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 *

Optima MR360/
Brivo MR355

Pre Installation Manual

5433834–1EN

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.				

SHEET TITLE: SITE READINESS
MODALITY TYPE: OPTIMA MR360 ADVANCE / BRIVO MR355 INSPIRE

PROJECT TITLE: 8–250F TYPICAL LAYOUT

PROJECT	REVISION
8–250f	00

DATE: 24.Sep.15
DRAWN BY: PMM
CHECKED BY: PMM

REVISION HISTORY:

PIM R6

RQ – 154968

SHEET C1

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

ITEM NO.	QUANTITY ORDERED	ITEM DESCRIPTION (* = EXISTING/REINSTALL)	WEIGHT	HEAT OUTPUT (PER HOUR)	DETAIL NO. (REFER TO SHEET "D")	STRC PLAN	ELEC PLAN	SEISMIC STATUS
1	1	SPT PHANTOM CABINET	350 lbs		M6115	.		–
2	1	MAGNET RUNDOWN UNIT	8 lbs		M1715C	–	MS4	C
3	1	BLOWER BOX	46 lbs	3412 btu	M5715	M58 15	MG6	S
4	1	PATIENT TABLE – FIXED	264 lbs		B8119	–		S
5	1	1.5 TESLA LCC ACTIVE SHIELD MAGNET	11728 lbs	8191 btu	M6515 M0215N M0315N M0115P M0115R	OM6 650	MS1	C
6	1	SYSTEM CABINET	1962 lbs	17064 btu	M0815P	–	MR2	–
7	1	MESH SHIELD			M0815L	.		–
8	1	PENETRATION PANEL			M5015G	–	PP1	–
9	1	MAGNET MONITOR	22 lbs	204 btu	M1615C	.	MM	C
10	1	SHIELD COOLER CABINET	264 lbs	1706 btu	M33004	.	MS5	C
11	1	COOLING UNIT FOR SYSTEM CABINET	108 lbs	5699 btu	M6015E	–	WC2	–
12	1	COOLING UNIT FOR BODY COIL	85 lbs	5699 btu	M6015E	–	WC1	–
13	1	OPERATOR WORKSPACE W/COLOR LCD MONITOR	19 lbs	4948 btu	M3015R	–	OW	C
14	1	OPERATOR WORKSPACE CABINET	85 lbs		M0615F	–		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.

EQUIPMENT LAYOUT

SCALE: 1/4" = 1'–0" 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

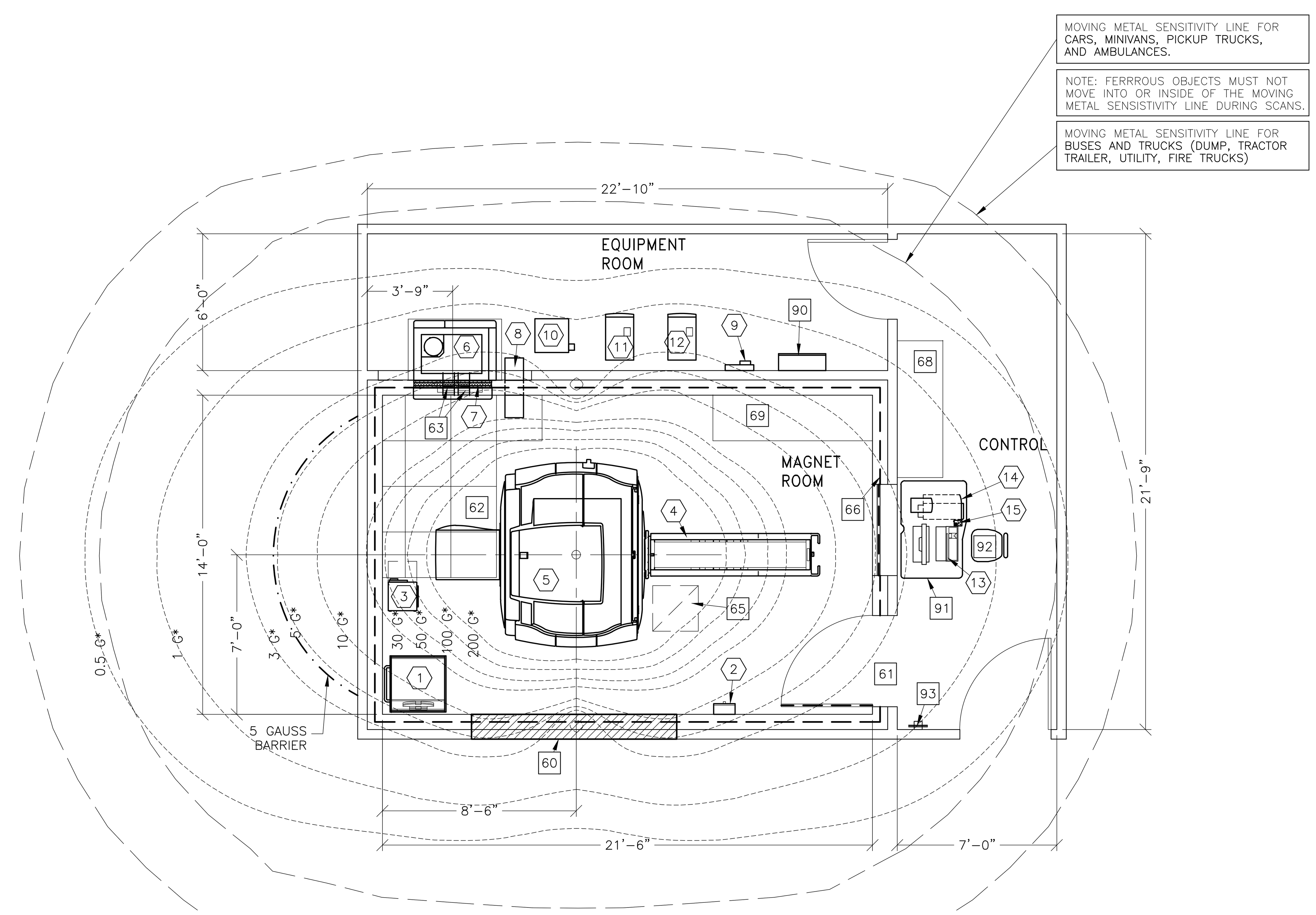
THIS IS ONLY A PARTIAL LIST OF ITEMS REQUIRED FOR DELIVERY OF THE MAGNET. FOR A COMPLETE CHECKLIST REFER TO THE PRE–INSTALLATION MANUAL REFERENCED ON SHEET C1.

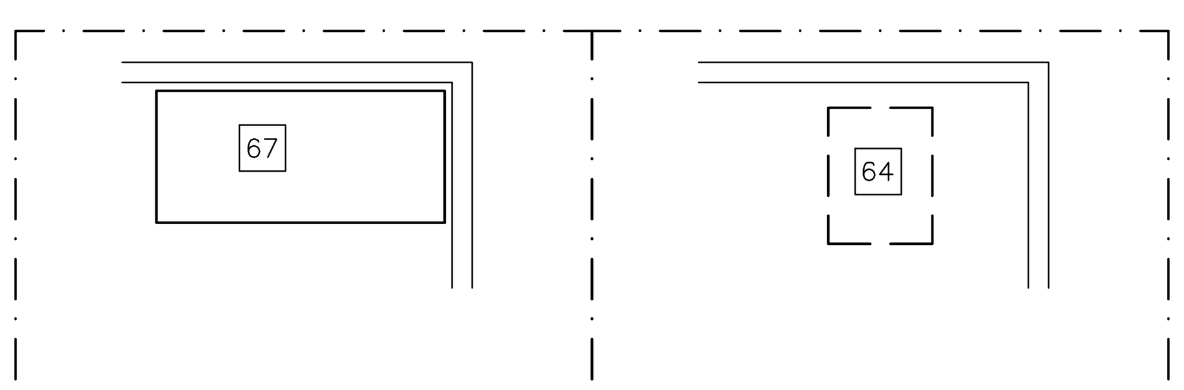
* THE ISOGAUSS CONTOUR PLOTS DEPICTED ON THIS DRAWING REPRESENT MAGNETIC FRINGE FIELDS RESULTING FROM THE NORMAL OPERATION OF THE MAGNET PROVIDED WITH THE MR SYSTEM. THE ACTUAL MAGNETIC FIELD INTENSITY AT ANY POINT IN THE VICINITY OF THE MAGNET WHEN INSTALLED MAY VARY FROM THE CONTOUR PLOTS DUE TO FACTORS 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.

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

NOTE: FERRROUS 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)





AIR CONDITIONING UNIT BY OTHERS LOCATED ELSEWHERE

WATER CHILLER BY OTHERS TO BE LOCATED IN FIELDS OF LESS THAN 10 GAUSS. (FINAL LOCATION TO BE DETERMINED BY OTHERS.) – OR HOSPITAL CHILLED WATER SUPPLY.

NORTH PLAN

ANCILLARY ITEMS

CUSTOMER/CONTRACTOR SUPPLIED AND INSTALLED ITEMS

ITEM NO.	ITEM DESCRIPTION (* INDICATES EXISTING)
60	MINIMUM 9 FT.–0 IN. [2743 mm] x 9 FT.–0 IN. [2743 mm] REMOVABLE WALL SECTION FOR MAGNET DELIVERY/REMOVAL.
61	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
62	NON–METAL ACCESS FLOOR WITH 2' x 2' (610 x 610mm) REMOVABLE PANELS & SUPPORT HARDWARE REQUIRED WITHIN MAGNET ROOM
63	RF FILTERS – LOCATE WITHIN 40 in. [1016 mm] OF THE RF COMMON GROUND STUD
64	WATER CHILLER
65	MAGNET ROOM EXHAUST FAN
66	RF SCREEN, INCLUSIVE OF WALLS, FLOOR, DOOR, ETC. GROUND IMPEDANCE GREATER THAN 1000 OHMS. ATTENUATION 100dB AT 100MHz +/–10MHz PLANEWAVE (RECOMMENDED 100dB AT 150MHz +/–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	MAIN DISCONNECT PANEL 900 BTU (264 W) 350 lbs (158kg) CAT NO. M3088TM
91	WORKSTATION TABLE CAT. NO. M1000MW
92	OPERATOR'S CHAIR CAT. NO. E8803BE
93	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: 59–89.6 DEG (F) [15–32 (C)] FOR THE CONTROL AND EQUIPMENT AREAS, {59–69.8 DEG (F) [15–24 1C)] 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 PROVIDE FLOORING TO PREVENT THE BUILDUP TO 8kV.
- 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 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 MAGNET ROOM EXHAUST FAN 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

- 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 R6

RQ – 154968

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: OPTIMA MR360 ADVANCE / BRIVO MR355 INSPIRE

PROJECT TITLE: 8–250F TYPICAL LAYOUT

PROJECT	REVISION
8–250f	00

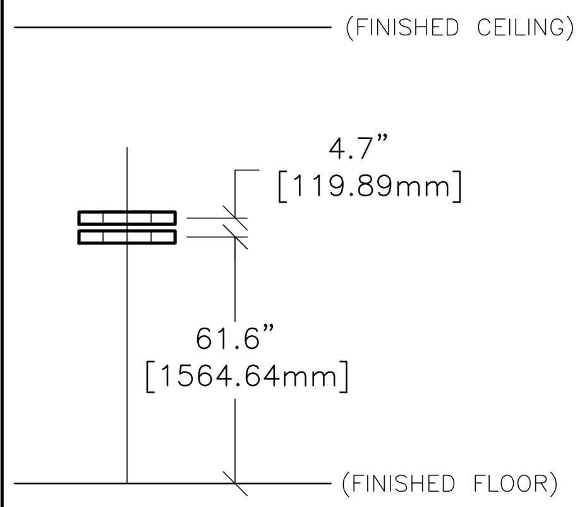
DATE: 24.Sep.15
DRAWN BY: PMM
CHECKED BY: PMM

REVISION HISTORY:

SHEET A1

TYPICAL WALL SUPPORT ELEVATIONS

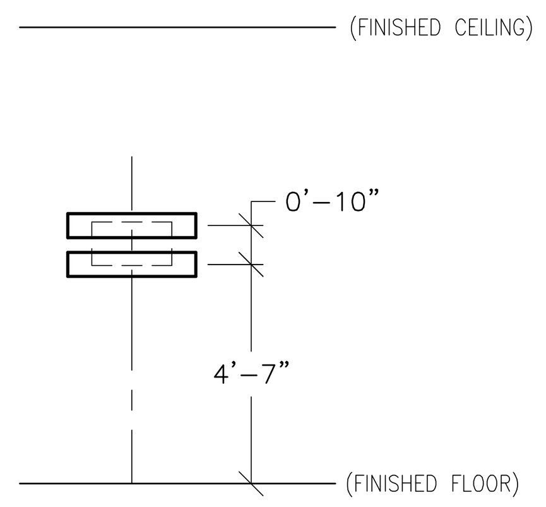
S63



SUPPORT FOR
MAGNET RUNDOWN UNIT

(NOT TO SCALE)

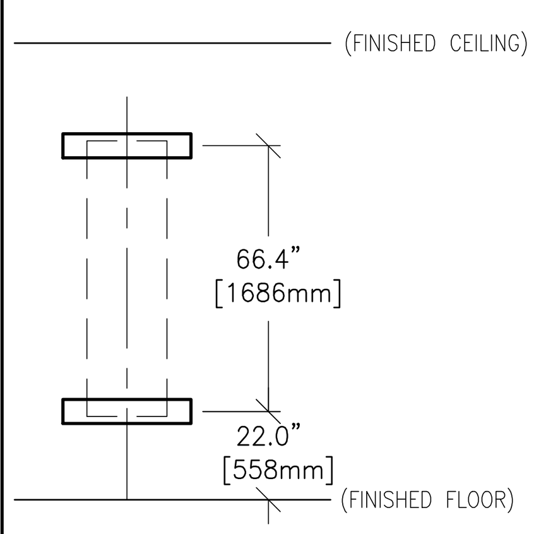
S86



SUPPORT FOR
MAGNET MONITOR

(NOT TO SCALE)

