MedLux® XLS-3
INSTALLATION MANUAL

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US Patent Nos. 7,629,570 and 8,025,424

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1.0 SAFETY

For the safe handling, installation and operation of the MedLux® XLS Lighting System, a thorough review and understanding of the material written in this manual must be completed before starting the installation process. Failure to properly install the MedLux® XLS System per these instructions will void your warranty. There are no serviceable components in the MedLux® XLS System. Attempting to repair or alter the MedLux® XLS System in any way will also void your warranty. Always install MedLux® XLS components according to all local, state, and national codes.

⚠ WARNING

Additional supports and/or hangers for the drop ceiling grids and MedLux® XLS fixture(s) are recommended and necessary in earthquake zoned areas or when required by local/state safety codes.

Other Important Safety Requirements and Precautions:

- ✓ All MEDLUX ® XLS System components are designed for indoor use and installation ONLY.
- ✓ MIN 90°C SUPPLY CONDUCTORS
- ✓ DO NOT INSTALL INSULATION WITHIN 76 mm (3 in) OF ANY PART OF THE LUMINAIRE
- ✓ DESIGNED FOR SUSPENDED CEILING APPLICATIONS; HARD CEILINGS MAY REQUIRE ACCESS PORTS
- ✓ DRY LOCATIONS ONLY
- ✓ ACCESS ABOVE CEILING REQUIRED
- ✓ Make sure that all required safety equipment is present and all workers are familiar with the local safety codes.
- ✓ Observe proper precautions when working in an MRI suite**. Always assume the magnet is active!**
- ✓ Installation requires one separate 120-VAC branch circuit (rated at 20 Amps) to power up to (32) XLS-3 fixture(s).
- ✓ Class 2 wiring (e.g. for dimmer cables between the XLS units).
- ✓ The MEDLUX® XLS System is not intended for use in air handling spaces.

⚠ DANGER

POWER TO MEDLUX® SYSTEM MUST BE DE-ACTIVATED BEFORE ATTEMPTING TO WIRE OR SERVICE THIS PRODUCT AT ANY TIME.

2.0 APPROVALS

1. **UL/cUL:** The MedLux® XLS system is constructed as an Indoor Recessed Down light per UL 1598, LUMINAIRE STANDARD (US) and CSA C22.2, No 9, No 250, CSA E598-2-2-98-CAN/CSA (Canadian) Requirements.
2. **LOCAL AUTHORITY:** The subcontractor/installer should secure permits with the appropriate authorities.
3. US Patent No. 7,629,570 Other patents pending

3.0 INTRODUCTION

3.1 SCOPE

This manual provides instructions for the installation of a MedLux® XLS-3 System. All MedLux® XLS System components are designed for Indoor use ONLY. For assistance during the installation process or operation there after, please contact Everbrite Lighting at 1-800-610-6053 between 8:00 am and 5:00 pm CST.

3.2 SYSTEM COMPONENTS SUPPLIED

The following components are included in the MedLux® XLS-3 System purchased:

- MedLux® XLS-3 Light Engine with Driver Assembly
- Trim Rings (round or square depending on order) and (2) Spanners
- Installation Instructions

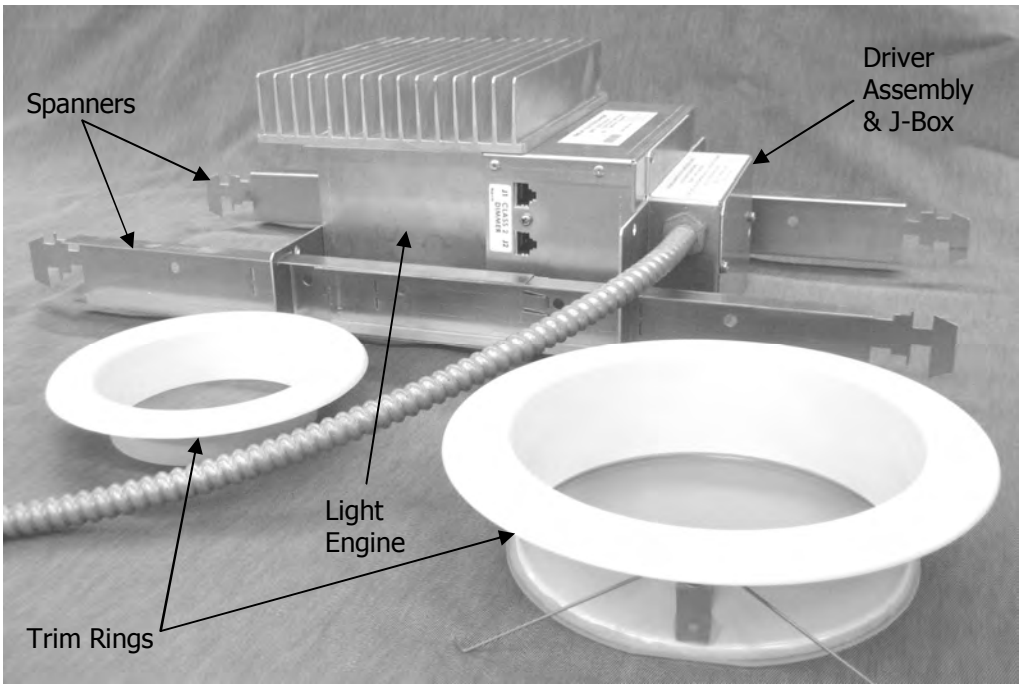


Figure 1: MedLux® XLS-3 Fixture Assembly

NOTE: MedLux® XLS-3 fixtures come with one Trim Ring (round or square). The customer specifies which Trim Ring configuration is desired and what color (white matte, alzak or custom color) when purchased.

3.3 OPTIONAL COMPONENTS

The following components are included in the MedLux® XLS System with dimmer option for shield or control room installations:

- MedLux® XLS Dimmer Module
- MedLux® XLS Dimmer Power Supply w/Class 2 PLTC power cable, 120V:16V "Bell" Transformer
- 10' Lamp Interconnect Cables (one fewer than the number of lamps purchased; shielded)
- 25' Lamp Drop Cable & Dimmer Interconnect Cable (shielded)
- (1) 100' Dual Twisted-Pair PLTC Cable for Control Room Installations only
- (1) 25' Patch Cable for Shield Room Installations only (shielded)
- Two Zone Drop Cable Connector Box for Control Room Installations only

3.4 SYSTEM COMPONENTS NOT SUPPLIED

⚠ WARNING

All components supplied by the installer for use inside an MRI room facility must be non-ferrous.

The following components are not supplied by Everbrite Lighting and must be made available by the customer to complete the installation process:

- Class 1 Conduit / box for incoming mains power wiring, reset switch and ceiling grid components
- Class 1 Conduit and fittings for the AC branch wiring between the MedLux® XLS Fixture(s) and the EMI Facility Filter
- EMI Facility Filter, minimum ratings: 120VAC, 20A. (1 circuit supplies up to 32 lights)
  NOTE: The filter used in the installation must be safety agency listed.
- XLS System Reset switch, a standard SPST light switch rated for 20A, or equivalent.
- Drop Ceiling Grid Supports, Hangers, or other hardware as required by National and Local Building Codes
- Dimmer Signal Filter (if dimming is used), 2 CH, 60VAC/DC (minimum), .5A, 0-14KHz into 200 Ohms, 100db Min. Attn.

3.5 TOOLS AND MATERIALS

⚠ CAUTION

All tools must be approved for use in a MRI suite (Always assume the magnet is active!).

The following items are recommended for the installation of this product.

- Tape Measure and Ladder(s)
- Wire Strippers
- Screwdrivers appropriate for hardware
- Drill with hole forming bit or saw appropriate for thru-wall EMI Dimmer Filter Installation (Optional)
- Channel Locks or Adjustable Wrench for EMI Filter Nut (Optional)
- Additional grid ceiling support wires as needed (must be non-ferrous)

3.6 GLOSSARY OF TERMS

MedLux® XLS-3 Light Fixture Assembly	The mechanical/electrical sub-assembly comprised of the LED light engine, driver assembly and electrical J-box. See Figure 1.
MedLux® XLS-3 Trim Rings	Decorative rings that are attached from the room side of the ceiling tile to the Light Fixture Assembly. See Figure 1.
MedLux® XLS Spanner Rails	Adjustable brackets used to attach the Light Fixture Assembly and the ceiling grid. See Figures 1 and 5.
MedLux® XLS System Reset switch	An electrical disconnect switch wired into the mains feed to the facility filter that supplies power to the XLS lighting circuit. This would normally be located in the equipment room. See figure 16.
MedLux® XLS Dimmer Module	The mechanical/electrical sub-assembly that sends each XLS lamp control information which is proportional to the setting of the desired illumination level. See page 15.
MedLux® XLS Dimmer EMI Filter	A filter assembly designed to prevent EMI (Electromagnetic Interference) from getting in the MRI room. This filter is **NOT** supplied as part of the optional MedLux® XLS Dimming System and is not necessary for non-MRI applications. See page 16.
MedLux® XLS Dimmer Interconnect Cables	The connecting cables between the Dimmer module, Dimmer filter, and XLS fixtures.

