

**PHILIPS**

Project: Allura Biplane FD10/10  
 Maine Medical Center  
 Portland, ME  
 - Cath Lab #6

Philips Contacts:  
 Project Manager: Wayne Erwin  
 Contact Number: (207) 651-5546  
 Email: we@philips.com  
 Date Drawn: 11-4-2010  
 Order: 6500107875.001000  
 Drawn By: Ken, Washburn

Project Details:  
 Drawing Number: N-EAS101154B  
 Date: 11-4-2010  
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**SD3**

**Emergency Power**

Philips does not require equipment to be on emergency power. If the customer deems it necessary for the equipment to be supplied with emergency power, the following specifications must be applied:

The circuit protection for emergency power should be capable of handling a high initial surge of approximately 40 amps.

The transfer switch must be double actuator type with a minimum time delay of 400 milliseconds in both directions (ability to emergency - emergency to utility). This time is required to allow filters to dissipate their stored energy before a different main voltage is applied. Russelectric type RMTD, Aeco Series 7000 delayed transition transfer switch or equivalent is recommended.

To reduce the emergency power generator load demand, Philips equipment can be put into a lower power mode (5.6kVA fluorescence → 4kVA geometry) of operation by the connection of a potential free closure from the transfer switch. This potential free, normally open contact, has to be rated for 24VDC/100mA. For Philips cardiovascular integris equipment, the two wires from this contact have to be routed to the equipment area and connected to the System Coordinator cabinet (MA).

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**Electrical Requirement Notes for Systems with PDU**

Electrical power distribution at the facility shall comply with:

Utilization voltages per ANSI C84.1 - 1992 range A.

Voltage to be supplied is 3 phase, delta or wye.

Phase conductors to be sized for instantaneous voltage drop per NEC 517 - 73 and Philips recommendations.

On systems with a PDU, the ground conductor for the power feeder shall never be less than 1/2 the cross-sectional area of the phase conductors and never smaller than #5 AWG.

Metal conduit shall not be used as the equipment ground conductor.

ANSI / NFPA 70 - National Electrical Code  
 Article 250 - Grounding  
 Article 517 - Healthcare Facilities  
 ANSI / NFPA 99 - Healthcare Facilities  
 NEMA standard XRS - Power Supply Guideline for X-ray Machines

**Power Quality Guidelines**

1. Power supplied to medical imaging equipment must be separate from power feeds to air conditioning, elevators, outdoor lighting, and other frequently switched or motorized loads. Such loads can cause waveform distortion and voltage fluctuations that can hinder high quality imaging.

2. Equipment that utilizes the facility power system to transmit control signals (especially clock systems) may interfere with medical imaging equipment, thus requiring special filtering.

3. The following devices provide a high impedance, nonlinear voltage source, which may affect image quality:  
 Static UPS systems, Series filters, Power conditioners, and Voltage regulators.

Do not install such devices at the main supply to medical imaging equipment without consulting Philips installation or service personnel.

4. Line impedance is the combined resistance and inductance of the electrical system and includes the installation of the power source, the facility distribution system, and all phase conductors between the source and the imaging equipment. Philips publishes recommended conductor sizes based on equipment power requirements, acceptable voltage drops, and assumptions about the facility source impedance. The minimum conductor size is based on the total line impedance and NEC requirements. Unless impedance calculations are performed by an electrical engineer, the recommended values must be used.

(08.0)

**General Electrical Information**

1. **General**  
 The customer shall be solely responsible, at its expense, for preparation of the site, including any required electrical alterations. The site preparation shall be in accordance with the plan and specifications, the architectural/construction drawings and in compliance with all safety and electrical codes, the customer shall be solely responsible for obtaining all electrical permits from jurisdictional authority.

2. **Materials and Labor**  
 The customer shall be solely responsible, at its expense, to provide and install all electrical ducts, boxes, conduit, cables, wires, fittings, bushing, etc., As separately specified herein.

3. **Electrical Ducts and Boxes**  
 Electrical ducts and boxes shall be accessible and have removable covers. Floor ducts and boxes shall have watertight covers. Ducts shall be divided into as many as three separate channels by metal dividers, separately specified herein, to separate wiring and/or cables into groups as follows: Group A: power wiring and/or cables. Group B: signal and/or data and protective ground wiring and/or cables. Group C: x-ray high voltage cables, the use of 60 deg. bends is not acceptable. On ceiling duct and wall duct use 45 deg. bends at all corners. All intersecting points in duct to have cross over tunnels supplied and installed by contractor to maintain separation of cables.