S60



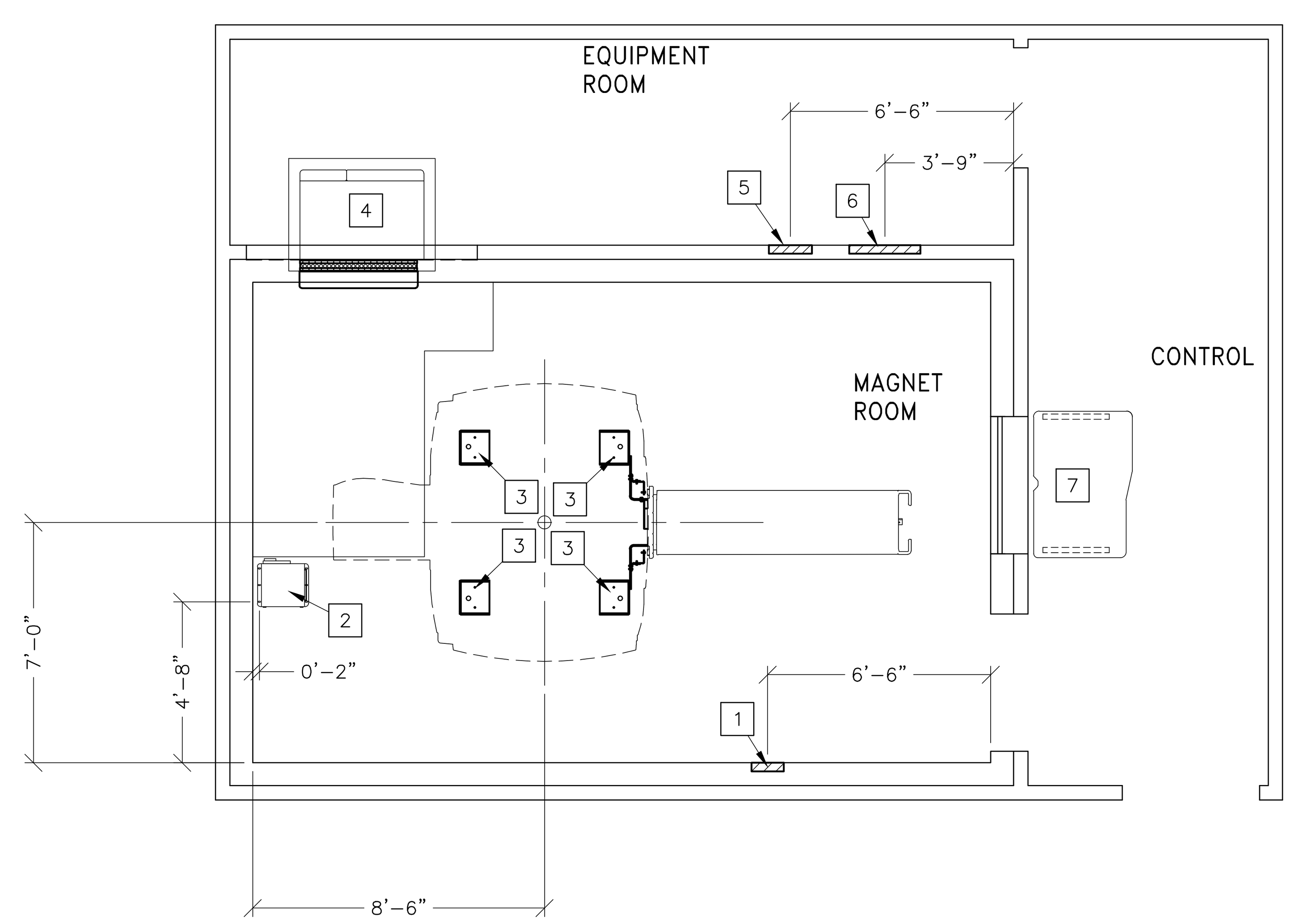
SUPPORT FOR
MAIN DISCONNECT CONTROL

(NOT TO SCALE)

STRUCTURAL LAYOUT

SCALE: 1/4" = 1'–0"

RECOMMENDED CEILING HEIGHT = 8'–9"



STRUCTURAL SUPPORT METHODS

CUSTOMER/CONTRACTOR SUPPLIED AND INSTALLED ITEMS

ITEM NO.	ITEM DESCRIPTION (* INDICATES EXISTING)
1	SUPPORT BACKING, LOCATE AS SHOWN, REFER TO ELEVATION DETAIL S63, FOR MAGNET RUNDOWN UNIT.
2	SEE BLOWER BOX FLOOR MOUNTING PATTERN DETAIL ON SHEET S2.
3	SEE MAGNET FLOOR MOUNTING DETAIL ON SHEET S2 FOR MORE INFORMATION.
4	FLOOR LEVELNESS – FLOOR AREA MUST BE HARD. FLOOR SLOPE: <+/–0.5 DEG FLOOR SURFACE: +/– 0.197 IN. (5MM)
5	SUPPORT BACKING, LOCATE AS SHOWN, REFER TO ELEVATION DETAIL S86, FOR MAGNET MONITOR.
6	SUPPORT BACKING, LOCATE AS SHOWN, REFER TO ELEVATION DETAIL S60, FOR MAIN DISCONNECT CONTROL.
7	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"

RQ – 154968 PIM R6

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: STRUCTURAL LAYOUT

MODALITY TYPE: OPTIMA MR360 ADVANCE / BRIVO MR355 INSPIRE

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: 8–250F TYPICAL LAYOUT

PROJECT	REVISION
8–250f	00

DATE: 24.Sep.15
DRAWN BY: PMM
CHECKED BY: PMM

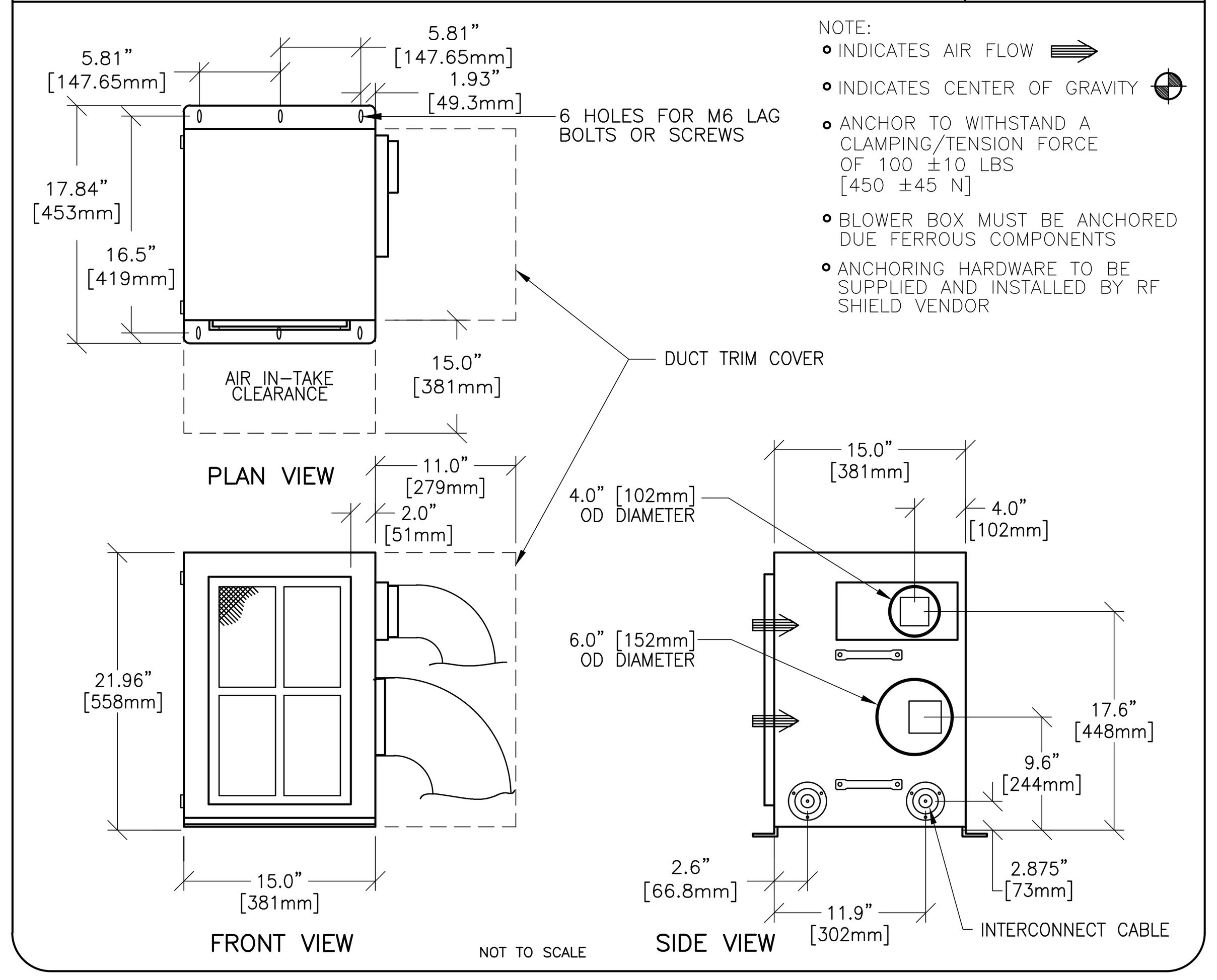
REVISION HISTORY:

SHEET S1

SUPPORT DETAIL
BLOWER BOX FLOOR MOUNTING PATTERN

M58–15

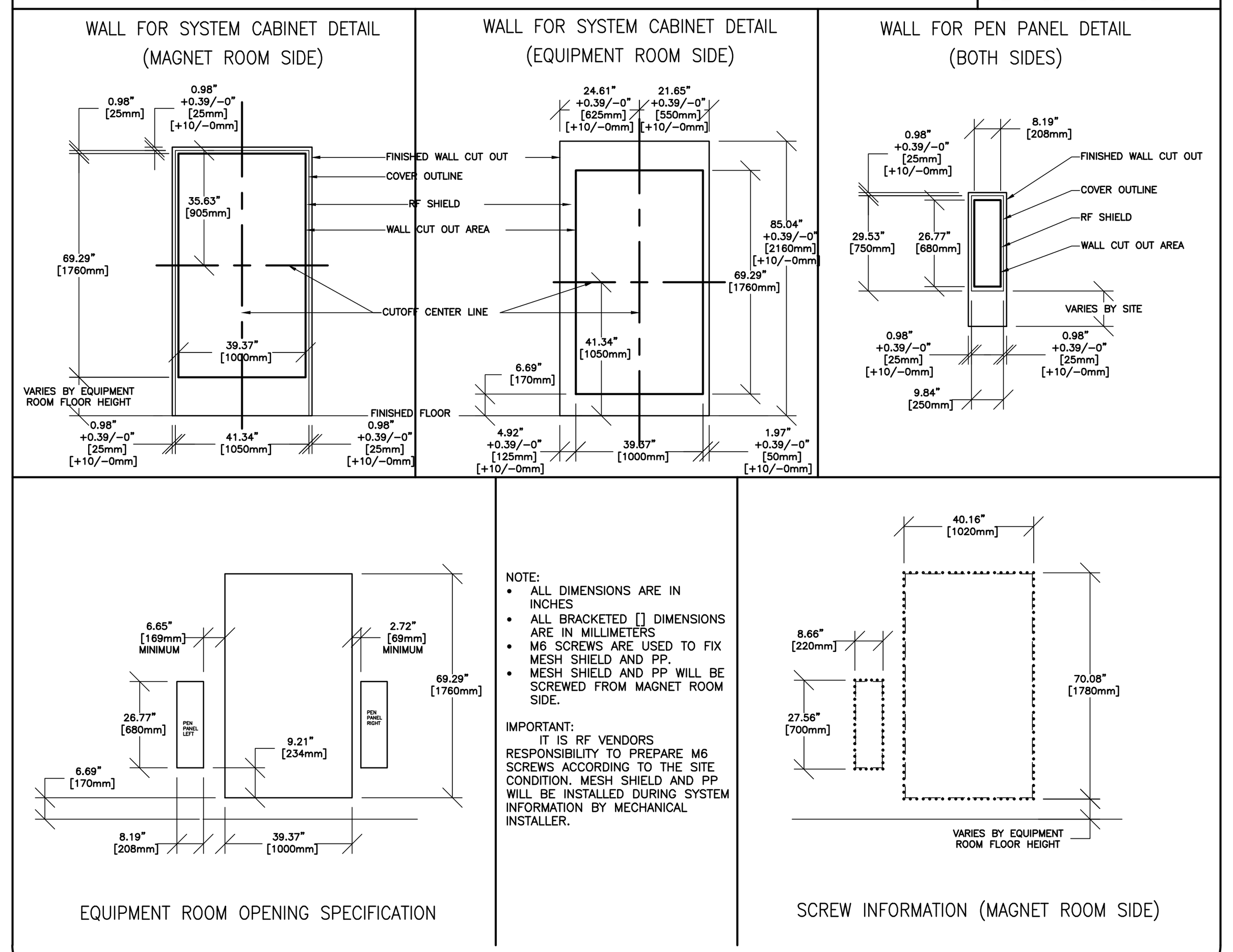
REV. DATE: 16.NOV.11



SUPPORT DETAIL
RF SHIELD AND WALL OPENING INFORMATION

B50–31V

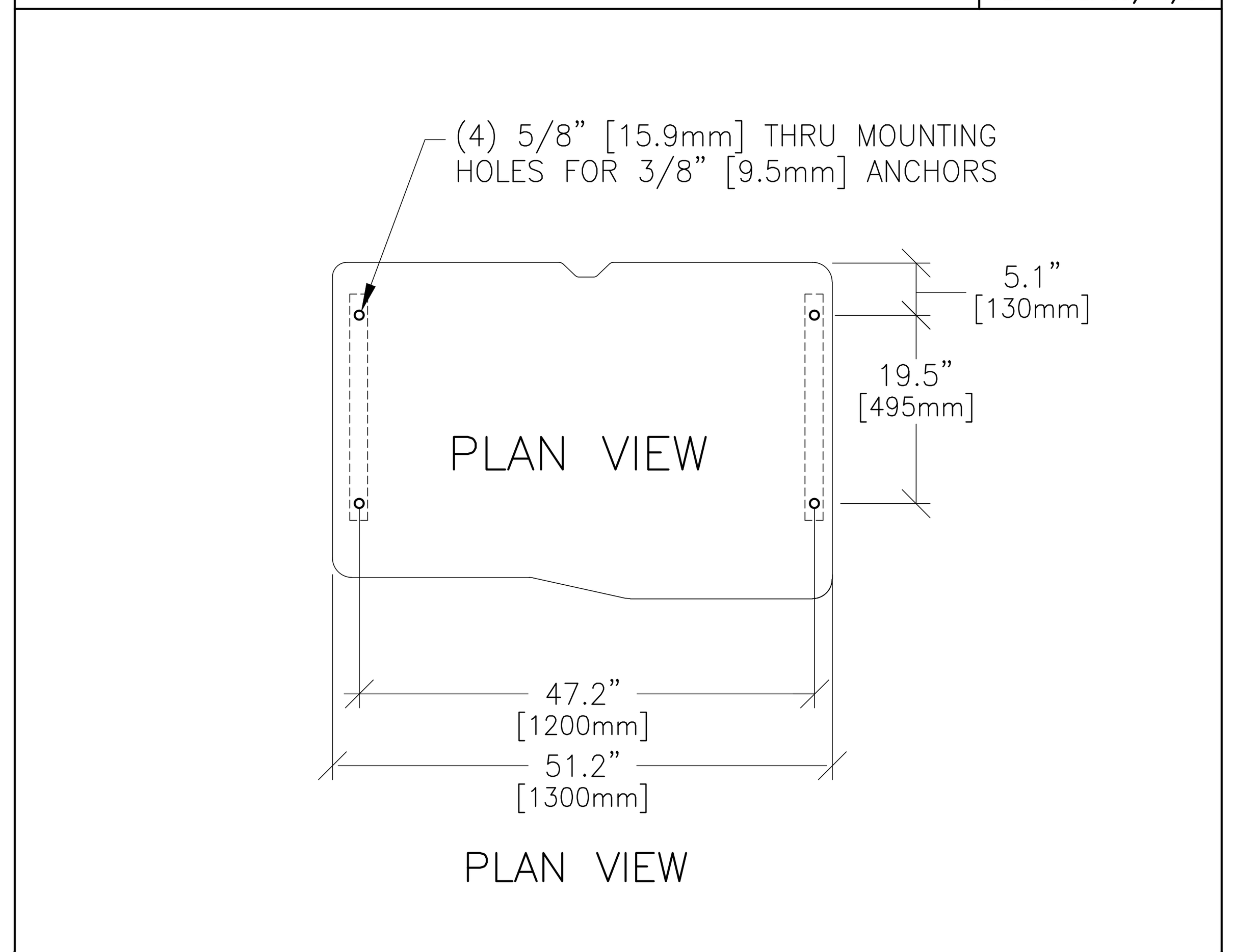
REV. DATE: 06.SEP.14



SUPPORT DETAIL
OPERATOR WORKSPACE FLOOR MOUNTING

M05–15K

REV. DATE: 09/11/09



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:

- OPERATOR AREA .... 80 dBA
- EQUIPMENT ROOM .... 80 dBA
- 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

- 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.
- 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.
- 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

- 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

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

- FREQUENCY AVERAGE A MINIMUM OF 20 LINEAR AVERAGES. DO NOT USE PEAK HOLD OR 1/3 OCTAVE ANALYSIS.
- AVERAGE AND STORE A MINIMUM OF 10 PLOTS TO SUPPORT THE SITE VIBRATIONS CONSISTENCY.
- 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:

- DETERMINE THE SOURCE OF THE VIBRATION
- PROPOSE A SOLUTION TO THE PROBLEM
- 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.