4.0 PRE-INSTALLATION

4.1 PRODUCT DELIVERY AND INSPECTION

Upon delivery, **immediately** remove the MedLux® XLS product from its packaging. Inspect the product to ensure that nothing is damaged and that all components have been received. **Immediately** notify the Freight Company of any damaged components. Damaged product must not leave the loading dock until the shipper can verify claim. Customer is responsible for any damage not reported within fifteen (15) days of receipt of shipment.

4.2 SITE PREPARATION

Before beginning site work, notify the business or construction manager of the following:

- Scope of Work - include duration of installation, any disruptions to electrical service, and what specific hours of the day the installation is to be done.
- Any safety requirements or conditions specific to the installation site.

4.3 VERIFICATION BEFORE INSTALLATION

1. Install with Minimum Spacings Between:

   (a) Center-To-Center Of Adjacent Luminaires: 610 mm (24 in);

   (b) Top Of Luminaire To Overhead Building Member: 75 mm (3 in);

   (c) Luminaire Center To Side Building Member: 305 mm (12 in).

   Assurer Les Dégagements Minimaux Suivants:

   (a) Entre L'entraxe Des Luminaires Adjacents 610 mm (24 po)

   (b) Entre Le Dessus Du Luminaire Et L'élément De Charpente Se Trouvant Au-Dessus

   75 mm (3 po)

   (c) Entre Le Centre Du Luminaire Et Un Élément De Charpente Latéral 305 mm (12 po)

2. A minimum clearance of 7.0" above the top surface of the drop ceiling is required for installation above every MedLux® XLS-3 Light Fixture. The XLS assembly rises 6.0" above the ceiling tile when installed.

⚠WARNING

Any ceiling grid, XLS fixture(s) or tile(s) falling onto a person(s) or equipment in a room where the XLS assembles have been installed may cause serious injury or damage, if statement #2 below is not verified.

2. The ceiling grid must be capable of supporting the combined weight of the XLS fixtures. The installer is responsible for verifying the load capability of the support grid.

4.4 ELECTRICAL REQUIREMENTS

- Circuits must be wired in accordance to all state and local electrical codes.
- If any XLS lamp senses an over-temperature condition, it will shut OFF. In order to restore normal operation it will be necessary to reset the system by turning the 'XLS System Reset' switch (normally located in the equipment room) OFF, then ON again. If an optional dimmer control is installed, turning it off WILL NOT restore the system properly.

- If a dimmer component is configured into the MedLux® XLS System, a 120 VAC connection is required for dimmer power. If the dimmer option is not required, a standard wall switch can be used to break the AC mains for the lighting circuit for ON/OFF operation. This switch will then also provide the 'System Reset' function.

⚠WARNING

- **Standard incandescent lighting dimmers (DC controllers) or fan speed controls will not work correctly with the XLS lighting system. Attempting to do so may damage the XLS lamps.**

5.0 INSTALLATION

5.1 MEDLUX® XLS-3 Fixtures

1. Assuming that all wiring and conduit is already installed per the site architect's direction, remove the ceiling tile in which the MEDLUX® XLS-3 fixture will be installed.
2. Find the desired mounting location on the ceiling tile that is going to be used for the installation and cut a hole for trim ring. The minimum distance to any edge of the tile from the hole's center point is 5.0".
3. Re-install the ceiling tile with the cutout.
4. Remove ceiling tile adjacent to the space where the MEDLUX® XLS-3 fixture will be located.
5. Assemble together two spanner rails using one Type A (tabs out) and one Type B (tabs in) spanner for each side. Adjust the rail ends to a pre-measured dimension that matches the width of the ceiling tiles on the job site. Then insert spanner rail tabs into the closest slots of the adjacent rail. See Figure 2.

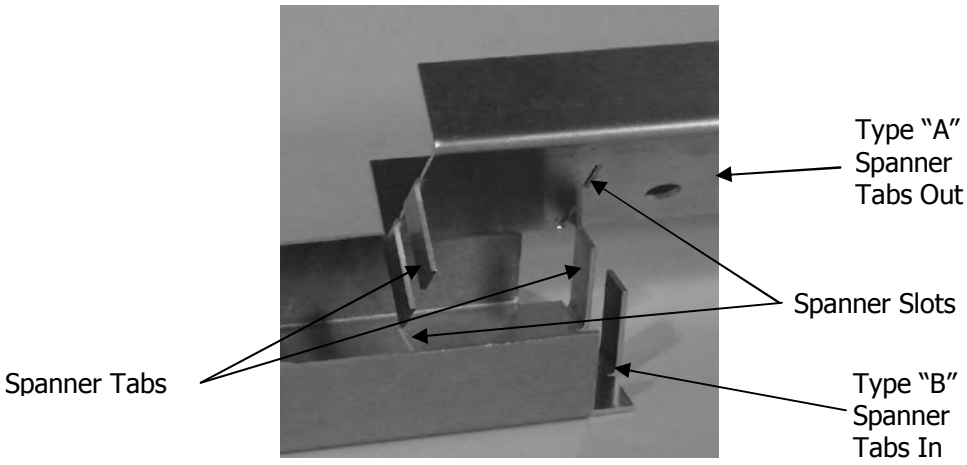


Figure 2: Spanner Tabs and Slots

6. Bend the tabs over flat to the surface of adjacent rail. See Figure 3.

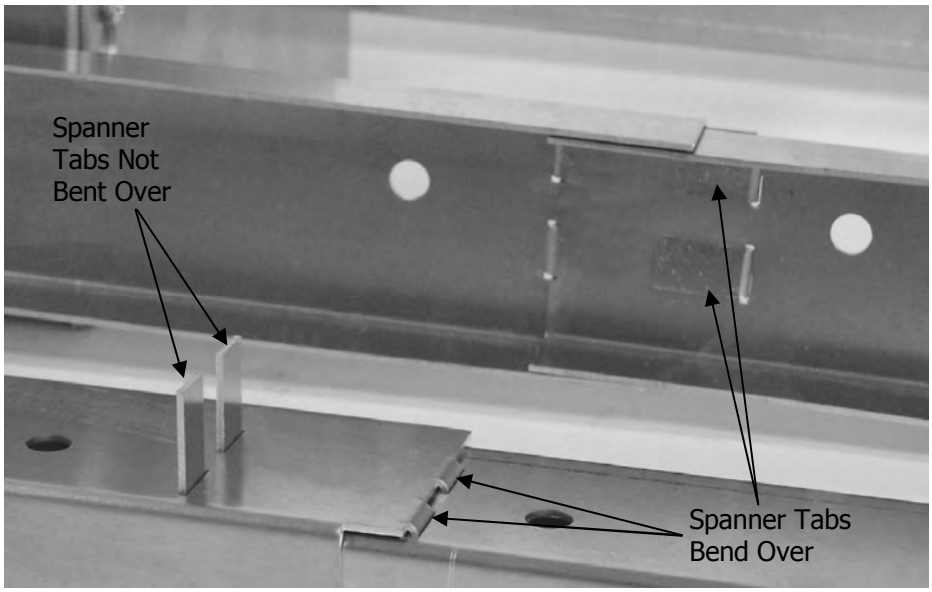


Figure 3: Bending Spanner Tabs Over

7. When all tabs are bent over on both rails, insert spanner rails through the ”C” slots of the light fixture brackets. See Figure 4.

