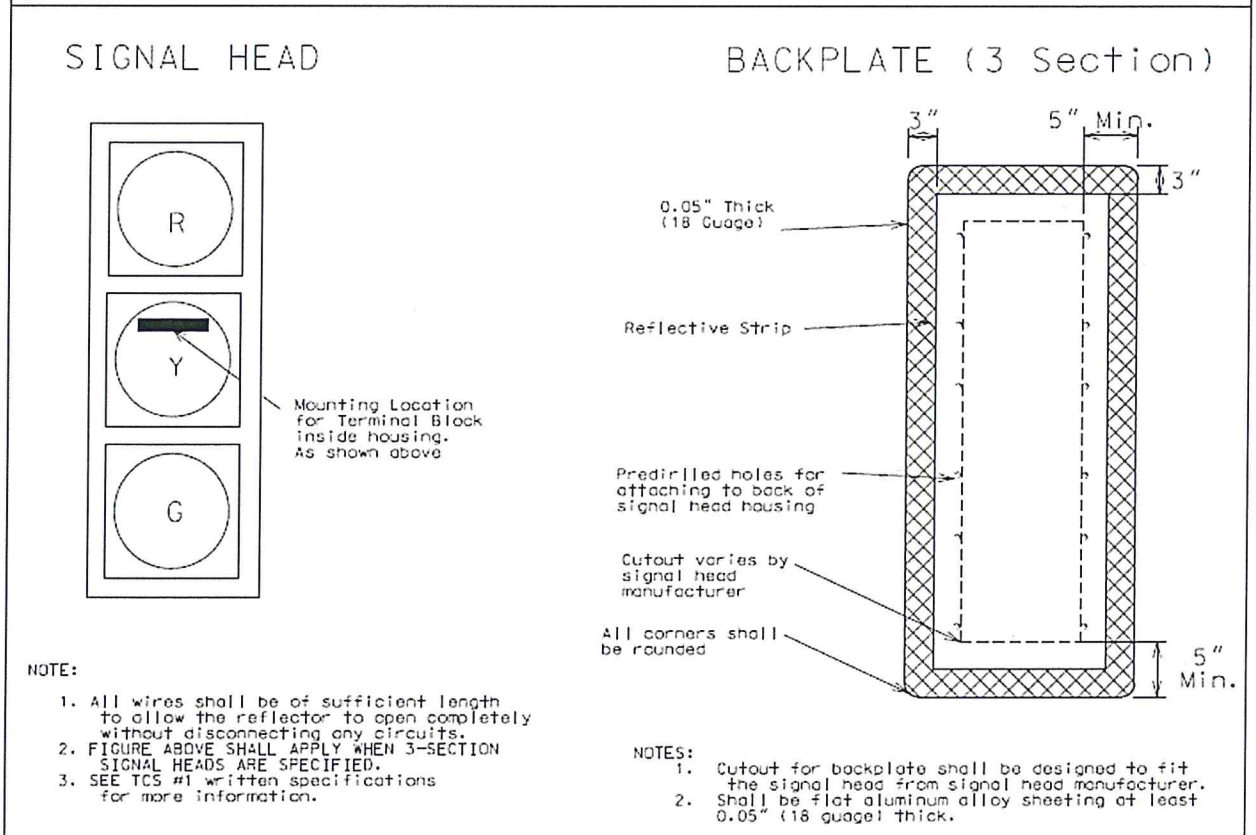


FIGURE 2 3-SECTION SIGNAL HEAD & TERMINAL BLOCK

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