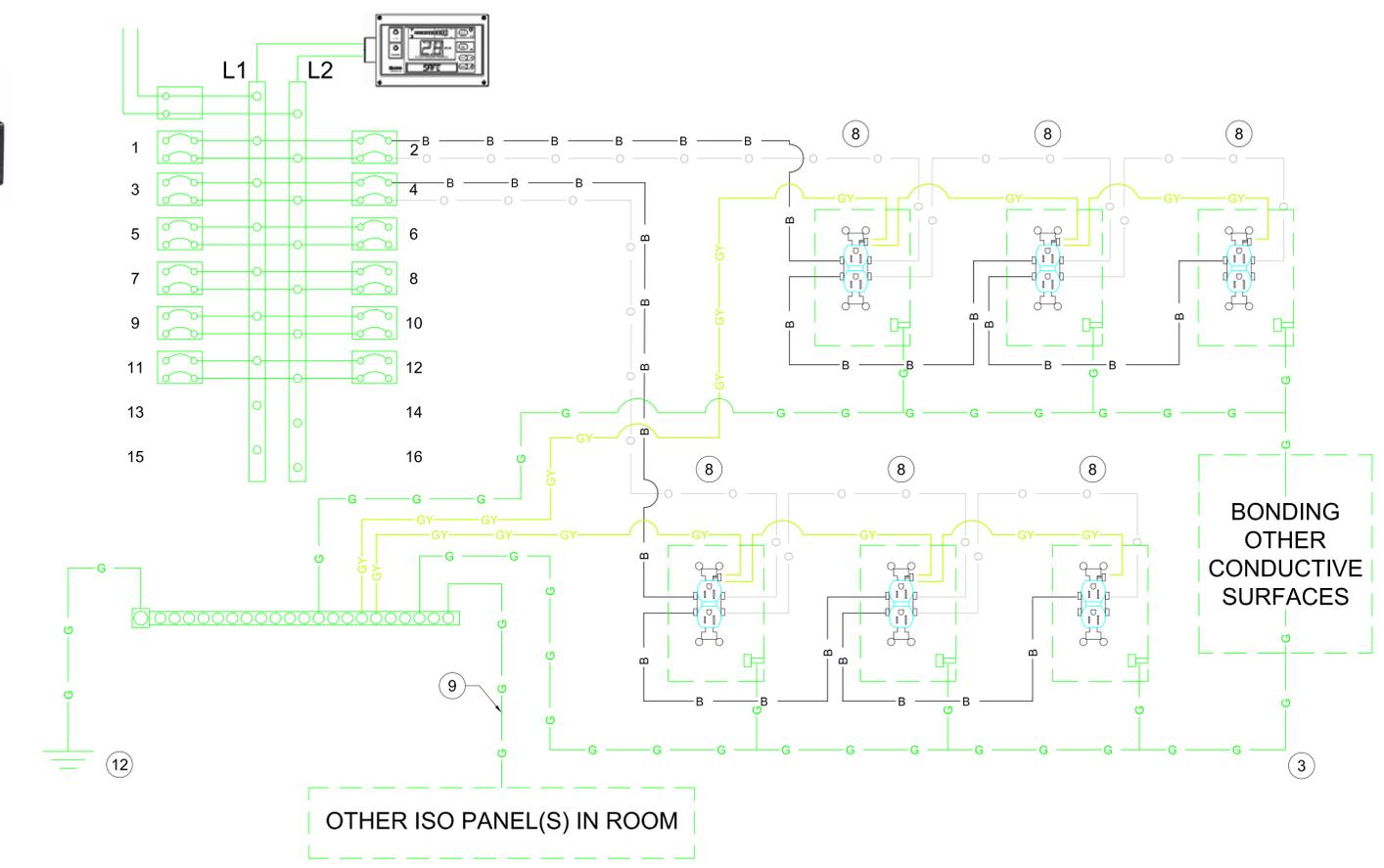
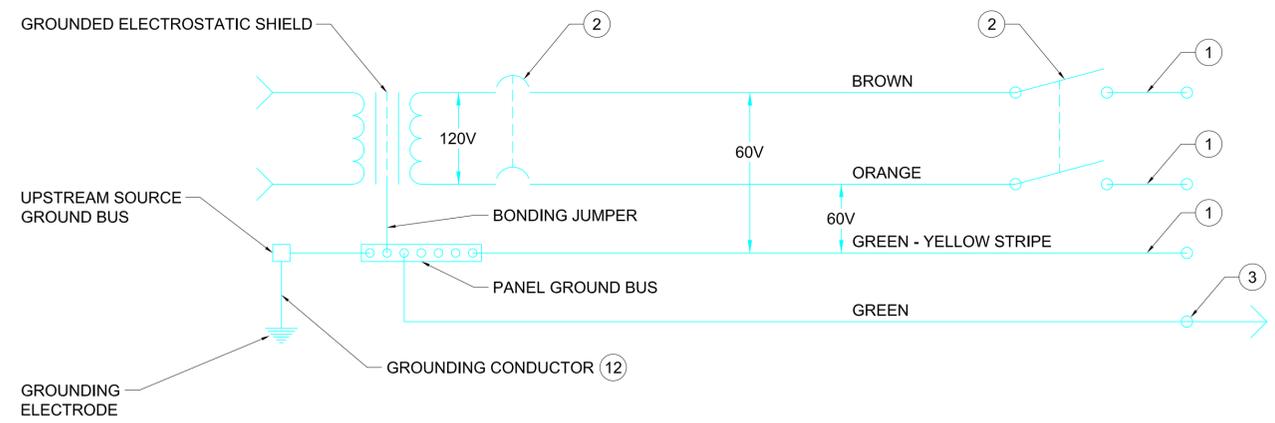