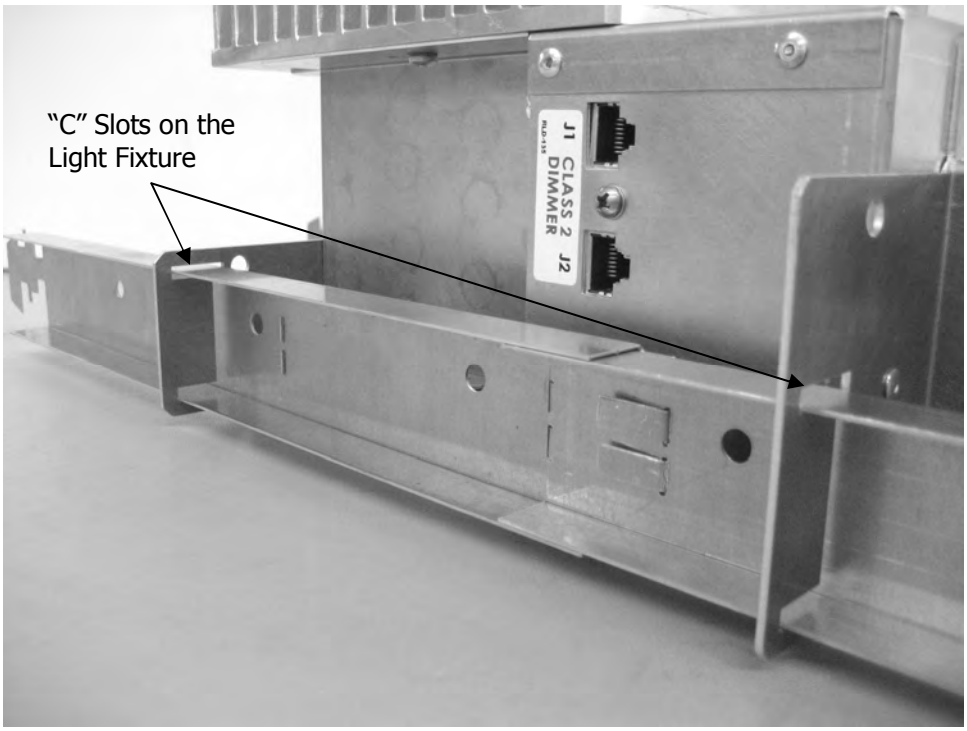


Figure 4: Inserting Spanner Rails into Light Fixture

8. Through the opening of the adjacent tile, place the Light Fixture on top of the tile and centered over the hole.

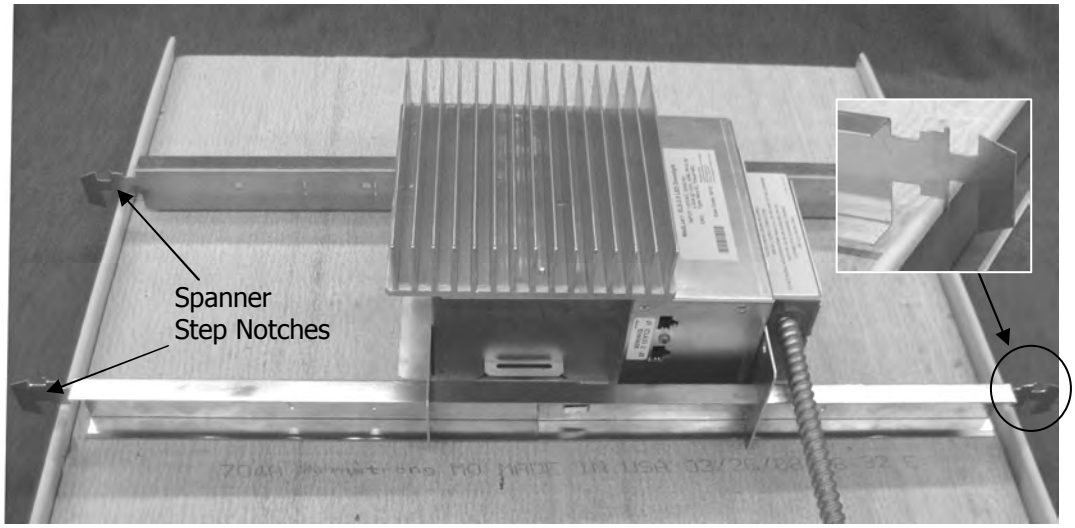


Figure 5: Placement of Light Fixture on Tile

9. Position step notches at the ends of the spanner rails onto the ceiling grid so the fixture flange rests lightly on the ceiling tile. It may be necessary to remove the spanner from the fixture assembly and flip over to achieve the correct notch position. See Figure 5.
10. From the room side of the ceiling tile, attach the Trim Ring by squeezing the spring wires together and inserting them into the slots alongside the light chamber. See Figure 6.

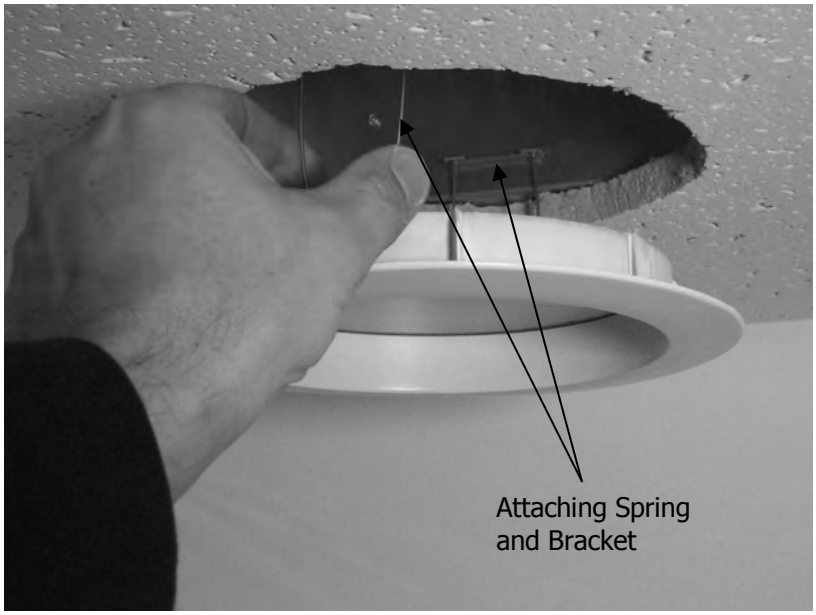


Figure 6: Trim Ring with Attachment Spring and Bracket

11. Locate the electrical Junction Box on the Light Fixture Assembly. Remove the cover plate by loosening the two cover screws. See Figure 7.

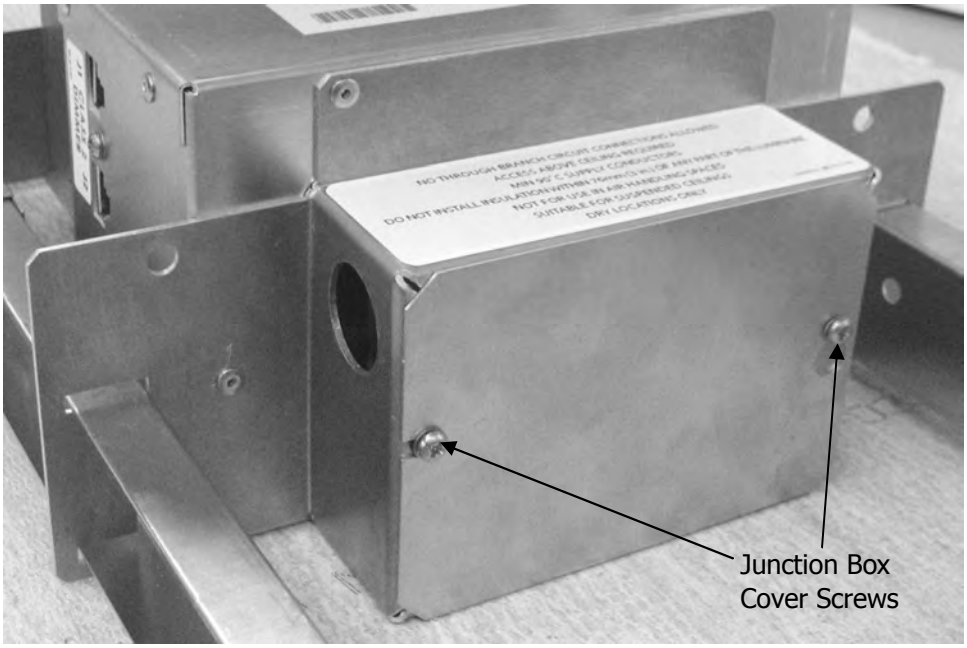


Figure 7: Electrical Junction Box Cover and Screws

12. Feed the AC Main wires and conduit through the junction box knockout hole using a non-ferrous fitting. See Figure 8.

NOTICE

Some magnet vendors may require the use of non-metallic conduit. This is acceptable as long as a good shield bond is supplied.

