Composite Frames and Covers Suggested Specification

General
This specification is applicable for composite frames and covers. All products shall be manufactured in the United States of America. All manufacturers shall be approved suppliers and be able to demonstrate that there is an acceptable quality control program at the producing facility prior to supplying products.

Material
Composite products shall be manufactured from fiber reinforced polymer (FRP). It shall consist of a FRP matrix consisting of between 45% to 70% fiber reinforcement by weight. Fiber reinforcement shall consist of fiberglass, carbon, aramid, basalt and/or natural fibers. The polymer matrix shall be thermoset consisting of a polyester, vinylester, epoxy, polyurethane, and/or hybrid chemical composition. The resin matrix must be thermoset.

Manufacture
Composite frames and covers shall be of uniform quality, with a dimensional tolerance of 1/16 of an inch. The finished product will feature a strength to weight ratio of 750:1. There shall be no possibility of corrosion welding between the cover and the frame, preventing damage to the infrastructure when opening. Gasket system shall be integrated to reduce traffic shock and abatement of noise and malodors. Static Coefficient of Friction shall be 0.6 or greater, as described in ASTM C1028 Standard, in both wet and dry applications.

Fatigue Performance
Composite products shall be tested against a fatigue performance consisting of 2 million cycles at 16,000 lbs. There shall be no visible damage, and must meet allowable permanent set for the applicable class. This test must be performed in a manner approximating the field installation as accurately as possible. After the product has gone through the cycle test, it must then pass the proof load requirements of AASHTO M 306 or H-20, depending on product application.

Proof Load Testing
Traffic service castings shall have a first article proof load test conducted and the results of that proof load shall be made available to the purchaser upon request. The proof load shall be conducted in accordance with the method and procedure that is outlined in AASHTO M 306. The product shall be tested on a suitable and calibrated load testing machine and the composite frame and cover shall hold a 50,000 pound proof load for one minute without experiencing any cracks or detrimental permanent deformation.

Inspection
Inspections shall be in accordance with AASHTO M 306. Results of these tests shall be furnished to the purchaser upon request. The production date and product numbers, as cast on the product, shall be the basis of traceability and recording of the tests.

Marking
Each product shall be identifiable and show, at a minimum, the following: name of the manufacturer, country of manufacture (such as "Made in USA"), material designation, and individual part number. Product shall include all lettering as shown on the specification drawings.

Sampling
Random checks of the products may be conducted by the purchaser. These random checks shall be conducted in accordance with specification drawings.