

2017-2018 FFA/GEMC Speech/Demonstration Topic

PROBLEM: The contestant will be expected to thoroughly explain the operating principles and installation for 2 multi-wire branch circuits located in a livestock facility with a concrete floor. The branch circuits will consist of two duplex receptacles mounted in a 4" square, weather proof box that will provide access to four, individual, 120V receptacle outlets. The outlets will be located adjacent to bedding stalls and/or livestock grooming areas in the facility and should be considered a damp environment at various times during its use. 12 AWG, THHN insulated, copper conductors will be installed in ½" rigid PVC conduit; each circuit will be protected by 20 amp GFCI circuit breakers. In accordance with local code requirements for agricultural buildings, copper service entrance conductors will be installed in 1" PVC conduit on the service entrance panel and a # 6 bare copper grounding conductor will be installed. Local code also requires that each receptacle be bonded independently from the box. No connections will be made in the service entrance.

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 circuit.

- 1 – 100 A Main Breaker Type, Eaton Service Entrance Panel
- 1 - 1" Schedule 40 Rigid PVC Conduit - 12" long
- 1 - 1" PVC threaded male adapter w/locking ring
- 1 - 1" conduit strap
- 3 - 2 AWG Copper THHN insulated conductors, 24" long
- 1 - #6, soft drawn bare copper grounding conductor
- 2 - 20 amp double pole GFCI circuit breaker
- 1 - Electrical box, wet location, 2 gang, ½" 3 hole, metal
- 1 - Receptacle Cover, weather proof, 4" square box, for two duplex receptacles
- 2 - 20 amp duplex receptacles with tab removed between the un-grounded terminals
- 2 each - Black, Red, White, Green - 12 AWG, Stranded, THHN insulated conductor
- 1 - Green, #12 AWG, THHN insulated grounding jumper w/screw
- 2 - Green, #12 AWG, THHN Insulated grounding jumpers
- 12 AWG insulated spade connectors
- ½" PVC conduit, Schedule 40
- 1 - ½" PVC coupling, Schedule 40
- 2 - ½" PVC 90°sweeps
- 2 - ½" PVC male threaded couplings w/lock rings
- 3 - ½" PVC straps
- 1 - Red solderless connector
- 1 – Roll, white electrical tape
- 1 - Book, Tyvek wire markers
- 1 - Wire crimping tool

References:

- 2017 National Electrical Code
- AAVIM Electrical Wiring
- Agricultural Wiring Handbook – 17th Edition
- Student Guide to Wiring
- Poster Size Schematic Drawing