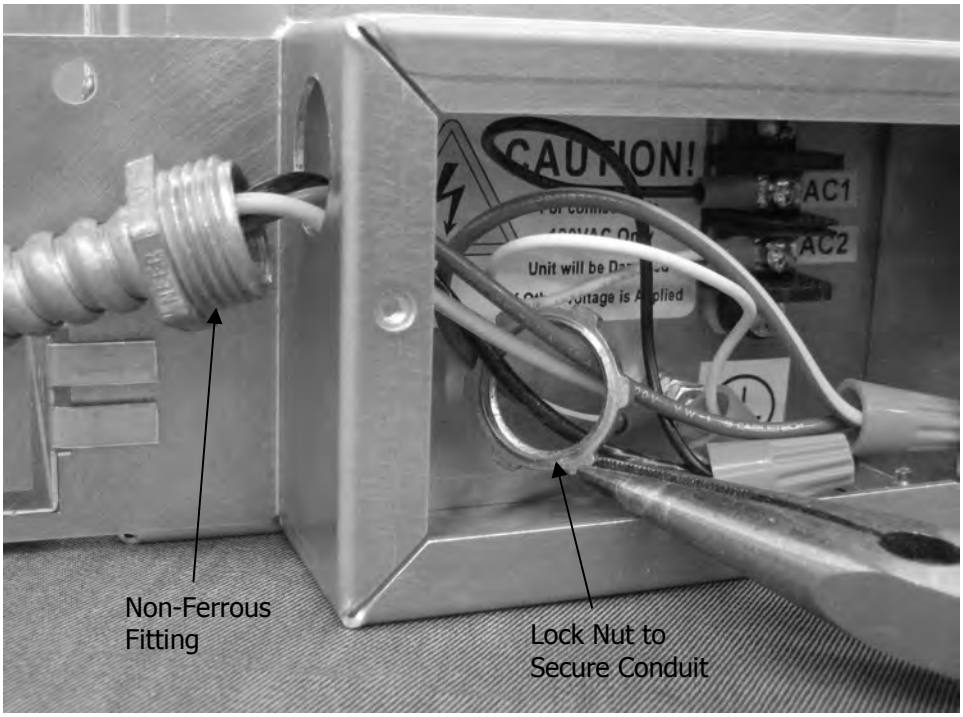


Figure 8: AC Mains Feed into Junction Box

13. Tighten the conduit fitting to the junction box using a lock nut as shown in Figure 8.

NOTICE

Some magnet vendors may require the use of non-metallic conduit. This is acceptable as long as a good shield bond is supplied.

14. Connect the black and white field wires to the respective ballast input wires with wire nuts. Attach the green grounding wire from the mains and the Junction Box ground wire using an appropriate wire nut. THIS GROUND CONNECTION MUST BE TRACEABLE BACK TO THE ROOM SHIELD! See Figure 9.

Figure 9: Completed Wiring in Junction Box

15. Replace and secure the cover plate on the junction box by tightening the two cover screws. Repeat this process until all fixture wiring is completed.
16. Connect the Dimmer Input/Output cables to the Light Fixture Assembly. Repeat this process until all Dimmer Jacks/cables are connected. See Figure 10. If multiple lighting zones are required, daisy-chain only those fixtures assigned to each zone.

    NOTE: Either jack can be used as an input or output.

NOTICE

When routing cables, do not pass any wire cables directly above the magnet. If your layout is routed around the perimeter of the room, you may have to split the layout at the drop point to the penetration panel. Use two drop cables at this point to minimize the distance from the filter to the first fixture. See Figure 17 for system wiring.

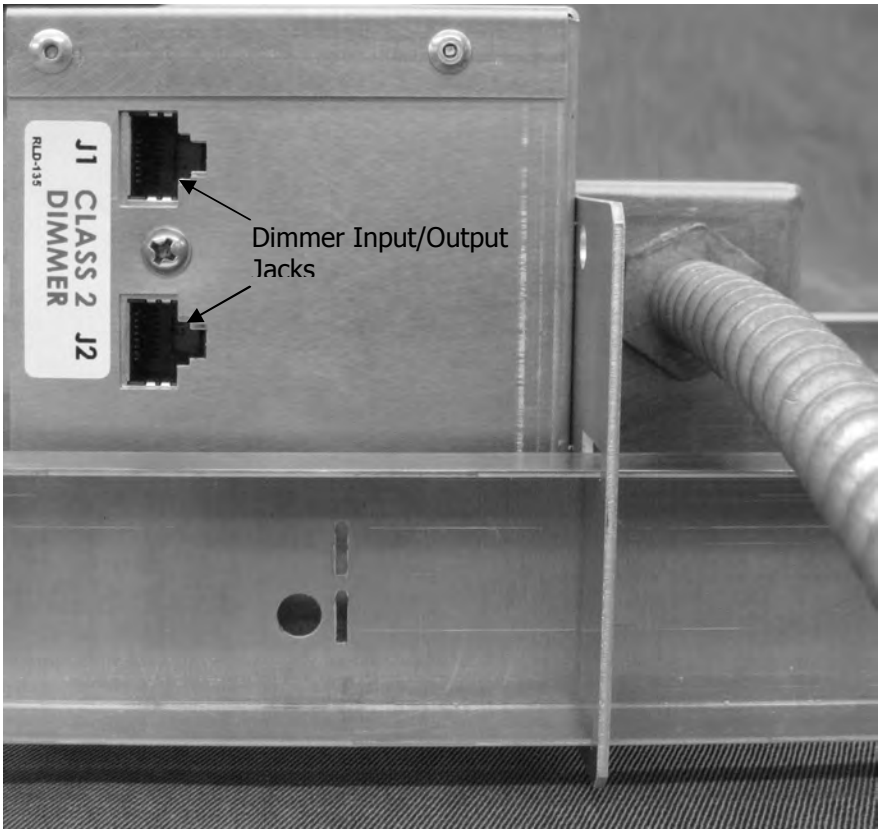


Figure 10: Dimmer Input /Output Connections

5.2 EMI Facility Filter Installation (Not supplied with MEDLUX® XLS-3 system)

An EMI Facility filter is designed to prevent EMI (Electromagnetic Interference) from entering the MRI room. The EMI Facility filter is NOT supplied as part of the MedLux® XLS system components and is not necessary for non-MRI applications.

Figure 11: EMI Filter Wiring Layout

The EMI Filter and mounting hardware is supplied by the customer or specified subcontractor. The EMI Filter functionally eliminates electromagnetic interference from entering the room. Mount the EMI Facility Filter according to approved system layout documentation. The interconnecting Class 1 wiring (Lamp-To-Lamp) is customer supplied and must meet local electrical code specifications. Refer to installation wiring diagram for ampacity requirements.