4. **Conduit**  
 Conduit point - to - point runs shall be as direct as possible. Empty conduit runs used for cables may require pull boxes located along the run. Consult with Philips. A pull wire or cord shall be installed in each conduit run. All conduits which enter duct prior to their termination point must maintain separation from other cables via use of dividers, cross over tunnels, or conduit supplied and installed by contractor from entrance into duct to meet from duct. Do not use flex conduit unless approved by Philips Service.

5. **Conductors**  
 All conductors, separately specified, shall be 75°C stranded copper, rung out and marked.

6. **Disconnecting Means**  
 A disconnecting means shall be provided as separately specified.

7. **Warning Lights and Door Switches**  
 X-ray on warning lights and x-ray termination door switches should be provided at all entrances to x-ray rooms as required by code.

8. **Dimmer Switches**  
 X-ray room lights should be provided with dimmer switches.

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**Electrical Notes**

1. The contractor will supply & install all breakers, shunt trip and incoming power to the breakers. The exact location of the breakers and shunt trips will be determined by the architect or contractor.

2. The contractor shall supply & install all pull boxes, raceways, conduit runs, chainless steel covers, etc. Conduit/raceways must be free from burrs and sharp edges over its entire length. A Greenlee pull string/measuring tape (no. 435, or equivalent) shall be provided with conduit runs.

3. All pre - terminated, cut to length cables, will be supplied and installed by Philips. All cables to the breakers, will be supplied and installed by the contractor, subject to local arrangements.

4. Provide and install 4 - 2" (50 mm) diameter, Chase nipples between adjacent wall boxes.

5. Electrical raceway shall be installed with removable covers. The raceway should be accessible for the entire length. In case of non - accessible floors, walls and ceilings, an adequate number of access hatches should be supplied to enable installation of cabling. Approved conduits may be substituted. All raceways will be designed in a manner that will not allow cables to fall out of the raceway when the covers are removed. In most cases, this will require above - ceiling raceway to be installed with the covers removable from the top. Raceway system as illustrated on this drawing are based upon length of furnished cables. Any changes in routing of raceway system could exceed maximum allowable length of furnished cables. Conduit or raceway above - ceiling must be kept as near to finished ceiling as possible.

6. Conduit sizes shall be verified by the architect, electrical engineer or contractor, in accordance with local or National Electrical Codes, whichever govern.

7. Convenience outlets are not illustrated. Their number and location are to be specified by the customer/architect.

8. Electrical contractor shall install ground bond wires at conduit opening within wall boxes as required by national and local electrical codes. Ground bond wires and legs shall be installed in such a way to prevent the inadvertent contact with the installed Philips equipment to maintain the Philips Equipotential Grounding Configuration and maintain patient safety. Install a #6 AWG stranded ground wire in the conduits from the Main Disconnect (CB) to the PDU and from the PDU to the MG wall box.

9. If the Philips system includes a PDU, the PDU is a "Separately Derived Source" by NEC standards, and must be ground according to NEC article 250-30.

10. Philips equipment must be electrically isolated from conduits, raceways, ducts, etc.

11. Acceptable cross-overs: Walker DuctCat #RPD10-TUN-3C7, Square D Cat. #RSV122ST.

(10.0)

