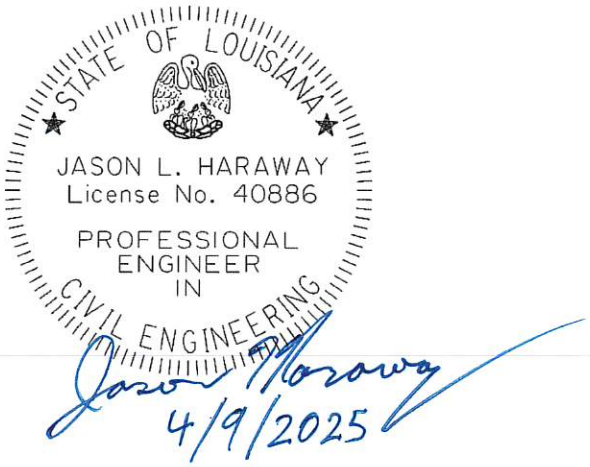
Louisiana
Department of Transportation
and
Development

Traffic Control Standard
Number 2

Optically Programmed
Traffic Signal Head Assemblies



Dated April 8, 2025

DESCRIPTION

This specification sets forth the requirements for optically programmed signal head assemblies. Assemblies must adhere to the requirements set forth in the currently adopted MUTCD as per LADOTD Traffic Engineering Manual. LED modules shall meet the requirements of the Institute of Transportation Engineers (ITE) Vehicle Traffic Control Signals Heads: Light Emitting Diode (LED) Circular Signal Supplement, 2005 and Vehicle Traffic Control Signals Heads: Light Emitting Diode (LED) Arrow Traffic Signal Supplement, 2008 as applicable.

Note: All drawings contained herein are for general design and/or installation information only.

OPTICALLY PROGRAMMED TRAFFIC SIGNAL HEAD ASSEMBLIES

Product ID No. 51342 – 3-Section Optically Programmed Assembly
Product ID No. 56160 – 4-Section Vertical Optically Programmed Assembly
Product ID No. 56161 – 4-Section Cluster Optically Programmed Assembly
Product ID No. 56162 – 5-Section Cluster Optically Programmed Assembly

GENERAL

Each section of an assembly shall be supplied with the following:

- One (1) Cap Visor and Installation Hardware
- One (1) Six (6) Position Terminal Block with Wiring
- Installation Hardware for Lenses

HOUSING

Material

Housing and doors shall be constructed of die cast aluminum or polycarbonate.

Die cast aluminum housings shall meet the requirements of and be an alloy designation listed in ASTM B-85 with a minimum yield tensile strength of 20 ksi. Aluminum must be finished on the outside, with a black powder coating or high-grade black enamel that is peel and chip resistant. Each housings shall be pre-drilled, threaded for the stainless steel machine screws and/or non-corrosive hardware that will be used to attach the visor, lens, and backplate.

Polycarbonate housings shall be constructed of one (1) piece black injection molded resin and include metal inserts that have been threaded for the stainless steel machine screws and/or non-corrosive hardware that will be used to attach the visor, lens, and backplate.

Note: Self-tapping screws will not be accepted in any circumstance.

Doors & Seals

Housing doors must be designed to accommodate the installation of any manufacturer's 12-inch objective lens. Doors shall be hinged and held securely to the body of the housing by a stainless steel locking device. Locking device shall be operable without the use of tools. Hinge pins shall prevent the housing door from accidentally disconnecting from the housing when open, regardless

of the signal position.

A weather-resistant, mildew-proof neoprene or silicone rubber sponge gasket shall be installed between the body of the housing and the housing door to prevent dust and moisture from entering the assembly.

Connections

Multi-section assemblies must be weather tight and securely fastened to each other via a flange/coupler assembly or equal device. To prevent breakage from shock, the portion of the housing that will be adjacent to the mounting bracket shall be reinforced.