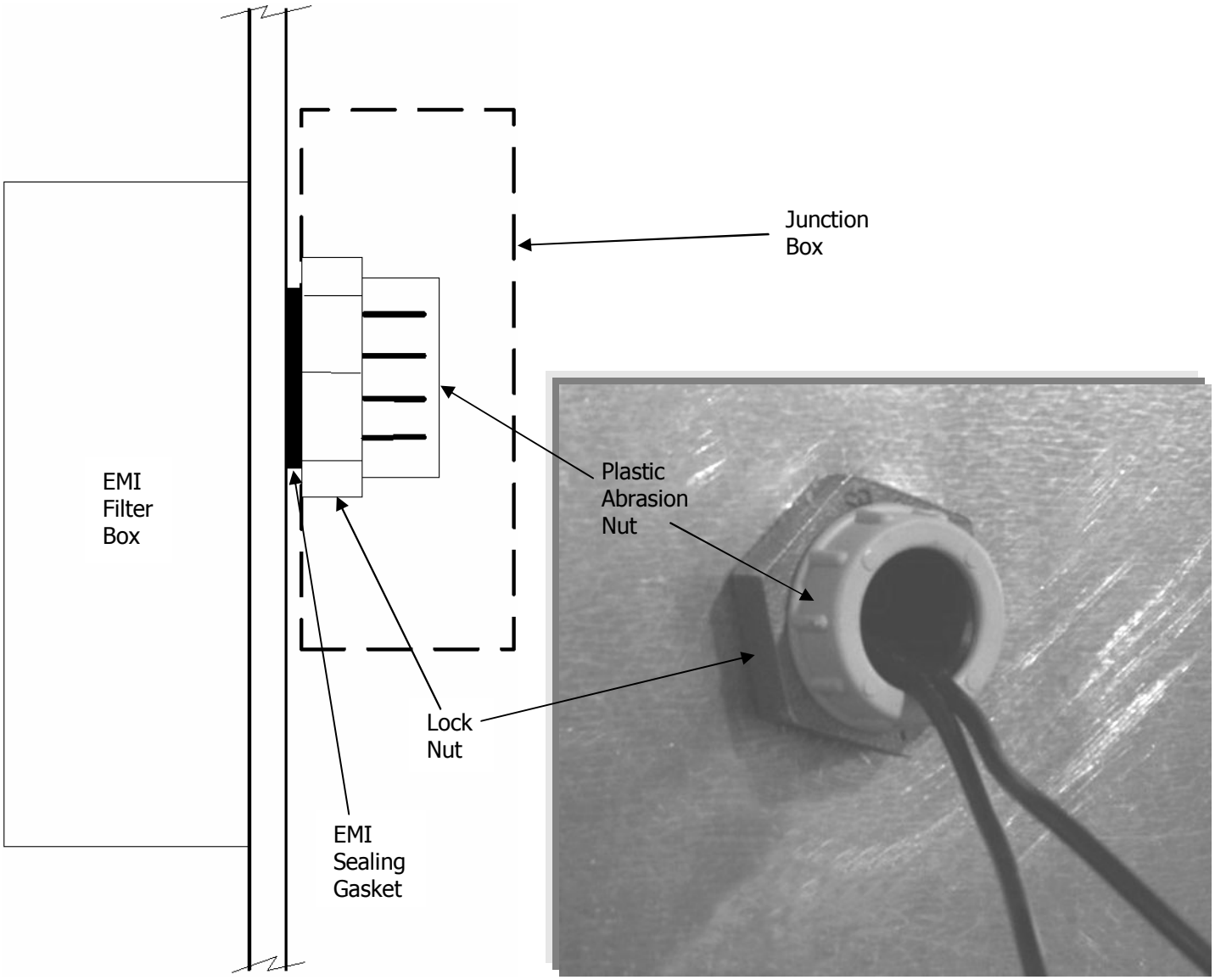


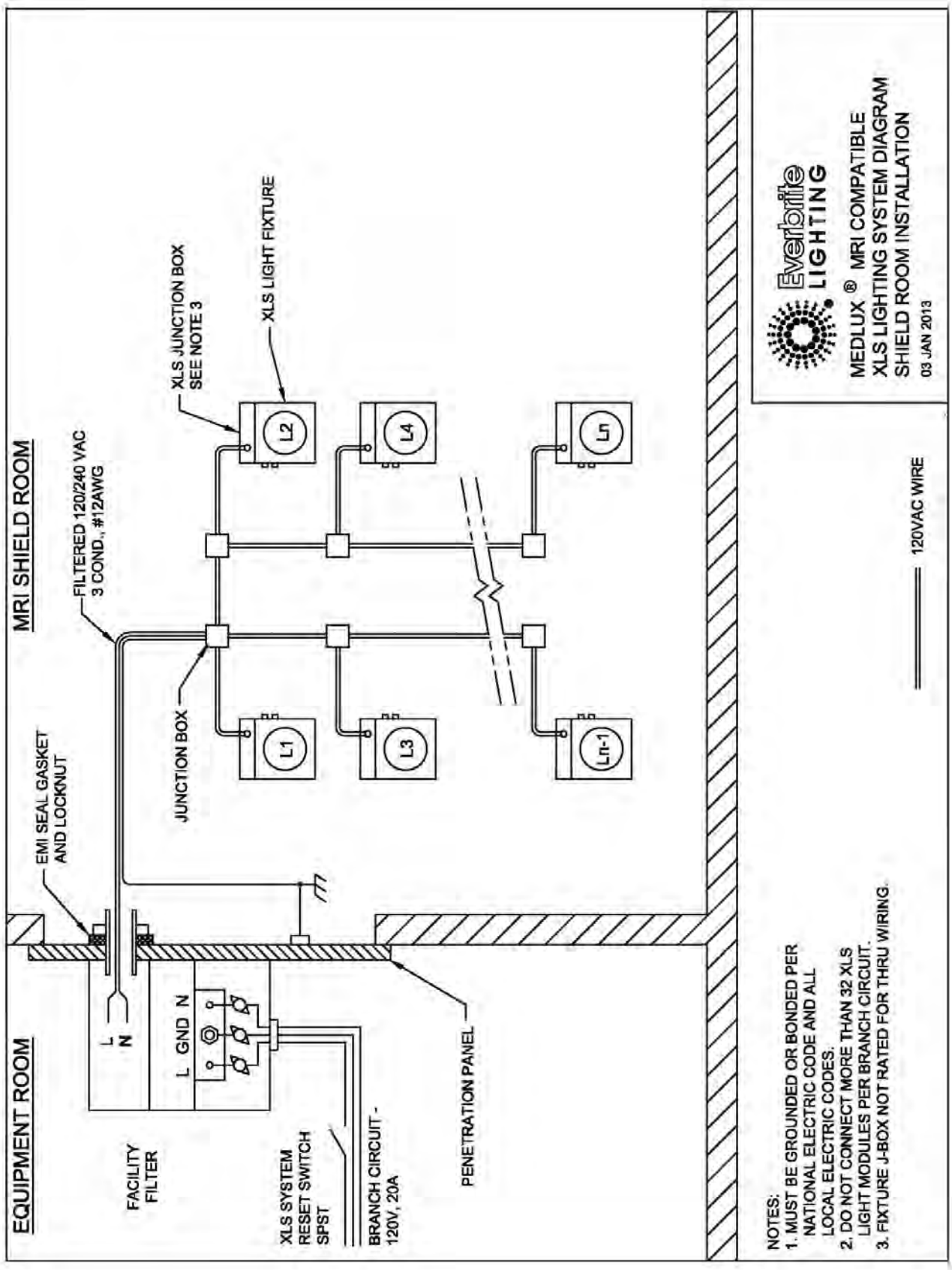
Figure 12: Channel Pipe from EMI Filter

Figure 13: Plastic Abrasion Nut

The threaded pipe at the rear of the EMI Filter module is guided through a pre-drilled hole in the access panel leading into the MRI room from the equipment control room. Later, it will be secured with a Lock Nut and Plastic Abrasion Nut inside a suitable junction box. Be sure to install an EMI sealing gasket, supplied with the filter, between the access panel and junction box. (See Figures 12 and 13.) Be certain to include a ground conductor that is directly connected to the shield at this point. The ground bus bar at the penetration panel is a good point for this connection. Each XLS Light fixture and any dimmer modules (if used) must have ground return connections for proper EMC performance.

5.3 Typical Wiring Scheme / XLS System

Figure 14: Non-Dimming System Installation



5.4 Optional Dimmer Installation

The optional dimmer components that are interconnected to the MedLux® XLS system are made up of a Remote Dimmer Controller (i.e. Dimmer Module) that is powered by a standard 12-24VAC or DC Wall Adapter, or a 16VAC Bell Transformer and a Dimmer Facility Filter for the control room version. They are directly wired into the MedLux® XLS system as shown in the pages that follow.

NOTICE

The dimmer wiring installation differs depending on whether the DIMMING controller is to be located in the Control Room or INSIDE the MRI Shield (Scanning) Room. Locating the dimmer within the shield room may not be possible with newer highly sensitive open-bore magnets and IS NOT recommended.

5.5 Dimmer Filter Option

The Dimmer Filter is similar to the EMI Facility filter, in that it is designed to prevent EMI (Electromagnetic Interference) from getting inside the MRI room. **Note that the Dimmer filter is not required if the dimmer controller and power source are located inside the MRI Scanning (Shield) Room.**

Install dimmer drop cable connector box coupler through penetration panel from MRI room side as shown below. Attach filter to coupler on opposite side of panel with hex nut. Attach the black wire to the filter ground lug. If "single zone" or "split wiring" is required, attach both the violet and blue wires to the filter signal terminal. See wiring diagrams for other multi-zone connection schemes.