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**EN**

**Electrical Legend**

Item Number	Description	Detail Sheet
ED1	480V, 3 phase 125 AMP circuit breaker with shunt trip. Run power from breaker to "PBK", leaving an 8' tail at "PDK" and from "PDK" to "MCP", leaving an 8' tail at each end. See Sheet "ED1" for power quality requirements. Location per local code or owner requirements. (Not shown on plan)	ED1
ED2	Shunt Trip (emergency off) - Large mushroom-head button on remote control station with contacts to operate feature of "CB" (if required by local code or owner, and mandatory for VA and D.O.D installations). (Not shown on plan)	ED2
ED3	Ground electrode per N.E.C. 250-26, building steel preferred. (Not shown on plan)	ED3
ED4	Central ground busbar mounted in a 12"W x 12"H x 4"D pull box with hinged cover, surface mounted to the bottom of "WR2" when possible.	ED4
ED5	18"W x 18"H x 8"D flanged-edge terminal wall box with removable screw-type cover plate, surface mounted 22" A.F.F. to bottom of box, provide (1) 1/2" and (2) 2" conduits through "PBK" cover plate to PDU cabinet.	ED5
ED6	19 1/4"W x 6 1/4"H x 4"D flanged-edge terminal wall box, surface mounted 75" A.F.F. to top of box. General contractor to cut top and/or bottom of box as required.	ED6
ED7	Grommet opening on "WR1". Approximate location shown is recommended and may be changed - verify relocation with local Philips Service.	ED7
ED8	10"W x 10"L x 8"D floor box, flush mounted with underside of AD7 universal floorplate.	ED8
ED9	12"W x 12"L x 4"D floor box with water tight removable steel cover plate, flush mounted @ Poly G cable opening. See "Detail - Poly G Floorplate Cable Entrance" on Sheet "ED3" for cable routing methods.	ED9
ED10	18"W x 18"L x 8"D ceiling box, flush mounted with removable screw-type cover plate. Provide one 2" diameter knockout.	ED10
ED11	18"W x 16"L x 6"D ceiling box, flush mounted with removable screw-type cover plate. Provide a 2 1/2" round cabinet [Two 2 1/2" round cabinets are required for systems with two monitor cartidges - verify relocation with local Philips Service].	ED11
ED12	10"W x 4"D wall raceway, surface mounted with removable screw-type cover plate. "WR1" is at finished floor. "WR2" is at 75" A.F.F. to bottom of raceway. "WR1" may need to be cut at the location of the "CY" connection box.	ED12
ED13	10"W x 4"D riser duct with removable screw-type cover plate, surface mounted from wall raceway to wall box.	ED13
ED14	Stub up point for physiological monitoring cables. Run conduit to customer's physiological console location. Contact manufacturer for power requirements, etc.	ED14
ED15	Auxiliary Box - 6"W x 4"H x 4"D wall box, flush mounted 70" A.F.F. to the bottom of the box with removable screw-type cover plate. Location shown is recommended and may be changed - verify relocation with local Philips Service.	ED15
ED16	(Customer's) Hard Copy Unit - Contact manufacturer for power requirements. (Not shown on plan)	ED16

**Electrical Legend**

Item Number	Description	Detail Sheet
ED1	Warning Light - Provide a surface or flush mounted light fixture above door to indicate when X-ray is on, if required by local code or physicist of record. See Sheet "ED2" diagram for connection details. (Not shown on plan)	ED1
ED2	Door Switch - 120V/5A switch limited to open when door is open. Mount in upper corner on strike side of main entry door(s) (Cooper no. 1665 or equivalent), if required by local code or physicist of record. See Sheet "ED2" diagram for connection details. (Not shown on plan)	ED2
ED3	Analog phone line for service (convenience). (Not shown on plan)	ED3
ED4	RJ45 type Ethernet 10/100/1000 Mbit network connector with access to customer's network. Locate within 10' of network card. Network fiber optic and Ethernet cabling, connectors, wall boxes, patch panels, etc. are the responsibility of the purchaser. Philips assumes no responsibility for procurement, installation, or maintenance of these components.	ED4
ED5	RJ45 type Ethernet 10/100/1000 Mbit network connector. Access to customer's network via their remote access server is needed for Remote Service Network (RSN) connectivity.	ED5
ED6	120V/20A dedicated duplex outlet for service in the equipment room. (Not shown on plan)	ED6
ED7	120V/20A duplex outlet for each of the wall video boxes (VB1).	ED7
ED8	480V, 3 phase 80 AMP circuit breaker. (Not shown on plan)	ED8
ED9	480V, 3 phase 50 AMP circuit breaker. (Not shown on plan)	ED9
ED10	Universal Transfer Switch.	ED10
ED11	Battery Cabinet.	ED11
ED12	50 KVA UPS.	ED12
ED13	Remote Status Monitor, wall mounted in the control area. (Not shown on plan)	ED13

See E1 - E3 sheets for conduit and raceway requirements.