Each housing section must be capable of being rotated 360 degrees about its mounting axis and shall be capable of locking at 5-degree intervals horizontally. Locking must be accomplished by the engagement of serrations in adjacent signal sections and the mounting bracket assembly. Housing sections shall have an adjustable connection that permits incremental tilting from 0 degrees to 10 degrees above or below the horizontal while maintaining a common vertical axis through couplers and mounting hardware.

For mounting purposes, the top and the bottom of each traffic signal housing configuration must be able to accommodate a Pelco Model No. AS-0152 and Pelco Model No. SE-0545, or equal mounting devices. Each opening must be provided with a fitting to prevent the entry of foreign material (e.g. dust, insects, and moisture).

The 4-section and 5-section cluster assemblies must be connected utilizing two (2) two-way tri-stud upper arms, Pelco Model No. SE-5059, or equal. See **Figure 5** for general design information.

CAP VISORS

General

Each housing section shall be supplied with a cap visor made of the same material as the housing. Visors shall be detached from the assemblies during shipment. Cap visor hardware shall be securely attached to the assembly during shipment.

Material

Aluminum visors must have a minimum thickness of 0.050 inches and must be finished both inside and out with a black powder coating or high-grade black enamel that is peel and chip resistant.

Polycarbonate visors must have a minimum thickness of 0.100 inches and shall be constructed from one (1) piece of injection molded black polycarbonate.

Design

Visor shall attach to the housing in a manner that makes the light filtration between the door and the visor imperceptible. Once installed, the visor must be capable of supporting the entire weight of the traffic signal.

Visor must tilt approximately 2 degrees to 4 degrees downward from the horizontal and shall measure 10 inches to 12 inches in depth.

Hardware

Cap visor hardware shall consist of stainless steel machine screws and/or noncorrosive hardware.

Note: Self-tapping screws will not be accepted in any circumstance.

TERMINAL BLOCKS AND WIRING

Each terminal block must include two (2) mounting screws, one (1) mechanical ground lug, and six (6) isolated terminals. Each terminal must include at least three (3) 0.25-inch wide male quick connect tabs and two (2) screws. See **Figure 6** for general design information.

Blocks shall be supplied with four (4) color coded (red, yellow, green, and white/black) 14 AWG or 16 AWG wire. Wires shall be long enough to reach the top section and bottom section of the housing assemblies while attached to the terminal block. All wire terminations shall be fully insulated female spade connectors.

LOUVERED BACKPLATES

Product ID No. 56163 – 3-Section Optically Programmed Assembly Backplate
Product ID No. 56164 – 4-Section Vertical Optically Programmed Assembly Backplate
Product ID No. 56165 – 4-Section Cluster Optically Programmed Assembly Backplate
Product ID No. 56166 – 5-Section Cluster Optically Programmed Assembly Backplate

General

All backplates shall be from the same manufacturer as the assembly.

Backplates must securely mount behind the faces of the signal configurations without obstructing any of the door openings nor the mounting assembly.

Material

Backplates shall be constructed of either a minimum 0.120-inch thick black plastic or a minimum 0.060-inch thick aluminum. Aluminum backplates shall be finished, with a black powder coating, a high-grade black enamel that is peel and chip resistant, or a non-chipping, black finish. High gloss finish will not be accepted. For installation purposes, backplates should be capable of supporting the entire weight of the signal assembly.

Design

The backplate shall be louvered with a minimum 2-inch wide retroreflective strip installed around the front outside edge of the backplate. Retroreflective strip shall not overlap onto louvers nor be installed directly on the edge of the backplate. See **Figure 1** through **Figure 4** for general information.

Retroreflective material shall be either Type VIII or XI yellow sheeting meeting the requirements of ASTM D4956 and be an approved product listed on the LADOTD Approved Materials List for Reflective Sheeting, Type VIII, Permanent (1015M00139) or Reflective Sheeting, Type XI, Permanent (1015M00241), respectively.

Hardware

Backplates shall be supplied with the appropriate amount of stainless steel machine screws and/or non-corrosive hardware to affix the backplate to the assembly configuration.

Note: Self-tapping screws will not be accepted in any circumstance.

