



FOR ADDITIONAL INFORMATION SEE DIRECTION 2223170

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THESE SHEETS ARE A DOCUMENT SET AND SHOULD NOT BE SEPARATED
ELECTRICAL INFORMATION AND REFERENCES ARE CONTAINED ON ALL SHEETS

MANDATORY REQUIREMENT, MUST READ!

A mandatory component of these drawings is the
GE Healthcare Preinstallation manual:

Preinstallation documents for GE Healthcare
products can be downloaded from:

<http://www.gehealthcare.com/company/docs/siteplanning.html>

Failure to reference the preinstallation manual will
result in incomplete documentation required for
site design and preparation.

CUSTOMER

THESE DRAWINGS ARE PROVIDED TO ASSIST YOU IN PREPARING THE ROOM FOR
INSTALLATION OF EQUIPMENT ACQUIRED FROM GE HEALTHCARE, AND ARE
NOT TO BE USED AS CONSTRUCTION DOCUMENTS. GE HEALTHCARE RESERVES
THE RIGHT TO MAKE CHANGES IN THE DRAWINGS OR SPECIFICATIONS SHOWN AT
ANYTIME WITHOUT NOTICE OR OBLIGATION, AND HEREBY DISCLAIMS
RESPONSIBILITY FOR ANY DAMAGES RESULTING THEREFROM.

ALL REQUIREMENTS FOR THIS EQUIPMENT ARE NOT NOTED ON THIS SHEET. IT
IS SUGGESTED THAT THESE DRAWINGS BE REVIEWED BY QUALIFIED
PROFESSIONALS WHO CAN ASSIST WITH MAKING DECISIONS REGARDING RADIATION
CONTAINMENT, MAGNETIC FIELD CONTAINMENT, ELECTRICAL, STRUCTURAL AND
MECHANICAL REQUIREMENTS. ALTHOUGH THE EQUIPMENT MAY BE INSTALLED IN
AN EXISTING ROOM OF SIMILAR FUNCTION, REQUIREMENTS STILL NEED TO BE
CHECKED.

– SITE PROGRESS CHECKLIST –

- ☐ REVIEW EQUIPMENT ORDER FOR EXACT ITEMS PURCHASED. OPTIONAL/–
FUTURE ITEMS NOT ON ORDER MAY BE INDICATED ON THESE PLANS.
- ☐ ALL ROOM DIMENSIONS ARE CRITICAL! IMMEDIATELY CONTACT GE HEALTHCARE
IF CHANGES OCCUR OR DIMENSIONS ARE NOT CORRECT.
- ☐ CONTACT A RADIATION PHYSICIST OR CONSULTANT TO SPECIFY
REQUIREMENTS FOR RADIATION CONTAINMENT.
- ☐ PROVIDE A LOCKABLE EQUIPMENT HOLDING AREA CLOSE TO THE
INSTALLATION FOR STORING TOOLS AND TEST EQUIPMENT.
- ☐ MAKE SURE A DUST FREE, TEMPERATURE AND HUMIDITY CONTROLLED
ENVIRONMENT IS AVAILABLE FOR STORING THE EQUIPMENT IF YOUR SITE
IS NOT READY FOR INSTALLATION AT THE TIME OF DELIVERY. ONCE THE
SITE IS PREPARED, YOU ARE THEN RESPONSIBLE FOR DELIVERING THE
EQUIPMENT TO THE SITE.
- ☐ MAKE ARRANGEMENTS FOR ANY RIGGING, SPECIAL HANDLING, OR FACILITY
MODIFICATIONS THAT MUST BE MADE IN ORDER FOR THE EQUIPMENT TO BE
DELIVERED TO THE INSTALLATION SITE. IF DESIRED, YOUR LOCAL GEHC
TEAM REPRESENTATIVE CAN SUPPLY A REFERENCE LIST OF RIGGERS.

FACILITIES COORDINATOR

FACILITY PLANNING IS TO BE COMPLETED WELL IN ADVANCE OF EQUIPMENT
DELIVERY. THESE DRAWINGS NEED TO BE REVIEWED FOR ELECTRICAL,
STRUCTURAL AND MECHANICAL REQUIREMENTS AS WELL AS CONTAINMENT NEEDS
(E.G. RADIATION, MAGNETIC FIELDS, RADIO FREQUENCY) TO DETERMINE ANY
ADDITIONAL CONSTRUCTION REQUIREMENTS OR MODIFICATION TO THE FACILITY.

– SITE PROGRESS CHECKLIST –

- ☐ MAKE SURE THE ROOM MEETS POWER AND GROUNDING REQUIREMENTS
INDICATED IN THE EQUIPMENT SPECIFICATIONS AND SUGGESTED LAYOUT.
- ☐ THE FOLLOWING MUST BE INSTALLED PRIOR TO EQUIPMENT INSTALLATION
AS DEPICTED ON THE ELECTRICAL PLAN (SHEET E1).
 - ☐ A DEDICATED DIRECT–DISTANCE–DIALING, VOICE GRADE TELEPHONE LINE.
 - ☐ EITHER A SEPARATE TELEPHONE DATA LINE OR NETWORK CONNECTION
AS SHOWN ON SHEET E1.
- ☐ MAKE SURE ALL CONSTRUCTION WORK HAS BEEN COMPLETED BEFORE THE
EQUIPMENT DELIVERY AND INSTALLATION BEGINS.
- ☐ MAKE SURE THE ROOM’S ENVIRONMENT IS CLEAN AND FREE OF DUST.
- ☐ IF REQUIRED, HAVE STAMPED ARCHITECTURAL PLANS ON SITE.
- ☐ PROVIDE AN ACCEPTABLE UNLOADING AREA WITH CLEAR ACCESS TO THE
EQUIPMENT HOLDING AREA. COORDINATE DELIVERY ROUTE WITH YOUR
LOCAL GE REPRESENTATIVE.
- ☐ ON NEW CONSTRUCTION, MAKE SURE THERE ARE CLEAN REST ROOMS, POWER
FOR DRILLS AND OTHER TEST EQUIPMENT, AND THE CAPABILITY FOR FILM
DEVELOPMENT.
- ☐ PROVIDE FOR REFUSE REMOVAL AND DISPOSAL. (E.G. CRATES, CARTONS,
PACKING)
- ☐ PROVIDE INSTALLER WITH PARKING CLOSE TO THE INSTALLATION SITE.
- ☐ MAKE SURE ALL NATIONAL, STATE AND LOCAL CODES ARE MET.
- ☐ ALL REQUIRED PERMITS ARE OBTAINED.
- ☐ WHERE REQUIRED, SEISMIC DOCUMENTATION MUST BE AVAILABLE TO THE
INSTALLERS.


CONSTRUCTION COORDINATOR

POWER IS CRITICAL FOR EQUIPMENT OPERATION. IF POWER SPECIFICATIONS
ARE NOT UPHELD, THE UNIT MAY NOT MEET MANUFACTURER’S SPECIFICATIONS.
MEETING CRITICAL POWER REQUIREMENTS IS THE RESPONSIBILITY OF THE
OWNER/CUSTOMER AND THEIR ELECTRICIAN.

ANY DEVIATION FROM THESE DRAWINGS MUST BE COMMUNICATED IN WRITING TO,
AND REVIEWED BY YOUR LOCAL GE HEALTHCARE SERVICE REPRESENTATIVE
PRIOR TO MAKING CHANGES.

– SITE PROGRESS CHECKLIST –

- ☐ MAKE SURE THE SUPPORT STRUCTURES FOR WALL, CEILING, AND FLOOR
MOUNTED EQUIPMENT HAVE BEEN INSTALLED ACCORDING TO THE LAYOUT.
REQUIRED NUTS, BOLTS, ANCHORS, AND OTHER HARDWARE SHOULD BE
AVAILABLE ON SITE.
- ☐ HAVE CEILINGS, WALLS AND FLOORS FINISHED AND PAINTED, EXCEPT AS
REQUIRED BY THE LOCAL INSTALLATION TEAM. (YOUR LOCAL GE TEAM
WILL PROVIDE YOU WITH THIS INFORMATION.)
- ☐ MAKE SURE HEATING, VENTILATION, AIR CONDITIONING, PLUMBING AND
LIGHTING ARE INSTALLED AND WORKING PROPERLY.
- ☐ HAVE BASEPLATES INSTALLED ACCORDING TO THE SUGGESTED LAYOUT. (GE
WILL ASSIST YOU WITH THIS.)
- ☐ MAKE SURE THAT ALL WIRES, JUNCTION BOXES, ACCESS FLOORING,
RACEWAYS AND CONDUIT HAVE BEEN INSTALLED WITH THE PROPER COVERS,
SCREWS AND CHASE NIPPLES ACCORDING TO THE SUGGESTED LAYOUTS. THE
FOLLOWING SPECIFICATIONS MUST BE MET:
 - ☐ 10 FOOT PIGTAILS AT ALL JUNCTION POINTS.
 - ☐ NO ALUMINUM OR SOLID WIRES.
 - ☐ ALL WIRING MUST BE THHN OR TFFN STRANDED COPPER THERMOPLASTIC
600 VOLT OR EQUIVALENT, UNLESS OTHERWISE STATED.
 - ☐ GROUNDING IS CRITICAL TO EQUIPMENT FUNCTION AND PATIENT
SAFETY. SITE MUST CONFORM TO WIRING SPECIFICATIONS SHOWN ON
PLAN.



GE Healthcare Technologies

Installation Services Design Center

Waukesha, Wisconsin

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SHEET TITLE: PREINSTALLATION CHECKLIST

MODALITY TYPE: 1.5T SIGNA MRI w/EXCITE

THIS PLAN IS SUBMITTED TO SUGGEST LOCATION OF GE HEALTHCARE EQUIPMENT
INSTALLATION. IT IS NOT TO BE USED FOR CONSTRUCTION DOCUMENTS.
IN PREPARING THIS PLAN, EVERY EFFORT HAS BEEN MADE TO CONFORM DETAILS
TO ACTUAL EQUIPMENT EXPECTED TO BE INSTALLED. IT IS NOT TO BE USED FOR
CONSTRUCTION DOCUMENTS. GE HEALTHCARE SERVICE REPRESENTATIVES
CANNOT BE HELD RESPONSIBLE FOR ANY DAMAGES RESULTING THEREFROM.

PROJECT TITLE:

TYPICAL MR
8–136F
TYPICAL INSTALLATION DRAWINGS

PROJECT	REVISION
8–136F	00
DATE: 10/16/03	
DRAWN BY: PMM	
CHECKED BY: PLM	

REVISION HISTORY:

SHEET

C1

[illegible]

SCALE: 1/4" = 1'-0"

This equipment layout indicates the placement and interconnection of the indicated equipment components. There may be federal, state, and/or local requirements that could impact the placement of these components. It remains the Customer's responsibility for ensuring the site and final equipment placement complies with all applicable federal, state, and/or local requirements.

CRITICAL ITEMS FOR MAGNET DELIVERY

- 24/7 CHILLED WATER AND 480V POWER FOR SHIELD/CRYO COOLER
- 24/7 120V POWER FOR THE MAGNET MONITOR
- PHONE LINES FOR MAGNET MONITORING AND EMERGENCY USE
- MAGNET ROOM EXHAUST FAN
- CRYOGEN VENTING (IF ROOF HATCH, COMPLETED WITHIN 24 HRS)
- MAGNET ANCHORS INSTALLED AND TESTED

THIS IS ONLY A PARTIAL LIST OF ITEMS REQUIRED FOR DELIVERY OF THE MAGNET. FOR A COMPLETE CHECKLIST REFER TO THE PRE-INSTALLATION MANUAL REFERENCED ON SHEET C1.

* THE ISOGAUSS CONTOUR PLOTS DEPICTED ON THIS DRAWING REPRESENT MAGNETIC FRINGE FIELDS RESULTING FROM THE NORMAL OPERATION OF THE MAGNET PROVIDED WITH THE MR SYSTEM. THE ACTUAL MAGNETIC FIELD INTENSITY AT ANY POINT IN THE VICINITY OF THE MAGNET WHEN INSTALLED MAY VARY FROM THE CONTOUR PLOTS DUE TO FACTORS SUCH AS THE CONCENTRATING EFFECTS OF NEARBY FERROUS OBJECTS, AMBIENT MAGNETIC FIELDS, INCLUDING THE EARTH'S MAGNETIC FIELD. THEREFORE, THE CONTOURS SHOWN ARE ONLY APPROXIMATIONS OF ACTUAL FIELD INTENSITIES FOUND AT A CORRESPONDING DISTANCE FROM THE MAGNET'S ISOCENTER.

MRI SITE PLANNING REMINDERS

- THE LAYOUT SHOULD BE ARRANGED SO THAT THE 5G LINE IS CONTAINED TO THE MAGNET ROOM. IF NOT POSSIBLE, A BARRIER IS RECOMMENDED TO PREVENT ENTRY TO THE 5G FIELD AREA.
- THE SPACES AROUND, ABOVE, AND BELOW THE MAGNET MUST BE REVIEWED FOR EFFECTS OF THE 5G, 3G, 1G, AND .5G FIELDS. REFER TO THE PROXIMITY LIMIT CHART IN THE MR SITE PLANNING DIRECTION.
- FOR MOVING METAL, THE RESTRICTION LINES TYPICALLY EXTEND OUTSIDE OF THE MRI SPACE. PLEASE CONFIRM THERE ARE NO MOVING METAL CONCERNS WITHIN THESE AREAS. AN EMI STUDY IS RECOMMENDED IF THE RESTRICTION LINES ARE VIOLATED.
- FOR VIBRATION, PLEASE CONFIRM THAT A VIBRATION STUDY HAS BEEN RECOMMENDED AND/OR SUCCESSFULLY COMPLETED.
- FOR EMI, PLEASE REVIEW THE SITE FOR THE LOCATION OF THE MAIN ELECTRICAL FEEDERS, AC DEVICES, OR DISTRIBUTION SYSTEMS. AN EMI STUDY IS RECOMMENDED IF LARGE AC SYSTEMS ARE NEARBY.
- DETAILS OF THE FLOOR BELOW THE MAGNET SHOULD BE REVIEWED. THE STRUCTURAL ENGINEER MUST VERIFY THAT THE QUANTITY OF STEEL IN THE VOLUME 10FT [3.1M] X 10FT [3.1M] X 1FT [.3M] DEEP (BELOW THE MAGNET) DOES NOT EXCEED THE ALLOWABLE STEEL CONTENT AS GIVEN IN THE MR SITE PLANNING DIRECTION.

RESPONSIBILITY FOR THE COORDINATION, DESIGN, ENGINEERING, AND SITE PREPARATION RESIDES WITH THE CUSTOMER AND THEIR PROJECT ARCHITECTS AND CONTRACTORS. GE DOES NOT, BY PROVIDING REVIEWS AND FURNISHING COMMENTS AND ASSISTANCE, ACCEPT ANY RESPONSIBILITY BEYOND ITS OBLIGATIONS AS DEFINED IN THE MR SYSTEM, SALE/PURCHASE AGREEMENT.

MOVING METAL SENSITIVITY LINE FOR CARS, MINIVANS, PICKUP TRUCKS, AND AMBULANCES.

NOTE: FERROUS OBJECTS MUST NOT MOVE INTO OR INSIDE OF THE MOVING METAL SENSITIVITY LINE DURING SCANS.

MOVING METAL SENSITIVITY LINE FOR BUSES AND TRUCKS (DUMP, TRACTOR TRAILER, UTILITY, FIRE TRUCKS)

The diagram illustrates the layout of an MRI suite. At the center is the **MAGNET ROOM**, which contains the main magnet assembly (labeled 16) and a control console (labeled 17). To the left of the magnet room is the **CONTROL** room, and to the right is the **READING** room. Adjacent to the reading room is the **EQUIPMENT ROOM**, which houses various support equipment numbered 1 through 71. The diagram includes concentric dashed lines representing magnetic field intensity contours: 0.5 G, 1 G, 3 G, 5 G, and 10 G. A shaded area at the bottom of the magnet room is labeled "5 GAUSS BARRIER". Dimensions for the rooms and overall suite are provided: Magnet Room is 25'-6" wide and 11'-3" high; Equipment Room is 6'-0" wide. A scale bar indicates 1/4" = 1'-0".

ACCURACY ITEMS		
CUSTOMER/CONTRACTOR SUPPLIED AND INSTALLED ITEMS		
ITEM NO.	ITEM DESCRIPTION (* INDICATES EXISTING)	
[60]	WORKSTATION TABLE	
[61]	WATER CHILLER	
[62]	RF FILTERS - LOCATE WITHIN 24 IN. [610 mm] OF THE PENETRATION PANEL	
[63]	MAGNET ROOM EXHAUST FAN	
[64]	MAINIMUM DOOR OPENING FOR EQUIPMENT DELIVERY IS 43 IN. H x 82 IN. W [1092mm x 2083mm], CONTINGENT ON A 96 IN. [2438mm] CORRIDOR WIDTH	
[65]	ACCESS FLOORING	
[66]	MINIMUM 9 FT.-0 IN. [2743 mm] x 9 FT.-0 IN. [2743 mm] REMOVABLE WALL SECTION FOR MAGNET DELIVERY/REMOVAL.	
[67]	WAVEGUIDE	
[68]	RF SCREEN, INCLUSIVE OF WALLS, FLOOR, DOOR, ETC. GROUND IMPEDANCE GREATER THAN 1000 OHMS. ATTENUATION 100db AT 10-100MHZ PLANEWAVE.	
[69]	COUNTERTOP WITH DRAWERS FOR MISCELLANEOUS ITEMS.	
[70]	BASE CABINET FOR STORAGE OF, SURFACE COILS, PATIENT POSITIONING PADS, PHANTOMS, ETC.	
[71]	AIR CONDITIONING (> VIBRATION ISOLATION IS RECOMMENDED AT SUPPORTS OF EACH UNIT TO BE INSTALLED.)	
THE FOLLOWING ITEMS ARE AVAILABLE FROM GE HEALTHCARE TECHNOLOGIES. CONTACT YOUR LOCAL GE HEALTHCARE SERVICE REPRESENTATIVE FOR PRICING AND AVAILABILITY.		
[90]	MAIN DISCONNECT CONTROL - 94 lbs. <43 kg>, 900 BTU/Hr. [264w] - CAT NO. E4503AT FORD 480-3 WYE.	
[91]	DC LIGHTING CONTROL PANEL 155 lbs <70 kg> 1024 BTU/HR. [CAT. NO. E4503AD/AW - BASIC SYSTEM]	
[92]	DC LIGHTING AUTO TRANSFORMER 60 lbs <27 kg> [PART OF VARIABLE DIMMER SYSTEM] [CAT. NO. E4503AF/AY INCLUDES BASIC SYSTEM]	
[93]	METAL DETECTOR (HAND HELD)	
GENERAL SPECIFICATIONS		
<ul style="list-style-type: none">o THE REQUIRED CEILING HEIGHT INDICATED ON THESE PLANS IS TO ENSURE EQUIPMENT FUNCTION IS NOT INHIBITED. CONSULT WITH YOUR LOCAL GEHC IS SPECIALIST REGARDING ACCEPTABILITY OF OTHER CEILING HEIGHTS.o CHECK ALL DOOR OPENINGS AND HALWAYS FROM DELIVERY LOCATION TO WHERE EQUIPMENT IS TO BE INSTALLED TO ENSURE THE ROUTE PHYSICALLY AND STRUCTURALLY WILL ACCOMMODATE THE EQUIPMENT AS SHIPPED.o RADIATION PROTECTION REQUIREMENTS ARE NOT INDICATED ON THIS PLAN. WHERE NEEDED PER NATIONAL OR LOCAL CODE THEY SHALL BE SPECIFIED BY A QUALIFIED RADIOLOGICAL PHYSICIST.o THE DEVELOPMENT OF THE EQUIPMENT LAYOUT, ROOM DIMENSIONS, MECHANICAL AND ELECTRICAL SUGGESTIONS IS PREDICATED UPON THE BEST INFORMATION OBTAINABLE FROM THE SITE, COUPLED WITH THE CUSTOMER'S KNOWN DESIRES. ARCHITECTURAL OR ELECTRICAL CHANGES INCLUDING RELOCATION OF EQUIPMENT ILLUSTRATED ON THIS DRAWING IS ALLOWED ONLY WITH NOTIFICATION, IN WRITING, AND REVIEW BY GEHC SERVICE DEPARTMENT. EQUIPMENT OPERATION, SERVICEABILITY, AND RESTRICTING CABLE LENGTHS, ETC., MAKE THIS ESSENTIAL FOR A PROPER IS. GEHC RESERVES THE RIGHT TO MAKE ON THE JOB CHANGES BECAUSE OF CUSTOMER REQUIREMENTS AND/OR OBSTACLES IN CONSTRUCTION, ETC..o ALL WORK TO BE IN COMPLIANCE WITH NATIONAL AND LOCAL BUILDING SAFETY CODES.o DIMENSIONS ARE TO FINISHED SURFACES OF ROOM		
SITE ENVIRONMENT SPECIFICATIONS		
<ul style="list-style-type: none">o AMBIENT OPERATING TEMPERATURE: 59-89.6 DEG (F) [15-32 (C)] FOR THE CONTROL AND EQUIPMENT AREAS. 59-69.8 DEG (F) [15-24 (C)] FOR THE MAGNET ROOM]. MAXIMUM ALLOWABLE TEMPERATURE CHANGE OF 5 DEG (F)/HR [3 (C)/HR]. MAXIMUM ROOM TEMPERATURE GRADIENT 5 DEG (F) [3 (C)].o HUMIDITY: 30 TO 75 (30-60 FOR THE MAGNET ROOM) PERCENT NON-CONDENSING, MAXIMUM ALLOWABLE CHANGE OF 5 PERCENT/HOUR.o ALTITUDE: 100 FT [30.5M] BELOW SEA LEVEL TO 8,000 FT. [2438M] ABOVE SEA LEVEL.o ENVIRONMENTAL RESTRICTIONS ABOVE MUST NOT EXCEED FOR THE ELECTRONICS.o WE DO NOT RESTRICT THE AIR INTAKE OR AIR EXHAUST OF THE SYSTEM COMPONENTS.o ENVIRONMENTAL CONDITIONS LISTED ABOVE MUST BE MAINTAINED AT ALL TIMES INCLUDING FOR EXAMPLE OVERNIGHT, WEEKENDS, AND HOLIDAYS.o THE SHIELD COOLER COMPRESSOR CABINET REQUIRES WATER COOLING TO DISSIPATE THE HEAT OUTPUT. HEAT DISSIPATION TO AIR IS NEGLIGIBLE. 24 HOUR POWER AND WATER COOLING MUST BE AVAILABLE UPON MAGNET DELIVERY.o CRYOGEN VENTING AND EMERGENCY EXHAUST SYSTEMS MUST BE COMPLETED IN THE MAGNET ROOM PRIOR TO DELIVERY.o FLUORESCENT LIGHTING IS NOT ALLOWED IN THE MAGNET ROOM DUE TO RF NOISE.		
MAGNETIC INTERFERENCE SPECIFICATIONS		
<ul style="list-style-type: none">o THE CUSTOMER MUST ESTABLISH PROTOCOLS TO PREVENT PERSONS WITH CARDIAC PACEMAKERS, NEUROSTIMULATORS, AND BIOSTIMULATION DEVICES FROM ENTERING MAGNETIC FIELDS OF GREATER THAN 5 GAUSS (EXCLUSION ZONE).o MAIN POWER TRANSFORMERS MUST REMAIN OUTSIDE THE 3 GAUSS FIELD. EMI < 40mc gA. EMI < 4.43m DC.o POTENTIAL EXISTS UNDER NORMAL FIELD CONDITIONS THAT THE 5 GAUSS LINE MAY EXPAND RADially TO 16.4 FT. [5.0 m] AND AXIALLY TO 22.96 FT. [7.0 m] FOR 2 SECONDS OR LESS. IT SHOULD BE NOTED THAT NORMAL RAMPOWDNS OR MRU (MAGNET RUNDOWN UNIT) INITIATED QUENCHES WILL NOT CAUSE THE MAGNETIC FIELD TO EXPAND.o IT IS RECOMMENDED EVERY SITE CONSIDER THE EVENT OF A QUENCH AND PLAN ACCORDINGLY (SUCH AS PLACING 5 GAUSS WARNING SIGNS AT EXPANDED LOCATIONS).o THE FERROUS METAL OBJECTS LISTED BELOW MUST NOT MOVE INTO OR INSIDE OF THE MOVING METAL SENSITIVITY LINE DURING SCANS.		
TYPICAL MOVING MAGNETIC MASS	DISTANCE RADially	DISTANCE AXIALLY
CARTS, GURNEYS 100-400 lbs [45-182 kg]	3 GAUSS LINE	3 GAUSS LINE
FORKLIFTS, SMALL ELEVATOR, CARS, MINIVANS VANS, PICKUP TRUCKS, AMBULANCES (OBJECTS GREATER THAN 400 lbs [182 kg])	15.5 ft. [4.72 m]	21.0 ft. [6.4 m]
BUSES AND TRUCKS (JUMP, TRACTOR TRAILER, UTILITY, FIRE TRUCKS)	18.1 ft. [5.52 m]	24.5 ft. [7.47 m]

PROJECT TITLE:
TYPICAL MR
8-136F
TYPICAL INSTALLATION DRAWINGS

REVISION HISTORY:

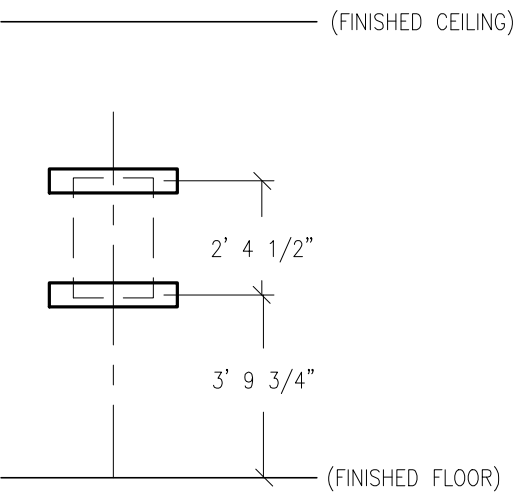
SHEET
A1
N°38-1002

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Milwaukee Wisconsin

TYPICAL WALL SUPPORT ELEVATIONS

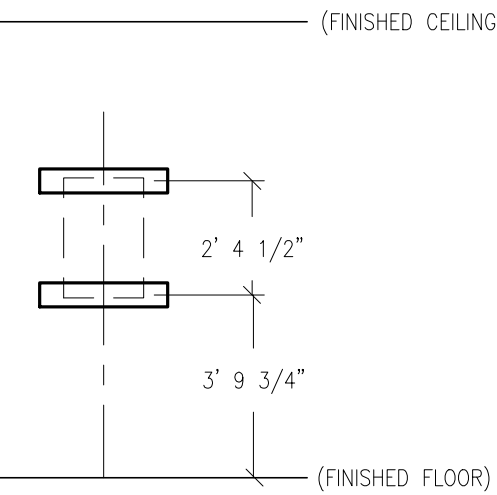
S60



SUPPORT FOR
MAIN DISCONNECT CONTROL

(NOT TO SCALE)

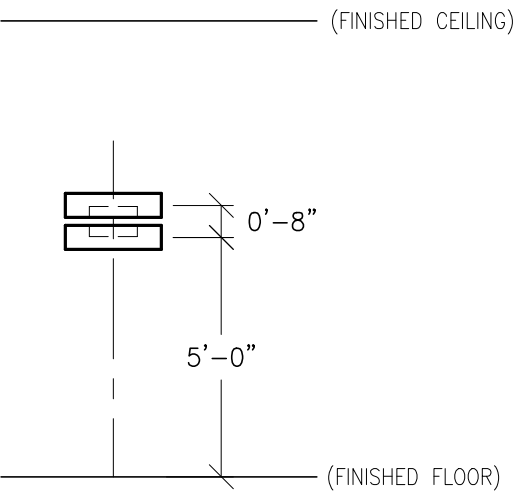
S62



SUPPORT FOR
DC LIGHTING CONTROLLER

(NOT TO SCALE)

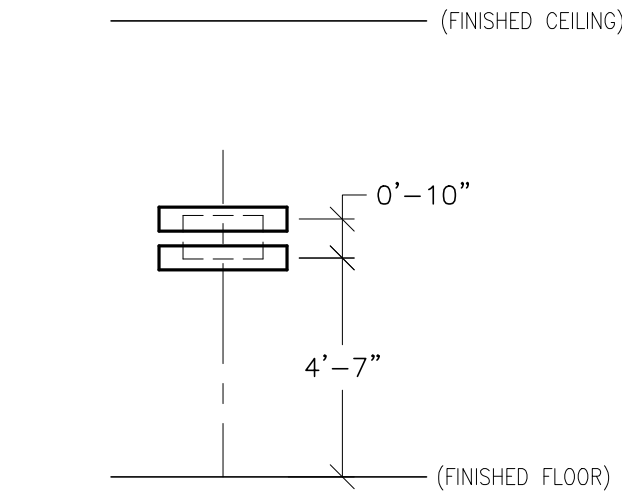
S63



SUPPORT FOR
MAGNET RUNDOWN UNIT

(NOT TO SCALE)

S86



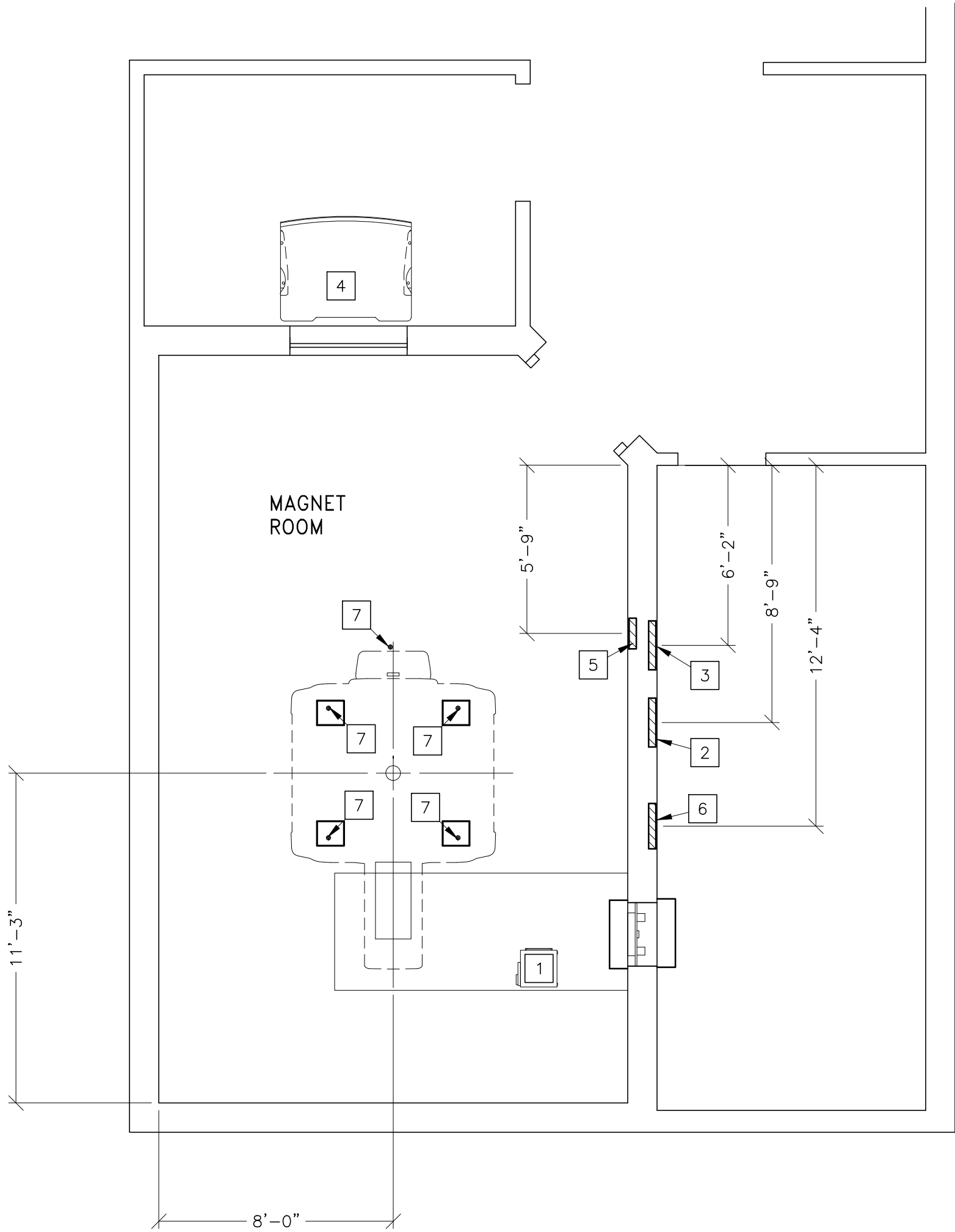
SUPPORT FOR
MAGNET MONITOR

(NOT TO SCALE)

SCALE: 1/4" = 1'-0"

STRUCTURAL LAYOUT

REQUIRED CEILING HEIGHT = 8'-9"



STRUCTURAL SUPPORT METHODS

CUSTOMER/CONTRACTOR SUPPLIED AND INSTALLED
ITEMS

ITEM NO.	ITEM DESCRIPTION (* INDICATES EXISTING)
<input type="checkbox"/>	
1	FLOOR MOUNTING AREA FOR BLOWER BOX. SEE DETAIL M58-15 ON SHEET S2.
2	SUPPORT BACKING, LOCATE AS SHOWN, REFER TO ELEVATION DETAIL S60, FOR MAIN DISCONNECT CONTROL.
3	SUPPORT BACKING, LOCATE AS SHOWN, REFER TO ELEVATION DETAIL S62, FOR DC LIGHTING CONTROL.
4	SEE DETAIL M58-15F ON SHEET S2 FOR FLOOR MOUNTING OF OPERATOR WORKSPACE.
5	SUPPORT BACKING, LOCATE AS SHOWN, REFER TO ELEVATION DETAIL S63, FOR MAGNET RUNDOWN UNIT.
6	SUPPORT BACKING, LOCATE AS SHOWN, REFER TO ELEVATION DETAIL S86, FOR MAGNET MONITOR.
7	LEVELING AREA FOR MAGNET AND TABLE SEE DETAILS M66-15A AND M66-15G ON SHEET S2.

STRUCTURAL NOTES

- ALL UNITS THAT ARE WALL MOUNTED OR WALL SUPPORTED ARE TO BE PROVIDED WITH SUPPORTS WHERE NECESSARY. WALL SUPPORTS ARE TO BE SUPPLIED AND INSTALLED BY THE CUSTOMER OR HIS CONTRACTORS. SEE PLAN AND DETAIL SHEETS FOR SUGGESTED LOCATIONS AND MOUNTING HOLE LOCATIONS.
- DIMENSIONS ARE TO FINISHED SURFACES OF ROOM.
- CERTAIN MR PROCEDURES REQUIRE AN EXTREMELY STABLE ENVIRONMENT TO ACHIEVE HIGH RESOLUTION IMAGE QUALITY. VIBRATION IS KNOWN TO INTRODUCE FIELD INSTABILITIES INTO THE IMAGING SYSTEM. THE VIBRATION EFFECTS ON IMAGE QUALITY CAN BE MINIMIZED DURING THE INITIAL SITE PLANNING OF THE MR SUITE BY MINIMIZING THE VIBRATION ENVIRONMENT. **SEE MOUNTING DETAIL ON SHEET S2 FOR ADDITIONAL INFORMATION.**
- STANDARD STEEL STUDS, NAILS, SCREWS, CONDUIT, PIPING, DRAINS AND OTHER HARDWARE ARE ACCEPTABLE IF PROPERLY SECURED. ANY LOOSE STEEL OBJECTS CAN BE VIOLENTLY ACCELERATED INTO THE BORE OF THE MAGNET. CAREFUL THOUGHT SHOULD BE GIVEN TO THE SELECTION OF LIGHT FIXTURES, CABINETS, WALL DECORATIONS, ETC. TO MINIMIZE THIS POTENTIAL HAZARD. FOR SAFETY, ALL REMOVABLE ITEMS WITHIN THE MAGNET ROOM SUCH AS FAUCET HANDLES, DRAIN COVERS, SWITCH BOX COVER PLATES, LIGHT FIXTURE COMPONENTS, MOUNTING SCREWS, ETC. MUST BE NON-MAGNETIC. IF YOU HAVE A SPECIFIC QUESTION ABOUT MATERIAL, BRING IT TO THE ATTENTION OF YOUR GE INSTALLATION SPECIALIST.
- FLOOR LEVELNESS IN THE MAGNET ROOM SHOULD NOT EXCEED 0.3125 in. (8 mm) WHEN MEASURING BETWEEN DEPRESSIONS AND HIGH SPOTS OVER ANY 120 in. (3048 mm) DISTANCE WITHIN THE 87.5 in. (2178 mm) BY 139.3 in. (3539 mm) AREA OF THE MAGNET ENCLOSURE AND THE AREA IN FRONT OF THE ENCLOSURE. THIS FLOOR LEVELNESS REQUIREMENT IS IMPORATANT FOR ACCURATE PATIENT TABLE DOCKING.
- NON-MOVABLE STEEL SUCH AS WALL STUDS OR HVAC COMPONENTS WILL PRODUCE NEGLIGIBLE EFFECT ON THE ACTIVE SHIELD MAGNET.

SHEET TITLE: STRUCTURAL LAYOUT

MODALITY TYPE: 1.5T SIGNA MRI w/EXCITE

THIS PLAN IS SUBMITTED TO SUGGEST LOCATION OF GE HEALTHCARE EQUIPMENT. GE HEALTHCARE MAKES NO WARRANTY, REPRESENTATION OR AGREEMENT. IN PREPARING THIS PLAN, EVERY EFFORT HAS BEEN MADE TO CONFORM DETAILS TO ACTUAL EQUIPMENT EXPECTED TO BE INSTALLED. IT IS NOT TO BE USED FOR CONSTRUCTION WITHOUT THE WRITTEN APPROVAL OF GE HEALTHCARE. GE HEALTHCARE ACCEPTS NO RESPONSIBILITY FOR ANY DAMAGES RESULTING THEREFROM.

TYPICAL MR
8-136F

TYPICAL INSTALLATION DRAWINGS

PROJECT TITLE:

PROJECT	REVISION
8-136F	00
DATE:	10/16/03
DRAWN BY:	PMM
CHECKED BY:	PLM

REVISION HISTORY:

SHEET

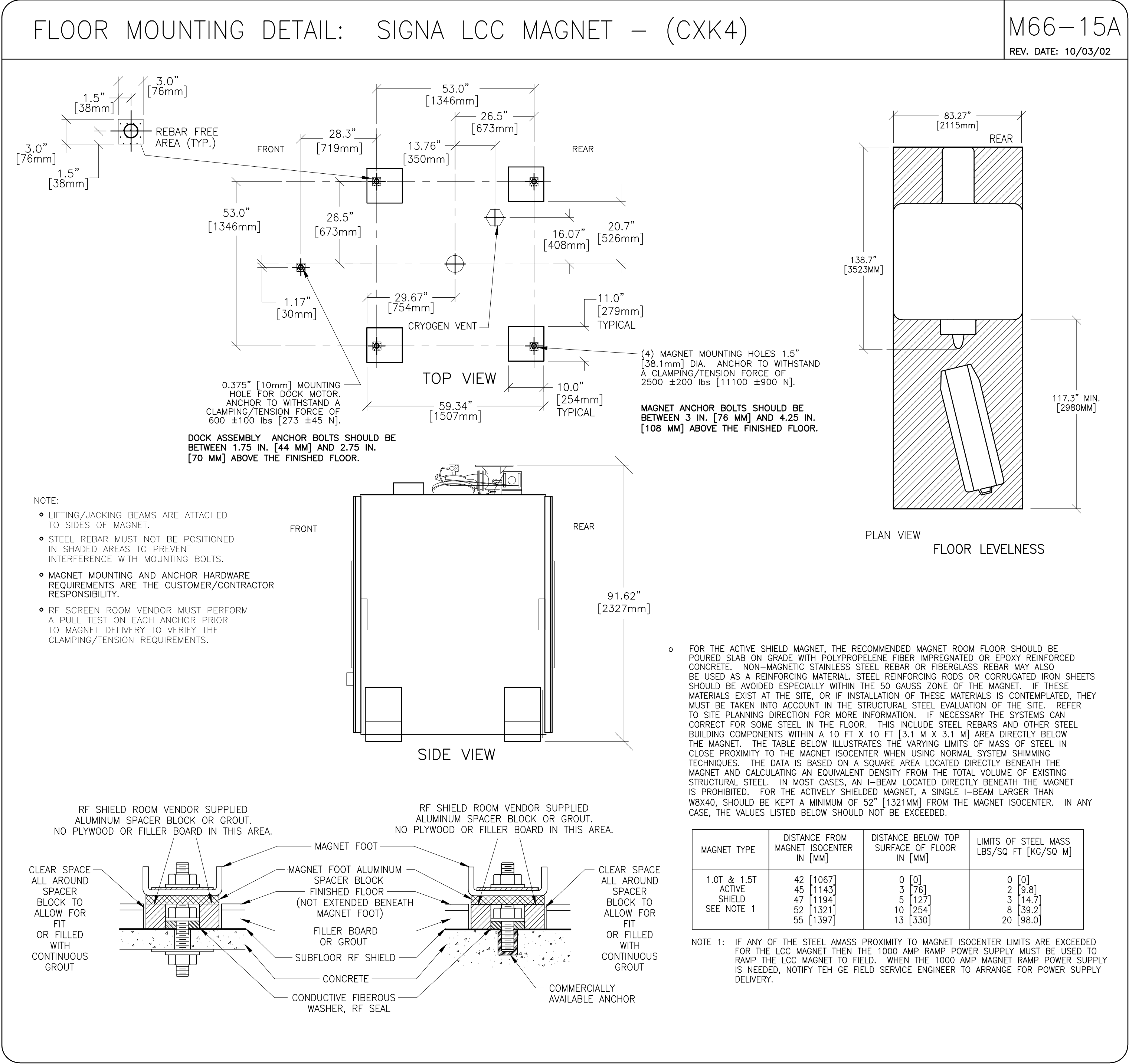
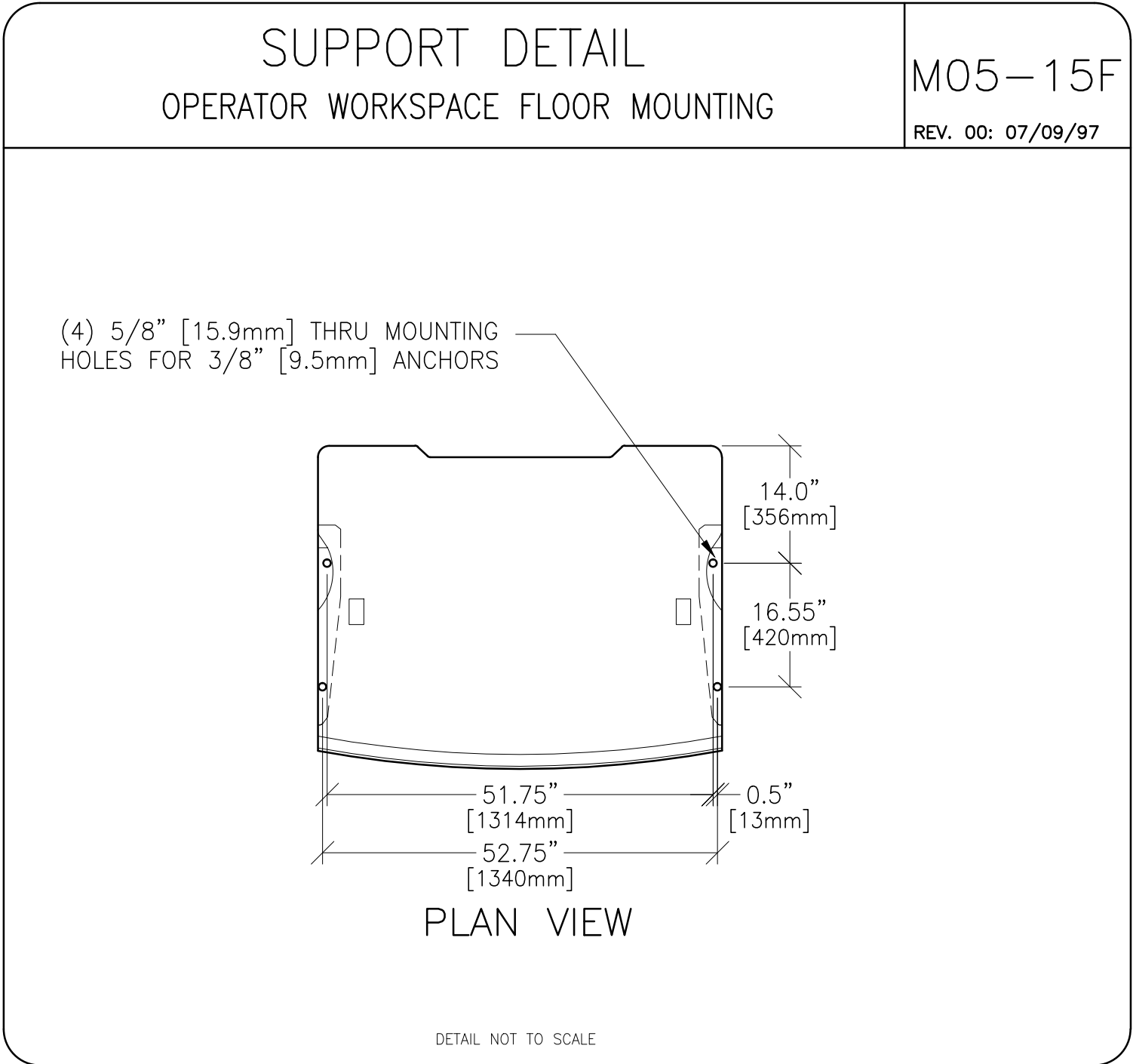
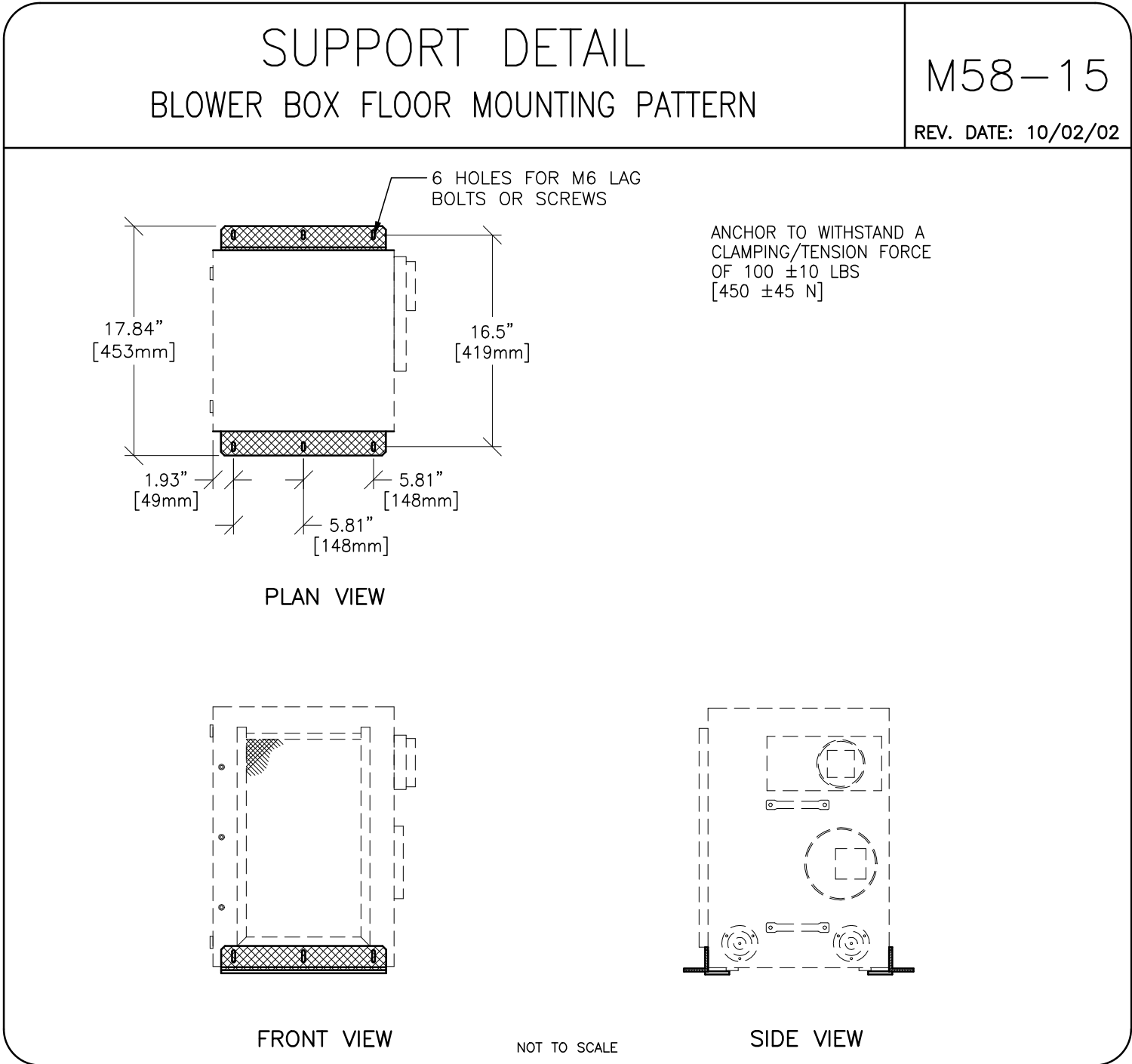
S1



GE Healthcare

IS Services Design Center

Milwaukee, Wisconsin



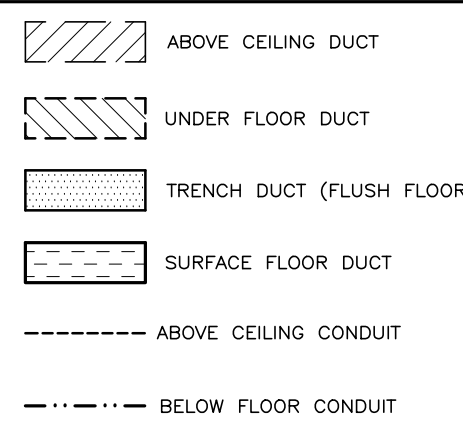
SCALE: 1/4" = 1'-0"

ELECTRICAL PLAN

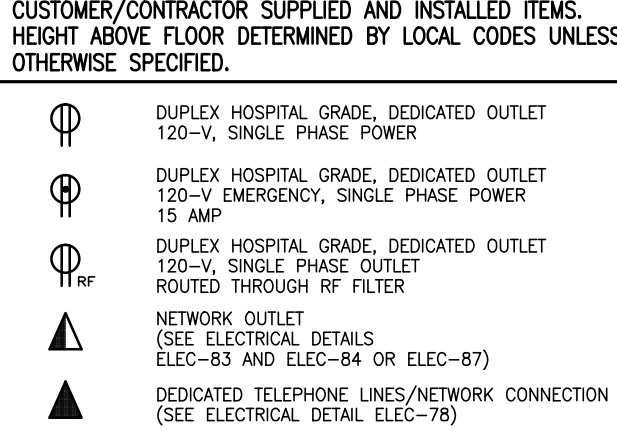
REQUIRED CEILING HEIGHT = 8'-9"

JUNCTION POINT DESCRIPTIONS

DUCT HATCHING LEGEND



ELECTRICAL OUTLET LEGEND



JUNCTION POINT NOTES

- ALL JUNCTION BOXES, CONDUIT, DUCT, DUCT DIVIDERS, SWITCHES, CIRCUIT BREAKERS, ETC., ARE TO BE SUPPLIED AND INSTALLED BY CUSTOMER'S ELECTRICAL CONTRACTOR.
- CONDUIT AND DUCT RUNS SHALL HAVE SWEEP RADIUS BENDS.
- CONDUITS AND DUCT ABOVE CEILING OR BELOW FINISHED FLOOR MUST BE INSTALLED AS NEAR TO CEILING OR FLOOR AS POSSIBLE TO REDUCE RUN LENGTH.
- CEILING MOUNTED JUNCTION BOXES ILLUSTRATED ON THIS PLAN MUST BE INSTALLED FLUSH WITH FINISHED CEILING.
- ALL DUCTWORK MUST MEET THE FOLLOWING REQUIREMENTS:
 - DUCTWORK SHALL BE METAL WITH DIVIDERS AND HAVE REMOVABLE, ACCESSIBLE COVERS.
 - DUCTWORK SHALL BE CERTIFIED/RATED FOR ELECTRICAL POWER PURPOSES.
 - DUCTWORK SHALL BE ELECTRICALLY AND MECHANICALLY BONDED TOGETHER IN AN APPROVED MANNER.
 - PVC AS A SUBSTITUTE MUST BE USED IN ACCORDANCE WITH ALL LOCAL AND NATIONAL CODES.
- ALL OPENINGS IN ACCESS FLOORING ARE TO BE CUT OUT AND FINISHED OFF WITH GROMMET MATERIAL BY THE CUSTOMER'S CONTRACTOR.
- GENERAL CONTRACTOR TO INSERT PULL CORDS FOR ALL CABLE RUN CONDUITS BETWEEN THE EQUIPMENT ROOM AND THE OPERATORS CONTROL ROOM.
- 10 FOOT PIGTAILS AT ALL JUNCTION POINTS.
- ALL WIRING MUST BE THIN OR THIN STRANDED COPPER THERMOPLASTIC 600 VOLT OR EQUIVALENT INSULATION. **ALUMINUM OR SOLID WIRES ARE NOT ALLOWED.**
- GROUNDING IS CRITICAL TO EQUIPMENT FUNCTION AND PATIENT SAFETY. SITE MUST CONFORM TO WIRING SPECIFICATIONS SHOWN ON THIS PLAN.