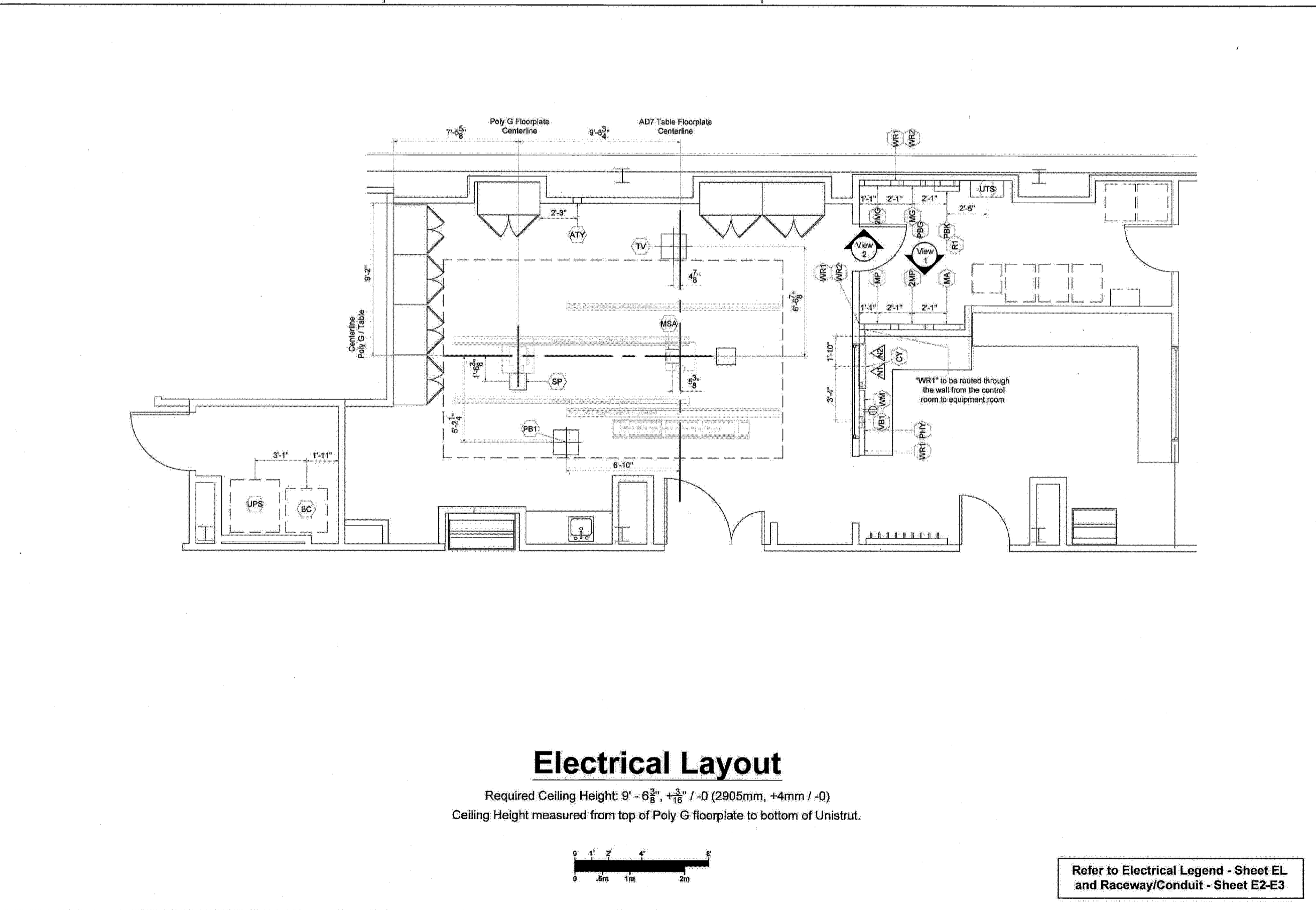
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**EL**



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**E1**

THIS SHEET IS PART OF THE DOCUMENT SET LISTED ON SHEET C1 AND SHOULD NOT BE SEPARATED.

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144 Eric Street, P.O. Box 618  
 Portland, Maine 04104  
 Tel: (207) 772-9846  
 Fax: (207) 772-1070  
 www.philips.com

ARCHITECTURE  
 ENGINEERING  
 PLANNING  
 INTERIOR DESIGN  
 COMMISSIONING

**SMRT**

PROJECT NORTH

MAINE MEDICAL CENTER  
 CATH. LAB # 6  
 PORTLAND, ME

ISSUED FOR CONSTRUCTION  
 12.21.10

REV	DESCRIPTION	DATE
0	ISSUED FOR CONSTRUCTION	12.21.10

GRAPHIC SCALE:  
 0' 1'

SCALE:  
 PROJECT MANAGER: KD  
 DATE DRAWN BY:  
 DATE OF RECORD:  
 PROJECT NO.: 10112-00  
 DATE: 12.21.10  
 SHEET TITLE:  
 VENDOR EQUIPMENT DRAWINGS, SHEET 5

SHEET No. Q-005

NOTE: THIS DRAWING WAS NOT PREPARED BY SMRT. IT IS PROVIDED FOR COORDINATION AND REFERENCE PURPOSES ONLY