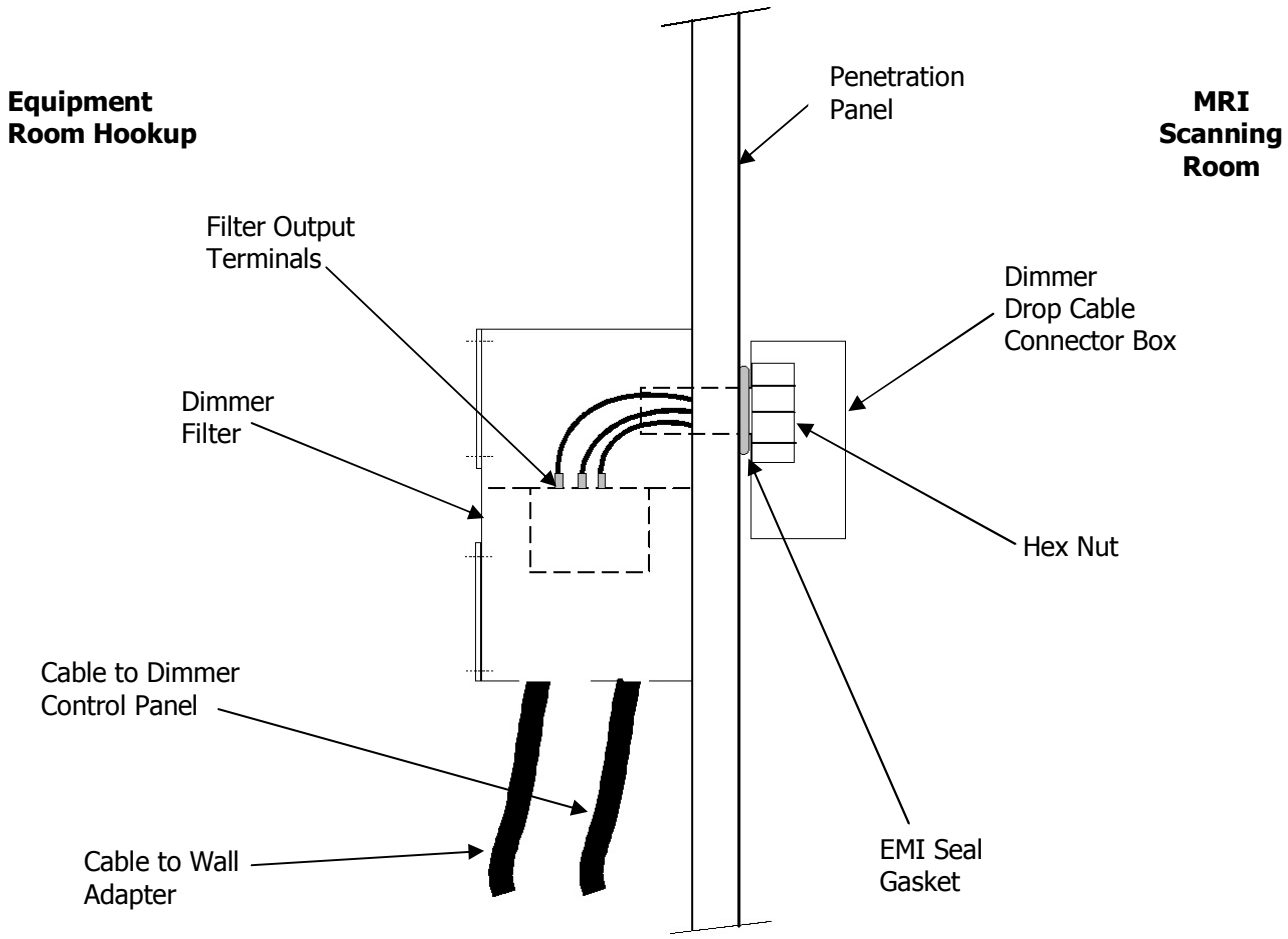


Figure 15: Dimmer Signal Filter

5.6 DIMMER WIRING with DIMMER CONTROLLER located in the MRI Control Room – See Figures 16, 17 & 18

NOTICE

The dimmer wiring installation differs depending on whether the DIMMING controller is to be located in the Control Room or INSIDE the MRI Shield (Scanning) Room. Locating the dimmer within the shield room may not be possible with newer highly sensitive open-bore magnets and IS NOT recommended.

1. If the Dimmer Controller is to be located in the MRI Control room, position the Dimmer Controller Box at the desired wall location in the MRI Control room using a plastic single-gang switch box, minimum 3" deep.
2. Pull a run of 2-pair, 18AWG PLTC cable (i.e. Belden #8638 supplied) between the dimming controller box location and the signal filter located in the equipment room. Since this is a Class 2 circuit, it is not necessary to run conduit for this cable unless required by local codes.
3. Connect the cable to the terminal block (TB1) located on the back of the Dimmer Controller Wall Plate. Use pair #1 for the dimmer signals: red to terminal 1, "DIM-A" and black to terminal 2, "DIM-B". Use pair #2 for the power feed: red to terminal 3, "+V" and black to terminal 4, "-V". The RJ-45 connector block is not used in this case and should be removed first if supplied with dimmer.
4. Carefully push the wires back into the box and mount the plate with two #6-32 SS screws (supplied).
5. In the equipment room, route the other end of the control cable to the input chamber of the EMI signal filter designated for use with the dimmer system.
6. Connect the red wire from pair #1 to the filter input terminal. Connect the black wire from pair #1 to the **earth** ground lug. THIS GROUND CONNECTION IS CRITICAL TO PROPER EMC PERFORMANCE OF THE SYSTEM!
7. Route the output cable from the dimmer power supply (12-24VAC typ.) to the input chamber of the EMI signal filter.
8. Connect either power supply wire to the red wire from pair #2 from the dimmer control cable and the other supply wire to the black wire from pair #2 using a small wire nut for each.
9. Turn ON the dimmer power source.
10. Return to the Dimmer Control. The blue MedLux® XLS window should be illuminated. If the window is not lit, double check all wiring connections for continuity and proper polarity. Press the "OFF" button at this time.
11. Run the 25' dimmer drop cable from the Dimmer Drop Cable Connector box directly into the Dimmer Input/Output Jack located next to the Junction Box on the nearest XLS® Fixture. See Figure 10 on page 11. Connect all remaining lamps in daisy chain fashion using the Dimmer Input /Output Jacks. Refer to previous directions for "loop" or multi-zone wiring recommendations.
12. Verify proper lamp operation by pressing the "ON" button on the Dimmer Control. All lamps should light to full-illumination.
13. Pressing the "Down Arrow" button, the lamps should gradually begin to dim and hold the present level when released.
14. Press the "Save" button to save a desired light level for future use. The blue window will flash three times to acknowledge the level is saved. Pressing the "Pre-Set" button will now restore any light level saved.
15. Press the "OFF" button to turn off all connected lamps.

Figure 16: XLS Lights in Scanning Room with Single Zone Dimming System Located in the Control Room Installation