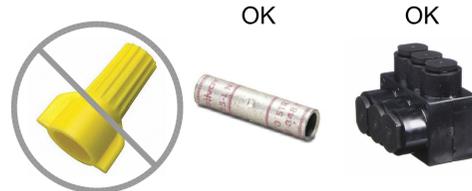
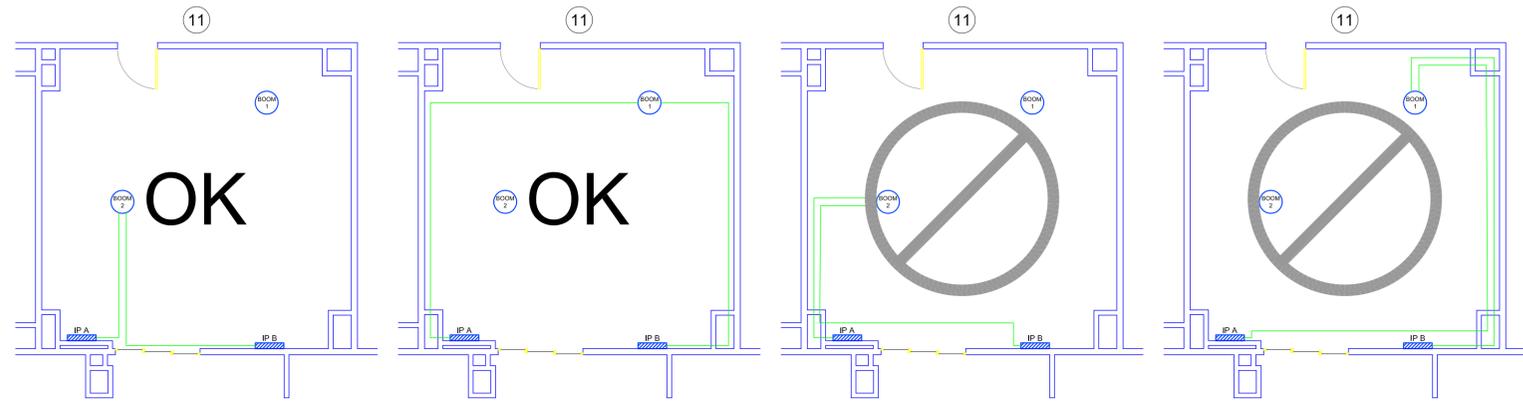