OPTICALLY PROGRAMED LED MODULES

Product ID No. 50921: Red Optically Programmed LED Module
Product ID No. 50922: Yellow Optically Programmed LED Module
Product ID No. 50923: Green Optically Programmed LED Module

Modules shall be 120 VAC, three (3) prong LEDs with an average rated life of at least 50,000 hours.

OBJECTIVE LENSES

Product ID No. 56167 – Red Ball Objective Lens
Product ID No. 56168 – Yellow Ball Objective Lens
Product ID No. 56169 – Green Ball Objective Lens
Product ID No. 56170 – Red Arrow Objective Lens
Product ID No. 56171 – Yellow Arrow Objective Lens
Product ID No. 56172 – Green Arrow Objective Lens

Objective lenses shall be 12 inches in diameter, high-resolution, planar, incremental lenses that are hermetically sealed within a flat lamination of weather-resistant acrylic. Lenses must be able to be rotated to any 90-degree orientation about the optical axis without displacing the primary image.

Lens holders shall be aluminum. Objective lenses must come complete with a silicone rubber gasket. Gasket shall be installed around the edge of the lens to form a weatherproof seal with the housing.

OPTICAL LIMITER

The optical limiter shall be composed of a heat-resistant glass and include a positive indexing means. The limiter shall provide an accessible imaging surface located at the point of the optical axis for objects 900 feet to 1200 feet in distance, and permit an effective veiling mask to be variably applied as determined by the desired visibility zone.

Note: Each signal section must be supplied with a nominal 2-inch by 3-foot masking material to adjust cone(s) of visibility.