POINT	THE FOLLOWING MATERIALS ARE TO BE SUPPLIED AND INSTALLED BY THE CUSTOMER'S ELECTRICAL CONTRACTOR		
	DESCRIPTION	QTY.	HARDWARE
DCL	DC LIGHTING	1	SEE DETAILS
DS	RF DOOR SWITCH	1	SEE DETAILS
EF1	RF EXHAUST FAN SWITCH	1	SEE DETAILS
EF2	RF EXHAUST FAN SWITCH	1	SEE DETAILS
ED1	EMERGENCY OFF BUTTON	1	SEE DETAILS
ED2	EMERGENCY OFF BUTTON	1	SEE DETAILS
ICC	INJECTOR DISPLAY	1	SEE DETAILS
IH	INJECTOR HEAD	1	SEE DETAILS
MDC	MAIN DISCONNECT	1	SEE DETAILS
MG6	BLOWER BOX	1	SEE DETAILS
MM	MAGNET MONITOR	1	SEE DETAILS
MR1	RF CABINET	1	SEE DETAILS
MR2	SYSTEM CONTROL CABINET	1	SEE DETAILS
MS1	MAGNET	1	SEE DETAILS
MS4	MAGNET RUNDOWN UNIT	1	SEE DETAILS
MS5	SHIELD COOLER CABINET	1	SEE DETAILS
OW	OPERATOR WORKSPACE	1	SEE DETAILS
PA	PATIENT ALERT CONTROL BOX	1	SEE DETAILS
PD	POWER DISTRIBUTION UNIT	1	SEE DETAILS
PP1	RF PENETRATION PANEL	1	SEE DETAILS
RL	MAGNET ROOM LIGHTS	1	SEE DETAILS
WC1	WATER CHILLER	1	SEE DETAILS

SHEET TITLE: ELECTRICAL LAYOUT

MODALITY TYPE: 1.5T SIGNA MRI w/EXCITE

THIS PLAN IS SUBMITTED TO SUGGEST LOCATION OF GE HEALTHCARE EQUIPMENT. GE HEALTHCARE EQUIPMENT IS NOT TO BE INSTALLED WITHOUT THE APPROVAL OF GE HEALTHCARE. IN PREPARING THIS PLAN, EVERY EFFORT HAS BEEN MADE TO CONFORM TO THE DETAILS OF THE EQUIPMENT. IT IS NOT TO BE USED FOR ANY OTHER PURPOSES. THE COMPANY CANNOT ACCEPT RESPONSIBILITY FOR ANY DAMAGES RESULTING THEREFROM.

PROJECT TITLE:

TYPICAL MR
8-136F
TYPICAL INSTALLATION DRAWINGS

PROJECT: 8-136F
REVISION: 00

DATE: 10/16/03
DRAWN BY: PMM
CHECKED BY: PLM

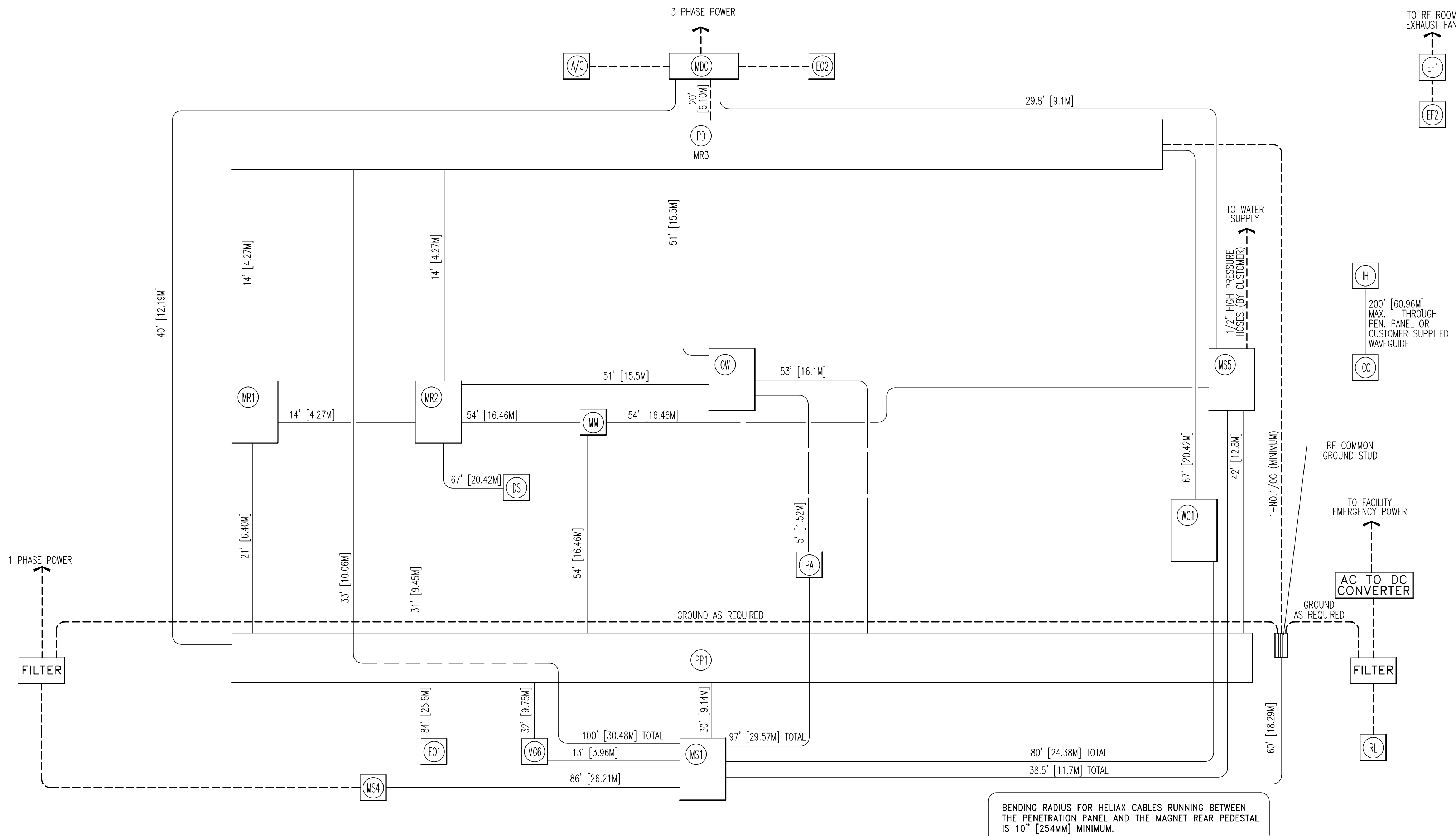
REVISION HISTORY:

REVISION HISTORY:

SHEET
E1

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

INTERCONNECT DIAGRAM



POWER SPECIFICATIONS

SIGNA MR/i, CV/i, NV/i WITH ACGD (REV. DATE 09/18/02)

VOLTAGE
PRIMARY SOURCE IS REQUIRED FOR ALL INSTALLATIONS.
RANGE OF LINE VOLTAGES: NOMINAL LINE VOLTAGE OF 380 TO 480, 3 PHASE, 50 OR 60 HZ.
RECOMMENDED POWER SUPPLY: WYE-CONNECTED OR DELTA-CONNECTED (GROUNDED DELTA).

MAXIMUM DAILY VOLTAGE VARIATION MUST FALL WITHIN ONE OF THE RANGES IN TABLE A.

TABLE A
ALLOWABLE
INPUT
VOLTAGES/
CURRENT
DEMAND

NOMINAL VOLTAGE	ABSOLUTE RANGE	CURRENT (AMPS)		MINIMUM STANDARD OVERCURRENT PROTECTION **
		MAX. MOMENTARY	CONTINUOUS	
380	342-418	113	82	125-A
400	360-440	107	78	100-A
415	374-456	103	75	100-A
480	432-528	89	65	90-A

** OVERCURRENT PROTECTION SIZED FOR 125% CONTINUOUS CURRENT. (CALCULATIONS BASED UPON NOMINAL VOLTAGE).

PHASE-
BALANCE.

PHASE-TO-PHASE VOLTAGES MUST BE WITHIN 2 PERCENT OF THE LOWEST PHASE-TO-PHASE VOLTAGE. MAXIMUM ALLOWABLE TRANSIENT VOLTAGE EXCURSIONS ARE 1.8 PERCENT OF RATED LINE VOLTAGE AT A MAXIMUM DURATION OF 1 CYCLE AND FREQUENCY OF 10 TIMES PER HOUR.

VOLTAGE TRANSIENT OR IMPULSE ON THE INCOMING POWER MUST BE HELD TO A MINIMUM. TRANSIENTS CAUSED BY LIGHTNING, SURGES, LOAD SWITCHING, STATIC ELECTRICITY ETC. CAN CAUSE SCAN ABORTS OR, IN EXTREME INSTANCES, COMPONENT FAILURE IN THE COMPUTER SUBSYSTEM.

POWER
DEMAND

MAXIMUM POWER DEMAND = 74 KVA.
74 KVA CONSISTING OF 65 KVA FOR PDU + 9 KVA (CONTINUOUS OPERATION) FOR SHIELD/CRYO COOLER CABINET.

TABLE B
MAXIMUM
POWER
DEMAND.

DEMAND	SIGNA SYSTEM
kVa *	74
POWER FACTOR AT	0.9

* DEMAND INCLUDES POWER FOR ENTIRE MR SYSTEM.
LINE VOLTAGE REGULATION AT MAXIMUM POWER DEMAND MUST BE LESS THAN OR EQUAL TO 2 PERCENT OR 4 PERCENT FROM POWER SOURCE.

DISTRIBUTION
TRANSFORMER

FOR A SINGLE UNIT INSTALLATION, THE MINIMUM TRANSFORMER SIZE IS 150 KVA. REGULATED TRANSFORMER IS NOT REQUIRED UNLESS VOLTAGE CHANGES EXCEED ±10% OVER A PERIOD OF 1 HOUR OR LONGER.

REFER TO DIRECTION 2223170 FOR ADDITIONAL INFORMATION.

ELECTRICAL NOTES

- NOTE 1: ALL WIRES SPECIFIED SHALL BE COPPER STRANDED, FLEXIBLE, THERMO-PLASTIC, COLOR CODED, CUT 10 FOOT LONG AT OUTLET BOXES, DUCT TERMINATION POINTS OR STUBBED CONDUIT ENDS.
ALL CONDUCTORS, POWER, SIGNAL AND GROUND, MUST BE RUN IN A CONDUIT OR DUCT SYSTEM. ELECTRICAL CONTRACTOR SHALL RING OUT AND TAG ALL WIRES AT BOTH ENDS. WIRE RUNS MUST BE CONTINUOUS COPPER STRANDED AND FREE FROM SPLICES. **ALUMINUM OR SOLID WIRES ARE NOT ALLOWED.**
- NOTE 2: WIRE SIZES GIVEN ARE FOR USE OF EQUIPMENT. LARGER SIZES MAY BE REQUIRED BY LOCAL CODES.
- NOTE 3: IT IS RECOMMENDED THAT ALL WIRES BE COLOR CODED, AS REQUIRED IN ACCORDANCE WITH NATIONAL AND LOCAL ELECTRICAL CODES.
- NOTE 4: CONDUIT SIZES SHALL BE VERIFIED BY THE ARCHITECT, ELECTRICAL ENGINEER OR CONTRACTOR, IN ACCORDANCE WITH LOCAL OR NATIONAL CODES.
- NOTE 5: CONVENIENCE OUTLETS ARE NOT ILLUSTRATED. THEIR NUMBER AND LOCATION ARE TO BE SPECIFIED BY OTHERS. LOCATE AT LEAST ONE CONVENIENCE OUTLET CLOSE TO THE SYSTEM CONTROL, THE POWER DISTRIBUTION UNIT AND ONE ON EACH WALL OF THE PROCEDURE ROOM. USE HOSPITAL APPROVED OUTLET OR EQUIVALENT.
- NOTE 6: GENERAL ROOM ILLUMINATION IS NOT ILLUSTRATED. CAUTION SHOULD BE TAKEN TO AVOID EXCESSIVE HEAT FROM OVERHEAD SPOTLIGHTS. DAMAGE CAN OCCUR TO CEILING MOUNTING COMPONENTS AND WIRING IF HIGH WATTAGE BULBS ARE USED. RECOMMEND LOW WATTAGE BULBS NO HIGHER THAN 75 WATTS AND USE DIMMER CONTROLS (EXCEPT MR). DO NOT MOUNT LIGHTS DIRECTLY ABOVE AREAS WHERE CEILING MOUNTED ACCESSORIES WILL BE PARKED.
- NOTE 7: **ROUTING OF CABLE DUCTWORK, CONDUITS, ETC., MUST RUN DIRECT AS POSSIBLE OTHERWISE MAY RESULT IN THE NEED FOR GREATER THAN STANDARD CABLE LENGTHS (REFER TO THE INTERCONNECTION DIAGRAM FOR MAXIMUM USABLE LENGTHS POINT TO POINT).**
- NOTE 8: CONDUIT TURNS TO HAVE LARGE, SWEEPING BENDS WITH MINIMUM RADIUS IN ACCORDANCE WITH NATIONAL AND LOCAL ELECTRICAL CODES.
- NOTE 9: A SPECIAL GROUNDING SYSTEM IS REQUIRED IN ALL PROCEDURE ROOMS BY SOME NATIONAL AND LOCAL CODES. IT IS RECOMMENDED IN AREAS WHERE PATIENTS MIGHT BE EXAMINED OR TREATED UNDER PRESENT, FUTURE, OR EMERGENCY CONDITIONS. CONSULT THE GOVERNING ELECTRICAL CODE AND CONFER WITH APPROPRIATE CUSTOMER ADMINISTRATIVE PERSONNEL TO DETERMINE THE AREAS REQUIRING THIS TYPE OF GROUNDING SYSTEM.
- NOTE 10: THE MAXIMUM POINT TO POINT DISTANCES ILLUSTRATED ON THIS DRAWING MUST NOT BE EXCEEDED.
- NOTE 11: PHYSICAL CONNECTION OF PRIMARY POWER TO GE EQUIPMENT IS TO BE MADE BY CUSTOMERS ELECTRICAL CONTRACTOR WITH THE SUPERVISION OF A GE REPRESENTATIVE. THE GE REPRESENTATIVE WOULD BE REQUIRED TO IDENTIFY THE PHYSICAL CONNECTION LOCATION, AND INSURE PROPER HANDLING OF GE EQUIPMENT.

DIAGRAM KEY

- CUSTOMER/CONTRACTOR SUPPLIED WIRING. ROUTE IN ADEQUATE CONDUIT OR RACEWAY.
- GE FURNISHED CABLE RUNS. ROUTE IN EMPTY CONDUIT OR RACEWAY.
- 50' [18M] MAXIMUM RUN LENGTH BETWEEN JUNCTION POINTS.
Feet [Meters]

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

SHEET TITLE: ELECTRICAL SPECIFICATIONS

MODALITY TYPE: 1.5T SIGNA MRI w/EXCITE

THIS PLAN IS SUBMITTED TO SUGGEST LOCATION OF GE HEALTHCARE EQUIPMENT. IT IS NOT TO BE USED FOR CONSTRUCTION. IN PREPARING THIS PLAN, EVERY EFFORT HAS BEEN MADE TO CONFORM DETAILS TO ACTUAL EQUIPMENT EXPECTED TO BE INSTALLED. IT IS NOT TO BE USED FOR ANY OTHER PURPOSE. THE COMPANY CANNOT ACCEPT RESPONSIBILITY FOR ANY DAMAGES RESULTING THEREFROM.

TYPICAL MR
8-136F
TYPICAL INSTALLATION DRAWINGS

PROJECT TITLE:

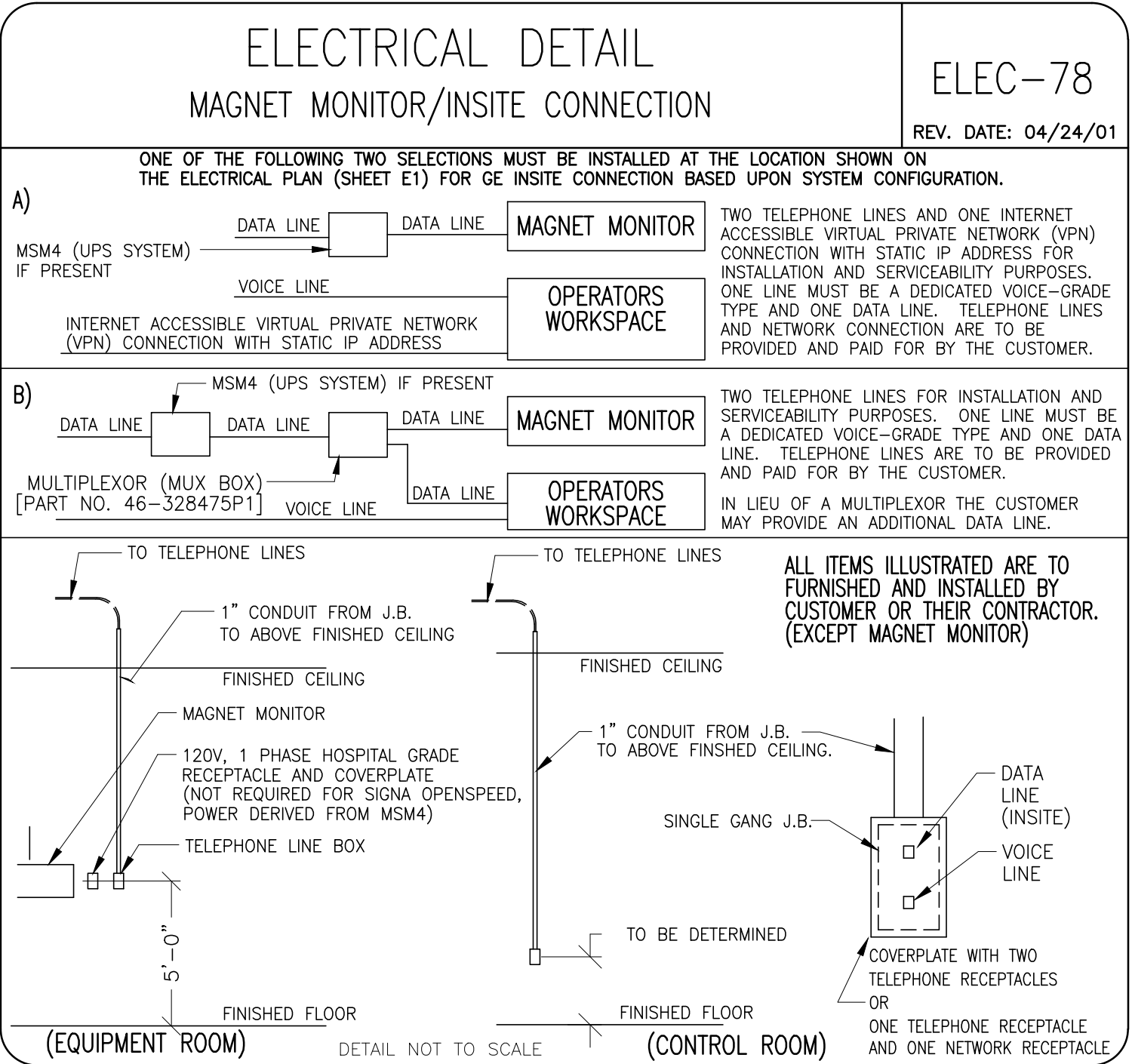
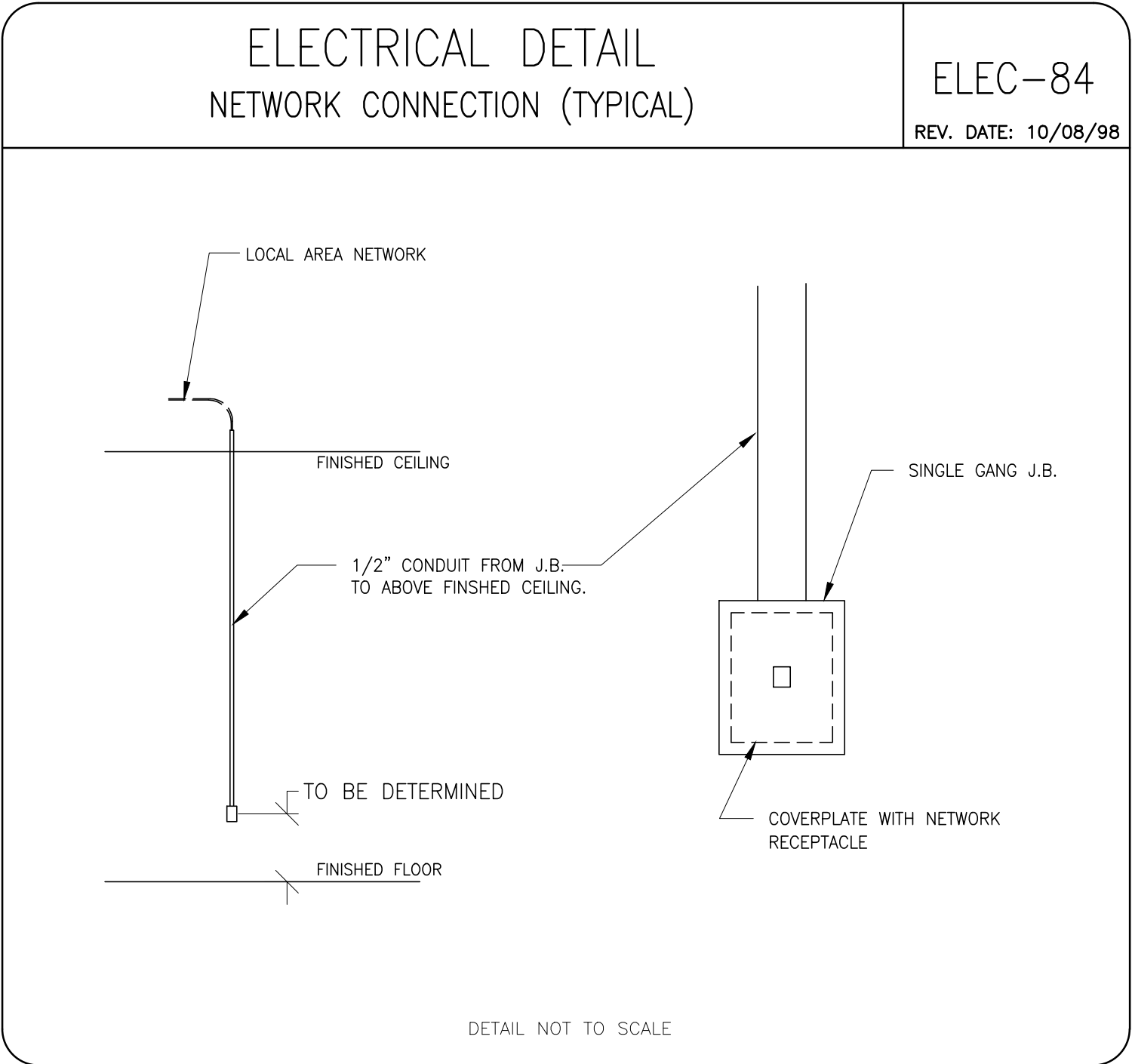
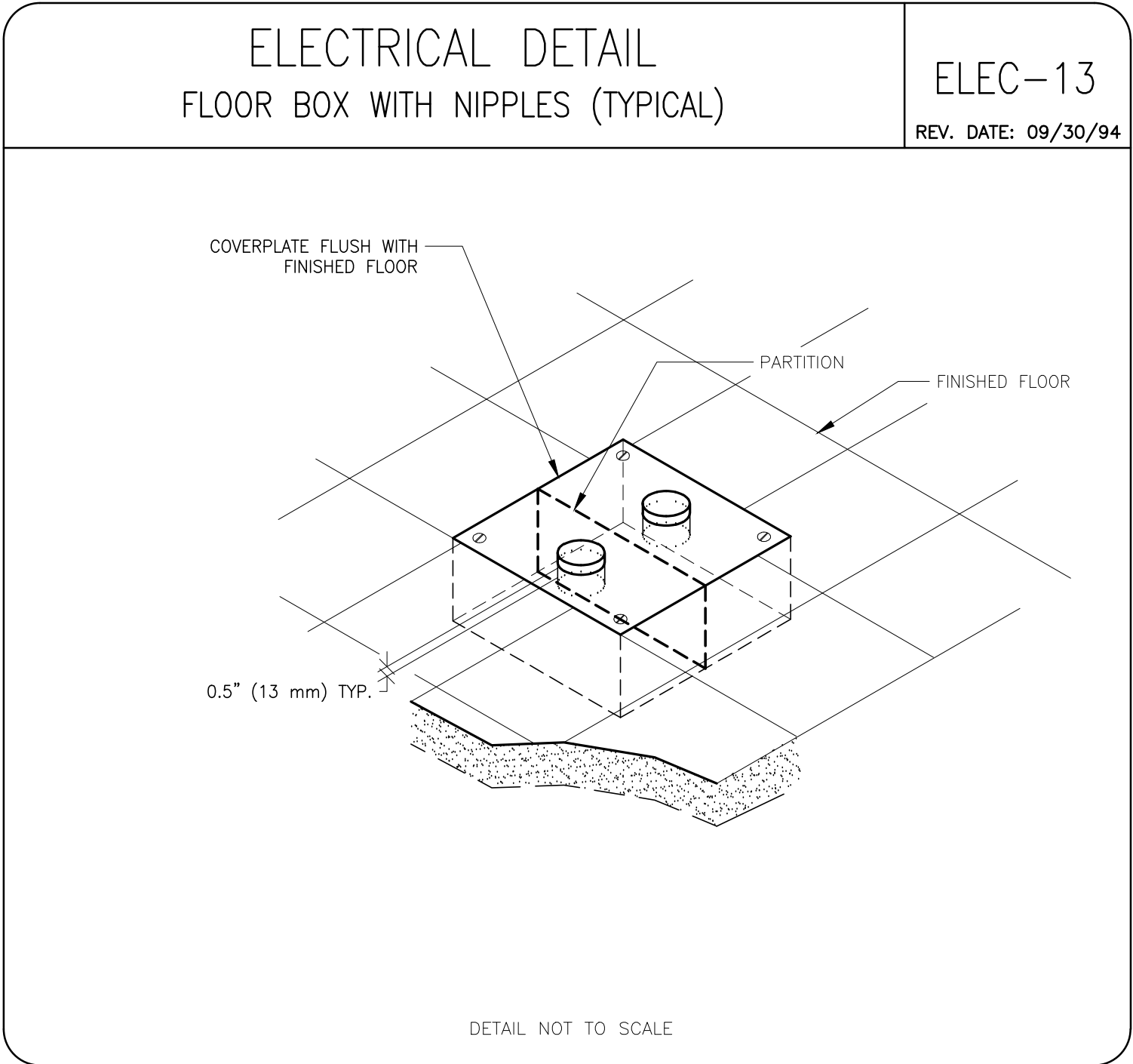
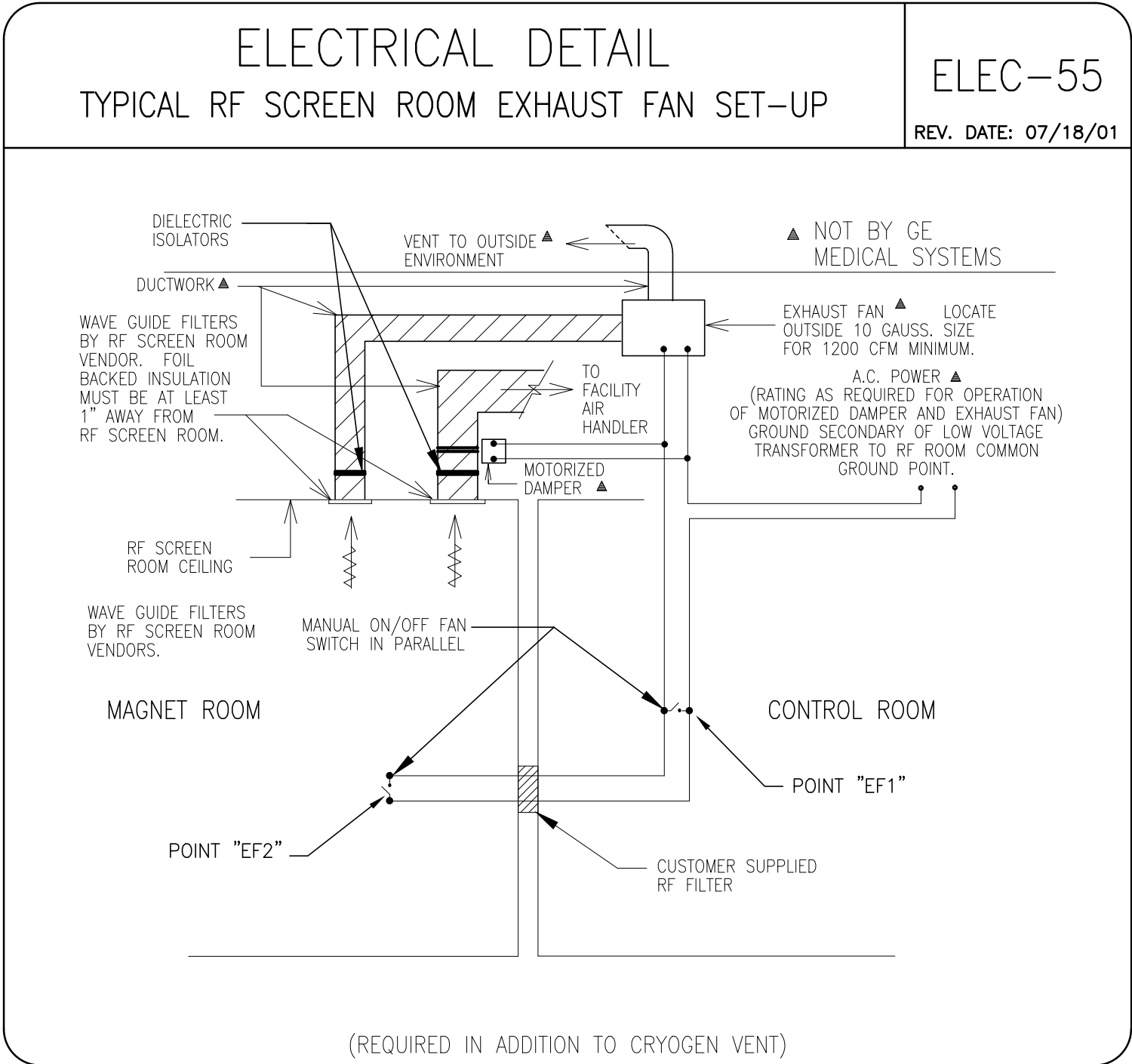
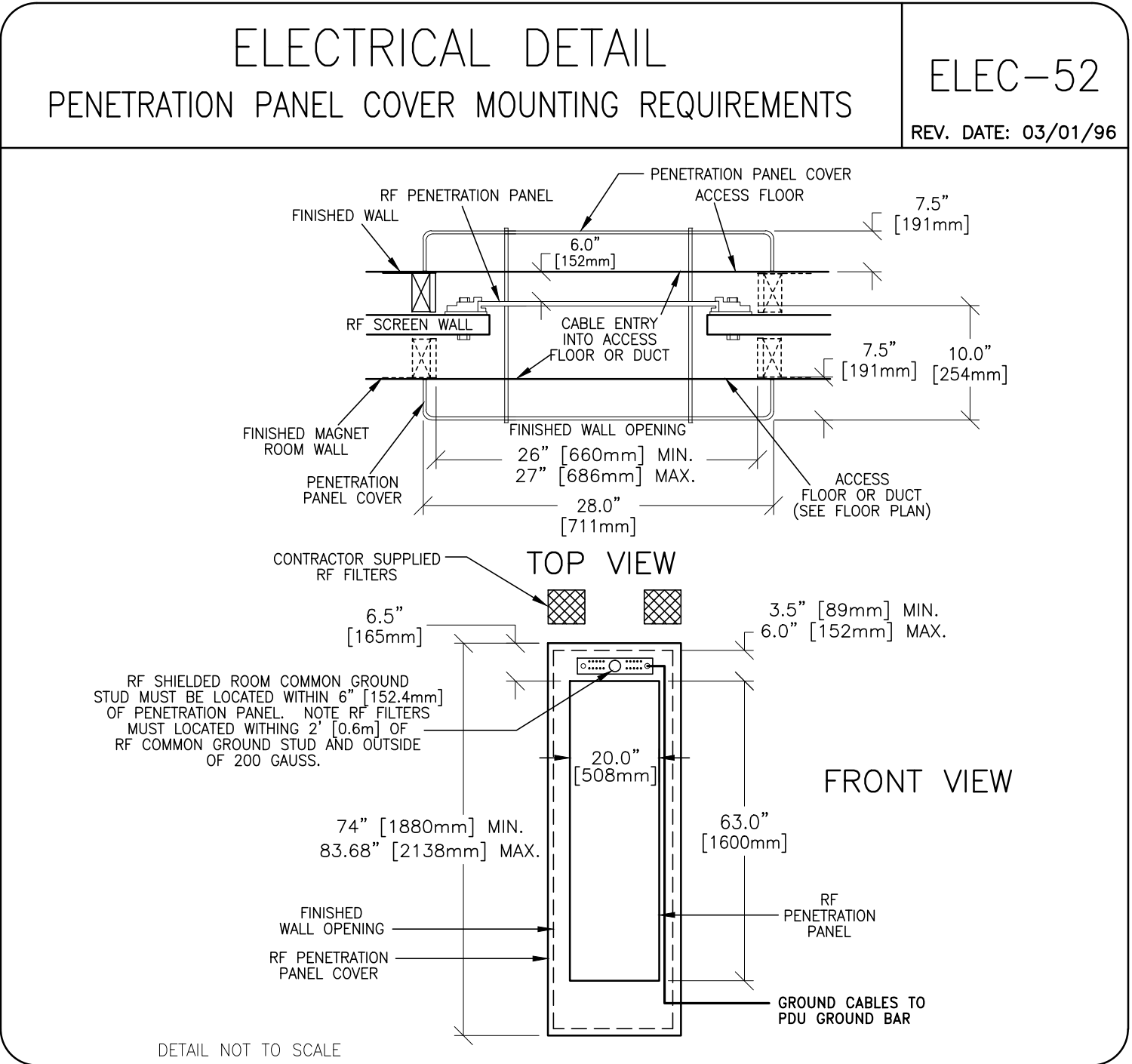
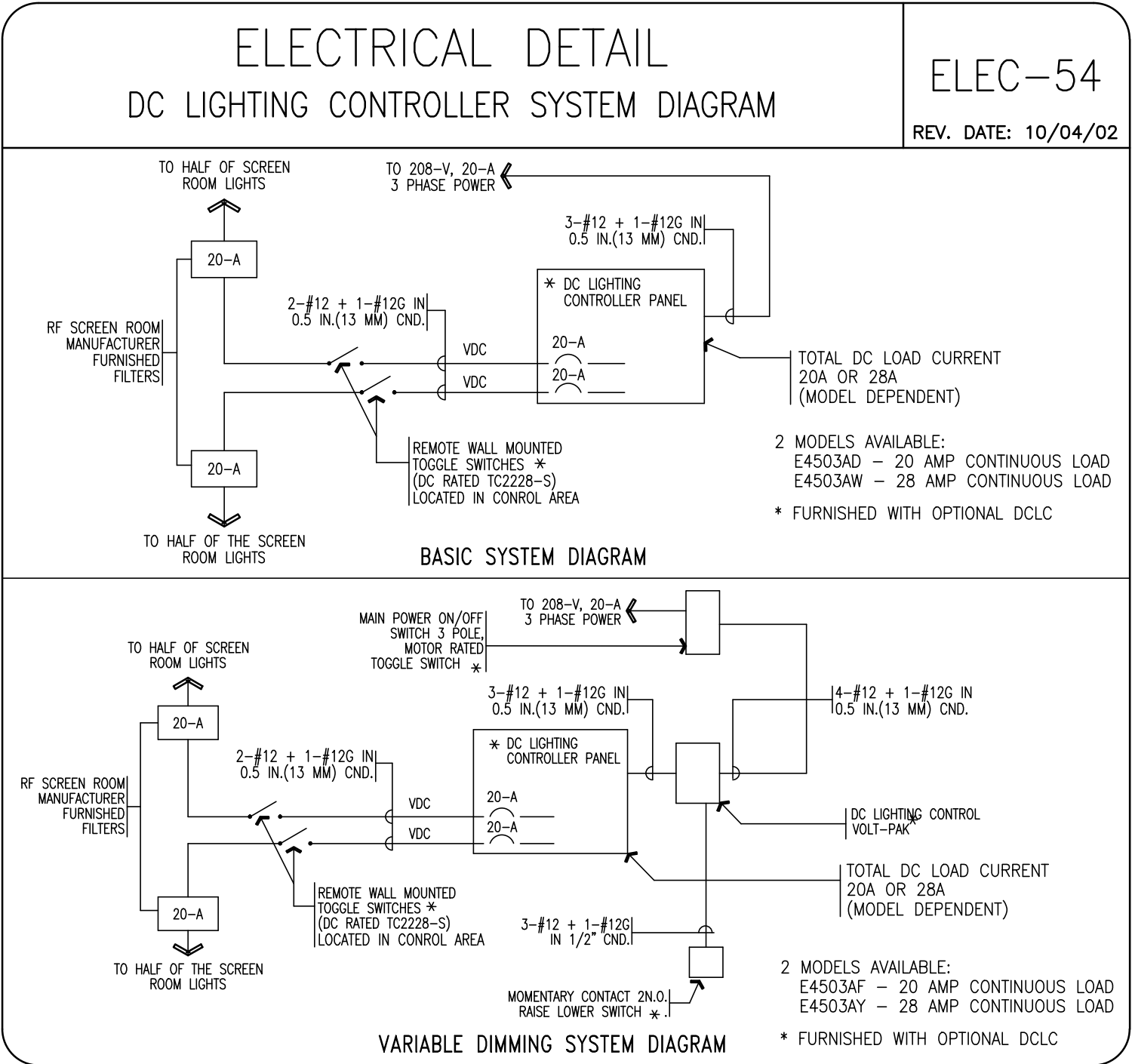
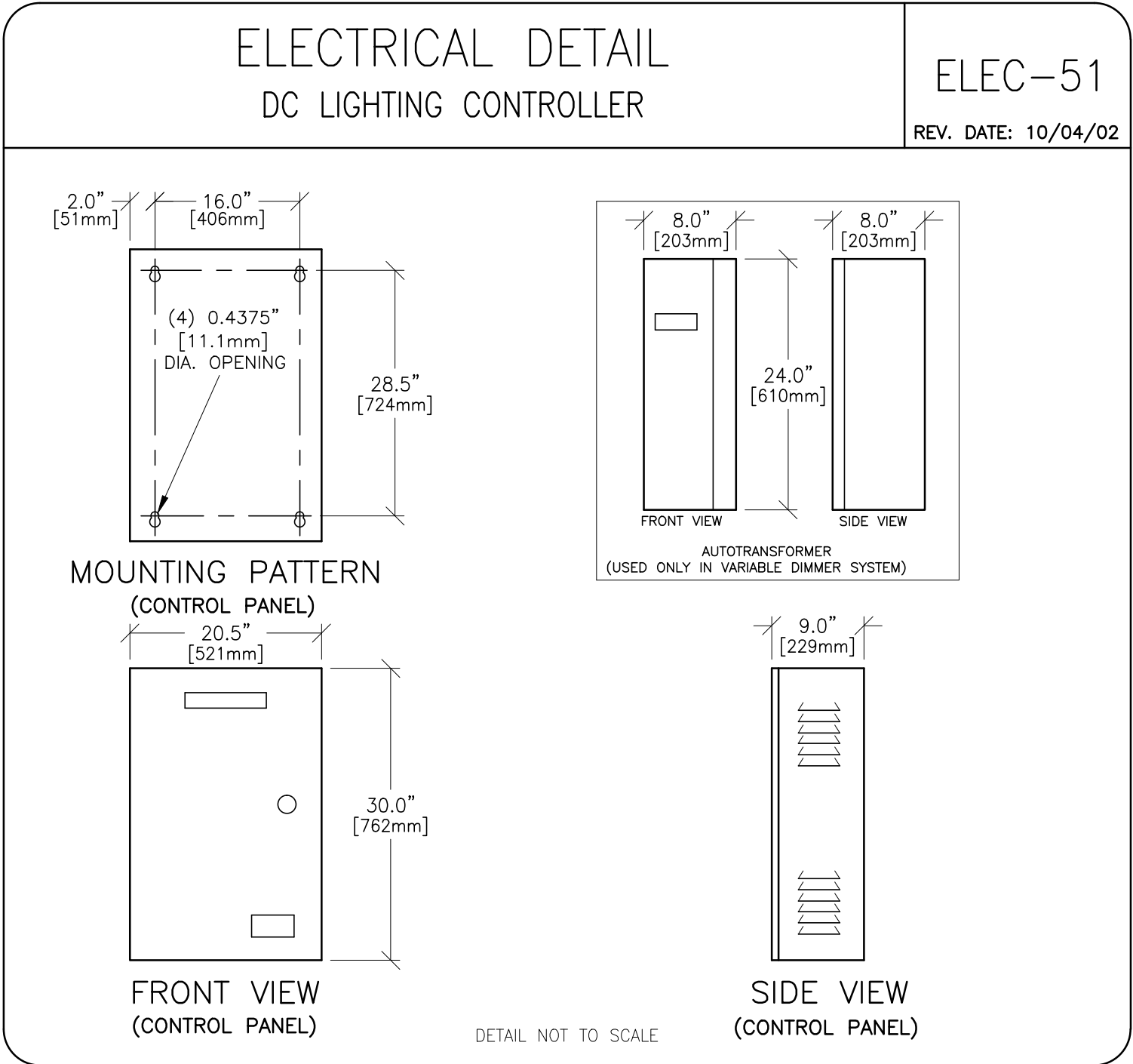
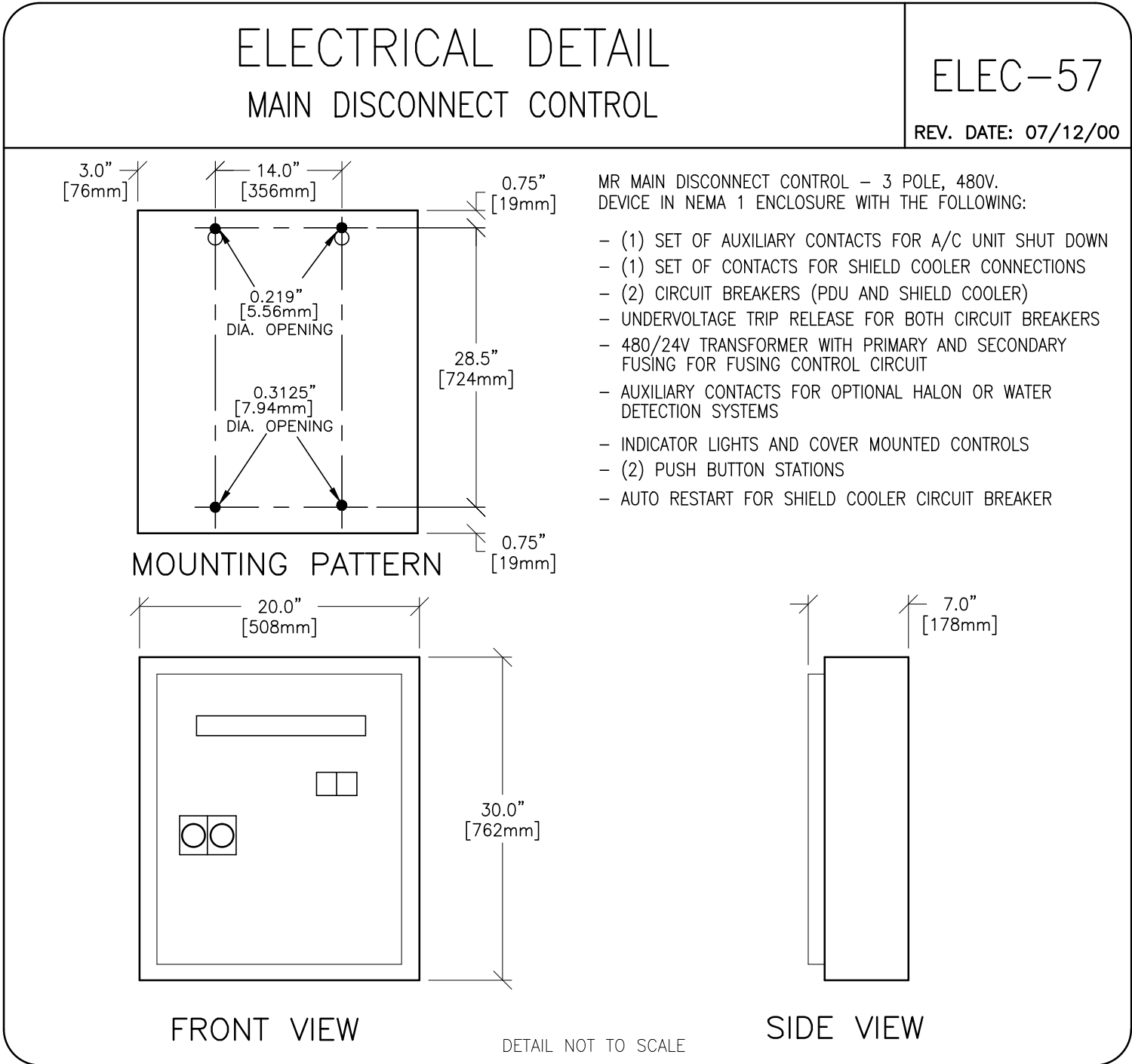
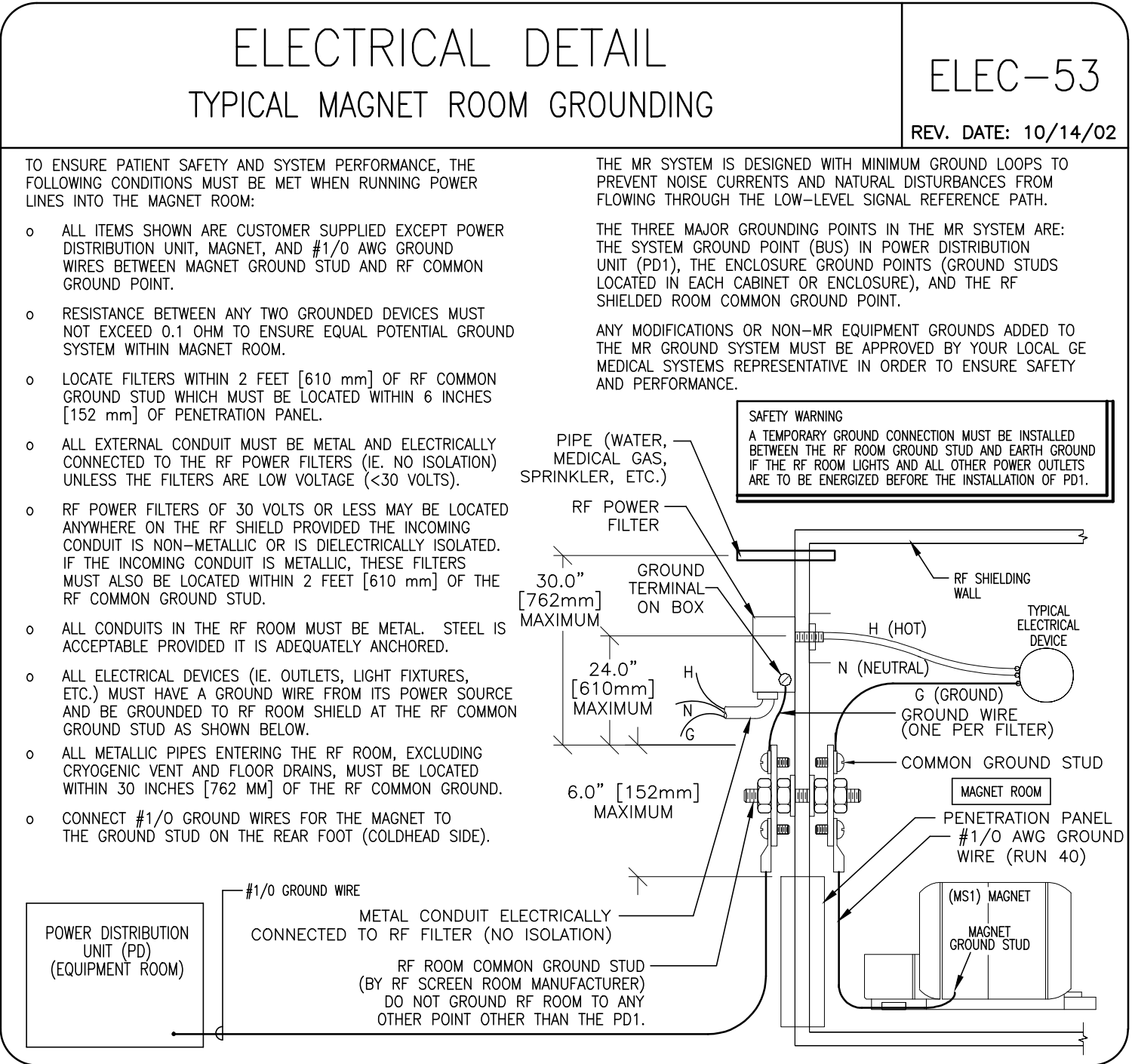
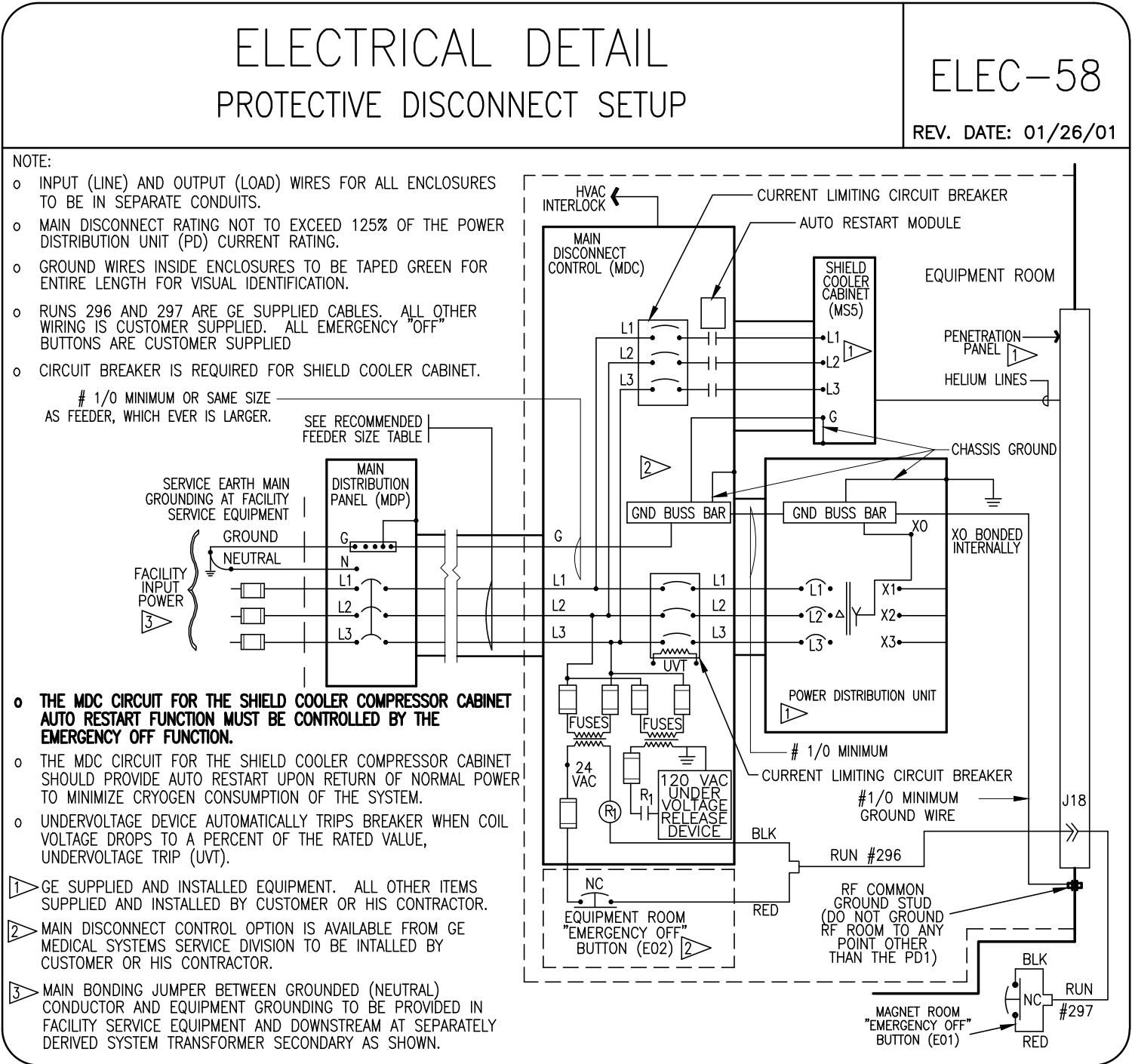
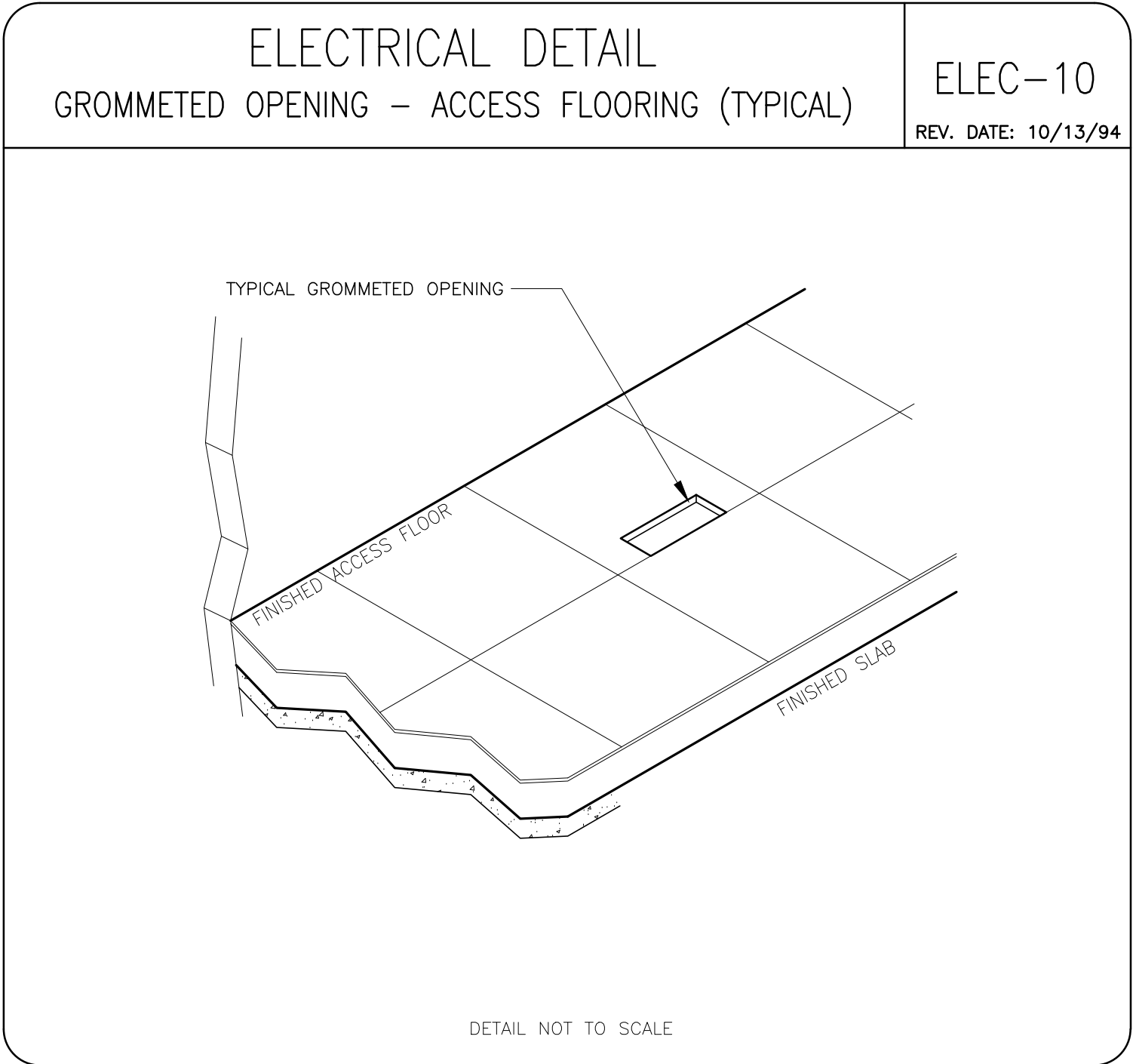
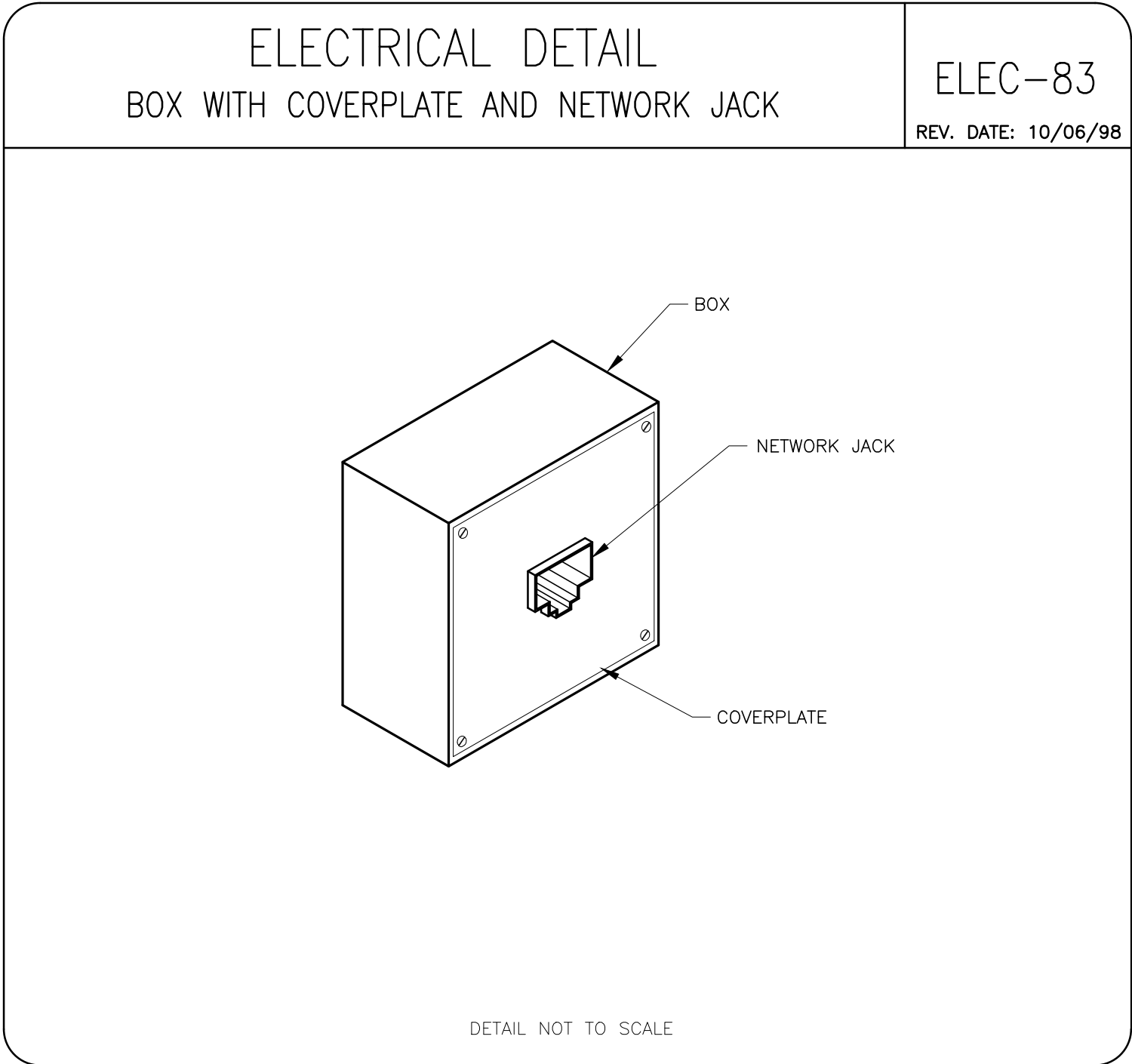
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8-136F	00
DATE:	10/16/03
DRAWN BY:	PMM
CHECKED BY:	PLM

