

**July / August, 2002**

## **Equipotential Planes**

***By: Truman Surbrook,***

Agricultural producers should be reminded when planning new livestock confinement facilities that the Michigan Electrical Code requires an equipotential plane to be installed in concrete floors. An equipotential plane can take many forms, but the easiest method of installation is to lay reinforcement steel mesh in the form before the pour. For best results weld or clamp the steel mesh sheets together. The sheets of steel mesh can also be connected together with a wire wrap. Key to equipotential plane effectiveness is to connect the steel mesh in the concrete to electrical equipment in the area where livestock may make contact such as a heated waterer. The purpose is to prevent livestock from being exposed to stray voltage that may develop between metal equipment and the floor. If a producer or a builder needs information about equipotential plane design and installation, please contact Truman Surbrook, Jon Althouse, or Keith Tinsey at the Agricultural Engineering Department.

Many agricultural producers and farm builders are not aware of this equipotential plane requirement since most agricultural installations are not required to have the electrical wiring inspected. The installation of the metal reinforcing mesh for the concrete floor is generally not a task for the electrician. The builder or concrete contractor needs to be made aware of the equipotential plane requirement. A copper wire not smaller than size 8 AWG needs to be connected to the metal reinforcing mesh and extended up out of the concrete for the electrician to connect to equipment or the electrical panel grounding bus. This wire needs to be sleeved with a short piece of PVC conduit at the point where it emerges from the concrete to prevent it from breaking at some time in the future.

Farm wiring as well as the utility electrical system can be a cause of stray voltage. Equipotential planes installed in milking barns, feeding areas, and around waterers can help prevent livestock from being affected by stray voltage if an electrical problem develops at a farm. If an agricultural producer is concerned about stray voltage all electric power suppliers in Michigan will conduct an evaluation at no charge to the producer. If you would like a list of power suppliers and the number to call, please contact Keith Tinsey.

Keep electrical equipment in good repair. Even though summer is a busy time, it is easier to do electrical repairs before cold weather. Make sure the bare or green safety grounding wire is properly connected for all equipment. If anything goes wrong in the wiring or equipment, that grounding wire will carry fault current safely back to the grounding terminal of the electrical panel. For added protection, install ground-fault circuit-interrupter type receptacles in damp and wet areas where portable tools will be used. If you have questions about electrical repairs, please give us a call.