FLOOR MOUNTING DETAIL: MAGNET

REFER TO SHEET A1 FOR ACTUAL MAGNET ORIENTATION

M6650

REV. DATE: 06.MAY.15

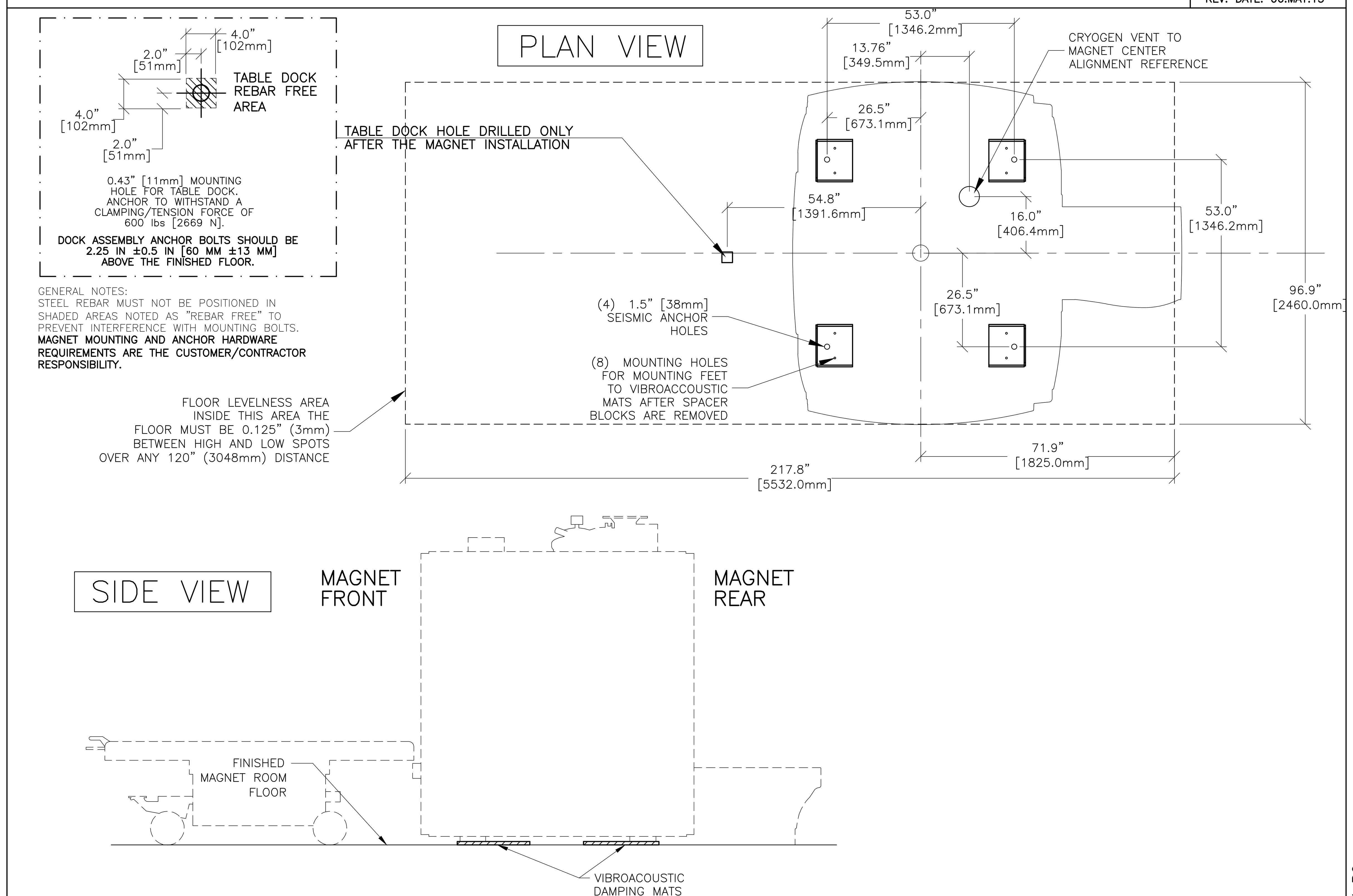
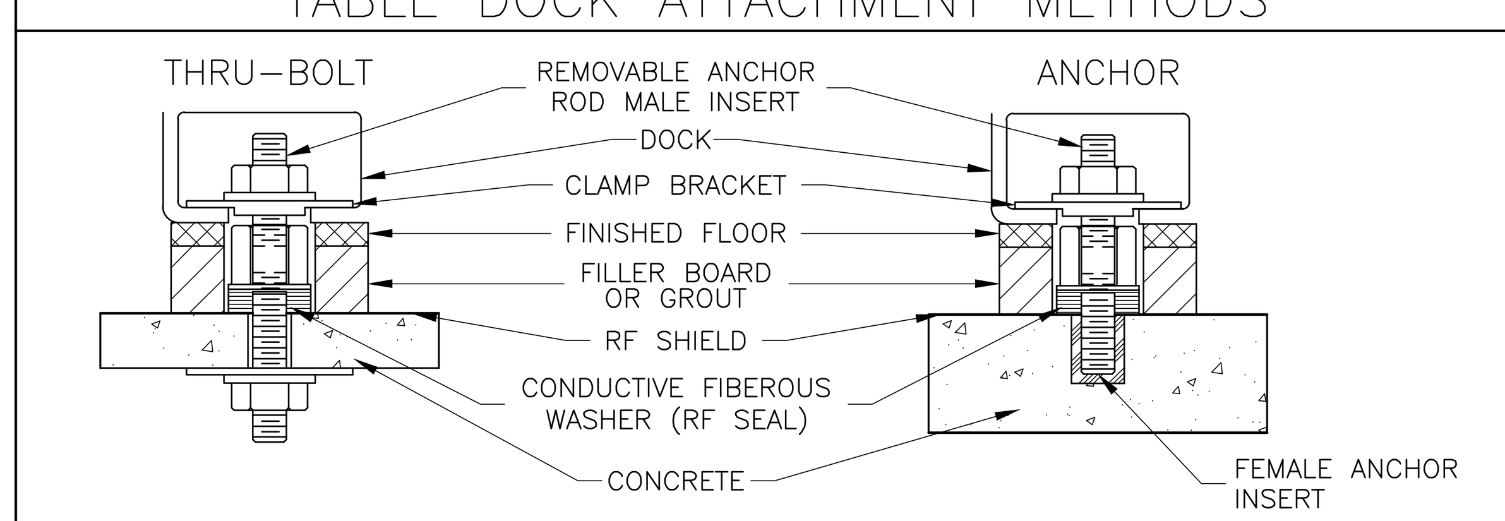


TABLE DOCK ATTACHMENT METHODS



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]	0–45 [0–1143]	0–3 [0–76]
	2 [9.8]	45–47 [1143–1194]	3–5 [76–127]
	3 [14.7]	47–52 [1194–1321]	5–10 [127–254]
	8 [39.2]	52–55 [1321–1397]	10–13 [254–330]
	20 [98.0]	55+ [1397+]	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.

PIM R6

RQ – 154968

GE Healthcare
Healthcare Project Implementation – Design Center
Milwaukee, Wisconsin

SHEET TITLE: STRUCTURAL DETAILS
MODALITY TYPE: OPTIMA MR360 ADVANCE / BRIVO MR355 INSPIRE

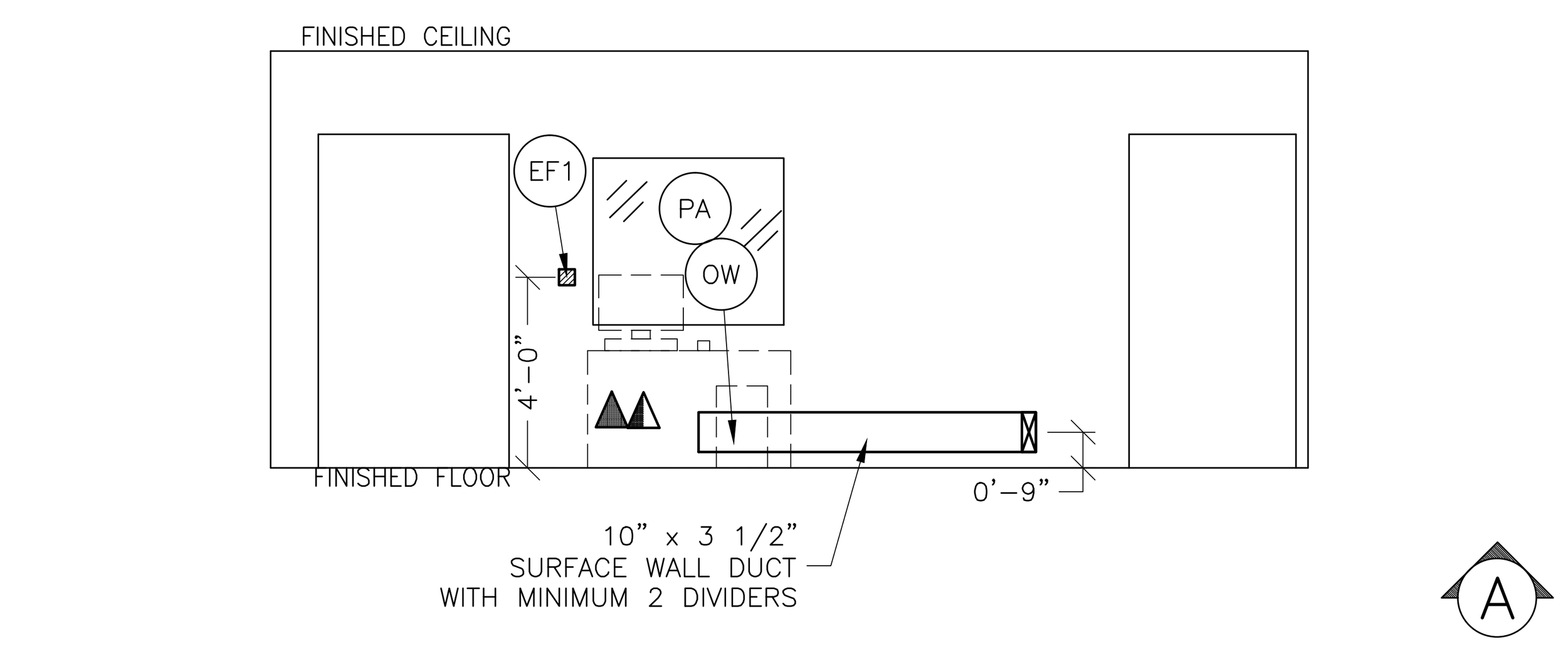
PROJECT TITLE: 8–250F TYPICAL LAYOUT

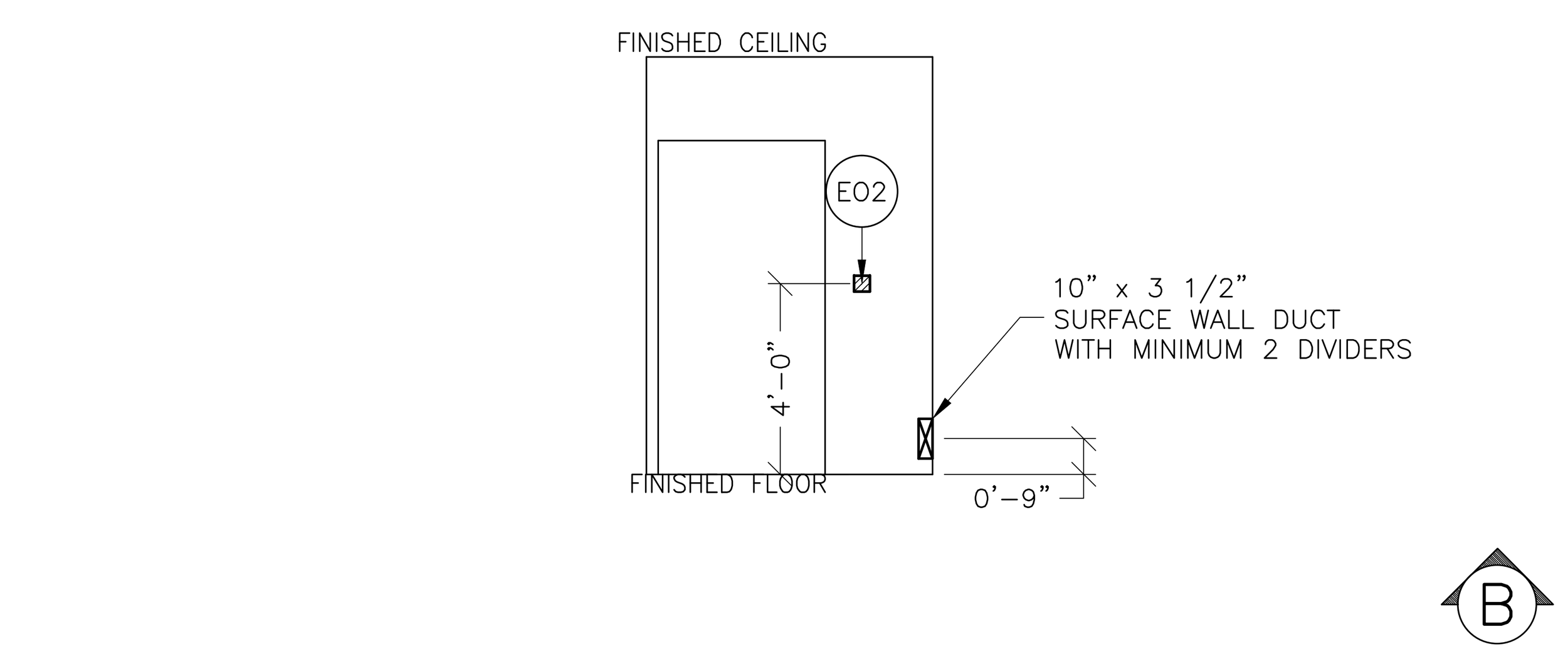
PROJECT	REVISION
8–250f	00

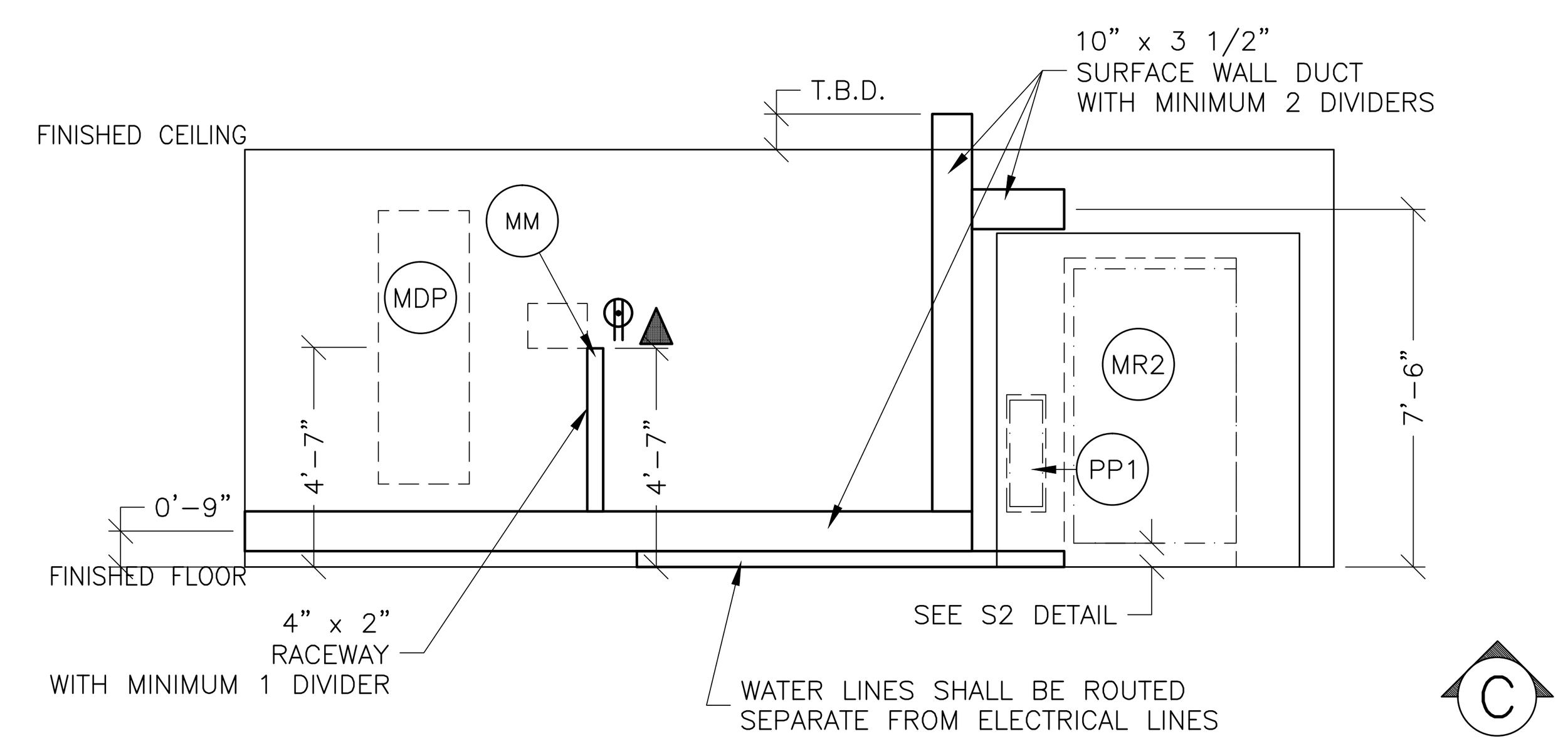
DATE: 24.Sep.15
DRAWN BY: PMM
CHECKED BY: PMM

