Fiberglass Conduit

1 Scope

This material specification provides minimum requirements for fiberglass conduit and fiberglass conduit fittings. Fiberglass conduit can be laid in the trench as conduit, used as bridge attachment or placed on a pole as a riser. Primary, secondary, or communication conductors can be pulled into this conduit.

2 Applicable Documents

The latest revisions of the following documents in effect on the date of invitation to bid apply to the extent specified herein.

UL 2515, *Aboveground Reinforced Thermosetting Resin Conduit (RTRC) and Fittings*

3 Material Requirements

The fiberglass conduit shall be built to meet or exceed all requirements outlined in UL 2515 except as outlined in this specification. All manufacturers and subcontractors (if the conduit was modified from original manufacturer) must be able to provide appropriate documentation to verify that their product meets or exceeds UL 2515 and is UL-listed.

For conduit that falls outside UL 2515 for aboveground standards, manufacturer shall certify that the conduit is manufactured using UL 2515 and shall have other conduits manufactured with a current UL 2515 aboveground listing.

3.1 Dimensions

The conduit shall be manufactured to IPS dimensions Type AG for aboveground use as shown in Table 1.

Table 1—Material Thickness and Variance (inches)*

Nominal Size	Minimum Inside Diameter	Wall Thickness		Outside Diameter		Maximum Out-of-Roundness
		Min.	Max.	Min.	Max.	
2†	2.215	0.090	0.105	2.365	2.460	0.040
3†	3.340	0.090	0.105	3.490	3.580	0.040
4	4.320	0.090	0.105	4.470	4.560	0.040
6	6.380	0.110	0.125	6.570	6.680	0.060

* All values shown in table shall be met at the stub end.

† This size conduit is larger than IPS.

3.2 Color

Conduit and elbows shall be black with three red longitudinal stripes spaced 120° apart. The width of the painted red stripe shall be between a minimum of 0.75″ and a maximum of 1″. All factory joints shall have a distinctive and visible yellow alignment mark to aid in inspecting the proper joint installation. This yellow mark should be non−visible once joints are correctly joined.

3.3 Markings

All conduits and elbows shall be durably and legibly marked in accordance with UL 2515, Section 6. The marking intervals shall not exceed five feet. Elbows shall have at least one of each marking. In addition, the following information shall be printed on the conduit, in lettering not less than 1″ high:

- Wall thickness (inches)
- UL 2515 listing label
- UL 2515 (required for electrical contractors)
- Manufacturer's name
- Date of manufacturing
- Angle and radius marked on all elbows

If any of the preceding information cannot be printed on the conduit, PacifiCorp's Standards department shall be consulted prior to approval.

3.4 Elbows

All elbows shall meet nominal radius + or −3° as listed in Table 2. All elbows shall maintain a minimum of 85% of their original internal diameter as specified in UL 2515, Section 4.5.3.

Table 2—Elbow Radii

Diameter (inches)	Radii (inches)
2.0	24″, 36″
3.0	36″, 48″
4.0	36″, 48″
6.0	48″, 60″

All elbows shall have one PVC deep-socket coupler and one PVC stub coupler for transitioning to PVC conduit or pole risers. All PVC couplings shall be installed by the manufacturer using fiberglass epoxy. The depth of the deep-socket coupler for conduit diameter is shown in Table 3.

Table 3—Coupler Size and Socket Depth

Nominal IPS Size (inches)	Coupling Length (inches)	Minimum Socket Depth (inches)
2.0	8.0	3.25
3.0	8.0	3.25
4.0	8.0	3.75
6.0	12.0	5.00

3.5 Coefficient of Friction (COF)

The internal conduit walls shall be smooth with all fibers embedded in the epoxy.

The supplier shall provide a friction test report to PacifiCorp at the time of approval showing that a dry fiberglass conduit tested with linear low-density polyethylene cable jacket has a dynamic COF of less than 0.25.

The manufacturer shall also state how frequently a COF test is run to assure quality. Further, if the manufacturer changes process or raw material, PacifiCorp shall be notified of the changes and provided updated information on the COF.

3.6 Elbow Burn-Through Test

The supplier shall provide information on burn-through tests performed on their elbows.

3.7 Quality Assurance Program for Elbows

The manufacturer shall develop and maintain an effective quality control system under written procedures which shall include material controls, test, and inspections throughout the manufacturing process, sufficient to assure that the conduit or elbow shipped meets the requirements of this specification. An ISO 9001 certification is preferred.

The manufacturer shall provide and maintain suitable and adequate facilities for inspection and testing. Inspection records and associated test data shall be made available for examination upon request. Quality assurance records shall be maintained by the supplier for a minimum of one year after shipment.

3.8 Conduit Joining

PacifiCorp requires a gasketed joint on all fiberglass conduits. This gasketed joint shall provide the minimum pullout strength as specified in Table 4.

Table 4—Joint Pullout Strength

Connection Type	Pullout Strength (pounds)
Fiberglass to Fiberglass	500
Fiberglass to PVC	500

4 Delivery

The conduit shall be packaged and delivered in such a way that a forklift can remove the conduit from the side of the trailer.

5 Manufacturing Inspection

Observation by a PacifiCorp representative of the manufacturer, including inspection and testing, shall be at the option of PacifiCorp.

6 Issuing Department

The Engineering and Asset Management Documentation department of PacifiCorp published this material specification. Questions regarding editing, revision history and document output may be directed to the lead editor at (503) 813−5293. Technical questions and comments may be submitted to Stephan Williams, Standards Engineering, (503) 813−6986.

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