REVISION HISTORY:

SHEET

E2

82-100



GE Healthcare

IS Services Design Center

Wisconsin

SHEET TITLE: ELECTRICAL DETAILS

MODALITY TYPE: 1.5T SIGNA MRI w/EXCITE

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TYPICAL MR

8-136F

TYPICAL INSTALLATION DRAWINGS

PROJECT TITLE:

PROJECT 8-136F

REVISION 00

DATE: 10/16/03

DRAWN BY: PMM

CHECKED BY: PLM

REVISION HISTORY:

1

2

3

4

5

SHEET

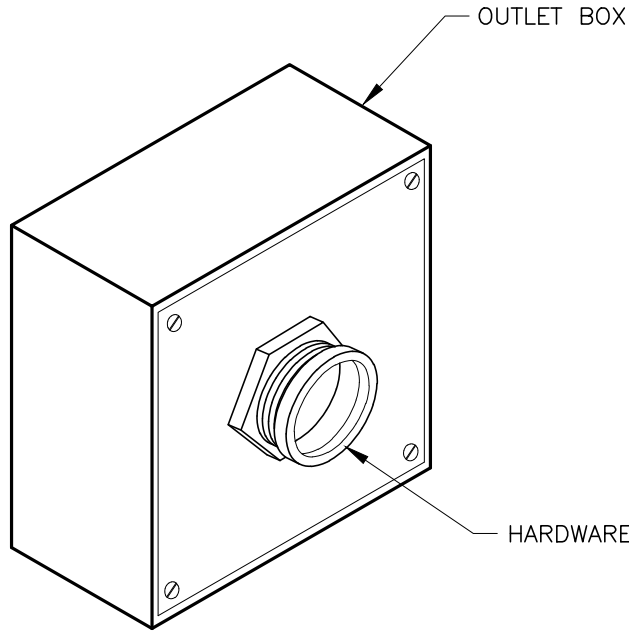
E3

92-101

ELECTRICAL DETAIL
BOX WITH COVERPLATE (TYPICAL)

ELEC-8

REV. DATE: 09/30/94

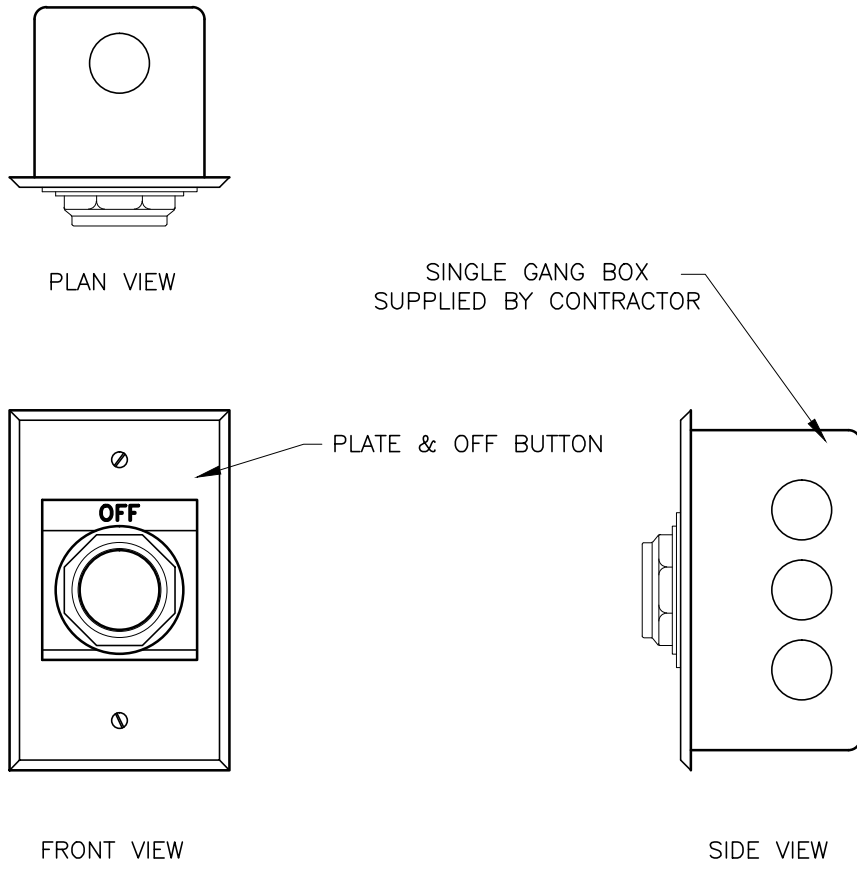


DETAIL NOT TO SCALE

ELECTRICAL DETAIL
EMERGENCY DISCONNECT

ELEC-16

REV. DATE: 06/04/03



DETAIL NOT TO SCALE

PROJECT TITLE:

TYPICAL MR
8-136F
TYPICAL INSTALLATION DRAWINGS

PROJECT	REVISION
8-136F	00
DATE:	10/16/03
DRAWN BY:	PMM
CHECKED BY:	PLM

REVISION HISTORY:

SHEET

E4

SHEET TITLE: ELECTRICAL DETAILS

MODALITY TYPE: 1.5T SIGNA MRI w/EXCITE

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GE Healthcare

IS Services Design Center

Milwaukee,

Wisconsin

WATER COOLING SPECIFICATIONS

MECH-07
REV. DATE: 04/08/03

o A CLOSED LOOP WATER COOLING SYSTEM IS REQUIRED FOR THE SHIELD COOLER COMPRESSOR. OPEN LOOP CITY WATER IS UNACCEPTABLE.

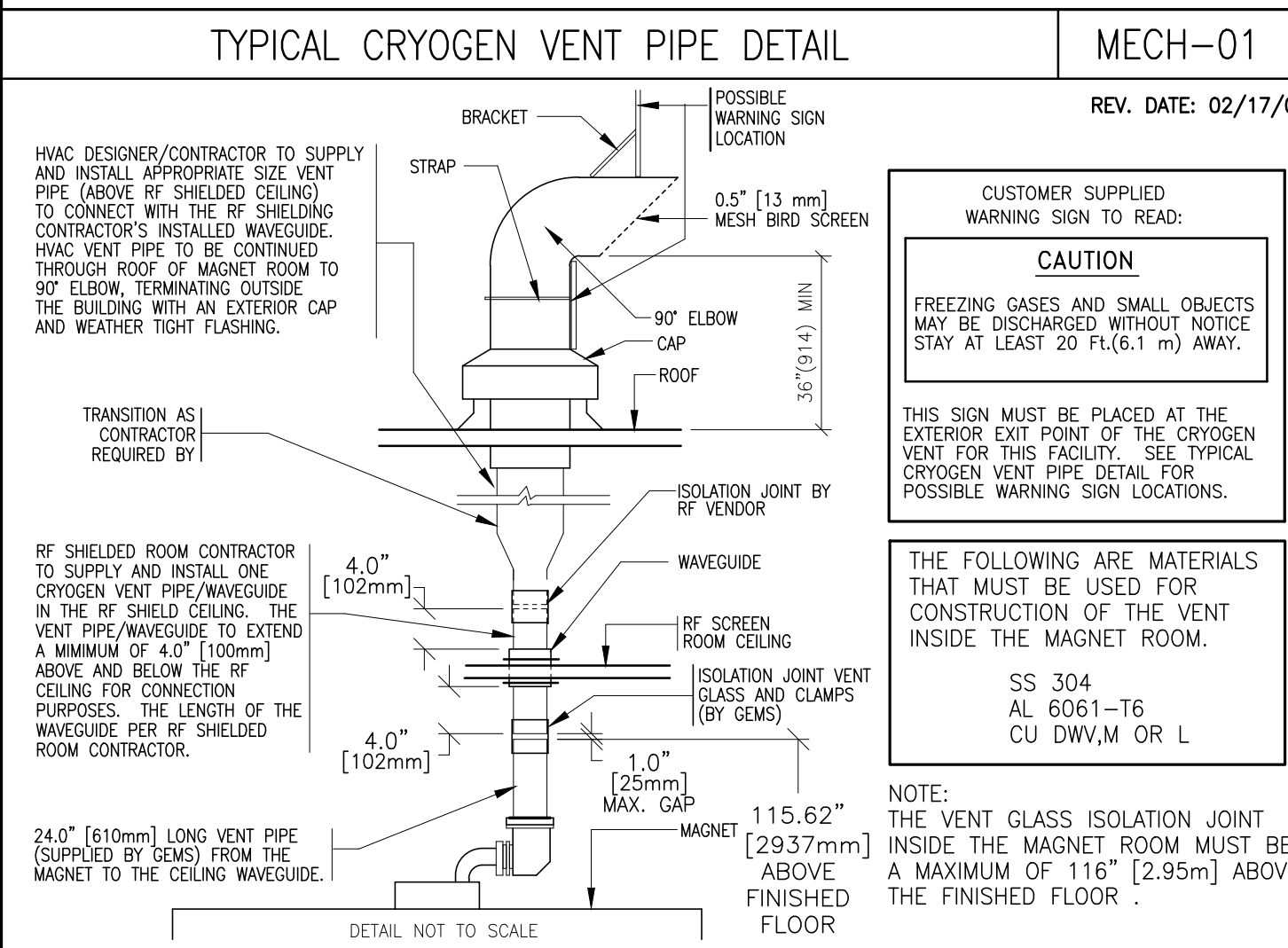
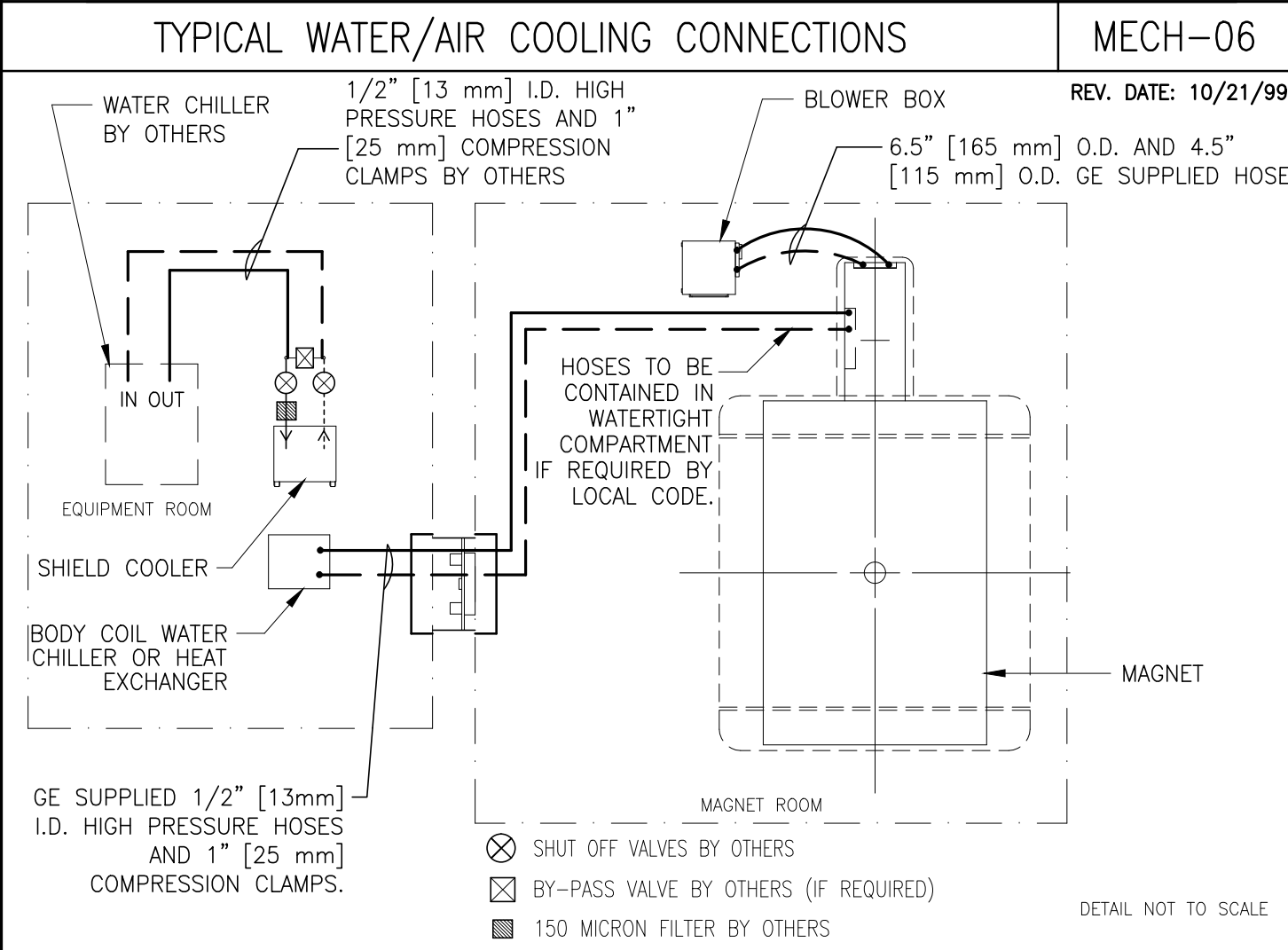
EQUIPMENT	INLET TEMPERATURE RANGE °F (°C)	INLET PRESS. psi (kPa)	RECOMMENDED FLOW RATE gal/min (liters/min)	PRESS. DROP psi (kPa)	TEMPERATURE RISE ▲ °F ▲(°C)	TYPICAL HEAT OUTPUT BTU/Hr (WATTS)	MAXIMUM HEAT OUTPUT BTU/Hr (WATTS)
SHIELD/CRYO COOLER COMPRESSOR	39.2-82.4 (4-28)	MIN. 29(200)	MINIMUM 1.1 (4)	AT MIN FLOW RATE 7.5 (52)	AT MIN FLOW RATE 48.4 (26.9)	25590 (7500)	28320 * (8300)
**		MAX. 100(690)	MAXIMUM 2.6 (10.0)	AT MAX FLOW RATE 47 (324)	AT MAX FLOW RATE 19.4 (10.8)	See Note 6	See Note 6

NOTES: * ENSURE WATER COOLING SYSTEM CAPACITY IS CAPABLE OF DISSIPATING MAXIMUM HEAT OUTPUT.