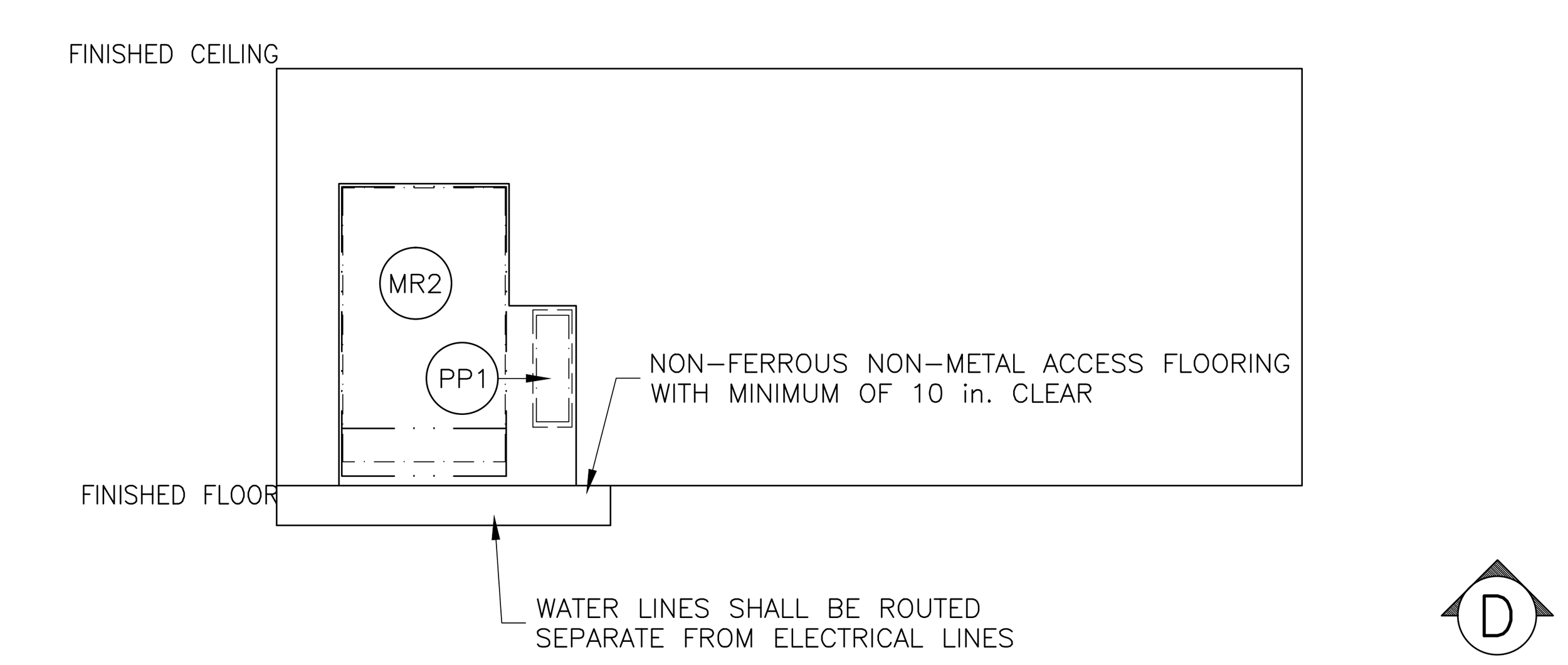
REVISION HISTORY:

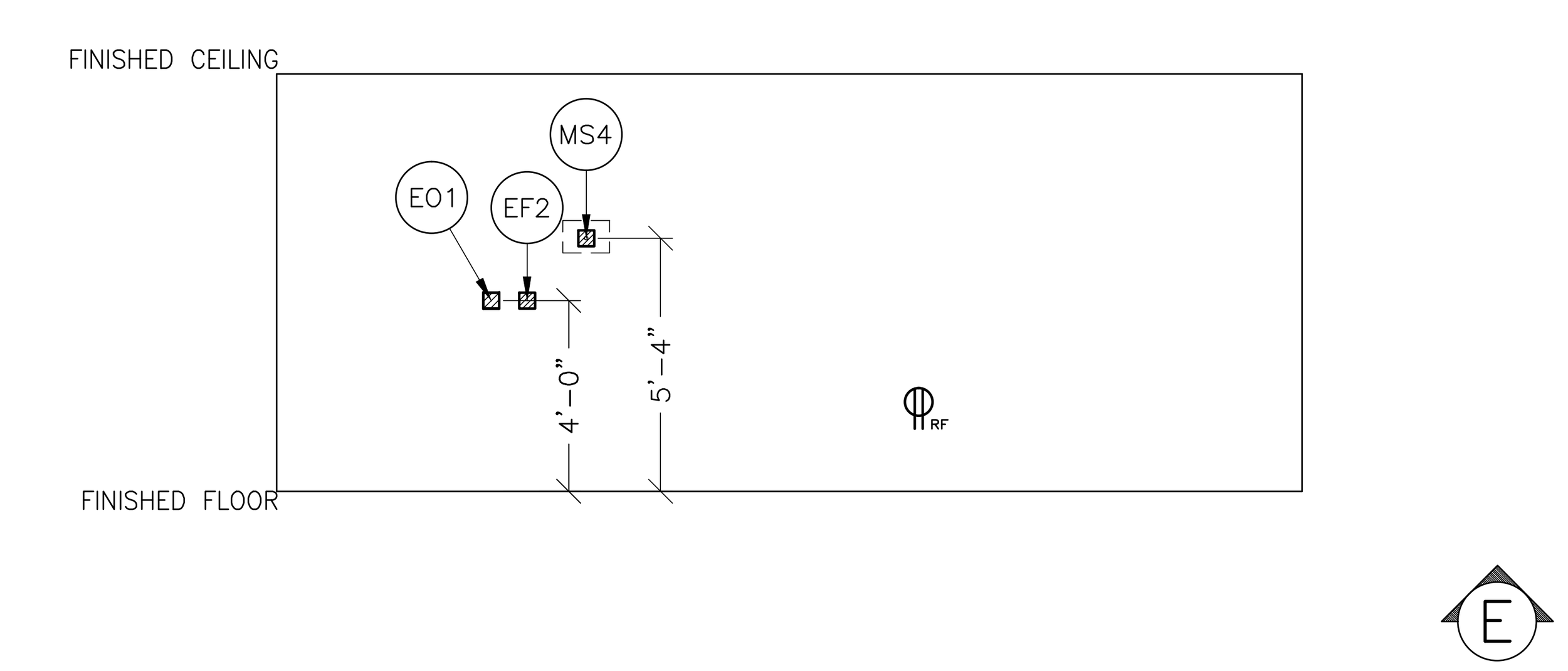
SHEET S2











FEEDER TABLE – COOLING TYPE B

- 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 PD USING NO.2 AWG [35 SQ mm].
- 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 POWER DISTRIBUTION UNIT.
- **FOR A FULL SYSTEM UPS REFER TO ELECTRICAL DETAILS FOR UPS FEEDER WIRES.**
- * MINIMUM WIRE SIZE FOR CIRCUIT BREAKER, BASED ON RECOMMENDED OVERCURRENT PROTECTION

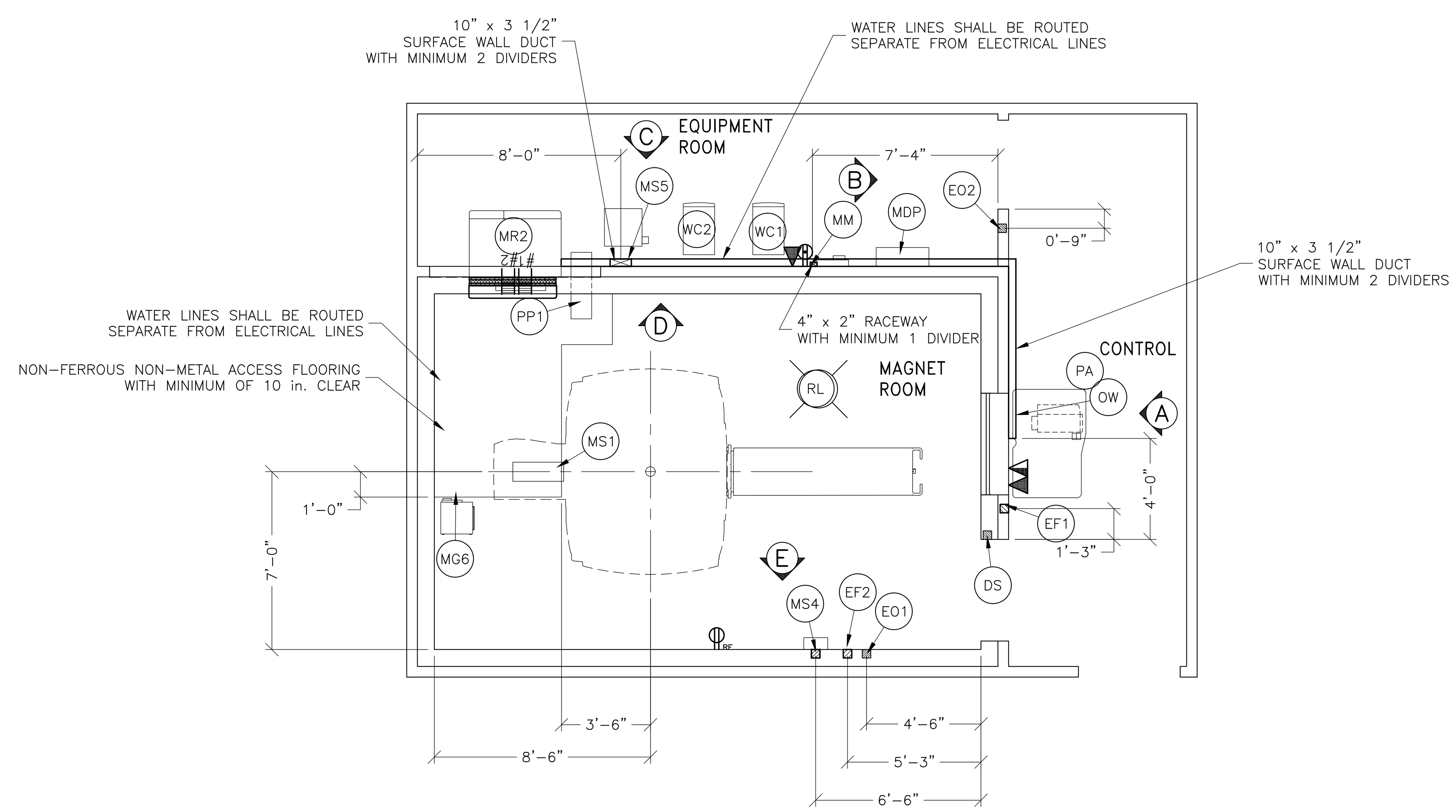
RUN LENGTH IN FEET	POWER SUPPLY VOLTAGE 342–418 380		360–440 400		374–456 415		**432–528 480**	
	FEEDER	GROUND	FEEDER	GROUND	FEEDER	GROUND	FEEDER	GROUND
100	* 1/0	6	* 1/0	6	* 1/0	6	*** 1/0**	**6**
150	* 1/0	6	* 1/0	6	* 1/0	6	*** 1/0**	**6**
200	* 1/0	6	* 1/0	6	* 1/0	6	*** 1/0**	**6**
250	* 1/0	6	* 1/0	6	* 1/0	6	*** 1/0**	**6**
300	* 1/0	6	* 1/0	6	* 1/0	6	*** 1/0**	**6**
350	* 1/0	6	* 1/0	6	* 1/0	6	*** 1/0**	**6**
400	1/0	6	* 1/0	6	* 1/0	6	*** 1/0**	**6**
450	2/0	4	1/0	6	1/0	6	*** 1/0**	**6**

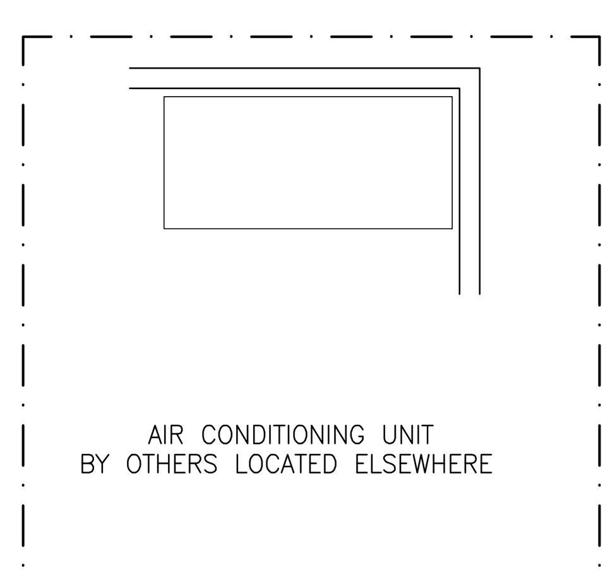
REV. DATE: 13.NOV.14

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.