FIGURE 1
3-SECTION OPTICALLY PROGRAMMED SIGNAL HEAD ASSEMBLY

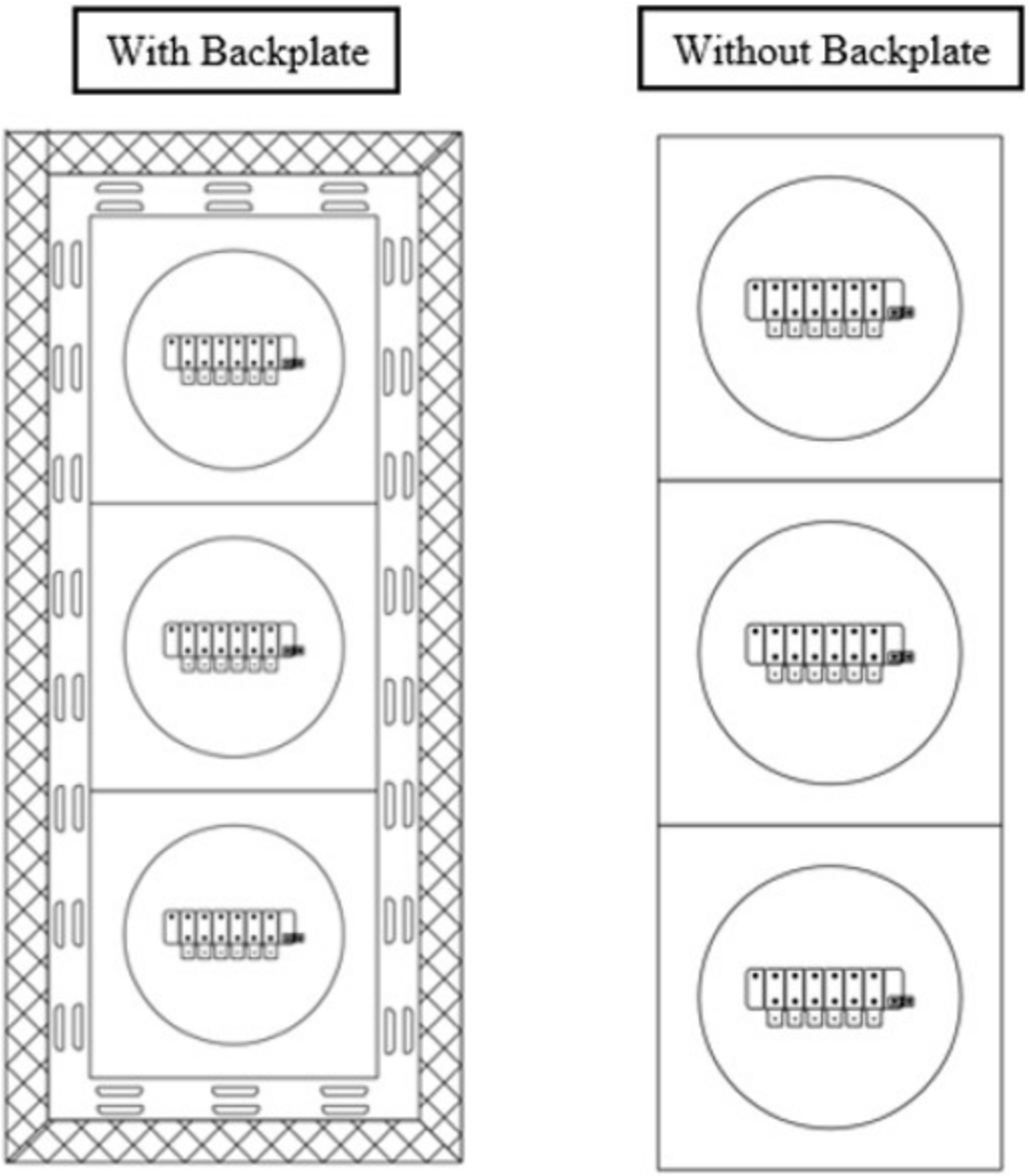


FIGURE 2
4-SECTION VERTICAL