**ISOLATED POWER SYSTEM KEY NOTES:**

- 1 ISOLATED POWER CONDUCTOR REQUIREMENTS:  
DIELECTRIC CONSTANT OF 3.5 OR LESS, (XHHW-2), WIRE SIZE #12 AWG TYPICAL.  
ORANGE WITH A DISTINCTIVE COLORED STRIPE OTHER THAN WHITE, GREEN OR GRAY. TERMINATES ON RECEPTACLE "NEUTRAL" TERMINAL.  
BROWN WITH A DISTINCTIVE COLORED STRIPE OTHER THAN WHITE, GREEN OR GRAY. TERMINATES ON RECEPTACLE "HOT" TERMINAL.  
GREEN W/ YELLOW STRIPE ISOLATED POWER BONDING GROUND, SEPARATE WIRE FOR EACH CIRCUIT FROM "GROUND" TERMINAL TO PANEL.
- 2 OVERCURRENT AND PROTECTION SWITCHES:  
BRANCH CIRCUIT BREAKERS TO BE 2-POLE, SINCE BOTH CONDUCTORS ARE CURRENT-CARRYING.  
HARDWIRED FIXED EQUIPMENT SHALL BE CONNECTED TO 2-POLE SWITCHES (FILM VIEWERS, UNDER-CABINET LIGHTING, BOOM MOTORS).
- 3 REFERENCE GROUND LOOP:  
#10 AWG (MINIMUM) GREEN COMMON GROUND WIRE FOR BONDING BACK BOXES, FLEXIBLE METALLIC CONDUITS, BOOM CHASSIS AND EXPOSED FIXED CONDUCTIVE SURFACES TO THE PANEL GROUND BUS BY TERMINATING AT BOTH ENDS. MAY USE WIRE NUTS.
- 4 CONDUIT FILL REQUIREMENTS:  
USE NONFLEXIBLE METAL CONDUIT IF AT ALL POSSIBLE. INSTALL REDUNDANT GROUND IF FLEXIBLE METAL CONDUIT IS NECESSARY.  
3/4" MINIMUM SIZE, WITH NOT MORE THAN 2 ISOLATED POWER CIRCUITS (6 CONDUCTORS) PER 3/4" CONDUIT.  
1" MAXIMUM SIZE, WITH NOT MORE THAN 4 ISOLATED POWER CIRCUITS (12 CONDUCTORS) PER 1" CONDUIT.  
NEVER USE WIRE PULLING COMPOUNDS!
- 5 WIRING SPLICES:  
MINIMIZE ISOLATED POWER CONDUCTOR (ORANGE, BROWN, AND GREEN/YELLOW STRIP) SPLICES AS MUCH AS POSSIBLE. IF SPLICES ARE NECESSARY, THEN USE COMPRESSION SPLICES. DO NOT USE WIRE NUTS.
- 6 WIRING DEVICES:  
USE HOSPITAL GRADE RECEPTACLES ONLY, PER NEC 517.  
DO NOT USE ISOLATED GROUND RECEPTACLES, PER NEC 517.  
DO NOT USE GFCI, SURGE PROTECTION POWER TAPS, OR ANY OTHER DEVICE THAT HAS A RELATIONSHIP WITH AN EQUIPMENT GROUND TO OPERATE.  
LINE INTERACTIVE UPS HAVE AN INHERENTLY HIGH LEAKAGE CURRENT. USE ONLY DOUBLE CONVERSION UPS IN THE ISOLATED POWER SYSTEM, IF REQUIRED BY THE MEDICAL EQUIPMENT.
- 7 LIMIT TOTAL LENGTH OF BRANCH CIRCUIT CONDUCTORS FED BY ONE ISOLATED POWER TRANSFORMER TO 480 FEET:  
MINIMUM IMPEDANCE TO GROUND  $\geq 200 \text{ K}\Omega$  AT COMMISSIONING PER NFPA 99 6.3.2.6.  
THEREFORE MAXIMUM ALLOWABLE SYSTEM HAZARD CURRENT =  $120 \text{ V} + 200 \text{ K}\Omega = 600 \text{ MA}$ .  
