

2020-2021 FFA/GEMC

Speech/Demonstration Topic

PROBLEM: The contestant will be expected to thoroughly explain the purpose, operating principles and installation of a 60 Amp, 4-wire feeder circuit serving 2 or more branch circuits in an enclosed livestock facility with a concrete floor. Metal livestock stalls, gates, working enclosures and a metal water piping will be installed in the building. Feeder circuit conductors will be run underground in conduit from a service entrance panel in a separate building. The feeder circuit conductors will be stranded, THHN insulated, 6 AWG copper.

Materials List:

The following list of materials will either be attached to the demo frame or laid out for the contestant to use as they explain the installation of the circuits.

- 1 - Eaton, BR12100 100 Amp Main Breaker Service Entrance Panel
- 1 - Eaton, BR12100 Feeder Panel with bonding strap removed
- 2 - Eaton, 60 Amp, Double Pole Circuit Breakers
- 1 - 24" Piece, 3/4" Rigid PVC Conduit, SCH 40
- 2 - 3/4" Rigid PVC Male, Threaded Couplings, SCH 40
- 2 - 3/4" Lock Nuts
- 2 - 3/4" Rigid PVC Couplings, SCH 40
- 1 - 3/4" Rigid PVC Elbows, SCH 40
- 1 - 3/4" PVC Strap
- 1 - 2-2-4 SE Cable, Installed
- 2 - #6 Soft Drawn Bare Copper Conductor installed
- 2 - 5/8" Grounding Rod attached to display board
- 2 - 5/8" Grounding Clamps
- 1 - Clamp, bronze, suitable for attaching the wire mesh/re-bar of an equipotential plane to the system grounding conductor
- 1 - Clamp, stainless steel, suitable for attaching metal enclosures and/or water piping system to the system grounding conductor
- 1 - Piece, #6 Soft Drawn Bare Copper Conductor, not installed
- 1 - Piece, wire mesh
- 1 - Piece, Rebar
- 1 - Galvanized, Stainless or Painted Metal Pipe of a type and size used for livestock gates, water, and/or enclosures
- 2 - 6 AWG, Black, Stranded, THHN Insulated, Copper Conductors
- 1 - 6 AWG, White, Stranded, THHN Insulated, Copper Conductor
- 1 - 6 AWG, Green, Stranded, THHN Insulated, Copper Conductor

References:

2020 National Electrical Code
Agricultural Wiring Handbook, 17th Edition
AAVIM Electrical Wiring 9th Edition
Student Guide to Wiring
Poster Size Schematic Drawing

FY21 EMC Speech Demonstration
60 Amp, 4-Wire Underground Feeder Service to a Livestock Building
with Metal Stalls/Working Enclosures on a Concrete Floor

