

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 (2002 Edition, page 18) IR539

The perimeter fences in question surround substations and are installed as follows:

1. Grounding conductors are installed around the existing fence for the entire length of the fence.
2. The fence posts are conductive. Approximately every 50 ft the conductive fence post is connected to the ground grid wire for the entire length of the fence.
3. The gateposts are connected to the perimeter ground grid wire, and the gate is connected to the gate post with a flexible ground wire. See photo below.
4. The fence mesh fabric is conductive and is tied to the conductive posts with conductive tie wraps. See photo below.
5. The barbed wire used above the fence is conductive and is tied to the conductive corner and gateposts with a conductive tie wrap.



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Discussion: The position of the requester is that the installation meets the bonding requirements of NESC Rule 092E. However, a consulting firm doing a focused audit of the requester’s service reliability in New Jersey is recommending that JCP&L extend ground grid conductors to the barbed wire and fence fabric to comply with the bonding requirements of Rule 092E. This consulting firm is interpreting the bonding requirement to mean a connection with wire. The position of the requester is also supported by IR528, dated March 12, 2002, which indicated that fence fabric connected with metallic ties to the conductive fence posts provides suitable grounding for the fence fabric and that additional ground connections to the fabric are not required. The position of the requester is that this same logic applies to the barbed wire, which is connected with metallic tie wraps to the grounded conductive corner and gateposts.

The IR528 response regarding barbed wire is based on the information given that the barbed wire only was sitting in loose slots and was not clamped in place. The response indicated that the barbed wire needs to be bonded and stated that, in general, the barbed wire extender/holders provide mechanical support rather than electrical contact. Herein lies the confusion and possibility for misinterpretation. The IR528 is ambiguous and can be interpreted two ways. IR528 indicates that the fence fabric being connected with conductive tie wraps to the grounded conductive posts satisfies the bonding requirement. The requester agrees. However, the requester also interprets this to mean that if the barbed wire is connected with conductive tie wraps to the grounded conductive posts that this also meets the bonding requirement. Others use the interpretation to mean that the barbed wire needs to be bonded with a grounding wire to the main grounds used for the fence posts. The IR528 is leading down two different interpretation paths and is not clear.

Clarification is requested as to whether or not the connection of the barbed wire and fence mesh with conductive tie wraps to the grounded conductive posts meets the bonding requirement of Rule 092E.

Interpretation

The Interpretations Subcommittee has considered the subject Interpretation Request for Rule 092E and has developed a consensus report as follows:

“The answer to the above question is yes with two qualifications. The connection of barbed wire and fence mesh with conductive tie wraps to grounded conductive posts, as shown in the photographs, meets the bonding requirements of Rule 092E, assuming:

1. The barbed wire is securely attached to the straps or the barbed wire is tensioned in such a manner as to provide a solid electrical contact, and
2. The barbed wire is also electrically connected to intermediate grounded conductive posts if additional grounding points are required. See IEEE Std 80-2000¹ for guidance.

It is not clear that the installation, as shown in the photographs, meets the above requirements.”

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