** THESE WATER COOLING SPECIFICATIONS ARE THE REQUIREMENTS AT THE EQUIPMENT. THE COOLING SYSTEM DESIGN MUST HAVE ALLOWANCES FOR PRESSURE/TEMPERATURE CHANGES DUE TO DISTANCE THE CHILLER IS LOCATED FROM THE EQUIPMENT.

- PRESSURE DROP AND WATER TEMPERATURE RISE ACROSS EQUIPMENT IS GIVEN FOR MINIMUM AND MAXIMUM RECOMMENDED FLOW RATES AS INDICATED. PRESSURE DROP IS MEASURED BETWEEN COOLANT INLET AND OUTLET AT COMPRESSOR UNIT.
- WATER FLOWMETER KIT (46-29405261) IS AVAILABLE TO CHECK/MONITOR FLOW RATE FOR THE SHIELD COOLER COMPRESSOR. ADD 2 PSI TO TOTAL SYSTEM PRESSURE DROP IF FLOWMETER IS PERMANENTLY INSTALLED IN SYSTEM.
- RECOMMEND A FLOWMETER BE PERMANENTLY INSTALLED IN SYSTEM, INCLUDE FLOWMETER DROP IN TOTAL SYSTEM PRESSURE DROP.
- SHIELD COOLER COMPRESSOR WATER FLOW RATE IS BASED ON INLET WATER TEMPERATURE OF 82.4° F (28° C). LOWER TEMPERATURE PERMITS LOWER FLOW.
- MINIMUM FLOW RATE IS FOR CLEAN WATER WITHOUT ANTI-FREEZE, MAXIMUM FLOW RATE IS ANY MIXTURE OF WATER/ANTI-FREEZE.
- WATER FLOW RATE AND TEMPERATURE RISE VALUE ARE BASED ON WATER. LABORATORY GRADE ETHYLENE GLYCOL OR PROPYLENE GLYCOL ANTI-FREEZE MAY BE USED (DO NOT MIX ETHYLENE GLYCOL WITH PROPYLENE GLYCOL). PREFERRED CONCENTRATION IS 65% WATER AND 35% GLYCOL TO MINIMIZE ORGANIC GROWTH. CONCENTRATION OF 50/50 IS ACCEPTABLE WITH A DERATE OF 0.8 IN SPECIFIC HEAT CALCULATIONS AND A 20% INCREASE IN FLOW.
- PRESSURE DROP VALUES BASED ON NEW SYSTEM, MAY RISE DUE TO CALCIFICATION.
- SHIELD/CRYO COOLER TEMPERATURE RISE, TYPICAL AND MAXIMUM HEAT OUTPUT ARE REDUCED BY 18% AT 50 HZ OPERATION.
- WATER COOLING CIRCUIT TYPICAL VALUES:
 - WATER INLET FLOW 1.8 TO 2.1 GAL/MINUTE (7 TO 8 LITER/MINUTE)
 - WATER INLET TEMPERATURE 53.6 TO 59° F (12 TO 15° C)

THERE IS A RISK OF DAMAGING THE SHIELD/CRYO COOLER COMP. WITH WATER INLET LOW TEMPERATURE AND LOW FLOW RANGE.

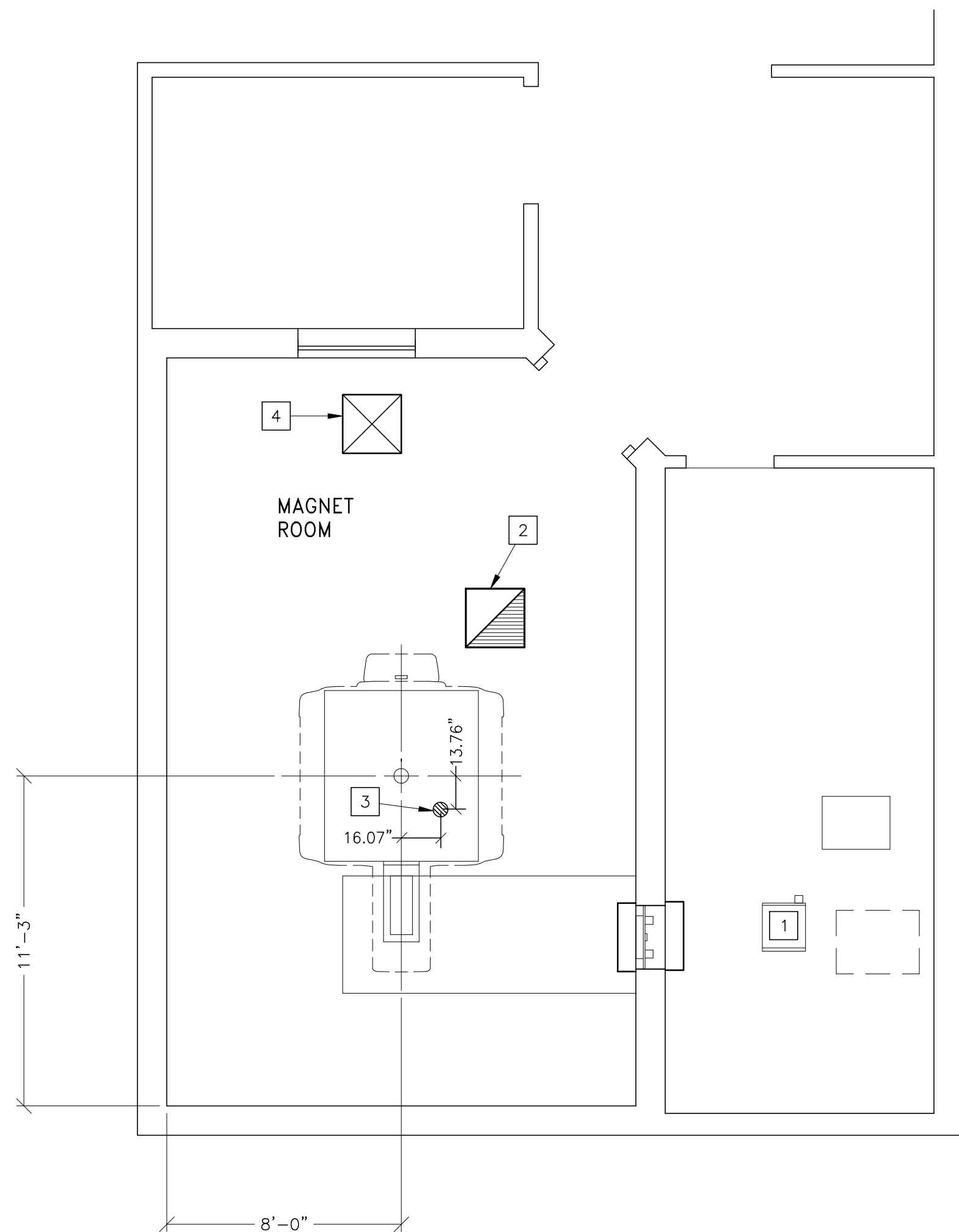


CRYOGENIC VENT SYSTEM PRESSURE DROP MATRIX (A)							MECH-04
(THIS TABLE MUST BE USED FOR CRYOGENIC VENT SYSTEM DESIGN)							REV. DATE: 10/04/02
CRYOGENIC VENT SYSTEM PRESSURE DROP MATRIX FOR A MAGNET WITH ≥ [203mm] VENT.				PRESSURE DROP PER ELBOW USED ANYWHERE WITHIN 20 FT VENT SEGMENT			
INSIDE DIAMETER OF VENT PIPE in.(mm)	DISTANCE OF VENT SYSTEM COMPONENT FROM MAGNET ft.(m)	PRESSURE DROP STRAIGHT VENT PIPE WITH SMOOTH SURFACE psi/ft (kPa/m)	STANDARD SWEEP ELBOW psi (kPa)	STANDARD SWEEP ELBOW psi (kPa)	LONG SWEEP ELBOW psi (kPa)	LONG SWEEP ELBOW psi (kPa)	
8(203)	0-20 (0-6.1)	0.10 (2.26)	1.10 (7.58)	2.06 (14.20)	0.55 (3.79)	1.03 (7.10)	
	20-40 (6.1-12.2)	0.21 (4.75)	2.25 (15.8)	4.12 (28.92)	1.12 (7.83)	2.15 (15.2)	
	40-60 (12.2-18.3)	0.30 (6.79)	2.85 (19.86)	5.20 (36.5)	1.44 (9.93)	2.69 (19.3)	
	60-80 (18.3-24.4)	0.38 (8.60)	3.70 (25.51)	6.71 (46.22)	1.85 (12.76)	3.36 (23.7)	
	80-100 (24.4-30.5)	0.47 (10.63)	4.50 (31.17)	8.22 (56.68)	2.28 (15.8)	4.11 (28.34)	
10(254)	0-20 (0-6.1)	0.03 (0.68)	0.55 (3.79)	0.82 (5.56)	0.27 (1.86)	0.41 (2.83)	
	20-40 (6.1-12.2)	0.07 (1.58)	0.82 (5.56)	1.51 (10.41)	0.41 (2.83)	0.75 (5.17)	
	40-60 (12.2-18.3)	0.10 (2.26)	1.15 (8.08)	2.19 (15.10)	0.62 (4.27)	1.10 (7.58)	
	60-80 (18.3-24.4)	0.12 (2.71)	1.51 (10.41)	2.74 (18.89)	0.75 (5.17)	1.37 (9.45)	
	80-100 (24.4-30.5)	0.16 (3.62)	1.92 (13.24)	3.43 (23.65)	0.96 (6.62)	1.71 (11.79)	
12(305)	0-20 (0-6.1)	0.013 (0.29)	0.27 (1.86)	0.41 (2.83)	0.14 (0.97)	0.21 (1.45)	
	20-40 (6.1-12.2)	0.027 (0.61)	0.41 (2.83)	0.82 (5.56)	0.21 (1.45)	0.41 (2.83)	
	40-60 (12.2-18.3)	0.041 (0.93)	0.55 (3.79)	1.10 (7.58)	0.27 (1.86)	0.55 (3.79)	
	60-80 (18.3-24.4)	0.054 (1.22)	0.69 (4.75)	1.37 (9.45)	0.34 (2.34)	0.69 (4.75)	
	80-100 (24.4-30.5)	0.069 (1.56)	0.96 (6.62)	1.51 (10.41)	0.48 (3.31)	0.75 (5.17)	
14(356)	0-20 (0-6.1)	0.008 (0.21)	0.09 (0.62)	0.17 (1.17)	0.05 (0.34)	0.08 (0.55)	
	20-40 (6.1-12.2)	0.016 (0.42)	0.18 (1.22)	0.34 (2.34)	0.10 (0.69)	0.16 (1.10)	
	40-60 (12.2-18.3)	0.024 (0.61)	0.27 (1.86)	0.55 (3.79)	0.16 (1.10)	0.24 (1.65)	
	60-80 (18.3-24.4)	0.032 (0.86)	0.36 (2.51)	0.72 (5.05)	0.21 (1.45)	0.32 (2.22)	
	80-100 (24.4-30.5)	0.041 (1.10)	0.47 (3.24)	0.93 (6.43)	0.27 (1.86)	0.41 (2.83)	
NOTE 1: ELBOWS WITH ANGLES GREATER THAN 90° MUST NOT BE USED.							
NOTE 2: THE TABLE DATA IS BASED ON THE FOLLOWING:							
A. INITIAL FLOW CONDITIONS AT MAGNET INTERFACE.							
B. GAS TEMPERATURE STARTING AT 4.5 KELVIN (-452° F OR -268° C).							
C. HELIUM GAS FLOW RATE OF 2.737 CUBIC FEET (77.5 CUBIC METERS) PER MINUTE							
D. 45° STANDARD SWEEP ELBOW K = 15 f							
E. 90° STANDARD SWEEP ELBOW K = 30 f							
F. 45° LONG SWEEP ELBOW K = 15 f							
G. 90° LONG SWEEP ELBOW K = 15 f							
NOTE 3: THE TOTAL PRESSURE DROP OF THE ENTIRE CRYOGENIC VENT SYSTEM MUST BE LESS THAN 17 PSI (117.2 KPa).							
THE CALCULATION STARTS AT THE MAGNET INTERFACE AND ENDS AT THE TERMINATION POINT OUTSIDE THE BUILDING.							
NOTE 4: FOR 14 IN. [356mm] AND 16 IN. [406mm] VENT PIPE DIAMETERS REFER TO PRE-INSTALLATION MANUAL, REFERENCED ON SHEET C1.							

SCALE: 1/4" = 1'-0"

MECHANICAL/PLUMBING LAYOUT

REQUIRED CEILING HEIGHT = 8'-9"



MECHANICAL/PLUMBING ITEMS	
CUSTOMER/CONTRACTOR SUPPLIED AND INSTALLED ITEMS	
ITEM NO.	ITEM DESCRIPTION (* INDICATES EXISTING)
1	<2> 1/2" [13 mm] I.D. HIGH PRESSURE HOSES AND <2> 1" [25 mm] COMPRESSION CLAMPS. 150 MICRON FILTER, SHUT OFF VALVES AND BY-PASS VALVE AS REQUIRED. SEE DETAIL MECH-06.
2	WATER QUALITY MUST BE 6.5-82 PH. A HARDNESS OF LESS THAN 200 PPM. SUSPENDED MATTER OF 10 MG PER LITER AND LESS THAN 150 MICRON PARTICLE SIZE. ANTI-FREEZE MINIMUM OF 25 PER CENT. MAXIMUM OF 50 PER CENT BY VOLUME. FOR WATER SPECIFICATIONS SEE DETAIL MECH-07 AND EQUIPMENT DETAIL M16-15E ON THE EQUIPMENT DETAIL SHEETS.
3	EXHAUST FAN AND AIR INLET TO PROVIDE A MINIMUM OF 12 AIR EXCHANGES PER HOUR OR 1200 CFM, WHICH EVER IS LARGER. SEE DETAIL ELEC-55 ON THE ELECTRICAL DETAIL SHEET[S].
4	MAGNET ROOM EXHAUST FAN INTAKE VENT MUST BE LOCATED AT THE HIGHEST CEILING PLANE NEAR THE MAGNET CRYOGEN VENT.
5	SEE SHEET S-2 FOR CRYOGEN VENT LOCATION.
6	8" [203 mm] CRYOGEN VENT - TOLERANCE FOR VENT LOCATION +/- 0.25" [6 mm]. SEE DETAILS MECH-04 AND MECH-01.
7	THE CUSTOMER'S DESIGNER IS RESPONSIBLE FOR SELECTING VENT MATERIALS AND HARDWARE CAPABLE OF SAFELY HANDLING THE PRESSURES AND COLD TEMPERATURE GENERATED WITHIN THE VENT AT EACH MRI SITE.
8	THE CUSTOMER'S CONTRACTOR IS RESPONSIBLE FOR PROVIDING AND INSTALLING THE CRYOGEN VENT FROM THE MAGNET VENT ADAPTER TO THE BUILDING'S EXTERIOR.
9	FOR NON-STANDARD VENT CONFIGURATIONS (I.E. OFFSET CEILING EXITS, WALL EXITS, AND GEDDESIC DOMES) THE CUSTOMER'S CONTRACTOR IS RESPONSIBLE FOR THE DESIGN AND INSTALLATION OF THE CRYOGENIC VENT SYSTEM AND VENT SUPPORTS WITHIN THE MAGNET ROOM.
10	MINIMUM 2 FT. x 2 FT. [0.61m x 0.61m] PRESSURE EQUALIZING WAVEGUIDE VENT IN THE MAGNET ROOM CEILING.

MECHANICAL/PLUMBING NOTES	
o ALL PIPING, FITTINGS, SUPPORTS, HOSES, CLAMPS, VENTILATION SYSTEMS, ETC. ARE TO BE SUPPLIED AND INSTALLED BY THE CUSTOMER OR HIS CONTRACTORS.	
o FOR COMPLETE DESIGN AND IS REQUIREMENTS, SPECIFICATIONS AND GUIDELINES REFER TO THE PRE-IS MANUAL REFERENCED ON SHEET C1 FOR:	
MR SYSTEMS - SYSTEM COOLING, CRYOGEN VENTING, WAVEGUIDES AND EXHAUST VENTING.	
CYCLOTRON SYSTEMS - CHEMISTRY LINES, GAS LINES, AND SYSTEM COOLING.	

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SHEET TITLE: MECHANICAL LAYOUT

MODALITY TYPE: 1.5T SIGNA MRI w/EXCITE

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TYPICAL MR 8-136F

TYPICAL INSTALLATION DRAWINGS

PROJECT TITLE:

PROJECT: 8-136F

REVISION: 00

DATE: 10/16/03

DRAWN BY: PMM

CHECKED BY: PLM

REVISION HISTORY:

SHEET

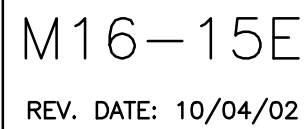
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92-100

