Drawing Index

These sheets are a document set and should not be separated.
Electrical information and references are contained on all sheets.

These drawings indicate the placement and interconnection of the listed equipment components. These drawings are not construction or site preparation drawings. Customer remains ultimately responsible for preparing the site to accommodate the operation of such equipment in compliance with GE Healthcare's written specifications and all applicable federal, state, and/or local requirements.

* REQUIRED REFERENCE *

Discovery MR450

Pre Installation Manual

5500109

A mandatory component of this drawing set is the GE Healthcare Pre Installation manual. Failure to reference the Pre Installation manual will result in incomplete documentation required for site design and preparation.

Pre Installation documents for GE Healthcare products can be accessed on the web at:

www.gehealthcare.com/siteplanning

GE Healthcare

MRi Site Planning

imagination at work

Customer Site Readiness Requirements

- Any deviation from these drawings must be communicated in writing to and reviewed by your local GE Healthcare Installation Project Manager prior to making changes.
- Make arrangements for any rigging, special handling, or facility modifications that must be made to deliver the equipment to the installation site. If desired, your local GE Healthcare Installation Project Manager can supply a reference list of rigging contractors.
- New construction requires the following;
  1. Secure area for equipment,
  2. Power for drills and other test equipment,
  3. Capability for image analysis,
  4. Restrooms.
- Provide for refuse removal and disposal (e.g. crates, cartons, packing)
- It is the customer's responsibility to contract a vibration consultant/engineer to implement site design modifications to meet the GE vibration specification. Refer to the system preinstallation manual for the vibration specification.

GE Equipment Delivery Requirements

The items on the GE Healthcare Site Readiness Checklist are REQUIRED to facilitate equipment delivery to the IS site. Equipment will not be delivered if these requirements are not satisfied.

GE Healthcare Site Readiness Checklist Rev 19

Before using this document ensure you have the latest Rev from MyWorkshop on DOC0422752

GEHC Global Order # : ____________ Customer: ____________

GEHC PMI : ____________ FE / Installer: ____________

The customer is responsible for proper site preparation regardless of any GEHC measurements/inspections/assessments.

	Inspection Date:				
	GEHC Minimum Requirements	Storage Is item ready?	PMI Is item ready?	FE Is item ready?	Comments If "N", enter comments or action plan
1	**MR Magnet Delivery Requirements:** Ensure cryogen venting system is available for magnet connection as defined by GEHC Pre-Installation Manual (PIM) requirements, exhaust fan system is installed and operational, 480V power, and chilled water supply is available 24x7 that meets system cooling requirements. External connectivity is available for magnet monitoring and phone service is available during delivery. Surface mount vibromat installed where required. Magnet room final flooring is in place.				
2	**MR RF Screen Room Requirements:** RF Screen Room is tested with copy of Test Report, emailed to ISAdminCOEMB@ge.com, that it is compliant with GEHC specifications. Dock Bolt and magnet anchors (if applicable) installed using 2 part anchor. For HDx systems, blower box mount bolts installed by RF vendor using 2 part anchors				
3	**State Regulatory Requirements:** Facility registration number provided for states of Ill, KY, HI, RI, SC, TX. X-ray shielding plan and state acknowledgment letter provided to installer for AR, DC, NC, SC, CO & WA. **Site Drawing Requirements:** Final version of equipment network and antenna, installation drawings (including red lined versions) verified to match actual room and has been provided to installer.				
4	**Surface Penetration Requirements:** Customer/Contractor scheduled to provide required drilling or cutting into floors, ceilings, and walls; OR surface penetration permit available and posted in the room when GEHC will perform the work.				
5	**Pre-Delivery Route Requirements:** The equipment delivery route from the truck to the final destination within the facility has been reviewed with all key stakeholders to safely meet the minimum requirements for equipment access, and all communications/notifications have occurred. Arrangements have been made for special handling (elevator, rigging, floor protection, fork lift, rollback truck, etc).				
6	**Finished Room Requirements:** Rooms that will contain equipment, including storage areas not in scan suite, are dust free. Provisions taken to maintain a dust free room. Precautions must be taken to prevent dust from entering rooms containing equipment when construction is incomplete in adjacent areas. All walls primed (final coat not needed on Day 1). Shielding, doors, and windows are to be installed. No contractor work being done during or after the installation that will cause dust in the installation areas or potential equipment damage. Room security to prevent unauthorized access and theft has been discussed with customer. The customer is aware of these security issues, implications and responsibility. For Storage: Room must meet PIM requirements for storage.				
7	**Electrical Requirements:** Lockable (LOTO) Main Disconnect Panel (MDP) is installed per GE guidelines and system power is available. Conduits, electrical cable ducting/dividers/cable trays, and access flooring is installed in proper location and height. Surface floor duct and load-side wires can be installed at time of system installation. Validate outlet location and requirements meet specifications for device/equipment.				
8	**HVAC Requirements:** The HVAC/Chilled Water systems designed to maintain the environment per spec/PIM is at running state and appears to provide the desired environmental conditions including location of vents, temperature and humidity for system operation.				
9	**Flooring Requirements:** Floor is clean and prepared for final floor covering. Floor levelness/flatness is measured and within tolerance, and there are no visible defects per GEHC specifications. Confirm customer anchoring plan aligns with designed floor thickness. Final flooring installed where required for network racks.				
10	**Ceiling Requirements:** Unistrut (or equivalent) location, levelness and spacing is measured (or vendor confirmed) and consistent with the requirement of the installation drawings. Ensure unistrut and rails are not used as mounting surfaces. Ceiling grid is installed. Permanent lighting is installed and operational. HVAC diffusers are installed and connected to ductwork. Ceiling tiles installed per PMI discretion.				
11	**Staging Requirements:** Space has been identified to support the active installation process only. This area meets PIM/project book requirements. Storage space has been identified, if needed. This secured space would be used to store equipment indefinitely. If offsite, transportation plan has been developed at customer expense. This space must meet PIM requirements.				
12	**Network Connectivity:** Hardwire for network connectivity(network drop) is in place prior to delivery with specified network firewall configuration where required. Site Surveys for wireless mobile XR units have been completed.				
13	**Medical Gases Requirements:** Systems (hard piped or portable) in place to allow testing and calibration of equipment (anesthesia), including ventilation.				

RQ – 154963 PIM R9

GE Healthcare

Healthcare Project Implementation – Design Center
Milwaukee, Wisconsin

SHEET TITLE: SITE READINESS

MODALITY TYPE: DISCOVERY MR450

THIS PLAN IS SUBMITTED TO SUGGEST LOCATION OF GE HEALTHCARE EQUIPMENT AND ASSOCIATED APPARATUS, ELECTRICAL WIRING DETAILS AND ROOM ARRANGEMENTS. 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 ACTUAL CONSTRUCTION PURPOSES, HOWEVER, AND THE COMPANY CANNOT ACCEPT RESPONSIBILITY FOR ANY DAMAGES RESULTING THEREFROM.

PROJECT TITLE: 8–226F TYPICAL LAYOUT

PROJECT	REVISION
8–226f	00

DATE: 22.Sep.15
DRAWN BY: DMS
CHECKED BY: PMM

REVISION HISTORY:

SHEET C1

csah0000–29.JAN.2013

GE EQUIPMENT LISTING

EQUIPMENT ON ORDER FROM GE HEALTHCARE, INSTALLED BY GE HEALTHCARE, PER : **NEITHER A QUOTE OR GON WAS ISSUED AT THE DATE OF THESE DRAWINGS**

NOTE: LOCAL CONDITIONS MAY DICTATE THAT ITEMS IDENTIFIED IN THIS CATEGORY BE INSTALLED BY OTHERS.

EQUIPMENT CROSS REFERENCE CHART

SEISMIC STATUS: P = PREAPPROVAL; C = CALCULATIONS/PENDING APPROVAL; S = SPECIFICATIONS ONLY

QUANTITY ORDERED — REFER TO SHEET "D"

ITEM NO.	QTY	ITEM DESCRIPTION (* = EXISTING/REINSTALL)	WEIGHT	HEAT OUTPUT (PER HOUR)	DETAIL NO.	STRC PLAN	ELEC PLAN	SEISMIC
1	1	SPT PHANTOM CABINET	350 lbs		M6115	.		–
2	1	1.5 TESLA LCC ACTIVE SHIELD MAGNET	12030 lbs	8191 btu	M3015K M2315E M0300H M0315H	–	MAG	C
3	1	REAR PEDESTAL	213 lbs			–		C
4	1	PATIENT TRANSPORT TABLE (DOES NOT INCLUDE PATIENT)	418 lbs		M2315A	.		S
5	1	MAGNET RUNDOWN UNIT	8 lbs		M1715C	–	MRU	C
6	1	BLOWER BOX		1535 btu	M3015J	–		–
7	1	PEN PANEL CABINET (EXAM ROOM SIDE)	639 lbs	10699 btu 1023 btu	M3015F	–	PEN	S
8	1	RF PENETRATION PANEL	92 lbs		M3015P	–	SPW	S
9	1	SHIELD COOLER CABINET	264 lbs	1706 btu	M33004	–	CRY	C
10	1	POWER, GRADIENT, RF CABINET	3143 lbs	20945 btu	M3015G	–	PGR	S
11	1	HEAT EXCHANGER CABINET	1349 lbs	3412 btu	M3015B M3015D	–	HEC	S
12	1	MAGNET MONITOR	11 lbs	819 btu	M1615C	.	MON	C
13	1	OPERATOR WORKSPACE W/COLOR LCD MONITOR	26 lbs	4948 btu	M3015O	.	OW	–
14	1	OPERATOR WORKSPACE CABINET	141 lbs		M0615E	–		C
15	1	PATIENT ALERT CONTROL BOX			M4815	.	PA	S

THE FOLLOWING ITEMS, WHICH HAVE BEEN ORDERED FROM GE HEALTHCARE, ARE TO BE INSTALLED BY THE CUSTOMER OR HIS CONTRACTOR.

ITEM NO.	QTY	ITEM DESCRIPTION	WEIGHT	HEAT OUTPUT	DETAIL NO.	STRC PLAN	ELEC PLAN	SEISMIC
50	1	MAIN DISCONNECT PANEL	130 lbs	901 btu	M1715E	–	MDP	C

SCALE: 1/4" = 1'–0" — EQUIPMENT LAYOUT — RECOMMENDED CEILING HEIGHT = 8'–9"

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.

MRI SITE PLANNING REMINDERS

PLEASE REFER TO PRE–INSTALLATION CHECKLIST IN PRE–INSTALLATION MANUAL LISTED ON SHEET C1 FOR ITEMS CRITICAL TO IMAGE QUALITY.

1. 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.
2. 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 PRE–INSTALLATION MANUAL REFERENCED ON C1.
3. 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.
4. FOR VIBRATION, ANALYSIS TO BE COMPLETED AS REQUIRED PER PRE–INSTALLATION MANUAL.
5. FOR EMI, 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.
6. DETAILS OF THE FLOOR BELOW THE MAGNET MUST 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 PRE–INSTALLATION MANUAL REFERENCED ON SHEET C1.

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.

IMAGE QUALITY CONSIDERATIONS

BROADBAND RF NOISE IS A SINGLE TRANSIENT OR CONTINUOUS SERIES OF TRANSIENT DISTURBANCES CAUSED BY AN ELECTRICAL DISCHARGE. LOW HUMIDITY ENVIRONMENTAL CONDITIONS WILL HAVE HIGHER PROBABILITY OF ELECTRICAL DISCHARGE. THE ELECTRICAL DISCHARGE CAN OCCUR DUE TO ELECTRICAL ARCING (MICRO ARCING) OR MERELY STATIC DISCHARGE. SOME POTENTIAL SOURCES CAPABLE OF PRODUCING ELECTRICAL DISCHARGE INCLUDE:

- LOOSE HARDWARE/FASTENERS VIBRATION OR MOVEMENT (ELECTRICAL CONTUNUITY MUST ALWAYS BE MAINTAINED)
- FLOORING MATERIAL INCLUDING RAISED ACCESS FLOORING (PANELS & SUPPORT HARDWARE) AND CARPETING
- ELECTRICAL FIXTURES (i.e. LIGHTING FIXTURES, TRACK LIGHTING, EMERGENCY LIGHTING, BATTERY CHARGERS, OUTLETS)
- DUCTING FOR HVAC AND CABLE ROUTING
- RF SHIELD SEALS (WALLS, DOORS, WINDOWS ETC.)

FOR ADDITIONAL INFORMATION REGARDING IMAGE QUALITY, REFER TO THE PRE–INSTALLATION MANUAL LISTED ON SHEET C1.

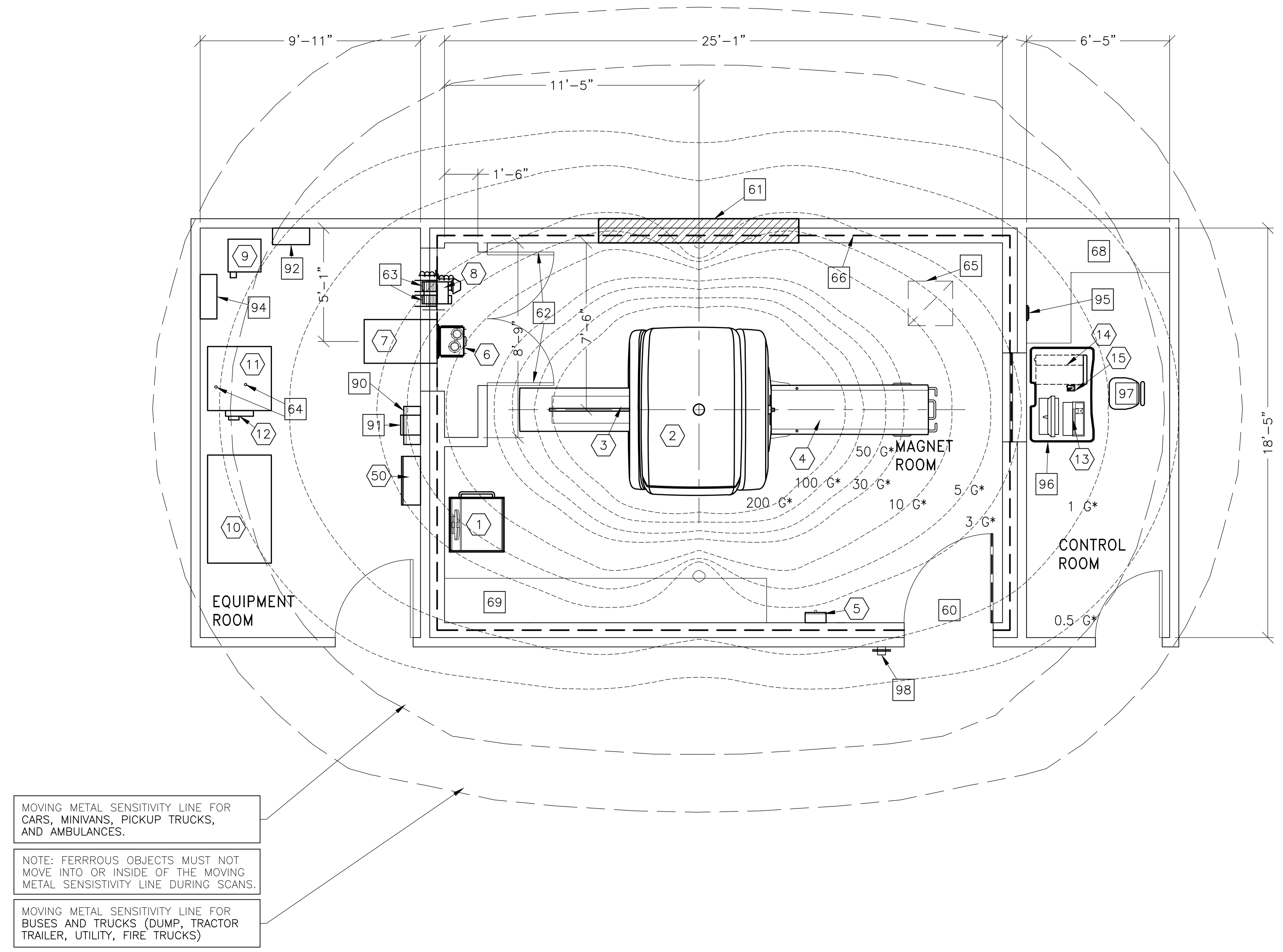
NOTE: VERIFY DELIVERY ROUTE FOR MAGNET, EQUIPMENT, AND SERVICE EQUIPMENT PRIOR TO DELIVERY.

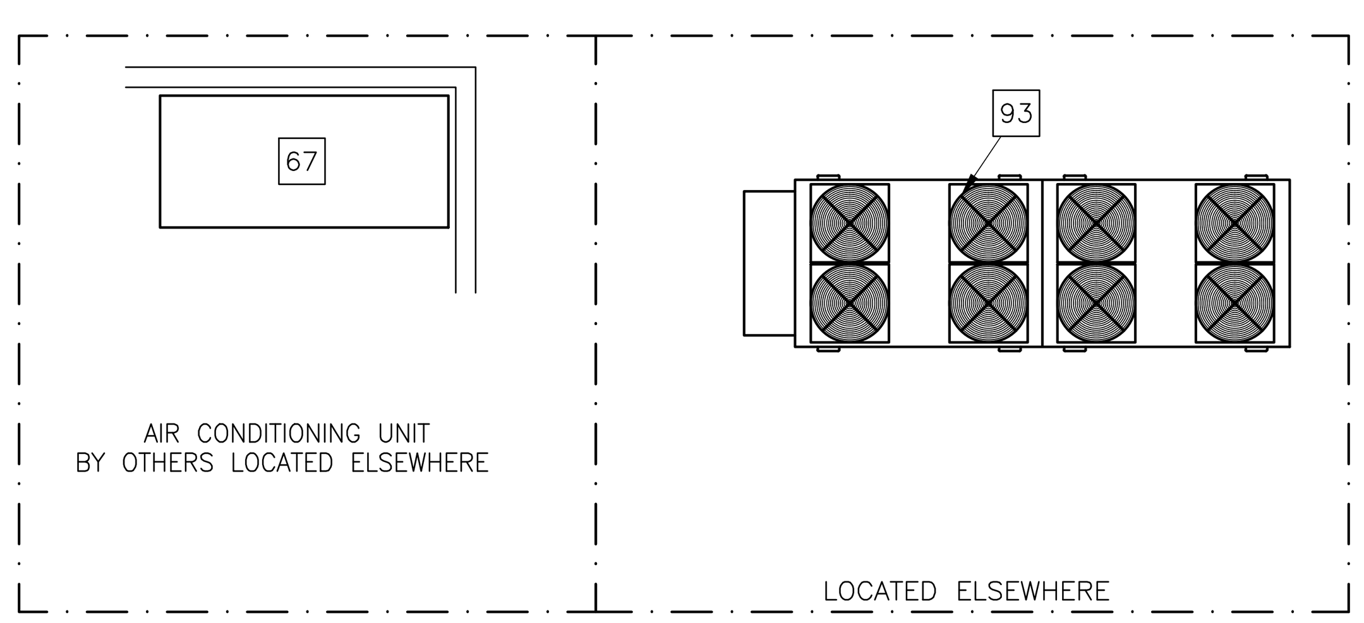
CRITICAL ITEMS FOR MAGNET DELIVERY

- ☐ 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.





NORTH PLAN

ANCILLARY ITEMS

CUSTOMER/CONTRACTOR SUPPLIED AND INSTALLED ITEMS

ITEM NO.	ITEM DESCRIPTION (* INDICATES EXISTING)
60	MINIMUM DOOR OPENING FOR EQUIPMENT DELIVERY IS 43 IN. W x 82 IN. H [1092mm x 2083mm], CONTINGENT ON A 96 IN. [2438mm] CORRIDOR WIDTH
61	MINIMUM 9 FT.–0 IN. [2743 mm] x 9 FT.–0 IN. [2743 mm] REMOVABLE WALL SECTION FOR MAGNET DELIVERY/REMOVAL.
62	LOUVERED DOORS – REFER TO PREINSTALL FOR REQUIREMENTS
63	RF FILTERS – LOCATE WITHIN 40 in. [1016 mm] OF THE RF COMMON GROUND STUD
64	PIPING FOR COOLING SYSTEM
65	MAGNET ROOM EXHAUST FAN
66	RF SCREEN, INCLUSIVE OF WALLS, FLOOR, DOOR, ETC. GROUND IMPEDANCE GREATER THAN 1000 OHMS. ATTENUATION 100dB AT 145MHz +/– 10MHz PLANEWAVE.
67	AIR CONDITIONING. (VIBRATION ISOLATION IS RECOMMENDED AT SUPPORTS OF EACH UNIT TO BE INSTALLED.)
68	COUNTERTOP WITH DRAWERS FOR MISCELLANEOUS ITEMS.
69	BASE CABINET FOR STORAGE OF: SURFACE COILS, PATIENT POSITIONING PADS, PHANTOMS, ETC.

THE FOLLOWING ITEMS ARE AVAILABLE FROM GE HEALTHCARE TECHNOLOGIES. CONTACT YOUR LOCAL GE HEALTHCARE SERVICE REPRESENTATIVE FOR PRICING AND AVAILABILITY.

ITEM NO.	ITEM DESCRIPTION
90	DC LIGHTING CONTROL PANEL 155 lbs (70 kg) 1024 BTU/HR. (300W) (CAT. NO. E4502SC/SE – BASIC SYSTEM)
91	DC LIGHTING AUTO TRANSFORMER 60 lbs [27 kg] 171 btu/hr (50W) (PART OF VARIABLE DIMMER SYSTEM) (CAT. NO. E4502SD/SF INCLUDES BASIC SYSTEM)
92	MANUAL CRYOGEN COMPRESSOR WATER BYPASS PANEL CAT NO. E8911CG
93	DIMPLEX 7500 CHILLER (CAT. NO. E8911CA/CB/CC/CD) 4301 lbs. (1951 kg) 240002 BTU/HR (70320 W)
94	WATER FILTER
95	REMOTE GRAPHIC DISPLAY
96	WORKSTATION TABLE CAT. NO. M1000MW
97	OPERATOR'S CHAIR CAT. NO. E8803BE
98	METAL DETECTOR (HAND HELD)

GENERAL SPECIFICATIONS

- 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 HALLWAYS FROM DELIVERY LOCATION TO WHERE EQUIPMENT IS TO BE INSTALLED TO ENSURE THE ROUTE PHYSICALLY AND STRUCTURALLY WILL ACCOMODATE 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

- o AMBIENT OPERATING TEMPERATURE: CONTROL AND EQUIPMENT ROOMS ARE 59–89.6 DEG (F) [15–32 (C)], MAGNET ROOM IS 59–69.8 DEG (F) [15–21 (C)]. MAXIMUM ALLOWABLE TEMPERATURE CHANGE OF 5 DEG (F)/HR [3 (C)/HR]. MAXIMUM ROOM TEMPERATURE GRADIENT 5 DEG (F) [3 (C)].
- o HUMIDITY: CONTROL AND EQUIPMENT ROOMS ARE 30 TO 70 PERCENT NON–CONDENSING, MAGNET ROOM IS 30 TO 60 PERCENT NON–CONDENSING, MAXIMUM ALLOWABLE CHANGE OF 5 PERCENT/HOUR.
- o ENVIRONMENTAL RESTRICTIONS ABOVE MUST NOT BE EXCEEDED FOR THE ELECTRONICS
- o 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 24 HOUR POWER AND HVAC MUST BE AVAILABLE UPON MAGNET DELIVERY. [THIS WILL INCLUDE CHILLED WATER SUPPLY].
- o CRYOGEN VENTING AND EMERGENCY EXHAUST SYSTEMS MUST BE COMPLETED IN THE MAGNET ROOM PRIOR TO DELIVERY.
- o FLUORESCENT LIGHTING, SCR DIMMERS OR RHEOSTATS ARE NOT ALLOWED IN THE MAGNET ROOM.
- o PROVIDE FLOORING TO PREVENT THE BUILD UP TO 8kV

MAGNETIC INTERFERENCE SPECIFICATIONS

- 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 (EXCLUSTION ZONE).
- o MAIN POWER TRANSFORMERS MUST REMAIN OUTSIDE THE 3 GAUSS FIELD. EMI < 40mG AC. EMI < 4.43mG DC.
- o POTENTIAL EXISTS UNDER FAULT 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 RAMPDOWNS 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.

TYPCIAL 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 (DUMP, TRACTOR TRAILER, UTILITY, FIRE TRUCKS)	18.1 ft. [5.52 m]	24.5 ft. [7.47 m]

PIM R9

RQ – 154963

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

GE Healthcare

Healthcare Project Implementation – Design Center
Milwaukee, Wisconsin

SHEET TITLE: EQUIPMENT LAYOUT

MODALITY TYPE: DISCOVERY MR450

PROJECT TITLE: 8–226F TYPICAL LAYOUT

PROJECT	REVISION
8–226f	00

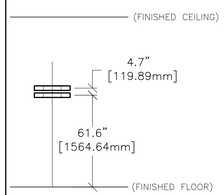
DATE: 22.Sep.15
DRAWN BY: DMS
CHECKED BY: PMM

REVISION HISTORY:

SHEET A1

TYPICAL WALL SUPPORT ELEVATIONS

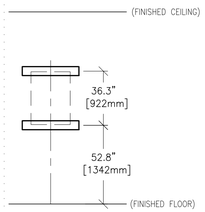
S63



SUPPORT FOR
MAGNET RUNDOWN UNIT

(NOT TO SCALE)

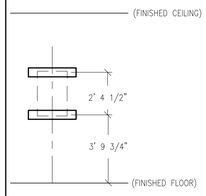
S60



SUPPORT FOR
MAIN DISCONNECT CONTROL

(NOT TO SCALE)

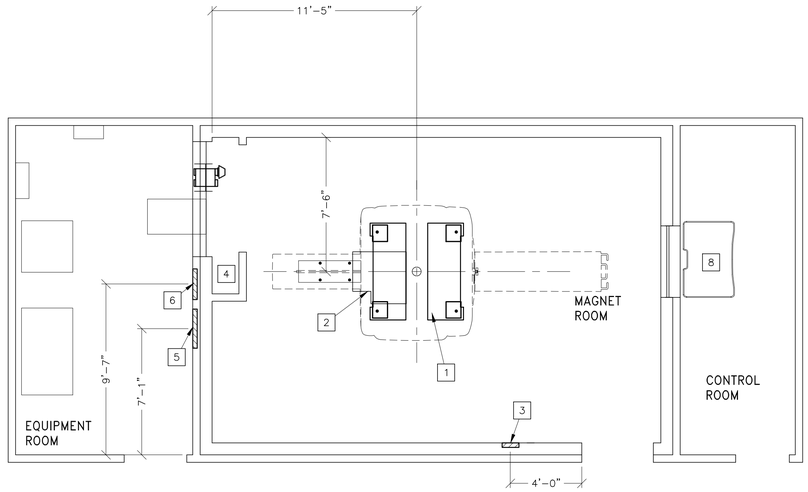
S62

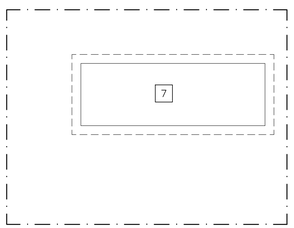


SUPPORT FOR
DC LIGHTING CONTROLLER

(NOT TO SCALE)

SCALE: 1/4" = 1'-0" STRUCTURAL LAYOUT RECOMMENDED CEILING HEIGHT = 8'-9"





STRUCTURAL SUPPORT METHODS

CUSTOMER/CONTRACTOR SUPPLIED AND INSTALLED ITEMS

ITEM NO.	ITEM DESCRIPTION (* INDICATES EXISTING)
1	SEE MAGNET FLOOR MOUNTING DETAIL ON SHEET S2 FOR MORE INFORMATION.
2	CABLE ACCESS OPENING AND CONCEALMENT FRAME IN CEILING, SEE DETAIL ON SHEET S2.
3	SUPPORT BACKING, LOCATE AS SHOWN, REFER TO ELEVATION DETAIL S63, FOR MAGNET RUNDOWN UNIT.
4	SUITABLE WALL BACKING FOR CABLE STORAGE CONSULT WITH FE OR PROJECT MANAGER
5	SUPPORT BACKING, LOCATE AS SHOWN, REFER TO ELEVATION DETAIL S60, FOR MAIN DISCONNECT CONTROL.
6	SUPPORT BACKING, LOCATE AS SHOWN, REFER TO ELEVATION DETAIL S62, FOR DC LIGHTING CONTROL.
7	CONCRETE PAD FOR CHILLER - CONSULT MANUFACTURER FOR SPECIFICATIONS
8	SEE OPERATOR WORKSPACE FLOOR MOUNTING DETAIL 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 PROJECT MANAGER OF INSTALLATIONS.
- FLOOR LEVELNESS REFER TO MAGNET FLOOR MOUNTING DETAIL ON S2. THIS FLOOR LEVELNESS REQUIREMENT IS IMPORTANT FOR ACCURATE PATIENT TABLE DOCKING.
- NON-MOVABLE STEEL SUCH AS WALL STUDS OR HVAC COMPONENTS WILL PRODUCE NEGLIGIBLE EFFECT ON THE ACTIVE SHIELD MAGNET.
- CUSTOMERS CONTRACTOR MUST PROVIDE ALL PENETRATIONS IN POST TENSION FLOORS.
- CUSTOMERS CONTRACTOR MUST PROVIDE AND INSTALL ANY NON-STANDARD ANCHORING. DOCUMENTS FOR STANDARD ANCHORING METHODS ARE INCLUDED WITH GE EQUIPMENT DRAWINGS FOR GEOGRAPHIC AREAS THAT REQUIRE SUCH DOCUMENTATION.
- CUSTOMERS CONTRACTOR MUST PROVIDE AND INSTALL HARDWARE FOR "THROUGH THE FLOOR" ANCHORING AND/OR ANY BRACING UNDER ACCESS FLOORS. THIS CONTRACTOR MUST ALSO PROVIDE FLOOR DRILLING THAT CANNOT BE COMPLETED BECAUSE OF AN OBSTRUCTION ENCOUNTERED WHILE DRILLING BY THE GE INSTALLER SUCH AS REBAR ETC.
- CUSTOMERS CONTRACTOR TO PROVIDE AND INSTALL APPROPRIATE SUPPORTS FOR THE STORAGE OF EXCESS CABLES.
- IT IS THE CUSTOMER'S RESPONSIBILITY TO PERFORM ANY FLOOR OR WALL PENETRATIONS THAT MAY BE REQUIRED. THE CUSTOMER IS ALSO RESPONSIBLE FOR ENSURING THAT NO SUBSURFACE UTILITIES (E.G., ELECTRICAL OR ANY OTHER FORM OF WIRING, CONDUITS, PIPING, DUCT WORK OR STRUCTURAL SUPPORTS (I.E. POST TENSION CABLES OR REBAR)) WILL INTERFERE OR COME IN CONTACT WITH SUBSURFACE PENETRATION OPERATIONS (E.G. DRILLING AND INSTALLATION OF ANCHORS/SCREWS) PERFORMED DURING THE INSTALLATION PROCESS. TO ENSURE WORKER SAFETY, GE INSTALLERS WILL PERFORM SURFACE PENETRATION OPERATIONS ONLY AFTER THE CUSTOMER'S VALIDATION AND COMPLETION OF THE "GE SURFACE PENETRATION PERMIT"

GE Healthcare

Healthcare Project Implementation – Design Center
Wisconsin
Milwaukee,

SHEET TITLE: STRUCTURAL LAYOUT

MODALITY TYPE: DISCOVERY MR450

PROJECT TITLE:
8-226F
TYPICAL LAYOUT

PROJECT	REVISION
8-226f	00

DATE: 22.Sep.15
DRAWN BY: DMS
CHECKED BY: PMM

REVISION HISTORY:

SHEET
S1

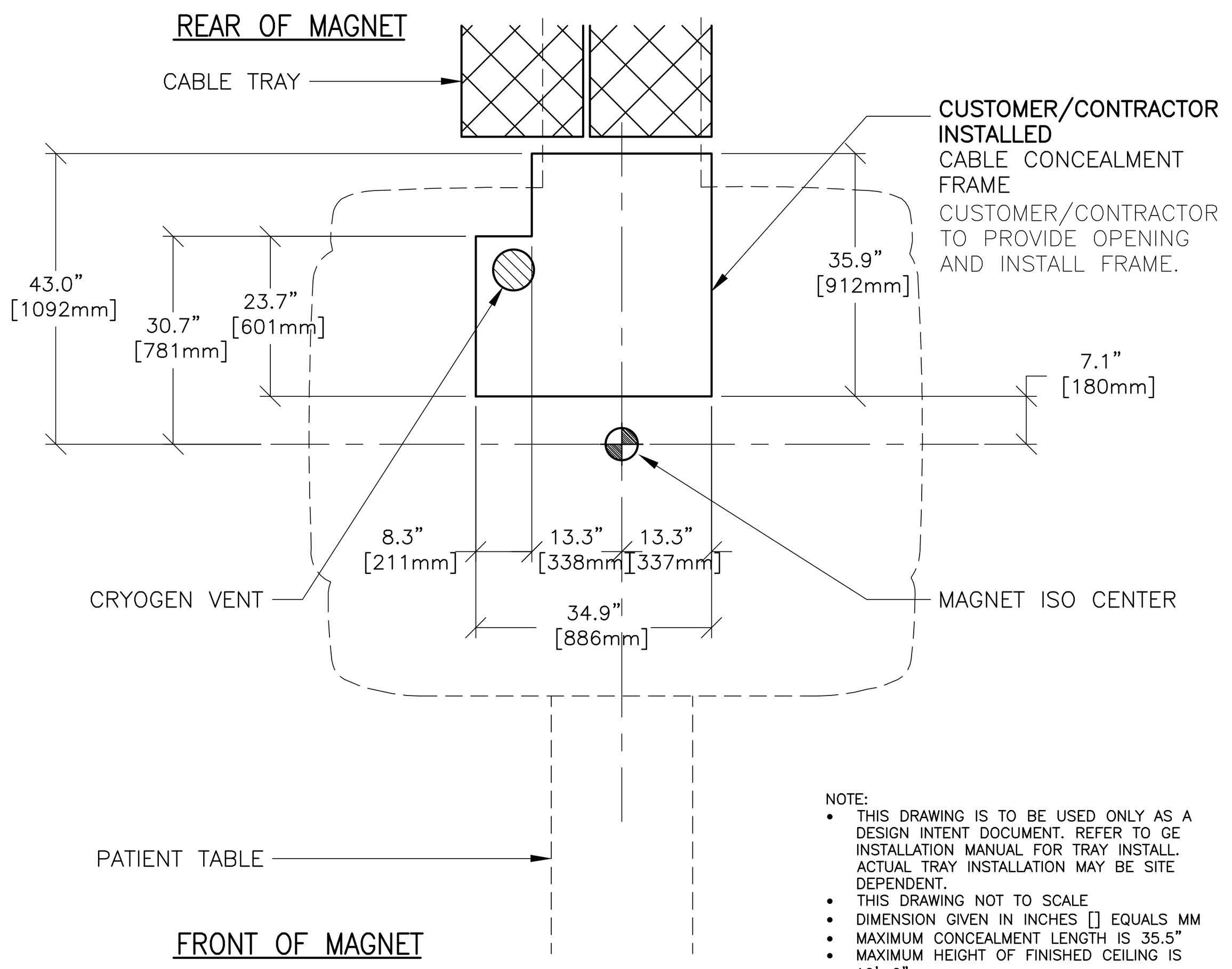
PIM R9
RQ - 154963

SUPPORT DETAIL

CABLE CONCEALMENT

M05–15J

REV. DATE: 05.AUG.14



NOTE:
- THIS DRAWING IS TO BE USED ONLY AS A DESIGN INTENT DOCUMENT. REFER TO GE INSTALLATION MANUAL FOR TRAY INSTALL. ACTUAL TRAY INSTALLATION MAY BE SITE DEPENDENT.
- THIS DRAWING NOT TO SCALE
- DIMENSION GIVEN IN INCHES [] EQUALS MM
- MAXIMUM CONCEALMENT LENGTH IS 35.5"
- MAXIMUM HEIGHT OF FINISHED CEILING IS 10'–0"

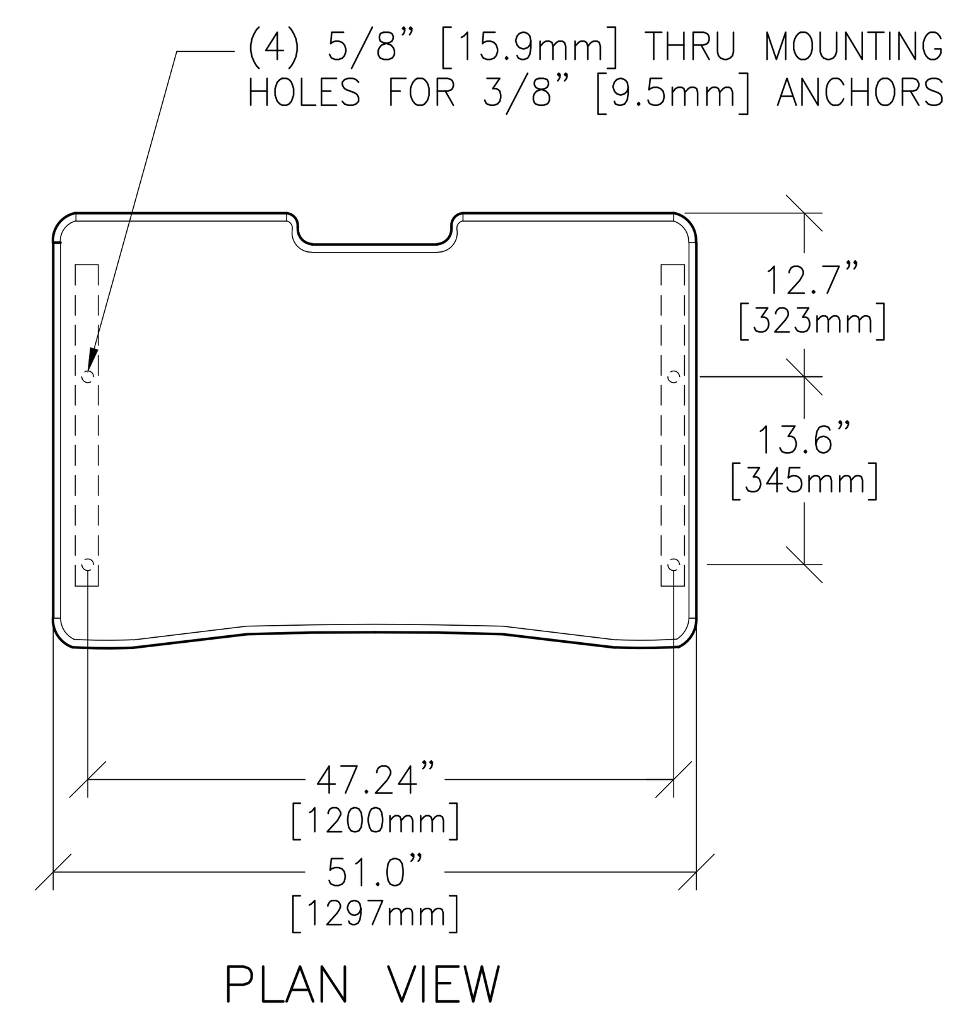
DETAIL NOT TO SCALE

SUPPORT DETAIL

OPERATOR WORKSPACE FLOOR MOUNTING

M05–15G

REV. 00: 01/23/08



PLAN VIEW

DETAIL NOT TO SCALE

ACOUSTICS AND VIBRATION GUIDELINES: MAGNET

M66–15G

REV. DATE: 11.MAR.14

SYSTEM ACOUSTIC NOISE LEVELS

ANY GE FACTORY–INSTALLED PROTOCOL CAN BE MODIFIED BY OPERATORS, WHICH CAN INCREASE OR DECREASE ACOUSTIC SPL (SOUND PRESSURE LEVEL); OR OPERATORS MAY CREATE THIER OWN PROTOCOL WHICH COULD PRODUCE A HIGHER OR LOWER ACOUSTIC SPL AS STATED UNDER OPERATING CONDITIONS CONDITION 1 BELOW. TYPICAL SCANS GENERATE ACOUSTIC LEVELS AS STATED UNDER OPERATING CONDITIONS CONDITION 2 BELOW. IN ADDITION, THE EXPOSURE TIMES ARE COMPLETELY UNDER OPERATOR CONTROL. CONSEQUENTLY, HEARING PROTECTION IS REQUIRED FOR ALL PEOPLE IN THE MAGNET ROOM DURING SCANS TO PREVENT HEARING IMPAIRMENT, ACOUSTIC LEVELS MAY EXCEED 99 dBA. AGAIN, FOR MORE INFORMATION ABOUT RECOMMENDED SAFETY PROCEDURES REGARDING PATIENT EXPOSURE TO MR–GENERATED ACOUSTIC NOISE, SEE THE MR SAFETY GUIDE INCLUDED IN THE USER MANUAL.

AMBIENT CONDITIONS

TO REDUCE ANY BACKGROUND NOISE DUE TO CABINET BLOWERS, ETC., ACOUSTICAL CEILINGS, WALLS, AND FLOORS ARE RECOMMENDED. THE FOLLOWING ARE TYPICAL NOISE LEVEL READINGS:

- o OPERATOR AREA .... 80 dBA
- o EQUIPMENT ROOM .... 80 dBA
- o MRCC (MR COMMON CHILLERS)........................ 69.1 dBA

OPERATING CONDITIONS

MR SCANNERS OPERATING CONDITIONS, COULD GENERATE ACOUSTIC LEVELS (AS MEASURED AT THE MAGNET ISO–CENTER) AS FOLLOWS:

AVERAGE SPL 127 dBA   SPL = SOUND PRESSURE LEVEL
FREQUENCY RANGE 20 TO 20k Hz

VIBRATION

- o THE MAGNET MAY BE SENSITIVE TO VIBRATIONS IN THE FREQUENCY RANGE OF 0.5 TO 45 Hz DEPENDING ON THE AMPLITUDE OF THE VIBRATION. IN THE PHYSICAL AREA WHERE THE MR SYSTEM IS TO BE LOCATED, EVERY PRECAUTION MUST BE TAKEN TO ENSURE THAT THE VIBRATION IS MINIMIZED. IN THE MAGNET SITING AREA, THE STRUCTURAL STABILITY AND BEHAVIORAL CHARACTERISTICS CAN BE ASSESSED. THE VIBRATION TESTS OUTLINED CAN BE USED TO ASSESS THE VIBRATION ENVIRONMENT. SITES WHICH CURRENTLY PASS THE VIBRATION STABILITY CRITERIA MAY PROCEED WITH INSTALLATION. SITES WHICH HAVE MARGINAL VIBRATION STABILITY REQUIRE SOURCE ISOLATION OR STRUCTURAL MODIFICATIONS. THEN IT IS THE CUSTOMER'S RESPONSIBLITY TO CONTRACT A VIBRATION CONSULTANT OR QUALIFIED ENGINEER TO IMPLEMENT DESIGN MODIFICATIONS TO MEET THE SPECIFIED LIMITS. WITH THE VIBRATION CONSULTANT PRESENT, LOCAL GE FIELD SERVICE AND/OR INSTALLATION SPECIALIST MUST VERIFY THE ELIMINATION/REDUCTION OF ALL IDENTIFIED SOURCES DO IMPROVE THE VIBRATION ENVIRONMENT. GE CAN ASSIST IN INTERPRETING MARGINAL SITE TEST RESULTS AND PREDICTING THE IMPACT ON SYSTEM PERFORMANCE. ULTIMATELY IT REMAINS THE CUSTOMER/ARCHITECT/ENGINEER RESPONSIBLITY TO DESIGN SITE SOLUTION.
- o TO MINIMIZE THE INTERFERENCE, THE MAGNET SHOULD BE PLACED ON A SOLID FLOOR, LOCATED AS FAR AS POSSIBLE FROM THE VIBRATION SOURCES, SUCH AS PARKING LOTS, ROADWAYS, SUBWAYS, TRAINS, HALLWAYS, ELEVATORS, HELIPORTS AND HOSPITAL PHYSICAL PLANTS CONTAINING PUMPS, MOTORS, AIR HANDLING EQUIPMENT, OR AIR CONDITIONING EQUIPMENT.

  PLEASE NOTE THAT OTHER ITEMS NOT LISTED COULD ALSO BE POTENTIAL SOURCES OF VIBTRATION.

  VIBRATION ISOLATION IS RECOMMENDED AT FLOOR CONNECTION POINTS OF THE AIR CONDITIONING UNIT(S) TO BE INSTALLED FOR THE PURPOSE OF COOLING THE MR SUITE.

  ISOLATION OF THE MR MAGNET IS NOT A RECOMMEDED SOLUTION FOR REDUCING ENVIRONMENTAL VIBRATION.
- o VIBRATION MEASUREMENTS SHOULD BE MADE WHEN THE PROPOSED SITE IS LOCATED NEAR ANY OF THE SOURCES LISTED HERE. MEASUREMENTS SHOULD BE MADE USING A SPECTRUM ANALYZER CAPABLE OF PERFORMING THE TEST GUIDELINES.

TRANSIENT VIBRATION

- o TIME HISTORY VIBRATION LEVELS (WITH ALL STEADY STATE VIBRATION SOURCES POWERED DOWN) EXCEEDING TRIGGER OF **0.0005 g, ZERO TO PEAK** MUST BE FULLY ANALYZED TO ASSESS THE POTENTIAL IMPACT TO THE BUILDING STRUCTURE. THE BUILDING (SPECTRAL) RESPONSE IMMEDIATELY FOLLOWING THE **0.0005 g, ZERO TO PEAK TRIGGER LEVEL** (ENDING AT THE DECAY OF THE VIBRATION SIGNAL) MUST NOT CAUSE THE SITE ENVIRONMENT TO EXCEED THE **STEADY STATE VIBRATION** LEVELS DEFINDED BELOW.

STEADY STATE VIBRATION

- o THE MAXIMUM STEADY STATE VIBRATION TRANSMITTED THROUGH THE FLOOR MUST NOT EXCEED THE FOLLOWING (ABOVE AMBIENT BASELINE):
  - o 5×10^{-5} g rms at 0 Hz ramping to 10×10^{-5} g at 20 Hz
  - o 10×10^{-5} g rms 20–40 Hz
  - o 25×10^{-5} g rms 40–50 Hz

IN ORDER TO ENSURE THAT ANY DISCRETE SIGNAL REPRESENTS A REAL MECHANICAL VIBRATION SOURCE, THE SIGNAL MUST HAVE A BANDWIDTH THAT TYPIFIES DYNAMIC SYSTEM RESPONSE.

TEST MEASUREMENTS (1.1)

VIBRATION MEASUREMENTS ARE IN THE RANGE OF 10^{-6}g. TEST EQUIPMENT MUST HAVE THE REQUIRED SENSITIVITY TO THESE LEVELS.

INSTRUMENTATION IS RECOMMENDED TO HAVE A LOW TOLERANCE TO TEMPERATURE EFFECTS AS MANY TIMES THE LOW FREQUENCY THERMAL DRIFT MAY INFLUENCE THE MEASUREMENTS.

IT IS HIGHLY RECOMMENDED ALL MEASURED DATA IS REAL TIME DATA ACQUISITION. RECORDING THE VIBRATION DATA WILL NOT ALLOW FOR A PROPER SITE SURVEY, SPECIFICALLY WHEN STUDYING TRANSIENT VIBRATION AND WHEN SEARCHING FOR SPECIFIC VIBRATION SOURCES.

ALL ANALYSES ARE TO BE NARROWBAND FAST FOURIER TRANSFORMS (FFT'S) OVER THE FREQUENCY BANDS LISTED BELOW:

FREQUENCYBAND	FREQUENCY RESOLUTION
0.2 TO 50 HZ	$\Delta f = 0.125$ HZ

TIME HISTORIES OF THE VIBRATION MUST BE RECORDED AS ACCELERATION LEVELS VS. TIME. THE RESOLUTION OF THE TIME HISTORY MUST BE ADJUSTED TO CLEARLY CAPTURE THE TRANSIENT EVENT. THE ANALYZER SET–UP WILL BE SITE DEPENDENT AND, IN SPECIAL CASES, VIBRATION RESPONSE DEPENDENT. IT IS THE RESPONSIBLITY OF THE VIBRATION CONSULTANT TO STUDY THE TRANSIENT ENVIRONMENT, CAPTURE DATA TO CONFIRM TRANSIENT ACTIVITY EXCEEDS THE TRIGGER LEVEL, THEN EXPAND THE TIME HISTORY DATA TO EXHIBIT THE STRUCTURAL RESPONSE.

EQUIPMENT (SPECTRAL ANALYZER) SET–UP (1.2)

- o FREQUENCY AVERAGE A MINIMUM OF 20 LINEAR AVERAGES. DO NOT USE PEAK HOLD OR 1/3 OCTAVE ANALYSIS.
- o AVERAGE AND STORE A MINIMUM OF 10 PLOTS TO SUPPORT THE SITE VIBRATIONS CONSISTENCY.
- o HANNING WINDOW MUST BE APPLIED TO THE ENTIRE SPECTRA

SPECTRUM ANALYZERS CAPABLE OF THESE MEASUREMENTS ARE READILY AVAILABLE FOR PURCHASE OR RENTAL. MODELS SUCH AS THE HP 3560A, NICOLET PHASZER, B&K PULSE, AND HP 35670 ARE ALL CAPABLE OF MAKING THE SITE VIBRATION MEASUREMENTS. ACCELEROMETERS MUST HAVE THE CAPABILITY TO MEASURE FROM 0.2 Hz BEYOND 50 Hz. TIME HISTORIES CAN BE RECORDED USING ANY OF THE ANALYZERS LISTED ABOVE. PLEASE NOTE THAT THE EQUIPMENT MENTIONED ARE FOR EXAMPLE ONLY. IT IS THE RESPONSIBILITY OF THE ENGINEERING TEST FIRM TO PROVIDE EQUIPMENT THAT WILL ALLOW MEASUREMENTS COMPLIANT WITH THIS GUIDELINE.

DATA COLLECTIONS (1.3)

AMBIENT BASELINE CONDITION:

ALL OF THE MEASUREMENTS DEFINED IN 1.1 AND 1.2 (ABOVE) MUST BE MADE IN A 'QUIET' ENVIRONMENT. THAT IS, IN AREAS WHERE EXCESSIVE TRAFFIC, SUBWAY TRAINS, ETC. EXISTS. A VIBRATION MEASUREMENT MUST ALSO BE MADE DURING PERIODS WITHOUT TRAFFIC OR DURING PERIODS OF LIGHT TRAFFIC. MEASUREMENTS MUST DEFINE THE LOWEST LEVELS OF VIBRATION POSSIBLE AT THE SITE.

THE SOURCE OF ANY STEADY STATE VIBRATION WHOSE LEVELS EXCEED THE SPECIFICATIONS MUST BE IDENTIFIED AS TO THE SOURCE OF THE VIBRATION DISTURBANCE. A SECOND MEASUREMENT SHOULD BE MADE WITH ALL OF THE IDENTIFIED CONTRIBUTORS POWERED DOWN IF POSSIBLE. IN SITUATIONS WHERE IT IS NOT POSSIBLE TO POWER DOWN EQUIPMENT, VIBRATION DATA MUST BE COLLECTED TO IDENTIFY SPECIFIC SOURCE OF THE VIBRATION CONCERN. THE MAJORITY OF STEADY STATE VIBRATION PROBLEMS CAN BE NEGATED BY ISOLATING THE VIBRATION SOURCE.

NORMAL CONDITION

ALL OF THE VIBRATION MEASUREMENTS LISTED ABOVE MUST BE REPEATED DURING PERIODS OF 'NORMAL' ENVIRONMENTAL CONDITIONS INCLUDING THE FFT'S AND TIME HISTORIES. THE TRANSIENT MEASUREMENTS MUST BE PROVIDED TO DEFINE THE DYNAMIC DISTURBANCES THE MR SYSTEM MIGHT BE EXPOSED TO. TRANSIENT ANALYSIS IS REQUIRED FOR A TRUE ASSESSMENT OF THE SITE.

SPEICAL ATTENTION MUST BE PAID TO THE SITE ASSESSMENT DURING THE ENTIRE ANALYSIS. SINCE TRANSIENT VIBRATION IS NOT EASILY ADDRESSED ONCE THE MR SUITE IS FULLY CONSTRUCTED, THE TEST CONSULTANT MUST FULLY UNDERSTAND THE NEEDS FOR THIS ANALYSIS. THE SOURCE OF ANY TRANSIENT MUST BE IDENTIFIED AND SUPPORTED WITH VIBRATION PLOTS. IF THE SOURCE OF ANY TRANSIENT IS NOT ABLE TO BE LOCATED, IT IS RECOMMENDED THAT THE CUSTOMER SHOULD HAVE AN ALTERNATE LOCATION IDENTIFIED AND VIBRATION STUDIED.

TRANSIENT VIBRATION IS DIFFICULT TO ASSESS IF THE DETAILS OF THE TRANSIENT VIBRATION IS NOT UNDERSTOOD. THE **0.0005 g, ZERO TO PEAK TRIGGER LEVEL** IS A STARTING POINT TO BEGIN UNDERSTANDING THE VIBRATION STABILITY. THE TRANSIENT VIBRATION PEAK AMPLITUDE, STRUCTURAL (TIME VARIANT) RESPONSE, DECAY RATE AND AN ESTIMATE OF THE NUMBER OF EVENTS PER UNIT TIME WOULD CONSTITUTE A COMPLETE TRANSIENT ANALYSIS. ALL TRANSIENT FAILURES MUST BE SUPPORTED BY TIME HISTORY PLOTS. THE PLOTS MUST CLEARLY SHOW THE STRUCTURAL RESPONSE, THE FREQUENCY OF THE SIGNATURE AND THE DECAY RATE. FROM THIS DATA, GE CAN HELP DETERMINE COMPLIANCE TO THE VIBRATION GUIDELINES.

TEST CONSULTANT MUST PROVE DESIGN RECOMMENDATIONS FOR ALL SITES/BUILDING STRUCTURES WHICH ARE FOUND TO EXCEED THE SPECIFICATIONS.

PRESENTATION/INTERPRETATION OF RESULTS (1.4)

THE RECOMMENDED FORMAT FOR SITE VIBRATION DATA COLLECTION, PRESENTATION, AND ANALYSIS IS ILLUSTRATED IN THE EXAMPLES SHOWN IN ILLUSTRATIONS 1.1 THROUGH 1.4. IN THE PRE–INSTALLATION MANUAL. PRESENTATION OF THE DATA IN ANY OTHER FORMAT (LINEAR UNITS ONLY) MAY RESULT IN AN INCORRECT INTERPRETATION AND DIAGNOSIS OF THE SITE. ADDITIONAL DATA COLLECTION OR PRESENTATION METHODS IS AT THE OPTION OF THE VIBRATION TESTING SERVICE.

IT IS THE RESPONSIBILITY OF THE CUSTOMER'S VIBRATION TESTING SERVICE TO INTERPRET THE RESULTS AND DETERMINE IF THAT SITE MEETS GE'S SPECIFICATIONS. ILLUSTRATIONS A–1 AND A–2 ARE EXAMPLES PROVIDED TO ASSIST A TEST CONSULTANT IN THE USE OF GE STEADY STATE SPECIFICATIONS (VIBRATION SPECIFICATIONS ABOVE AMBIENT BASELINE). IF THE VIBRATION LEVELS ARE TOO HIGH, ADDITIONAL DATA ACQUISITION MAY BE NECESSARY TO:

- o DETERMINE THE SOURCE OF THE VIBRATION
- o PROPOSE A SOLUTION TO THE PROBLEM
- o FIND AN ALTERNATE SITE LOCATION.

ILLUSTRATIONS A–3 AND A–4 IN THE PRE–INSTALLATION MANUAL ARE EXAMPLES PROVIDED TO ASSIST A TEST CONSULTANT IN THE USE OF GE TRANSIENT SPECIFICATIONS. THE **500 MICRO–G, ZERO TO PEAK TRIGGER LEVEL** IDENTIFIES DATA COLLECTION TO BEGIN ASSESSMENT OF THE SITE VIBRATION ANALYSIS. THE RESPONSE OF THE TRANSIENT MUST BE ASSESSED RELATIVE TO THE STEADY STATE VIBRATION SPECIFICATIONS IN SECTION SPECIFICATIONS.

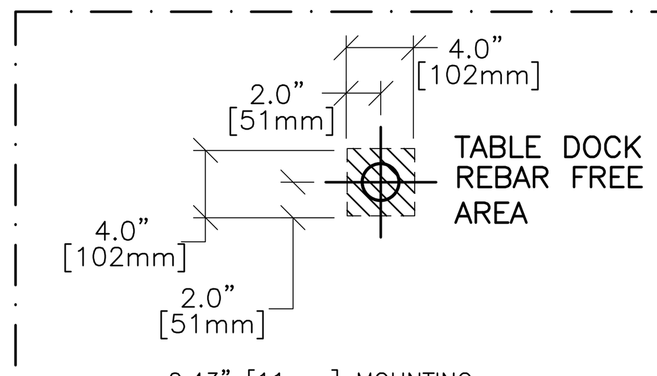
ANY QUESTIONS REGARDING TEST EQUIPMENT REQUIREMENTS, TEST PARAMETERS, OR GENERAL QUESTIONS SHOULD BE DISCUSSED WITH YOUR GE PROJECT MANAGER.

MAGNET FLOOR MOUNTING DETAIL

REFER TO SHEET A1 FOR ACTUAL MAGNET ORIENTATION

M6615A2

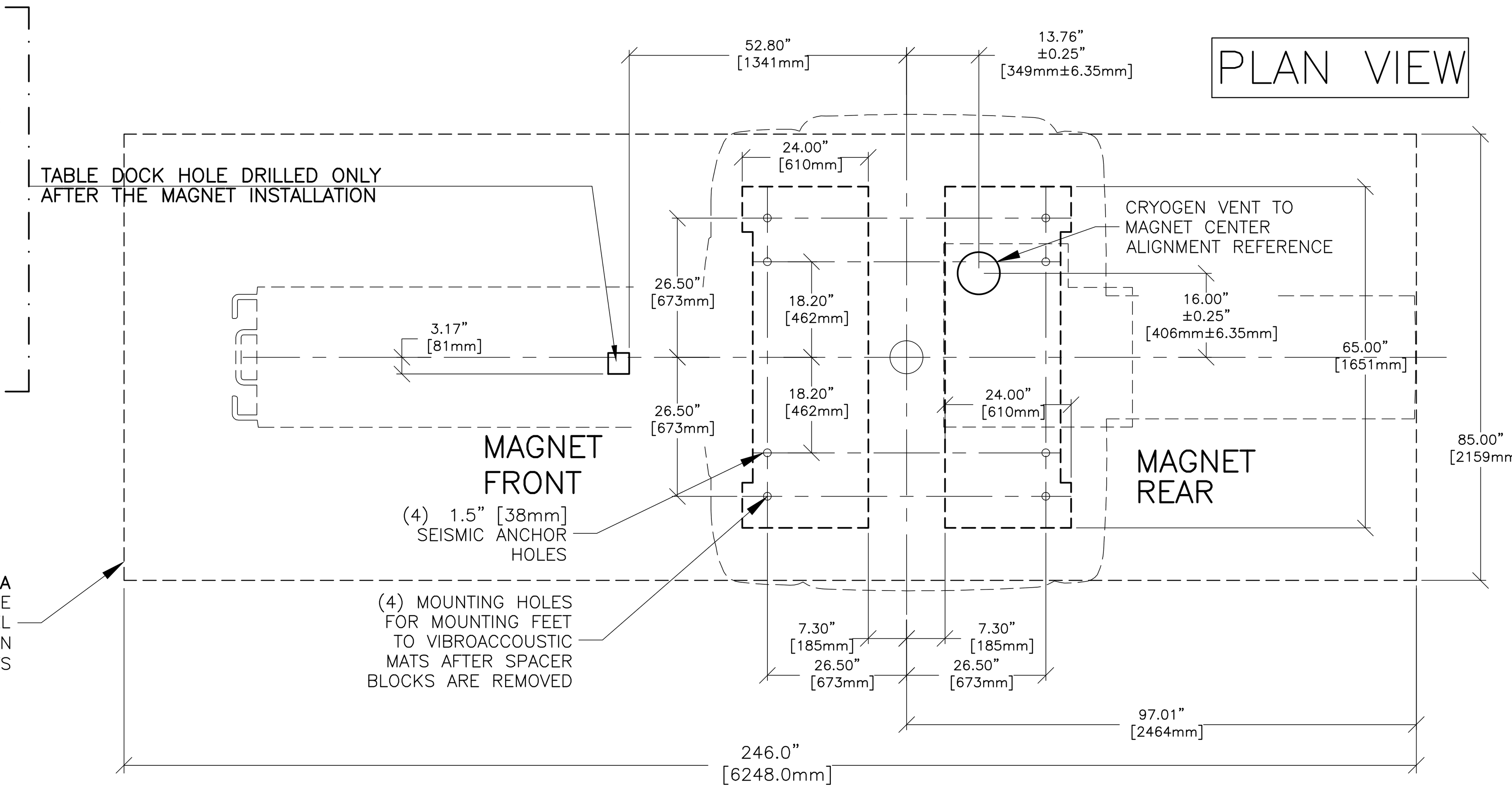
REV. DATE: 06MAY.15



0.43" [11mm] MOUNTING HOLE FOR TABLE DOCK. ANCHOR TO WITHSTAND A CLAMPING/TENSION FORCE OF 600 lbs [2669 N].

DOCK ASSEMBLY ANCHOR BOLTS SHOULD BE 2.25 IN ±0.5 IN [60 MM ±13 MM] ABOVE THE FINISHED FLOOR.

GENERAL NOTES:
STEEL REBAR MUST NOT BE POSITIONED IN SHADED AREAS NOTED AS "REBAR FREE" TO PREVENT INTERFERENCE WITH MOUNTING BOLTS.
MAGNET MOUNTING AND ANCHOR HARDWARE REQUIREMENTS ARE THE CUSTOMER/CONTRACTOR RESPONSIBILITY.



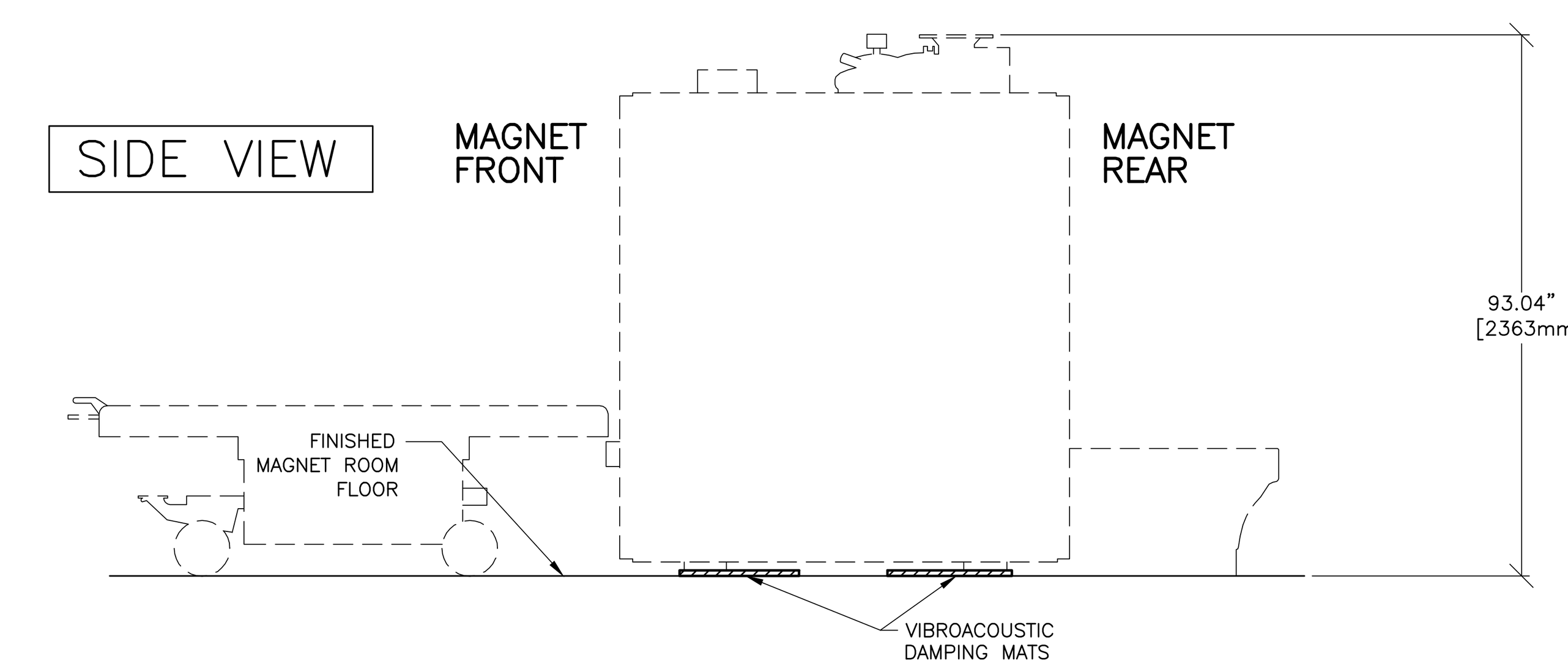
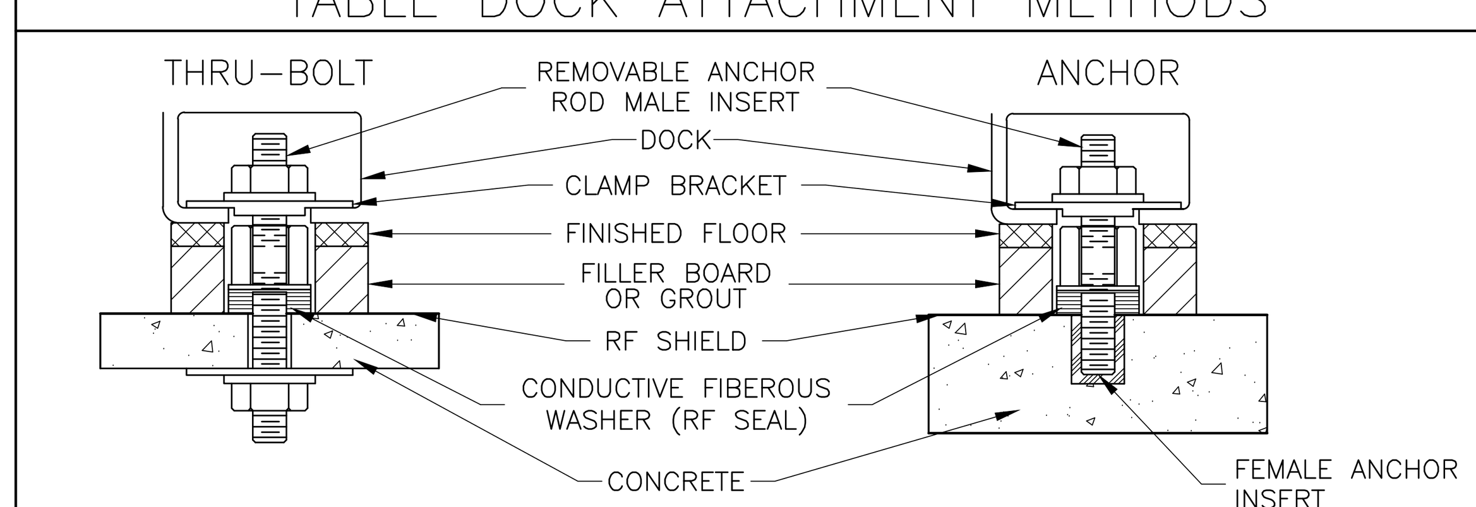


TABLE DOCK ATTACHMENT METHODS



THE DOCK ANCHOR MUST BE A COMMERCIALLY AVAILABLE TWO PART ASSEMBLY WITH A REMOVABLE BOLT OR THREADED ROD/NUT. IT IS PROVIDED/INSTALLED BY THE RF VENDOR AFTER THE MAGNET IS DELIVERED.