Symbol	Description
Duplex outlet	DUPLEX HOSPITAL GRADE, DEDICATED OUTLET 120-V, SINGLE PHASE POWER
Duplex outlet RF	DUPLEX HOSPITAL GRADE, DEDICATED OUTLET 120-V, SINGLE PHASE OUTLET ROUTED THROUGH RF FILTER
Duplex outlet (dot)	DUPLEX HOSPITAL GRADE, DEDICATED OUTLET 120-V EMERGENCY, SINGLE PHASE POWER, 15A
Half-shaded triangle	NETWORK OUTLET
Shaded triangle	DEDICATED TELEPHONE LINES/NETWORK CONNECTION

ADDITIONAL CONDUIT RUNS (CONTRACTOR SUPPLIED AND INSTALLED)

CONDUITS REQUIRED FOR BASE SYSTEM

REV DATE: 17.Feb.15

From		To	Conduit
MDP	TO	FEEDER	ONE CND. AS REQ'D
MDP	TO	PD	ONE CND. AS REQ'D
MDP	TO	EO2	ONE 1/2" CND.
MDP	TO	PP1	ONE 3/4" CND.
MDP	TO	A/C	ONE 1/2" CND.
DS	TO	MR2	ONE 3/4" CND.
EO1	TO	PP1	ONE 3/4" CND.
MS4	TO	MS1	ONE 1" CND.
MS4	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

JUNCTION POINT DESCRIPTIONS

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

POINT	DESCRIPTION	QTY.	HARDWARE	DETAIL NO., SHT. E3
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
MDP	MAIN DISCONNECT * AVAILABLE FROM GEHC, CALL: 800-279-7925 OR LOCAL GE INSTALLATION PROJECT MGR.	1 1	12 IN. GROMMET MATERIAL FOR OPENING IN DUCT OR ACCESS FLOOR 3-POLE 480V DEVICE IN NEMA 1 ENCLOSURE. GEMS CAT. NO. M3088TM. TWO PUSHBUTTONS AND COVERS INCLUDED.	ELEC-178 ELEC-174
MG6	BLOWER BOX	1	40 IN. OF GROMMET MATERIAL FOR A 12 X 8 IN. OPENING IN ACCESS FLR	ELEC-10
MM	MAGNET MONITOR	1	FITTINGS AS REQUIRED	ELEC-78
MR2	SYSTEM CONTROL CABINET	1	32 IN. OF GROMMET MATERIAL FOR AN 8 X 8 IN. OPENING IN DUCT COVER	ELEC-5 ELEC-190
MS1	MAGNET	1	66 IN. OF GROMMET MATERIAL FOR A 24 X 9 IN. OPENING IN ACCESS FLR.	ELEC-10
MS4	MAGNET RUNDOWN UNIT	1 1	4 X 4 X 2 IN. BOX COVERPLATE WITH 1 IN. KNOCKOUT IN CENTER	ELEC-8
MS5	SHIELD COOLER CABINET	1	32 IN. OF GROMMET MATERIAL FOR AN 8 X 8 IN. OPENING IN DUCT COVER	ELEC-5 ELEC-6
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	
PP1	PENETRATION PANEL	1	GROMMET MATERIAL	
RL	MAGNET ROOM LIGHTS	1 1 1	LOCKNUT BOX AS REQUIRED INCANDESCENT LIGHT FIXTURE	
WC1	COOLING UNIT FOR BODY COIL	1	12 IN. OF GROMMET MATERIAL FOR A 3 X 3 IN. OPENING IN DUCT COVER	ELEC-5 ELEC-6
WC2	COOLING UNIT FOR SYSTEM CABINET	1	12 IN. OF GROMMET MATERIAL FOR A 3 X 3 IN. OPENING IN DUCT COVER	ELEC-5 ELEC-6

CONTRACTOR SUPPLIED AND INSTALLED WIRING

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

WIRE RUN, FROM – TO	QUANTITY, WIRE SIZE/COLOR
RF FILTER > MS4	1-BLACK, 1-WHITE, 1-GREEN – (SIZE AS REQUIRED)
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)
EMERG PWR > CONVERTER	1-BLACK, 1-WHITE, 1-GREEN – (SIZE AS REQUIRED)
RF GND STUD > RF FILTER	1-GREEN (SIZE AS REQUIRED FOR EACH FILTER)
MDP > PD	3-NO. 2 BLACK, 1-NO. 1/0 GREEN (MAX. 20 FT. [6095MM])
MDP > A/C UNIT	1-NO. 12 BLACK, 1-NO. 12 WHITE, 1-NO. 12 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
RF FAN > EF1	1-BLACK, 1-WHITE – (SIZE AS REQUIRED)
EF1 > EF2	1-BLACK, 1-WHITE – (SIZE AS REQUIRED)

PIM R6

RQ – 154968

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: OPTIMA MR360 ADVANCE / BRIVO MR355 INSPIRE

PROJECT TITLE: 8–250F TYPICAL LAYOUT

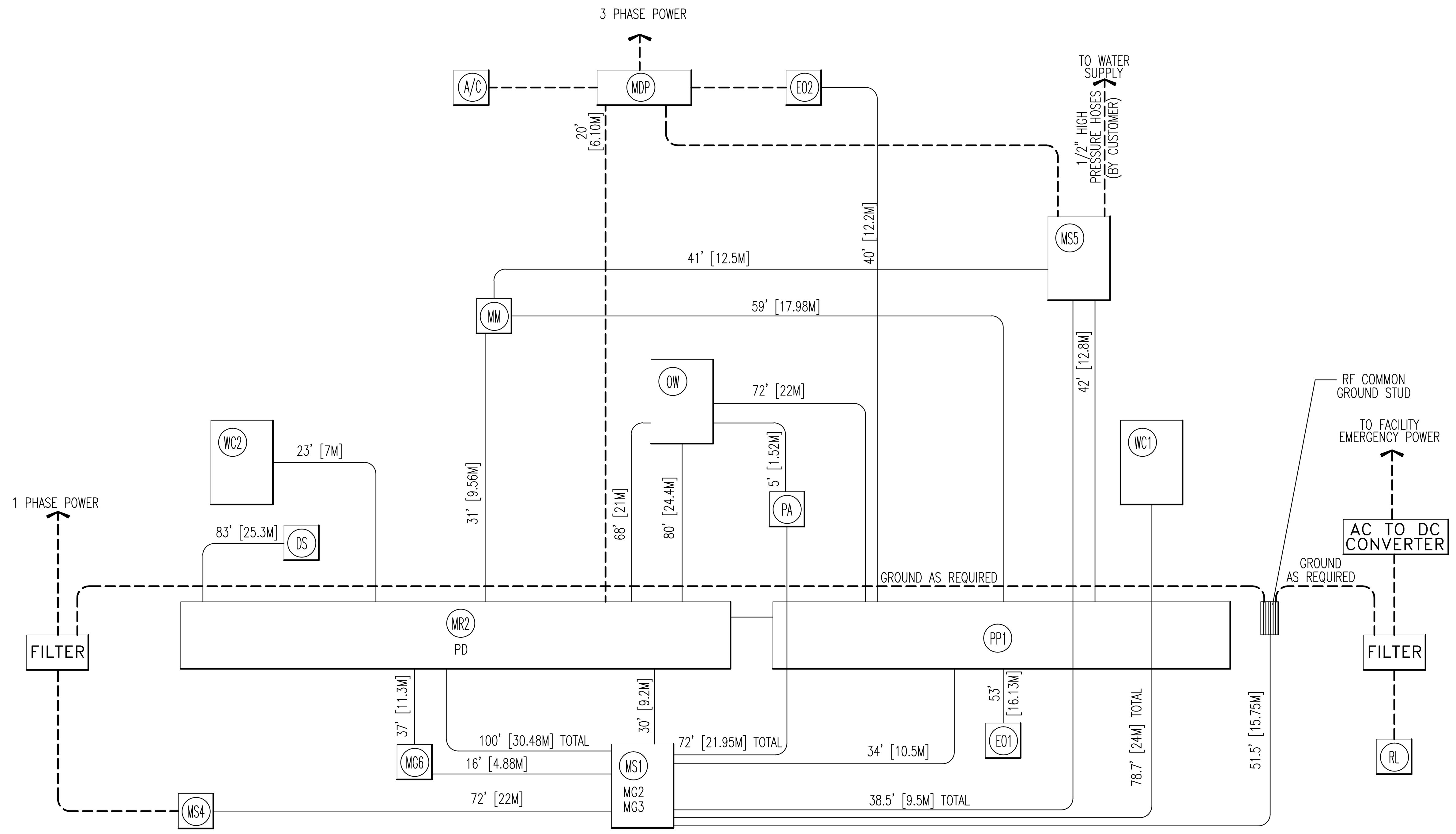
PROJECT	REVISION
8–250f	00

DATE: 24.Sep.15
DRAWN BY: PMM
CHECKED BY: PMM

REVISION HISTORY:

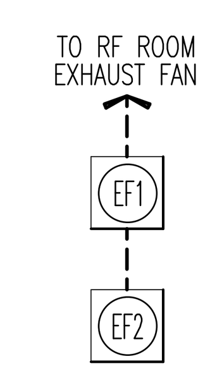
SHEET
E1

INTERCONNECT DIAGRAM



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

A PARTIAL LIST INCLUDES:
10" BETWEEN THE MR1 AND PP1
10" BETWEEN PP1 AND MS1
8" BETWEEN THE MS5 AND MS1
7" BETWEEN SYSTEM COOLING CABINET AND MS1.



POWER SPECIFICATIONS

SIGNA/OPTIMA/BRIVO (TYPE B)

(REV. DATE 13.NOV.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–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	66	51	90–A
400	360–440	63	48	90–A
415	374–456	61	47	90–A
480	**432–528**	**52**	**40**	**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 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 = 43.5 KVA.

SYSTEM EQUIPMENT	POWER DEMAND
PDU (IN SYSTEMS CABINET, MR2)	30 kVA
MAGNET MONITOR (MM)	4.5 kVA
SHIELD/CRYO COOLER COMPRESSOR (MS5)	9 kVA

TABLE B MAXIMUM POWER DEMAND.

DEMAND	MR355/ MR360
kVa *	43.5
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 112.5 KVA. REGULATED TRANSFORMER IS NOT REQUIRED UNLESS VOLTAGE CHANGES EXCEED ±10% OVER A PERIOD OF 1 HOUR OR LONGER.

REFER TO DIRECTION LISTED ON C1 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 – 154968 PIM R6

GE Healthcare

Healthcare Project Implementation – Design Center
Milwaukee, Wisconsin

SHEET TITLE: ELECTRICAL SPECIFICATIONS

MODALITY TYPE: OPTIMA MR360 ADVANCE / BRIVO MR355 INSPIRE

PROJECT TITLE: 8–250F TYPICAL LAYOUT

PROJECT	REVISION
8–250f	00

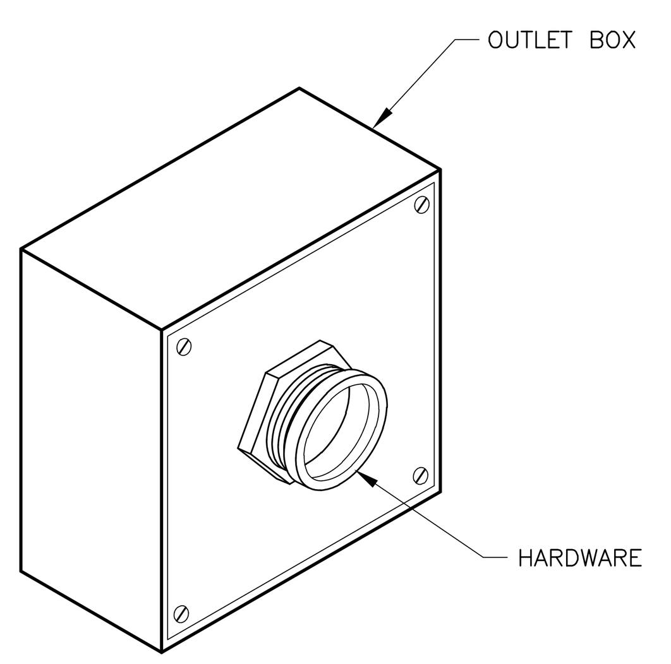
DATE: 24.Sep.15
DRAWN BY: PMM
CHECKED BY: PMM

REVISION HISTORY:

SHEET E2

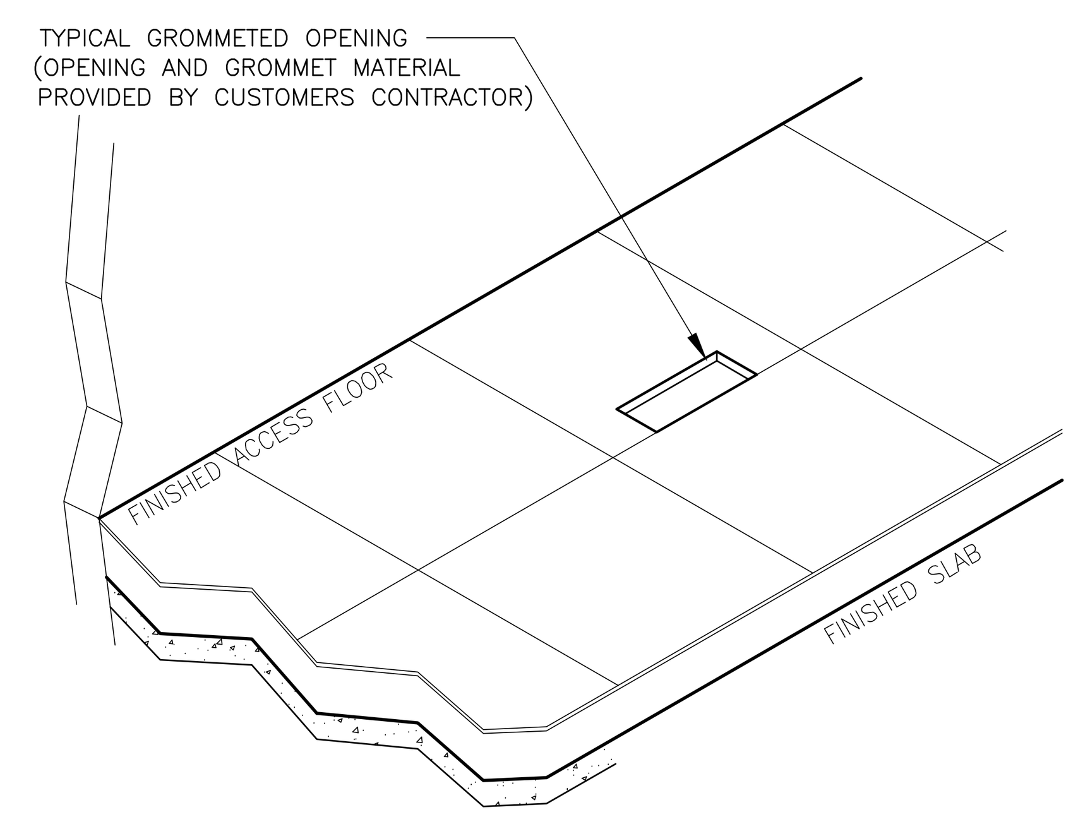
NFSH–1002

ELECTRICAL DETAIL
BOX WITH COVERPLATE (TYPICAL)
ELEC-8
REV. DATE: 09/30/94



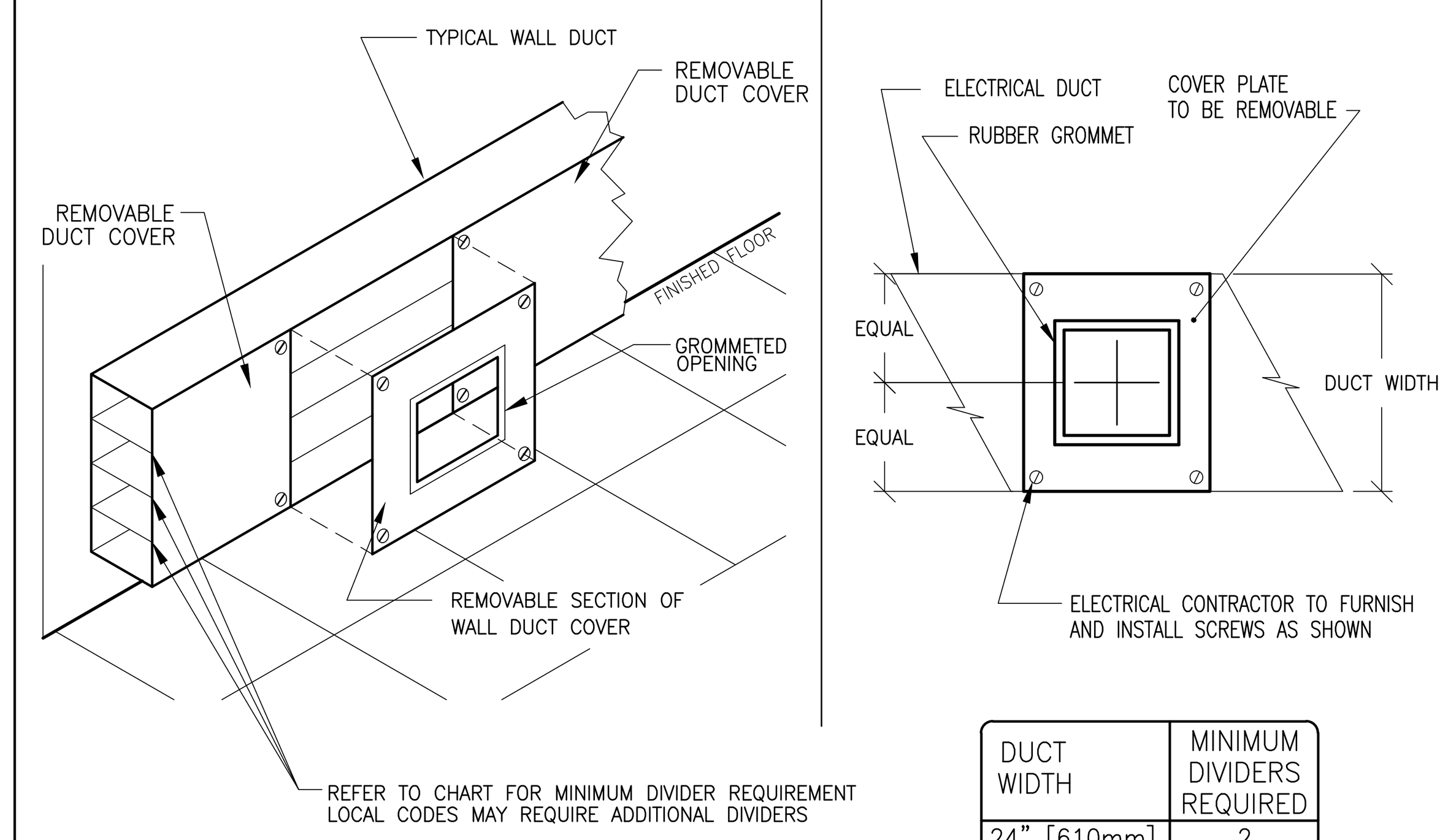
DETAIL NOT TO SCALE

ELECTRICAL DETAIL
GROMMETED OPENING – ACCESS FLOORING (TYPICAL)
ELEC-10
REV. DATE: 04/21/05



DETAIL NOT TO SCALE

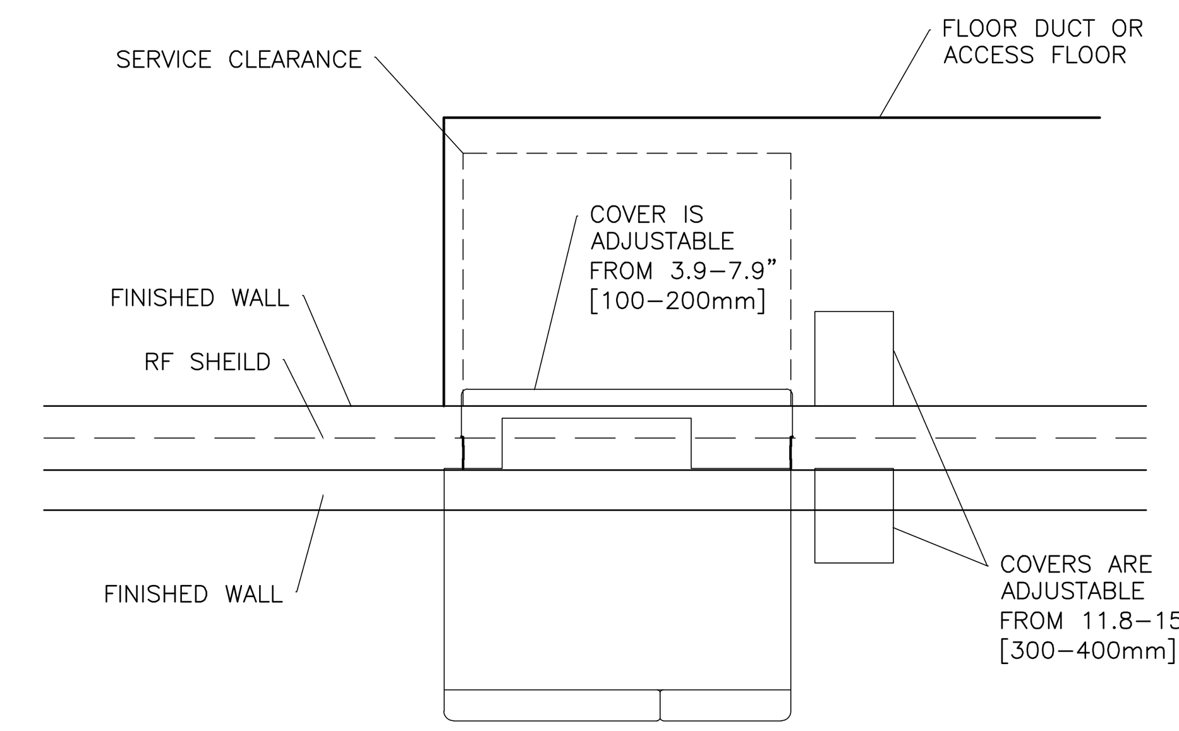
ELECTRICAL DETAIL
HORIZONTAL WALL DUCT (TYPICAL)
ELEC-5
REV. DATE: 03/19/04



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

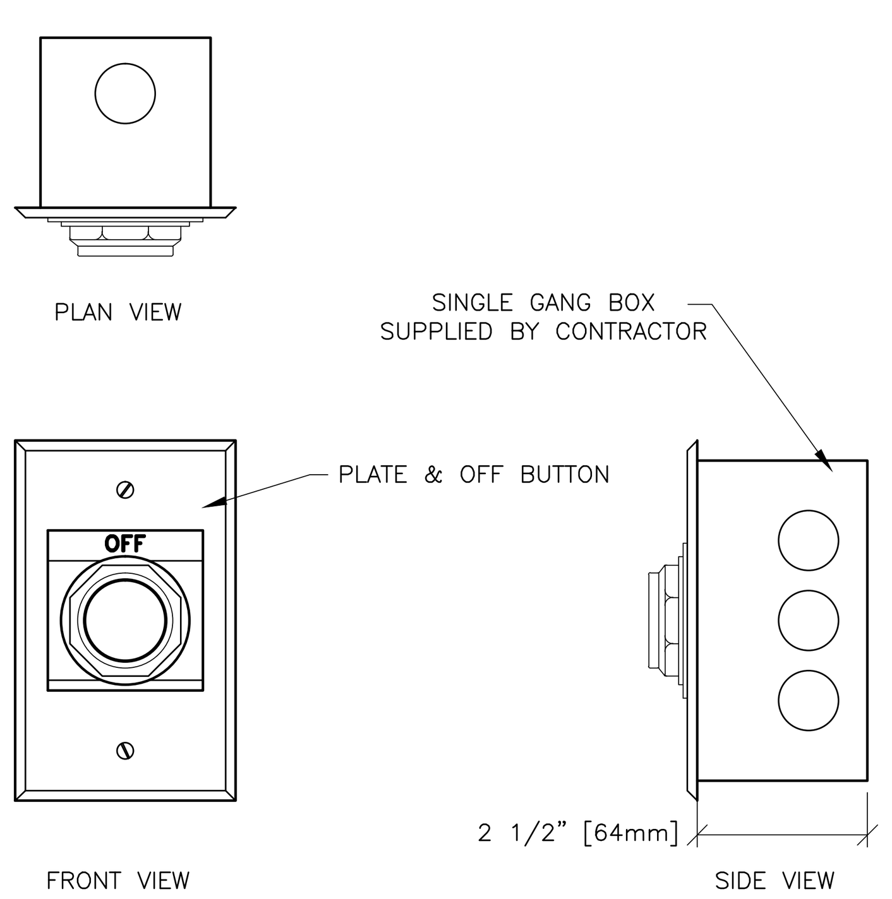
DETAIL NOT TO SCALE

ELECTRICAL DETAIL
FLOOR DUCT OR ACCESS FLOOR
ELEC-190
REV. DATE: 05.SEP.14



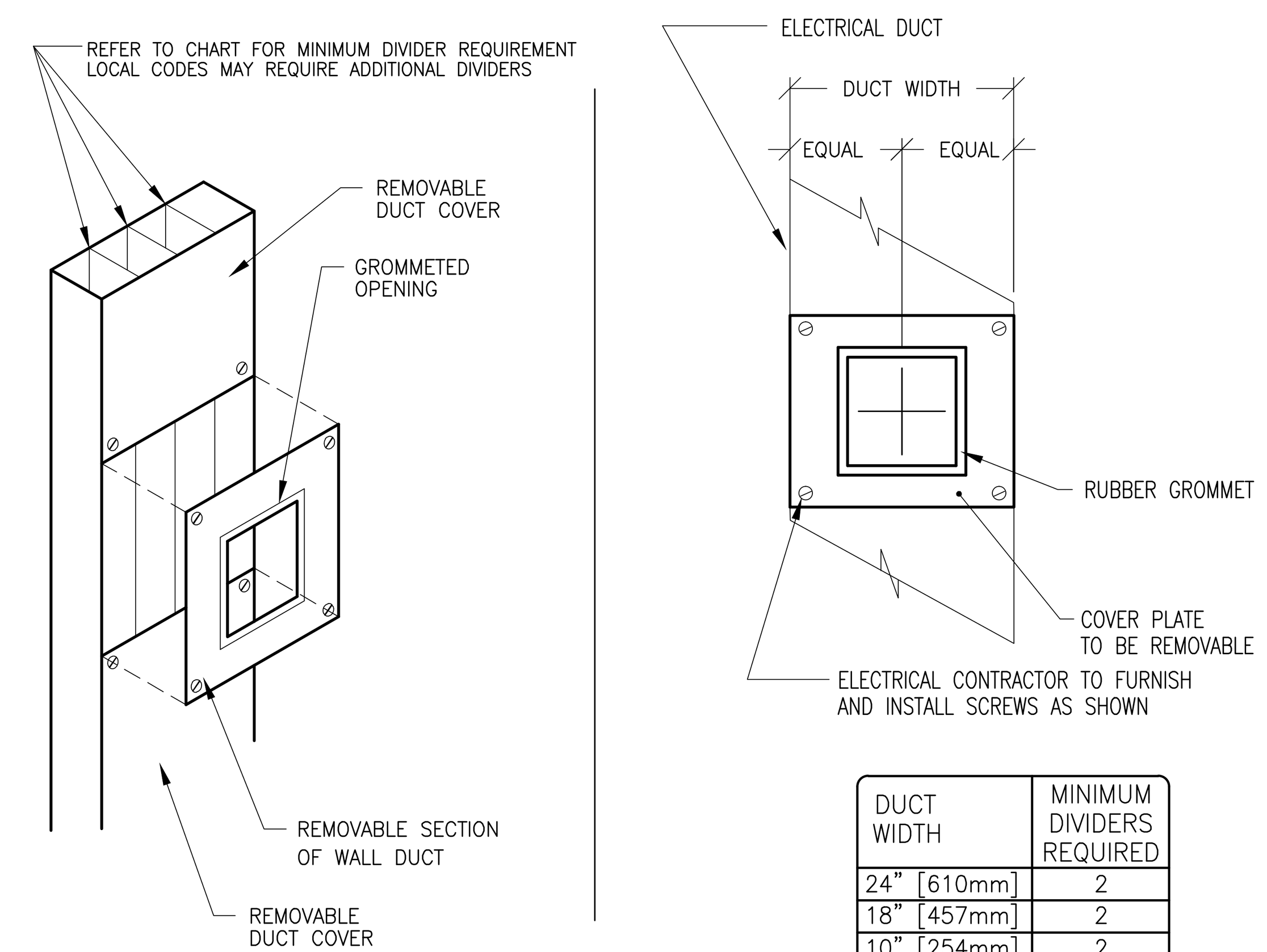
DETAIL NOT TO SCALE

ELECTRICAL DETAIL
EMERGENCY OFF BUTTON
ELEC-16
REV. DATE: 05/14/09



DETAIL NOT TO SCALE

ELECTRICAL DETAIL
VERTICAL WALL DUCT (TYPICAL)
ELEC-6
REV. DATE: 03/19/04

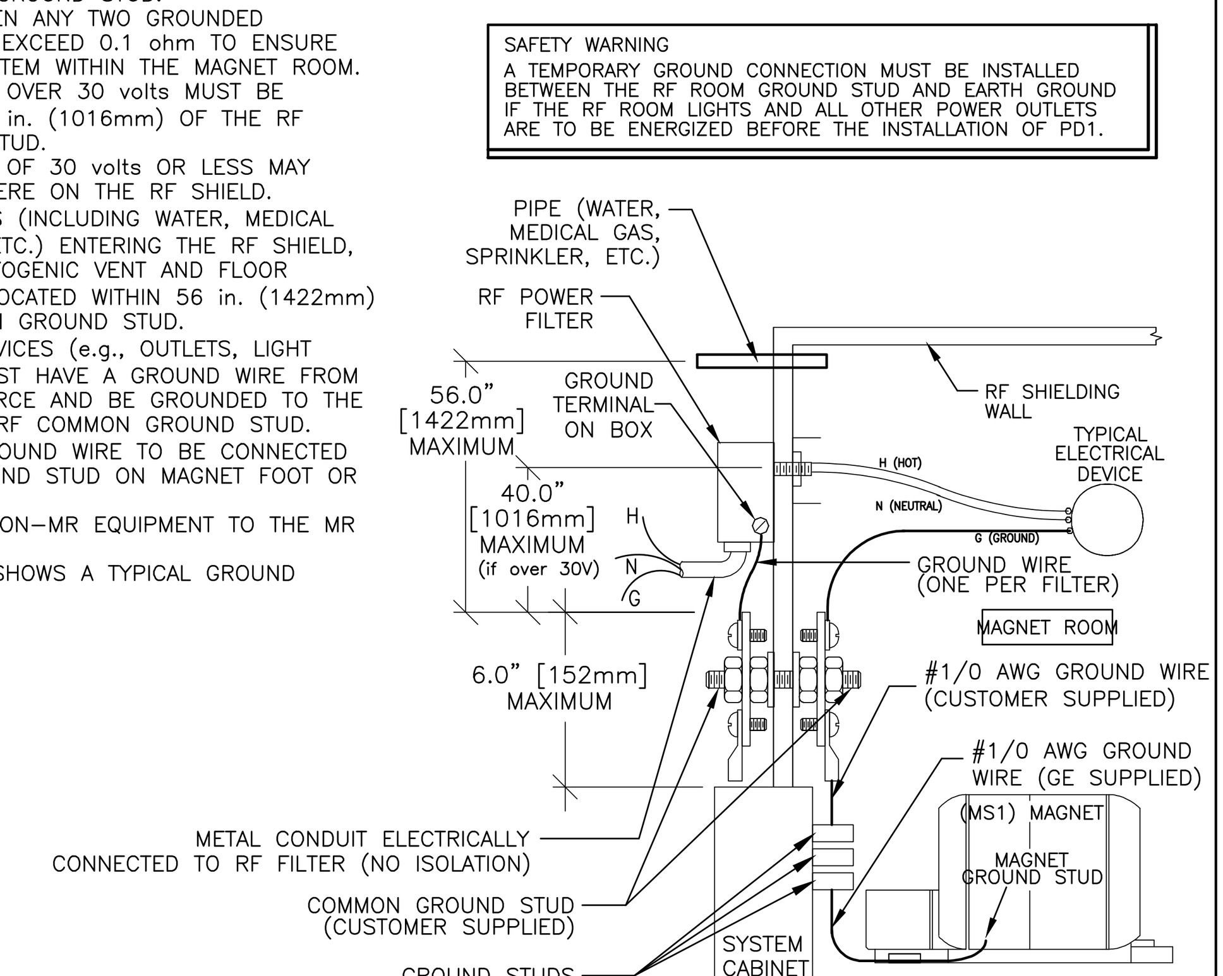


DUCT WIDTH	MINIMUM DIVIDERS REQUIRED
24" [610mm]	2
18" [457mm]	2
10" [254mm]	2
6" [152mm]	1
4" [102mm]	1

