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Electrical Labeling Requirements

Labels are required on the facility, electrical equipment and associated support conduit and wiring for safety reasons and for providing operating instructions and other technical information for facility management personnel. Labeling requirements are specified in several publications including the CPSM, VUSBC, NEC, and NPFA, and within the instructions provided by equipment manufacturers. All applicable labeling requirements must be followed in order to:

- achieve a code compliant design
- simplify operations
- protect life



Certain other labeling may be required by the Authority Having Jurisdiction (AHJ) where, in their judgement, such labels are necessary. Some common labeling requirements are described below.

Labels are not only required for electrical equipment, but may also be required on doors, gates, walls, floors, and conductors. This could include signs to alert individuals of a hazard or of limited access to spaces such as electrical rooms, elevator control rooms, etc.. Electrical clearances are to be marked on concrete floors. Conductors may need to be color-coded depending on their use and system voltages.

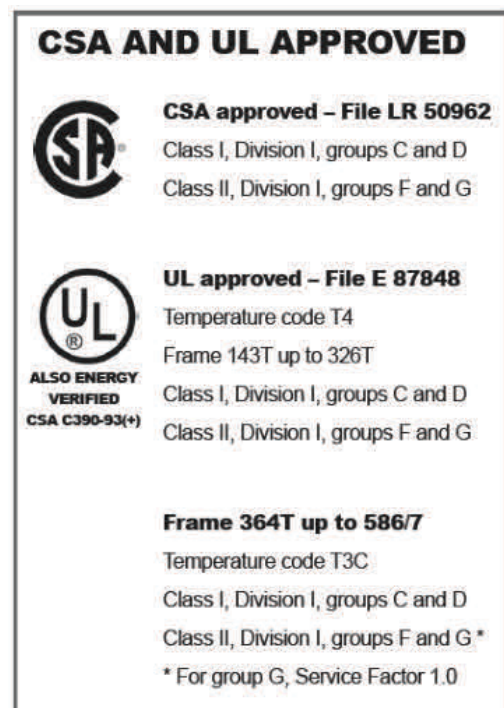
Service entrance equipment contains energized components protected by the utility only. As such, they present special requirements for preventing access and to identify all service entrances available. For all services, provide permanent labels identifying all service entrance equipment, other services present in the facility, and arc flash warnings. In addition, all critical power systems must be identified to include emergency systems (NEC 700), legally required systems (NEC 701), and optional standby systems (NEC 702).

Critical power systems need to be identified to ensure they are handled differently than other circuits. Providing more information for such systems can assist in ensuring their survivability. Provide red marking on fire alarm circuit breaker. Affix the label with the circuit number to fire alarm control panel. Label circuits, raceways, and boxes.



All electrical equipment has potential for some type of labeling. These requirements may include, but are not limited to identifying electrical sources and downstream equipment as required by the AHJ. Provide complete circuit directories and a color code legend at all panelboards. Provide permanent labels with written procedures and other information required by the manufacturer.

All equipment will be listed or recertified by the manufacturer or a Nationally Recognized Testing Laboratory (NRTL) with the listing indicated on the equipment. In addition to these requirements, as part of any construction effort, any requirements provided in contract drawings, specifications, or otherwise by the contract are considered mandatory. The specific means and methods are between the agency and the engineer. Any requests for clarification or direction should be made in a written RFI to the design professional.



Specifying “Basis of Design” for Technical Specifications

Reference: *Construction and Professional Services Manual (CPSM)*
2016 Edition, Rev. 0
Section 6.0.2.2, Basis of Design, and
Section 5.3.9, Types of Specifications

When design professionals specify a “Basis of Design” product, the tendency is to provide specific information with regard to the product used in the design. Often, the specifications do not list additional acceptable manufacturers and their products to the same level of detail as the “Basis of Design” product. It is important to list at least two additional products, identifying the manufacturers, with makes, model numbers, finishes, contact information and other attributes. This information identifies the acceptability of the additional products relative to the “Basis of Design” product.

For example, from a recent specification:

Basis-of-Design Product: the design for accessories is based on products indicated. Subject to compliance with requirements, provide the named product or a comparable product by one of the following:

1. *A&J Washroom Accessories, Inc.*
2. *Bobrick Washroom Equipment, Inc.*
3. *Bradley Corporation*

The specification section went on to list the various toilet room accessories using only Bobrick’s product numbers, but failed to list the product numbers for the other acceptable manufacturers. In order to comply with the CPSM, when product manufacturers are listed, the product numbers must be provided for each manufacturer listed.