ENVIRONMENTAL STEEL LIMITS

A STATIC MAGNETIC FIELD EXTENDS IN A THREE–DIMENSIONAL SPACE AROUND THE MAGNET ISOCENTER. ENVIRONMENTAL STEEL WITHIN THE STATIC MAGNETIC FIELD AFFECTS THE UNIFORMITY (OR HOMOGENEITY) OF THE FIELD. FIELD UNIFORMITY IS CRITICAL TO BOTH IMAGE QUALITY AND CHEMICAL SHIFT ANALYSIS (SPECTROSCOPY). AN ANALYSIS OF THE ENVIRONMENTAL STEEL IS REQUIRED WITHIN A 5 FEET (1.524 METERS) SPHERICAL RADIUS OF THE MAGNET ISOCENTER. ENVIRONMENTAL STEEL INCLUDES PIPES, BEAMS, CONCRETE REBAR, OR ANY OTHER STRUCTURAL STEEL IN THE FLOORS, WALLS, OR CEILING.

MAGNET TYPE	LIMITS OF STEEL MASS LBS/SQ FT [KG/SQ M]	DISTANCE FROM MAGNET ISOCENTER IN [MM]	DISTANCE BELOW TOP SURFACE OF FLOOR IN [MM]
1.5T ACTIVE SHIELD SEE NOTES	0 [0] 2 [9.8] 3 [14.7] 8 [39.2] 20 [98.0]	0–45 [0–1143] 45–47 [1143–1194] 47–52 [1194–1321] 52–55 [1321–1397] 55+ [1397+]	0–3 [0–76] 3–5 [76–127] 5–10 [127–254] 10–13 [254–330] 13+ [330+]

NOTE THE FOLLOWING ITEMS MUST BE LIMITED PER THE ABOVE TABLE
1. NON–MOVABLE STEEL CONSTRUCTION MATERIAL SUCH AS WALL STUDS OR HVAC COMPONENTS.
2. METALLIC PIPES AND DRAINS.
3 STEEL IN THE FLOOR IN A 10 FOOT BY 10 FOOT (3.1 METER BY 3.1 METER) AREA DIRECTLY BELOW THE MAGNET.

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

PIM R9

RQ – 154963

GE Healthcare

Healthcare Project Implementation – Design Center
Milwaukee, Wisconsin

SHEET TITLE: STRUCTURAL DETAILS

MODALITY TYPE: DISCOVERY MR450

PROJECT TITLE: 8–226F TYPICAL LAYOUT

PROJECT	REVISION
8–226f	00

DATE: 22.Sep.15
DRAWN BY: DMS
CHECKED BY: PMM

REVISION HISTORY:

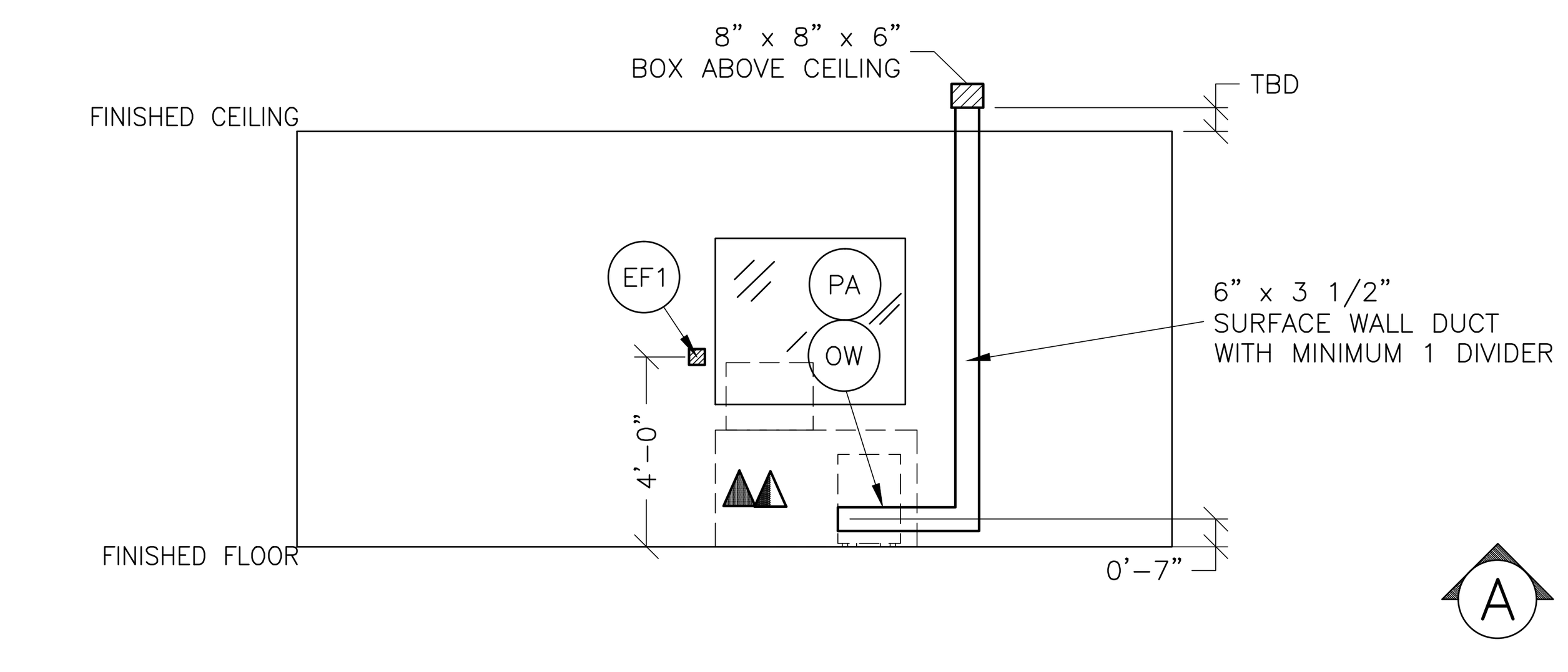
SHEET

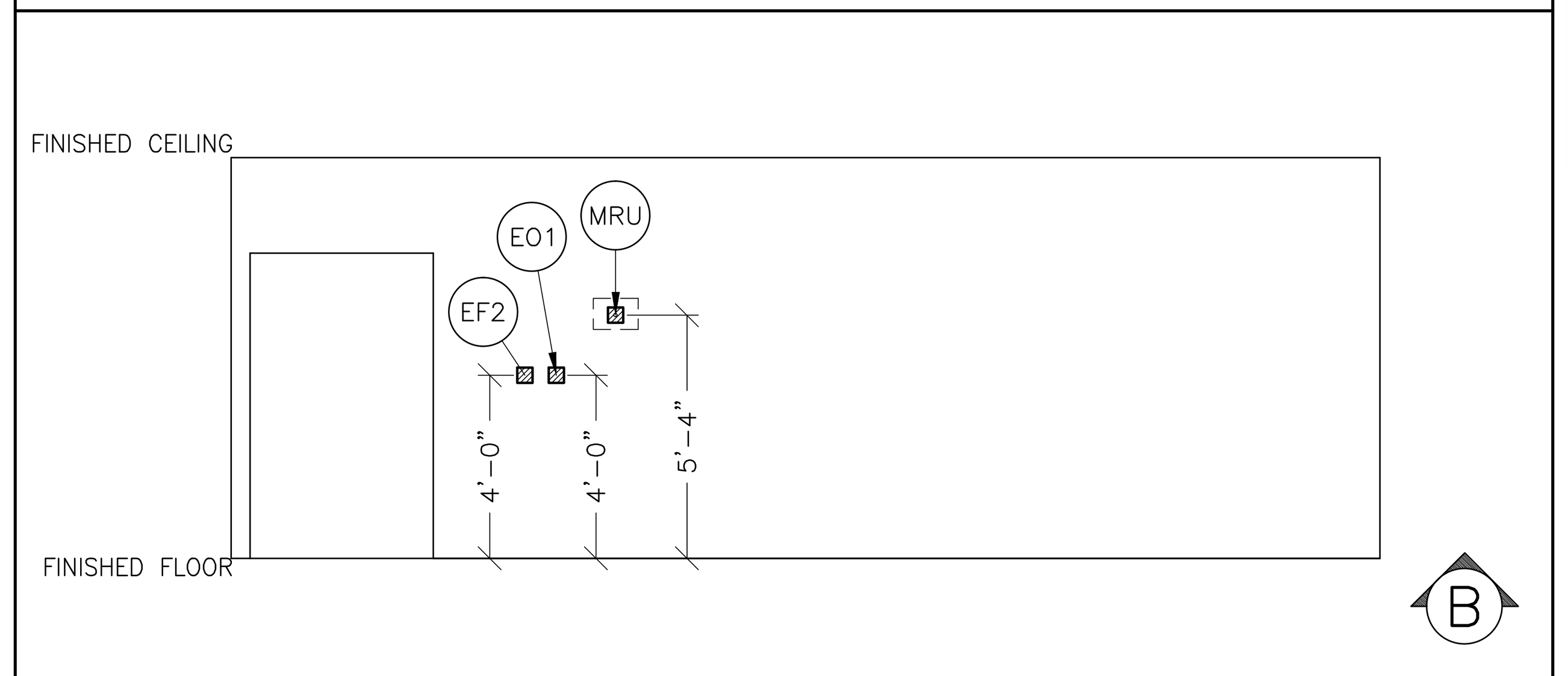
S2

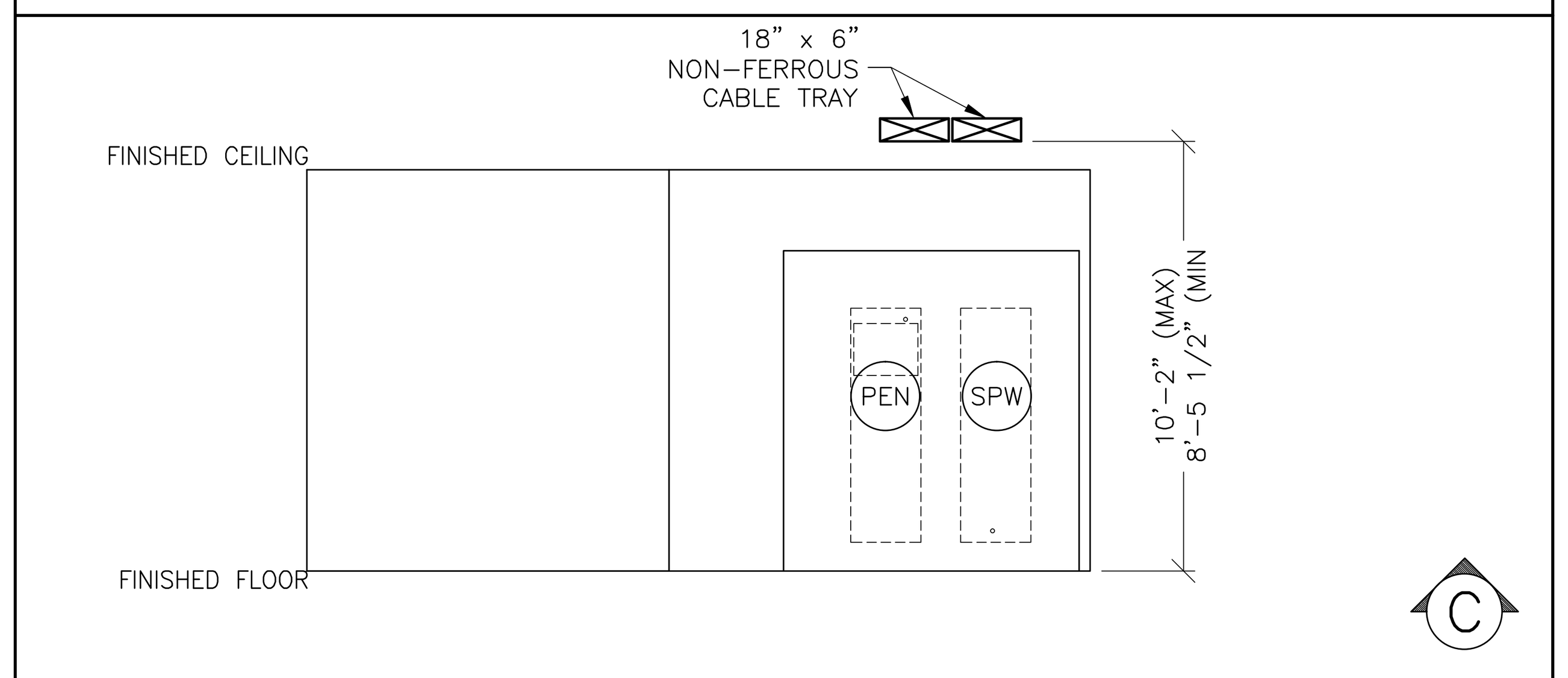
SCALE: 1/4" = 1'-0"

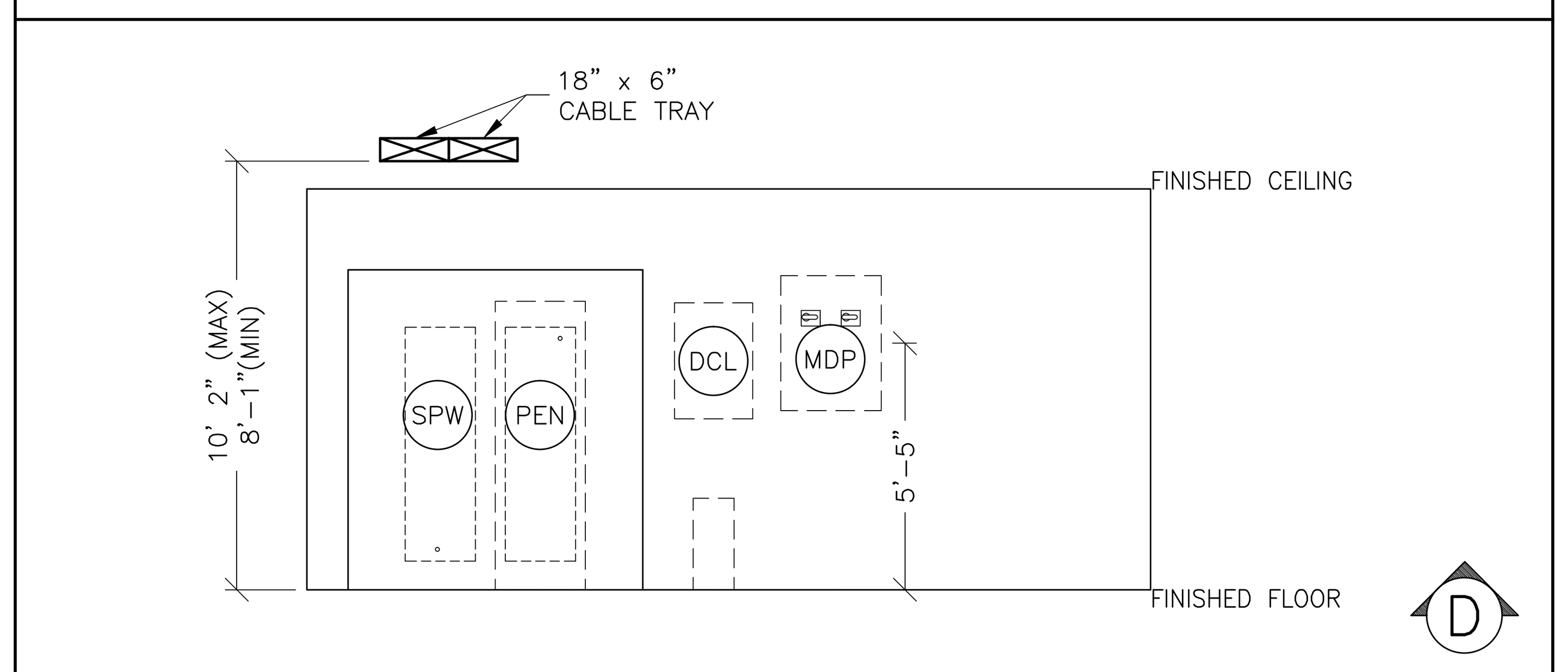
ELECTRICAL PLAN

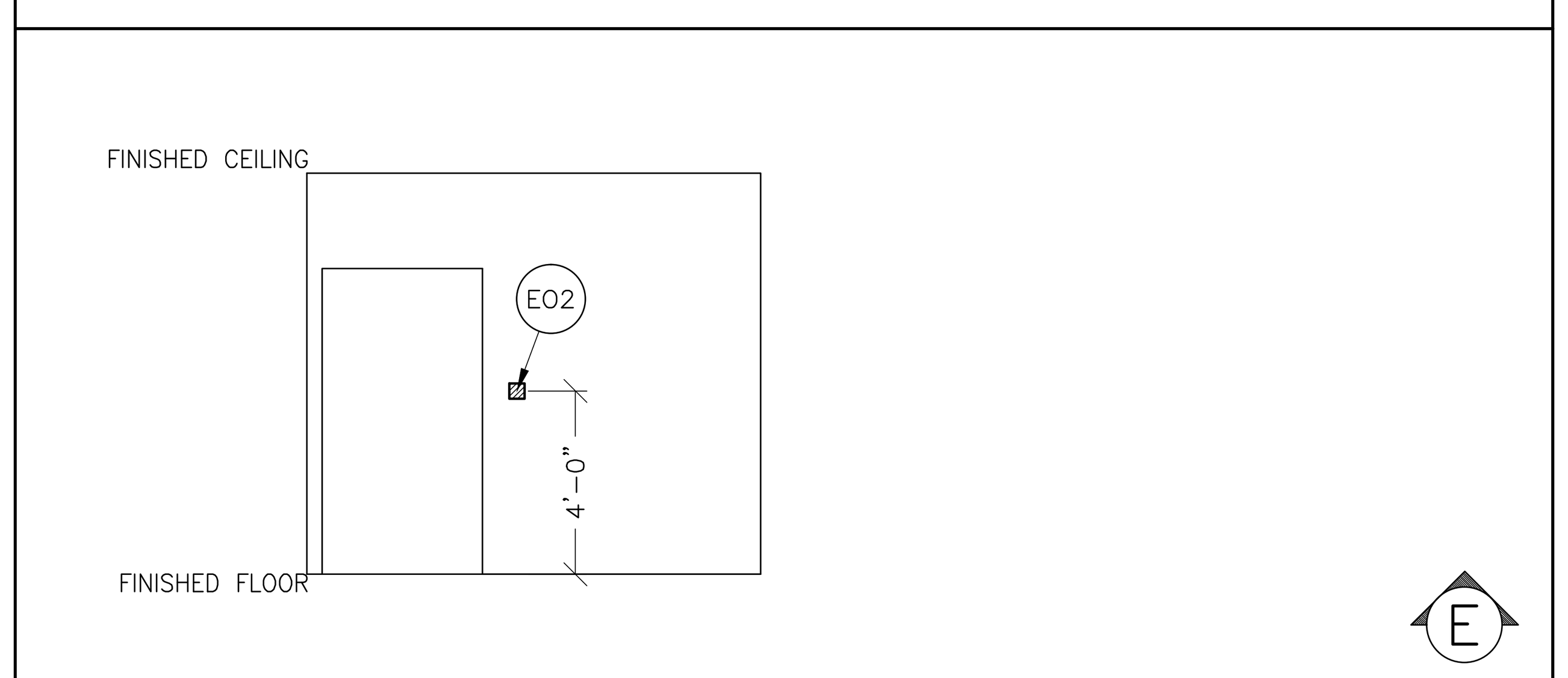
RECOMMENDED CEILING HEIGHT = 8'-9"

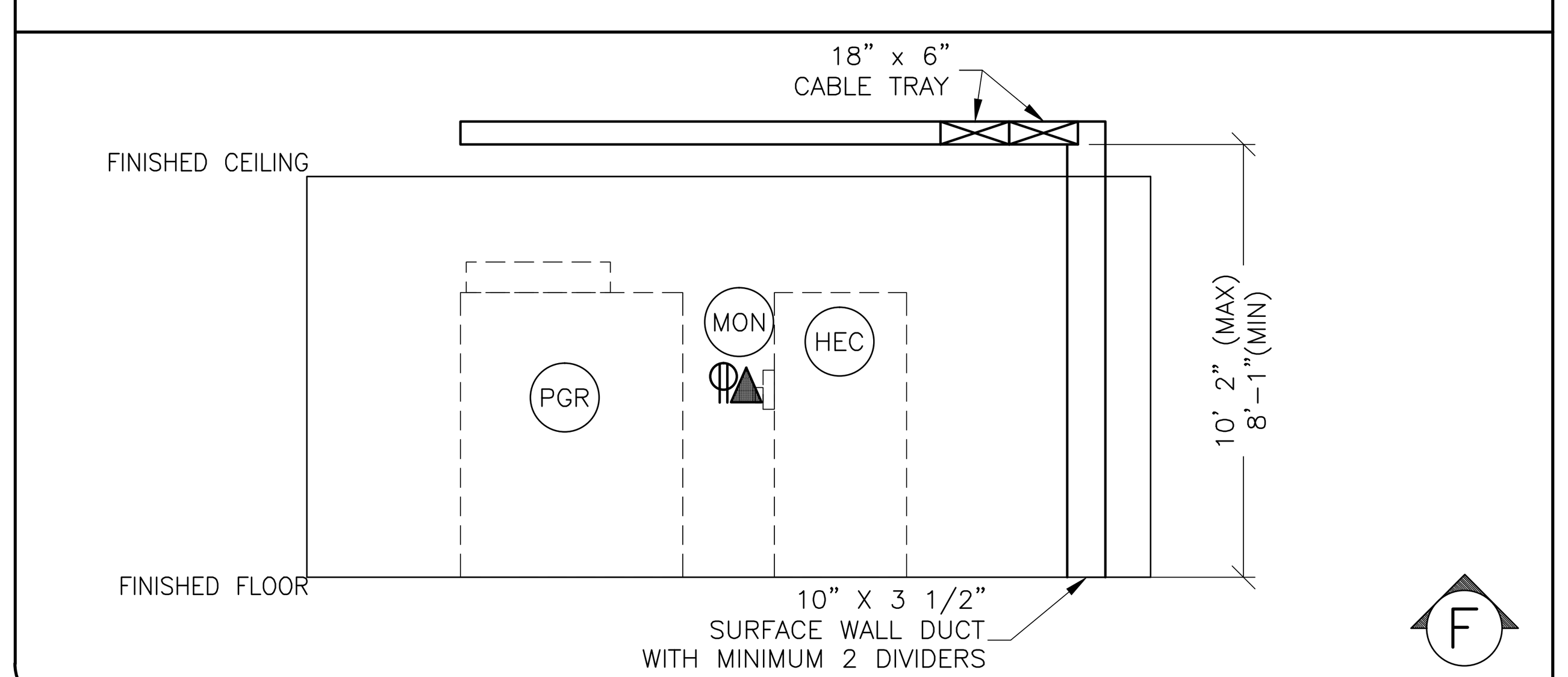












FEEDER TABLE

- CALCULATIONS BASED UPON NOMINAL VOLTAGE, WIRE SIZE IN AWG.
- RECOMMENDED FEEDER SIZES FROM DIST. TRANS. TO MDP, ALL CALCULATIONS BASED UPON A 20 FT. [6.1m] RUN FROM MDP TO PGR USING 1/0 AWG.
- THE GROUNDING CONDUCTOR ( ) SHALL BE COPPER AND WILL RUN IN THE SAME CONDUIT AS THE FEEDERS FROM EQUIPMENT BACK TO THE ROOM POWER SOURCE GROUNDING POINT.
- IF THE GENERAL ELECTRIC EQUIPMENT IS BEING FED BY A DELTA SECONDARY, IT IS RECOMMENDED THAT THE B PHASE ON THE SECONDARY BE CONNECTED TO GROUND TO PREVENT DAMAGE TO THE SYSTEM.
- NEUTRAL MUST BE TERMINATED PRIOR TO OR INSIDE THE MAIN DISCONNECT PANEL AND NOT BROUGHT INTO THE PGR OR HEC CABINET.
- * MINIMUM WIRE SIZE FOR CIRCUIT BREAKER, BASED ON RECOMMENDED OVERCURRENT PROTECTION.
- **FOR A FULL SYSTEM UPS REFER TO ELECTRICAL DETAILS FOR UPS FEEDER WIRES.**

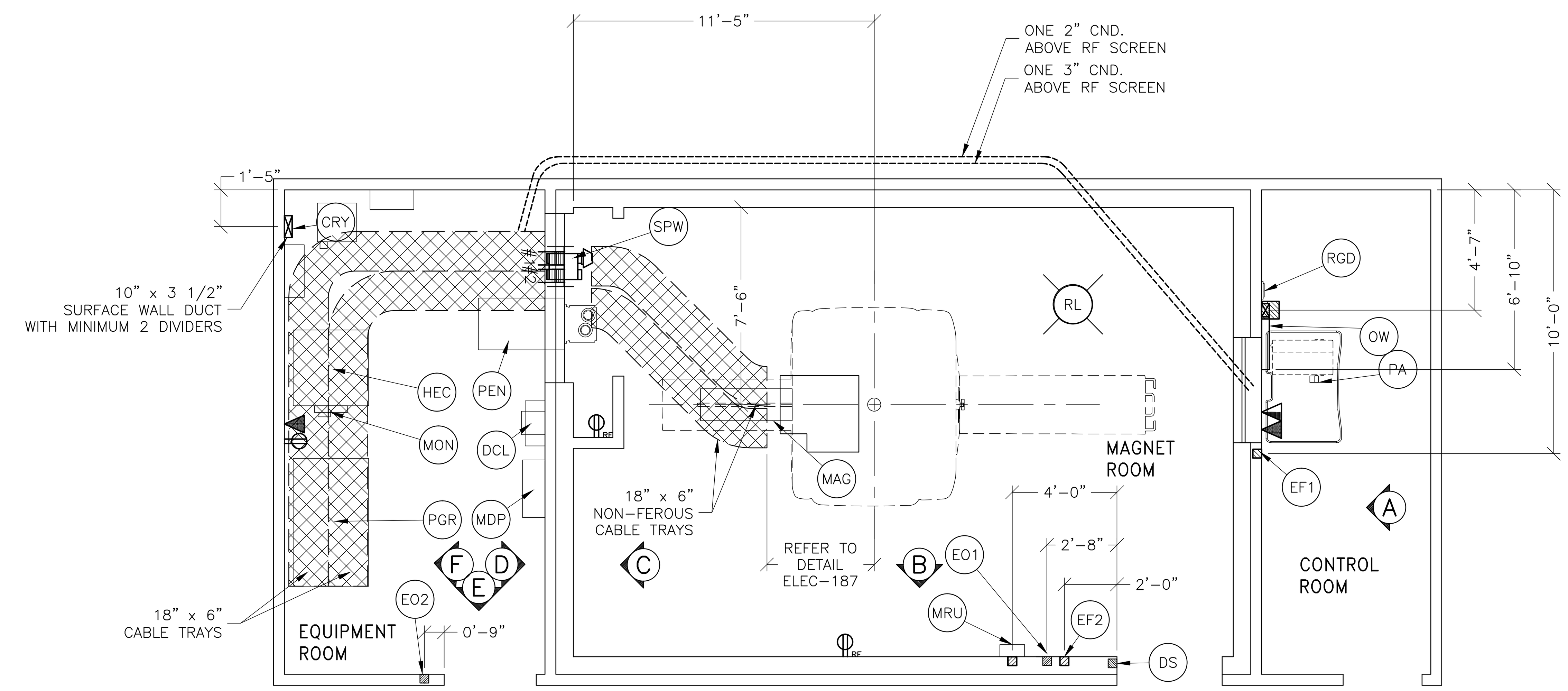
RUN LENGTH IN FEET	POWER SUPPLY VOLTAGE							
	342–418 380		360–440 400		374–456 415		**432–528 480**	
	FEEDER	GROUND	FEEDER	GROUND	FEEDER	GROUND	FEEDER	GROUND
100	* 3/0	(4)	* 3/0	(4)	* 3/0	(4)	*** 3/0**	**(4)**
150	* 3/0	(4)	* 3/0	(4)	* 3/0	(4)	*** 3/0**	**(4)**
200	* 3/0	(4)	* 3/0	(4)	* 3/0	(4)	*** 3/0**	**(4)**
250	4/0	(2)	3/0	(4)	3/0	(4)	*** 3/0**	**(4)**
300	250M	(2)	4/0	(2)	4/0	(2)	*** 3/0**	**(4)**
350	300M	(2)	300M	(2)	250M	(2)	**3/0**	**(4)**
400	400M	(1/0)	350M	(2)	300M	(2)	**4/0**	**(2)**
450	500M	(1/0)	400M	(1/0)	350M	(2)	**4/0**	**(2)**

REV. DATE: 13.NOV.14

PLEASE SEE BELOW FOR ADDITIONAL REQUIRED CONDUIT RUNS AND SIZES.

JUNCTION POINT NOTES

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



ELECTRICAL OUTLET LEGEND

CUSTOMER/CONTRACTOR SUPPLIED AND INSTALLED ITEMS. HEIGHT ABOVE FLOOR DETERMINED BY LOCAL CODES UNLESS OTHERWISE SPECIFIED.