OPTICALLY PROGRAMMED SIGNAL HEAD ASSEMBLY

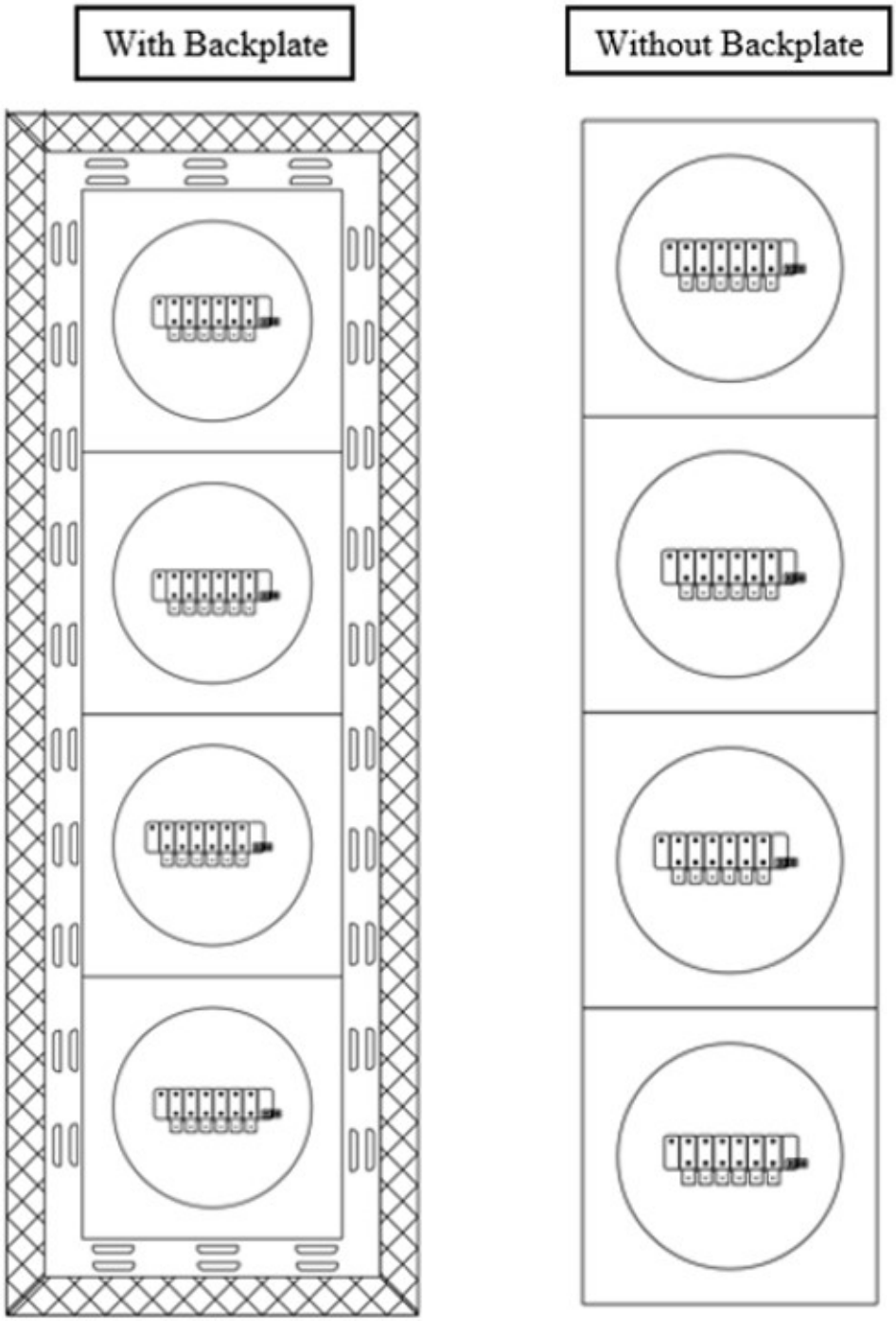


FIGURE 3
4-SECTION CLUSTER OPTICALLY PROGRAMMED SIGNAL HEAD ASSEMBLY

