

**10-3. STATE-FURNISHED BATTERY BACKUP SYSTEM**The battery backup system (BBS), including inverter/charger, power transfer relay, batteries, a separate manually operated non-electronic bypass switch, hardware and interconnect wiring will be State-furnished as provided under in "Materials" of these special provisions.

The Contractor shall construct each battery backup cabinet foundation as shown on the plans \_\_\_\_\_ for Model 332 and 334 cabinets \_\_\_\_\_ and as directed by the Engineer, including furnishing and installing anchor bolts.

The battery backup system will be furnished and installed by State forces. The Contractor's responsibility for State-furnished battery backup system shall be limited to conforming to the provisions in Section 6-1.02, "State-Furnished Materials," of the Standard Specifications.

The battery backup system will be installed by the Contractor. All necessary hardware and interconnect wiring not supplied as State-furnished, to the Contractor, shall be Contractor-furnished for proper installation and operation. The BBS shall provide reliable emergency power to a traffic signal in the event of a power failure or interruption. The Contractor's responsibility for State-furnished battery backup system shall be limited to conforming to the provisions in Section 6-1.02, "State-Furnished Materials," of the Standard Specifications.

The State-furnished BBS will be capable of providing power for full run-time operation for an "LED-only" intersection (all colors red, yellow, and green) or flashing mode operation for an intersection using red LED's. The State-furnished BBS will be designed for outdoor applications and will be installed inside the State-furnished cabinet, in accordance with the Caltrans Transportation Electrical Equipment Specifications (TEES), dated November 19, 1999, Chapter 1, Section 8 requirements and to all addenda thereto current at the time of projects advertisement.

**Mounting and Configuration**

Inverter and charger unit, power transfer relay and manual bypass switch shall be mounted on the Model 332 cabinet standard EIA-310 rack cage as shown on Figure 2 – Mounting Diagram of the BBS electrical details on the plans.

All interconnect wiring provided between power transfer relay, manual bypass switch and cabinet terminal service block shall be no less than 7 feet of No. 10 AWG wire.

Relay contact wiring provided for each set of NO/NC relay contact closure terminals shall be 7 feet of No. 18 AWG wire.

A minimum of 6 bolts and fasteners shall be used to secure swing-trays to the Model 332 cabinet standard **EIA 482.6 mm rack**. All bolts, fasteners and washers shall meet the following requirements:

Screw type	Pan Head Phillips machine screw.
Size and Thread pitch	10-32.
Material	18-8 stainless steel (Type 316 stainless steel is acceptable as an alternate).
Washer	Use one flat washer (18-8 stainless steel) under the head of each 10-32 screw (provided that the screws are properly tightened, lock washers are unnecessary.)
Number of screws per swivel bracket, minimum	6 screws (minimum) per swivel bracket. Spaced evenly along bracket, with one screw near each end.

Complete BBS, including batteries, shall fit inside a typical, fully equipped Model 332 Cabinet that includes one Model 170 or 2070 controller.

A listing of conductor terminations for the State-furnished BBS, in the State-furnished controller cabinet, will be furnished free of charge to the Contractor at the site of the work.

Batteries shall be swing-tray mounted below the Model 170 or 2070 controller unit supports as shown on Figure 2 – Mounting Diagram of the BBS electrical details on the plans.

### **Functional Testing**

Upon the completion of the installation and connection of the BBS, the order of functional testing shall be as follows:

1. Perform functional testing as outlined in Section 86-2.14C, "Functional Testing," of the Standard Specifications.
2. Perform functional testing with BBS only. Functional testing shall consist of not less than 30 minutes of continuous, satisfactory operation in the presence of the Engineer. If unsatisfactory performance of the BBS develops, the condition shall be corrected by the Contractor and the test shall be repeated until the 30 minutes of continuous, satisfactory operation is obtained.