- DUPLEX HOSPITAL GRADE, DEDICATED OUTLET 120-V, SINGLE PHASE POWER
- (RF) DUPLEX HOSPITAL GRADE, DEDICATED OUTLET 120-V, SINGLE PHASE OUTLET ROUTED THROUGH RF FILTER
- NETWORK OUTLET
- DEDICATED TELEPHONE LINES/NETWORK CONNECTION

ADDITIONAL CONDUIT RUNS (CONTRACTOR SUPPLIED AND INSTALLED)

CONDUITS REQUIRED FOR BASE SYSTEM

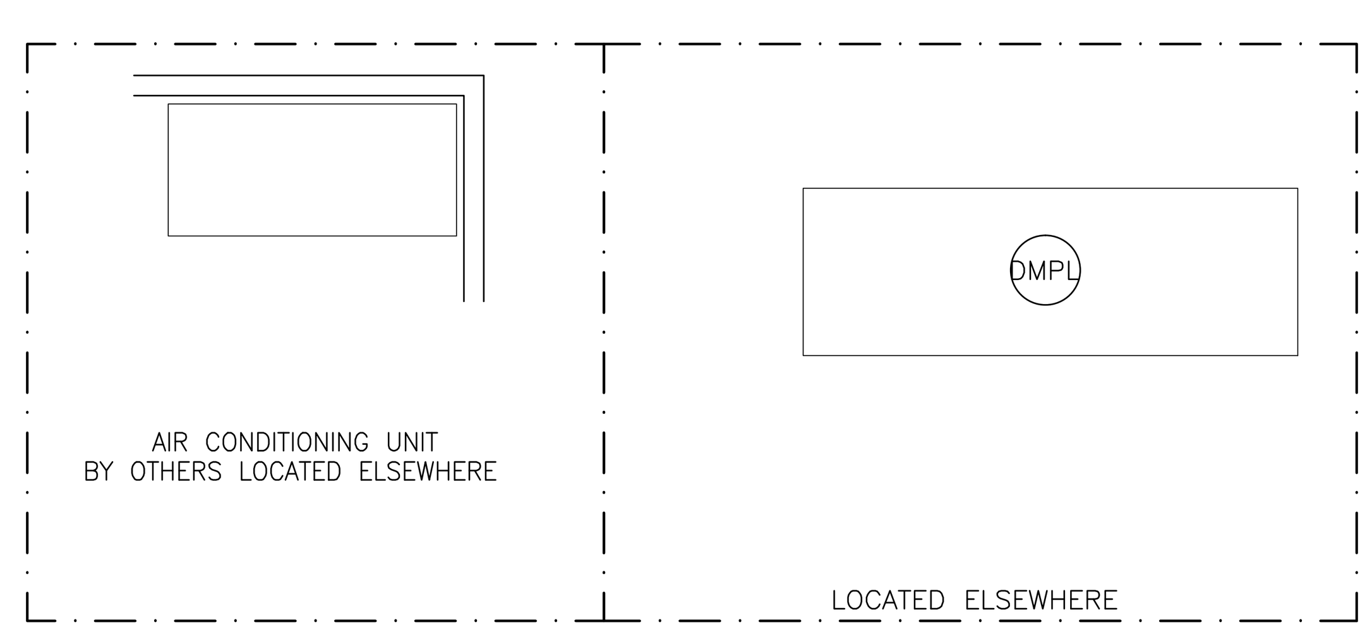
REV DATE: 20.Apr.15

MDP	TO	FEEDER	ONE CND. AS REQ'D
MDP	TO	PGR	ONE CND. AS REQ'D
MDP	TO	HEC	ONE CND. AS REQ'D
MDP	TO	EO2	ONE 1/2" CND.
EO2	TO	SPW	ONE 1/2" CND.
DS	TO	PGR	ONE 3/4" CND.
EO1	TO	SPW	ONE 3/4" CND.
MRU	TO	PEN	ONE 1" CND.
MRU	TO	RF #1 FILTER	ONE CND. AS REQ'D
RF #1 FILTER	TO	120-V 1ø POWER	CONDUIT AS REQ'D
RL	TO	RF #2 FILTER	ONE CND. AS REQ'D
RF #2 FILTER	TO	FACILITY EMERGENCY POWER	CONDUIT AS REQ'D

NOTE: SEE E2 PAGE FOR STANDARD RUN LENGTHS

CONDUITS REQUIRED FOR Dimplex Chiller

DMPL	TO	RGD	ONE 3/4" CND.
DMPL	TO	480-V 3ø POWER	CONDUIT AS REQUIRED



JUNCTION POINT DESCRIPTIONS

THE FOLLOWING MATERIALS ARE TO BE SUPPLIED AND INSTALLED BY THE CUSTOMER'S ELECTRICAL CONTRACTOR

POINT	DESCRIPTION	QTY.	HARDWARE	DETAIL NO., SHT. E3
CRY	SHIELD COOLER CABINET	1	32 IN. OF GROMMET MATERIAL FOR AN 8 X 8 IN. OPENING IN DUCT COVER	ELEC-6
DCL	DC LIGHTING	1 1	SEE DETAILS *AVAILABLE FROM GEMSG, CALL: 800-279-7925 OR LOCAL GE INSTALLATION PROJECT MGR.	ELEC-54
DMPL	DIMPLEX CHILLER	1	BOX AS REQUIRED	
DS	RF DOOR SWITCH	1 1	SINGLE GANG BOX RF DOOR SWITCH RATED FOR 24 VOLTS AND 750 MILLIAMPERES, NORMALLY OPEN (OFF) WHEN DOOR IS OPEN	
EF1	RF EXHAUST FAN SWITCH	1 1 1	COVERPLATE SINGLE GANG BOX SINGLE POLE SWITCH	ELEC-55
EF2	RF EXHAUST FAN SWITCH	1 1 1	COVERPLATE SINGLE GANG BOX SINGLE POLE SWITCH	ELEC-55
EO1	EMERGENCY OFF BUTTON	1	SINGLE GANG BOX	ELEC-16
EO2	EMERGENCY OFF BUTTON	1	SINGLE GANG BOX	ELEC-16
HEC	HEAT EXCHANGER CABINET	1 2	GROMMET MATERIAL 36IN. FLEXIBLE POWER LINE SERVICE LOOPS	
MAG	MAGNET	1	GROMMET MATERIAL	ELEC-187
MDP	MAIN DISCONNECT	1 2	200-AMP PANEL INCLUDED IN ORDER PUSHBUTTONS AND COVERS INCLUDED	ELEC-152
MON	MAGNET MONITOR	1	FITTINGS AS REQUIRED	
MRU	MAGNET RUNDOWN UNIT	1 1	COVERPLATE WITH 1 IN. KNOCKOUT IN CENTER 4 X 4 X 2 IN. BOX	ELEC-8
OW	OPERATOR WORKSPACE	1	12 IN. OF GROMMET MATERIAL FOR A 3 X 3 IN. OPENING IN DUCT COVER	ELEC-5
PA	PATIENT ALERT CONTROL BOX	1	SAME ROUTING AS OW	
PEN	RF PENETRATION PANEL CABINET	1	GROMMET MATERIAL	ELEC-153
PGR	POWER, GRADIENT, RF CABINET	1 1 1	6 FT. LENGTH OF SUITABLE FLEXIBLE METAL CONDUIT GROMMET MATERIAL SUITABLE BUSHING & LOCKNUT	
RGD	REMOTE DISPLAY	1	BOX AS REQUIRED	
RL	MAGNET ROOM LIGHTS	1 1 1	LOCKNUT BOX AS REQUIRED INCANDESCENT LIGHT FIXTURE	
SPW	RF PENETRATION PANEL	1	GROMMET MATERIAL	ELEC-166

CONTRACTOR SUPPLIED AND INSTALLED WIRING

ELECTRICAL CONTRACTOR SHALL RING OUT, TAG AND TERMINATE ALL WIRES AT BOTH ENDS.

WIRE RUN, FROM – TO	QUANTITY, WIRE SIZE/COLOR
120-V > RF FILTER	1-BLACK, 1-WHITE, 1-GREEN – (SIZE AS REQUIRED)
RF FILTER > RL	1-BLACK, 1-WHITE, 1-GREEN – (SIZE AS REQUIRED)
CONVERTER > RF FILTER	1-BLACK, 1-WHITE, 1-GREEN – (SIZE AS REQUIRED)
EMER PWR > CONVERTER	1-BLACK, 1-WHITE, 1-GREEN – (SIZE AS REQUIRED)
RF GND STUD > RF FILTR	1-GREEN (SIZE AS REQUIRED FOR EACH FILTER)
RF FILTER > MRU	1-BLACK, 1-WHITE, 1-GREEN – (SIZE AS REQUIRED)
MDP > PGR	3-NO. 1/0 BLACK, 1-NO. 1/0 GREEN
MDP > EO2	1-BLACK, 1-RED, 1-GREEN – (SIZE AS REQUIRED)
480-V > MDP	3-BLACK, 1-WHITE, 1-GREEN – REFER TO FEEDER TABLE
MDP > HEC	3-NO. 8 BLACK, 1-NO. 8 GREEN
480-V > DMPL	4-BLACK, 1-GREEN (SIZE AS REQUIRED)
RF FAN > EF1	1-BLACK, 1-WHITE – (SIZE AS REQUIRED)
EF1 > EF2	1-BLACK, 1-WHITE – (SIZE AS REQUIRED)

PIM R9

RQ – 154963

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

GE Healthcare

Healthcare Project Implementation – Design Center
Milwaukee, Wisconsin

SHEET TITLE: ELECTRICAL LAYOUT

MODALITY TYPE: DISCOVERY MR450

THIS PLAN IS SUBMITTED TO SUGGEST LOCATION OF GE HEALTHCARE EQUIPMENT AND ASSOCIATED APPARATUS, ELECTRICAL WIRING DETAILS AND ROOM ARRANGEMENTS. 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 ACTUAL CONSTRUCTION PURPOSES, HOWEVER, AND THE COMPANY CANNOT ACCEPT RESPONSIBILITY FOR ANY DAMAGES RESULTING THEREFROM.

PROJECT TITLE: 8–226F TYPICAL LAYOUT

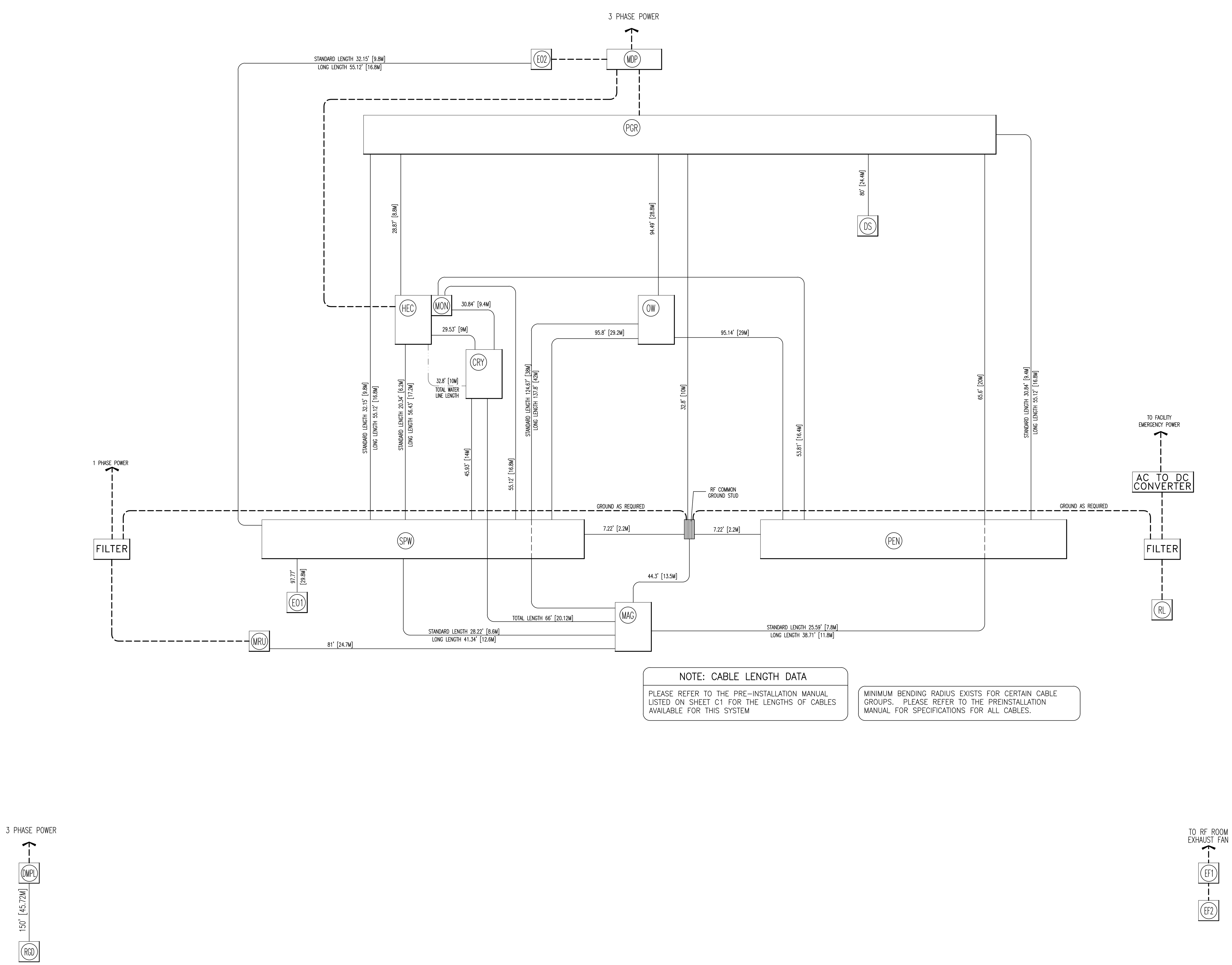
PROJECT	REVISION
8-226f	00

DATE: 22.Sep.15
DRAWN BY: DMS
CHECKED BY: PMM

REVISION HISTORY:

SHEET
E1

INTERCONNECT DIAGRAM



NOTE: CABLE LENGTH DATA

PLEASE REFER TO THE PRE-INSTALLATION MANUAL LISTED ON SHEET C1 FOR THE LENGTHS OF CABLES AVAILABLE FOR THIS SYSTEM

MINIMUM BENDING RADIUS EXISTS FOR CERTAIN CABLE GROUPS. PLEASE REFER TO THE PREINSTALLATION MANUAL FOR SPECIFICATIONS FOR ALL CABLES.

POWER SPECIFICATIONS

DISCOVERY/OPTIMA

(REV. DATE 06.AUG.14)

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-WITH GROUND OR FLOATING DELTA WITH GROUND

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	187	151	200–A
400	360–440	178	143	200–A
415	374–456	171	138	200–A
480	**432–528**	**148**	**119**	**200–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 ABOVE OR BELOW NOMINAL WAVESHAPE FORM NOT TO EXCEED 200V 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 AVERAGED OVER 5 SECONDS = 123 KVA.

SYSTEM EQUIPMENT	POWER DEMAND
PDU 5 SECOND POWER (IN PGR)	103 kVA
HEC CONTINUOUS POWER (INCLUDING CRY)	20 kVA
CRYO COMPRESSOR CONTINUOUS POWER (CRY)	9 kVA

STANDBY (NO SCAN) POWER DEMAND = 17 KVA.

TABLE B MAXIMUM POWER DEMAND.

DEMAND	DISCOVERY/ OPTIMA
kVa * POWER FACTOR AT	123 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 225 KVA. REGULATED TRANSFORMER IS NOT REQUIRED UNLESS VOLTAGE CHANGES EXCEED ±10% OVER A PERIOD OF 1 HOUR OR LONGER.

REFER TO PRE-INSTALLATION MANUAL 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 DISTRITBUTION 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.

NOTE 12: GEHC CONDUCTS POWER AUDITS TO VERIFY QUALITY OF POWER BEING DELIVERED TO THE SYSTEM. THE CUSTOMER'S ELECTRICAL CONTRACTOR IS REQUIRED TO BE AVAILABLE TO SUPPORT THIS ACTIVITY.

DIAGRAM KEY

- – – – CUSTOMER/CONTRACTOR SUPPLIED WIRING. ROUTE IN ADEQUATE CONDUIT OR RACEWAY.
- ——— GE FURNISHED CABLE RUNS. ROUTE IN EMPTY CONDUIT OR RACEWAY.
- 59' [18M] MAXIMUM RUN LENGTH BETWEEN JUNCTION POINTS. Feet [Meters]

RQ – 154963 PIM R9

GE Healthcare

Healthcare Project Implementation – Design Center
Milwaukee, Wisconsin

SHEET TITLE: ELECTRICAL SPECIFICATIONS

MODALITY TYPE: DISCOVERY MR450

PROJECT TITLE: 8–226F TYPICAL LAYOUT

PROJECT	REVISION
8–226f	00

DATE: 22.Sep.15
DRAWN BY: DMS
CHECKED BY: PMM

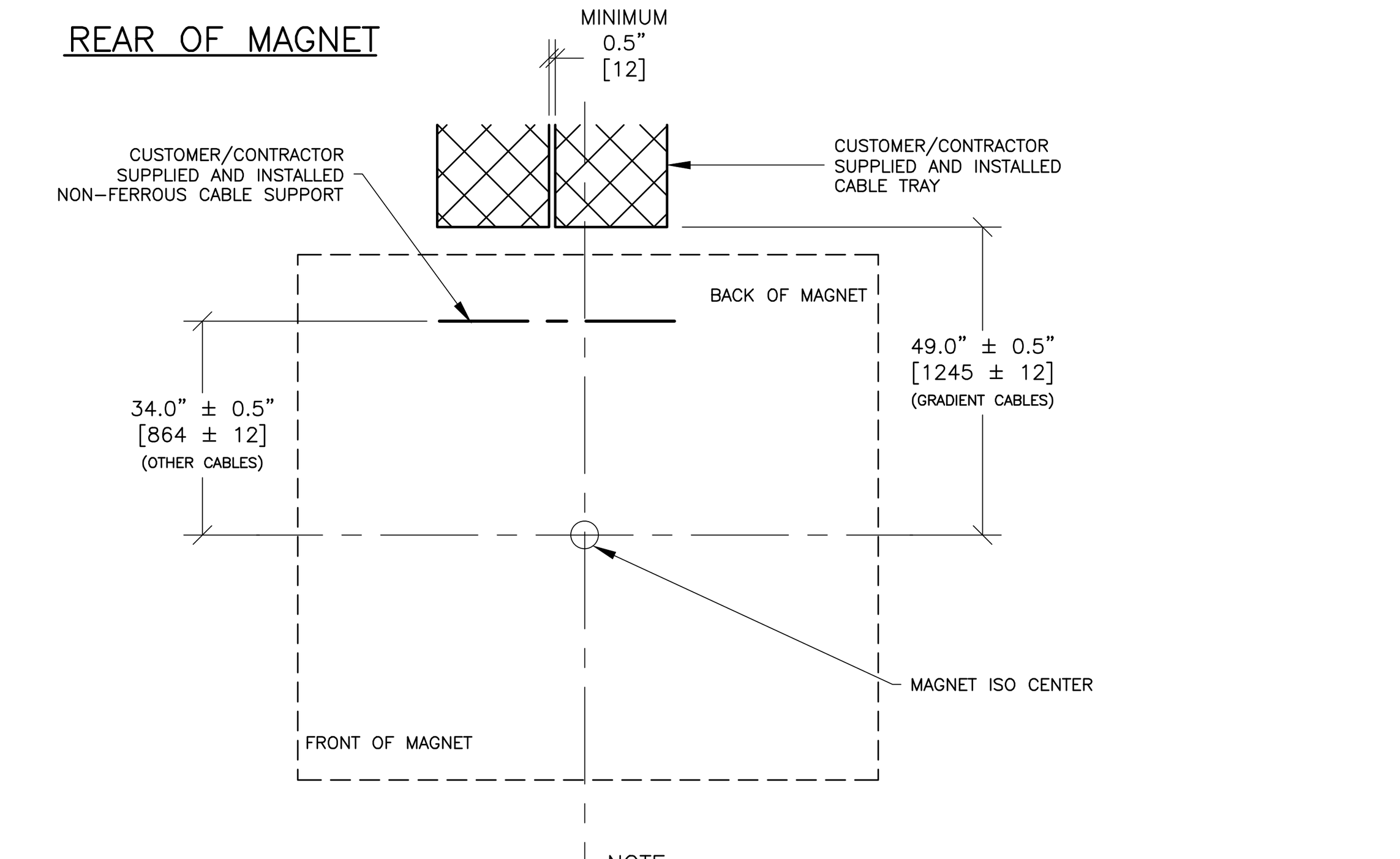
REVISION HISTORY:

SHEET E2

ELECTRICAL DETAIL — CABLE TRAY REQUIREMENTS

ELEC-187
REV. DATE: 19.JUN.15

REAR OF MAGNET



NOTE:
DIMENSION GIVEN IN INCHES [] EQUALS MM

MINIMUM CABLE TRAY HEIGHT AT BACK OF MAGNET IS 101.5" [2578] – TRAY HEIGHT MAY BE LOWER AT OTHER POINTS TO AVOID OBSTRUCTIONS

MAXIMUM CABLE TRAY HEIGHT TO TOP OF TRAY IS 128" [3251]

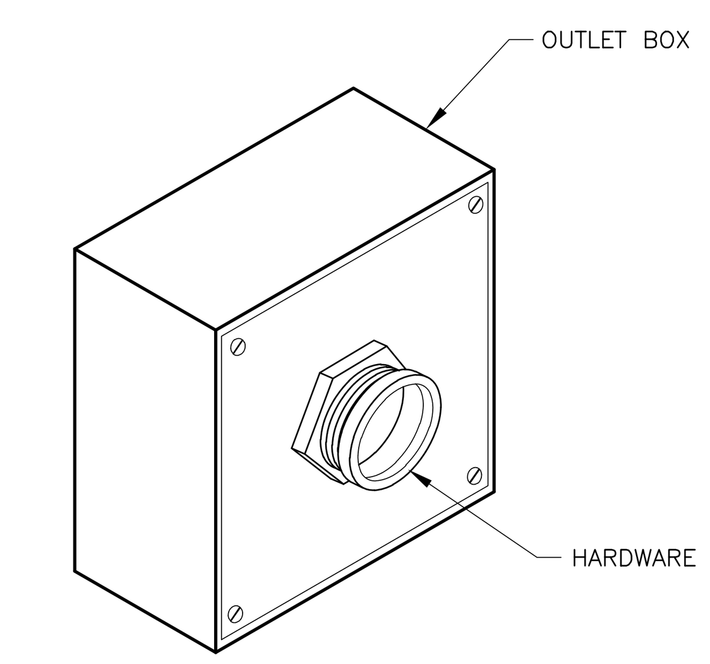
MINIMUM DISTANCE FROM TOP OF CABLE TRAY TO ANY OBSTRUCTION IS 10" [254]

FRONT OF MAGNET

DETAIL NOT TO SCALE

ELECTRICAL DETAIL — BOX WITH COVERPLATE (TYPICAL)

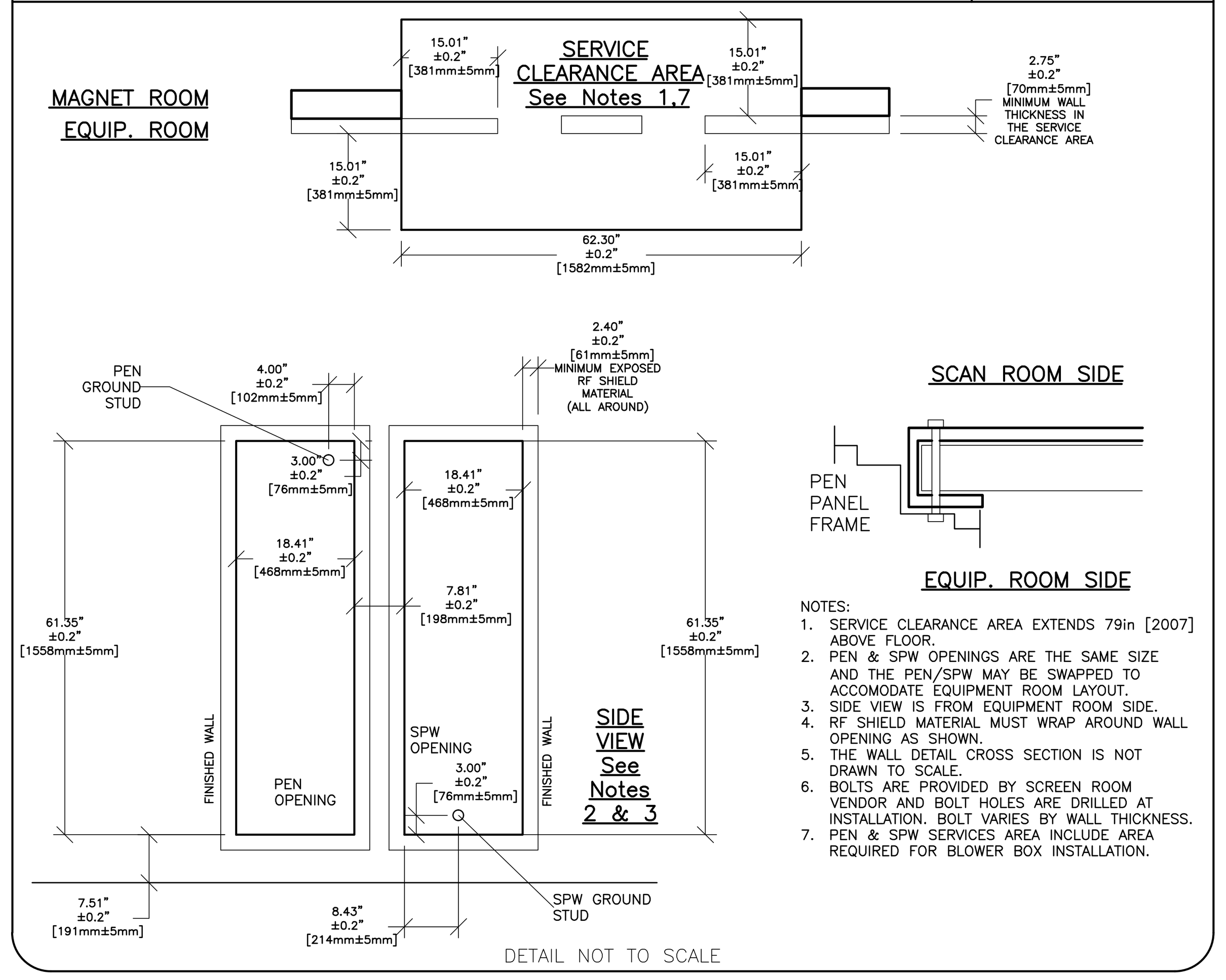
ELEC-8
REV. DATE: 09/30/94



DETAIL NOT TO SCALE

ELECTRICAL DETAIL — PENETRATION BRACKET INSTALL

ELEC-153
REV. DATE: 09.SEP.14



NOTES:
1. SERVICE CLEARANCE AREA EXTENDS 79in [2007] ABOVE FLOOR.
2. PEN & SPW OPENINGS ARE THE SAME SIZE AND THE PEN/SPW MAY BE SWAPPED TO ACCOMODATE EQUIPMENT ROOM LAYOUT.
3. SIDE VIEW IS FROM EQUIPMENT ROOM SIDE.
4. RF SHIELD MATERIAL MUST WRAP AROUND WALL OPENING AS SHOWN.
5. THE WALL DETAIL CROSS SECTION IS NOT DRAWN TO SCALE.
6. BOLTS ARE PROVIDED BY SCREEN ROOM VENDOR AND BOLT HOLES ARE DRILLED AT INSTALLATION. BOLT VARIES BY WALL THICKNESS.
7. PEN & SPW SERVICES AREA INCLUDE AREA REQUIRED FOR BLOWER BOX INSTALLATION.

DETAIL NOT TO SCALE

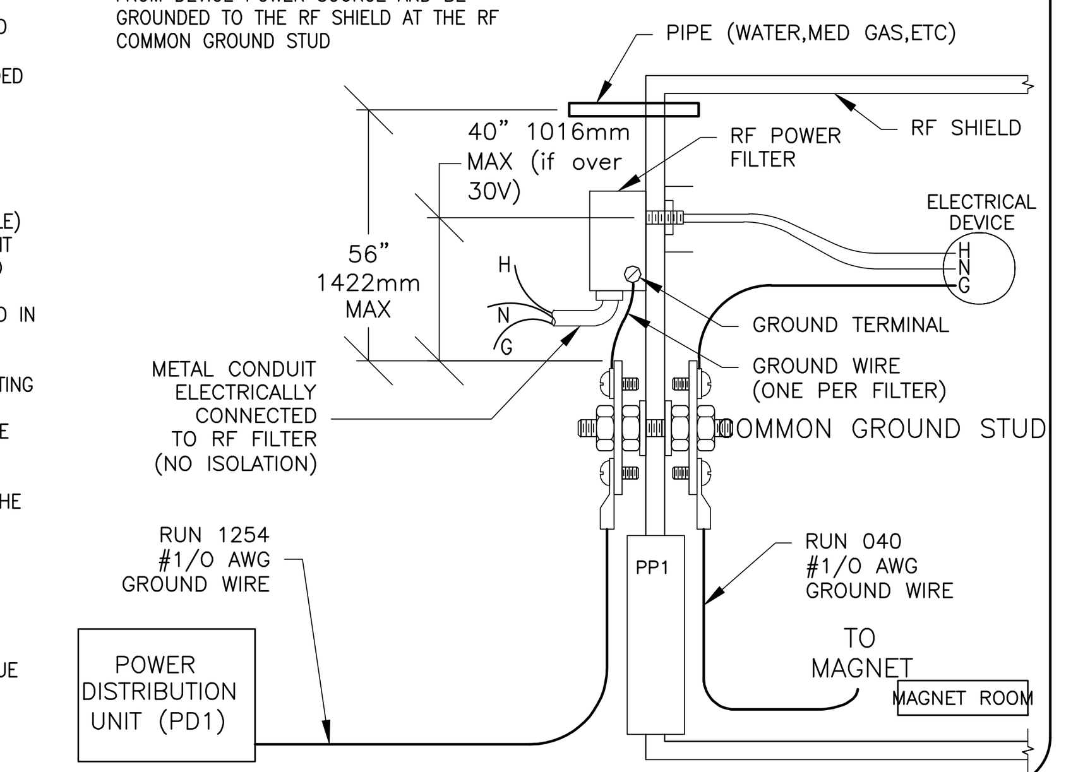
ELECTRICAL DETAIL — TYPICAL MAGNET ROOM GROUNDING

ELEC-166
REV. DATE: 05.JUN.13

ELECTRICAL LINE AND FILTER REQUIREMENTS
1. RF SHIELDED ROOM VENDOR AND ELECTRICAL CONTRACTOR MUST DESIGN AND INSTALL ALL ELECTRICAL LINES THROUGH THE RF SHIELDING
2. THE RF SHIELDED ROOM VENDOR MUST SUPPLY ELECTRICAL LINE FILTERS FOR ALL LINES THROUGH THE RF SHIELDING (EXCLUDING ELECTRICAL LINES THROUGH THE GE SUPPLIED PENETRATION PANELS) TO ENSURE COMPLIANCE WITH THE RF SHIELDED ROOM ATTENUATION REQUIREMENTS
3. ELECTRICAL LINE FILTERS MUST BE LOCATED OUTSIDE THE 200 GAUSS (20 MT) LINE

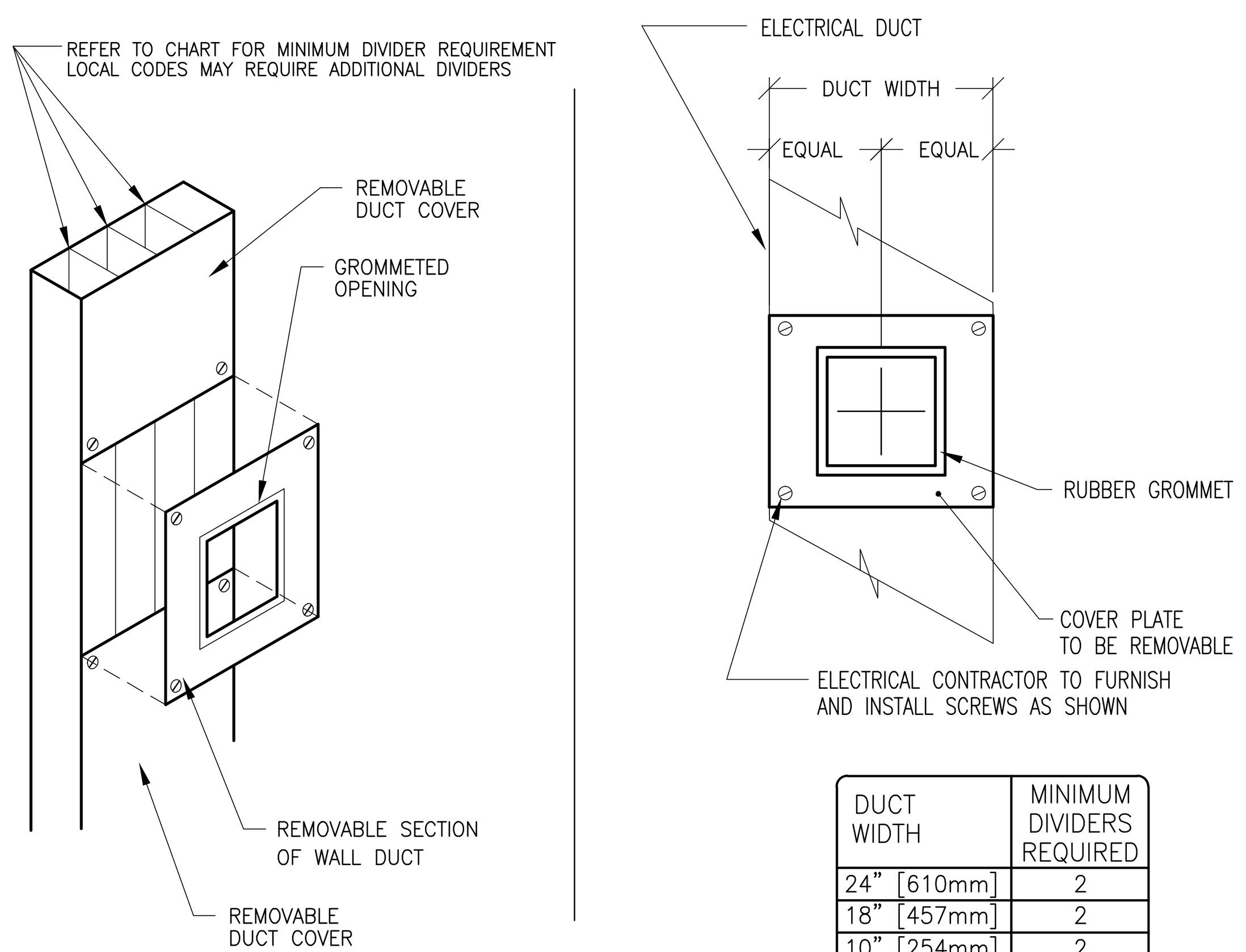
LIGHTING REQUIREMENTS
1. ALL LIGHTING FIXTURES AND ASSOCIATED COMPONENTS MUST MEET ALL RF SHIELDED ROOM AND RF GROUNDING REQUIREMENTS (E.G., TRACK LIGHTING IS NOT RECOMMENDED DUE TO POSSIBLE RF NOISE)
2. ALL REMOVABLE LIGHTING FIXTURES AND ASSOCIATED COMPONENTS MUST BE NON-MAGNETIC
3. ALL LIGHTING MUST USE DIRECT CURRENT (THE DC MUST HAVE LESS THAN 5% RIPPLE)
4. 300 LUX MUST BE PROVIDED AT THE FRONT OF THE MAGNET FOR PATIENT ACCESS AND ABOVE THE MAGNET FOR SERVICING
5. FLUORESCENT LIGHTING MUST NOT BE USED IN THE MAGNET ROOM
6. LIGHTING MUST BE ADJUSTED USING A DISCRETE SWITCH OR A VARIABLE DC LIGHTING CONTROLLER
7. SCR DIMMERS OR RHEOSTATS MUST NOT BE USED
8. DC LED LIGHTING MAY BE USED IF THE DC POWER CONVERTER IS LOCATED OUTSIDE THE MAGNET ROOM RF SHIELD
9. BATTERY CHARGERS (E.G., USED FOR EMERGENCY LIGHTING) MUST BE LOCATED OUTSIDE THE MAGNET ROOM
10. SHORT FILAMENT LENGTH BULBS ARE RECOMMENDED
11. LINEAR LAMPS ARE NOT RECOMMENDED DUE TO THE HIGH BURNOUT RATE

