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Guidelines for Conduit-in-Casing Construction

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Foreword

The purpose of these guidelines is to describe the benefits, types and sizes, requirements, procedures, and recommended practices for installing conduit-in-casing construction.

These guidelines are in no way intended to assume or replace any responsibilities of engineers, customer representatives, owners, or other persons in establishing engineering design practices and procedures best suited to individual job conditions.

User needs have been considered during the development of this Standard.

The NEMA Polymer Raceway Products Section, through its members, works closely with the American Society for Testing and Materials, appropriate government agencies, and other organizations in the periodic review and revision of its Standards for any changes necessary to keep them up to date with advancing technology. Proposed or recommended revisions should be submitted to:

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These guidelines were developed and approved by the NEMA Polymer Raceway Section. Approval does not necessarily imply that all members of the Section voted for its approval. At the time of approval, the Polymer Raceway Section consisted of the following members:

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Invention

I've done it, I've done it!
Guess what I've done!
Invented a light that plugs into the sun.
The sun is bright enough,
The bulb is strong enough,
But, oh, there's only one thing wrong…

The cord ain't long enough.

The poem "Invention"[1] illustrates the never-ending quest by the power and communication industries to "get the cord long enough." Conduit-in-casing construction is one method that helps make the cord long enough to get from the communication or power source to the consumer. If you can't go over it, can't go around it and, therefore, need to go under it, conduit-in-casing is often the construction method of choice.

[1]Silverstein, Shel. "Invention." Where the Sidewalk Ends. New York: Harper Collins, 1974. 48. Reprinted with permission.

NEMA Guidelines for Conduit-In-Casing Construction

What Is Conduit-In-Casing Construction?

The conduit-in-casing construction procedure is a solution to the problem of laying power/ communication cables under a surface obstruction (highway, runway, rail bed, river, etc.) without disrupting traffic roadbed, rail bed or riverbed. The basic procedure is to:

a. Excavate and shore pits on both sides of the surface obstruction;
b. Bore under the surface obstruction connecting the excavated pits and install a steel casing;
c. Place conduits in the steel casing;
d. Inject grout into the area between the conduits and steel casing;
e. Allow the grout to cure;
f. Pull power and/or communication cables through the conduits.

The steel casing is usually pushed into place with hydraulic jacks, while the earth ahead of the casing is removed with special boring machines or by hand.

Why Use Conduit-In-Casing Construction?

Organization: Conduit-in-Casing construction keeps the conduits organized within the steel casing. The advantage of this method is the precise placement of the casing within the earth. Such precision helps avoid existing underground pipes, cables, and obstructions. The organization also keeps to a minimum underground clutter that might hinder future construction projects. The casing is easily located and avoided by those doing future underground work.

Protection: Conduit-in-casing is the obvious choice when maximum cable protection is a priority. The casing protects mission-critical cables, such as airport cables, from being severed by a natural disaster or construction accident.

Longevity: Conduit-in-casing construction provides the ultimate in longevity. Further, it is usually possible to replace cables by simply pulling out the old cables and pulling in new ones.