

National Electrical Safety Code Committee, Accredited Standards Committee C2

National Electrical Safety Code[®]

Interpretation

Section 9. Grounding Methods for Electric Supply and Communications Facilities

Rule 092E, Point of Connection of Grounding Conductor, Fences (12 March 2002) IR528

The perimeter fence in question surrounds a new generation station and transmission substation and is installed as follows:

1. Grounding conductors are installed 3 ft inside and 3 ft outside the existing fence for the entire length of the fence.
2. The fence posts are conductive. Approximately every 50 ft there is a connection from a fence post to the ground cable for the entire length of the fence.
3. The fence mesh is conductive. The mesh is tied to the conductive posts via conductive tie wraps.
4. Three strands of barbed wire exist above the fence mesh for the entire length of the fence. This barbed wire sits in loose slots of the barbed wire extender/holder, which is connected to the top of each of the fence posts. The barbed wire is not clamped in place. There are no ground connections to the barbed wire other than by virtue of the extender/holder connection to the conductive fence posts and the fact that the barbed wire sits in the loose slots of that extender/holder.

My position is that the barbed wire must have an electrical bond from the barbed wire to the grounded posts or grounding conductor. Rule 092E4 and the NESC Handbook seems to support this position.

Our contractor offers the following interpretation to Rule 092E.

“Rule 092E of the NESC describes grounding methods applicable to fences at electric supply facilities. Paragraph 092E6 of that article requires fences with nonconducting fence posts to have grounding connections to the fence mesh strands and to the barbed wire, at each grounding conductor point. However, Rule 092E5, which addresses fences with conducting fence posts such as used at [the project], calls for grounding connections to “the fence post or posts as required.” Connections to the fence mesh strands and the barbed wire are not specified for fences that have conducting posts. Note that Rule 092E4 calls for grounding of barbed wire strands installed above the fence mesh by connecting the strands to the ground conductor, jumper, or the fence.

Based on the above discussion, the requirements of the NESC regarding grounding of perimeter fences at electric supply facilities are satisfied, and additional grounding connections to the fence barbed wire, mesh, and horizontal rails are not required.”

Our contractor suggests that Rule 092E5 negates the requirements of Rule 092E4. My position (stated above) obviously differs from our contractor's position. Can you please provide the NESC committee's interpretation to Rule 092E4, i.e., do the barbed wire strands need to be bonded (other than by virtue of the barbed wire extender/holder connection to the conductive fence post) to the conductive fence post or grounding conductor?

Also, the fence mesh is held in place by metallic, conductive tie wraps tied to the conductive posts. Rule 092E6 addresses fence mesh grounding—but only for fences with non-conducting fence posts. The fence mesh doesn't appear to be addressed for conductive fence posts in Rule 092E. Can you please provide the NESC committee's interpretation of Rule 092E. as it pertains to grounding of fence mesh on fences with conductive fence posts?

Interpretation

The Interpretations Subcommittee has considered the subject Interpretation Request and has developed a consensus report as follows:

“The intent of Rule 092E is to provide an intentional, conductive path to earth for all metallic fence components, either by direct connection to a grounding conductor or by bonding to another suitable grounded fence component. Note the definition of bonding: “The electrical interconnection of conductive parts...”

Rules 092E1–6, inclusive, provide the requirements for fence grounding. Each rule is independent of the others, to be followed if applicable. Consequently, your position (restated) that the barbed wire strands must be bonded as required by Rule 092E is correct. In general, the barbed wire extender/holders provide mechanical support rather than electrical contact, hence the requirement for bonding. Also, Rule 092E5 does not negate the bonding requirement contained in Rule 092E4; Rule 092E4 applies to conductive fence posts whether or not barbed wire is installed above the fence fabric.

In response to your question regarding grounding of the fence fabric (mesh), you state that metallic ties are used to secure the mesh to the posts and that all of these elements are conductive. Rule 092E5 requires the grounding conductor to be connected to conductive fence posts, as done in your example. This type of installation provides suitable grounding for the fence fabric. Accordingly, additional ground connections to the fabric are not required.”