DETAIL NOT TO SCALE

ELECTRICAL DETAIL
TYPICAL MAGNET ROOM GROUNDING
ELEC-178
REV. DATE: 05.JUN.13

1. ALL ITEMS SHOWN ARE CUSTOMER SUPPLIED EXCEPT SYSTEM CABINET, MAGNET, AND #1/0 AWG GROUND WIRE BETWEEN SYSTEM CABINET GROUND STUD AND MAGNET GROUND STUD.
2. RESISTANCE BETWEEN ANY TWO GROUNDED DEVICES MUST NOT EXCEED 0.1 ohm TO ENSURE EQUAL GROUND SYSTEM WITHIN THE MAGNET ROOM.
3. RF POWER FILTERS OVER 30 volts MUST BE LOCATED WITHIN 40 in. (1016mm) OF THE RF COMMON GROUND STUD.
4. RF POWER FILTERS OF 30 volts OR LESS MAY BE LOCATED ANYWHERE ON THE RF SHIELD.
5. 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 in. (1422mm) OF THE RF COMMON GROUND STUD.
6. 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.
7. ONE #1/0 AWG GROUND WIRE TO BE CONNECTED TO ONLY ONE GROUND STUD ON MAGNET FOOT OR CRYOSTAT.
8. DO NOT GROUND NON–MR EQUIPMENT TO THE MR GROUND SYSTEM.
9. THE ILLUSTRATION SHOWS A TYPICAL GROUND LAYOUT.



ELECTRICAL DETAIL
PROTECTIVE DISCONNECT SETUP
ELEC-174
REV. DATE: 12.MAR.14

NOTES:
RUNS 296 AND 297, & POWER CORDS FOR SHIELD/CRYO COOLER COMPRESSOR CABINET, MRCC, & MAGNET MONITOR EQUIPMENT (MAGNET MONITOR, UPS INPUT & OUTPUT, MODEM, OPTIONAL MULTIPLEXER) ARE GE SUPPLIED CABLES. ALL OTHER WIRING IS CUSTOMER SUPPLIED.

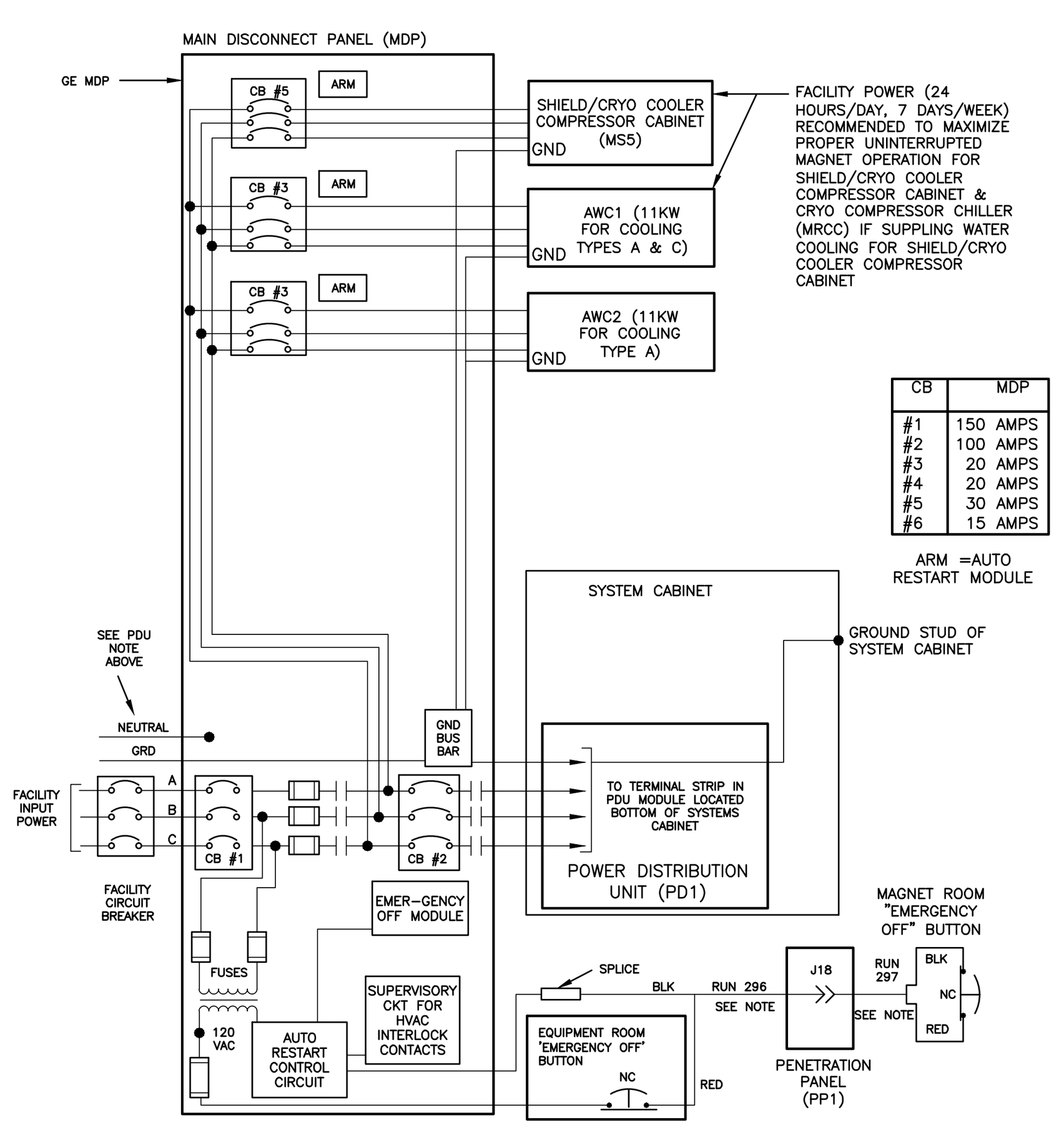
TWO REMOTE EMERGENCY "OFF" BUTTONS ARE SUPPLIED WITH GE MDP OPTION, EMERGENCY OFF BUTTONS ARE CUSTOMER SUPPLIED IF GE MDP OPTION NOT USED.

CIRCUIT BREAKERS ARE PROVIDED FOR PDU, CRYO COOLER COMPRESSOR CHILLER, GRADIENT CHILLER, SHIELD/CRYO COOLER COMPRESSOR CABINET, MAGNET MONITOR EQUIPMENT CIRCUITS.

ALL BRANCH CIRCUITS DROP OUT ON LOSS OF POWER. COLDHEAD MRCC, GRADIENT MRCC, SHIELD/CRYO COOLER COMPRESSOR CABINET, & MAGNET MONITOR EQUIPMENT AUTOMATICALLY RESTART AFTER 3 SEC TIME DELAY UPON RESTORATION OF POWER. EMERGENCY OFF LOCKS OUT ALL CONTACTORS.

IF 3 PHASE WYE WITH NEUTRAL AND GROUND (5 WIRE SYSTEM) INPUT USED THEN NEUTRAL MUST BE TERMINATED INSIDE THE MAIN DISCONNECT PANEL AND NOT BROUGHT TO THE POWER CABINET.

SUPERVISORY CIRCUIT FOR HVAC INTERLOCK CONTACTS OPEN ON LOSS OF DC POWER OR EMERGENCY OFF POSITION.



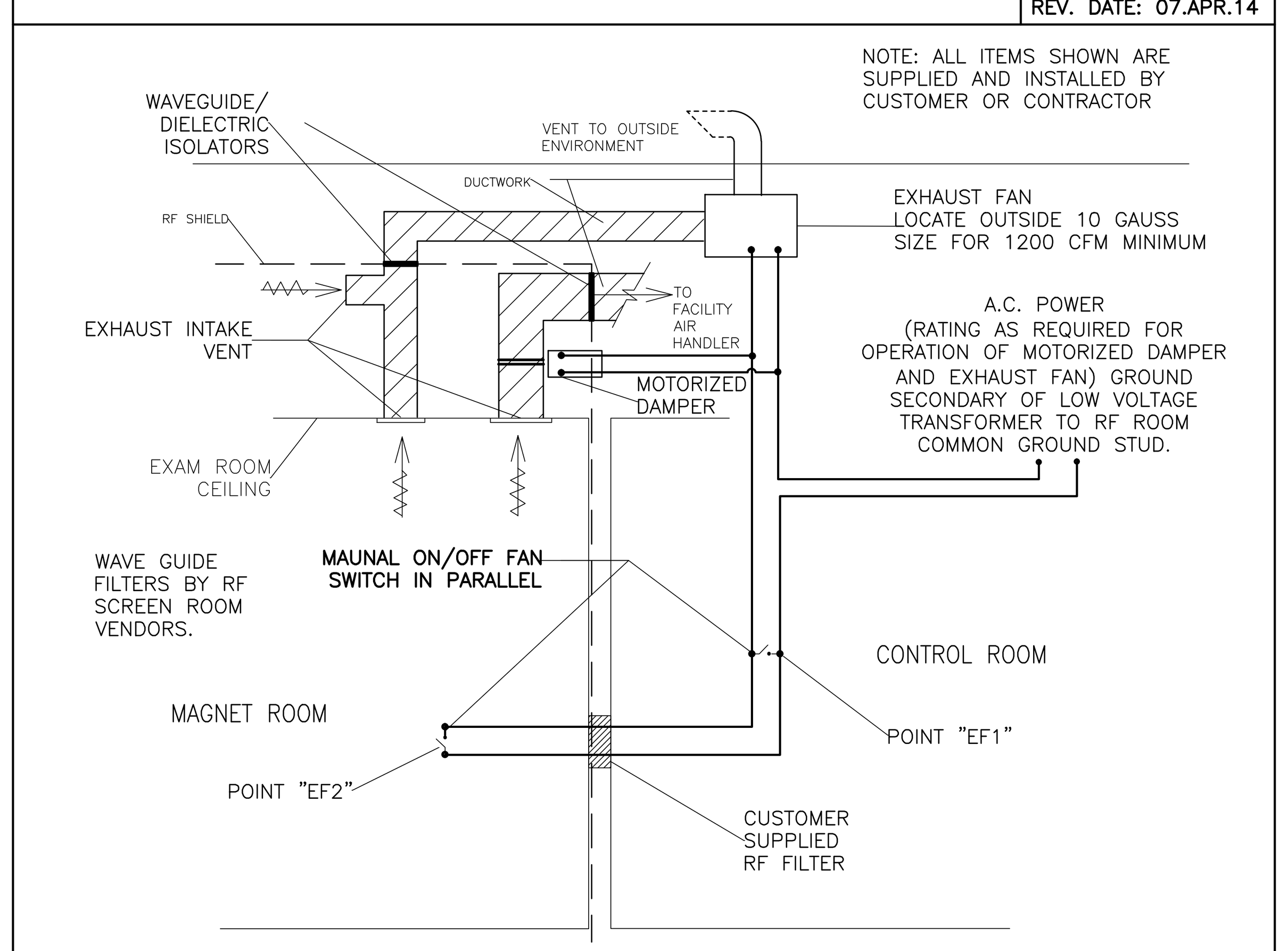
CB	MDP
#1	150 AMPS
#2	100 AMPS
#3	20 AMPS
#4	20 AMPS
#5	30 AMPS
#6	15 AMPS

ARM =AUTO RESTART MODULE

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)

PIM R6

RQ – 154968

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 DETAILS
MODALITY TYPE: OPTIMA MR360 ADVANCE / BRIVO MR355 INSPIRE

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: 8–250F TYPICAL LAYOUT

PROJECT	REVISION
8–250f	00

DATE: 24.Sep.15
DRAWN BY: PMM
CHECKED BY: PMM

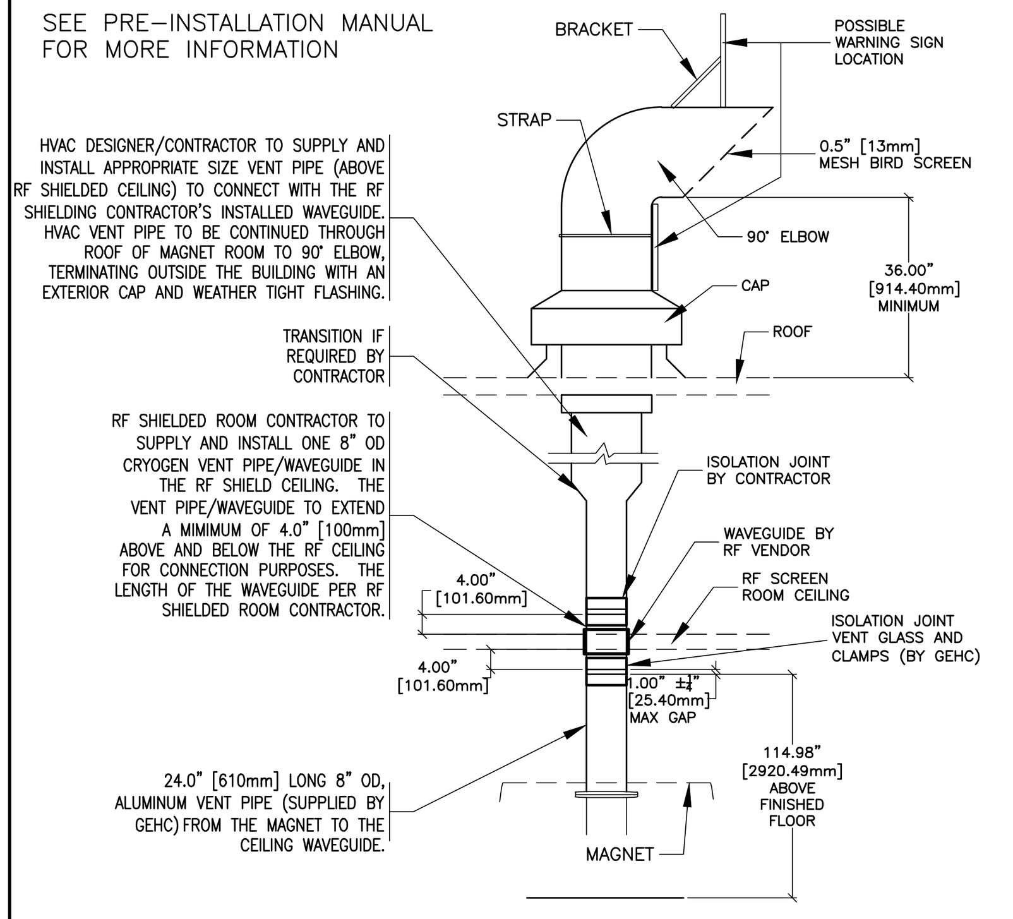
REVISION HISTORY:

SHEET
E3

TYPICAL CRYOGEN VENT PIPE DETAIL

MECH-01
REV. DATE: 20.MAR.15

SEE PRE-INSTALLATION MANUAL FOR MORE INFORMATION



DETAIL NOT TO SCALE

CUSTOMER SUPPLIED WARNING SIGN TO READ:

CAUTION
FREEZING GASES AND SMALL OBJECTS MAY BE DISCHARGED WITHOUT NOTICE
STAY AT LEAST 20 Ft.(6.1 m) AWAY.
*35FT (10.7M) FOR 3T

THIS SIGN MUST BE PLACED AT THE EXTERIOR EXIT POINT OF THE CRYOGEN VENT FOR THIS FACILITY. SEE TYPICAL CRYOGEN VENT PIPE DETAIL FOR POSSIBLE WARNING SIGN LOCATIONS.