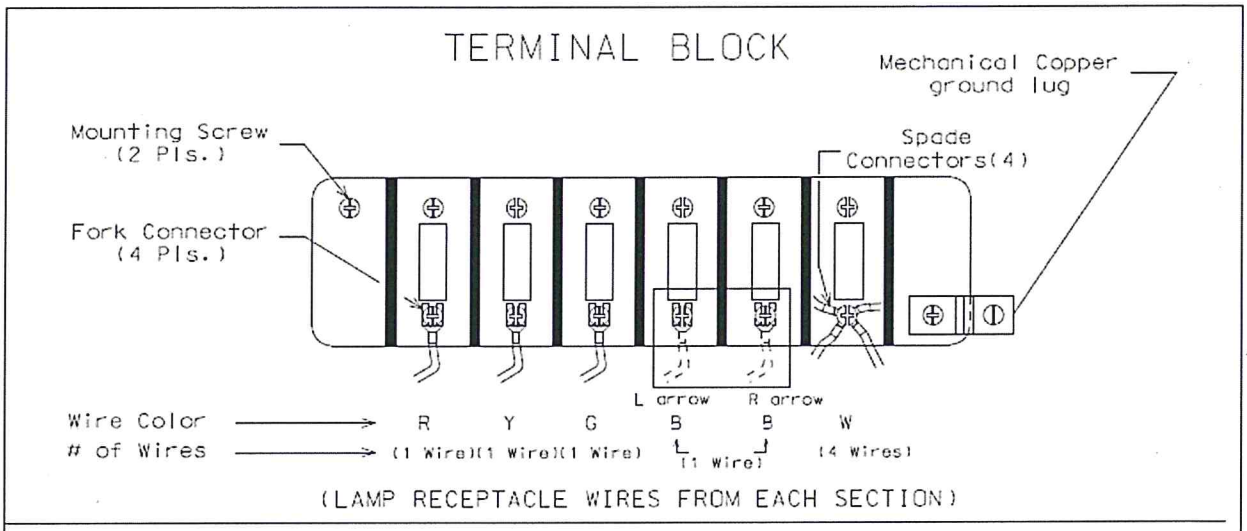
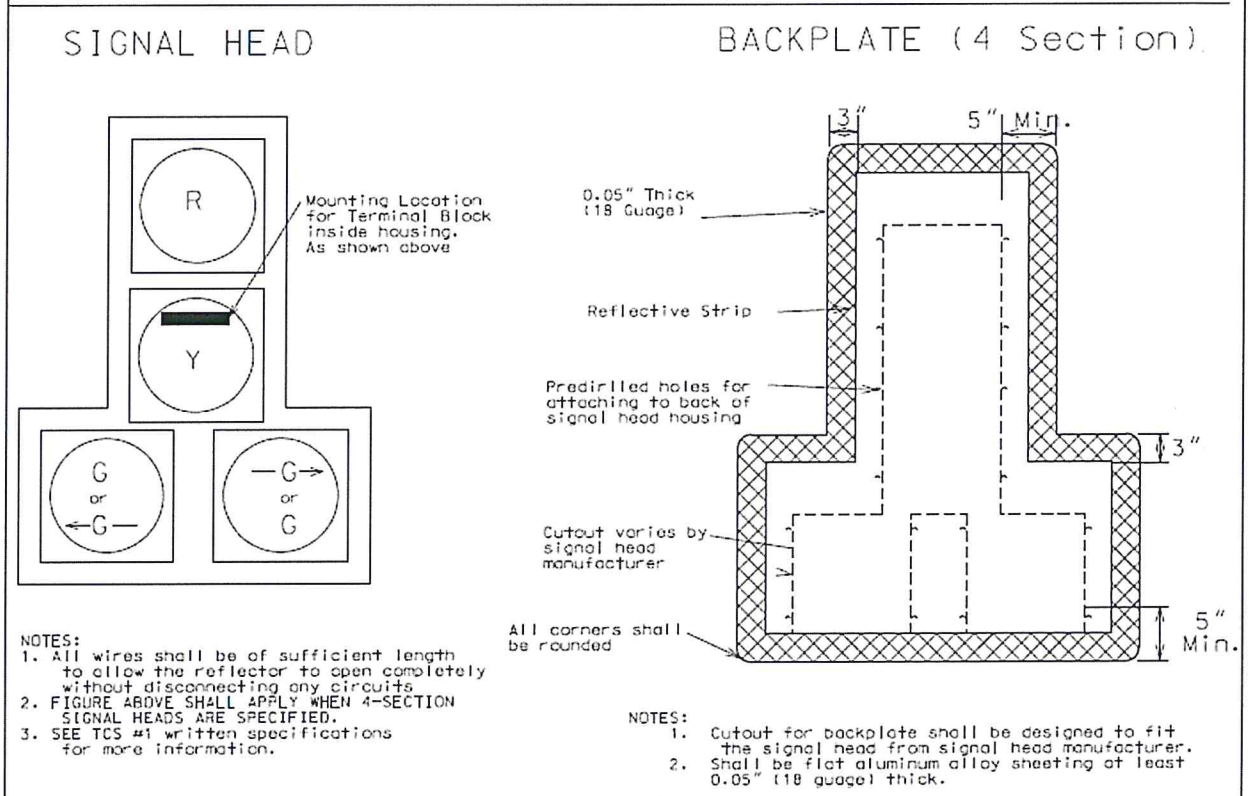
TRAFFIC CONTROL STANDARD NO. 1
DRAWN BY: SDM DATE: 03/25/2013