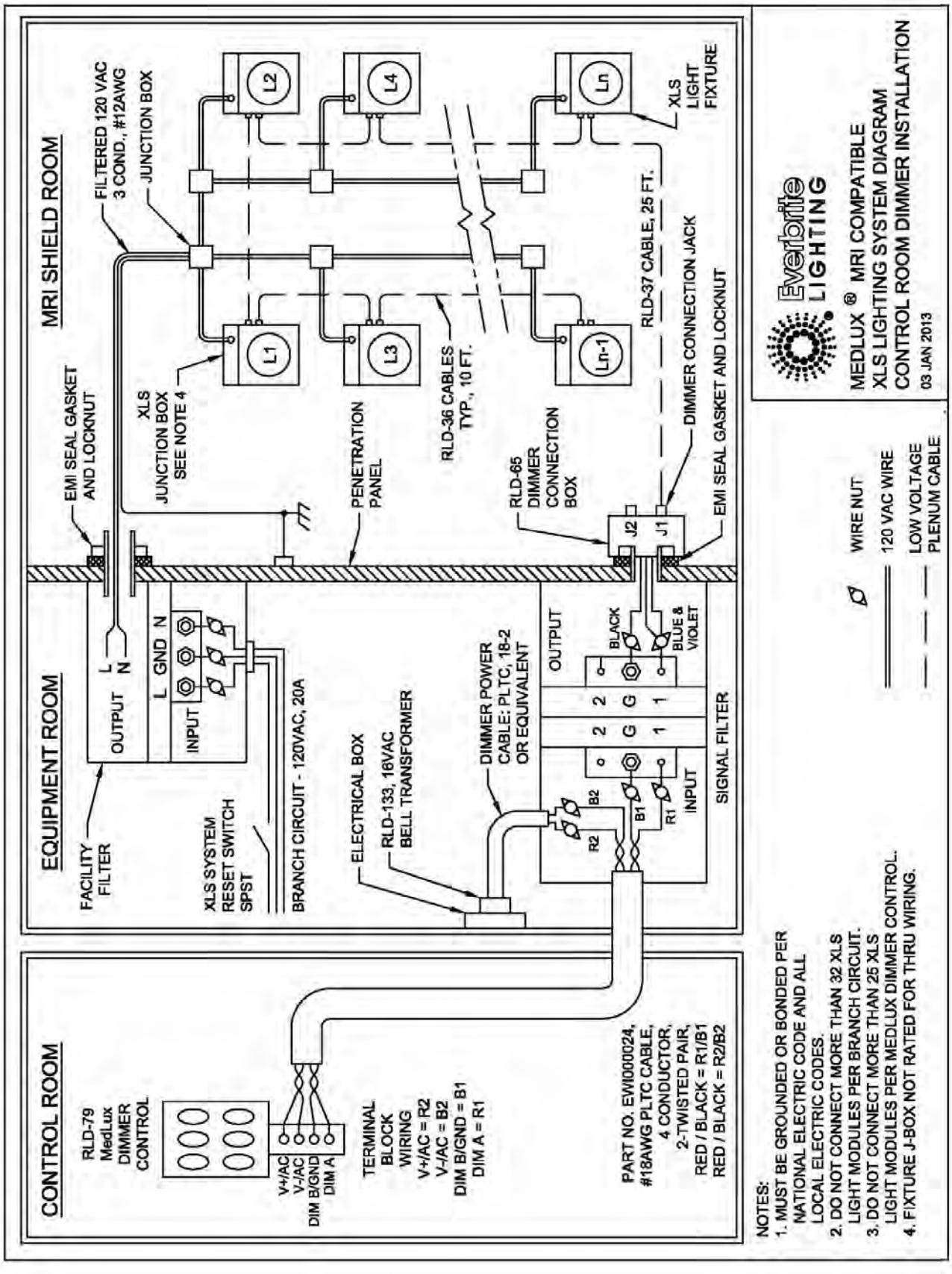


Figure 17: XLS Lights in Scanning Room with Shielded Cable and a Split Loop Configuration – Single Dimming Control Room Installation

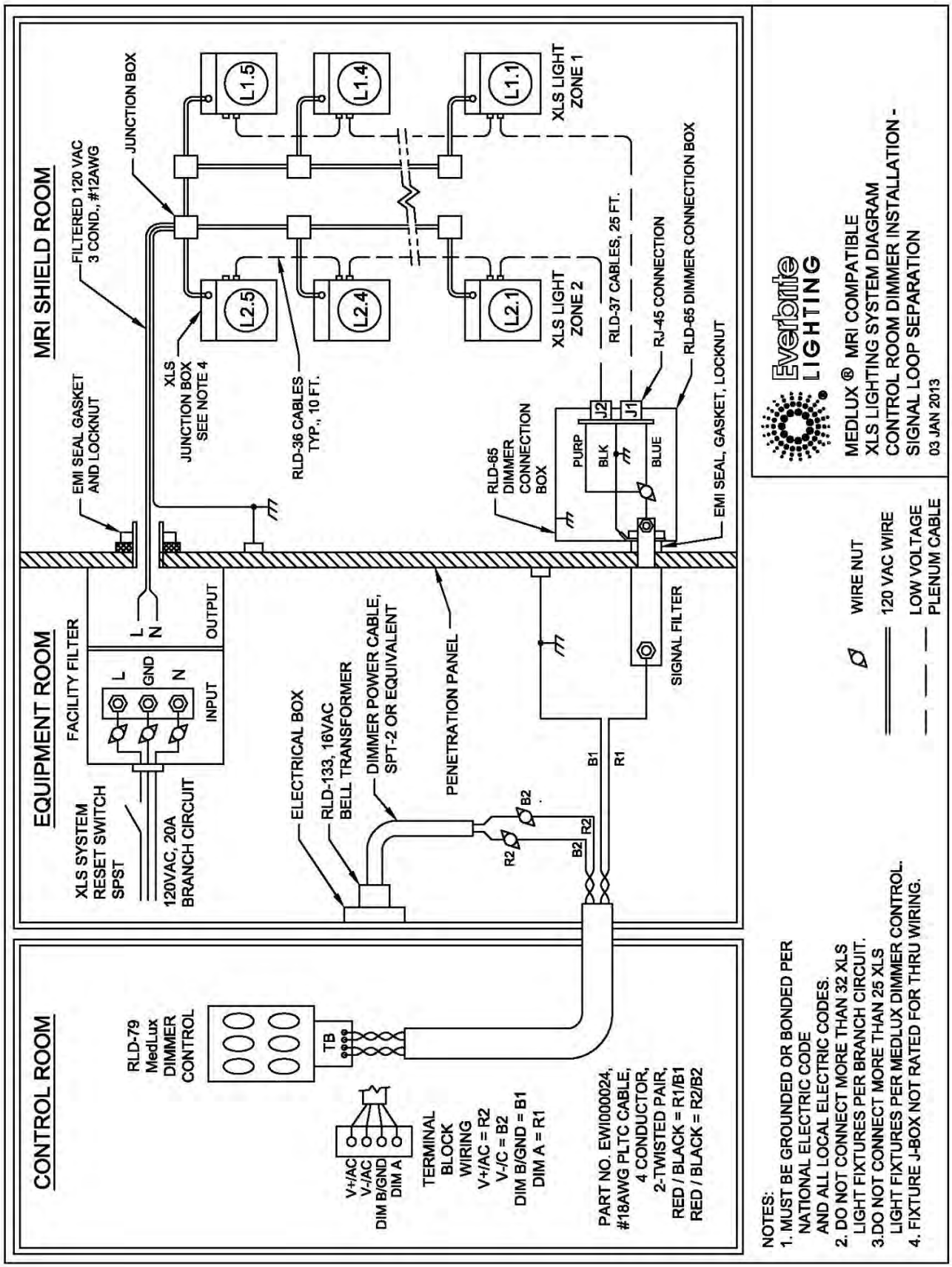
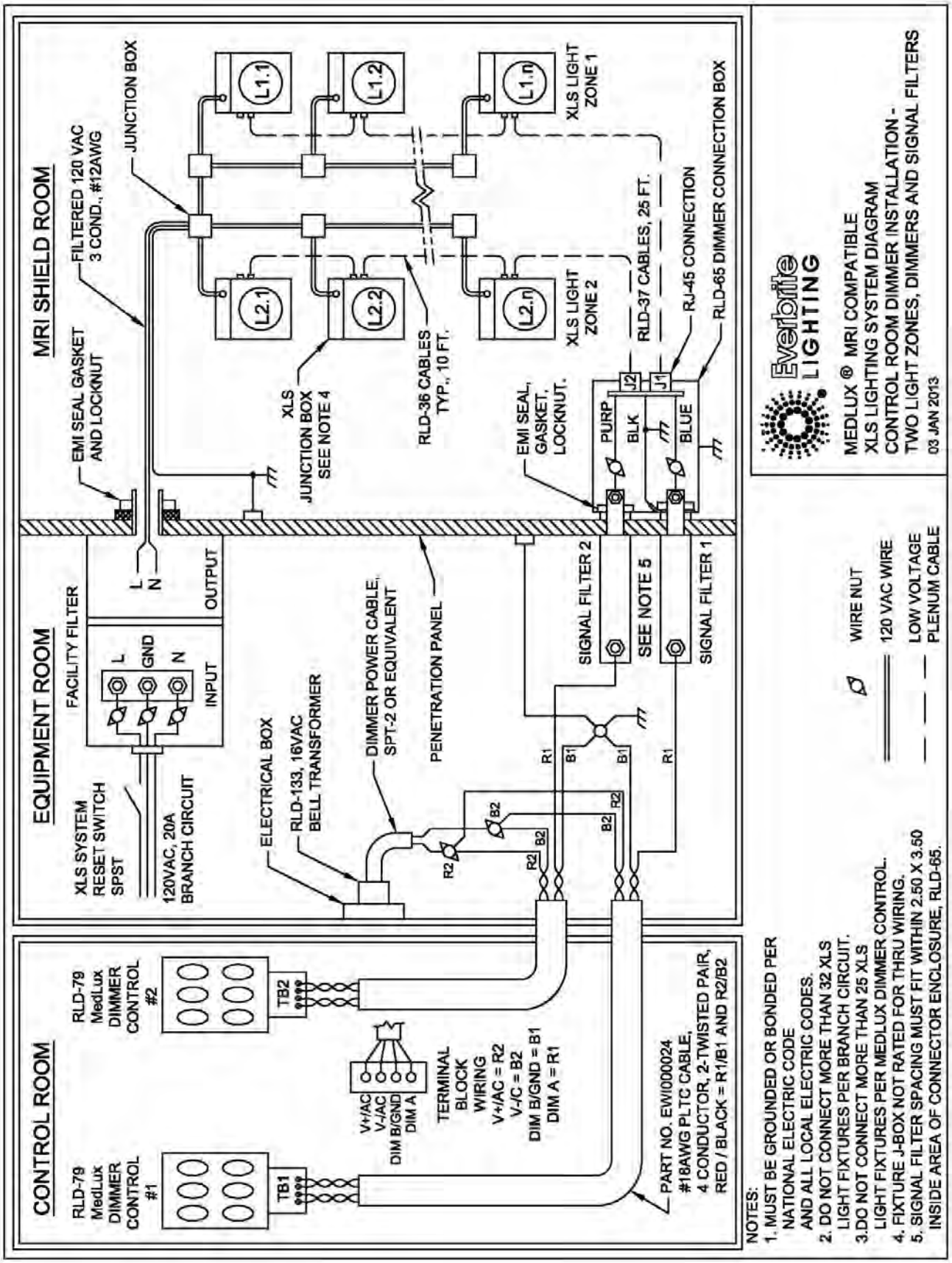