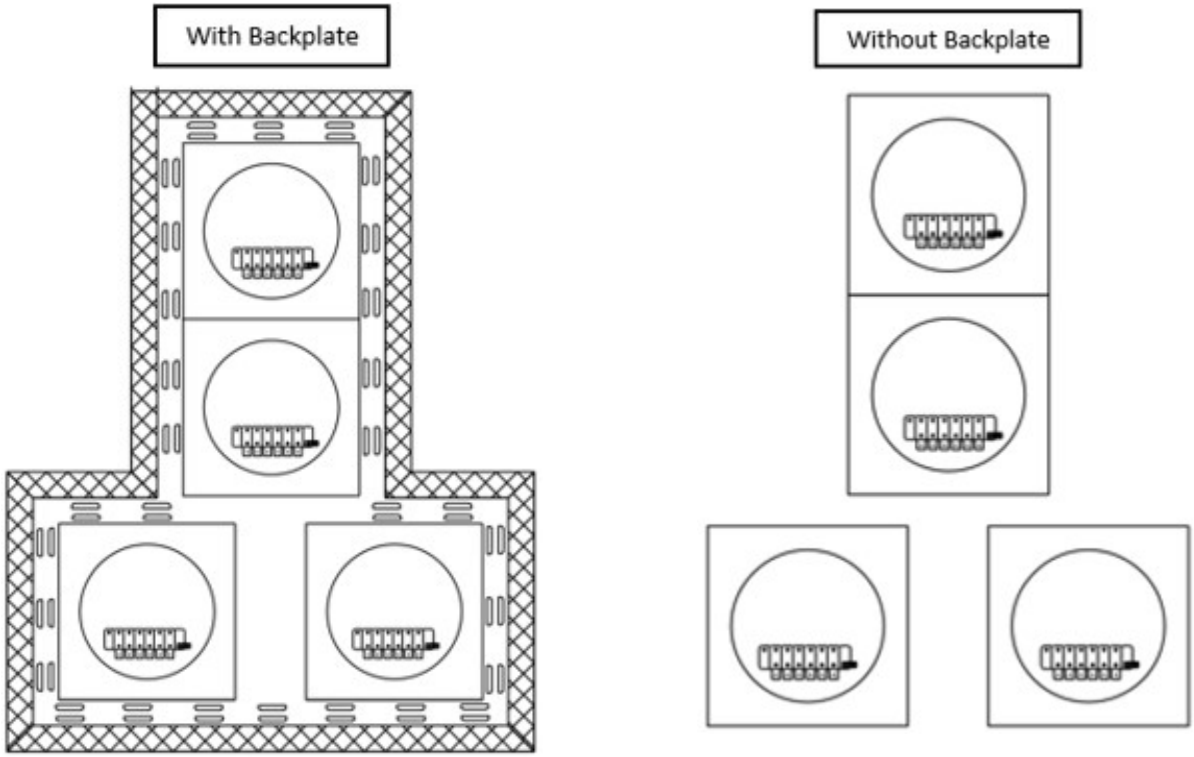


FIGURE 4
5-SECTION CLUSTER OPTICALLY PROGRAMMED SIGNAL HEAD ASSEMBLY