GROUNDING REQUIREMENTS
1. THE PENETRATION PANEL PEN WALL AND SECONDARY PEN WALL (SPW) ARE CONNECTED TO THE RF COMMON GROUND STUD WITH THE GE HEALTHCARE SUPPLIED GROUND CABLE (REFER TO ILLUSTRATION 3-17CHAPTER 4, PEN AND SPW WALL OPENING REQUIREMENTS)
2. ALL RF POWER FILTERS OVER 30V (INCOMMING) MUST BE LOCATED WITHIN 40 IN. (1016 MM) OF THE RF COMMON GROUND STUD
3. ALL POWER LINES INTO THE RF SHIELDED ROOM REQUIRE AN RF FILTER
4. ALL ELECTRICAL DEVICES (E.G., OUTLETS, LIGHT FIXTURES, ETC.) MUST HAVE A GROUND WIRE FROM DEVICE POWER SOURCE AND BE GROUNDED TO THE RF SHIELD AT THE RF COMMON GROUND STUD
5. RESISTANCE BETWEEN ANY TWO GROUNDED DEVICES MUST NOT EXCEED 0.1 OHM TO ENSURE EQUAL POTENTIAL GROUND SYSTEM WITHIN THE MAGNET ROOM (E.G., MGD TO PDU)
6. DO NOT GROUND NON-MR EQUIPMENT TO THE MR GROUND SYSTEM
7. ALL METALLIC PIPES (INCLUDING WATER, MEDICAL GAS, SPRINKLERS, ETC.) ENTERING THE RF SHIELD, EXCLUDING THE CRYOGENIC VENT AND FLOOR DRAINS, MUST BE LOCATED WITHIN 56 INCHES (1422 MM) OFTHE RF COMMON GROUND STUD
8. THE ILLUSTRATION BELOW SHOWS A TYPICAL GROUND LAYOUT



ELECTRICAL DETAIL — VERTICAL WALL DUCT (TYPICAL)

ELEC-6
REV. DATE: 03/19/04



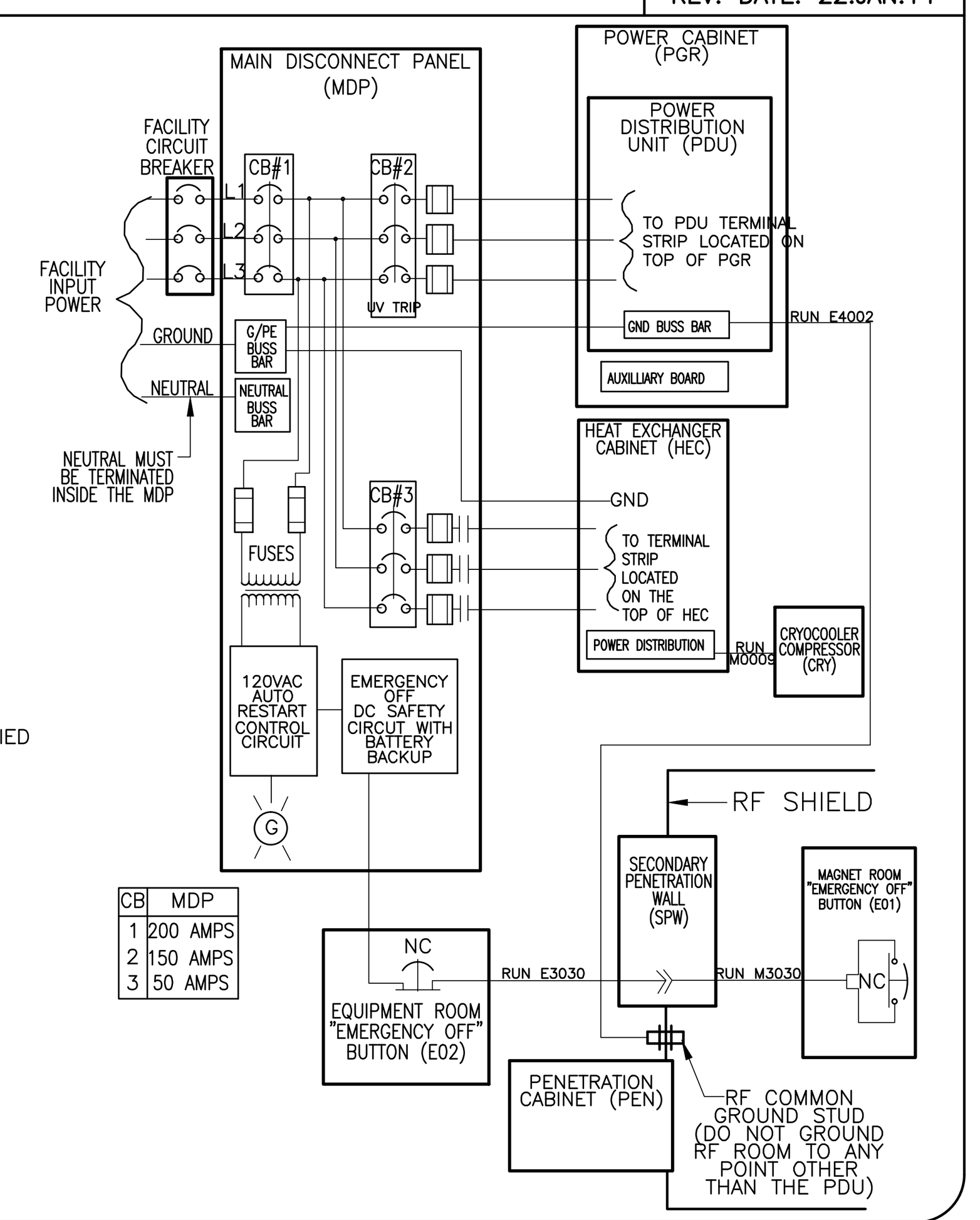
DUCT WIDTH		MINIMUM DIVIDERS REQUIRED
24"	610mm	2
18"	457mm	2
10"	254mm	2
6"	152mm	1
4"	102mm	1

DETAIL NOT TO SCALE

ELECTRICAL DETAIL — PROTECTIVE DISCONNECT SETUP

ELEC-152
REV. DATE: 22.JAN.14

NOTE:
THE HEAT EXCHANGER CABINET (HEC) PROVIDES POWER TO THE CRYOCOOLER COMPRESSOR (CRY) WHICH MUST OPERATE 24 HOURS PER DAY, 7 DAYS PER WEEK TO MAXIMIZE PROPER UNINTERRUPTED MAGNET OPERATION.
RUNS E3030, M0009, M3030 AND E4002 ARE GE SUPPLIED CABLES. ALL OTHER WIRING IS CUSTOMER SUPPLIED.
TWO REMOTE FLUSH WALL MOUNTED EMERGENCY OFF BUTTONS ARE SUPPLIED WITH THE MDP.
MDP PROVIDES CIRCUIT BREAKERS FOR PDU (LOCATED IN THE POWER CABINET (PGR)) AND THE HEAT EXCHANGER CABINET (HEC).
ALL MDP OUTPUT CIRCUITS DROP OUT ON LOSS OF POWER. THE HEC CIRCUIT WILL AUTOMATICALLY RESTART UPON RESTORATION OF POWER. EMERGENCY OFF LOCKS OUT ALL CONTRACTORS.
GE MDP SHORT CIRCUIT CURRENT RATING IS 25,000 AMPERES AT 480 VAC.
GE MDP IS UL AND cUL LABELED.
ALL CIRCUITS REQUIRE GROUND WIRES.
THE WIRE SIZE FOR THE EMERGENCY-OFF CIRCUIT IS 12-22 AWG CUSTOMER SUPPLIED

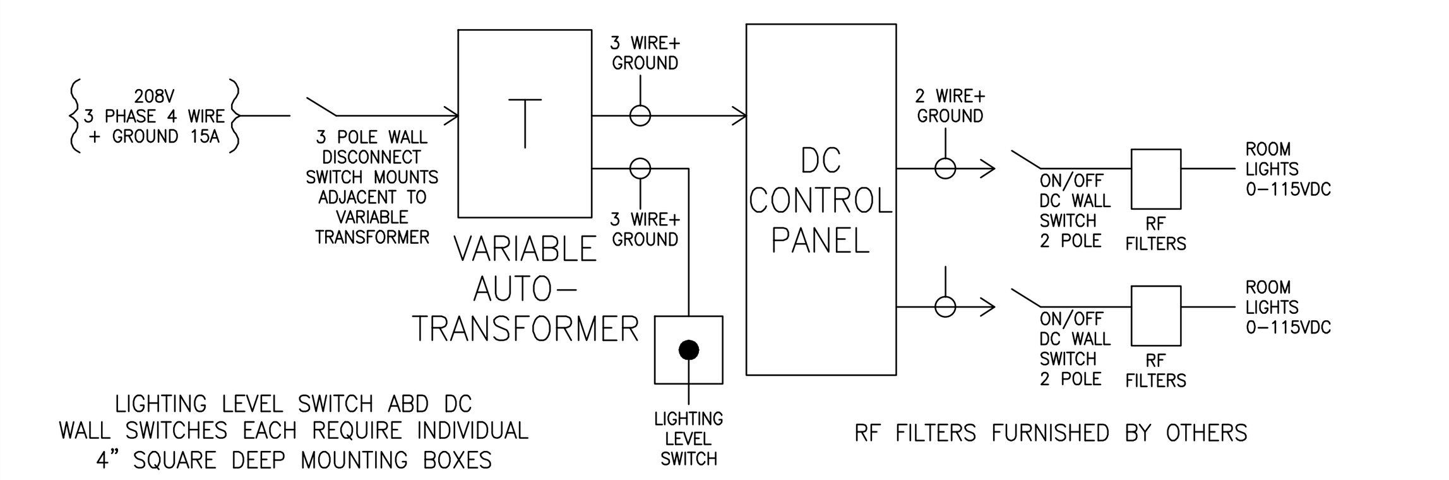


CB	MDP
1	200 AMPS
2	150 AMPS
3	50 AMPS

ELECTRICAL DETAIL — DC LIGHTING CONTROLLER SYSTEM DIAGRAM

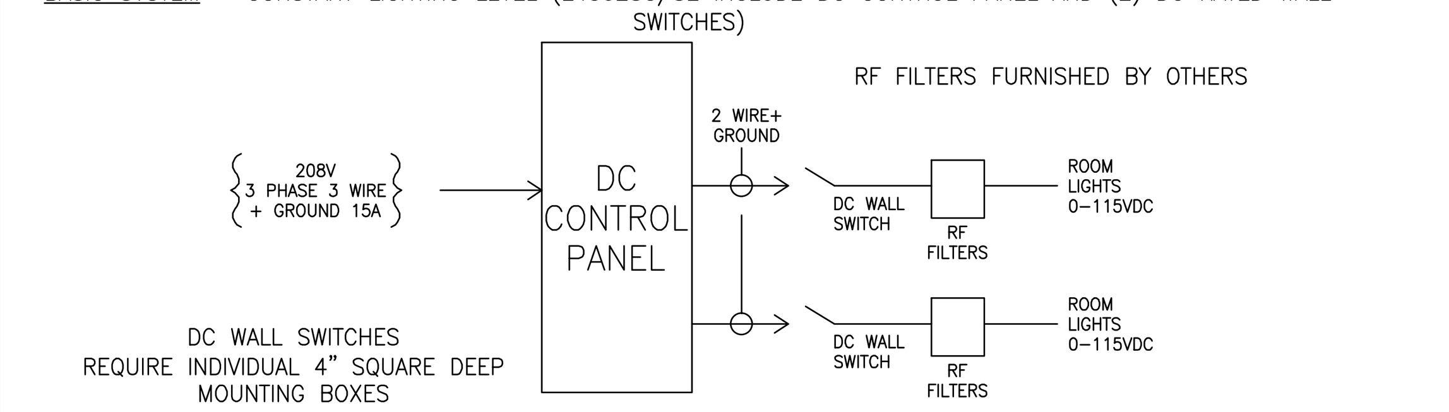
ELEC-54
REV. DATE: 07/20/09

VARIABLE SYSTEMS (E4502SD/SF INCLUDE 3 POLE WALL DISCONNECT SWITCH, VARIABLE AUTO TRASNFORMER, DC CONTROL PANEL, LIGHTING LEVEL SWITCH, AND 2 DC RATED FLUSH WALL SWITCHES)



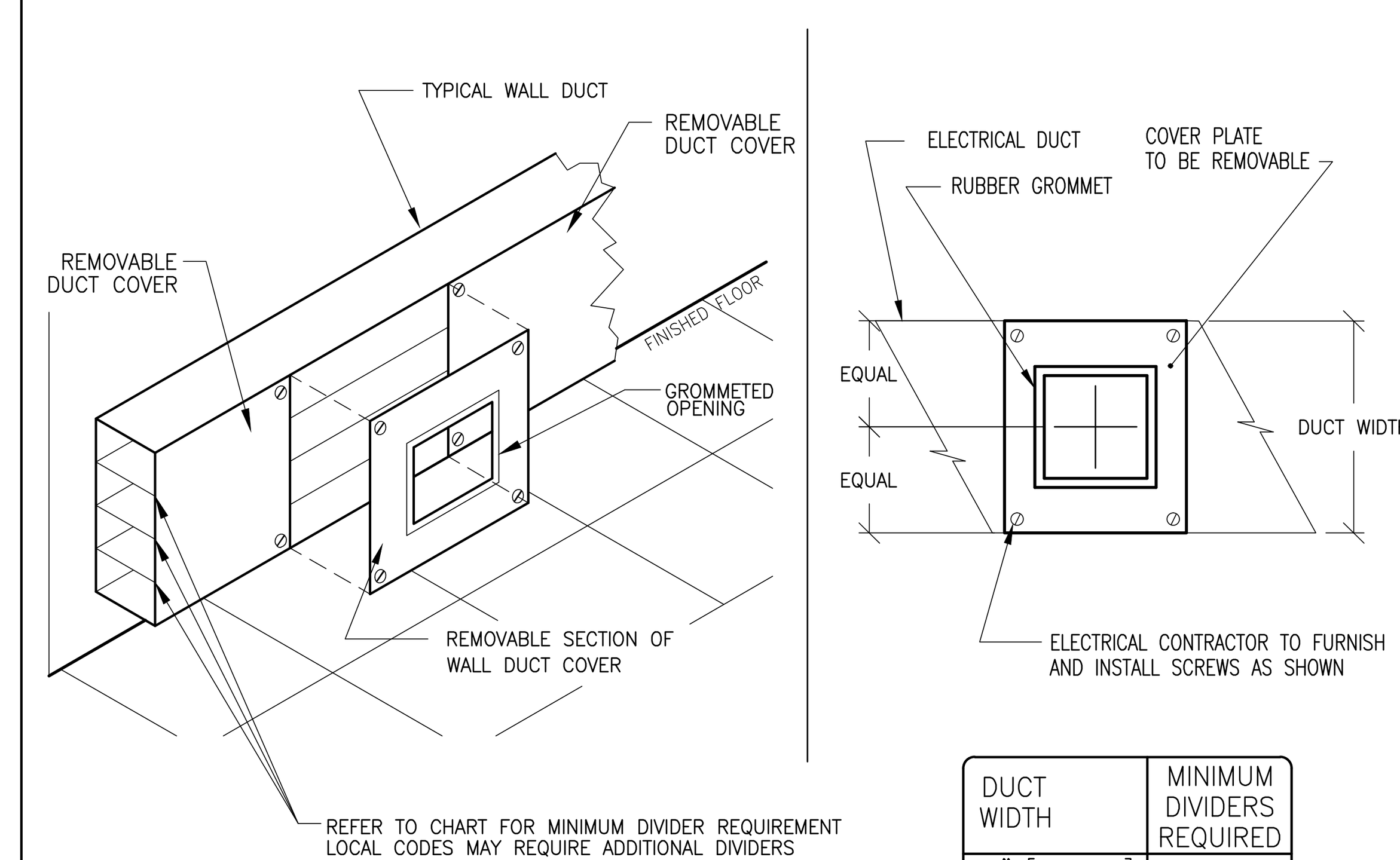
TYPICAL ROOM USUALLY REQUIRES A CONSTANT OR VARIABLE SYSTEM BASED ON TOTAL LOAD AND LIGHTING LOADS

BASIC SYSTEM – CONSTANT LIGHTING LEVEL (E4502SC/SE INCLUDE DC CONTROL PANEL AND (2) DC RATED WALL SWITCHES)



ELECTRICAL DETAIL — HORIZONTAL WALL DUCT (TYPICAL)

ELEC-5
REV. DATE: 03/19/04

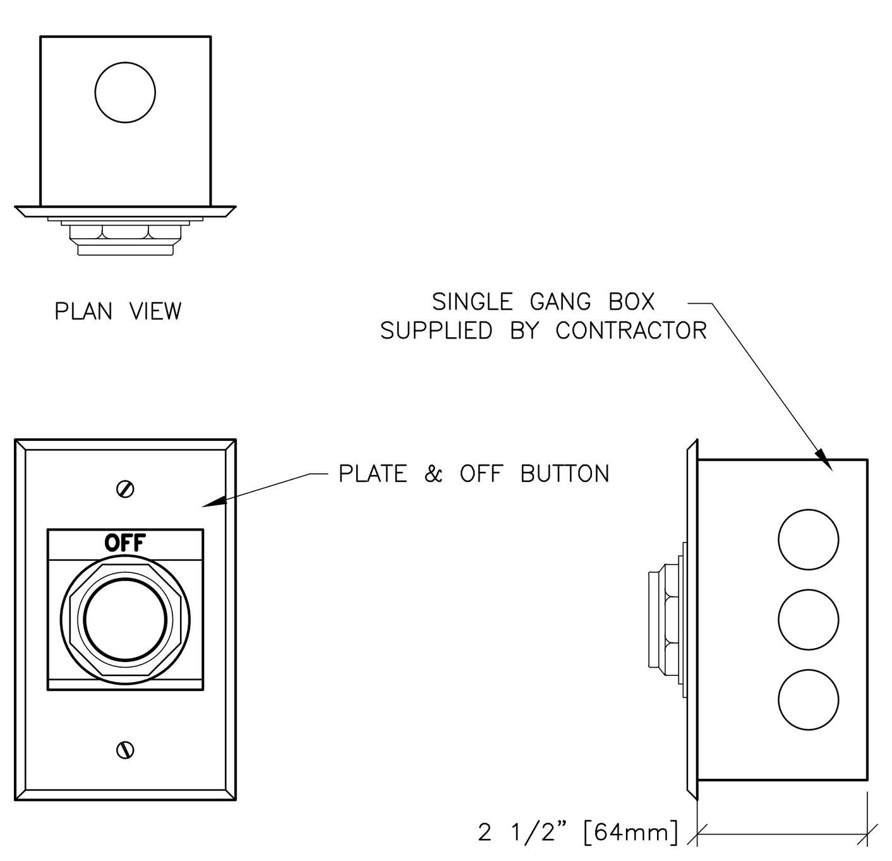


DUCT WIDTH		MINIMUM DIVIDERS REQUIRED
24"	610mm	2
18"	457mm	2
10"	254mm	2
6"	152mm	1
4"	102mm	1

DETAIL NOT TO SCALE

ELECTRICAL DETAIL — EMERGENCY OFF BUTTON

ELEC-16
REV. DATE: 05/14/09

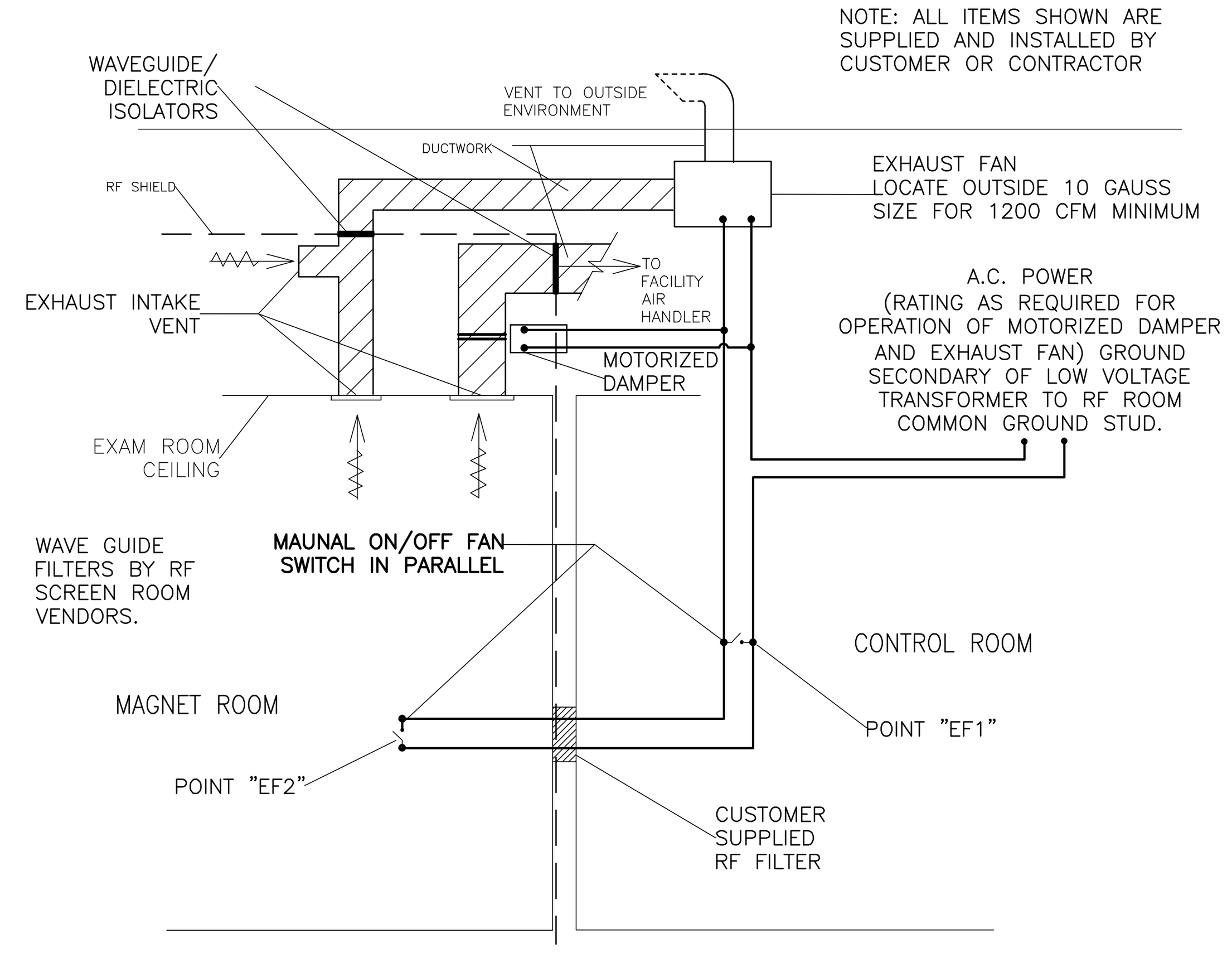


DETAIL NOT TO SCALE

ELECTRICAL DETAIL — TYPICAL RF SCREEN ROOM EXHAUST FAN SET-UP

ELEC-55
REV. DATE: 07.APR.14

NOTE: ALL ITEMS SHOWN ARE SUPPLIED AND INSTALLED BY CUSTOMER OR CONTRACTOR



(REQUIRED IN ADDITION TO CRYOGEN VENT)

GE Healthcare
Healthcare Project Implementation – Design Center
Milwaukee, Wisconsin

SHEET TITLE: ELECTRICAL DETAILS
MODALITY TYPE: DISCOVERY MR450

PROJECT TITLE: 8-226F TYPICAL LAYOUT

PROJECT	REVISION
8-226f	00

DATE: 22.Sep.15
DRAWN BY: DMS
CHECKED BY: PMM

REVISION HISTORY:

PIM R9
RQ – 154963

SHEET E3

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

CRYOGENIC VENT SYSTEM PRESSURE DROP MATRIX (A)

MECH–04
REV. DATE: 02.MAY.12

(THIS TABLE MUST BE USED FOR CRYOGENIC VENT SYSTEM DESIGN)

CRYOGENIC VENT SYSTEM PRESSURE DROP MATRIX FOR A MAGNET WITH 8" [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 INSIDE SURFACE psi/ft (KPa/m)	STANDARD SWEEP 45° ELBOW psi (KPa)	STANDARD SWEEP 90° ELBOW psi (KPa)	LONG SWEEP 45° ELBOW psi (KPa)	LONG SWEEP 90° 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)	2.10 (14.48)	3.70 (25.51)	1.03 (7.10)	1.85 (12.76)
	40–60 (12.2–18.3)	0.30 (6.79)	2.88 (19.86)	5.21 (35.92)	1.44 (9.93)	2.60 (17.92)
	60–80 (18.3–24.4)	0.38 (8.60)	3.70 (25.51)	6.71 (46.27)	1.85 (12.76)	3.36 (23.17)
	80–100 (24.4–30.5)	0.47 (10.63)	4.52 (31.17)	8.22 (56.68)	2.26 (15.58)	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 (5.55)	1.51 (10.41)	0.41 (2.83)	0.75 (5.17)
	40–60 (12.2–18.3)	0.10 (2.26)	1.23 (8.48)	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 (5.65)	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 (4.76)	1.37 (9.45)	0.34 (2.34)	0.69 (4.76)
	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)
	100–120 (30.5–36.6)	0.08 (1.81)	1.09 (7.52)	1.77 (12.20)	0.55 (3.79)	0.88 (6.07)
	120–140 (36.6–42.7)	0.10 (2.26)	1.27 (8.76)	2.07 (14.27)	0.63 (4.34)	1.04 (7.17)
	140–160 (42.7–48.8)	0.11 (2.49)	1.43 (9.86)	2.36 (16.27)	0.72 (4.96)	1.19 (8.20)
	160–180 (48.8–54.9)	0.12 (2.71)	1.60 (11.03)	2.53 (17.44)	0.80 (5.52)	1.27 (8.76)
	180–200 (54.9–61.0)	0.17 (3.85)	1.75 (12.07)	2.93 (20.20)	0.88 (6.07)	1.47 (10.14)

NOTE 1: ELBOWS WITH ANGLES GREATER THAN 90° MUST NOT BE USED.

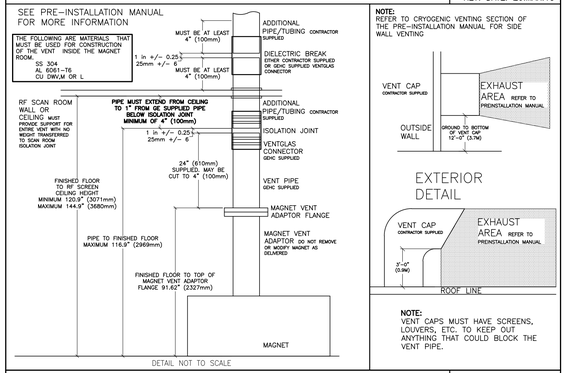
NOTE 2: THE TABLE DATA IS BASED ON THE FOLLOWING:
- A. INITIAL FLOW CONDITIONS AT MAGNET INTERFACE.
- B. GAS TEMPERATURE STARTING AT 4.5 KELVIN (–452° F OR –268° C).
- C. HELIUM GAS FLOW RATE OF 2,737 CUBIC FEET (77.5 CUBIC METERS) PER MINUTE
- D. 45° STANDARD SWEEP ELBOW K = 15 f_t
- E. 90° STANDARD SWEEP ELBOW K = 30 f_t
- F. 45° LONG SWEEP ELBOW K = 7.5 f_t
- G. 90° LONG SWEEP ELBOW K = 15 f_t

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 VENT 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.

TYPICAL CRYOGEN VENT PIPE DETAIL

MECH–01
REV. DATE: 20.MAR.15



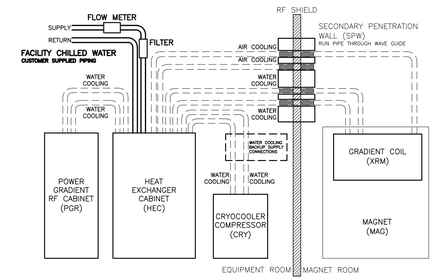
NOTE:
REFER TO CRYOGENIC VENTING SECTION OF THE PRE–INSTALLATION MANUAL FOR SIDE WALL VENTING

NOTE:
VENT CAPS MUST HAVE SCREENS, LOUVERS, ETC. TO KEEP OUT ANYTHING THAT COULD BLOCK THE VENT PIPE.

SYSTEM CHILLER PIPING

MECH–41
REV. DATE: 15.JAN.15

PLEASE REFER TO THE PRE–INSTALLATION MANUAL FOR COMPLETE FACILITY WATER REQUIREMENTS



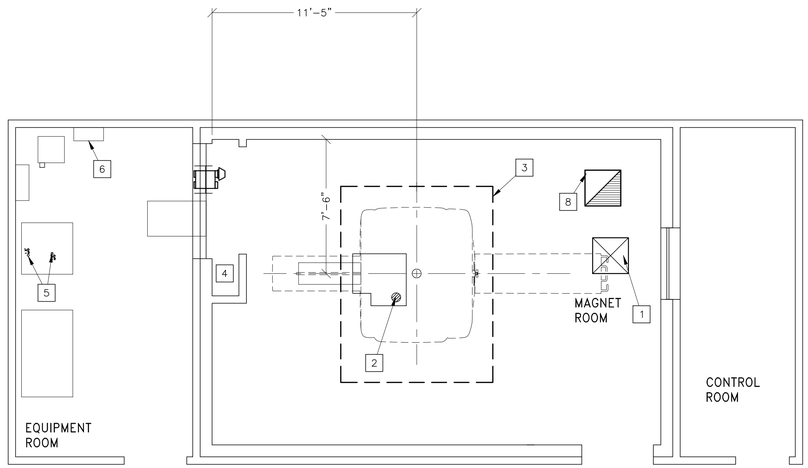
NOTE: CUSTOMER/CONTRACTOR
- TO INSTALL THE FLOW METER AND FILTER.
- IF DIMPLEX CHILLER IS NOT PART OF GE ORDER, SUPPLY AND INSTALL THE FLOW METER AND FILTER
- RESPONSIBLE FOR ALL PIPING AND ELECTRICAL CONNECTIONS

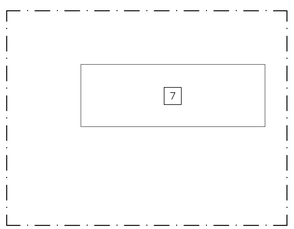
FACILITY WATER REQUIREMENTS

MECH–46
REV. DATE: 06.FEB.14

PARAMETER	REQUIREMENTS
AVAILABILITY	CONTINUOUS
ANTIFREEZE	0–40% PROPYLENE GLYCOL
MINIMUM FLOW	30 GPM (114 L/MIN)
MAXIMUM FLOW	35 GPM (132 L/MIN)
MAXIMUM PRESSURE DROP IN HEC AT MINIMUM FLOW	34.8 PSI (2.4 BAR) WITH 40% PROPYLENE GLYCOL–WATER; 1021 KG/M3 DENSITY
MAXIMUM PRESSURE DROP IN HEC AT MAXIMUM FLOW	47.8 PSI (3.3 BAR) WITH 40% PROPYLENE GLYCOL–WATER; 1021 KG/M3 DENSITY
TEMPERATURE RISE AT MINIMUM FLOW	17.3°F (9.6°C) WITH 40% PROPYLENE GLYCOL–WATER; 3730 J/(KG K) SPECIFIC HEAT; 1021 KG/M3 DENSITY; 70 KW HEAT
TEMPERATURE RISE AT MAXIMUM FLOW	15.1°F (8.4°C) WITH 40% PROPYLENE GLYCOL–WATER; 3730 J/(KG K) SPECIFIC HEAT; 1021 KG/M3 DENSITY; 70 KW HEAT
MAXIMUM INLET PRESSURE AFTER THE FILTER	87 PSI (3.9 TO 6 BAR) MEASURED AT THE INLET TO THE HEC
MAXIMUM HEAT OUTPUT TO WATER	MINIMUM 70 KW
MINIMUM CONTINUOUS HEAT LOAD	7.5 KW
INLET TEMPERATURE	42.8 TO 53.6°F (6 TO 12°C) MEASURED AT THE INLET TO THE HEC
CUSTOMER SUPPLIED FEEDER HOSE (FROM MAIN WATER SUPPLY TO HEC)	1.5 INCH (38.1 MM) MINIMUM HOSE INSIDE DIAMETER
HOSE CONNECTIONS TO THE HEC	1.5 INCH (38.1 MM) MALE NPT
PH LEVEL	6.5 TO 8.2 AT 77°F (25°C)
HARDNESS	LESS THAN 200 PPM OF CALCIUM CARBONATE
SUSPENDED MATTER	LESS THAN 10 PPM
FACILITY FILTER	100 MICRON OR SMALLER WITH A FIELD–CHANGEABLE FILTER
CONDENSATION PROTECTION	FACILITY PLUMBING TO THE HEC MUST BE PROPERLY ROUTED AND INSULATED TO PREVENT EQUIPMENT DAMAGE OR SAFETY HAZARDS.