Figure 18: XLS Lights in Scanning Room With a Two Zone Control Room Dimming System and Independent Signal Filters Installation



5.7 DIMMER WIRING with DIMMER CONTROLLER Located INSIDE the MRI Shield Room

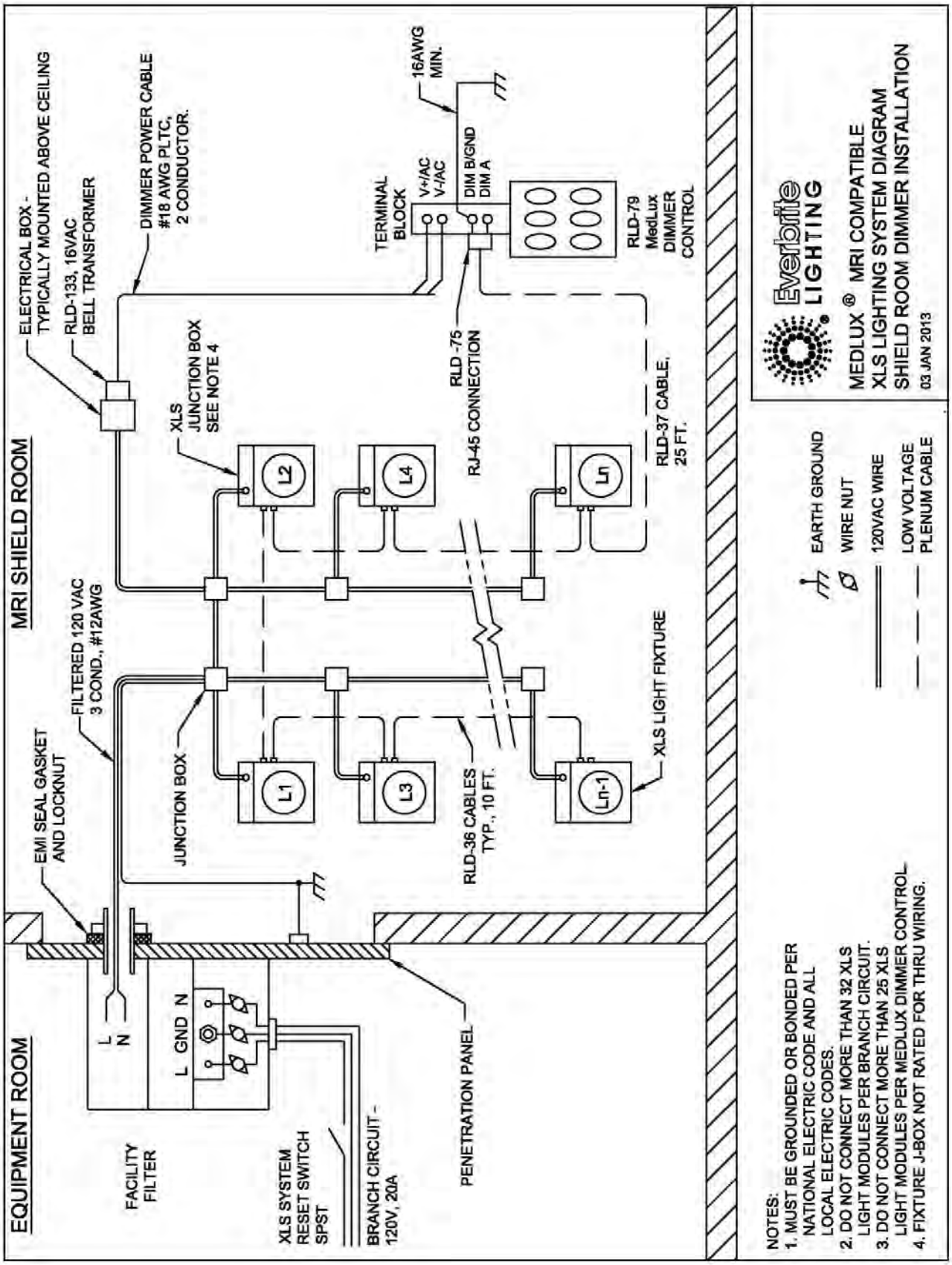
NOTE: See Figure 19 for Installation Diagram

NOTICE

The dimmer wiring installation differs depending on whether the DIMMING controller is to be located in the Control Room or INSIDE the MRI Shield (Scanning) Room. Locating the dimmer within the shield room may not be possible with newer highly sensitive open-bore magnets and IS NOT recommended.

1. If the Dimmer Controller is to be located INSIDE the MRI shield (scanning) room, position the Dimmer Controller Box at the desired wall location inside the MRI Shield (scanning) Room using a plastic single-gang switch box, minimum 3" deep.
2. Mount and wire a duplex outlet above the drop ceiling in line with the desired dimmer location. If local codes disallow the use of a plug-in adapter above a drop ceiling, substitute with an octal box and use a standard 16VAC, 10VA Bell transformer. The dimmer will operate from either an AC or DC source.
3. Route the power source output wires through the wall and into the dimmer control box. Connect one of these wires to terminal block TB1, terminal #3 (+V/AC). Connect the other supply lead wire to TB1, terminal #4 (-V/AC). IT IS CRITICAL THAT A GROUND WIRE BE RUN FROM TB1, terminal #2 BACK TO THE SHIELD (penetration panel) TO PROVIDE PROPER EMC PERFORMANCE!
4. With the dimmer power source turned ON, verify that the blue MedLux® window is illuminated, then press the "OFF" button.
5. Route the Dimmer Drop Cable from the nearest XLS lamp, through the wall, and into the dimmer control box (See Figure 15). Plug it into the RJ-45 connector, J2, on back of the dimmer control panel. Connect all remaining lamps in daisy chain fashion using the Dimmer Input/Output Jacks shown in Figure 10. Refer to previous directions for "loop" or Multi-zone wiring recommendations.
6. Dress the wires within the box and mount the control panel with two #6-32 SS screws (supplied).
7. Verify proper lamp operation by pressing the "ON" button on the Dimmer Control. All lamps should light to full-illumination.
8. Pressing the "down Arrow" button, the lamps should gradually begin to dim and hold the present level when released.
9. Press the "Save" button to save a desired light level for future use. The blue window will flash three times to acknowledge the level is saved. Pressing the "Pre-Set" button will now restore the latest light level saved.
10. Press the "OFF" button to turn off all connected lamps.

Figure 19: XLS Lights and DIMMING CONTROLLER both located INSIDE the MRI Shield (Scanning) Room Installation



6.0 SITE CLEAN-UP

Ensure that all packaging materials, screws, tools, etc. are disposed of properly.