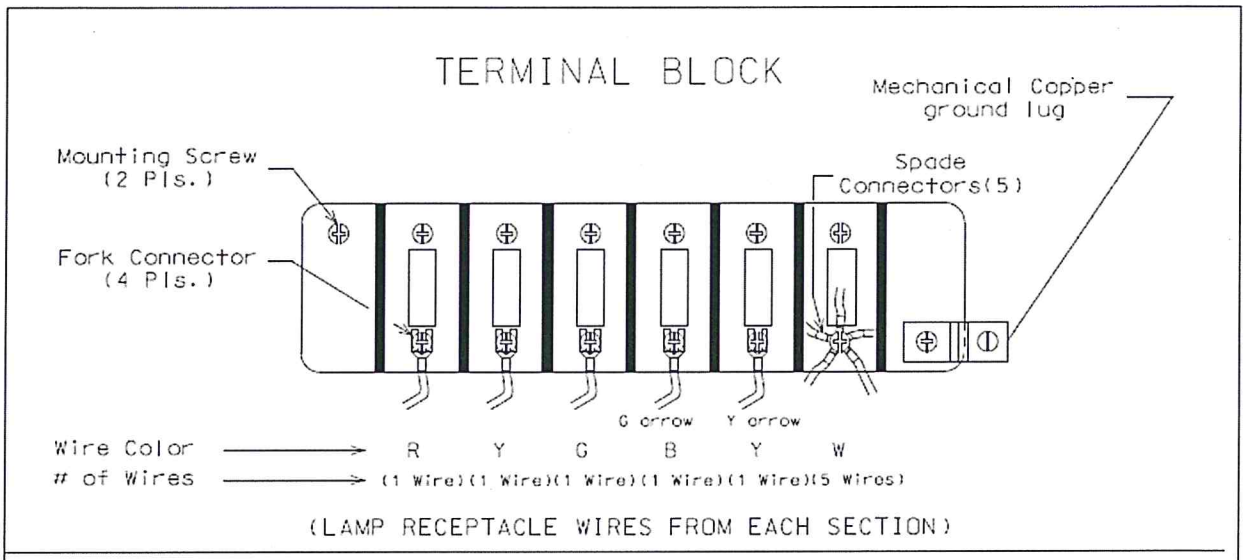


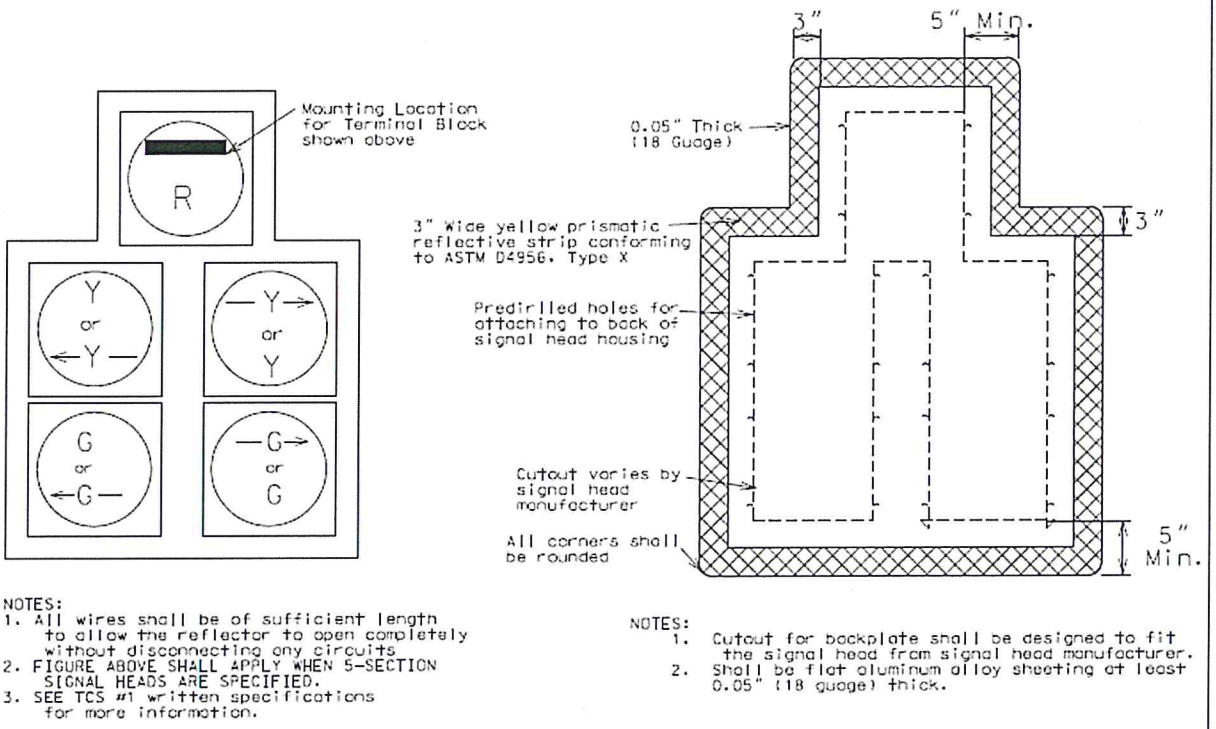
NOTES:
1. All wires shall be of sufficient length to allow the reflector to open completely without disconnecting any circuits.
2. FIGURE ABOVE SHALL APPLY WHEN 4-SECTION SIGNAL HEADS ARE SPECIFIED.
3. SEE TCS #1 written specifications for more information.