TYPICAL PANEL LEAKAGE = 50 MA (INTERIOR DEVICES) + 25 MA (10 KVA TRANSFORMER) = 75 MA.  
REMAINING ALLOWABLE LEAKAGE FOR CIRCUIT CONDUCTORS =  $600 \text{ MA} - 75 \text{ MA} = 525 \text{ MA}$ .  
LEAKAGE CURRENT OF XLPE CABLE IS 1 MA/FT IN METALLIC CONDUIT PER IEEE 602-2007. USE CONSERVATIVE VALUE OF 1.1 MA/FT.  
TOTAL RECOMMENDED CIRCUIT CONDUCTORS LENGTH =  $525 \text{ MA} + 1.1 \text{ MA/FT} = 477.27 \text{ FEET}$ .
- 8 RECOMMENDED LIMITING CIRCUITS TO NO MORE THAN THREE DUPLEX RECEPTACLES (6 OUTLETS) EACH:  
THE LINE ISOLATION MONITOR IS TESTING FOR A WORST CASE SCENARIO, THEREFORE ADDING ADDITIONAL EQUIPMENT TO A CIRCUIT CAN CAUSE ADDITIONAL LEAKAGE TO THE MONITORED CIRCUIT.
- 9 BOND THE ISOLATION PANEL GROUND BUSS TERMINALS WITHIN EACH ROOM WITH A #6 AWG GREEN GROUND WIRE:  
THIS WIRE IS TO CONNECT TO NO OTHER DEVICES IN THE ROOM.  
THIS ISOLATION PANEL GROUND BUS TERMINAL BOND WIRE IS NOT TO EXTEND INTO ANY OTHER ROOMS.
- 10 CONFIRM EQUIPMENT MANUFACTURER'S LISTED LEAKAGE CURRENT RATING PRIOR TO INSTALLATION:  
**WALL MOUNTED DIGITAL CLOCKS, UNDER-CABINET LIGHT FIXTURES, AND OTHER HARDWIRED (I.E. NOT PLUGGED INTO RECEPTACLES) HAVE PREVIOUSLY BEEN KNOWN TO HAVE HIGH LEAKAGE CURRENT VALUES WHEN INSTALLED, THEREBY LIMITING THE ISOLATED POWER SYSTEM LIM CAPACITY. CONFIRM WITH AHJ IF THESE FIXED-MOUNTED EQUIPMENT WITH NON-MOVEABLE ELEMENTS COMPLETELY LOCATED OUTSIDE OF THE PATIENT VICINITY ARE EVEN REQUIRED TO BE SUPPLIED WITH ISOLATED POWER.**
- 11 DESIGN AND INSTALL ELECTRICAL CONDUITS IN MANNER THAT MINIMIZES CIRCUIT LENGTH:  
COORDINATE WITH OTHER TRADES AND SYSTEMS TO PROVIDE THE MOST DIRECT ROUTE FROM THE PANEL TO THE LOAD.
- 12 INCOMING GROUNDING CONDUCTOR:  
THE EQUIPMENT GROUNDING CONDUCTOR FROM THE 277 VOLT PANEL BOARD SERVICE SHALL BE A MINIMUM OF #8 AWG.
- 13 MODULAR WIRING MODULES PROHIBITED:  
DUPLEX RECEPTACLE OUTLETS WHICH ARE CONNECTED TO WIRING MODULES ARE PROHIBITED FOR USE ON ISOLATED POWER CIRCUITS. STANDARD BACK OR SIDE WIRE TERMINATIONS ARE PREFERRED.



**1 ISOLATED (UNGROUND) SYSTEM**  
E-IP-1 NO SCALE



**2 CONDUIT FILL REQUIREMENTS**  
E-IP-1 NO SCALE

BEST PRACTICES  
1 OF 2  
INSTRUCTIONS

ISOLATED POWER SYSTEMS

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