CPSM Section 6.0.3.1 Proprietary Specifications

Very often the project team is aware of the need for a proprietary item early in the design of the project. To avoid delays, contact the project’s lead reviewer at BCOM as soon as possible to discuss specifying a proprietary product. The ideal time to identify proprietary products is during the preliminary phase of design.

An example of a justified case for a proprietary specification was the use of a specific manufacturer’s nurse call stations for a Veterans Care Center addition. In this project, the argument for the purchase of the particular manufacturer’s product was the operational need to seamlessly tie the new devices into the existing facility’s system for the benefit of both the patients and caregivers.

CPSM Section 5.3.9 Types of Specifications

In order to understand the background for proprietary specifications, an explanation of the three general types of specifications used on state projects may be helpful:

5.3.9.1 Non-Proprietary and Performance Specifications

This is the preferred method of specifying materials, equipment and systems. A non-proprietary specification shall be written either as (a) a generic performance specification (preferred); or as (b) a specification naming a minimum of three manufacturers with model or series numbers.

(a) A generic performance specification must be written to describe the required characteristics, performance standards, capacities, quality, size or dimensions, etc. of the item or system. A minimum of three manufacturers must be able to meet all requirements shown in the specification. The specification shall not be contrived to exclude any of the three manufacturers or to benefit any one manufacturer over any of the other manufacturers. The performance specification shall not name manufacturers or brand name products.

(b) A non-proprietary manufacturer/model number type specification must list at least three manufacturers with their respective model numbers. Each of the listed manufacturers/model numbers must have been determined by the A/E to meet the specifications and be acceptable. If a named manufacturer pre-packages or pre-assembles its item or system, the model number shall be specified. If the named manufacturer(s) custom builds the item or system, naming of model numbers is not required.

The manufacturer/model type specification must describe the required characteristics, performance standards and capacities which will be used to determine equal products as allowed by Section 26 of the General Conditions. Do not specify extraneous characteristics that do not relate to the product's performance or suitability for the project. If only two acceptable manufacturers can be found and documented by model number but other equal products are acceptable if found by the bidder, the A/E may request permission from the Director, Division of Engineering and Buildings, to list only those two manufacturers but consider equals if proposed by the Contractor.

5.3.9.2 Proprietary Specifications

A specification is proprietary if it specifies a product / requirements which only one manufacturer can meet but the product is available from multiple vendors or sources.

Although a proprietary specification should be avoided because it restricts competition, circumstances such as space limitations, mandatory performance standards, compatibility with an

existing system, etc., may leave no other reasonable choice.

Two typical situations that may require proprietary specifications are:

- When only two manufacturers or suppliers provide an acceptable product or system, when there are no equals and when no substitutions are allowed; or
- When there is only one manufacturer but two or more vendors or suppliers can purchase the material and compete to provide the product or system to contractors or bidders.

Proprietary specifications may be used when the agency requests and receives, in writing, authority from the Director of the DEB to use a proprietary specification. The agency must request authority as soon as the need for the specification is recognized, preferably in the preliminary design stage, but definitely prior to submission of Working Drawings. The request shall explain why the proprietary specification is necessary. If approved to use a proprietary specification, the specification shall state that that "the product specified shall be used to the exclusion of all others and no other product will be considered to be equal."

5.3.9.3 Sole Source Specifications

A specification is sole source when it names only one manufacturer or product to the exclusion of others, or when it is contrived so that only one manufacturer, product, or supplier can satisfy the specification. Because it eliminates all competition, it can be used only in the most exceptional circumstances and under the strictest conditions. A product, piece of equipment or service which is available only thru an area franchised vendor is also considered to be a Sole Source item.

It is the policy of the Commonwealth of Virginia that contracts be awarded on a competitive basis and that the use of a sole source procurement be limited to those instances where only one source is practically available which will meet the specific requirements of the project.

The agency shall obtain approval from the Director, Division of Engineering & Buildings to use a sole source specification / procurement for any and all items of material, equipment or services proposed to be included in the construction contract procurement. Submit the request to DEB using a completed CO-18 (DGS-30-196) with back-up justification, including the "Sole Source Procurement Non-Disclosure Statement" (DGS-30-197), attached to the CO-18.

Prior to advertising the project for bids, the Agency shall either procure the sole source item and specify it as Owner furnished/Contractor installed, or the Agency shall negotiate a fixed price for the item or system with the sole source vendor and require that the vendor provide the specified Sole Source Work as a subcontract to the bidder who is awarded the contract. In the latter case, the Bid Form shall show the vendor's name and the subcontract price for the item/system to be included in the Contractor's bid.