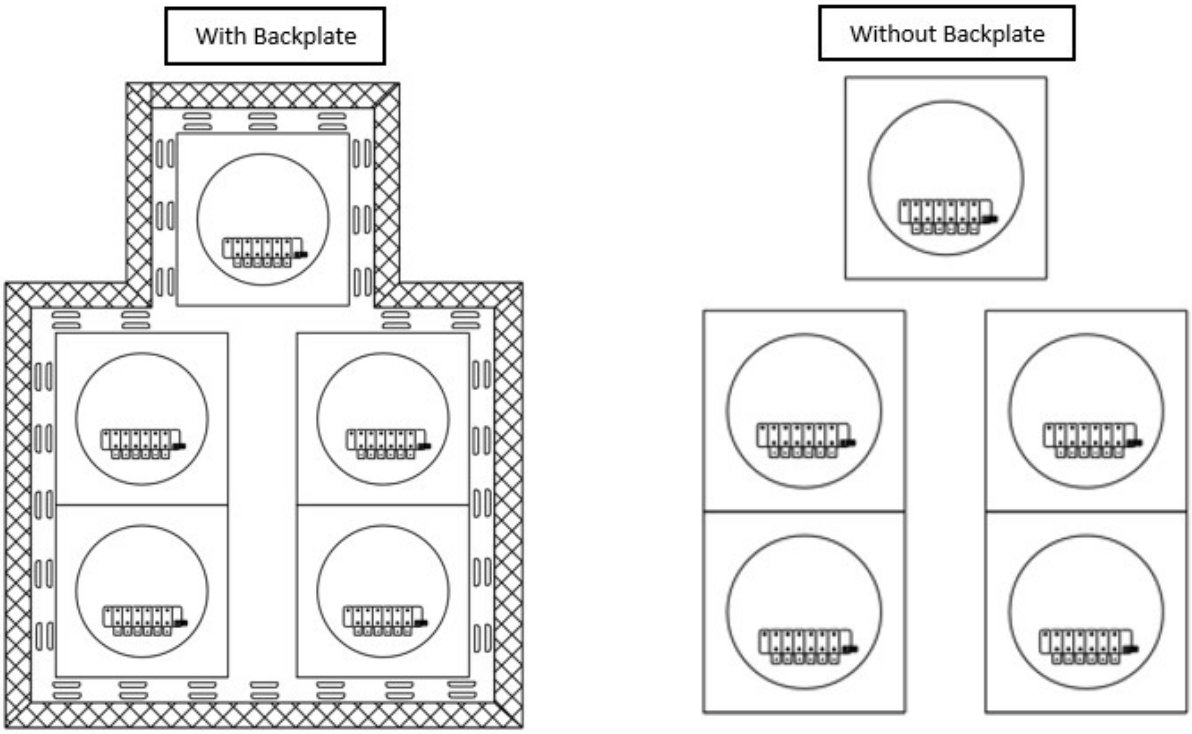


FIGURE 5
TWO-WAY TRI-STUD UPPER ARMS

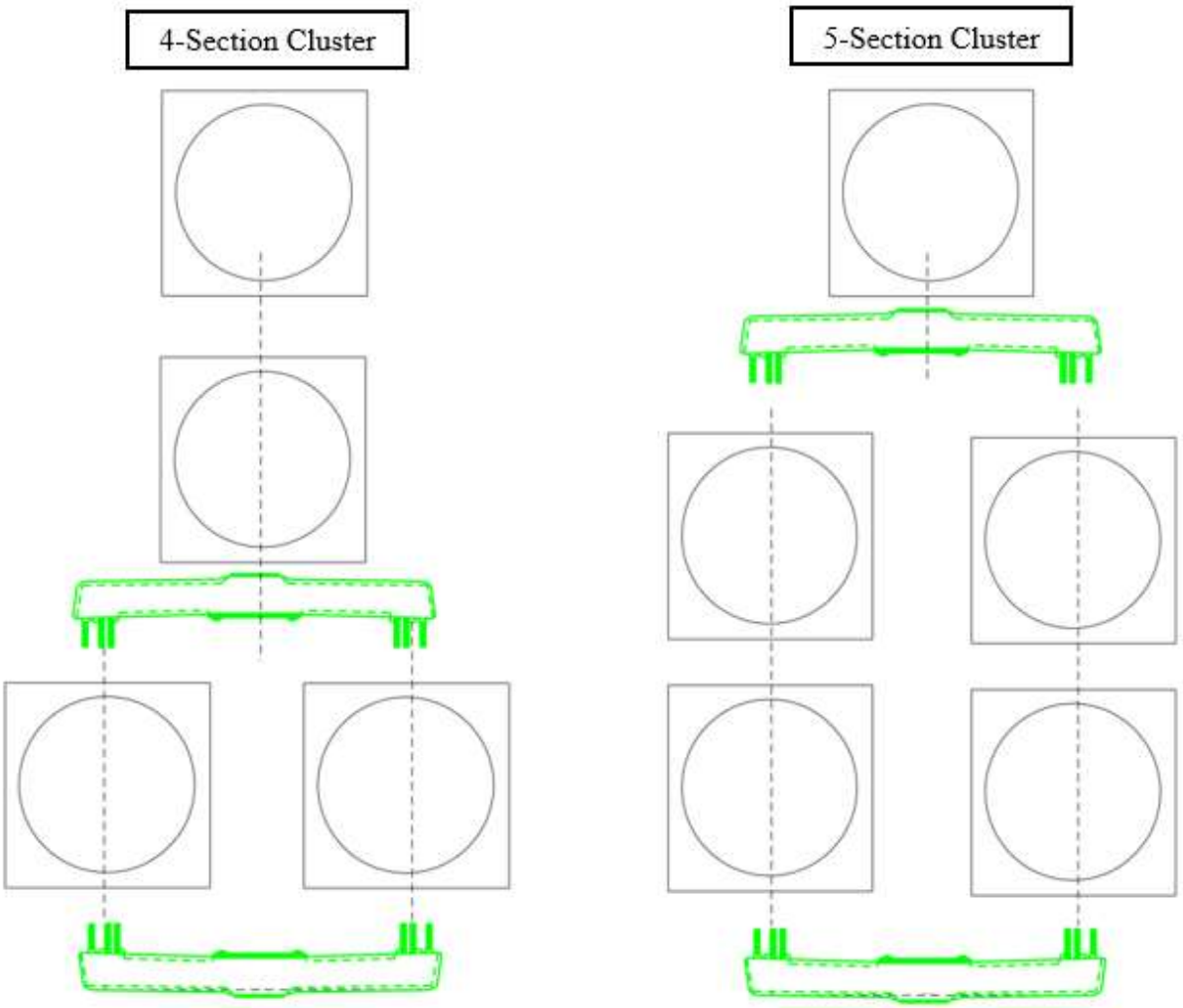


FIGURE 6
TERMINAL BLOCK