SCALE: 1/4" = 1'–0" MECHANICAL/PLUMBING LAYOUT RECOMMENDED CEILING HEIGHT = 8'–9"





MECHANICAL/PLUMBING ITEMS

CUSTOMER/CONTRACTOR SUPPLIED AND INSTALLED ITEMS

ITEM NO.	ITEM DESCRIPTION (* INDICATES EXISTING)
1	MINIMUM 2 FT. x 2 FT. [0.61m x 0.61m] PRESSURE EQUALIZING WAVEGUIDE VENT IN THE MAGNET ROOM CEILING.
2	REFER TO PRE–INSTALLATION MANUAL FOR CRYOGEN VENT REQUIREMENTS. SEE SHEET S–2 FOR CRYOGEN VENT LOCATION. 8" [203 mm] CRYOGEN VENT – TOLERANCE FOR VENT LOCATION +/– 0.25" [6 mm]. SEE CRYOGEN VENT DETAILS. 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. THE CUSTOMER'S CONTRACTOR IS RESPONSIBLE FOR PROVIDING AND INSTALLING THE CRYOGEN VENT FROM THE MAGNET VENT ADAPTER TO THE BUILDING'S EXTERIOR. FOR NON–STANDARD VENT CONFIGURATIONS (I.E. OFFSET CEILING EXITS, WALL EXITS, AND GEODESIC DOMES) THE CUSTOMER'S CONTRACTOR IS RESPONSIBLE FOR THE DESIGN AND INSTALLATION OF THE CRYOGENIC VENT SYSTEM AND VENT SUPPORTS WITHIN THE MAGNET ROOM.
3	MINIMUM CEILING HEIGHT REQUIREMENT AREA. REFER TO MAGNET EQUIPMENT DETAILS FOR MORE INFORMATION
4	CLOSET MUST ALLOW FREE AIR EXCHANGE OF 400 CFM (680 M3/HR) BETWEEN MAGNET ROOM AND CLOSET
5	TWO (2) 1 1/2 IN. (38MM) COPPER LINES (INSULATED) TWO (2) SHUT OFF VALVES. REFER TO SYSTEM CHILLER PIPING DETAIL. PLEASE REFER TO THE PRE–INSTALLATION MANUAL FOR COMPLETE FACILITY WATER REQUIREMENTS.
6	REFER TO EQUIPMENT DETAIL 805–71 FOR MORE INFORMATION PROVIDE AS NEEDED – LOW PRESSURE RUBBER MULTIPURPOSE HOSE, INSIDE DIA. 1/2" WORKING PRESSURE RANGE: 250 TO 499 PSI
7	(2) 2" I.D. HIGH PRESSURE HOSES AND (2) 2" TO 1 1/2" REDUCERS
8	EXHAUST FAN AND AIR INLET MUST BE SIZED FOR A MINIMUM OF 1200 CFM (34 M3/MINUTE) AND A MINIMUM OF 12 AIR EXCHANGES PER HOUR. SEE DETAIL ELEC–55 ON THE ELECTRICAL DETAIL SHEET(S). MAGNET ROOM EXHAUST FAN INTAKE VENT MUST BE LOCATED AT THE HIGHEST CEILING PLANE NEAR THE MAGNET CRYOGEN VENT

MECHANICAL/PLUMBING NOTES

- ALL PIPING, FITTINGS, SUPPORTS, HOSES, CLAMPS, VENTILATION SYSTEMS, ETC. ARE TO BE SUPPLIED AND INSTALLED BY THE CUSTOMER OR HIS CONTRACTORS.
- FOR COMPLETE DESIGN AND REQUIREMENTS, SPECIFICATIONS AND GUIDELINES REFER TO THE PRE–INSTALLATION MANUAL:

  MR SYSTEMS – SYSTEM COOLING, CRYOGEN VENTING, WAVEGUIDES AND EXHAUST VENTING.

  CYCLOTRON SYSTEMS – CHEMISTRY LINES, GAS LINES, AND SYSTEM COOLING.
- AN EMERGENCY WATER COOLING BACK–UP SUPPLY IS RECOMMENDED FOR CONTINUOUS CRYOGEN COMPRESSOR OPERATION.
  IF USING AN OPEN LOOP BACK–UP DESIGN, ENSURE A DRAIN IS PROVIDED.
  PLEASE REFER TO THE PRE–INSTALL MANUAL FOR OPTIONAL BACK–UP COOLANT SUPPLY REQUIREMENTS

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

GE Healthcare
Healthcare Project Implementation – Design Center
Wisconsin
Milwaukee,

SHEET TITLE: MECHANICAL LAYOUT
MODALITY TYPE: DISCOVERY MR450

PROJECT TITLE:
8–226F
TYPICAL LAYOUT

PROJECT	REVISION
8–226f	00

DATE: 22.Sep.15
DRAWN BY: DMS
CHECKED BY: PMM

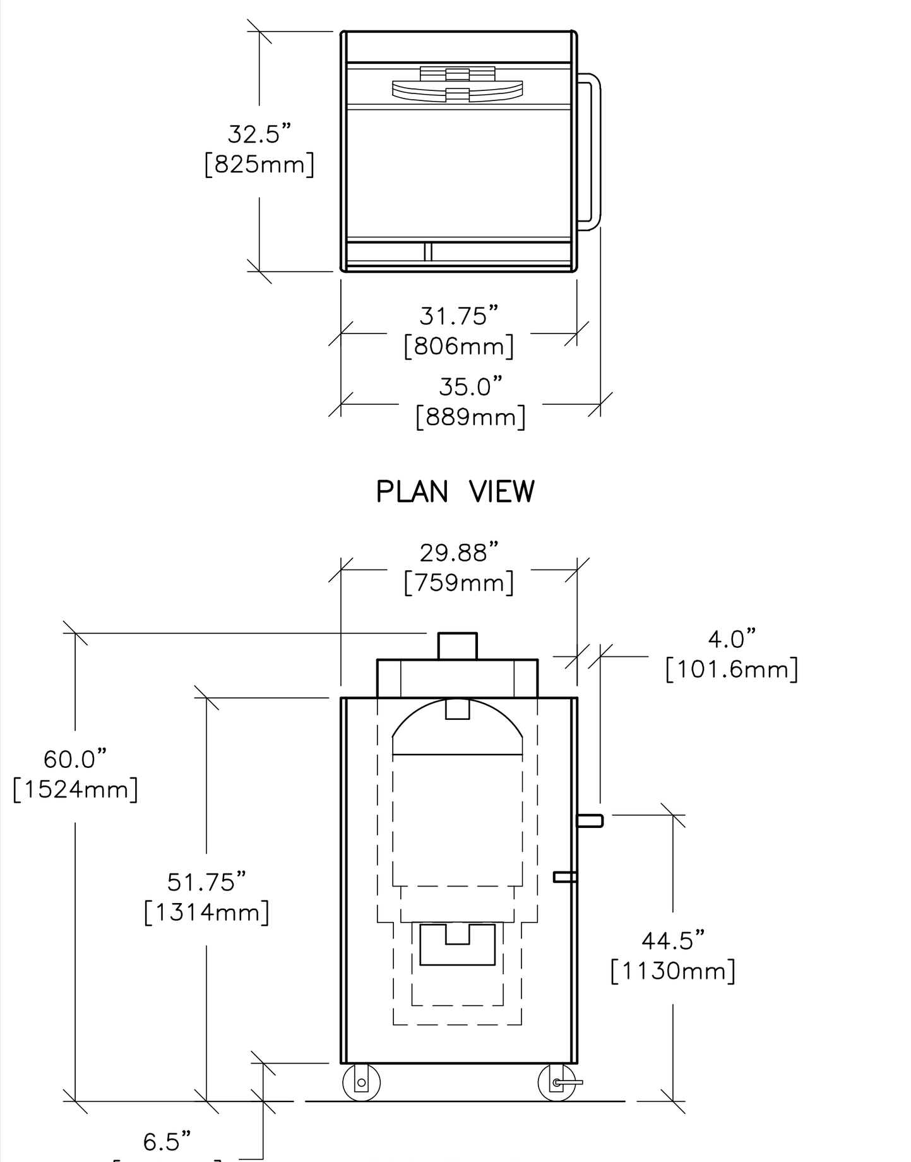
REVISION HISTORY:

RQ – 154963 PIM R9

SHEET
M1

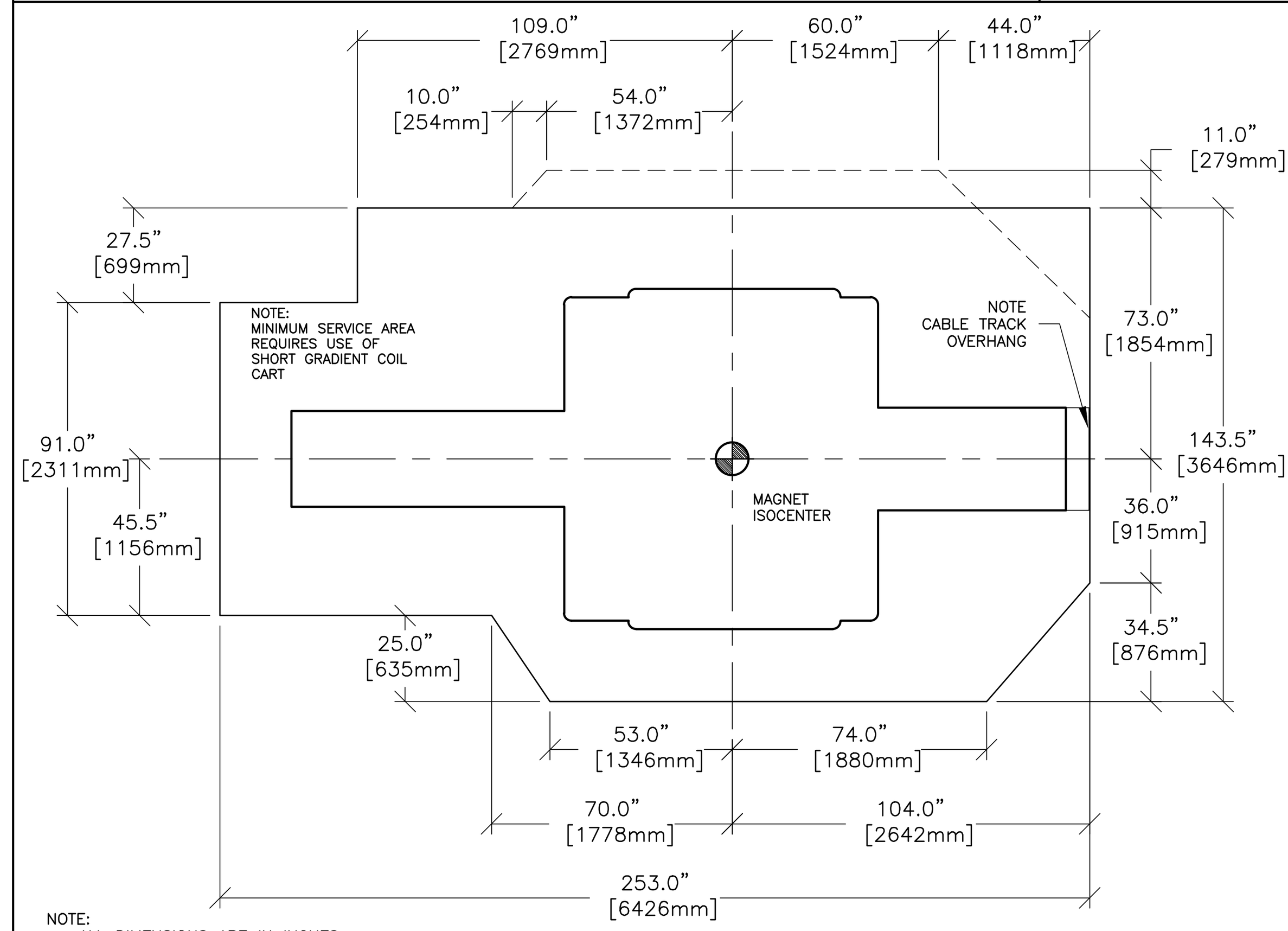
EQUIPMENT DETAIL — M61-15
SPT PHANTOM STORAGE CABINET
REV. DATE: 10/07/02

NOTE:
- INDICATES AIR FLOW
- INDICATES CENTER OF GRAVITY



DETAIL NOT TO SCALE

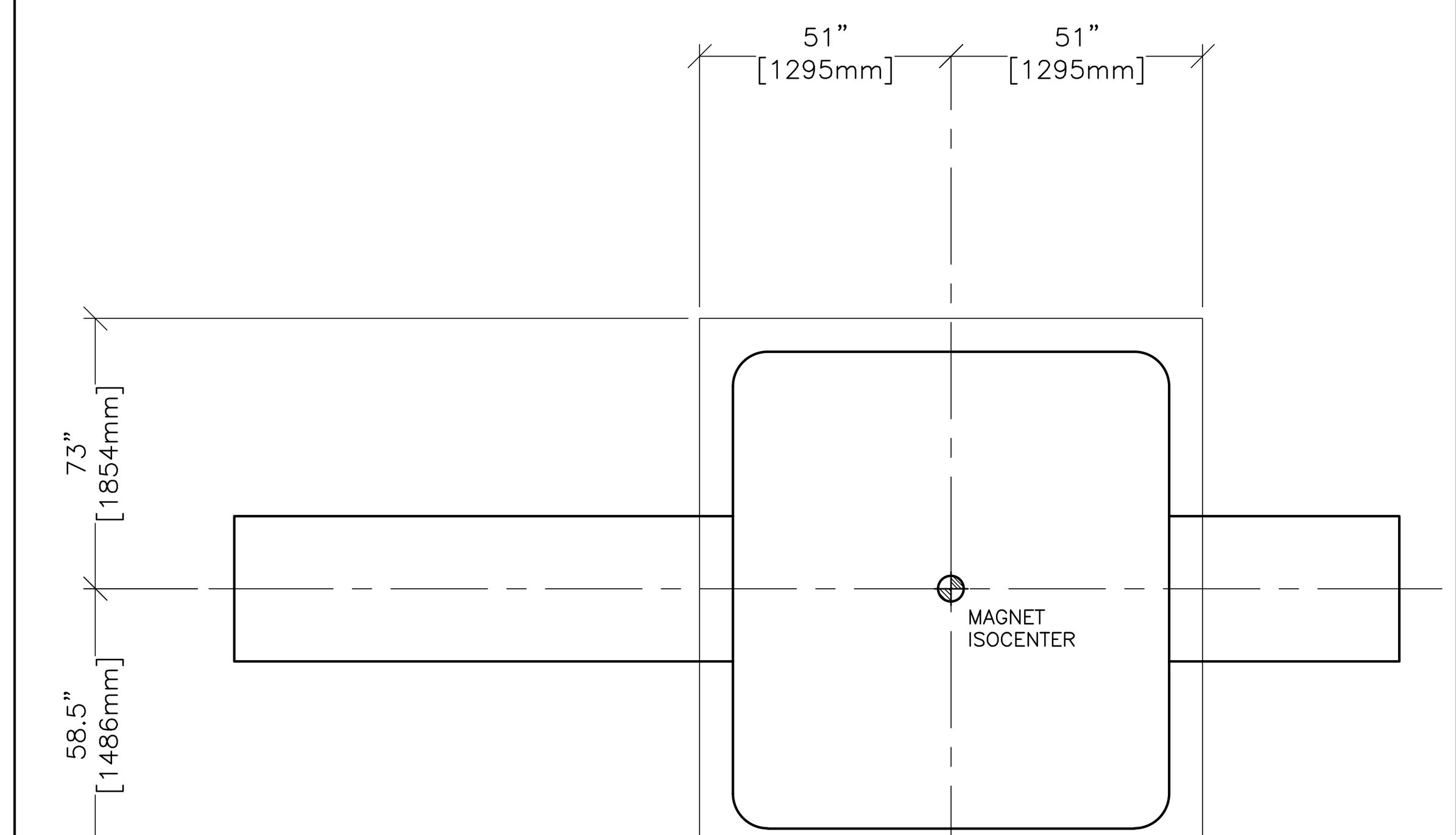
EQUIPMENT DETAIL — M30-15K
MINIMUM MAGNET SERVICE AREA
REV. DATE: 25.FEB.14



NOTE:
- ALL DIMENSIONS ARE IN INCHES
- BRACKETED DIMENSIONS ARE IN MILLIMETERS
- DETAIL NOT TO SCALE
- SOLID LINES ENCLOSE MINIMUM SERVICE AREA
- MINIMUM SERVICE AREA DESIGN TRADEOFF

DETAIL NOT TO SCALE

EQUIPMENT DETAIL — M23-15E
MAGNET – MINIMUM CEILING HEIGHT REQUIREMENT
REV. DATE: 24.FEB.14

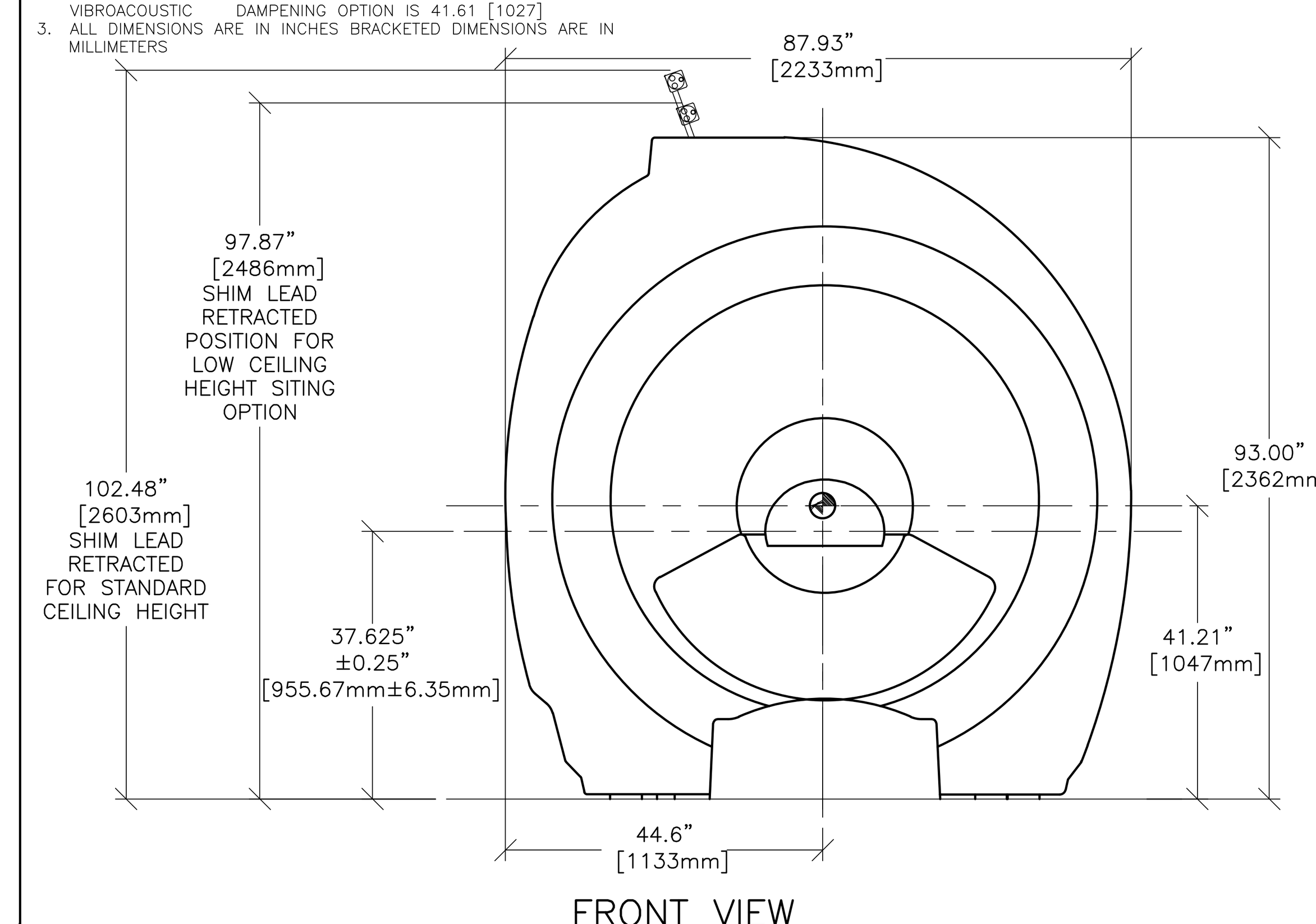


DETAIL NOT TO SCALE

EQUIPMENT DETAIL — M03-00H
MAGNET ENCLOSURE (FRONT VIEW)
REV. DATE: 03.MAR.14

NOTE:
1. CENTER OF GRAVITY IS APPROXIMATE AND INCLUDES THE GE HEALTHCARE SUPPLIED VIBROACOUSTIC DAMPENING OPTION, BUT DOES NOT INCLUDE CRYOGENS, GRADIENT ASSEMBLY, SIDE MOUNTED ELECTRONICS, OR ENCLOSURES
2. CENTER OF GRAVITY WITHOUT THE GE HEALTHCARE SUPPLIED VIBROACOUSTIC DAMPENING OPTION IS 41.61 [1027]
3. ALL DIMENSIONS ARE IN INCHES BRACKETED DIMENSIONS ARE IN MILLIMETERS

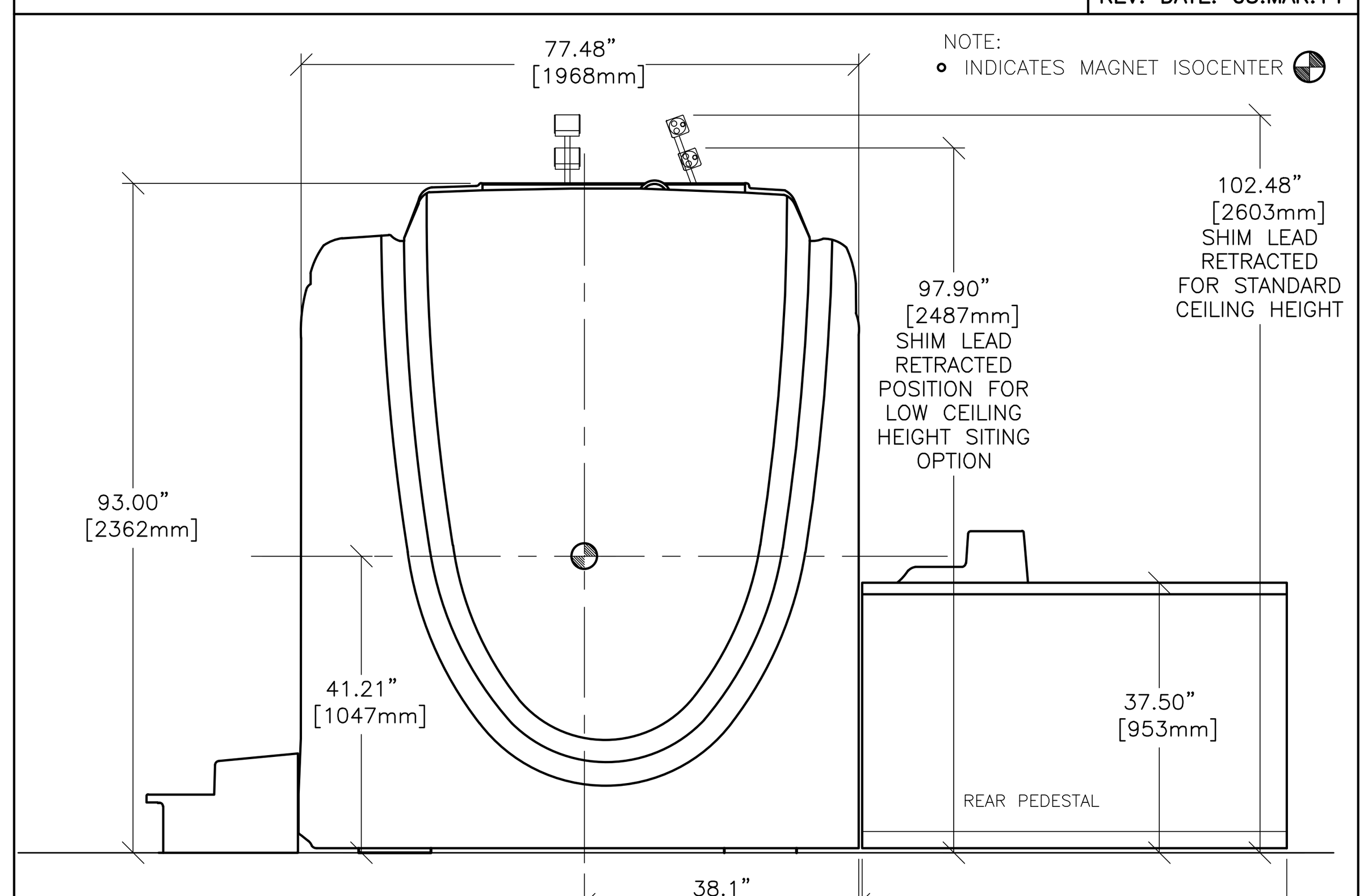
NOTE:
- INDICATES MAGNET ISOCENTER



DETAIL NOT TO SCALE

EQUIPMENT DETAIL — M03-15H
MAGNET CABLE ACCESS
REV. DATE: 03.MAR.14

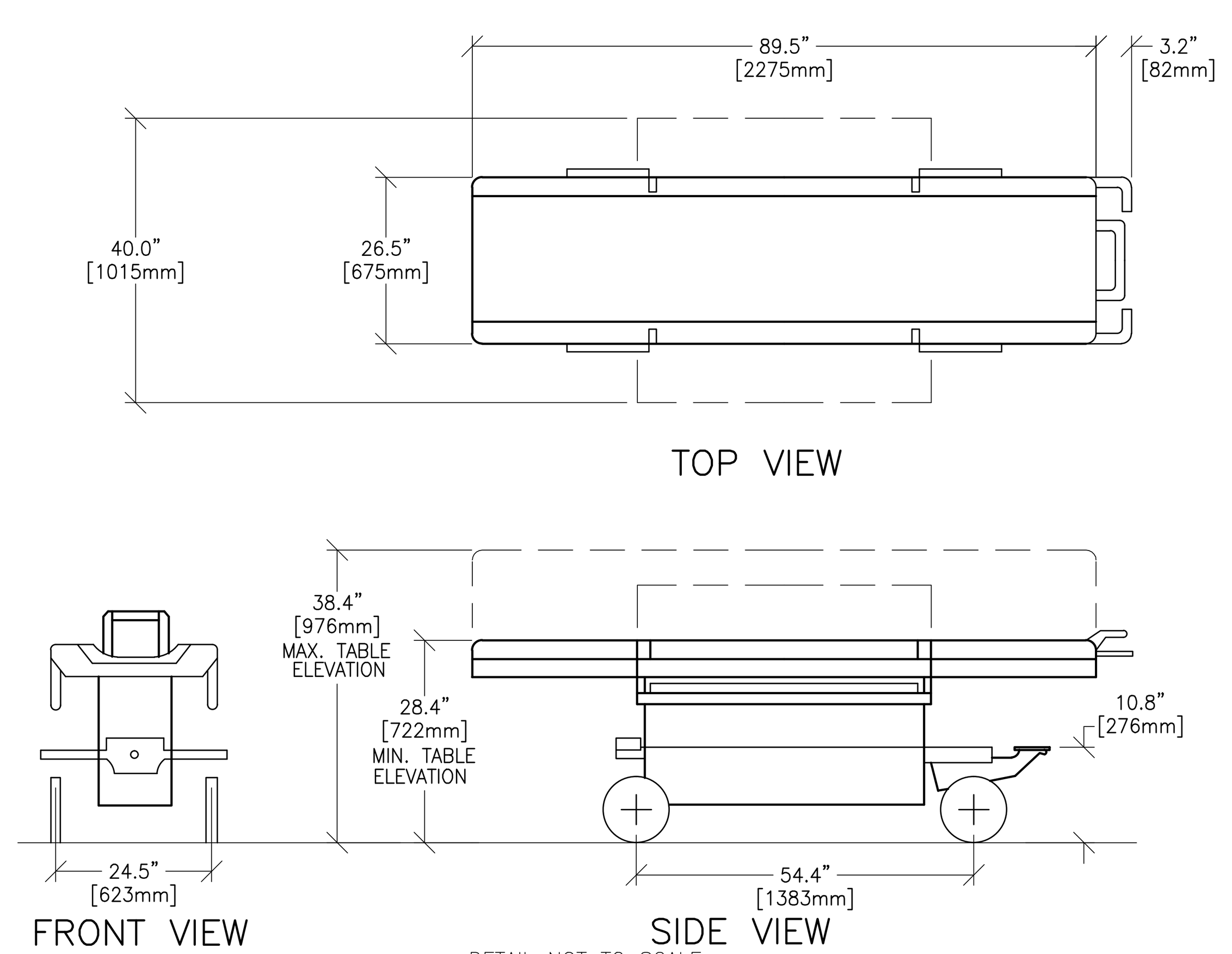
NOTE:
- INDICATES MAGNET ISOCENTER



NOTE:
1. CENTER OF GRAVITY IS APPROXIMATE AND INCLUDES THE GE HEALTHCARE SUPPLIED VIBROACOUSTIC DAMPENING OPTION, BUT DOES NOT INCLUDE CRYOGENS, GRADIENT ASSEMBLY, SIDE MOUNTED ELECTRONICS, OR ENCLOSURES
2. CENTER OF GRAVITY WITHOUT THE GE HEALTHCARE SUPPLIED VIBROACOUSTIC DAMPENING OPTION IS 41.61 [1027]
3. ALL DIMENSIONS ARE IN INCHES BRACKETED DIMENSIONS ARE IN MILLIMETERS