NOTES:
1. Cutout for backplate shall be designed to fit the signal head from signal head manufacturer.
2. Shall be flat aluminum alloy sheeting at least 0.05" (18 guage) thick.

FIGURE 3 4-SECTION SIGNAL HEAD & TERMINAL BLOCK

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT
TRAFFIC CONTROL STANDARD NO. 1
DRAWN BY: SDM DATE: 03/25/2013





NOTES:
1. All wires shall be of sufficient length to allow the reflector to open completely without disconnecting any circuits
2. FIGURE ABOVE SHALL APPLY WHEN 5-SECTION SIGNAL HEADS ARE SPECIFIED.
3. SEE TCS #1 written specifications for more information.

NOTES:
1. Cutout for backplate shall be designed to fit the signal head from signal head manufacturer.
2. Shall be flat aluminum alloy sheeting at least 0.05" (18 guage) thick.

FIGURE 4 5-SECTION SIGNAL HEAD & TERMINAL BLOCK

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TRAFFIC CONTROL STANDARD NO. 1
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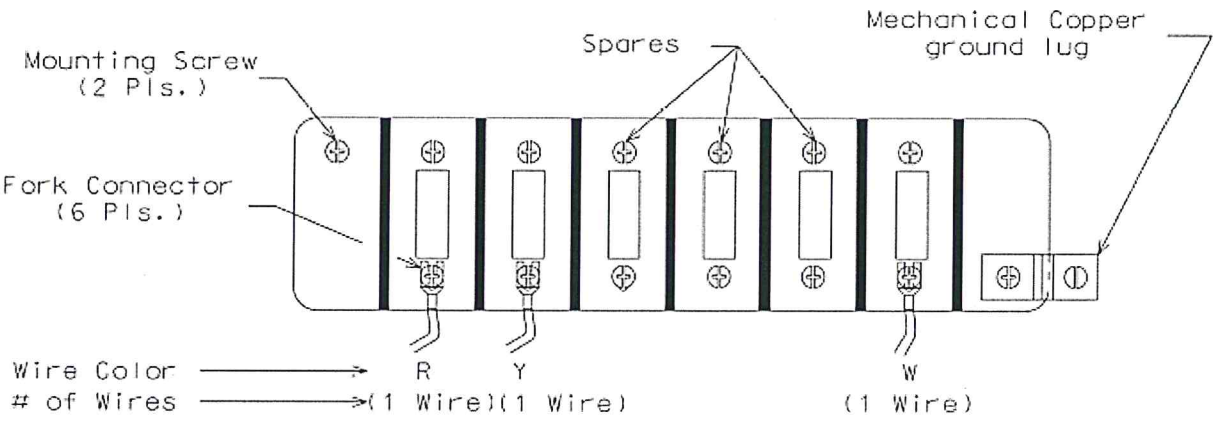
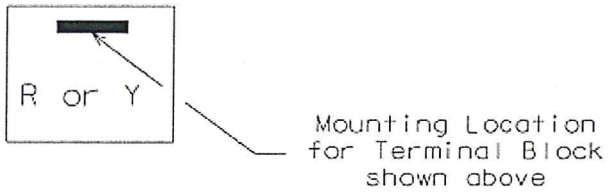
TERMINAL BLOCK

(OPTICALLY PROGRAMMED SIGNAL HOUSINGS MAY USE A 5 POSITION TERMINAL BLOCK)



(LAMP RECEPTACLE WIRES FROM EACH SECTION)

SIGNAL HEAD



NOTE:

1. All wires shall be of sufficient length to allow the reflector to open completely without disconnecting any circuits.
2. FIGURE ABOVE SHALL APPLY WHEN 1-SECTION SIGNAL HEADS ARE SPECIFIED.
3. SEE TCS #1 written specifications for more information.

FIGURE 5 1-SECTION SIGNAL HEAD & TERMINAL BLOCK

LOUISIANA DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT
TRAFFIC CONTROL STANDARD NO. 1
DRAWN BY: SDM DATE: 10/14/2015