M1011AW
REV. DATE: 08/25/98



M16-15B
REV. DATE: 04/29/99



M60-15A
REV. DATE: 10/07/04



M57-15
REV. DATE: 06/21/96



M09-15F
REV. DATE: 10/07/02



M08-15D
REV. DATE: 10/07/02



M50-15C
REV. DATE: 10/07/02



M27-15C
REV. DATE: 09/04/03



M20-15/
M20-15A
REV. DATE: 08/02/01



M56-15
REV. DATE: 06/21/96



M55-15



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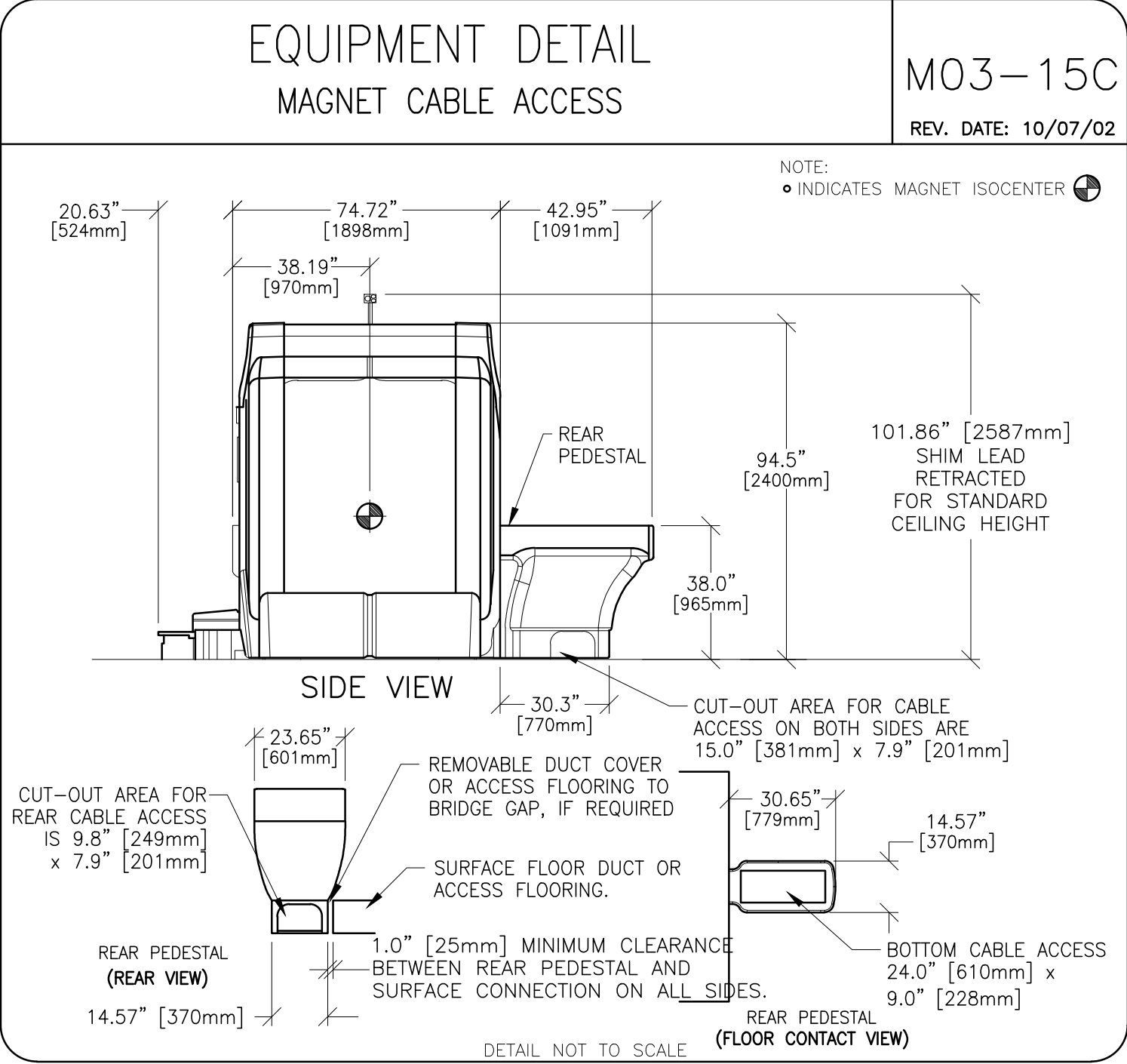
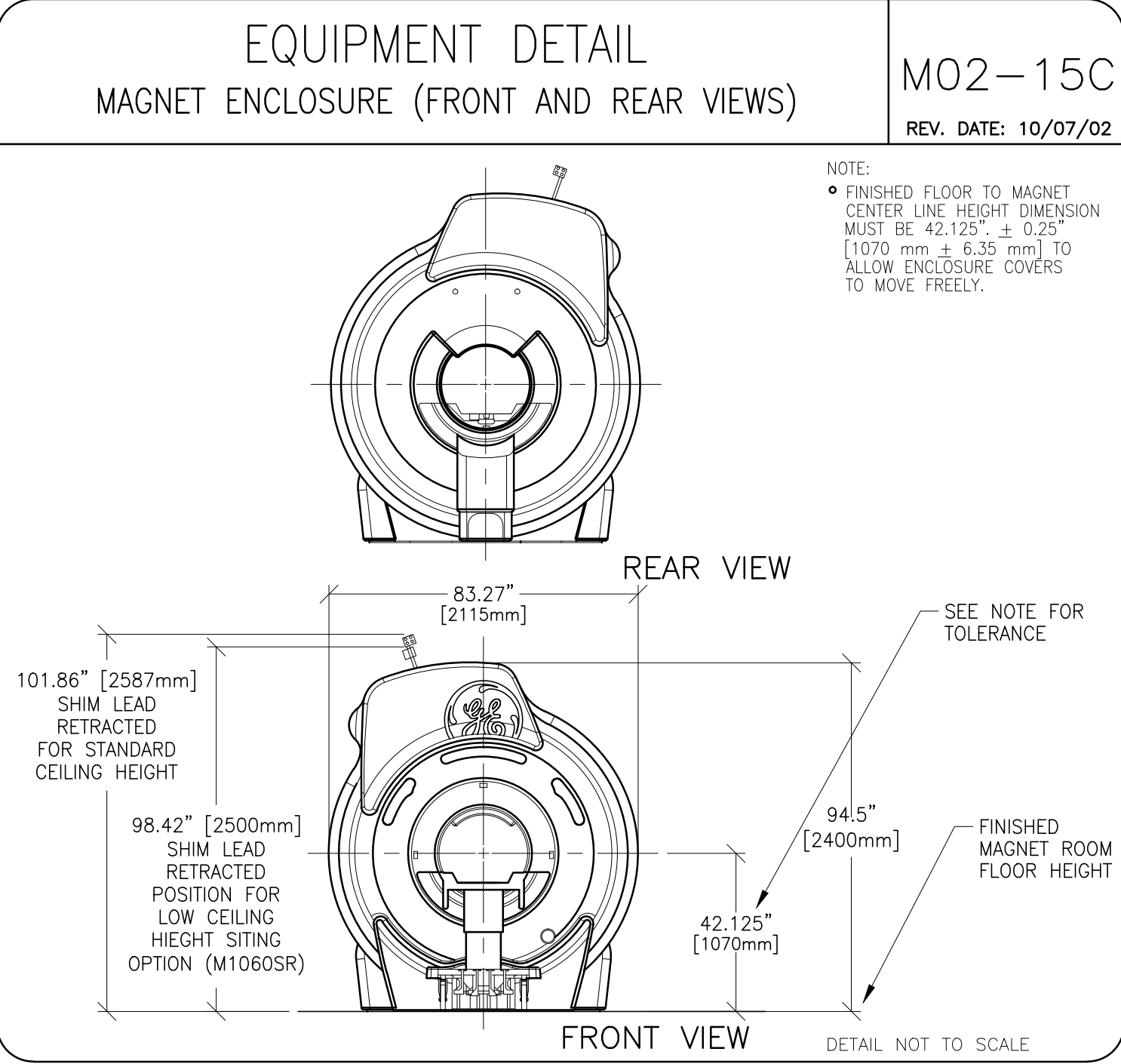
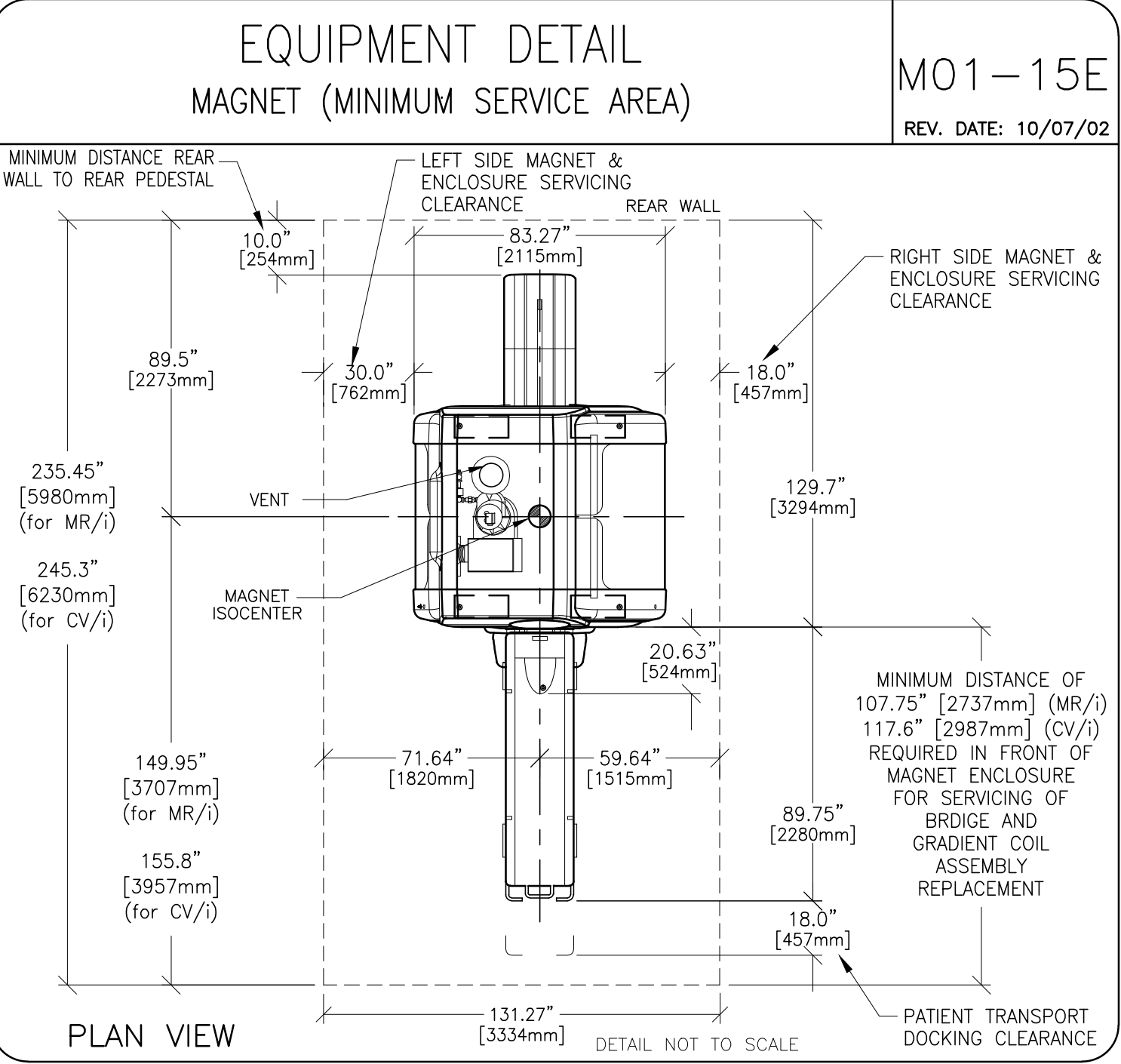
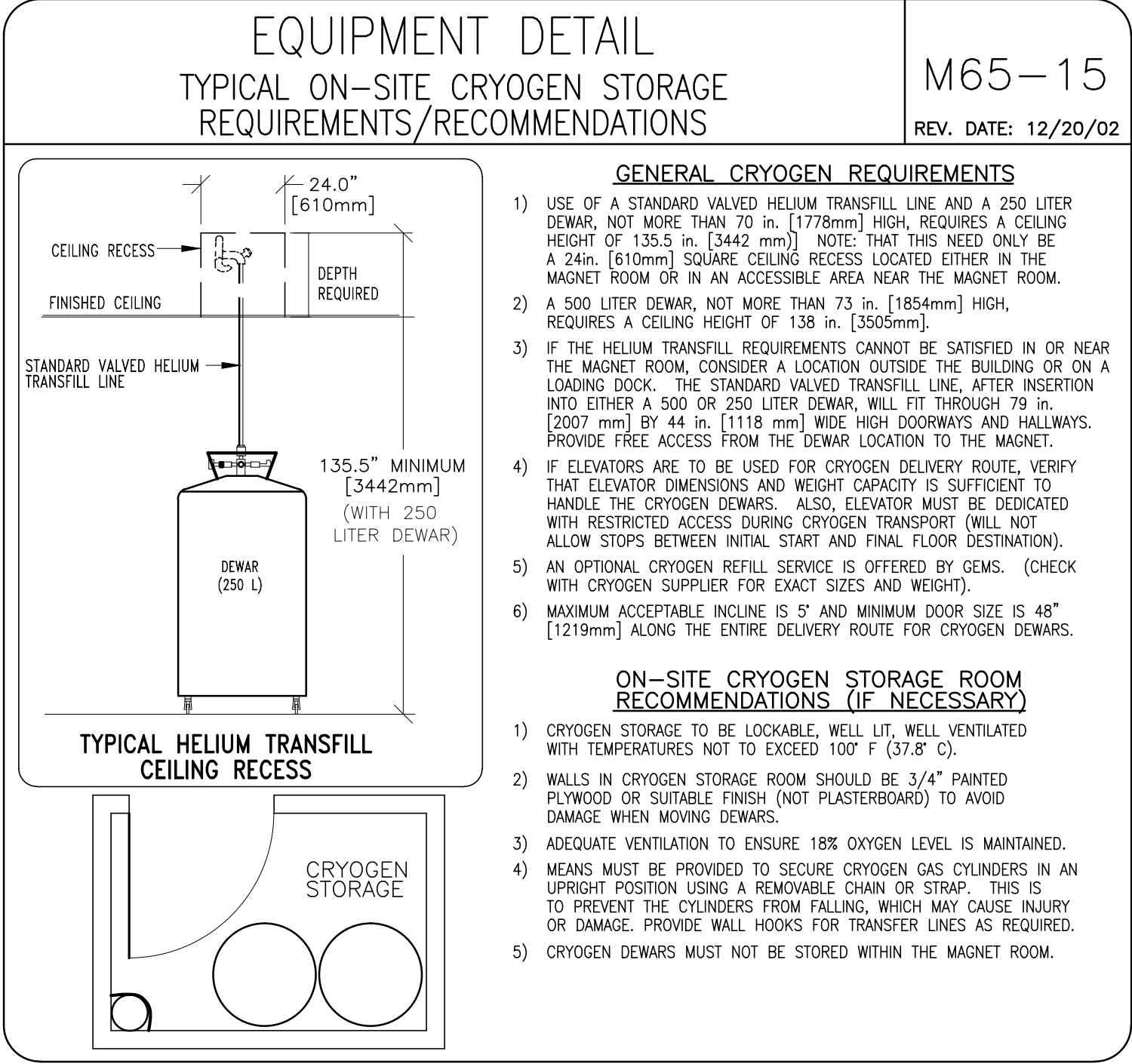
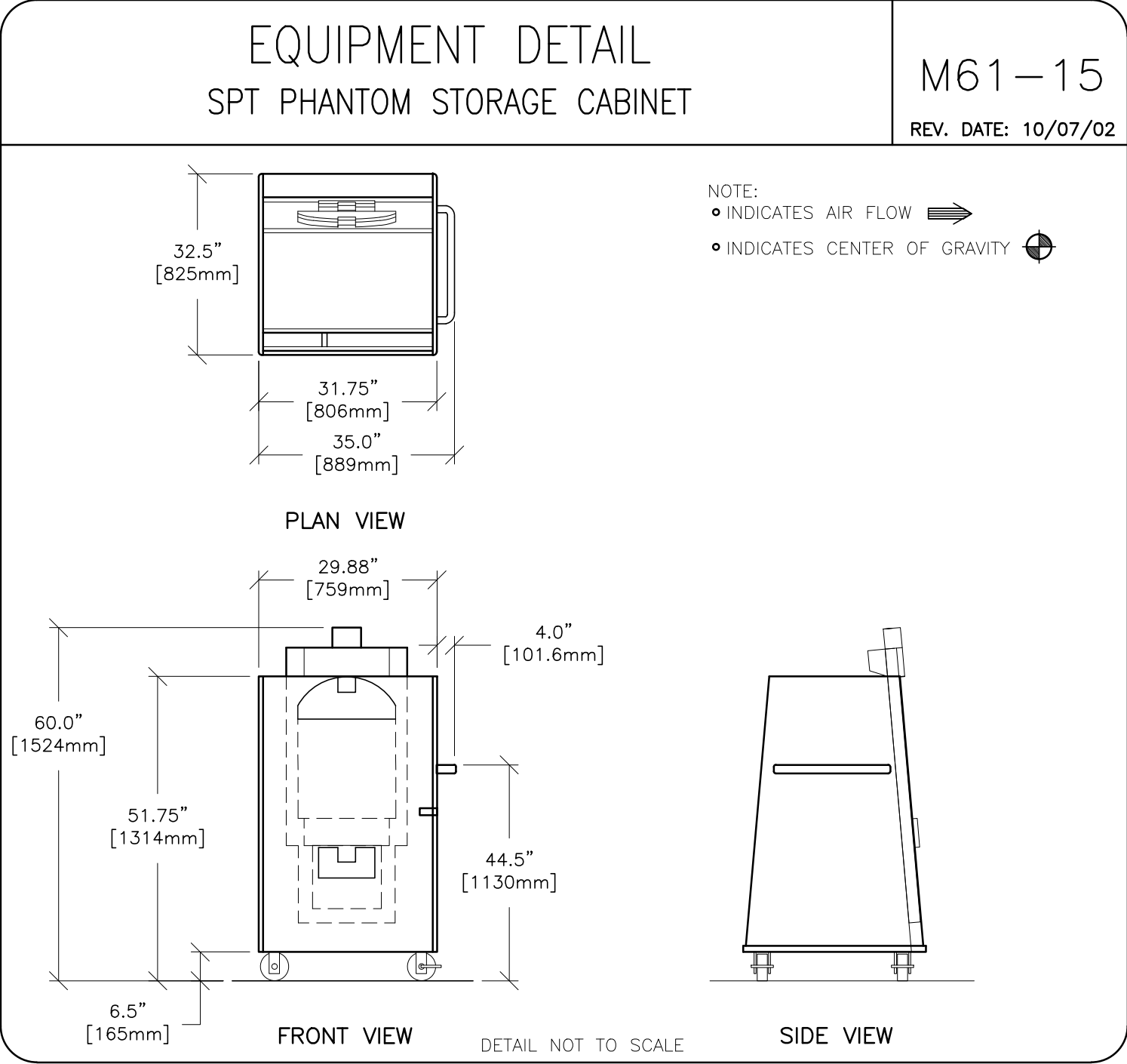
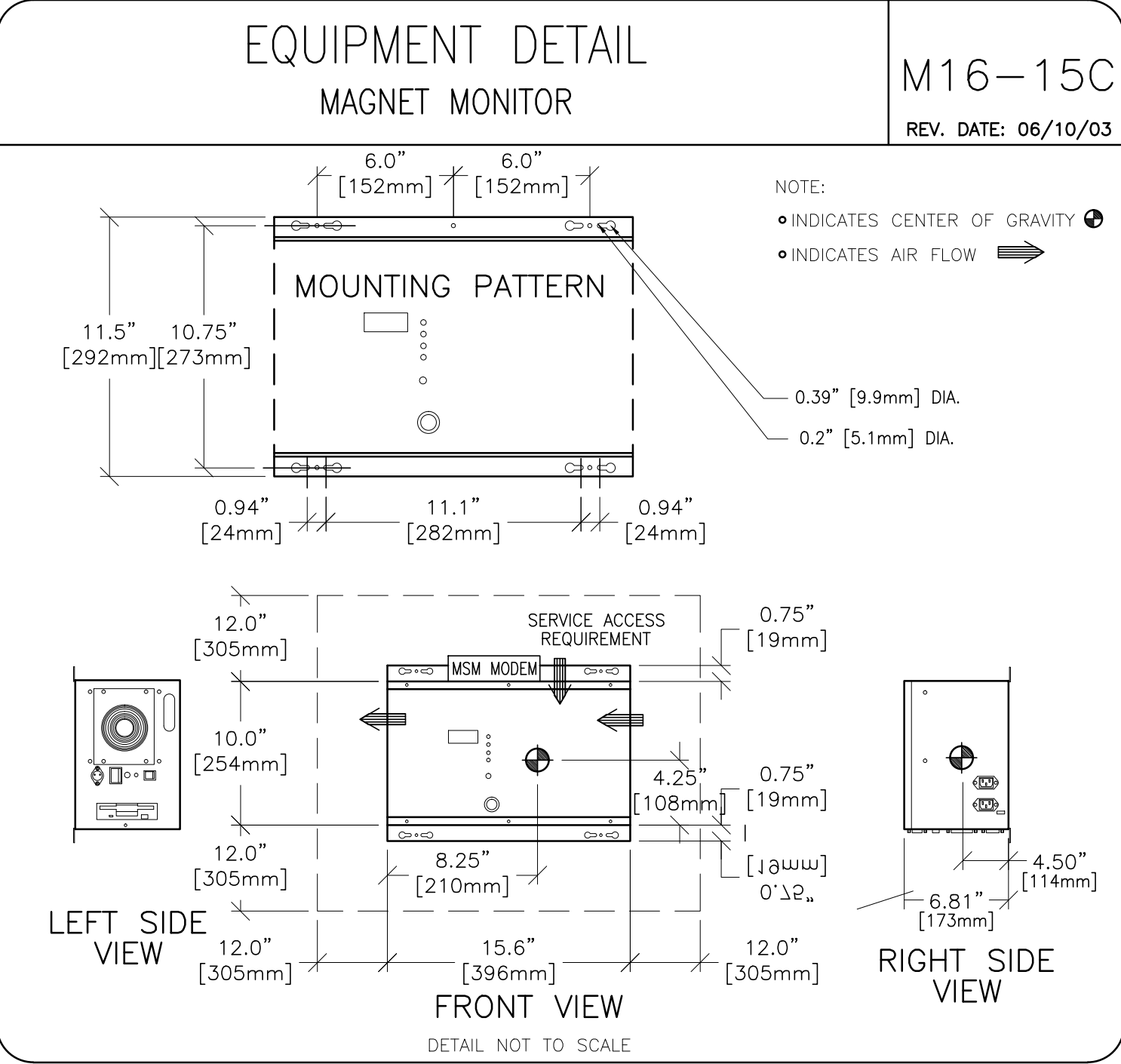
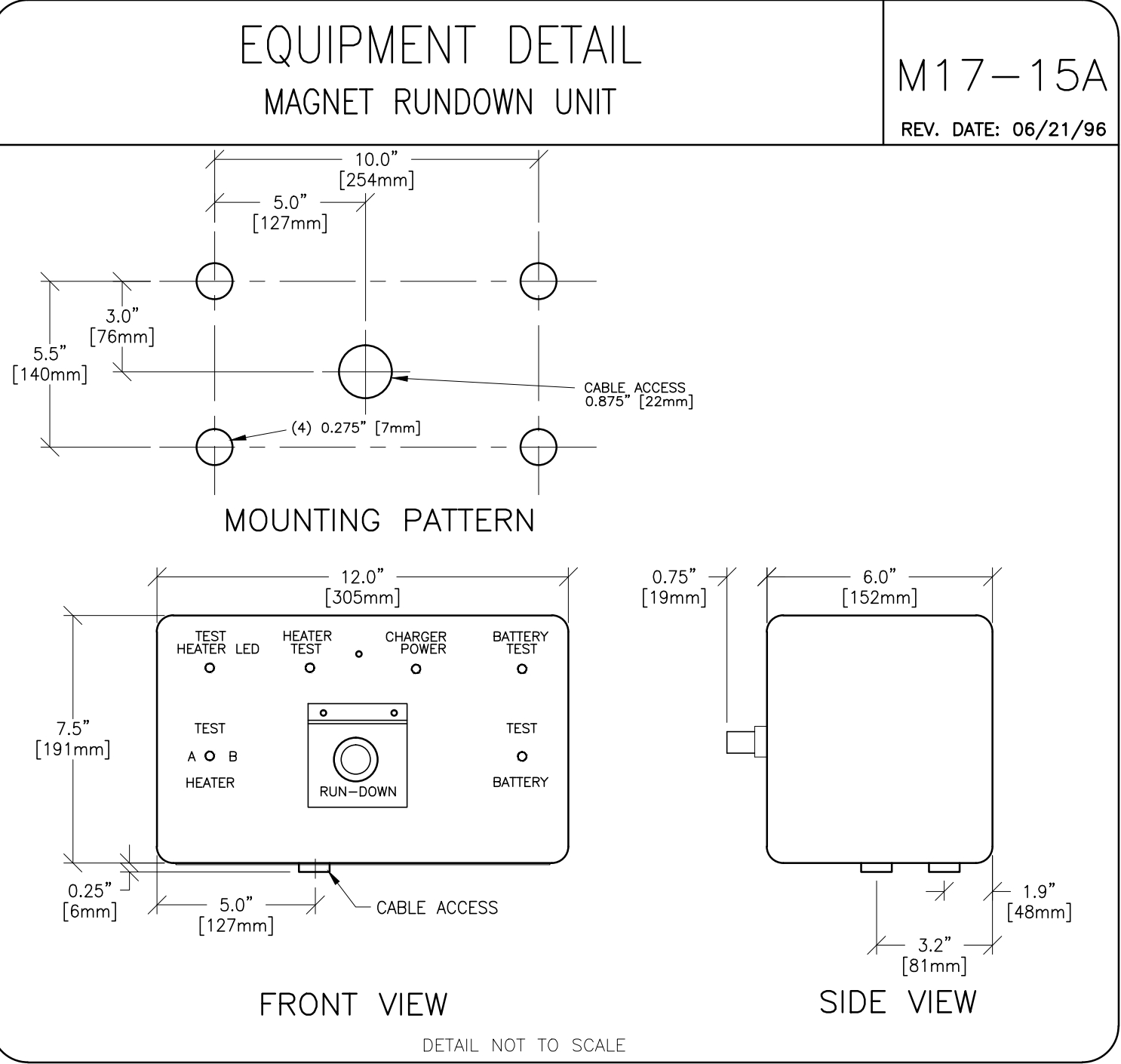
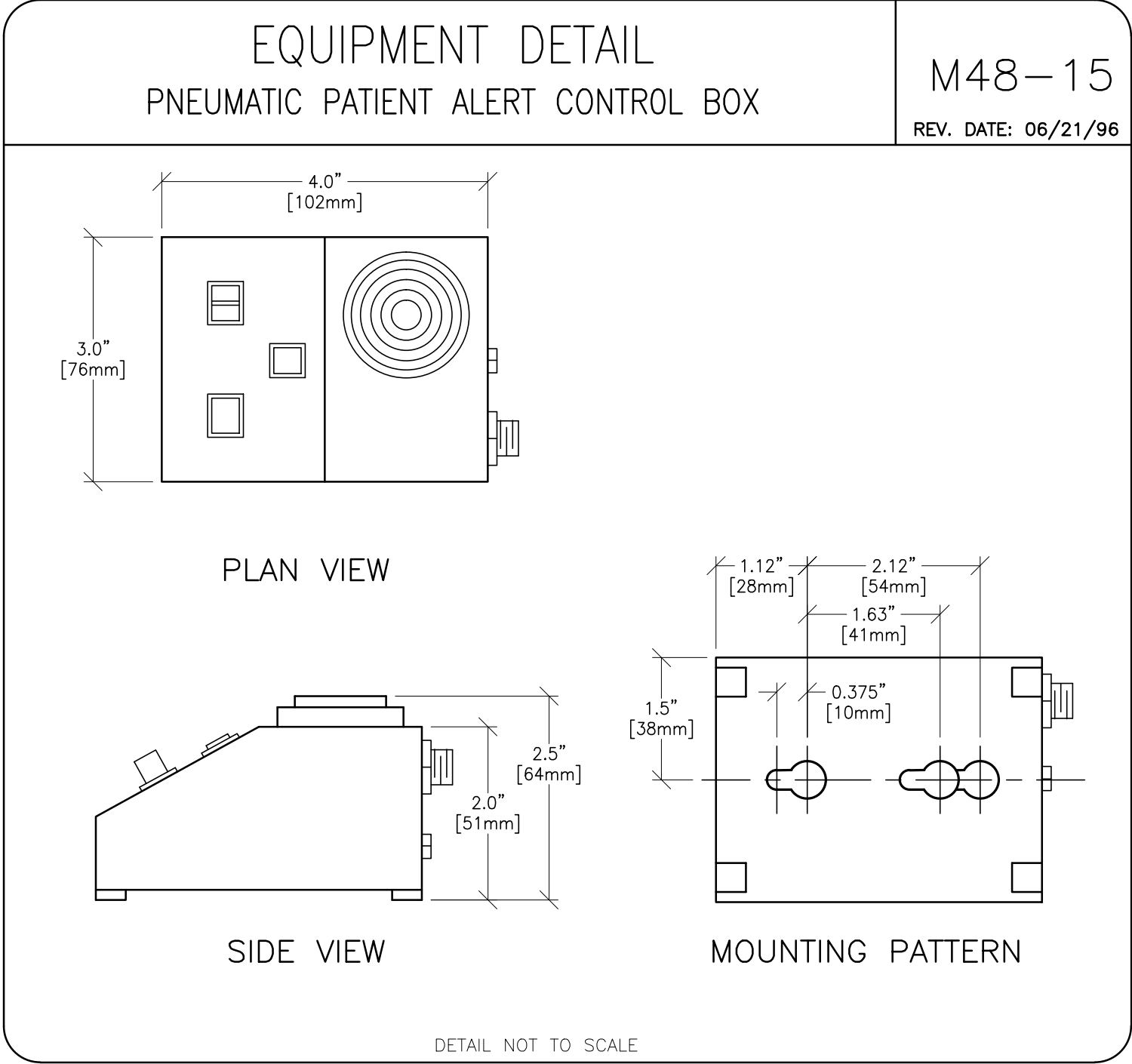
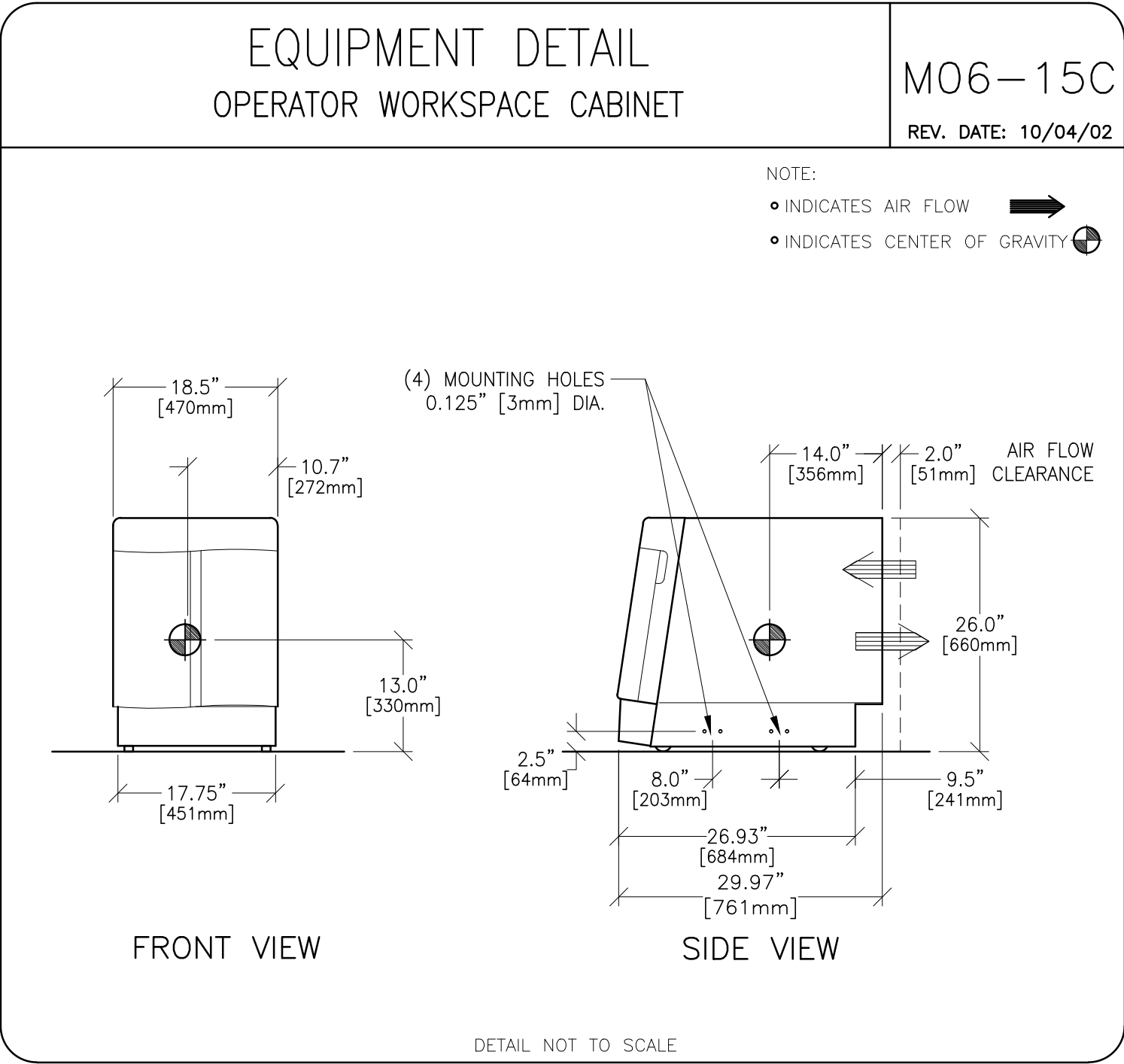
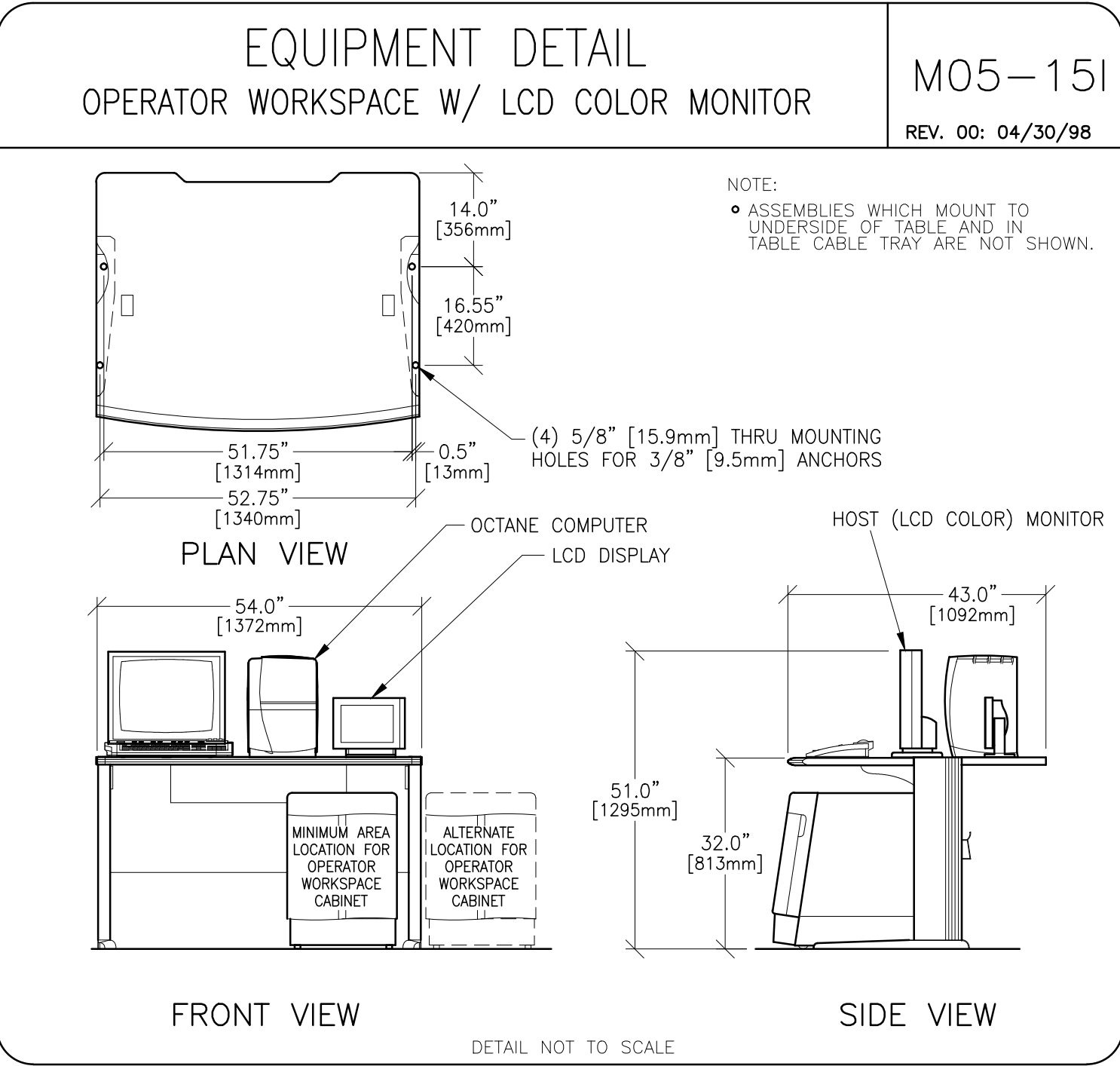
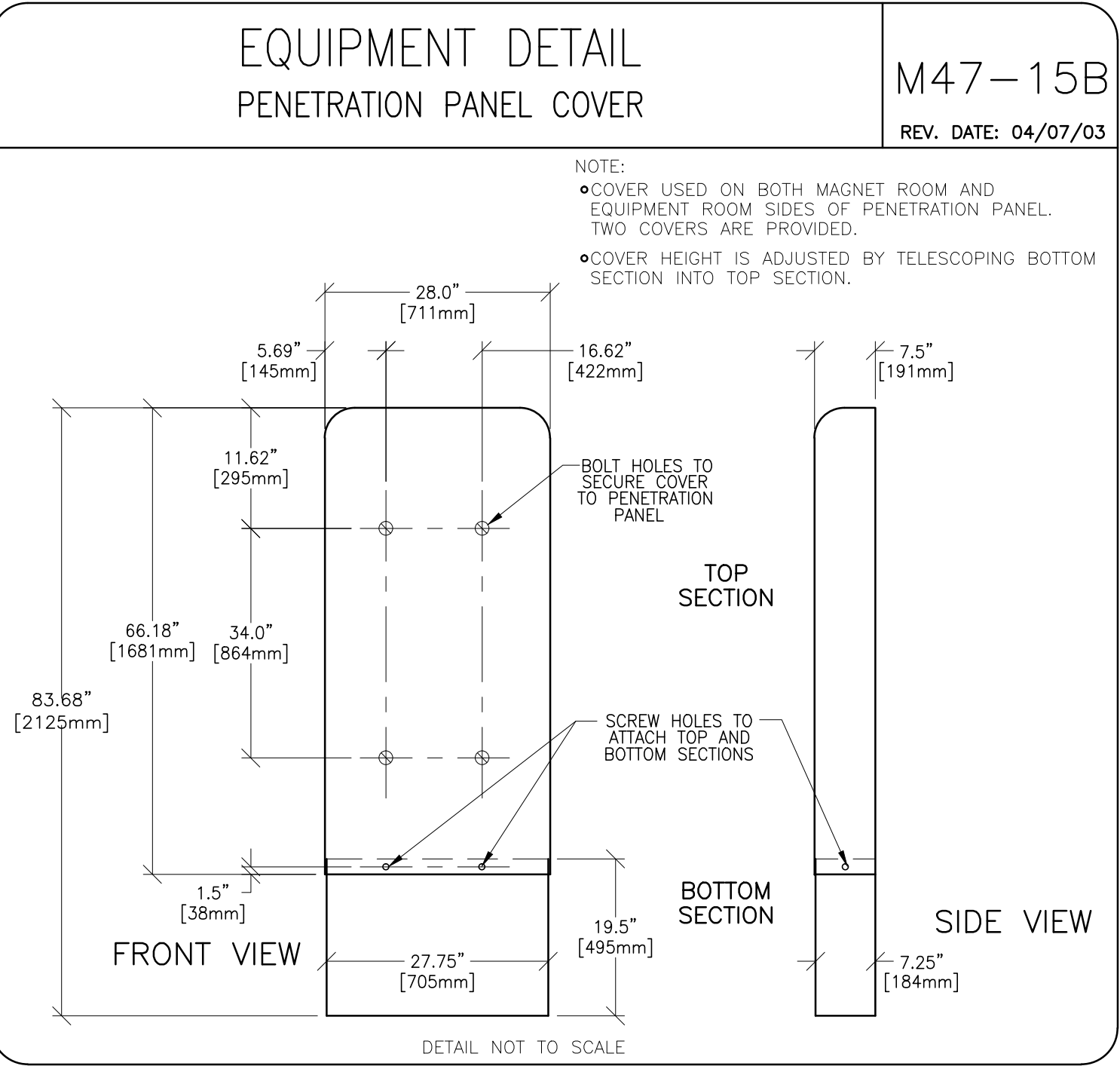
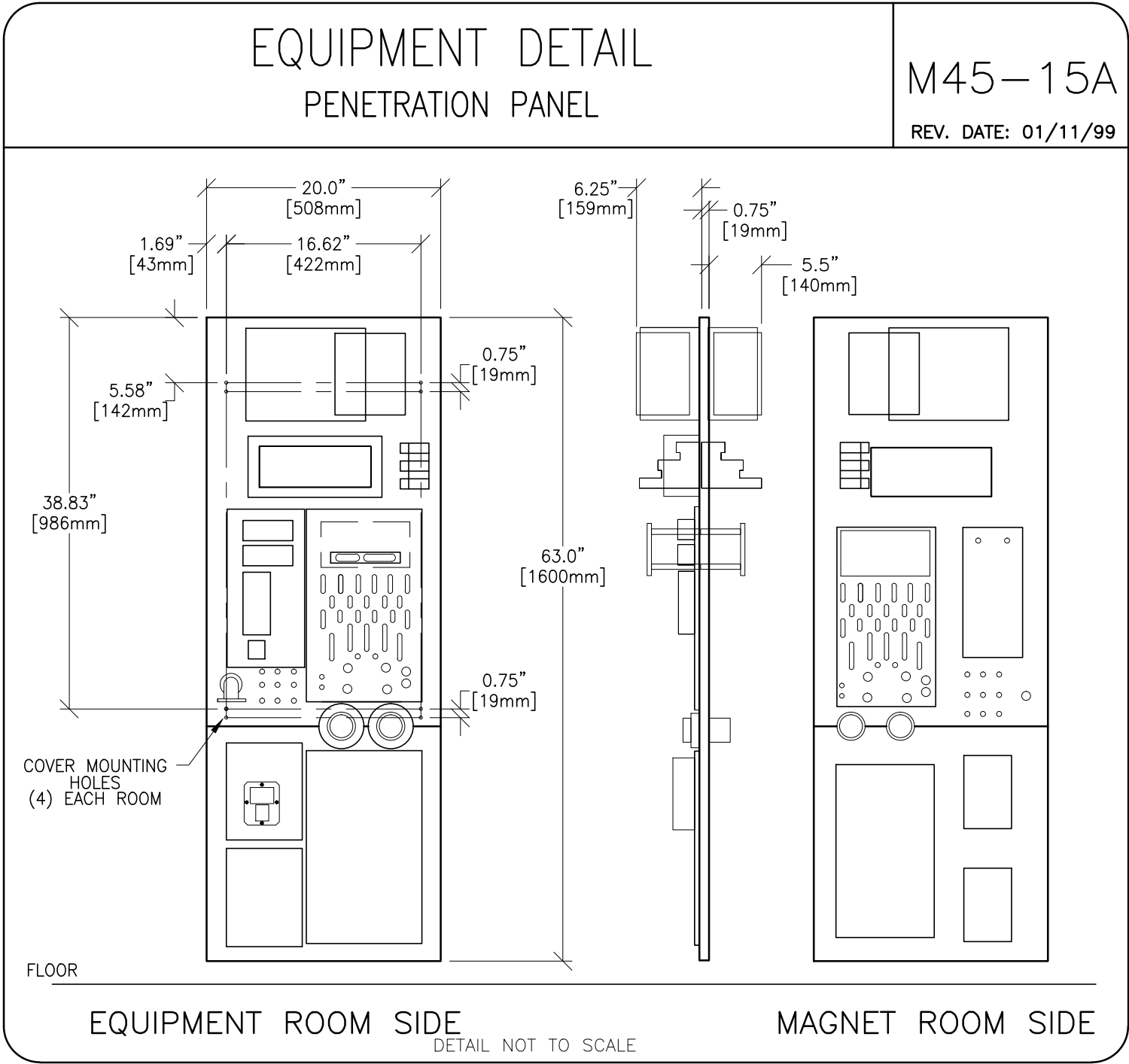
PROJECT TITLE:

DATE: 10/16/03
DRAWN BY: PMM
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D1

S Services Design Center
Milwaukee,

Wisconsin



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Wisconsin

SHEET TITLE: EQUIPMENT DETAILS

MODALITY TYPE: 1.5T SIGNA MRI w/EXCITE

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TYPICAL MR 8-136F

TYPICAL INSTALLATION DRAWINGS

PROJECT	REVISION
8-136F	00

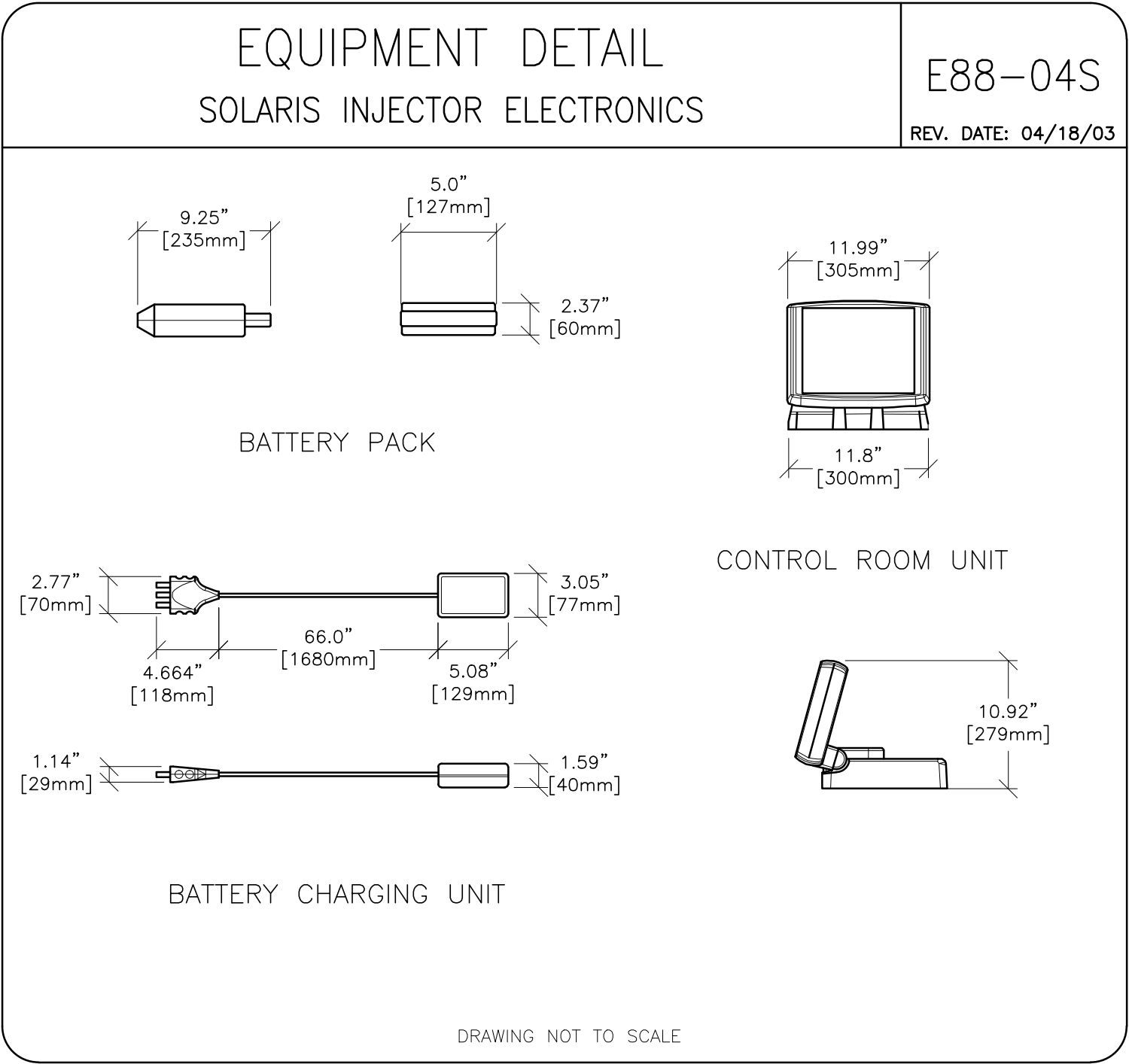
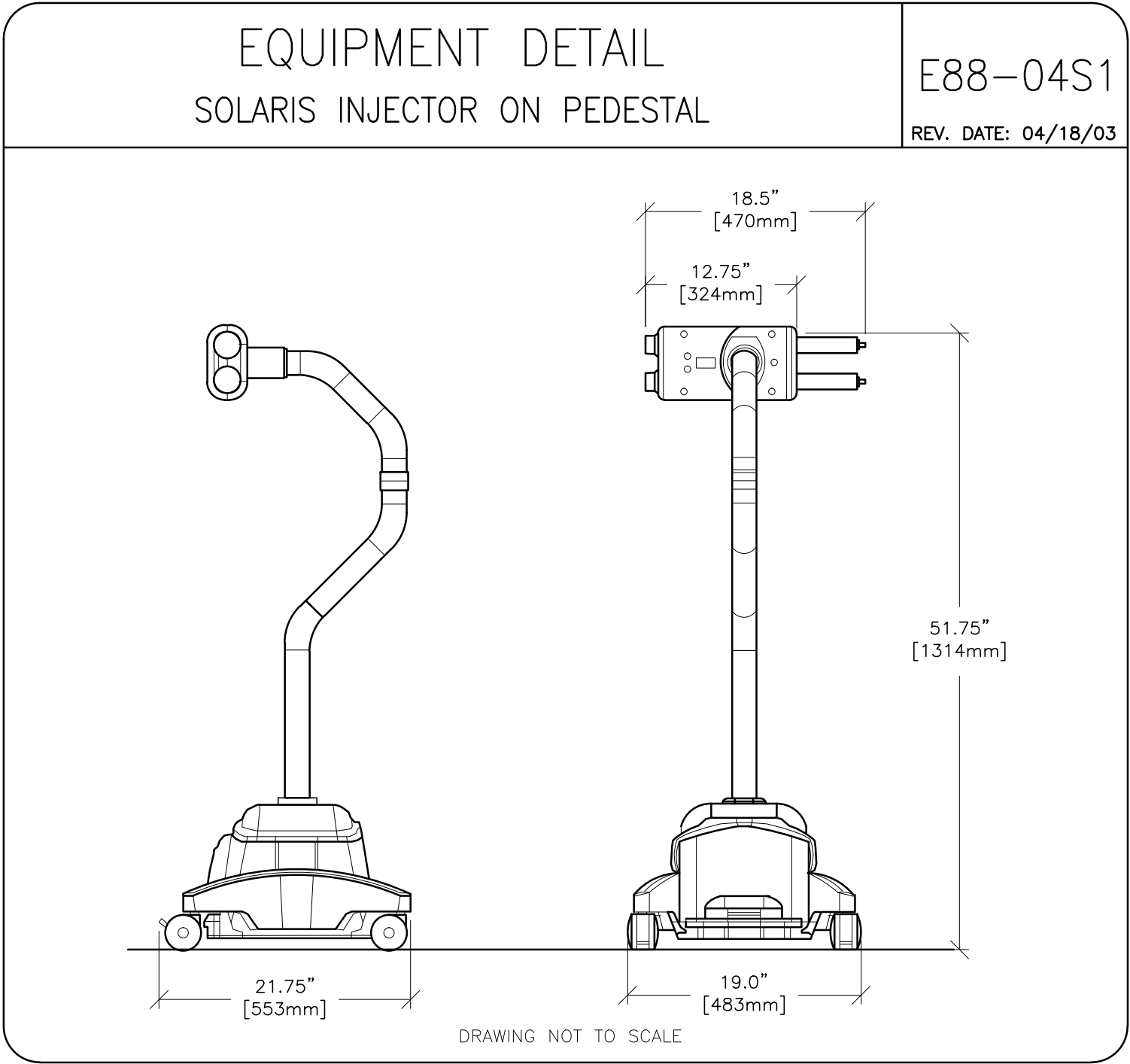
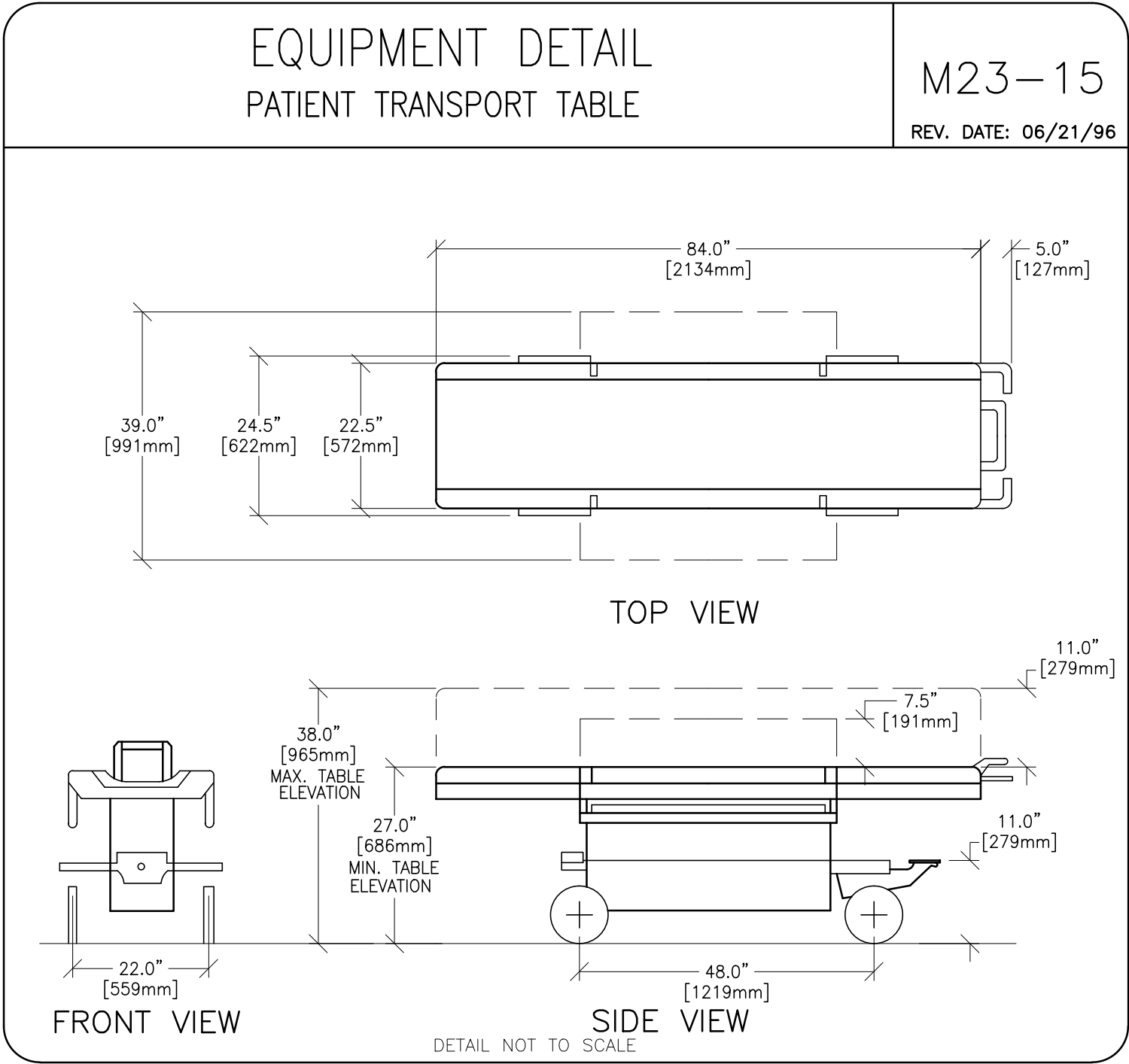
DATE: 10/16/03

DRAWN BY: PMM

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REVISION HISTORY:

SHEET D2



GE Healthcare

IS Services Design Center

Wisconsin

SHEET TITLE: EQUIPMENT DETAILS

MODALITY TYPE: 1.5T SIGNA MRI w/EXCITE

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PROJECT TITLE:

TYPICAL MR 8-136F

TYPICAL INSTALLATION DRAWINGS

PROJECT	REVISION
8-136F	00
DATE:	10/16/03
DRAWN BY:	PMM
CHECKED BY:	PLM

REVISION HISTORY:

SHEET

D3