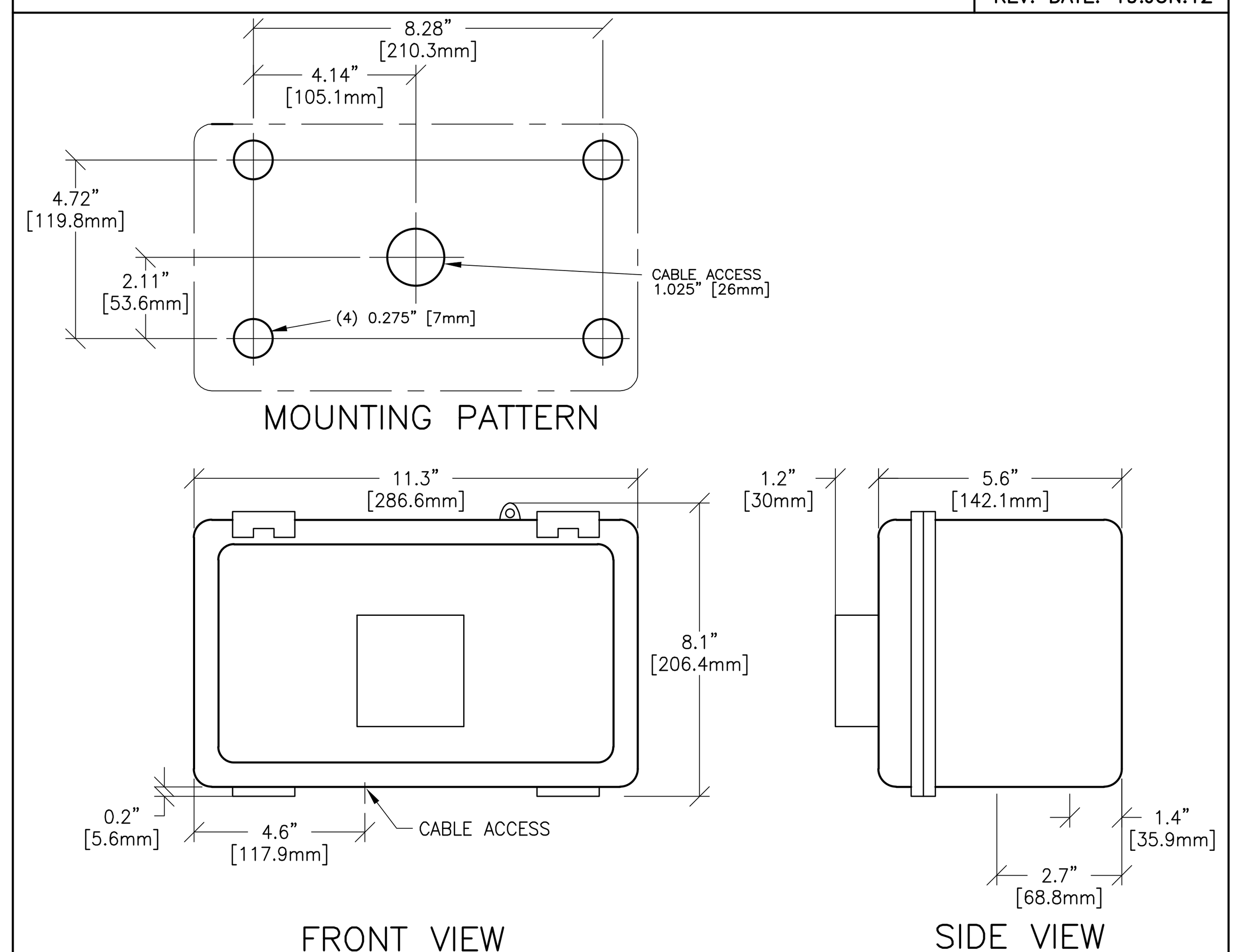
DETAIL NOT TO SCALE

EQUIPMENT DETAIL — M23-15A
DISCOVERY MR PATIENT TRANSPORT TABLE
REV. DATE: 02/20/09



DETAIL NOT TO SCALE

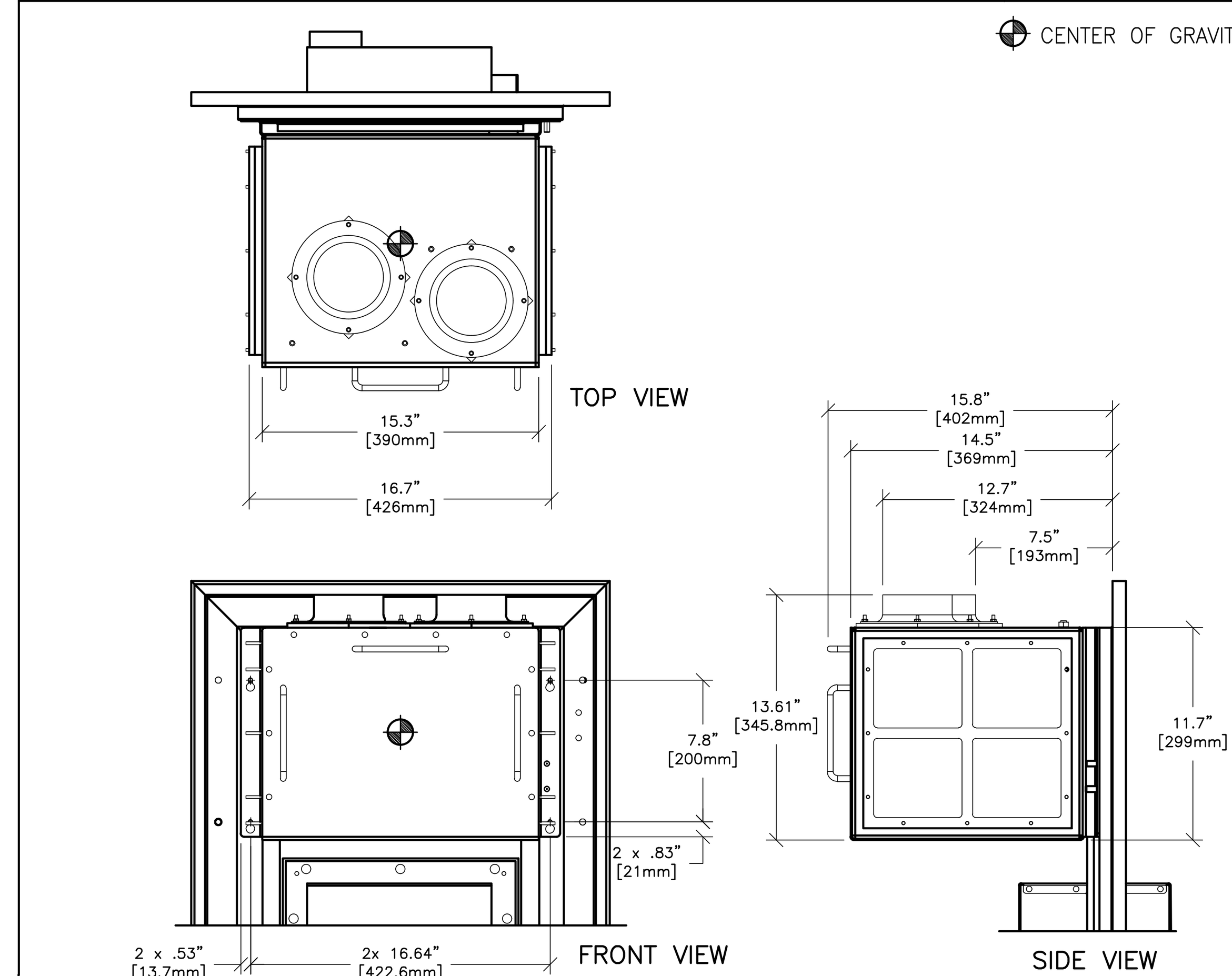
EQUIPMENT DETAIL — M17-15C
MAGNET RUNDOWN UNIT
REV. DATE: 19.JUN.12



DETAIL NOT TO SCALE

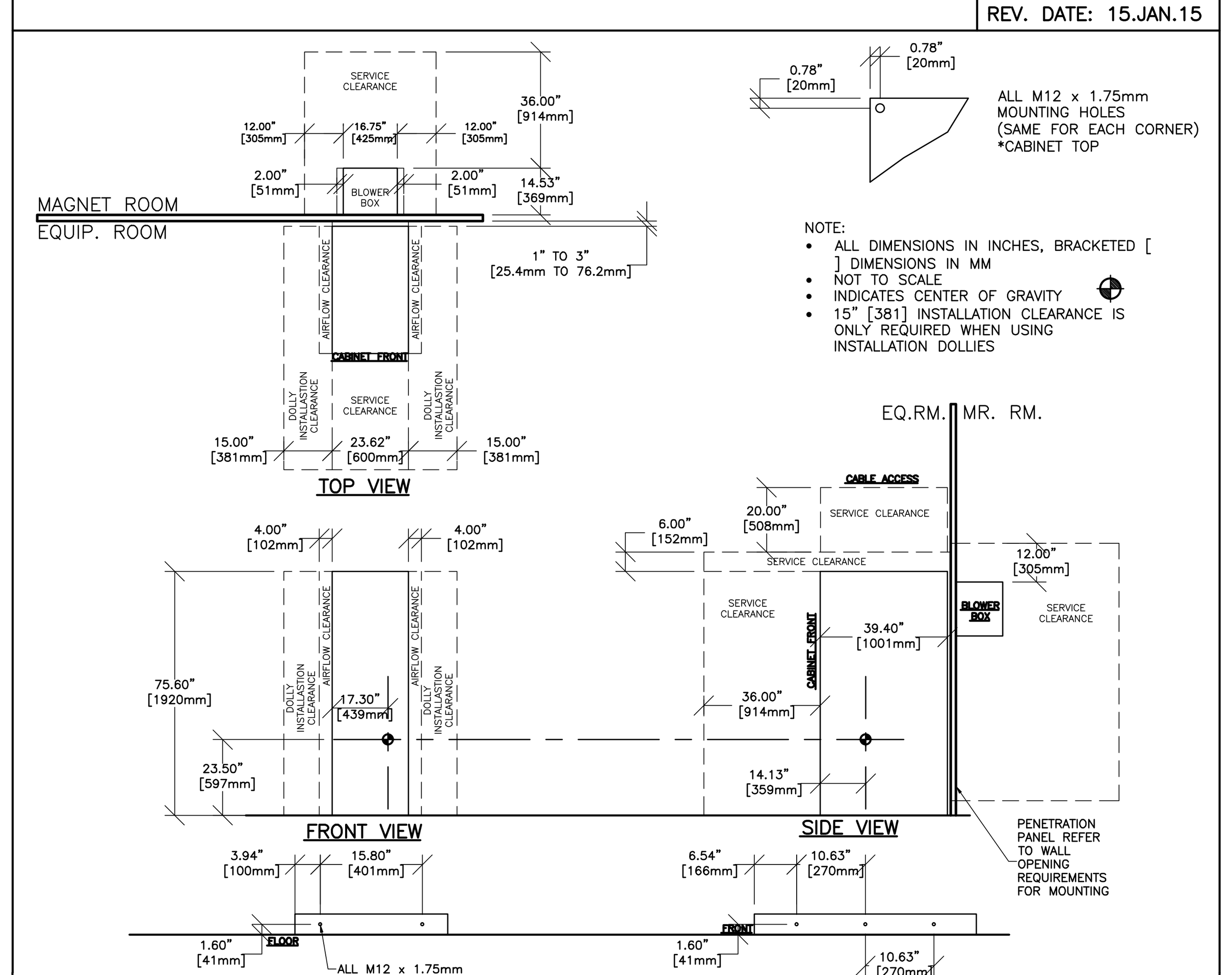
EQUIPMENT DETAIL — M30-15J
BLOWER BOX
REV. DATE: 02/20/09

CENTER OF GRAVITY



DETAIL NOT TO SCALE

EQUIPMENT DETAIL — M30-15F
PENETRATION CABINET
REV. DATE: 15.JAN.15

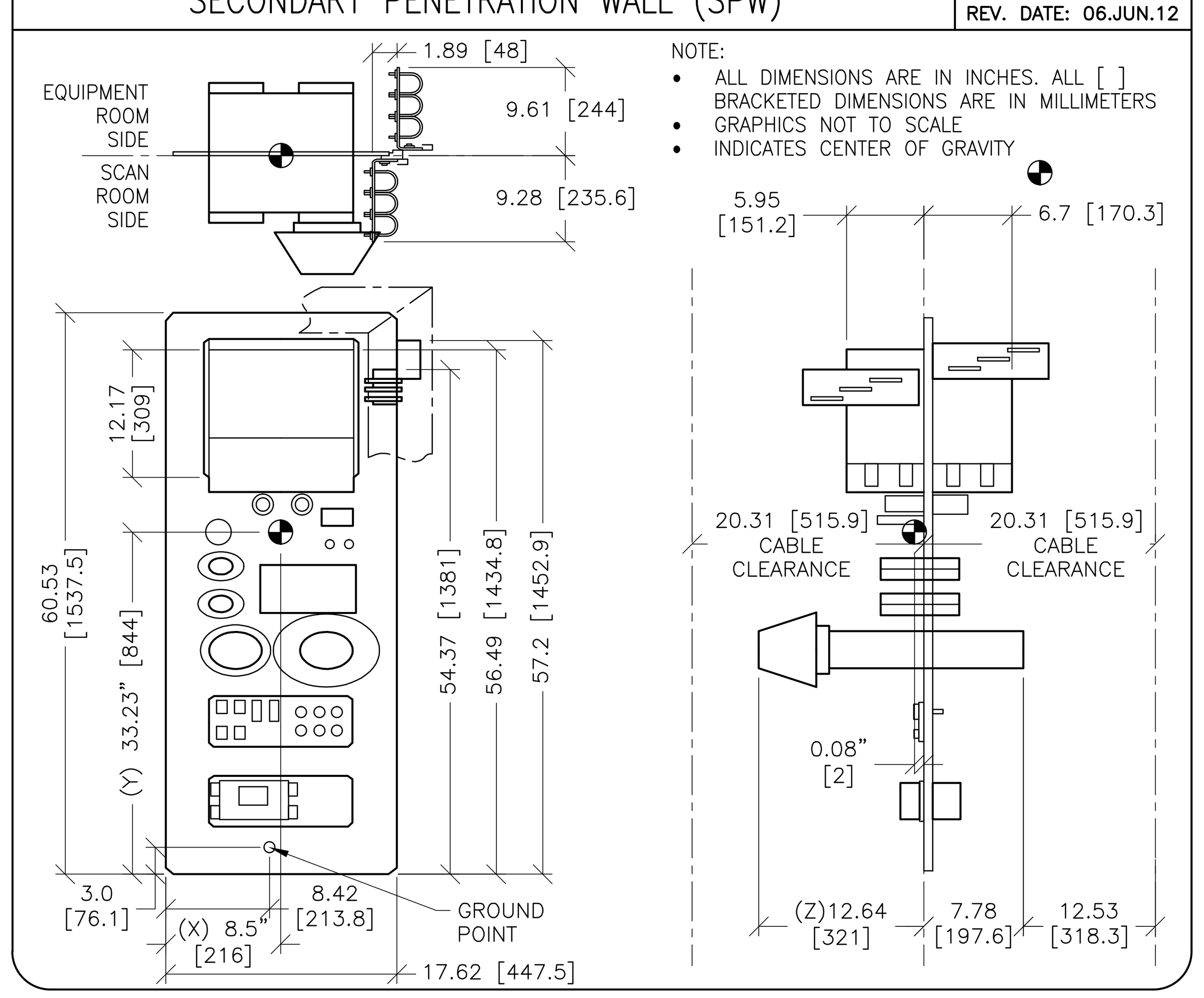


NOTE:
- ALL DIMENSIONS IN INCHES, BRACKETED [ ] DIMENSIONS IN MM
- NOT TO SCALE
- INDICATES CENTER OF GRAVITY
- 15" [381] INSTALLATION CLEARANCE IS ONLY REQUIRED WHEN USING INSTALLATION DOLLIES

DETAIL NOT TO SCALE

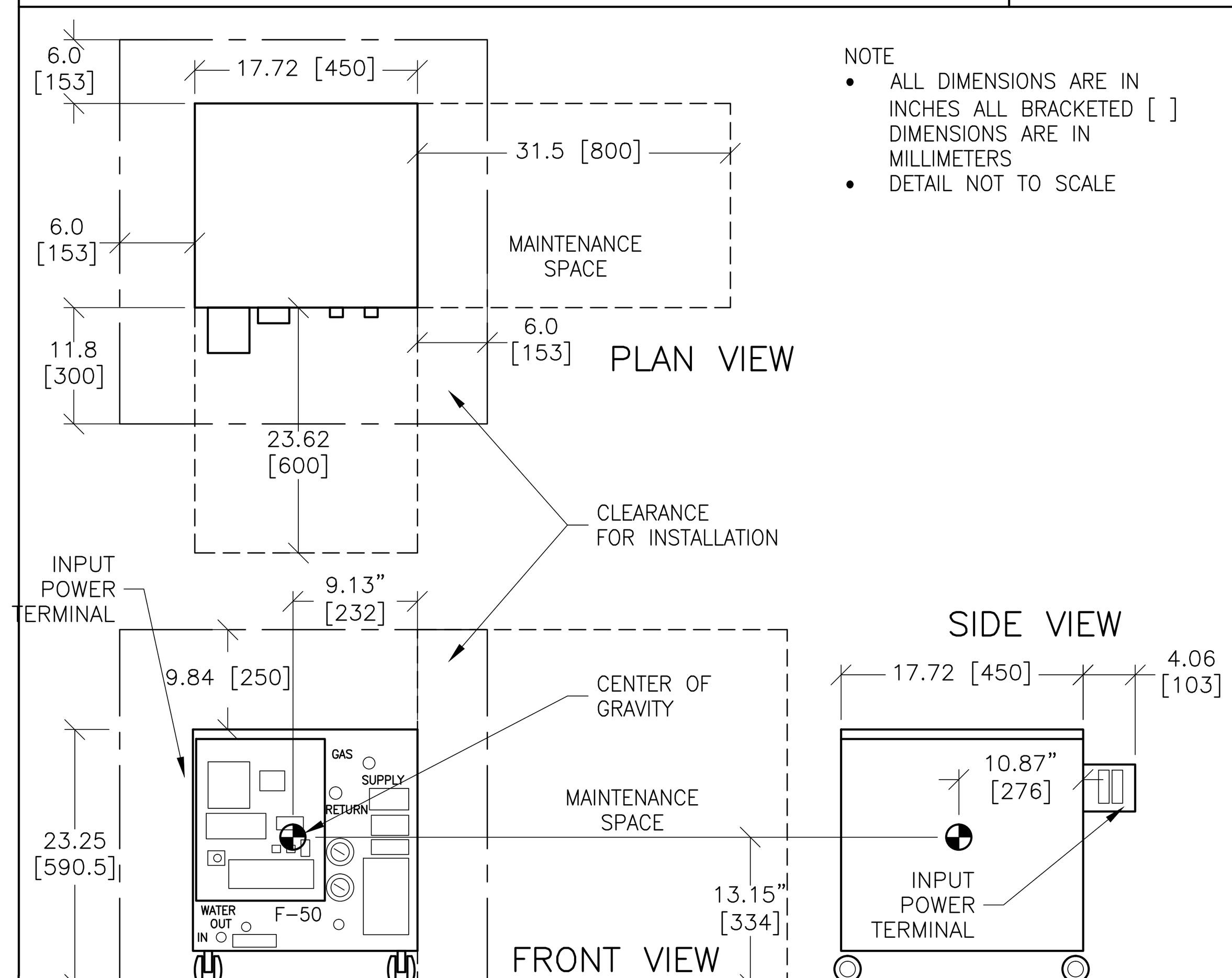
EQUIPMENT DETAIL — M30-15P
SECONDARY PENETRATION WALL (SPW)
REV. DATE: 06.JUN.12

NOTE:
- ALL DIMENSIONS ARE IN INCHES. ALL [ ] BRACKETED DIMENSIONS ARE IN MILLIMETERS
- GRAPHICS NOT TO SCALE
- INDICATES CENTER OF GRAVITY



EQUIPMENT DETAIL — M33004
CRYOCOOLER COMPRESSOR F50
REV. DATE: 20.JUN.12

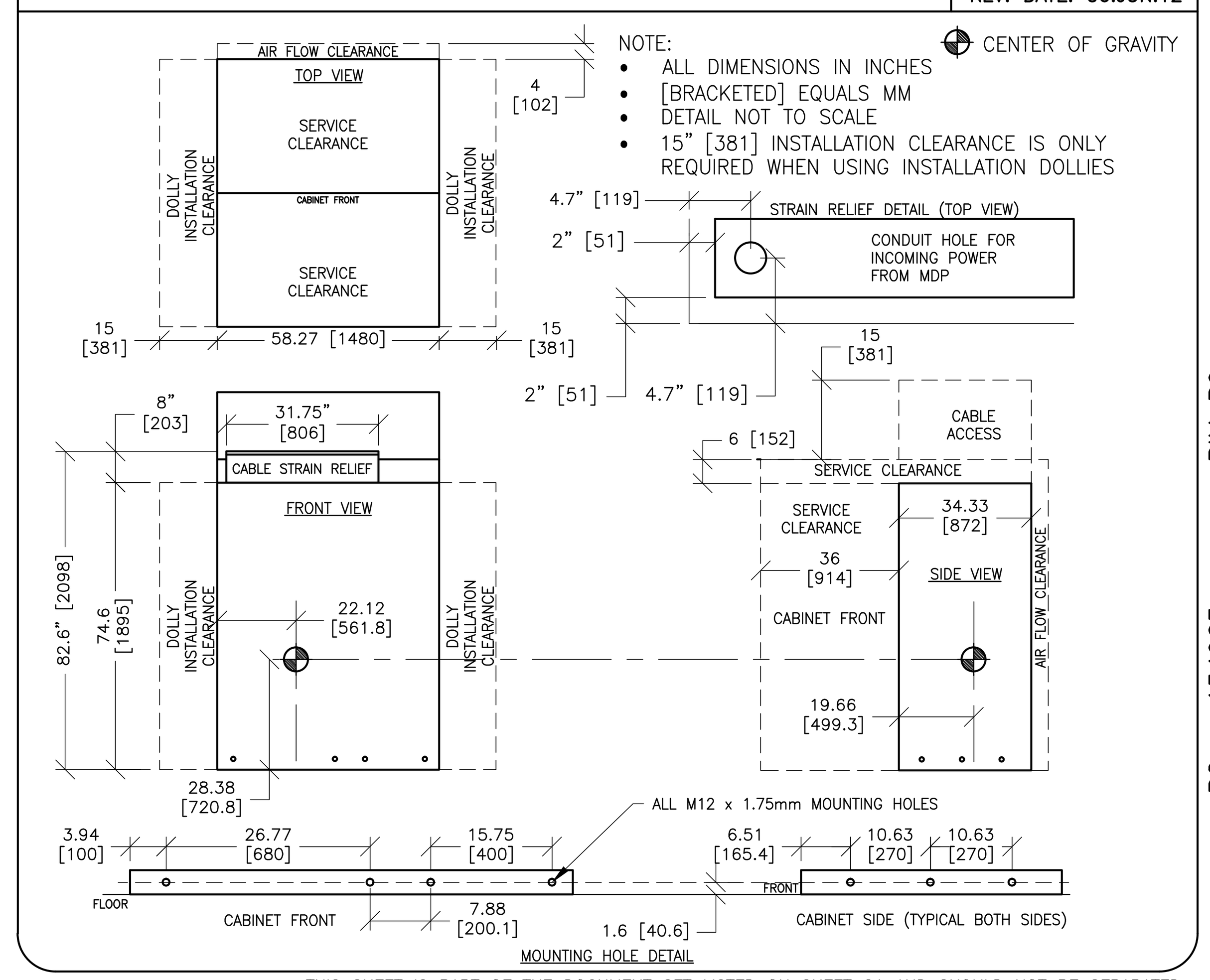
NOTE
- ALL DIMENSIONS ARE IN INCHES ALL BRACKETED [ ] DIMENSIONS ARE IN MILLIMETERS
- DETAIL NOT TO SCALE



EQUIPMENT DETAIL — M30-15G
POWER ELECTRONICS CABINET
REV. DATE: 06.JUN.12

NOTE:
- ALL DIMENSIONS IN INCHES
- [BRACKETED] EQUALS MM
- DETAIL NOT TO SCALE
- 15" [381] INSTALLATION CLEARANCE IS ONLY REQUIRED WHEN USING INSTALLATION DOLLIES

CENTER OF GRAVITY



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

RQ – 154963 PIM R9

GE Healthcare
Healthcare Project Implementation – Design Center
Milwaukee, Wisconsin

SHEET TITLE: EQUIPMENT DETAILS
MODALITY TYPE: DISCOVERY MR450

THIS PLAN IS SUBMITTED TO SUGGEST LOCATION OF GE HEALTHCARE EQUIPMENT AND ASSOCIATED APPARATUS, ELECTRICAL WIRING DETAILS AND ROOM ARRANGEMENTS. 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 ACTUAL CONSTRUCTION PURPOSES, HOWEVER, AND THE COMPANY CANNOT ACCEPT RESPONSIBILITY FOR ANY DAMAGES RESULTING THEREFROM.

PROJECT TITLE: 8-226F TYPICAL LAYOUT

PROJECT	REVISION
8-226f	00

DATE: 22.Sep.15
DRAWN BY: DMS
CHECKED BY: PMM

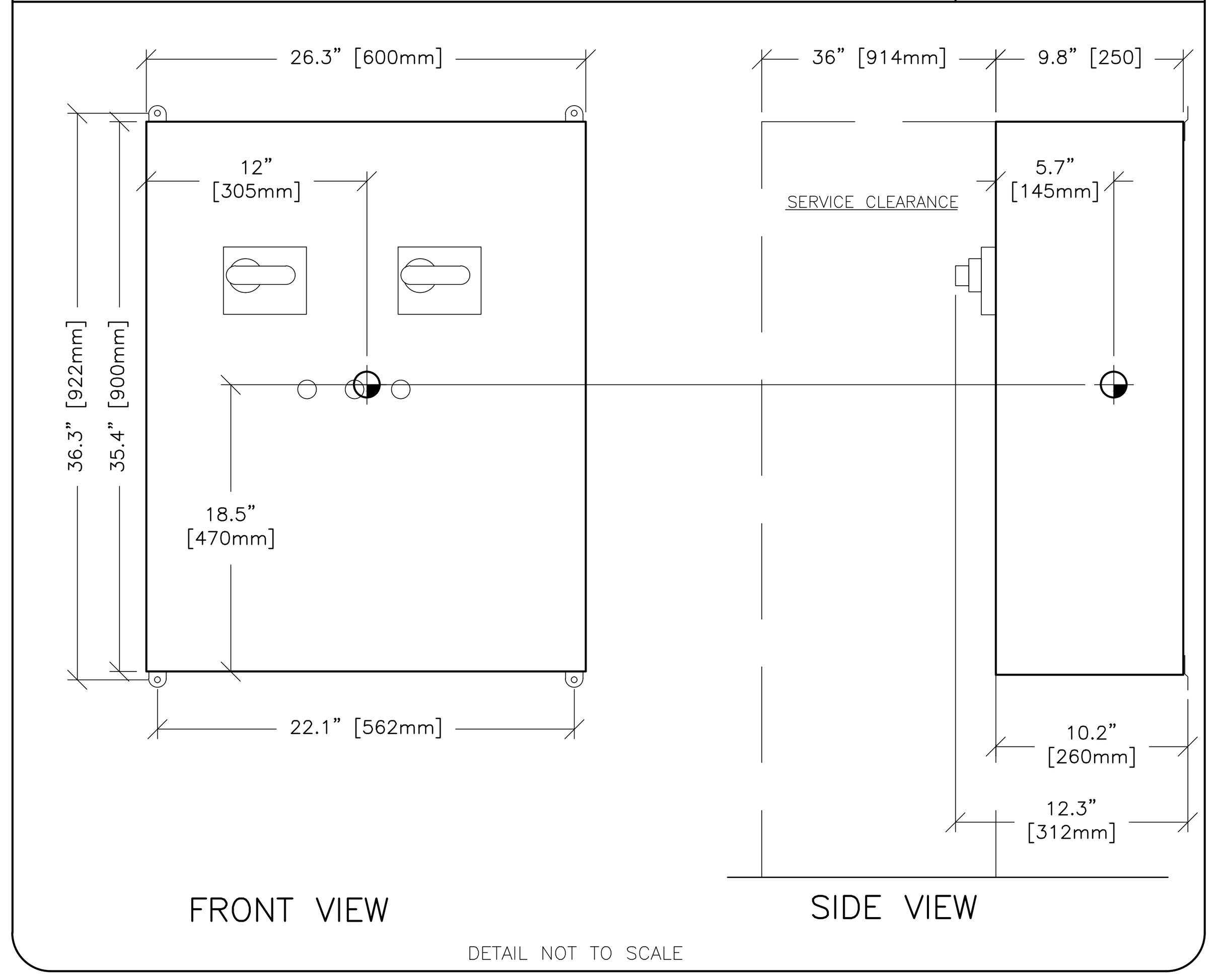
REVISION HISTORY:

SHEET D1

EQUIPMENT DETAIL
MAIN DISCONNECT

M17-15E

REV. DATE: 26.JUN.12

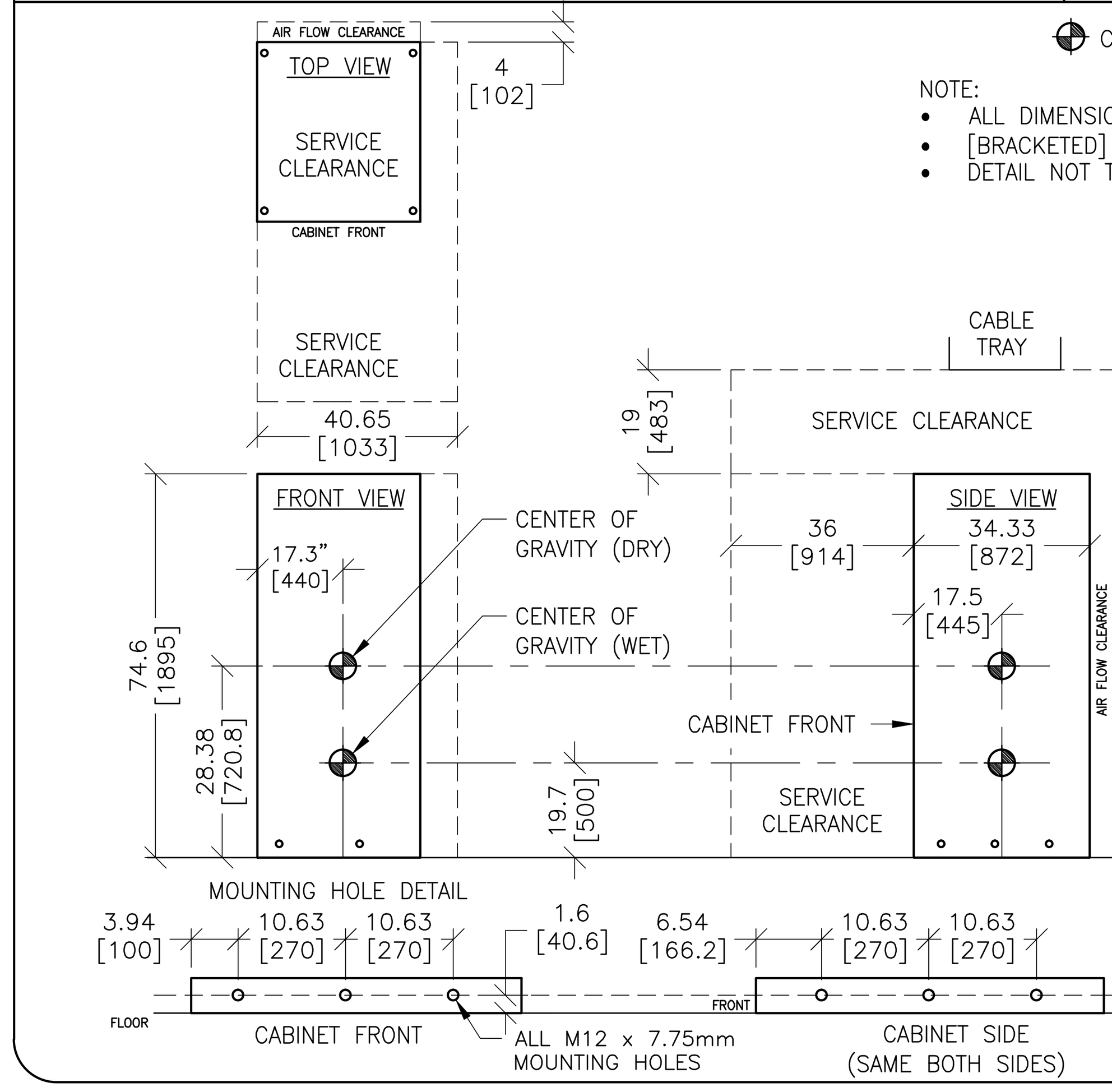


EQUIPMENT DETAIL
HEAT EXCHANGER CABINET

M30-15B

REV. DATE: 06.JUN.12

NOTE:
- ALL DIMENSIONS IN INCHES
- [BRACKETED] EQUALS MM
- DETAIL NOT TO SCALE

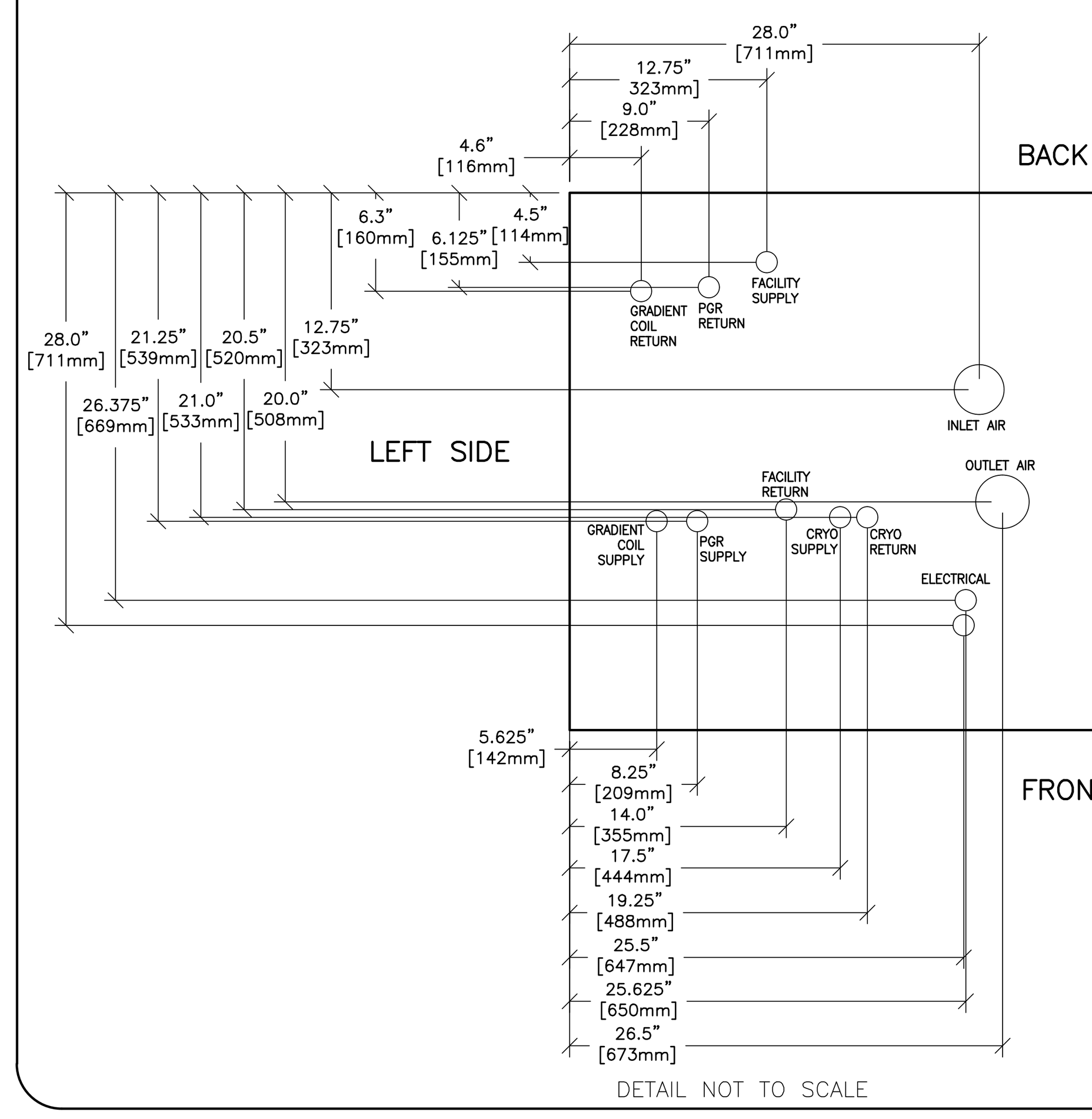


EQUIPMENT DETAIL
SUPPLY AND RETURN CONNECTIONS AT TOP OF HEC

M30-15D

REV. DATE: 11/20/10

SEE DETAIL M30-15B FOR HEAT EXCHANGER CABINET DETAIL

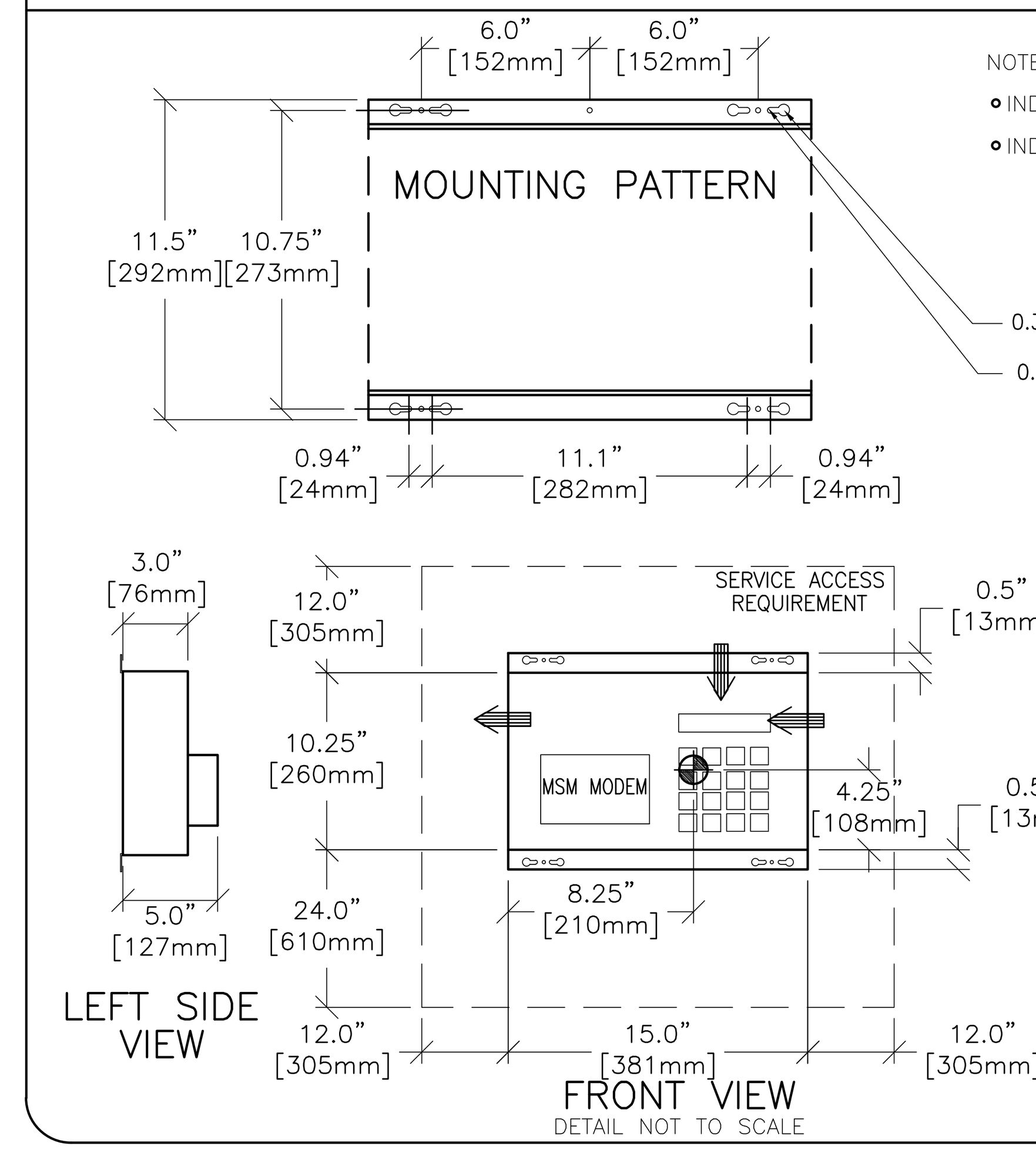


EQUIPMENT DETAIL
MAGNET MONITOR

M16-15C

REV. DATE: 04/24/07

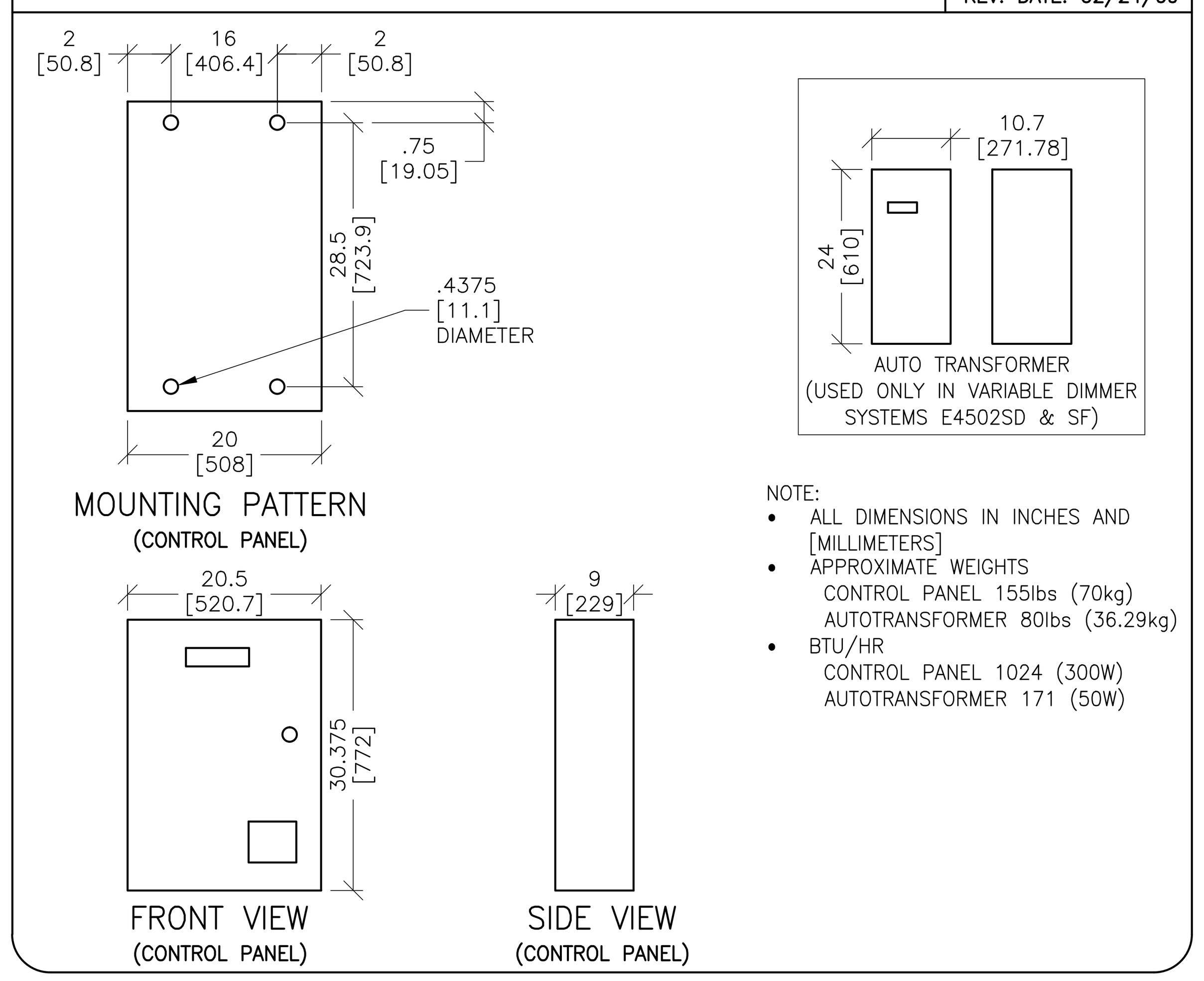
NOTE:
- INDICATES CENTER OF GRAVITY
- INDICATES AIR FLOW



EQUIPMENT DETAIL
DC LIGHTING CONTROLLER

M20-15/ M20-15A

REV. DATE: 02/24/09



NOTE:
- ALL DIMENSIONS IN INCHES AND [MILLIMETERS]
- APPROXIMATE WEIGHTS
  CONTROL PANEL 155lbs (70kg)
  AUTOTRANSFORMER 80lbs (36.29kg)
- BTU/HR
  CONTROL PANEL 1024 (300W)
  AUTOTRANSFORMER 171 (50W)

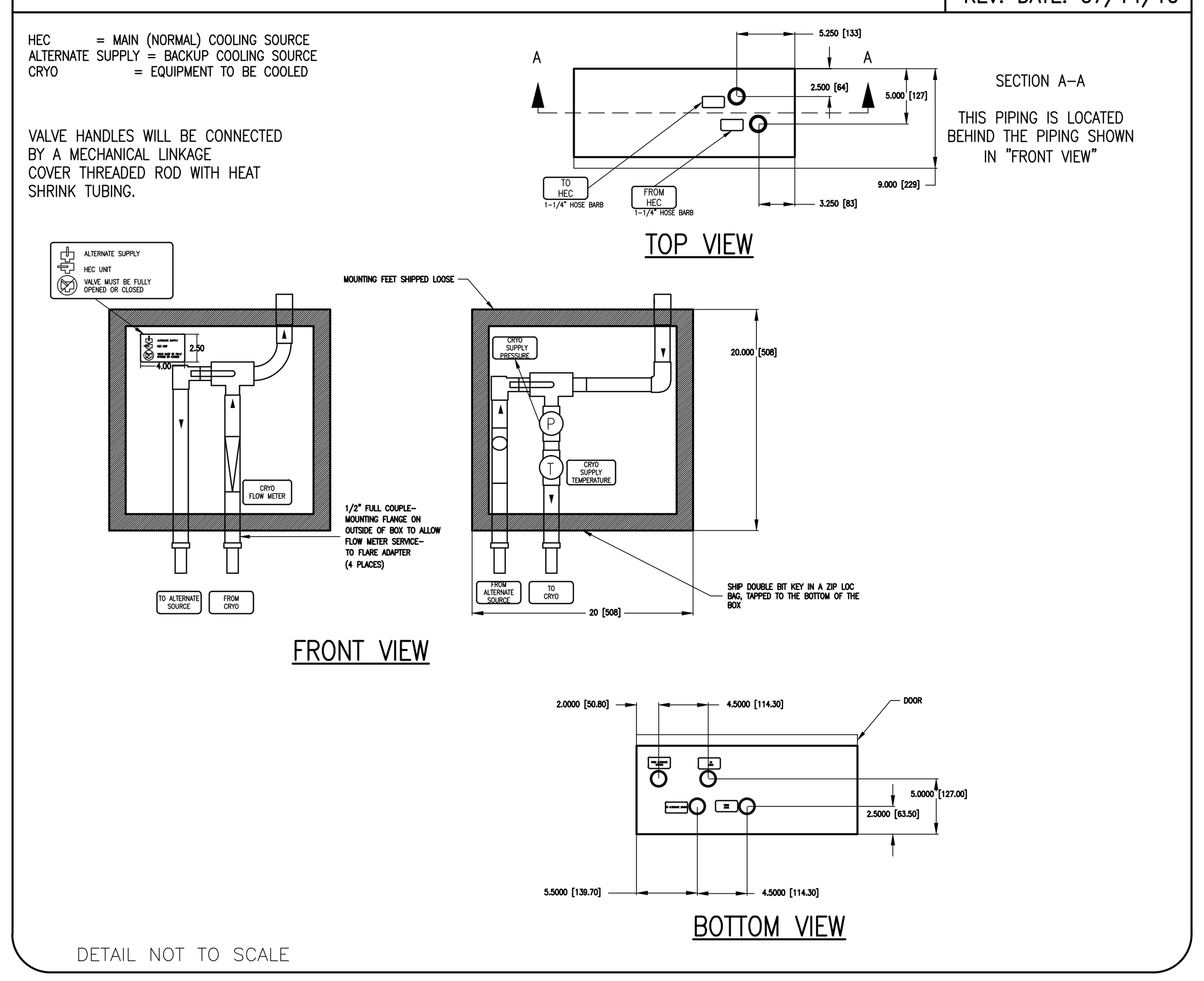
EQUIPMENT DETAIL
WATER BYPASS PANEL

B05-71

REV. DATE: 07/14/10

HEC = MAIN (NORMAL) COOLING SOURCE
ALTERNATE SUPPLY = BACKUP COOLING SOURCE
CRYO = EQUIPMENT TO BE COOLED

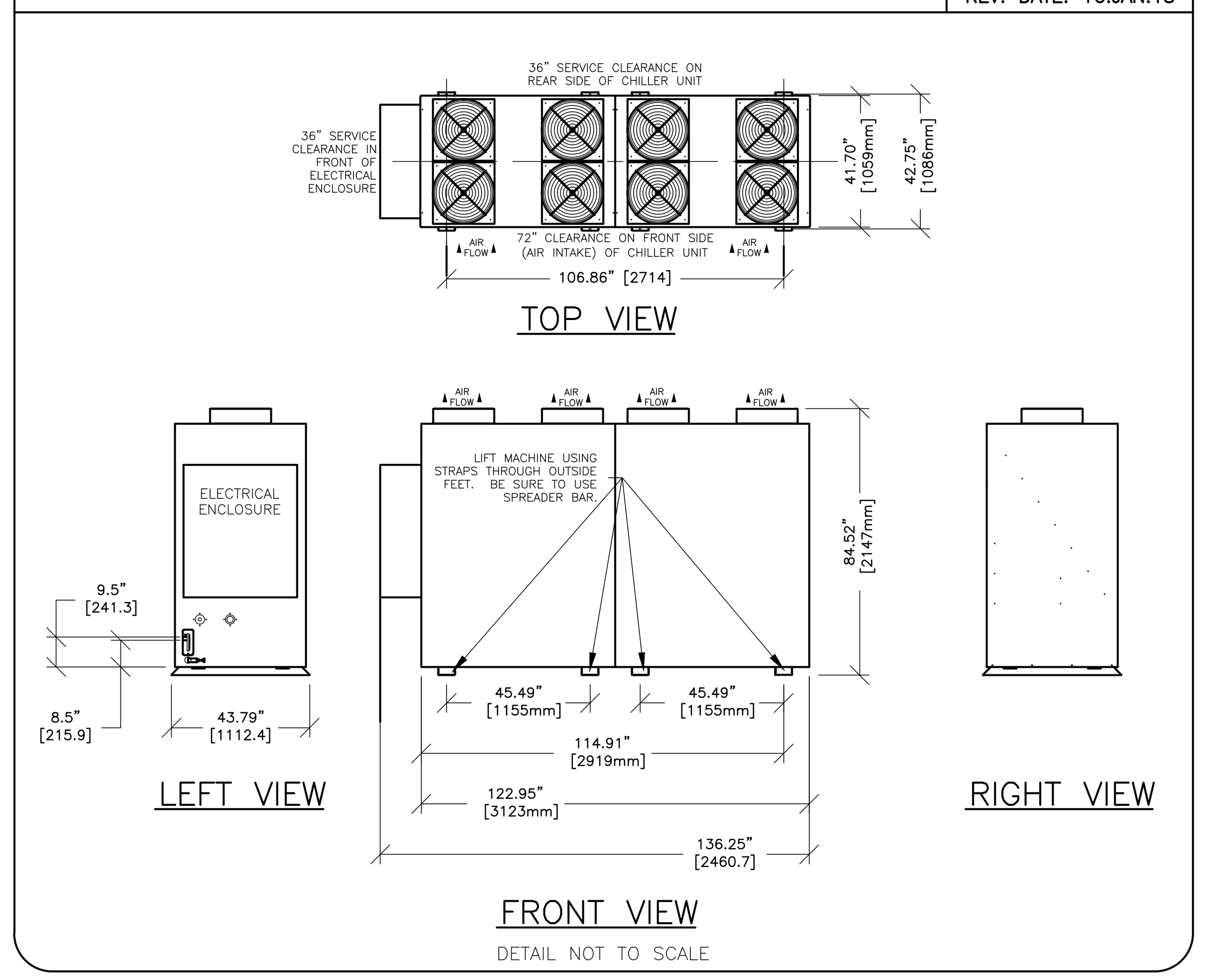
VALVE HANDLES WILL BE CONNECTED BY A MECHANICAL LINKAGE
COVER THREADED ROD WITH HEAT SHRINK TUBING.



EQUIPMENT DETAIL
DIMPLEX 7500 CHILLER

M03-00F

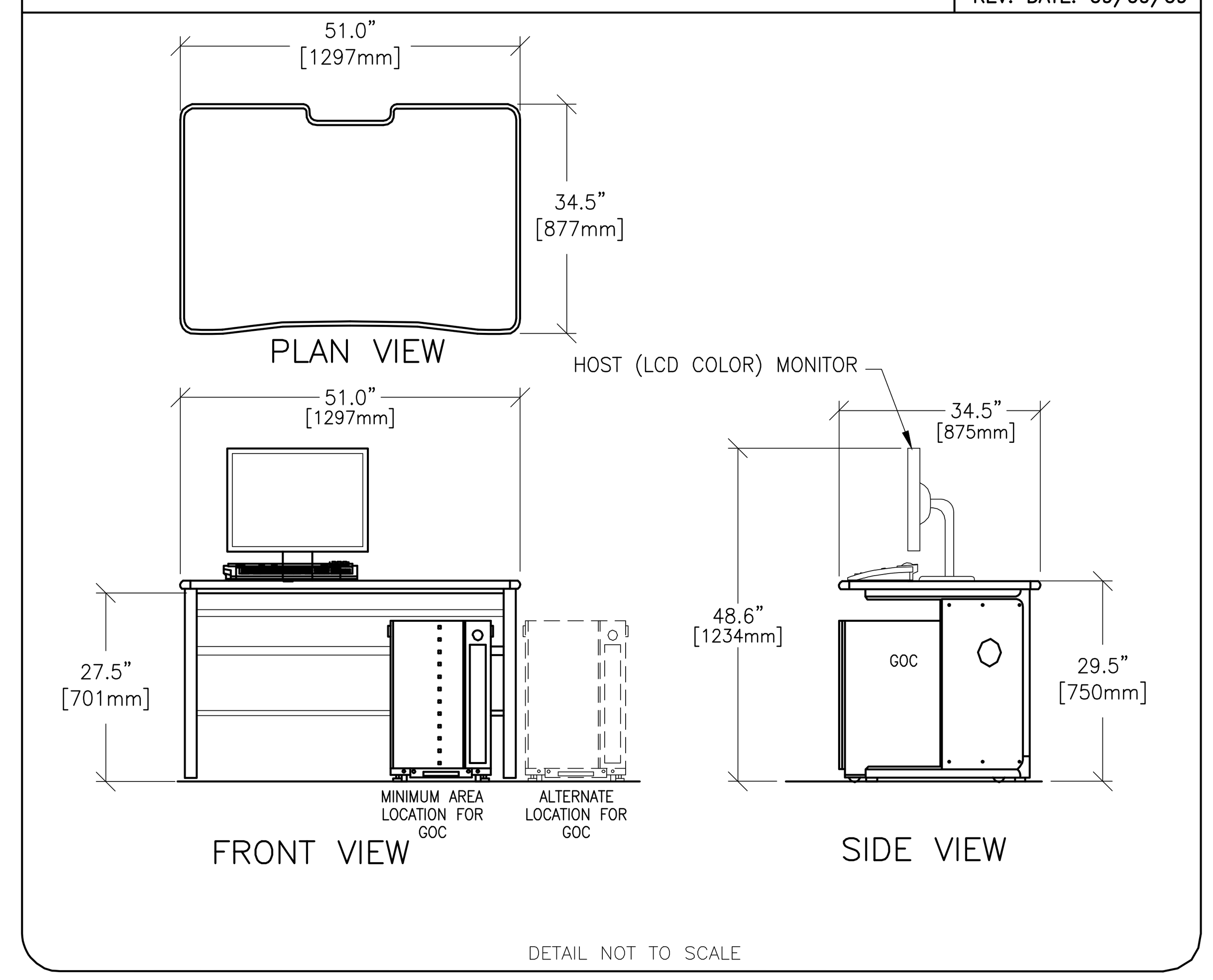
REV. DATE: 16.JAN.15



EQUIPMENT DETAIL
OPERATOR WORKSPACE

M05-16C

REV. DATE: 09/09/09

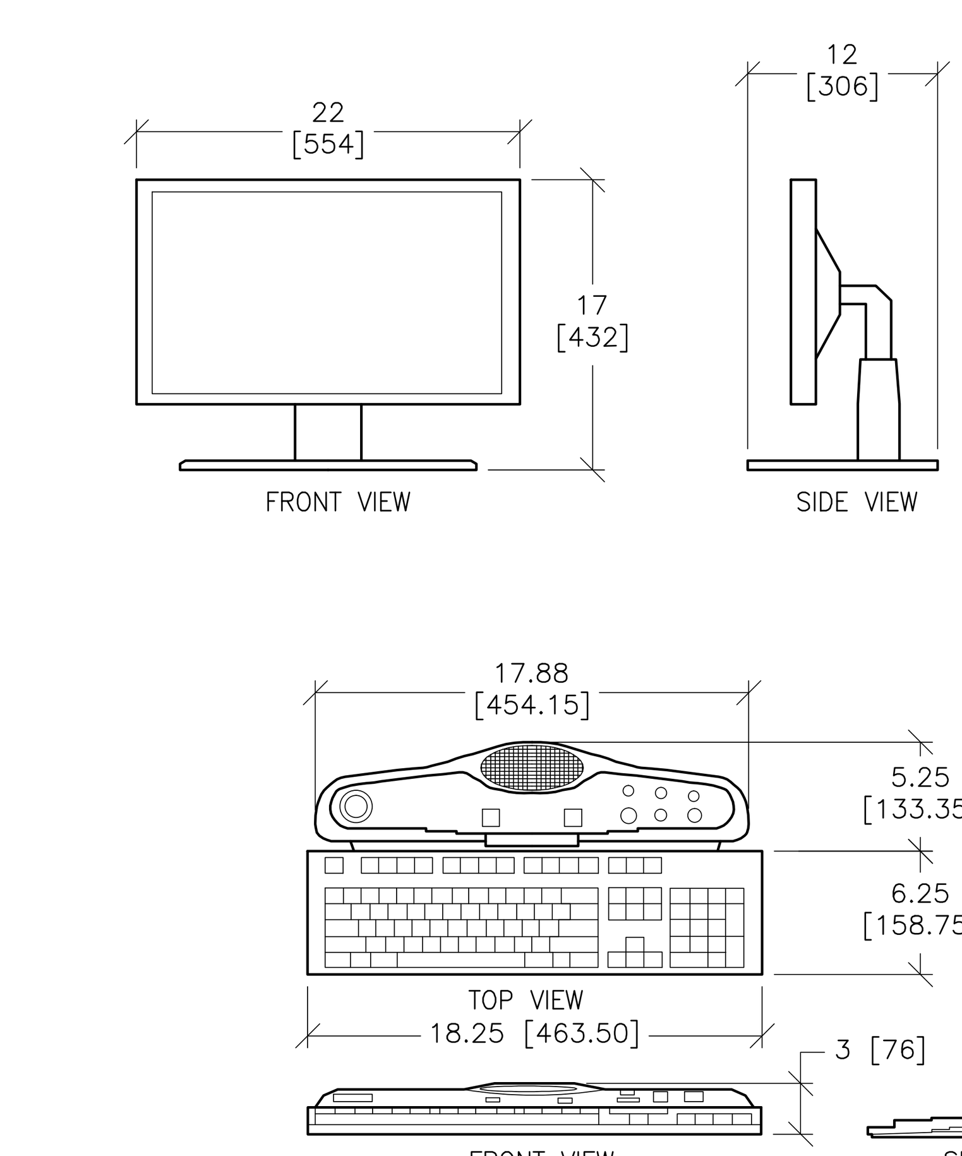


EQUIPMENT DETAIL
CONSOLE, HOST MONITOR & KEYBOARD

M30-150

REV. DATE: 05/22/08

NOTE:
- ALL DIMENSIONS ARE IN INCHES ALL BRACKETED [] DIMENSIONS ARE IN MILLIMETERS
- DETAIL NOT TO SCALE



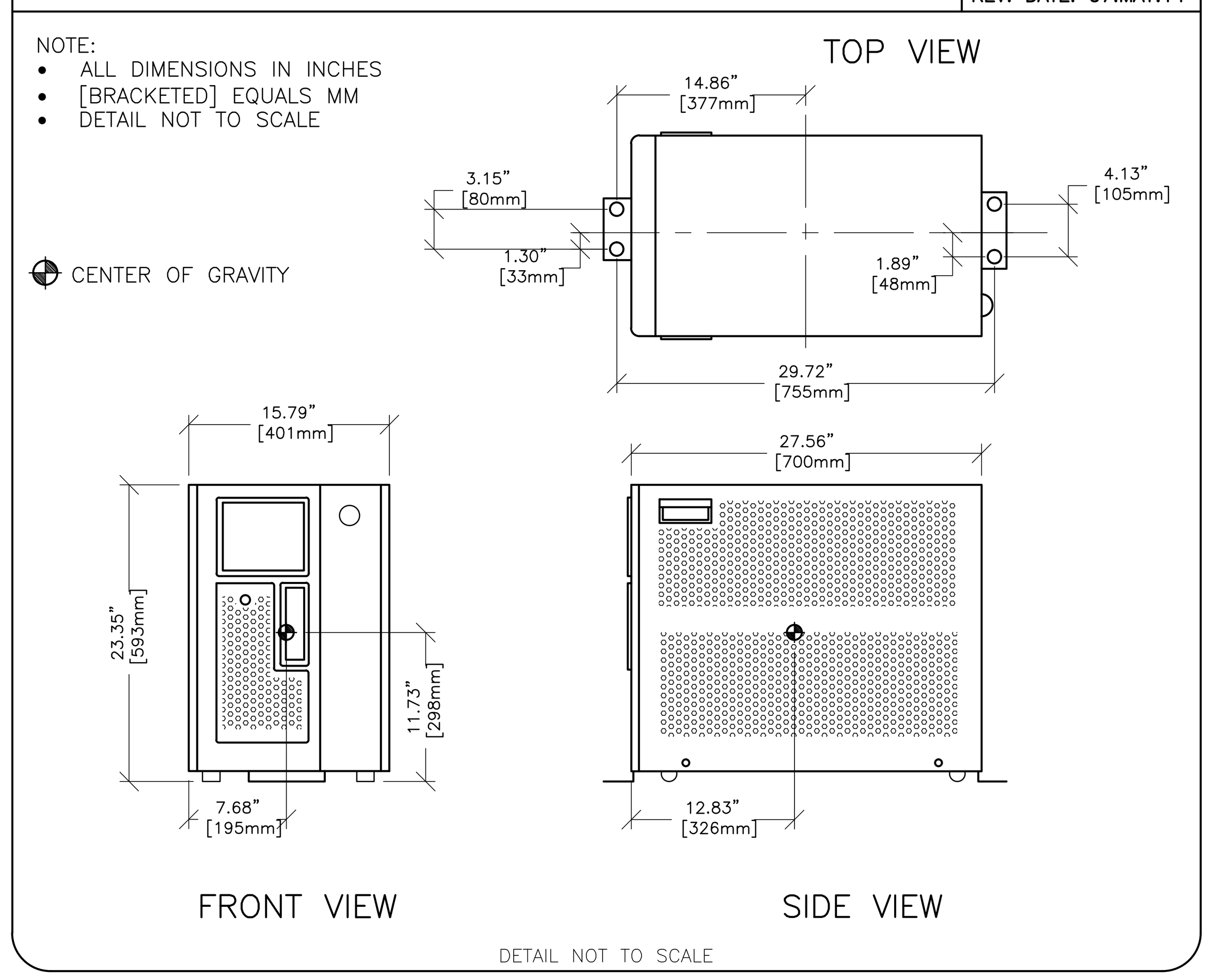
EQUIPMENT DETAIL
OPERATOR WORKSPACE CABINET

M06-15E

REV. DATE: 07.MAY.14

NOTE:
- ALL DIMENSIONS IN INCHES
- [BRACKETED] EQUALS MM
- DETAIL NOT TO SCALE

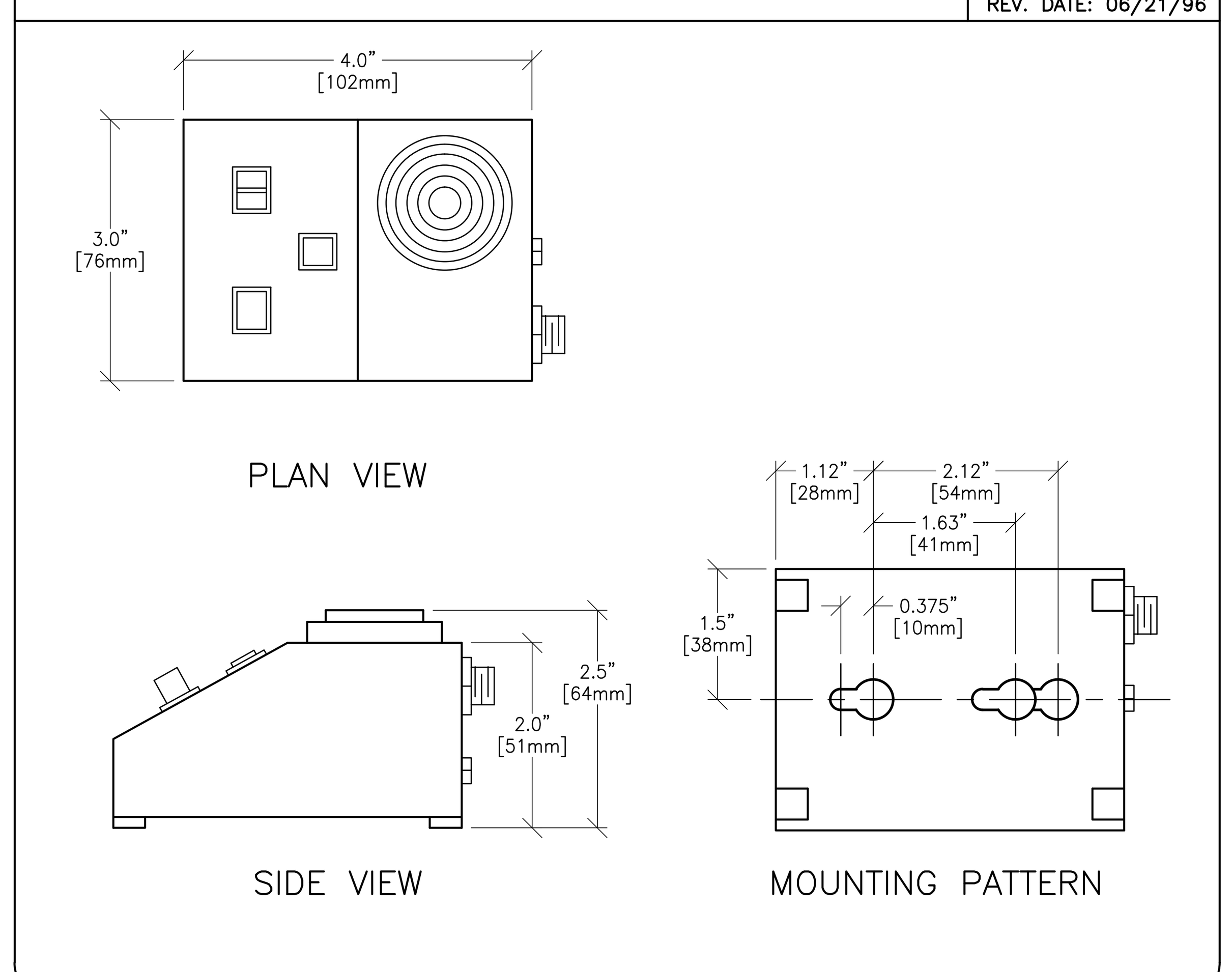
CENTER OF GRAVITY



EQUIPMENT DETAIL
PNEUMATIC PATIENT ALERT CONTROL BOX

M48-15

REV. DATE: 06/21/96



PIM R9

RQ – 154963

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

GE Healthcare
Healthcare Project Implementation – Design Center
Milwaukee, Wisconsin

SHEET TITLE: EQUIPMENT DETAILS
MODALITY TYPE: DISCOVERY MR450

PROJECT TITLE: 8-226F TYPICAL LAYOUT

PROJECT	REVISION
8-226f	00

DATE: 22.Sep.15
DRAWN BY: DMS
CHECKED BY: PMM

REVISION HISTORY:

SHEET D2