THE FOLLOWING ARE MATERIALS THAT MUST BE USED FOR CONSTRUCTION OF THE VENT INSIDE THE MAGNET ROOM.
SS 304
AL 6061-T6
CU DWV,M OR L

NOTE:
VENTGLASS AND CLAMPS FOR 8 IN. [203mm] DIAMETER PIPE SUPPLIED BY GEHC.

NOTE:
THE VENT GLASS ISOLATION JOINT INSIDE THE MAGNET ROOM MUST BE A MAXIMUM OF 116" [2.95m] ABOVE THE FINISHED FLOOR .

NOTE:
GE SUPPLIES VENTGLASS & CLAMPS WHICH CAN BE USED FOR 8 IN. (203mm) DIAMETER PIPE ONLY. THESE MATERIALS MAY BE USED FOR ISOLATION JOINT OUTSIDE RF ROOM AT THE CONTRACTORS OPTION IF THE MATERIALS MEETS THE CONTRACTORS DESIGN REQUIREMENTS.
- THE MATING DIAMETERS MUST MATCH WITHIN ±0.125 IN (3mm)
- THE VENTGLASS MUST NOT BE USED FOR STRUCTURAL SUPPORT

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

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 (5.56)	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.

WATER COOLING SPECIFICATIONS

MECH-07
REV. DATE: 03/05/09

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

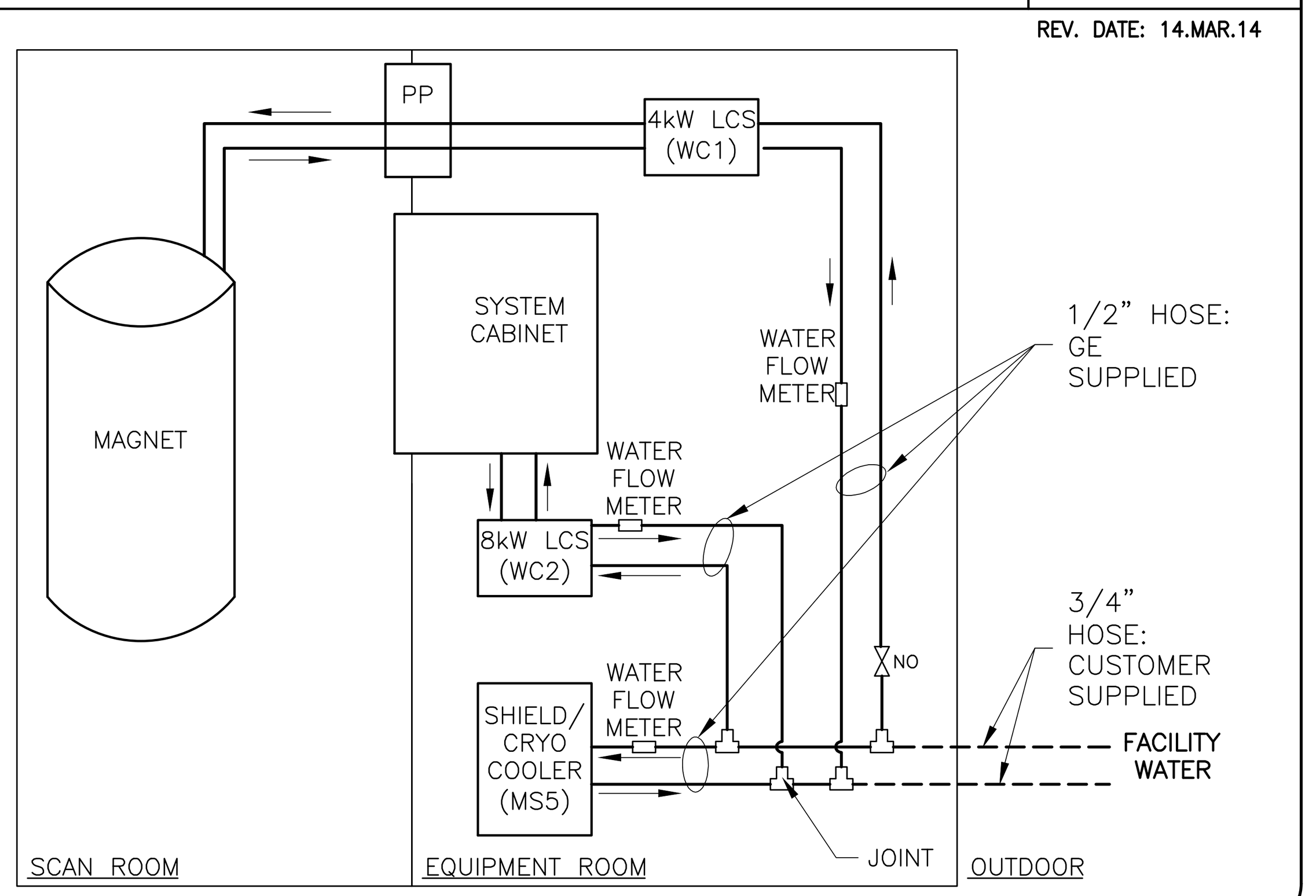
EQUIPMENT	INLET TEMPERATURE RANGE °F (°C)	INLET PRESS. psi (KPa)	RECOMMENDED FLOW RATE gal/min (liter/min) See Notes 3, 4	PRESS. DROP psi (KPa) See Note 1	TEMPERATURE RISE ▲°F ▲(°C) (At 60 Hz) See Notes 1, 4, 6	TYPICAL HEAT OUPUT BTU/Hr (WATTS) (At 60 Hz)	MAXIMUM HEAT OUPUT BTU/Hr (WATTS) (At 60 Hz)
SHIELD/CRYO COOLER COMPRESSOR **	39.2-82.4 (4-28)	MIN. 29(200)	MINIMUM 1.1 (4) See Notes 2, 3, 9	AT MIN FLOW RATE 9.5 (65.5) See Notes 2, 5, 9	AT MIN FLOW RATE 48.4 (26.9)	25590 (7500) See Note 6	28320 * (8300) See Note 6
		MAX. 100(690)	MAXIMUM 2.6 (10.0) See Notes 2, 3, 9	AT MAX FLOW RATE 49 (337.8) See Notes 2, 5, 9	AT MAX FLOW RATE 19.4 (10.8)		

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 SYTEM DESIGN MUST HAVE ALLOWANCES FOR PRESSURE/TEMPERATURE CHANGES DUE TO DISTANCE THE CHILLER IS LOCATED FROM THE EQUIPMENT.

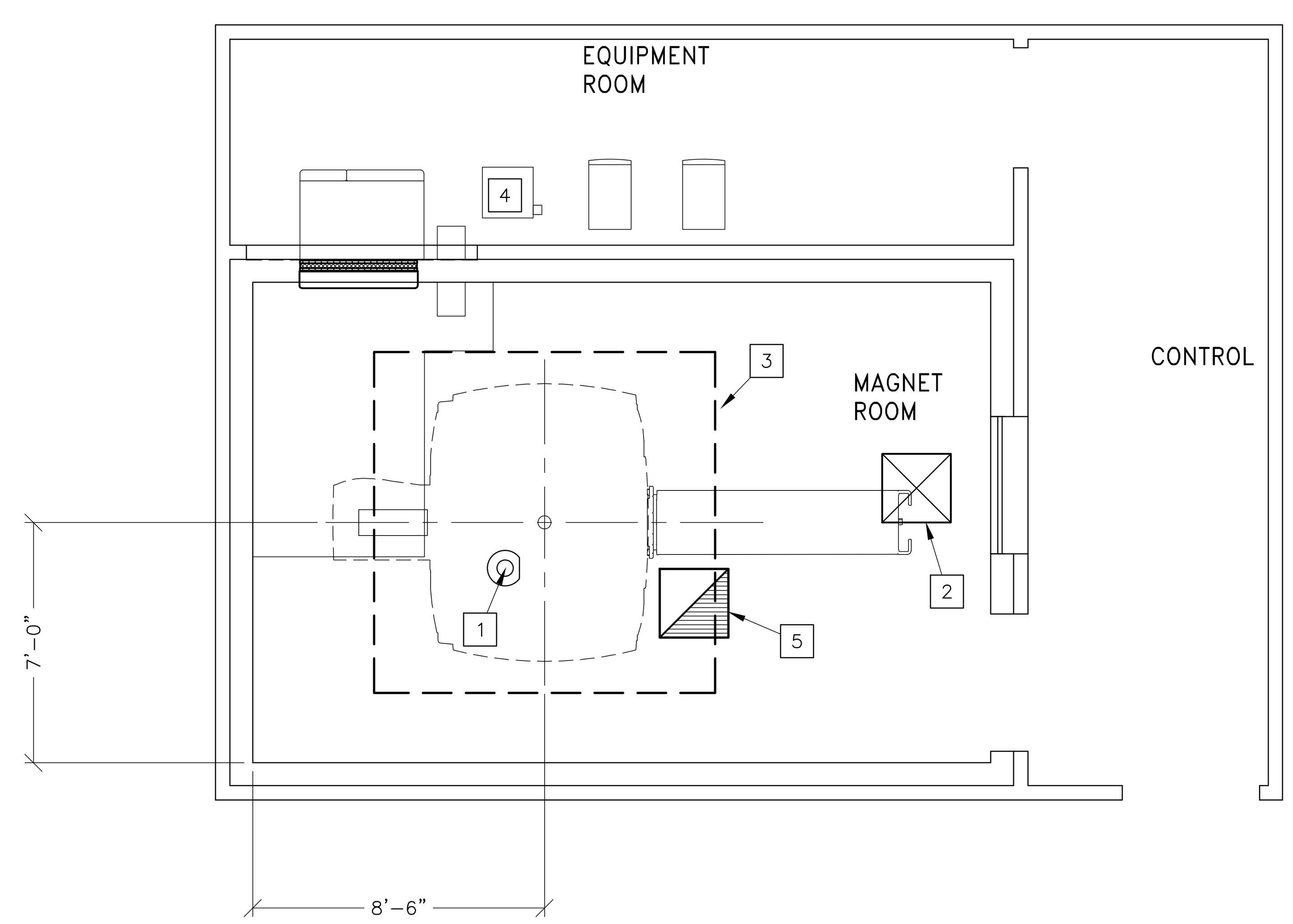
1. PRESSURE DROP AND WATER TEMPERATURE RISE ACROSS EQUIPMENT IS GIVEN FOR MINIMUM AND MAXIMUM RECOMMENDED FLOW RATES AS INDICATED. PRESSURE DROP IS MEASURED BETWEEN COOLANT INLET AND OUTLET AT COMPRESSOR UNIT.
2. WATER FLOWMETER KIT (46-294052G1) IS AVAILABLE TO CHECK/MONITOR FLOW RATE FOR THE SHIELD COOLER COMPRESSOR. ADD 2 psi TO TOTAL SYSTEM PRESSURE DROP IF FLOWMETER IS PERMANENTLY INSTALLED IN SYSTEM.
3. RECOMMEND A FLOWMETER BE PERMANENTLY INSTALLED IN SYSTEM, INCLUDE FLOWMETER DROP IN TOTAL SYSTEM PRESSURE DROP.
4. SHIELD COOLER COMPRESSOR WATER FLOW RATE IS BASED ON INLET WATER TEMPERATURE OF 82.4° F (28° C), LOWER TEMPERATURE PERMITS LOWER FLOW. SEE DETAIL M16-15E FOR GRAPHIC WATER TEMPERATURE AND FLOW RATE ADMISSIBLE RANGE.
5. MINIMUM FLOW RATE IS FOR CLEAN WATER WITHOUT ANTI-FREEZE, MAXIMUM FLOW RATE IS ANY MIXTURE OF WATER/ANTI-FREEZE.
6. WATER FLOW RATE AND TEMPERATURE RISE VALUE ARE BASED ON WATER. LABORATORY GRADE ETHYLENE GLYCOL OR PROPYLENE GLYCOL ANTI-FREEEZE MAY BE USED (DO NOT MIX ETHYLENE GLYCOL WITH PROPYLENE GLYCOL). PREFERRED CONCENTRATION IS 65% WATER AND 35% GYLCOL 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 WITH A RESULTANT INTERNAL PRESSURE INCREASE OF 40%.
7. PRESSURE DROP VALUES BASED ON NEW SYSTEM, MAY RISE DUE TO CALCIFICATION.
8. SHIELD/CRYO COOLER TEMPERATURE RISE, TYPICAL AND MAXIMUM HEAT OUTPUT ARE REDUCED BY 18% AT 50 Hz OPERATION.
9. 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.

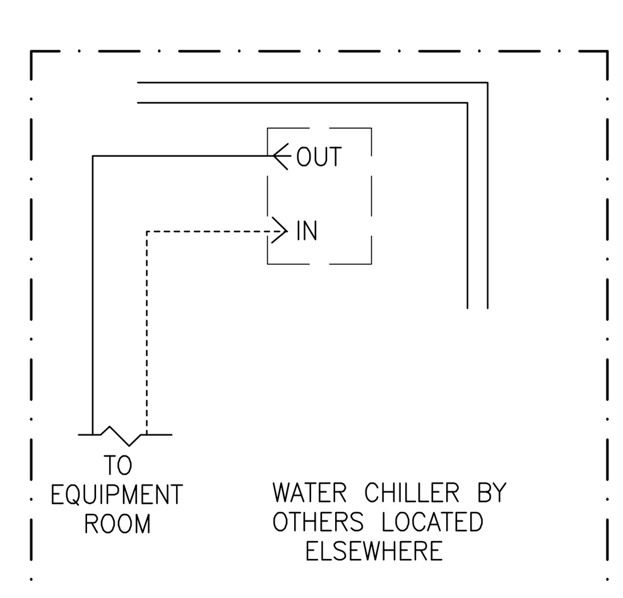
SYSTEM CHILLER PIPING (COOLING TYPE B)

MECH-51
REV. DATE: 14.MAR.14



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	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]. REFER TO 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.
2	MINIMUM 2 FT. x 2 FT. [0.61m x 0.61m] PRESSURE EQUALIZING WAVEGUIDE VENT IN THE MAGNET ROOM CEILING.
3	MINIMUM CEILING HEIGHT REQUIREMENT AREA. REFER TO MAGNET EQUIPMENT DETAILS FOR MORE INFORMATION
4	(2) 1/2" [13 mm] I.D. HIGH PRESSURE HOSES AND (4) 1" [25 mm] COMPRESSION CLAMPS. 150 MICRON FILTER, SHUT OFF VALVES AND BY-PASS VALVE AS REQUIRED. SEE SYSTEM CHILLER PIPING DETAIL. 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 MINIUMUM OF 25 PER CENT, MAXIMUM OF 50 PER CENT BY VOLUME. FOR WATER SPECIFICATIONS SEE WATER COOLING SPECIFICATIONS AND EQUIPMENT DETAIL M16-15E ON THE EQUIPMENT DETAIL SHEETS.
5	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

- o ALL PIPING, FITTINGS, SUPPORTS, HOSES, CLAMPS, VENTLATION SYSTEMS, ETC. ARE TO BE SUPPLIED AND INSTALLED BY THE CUSTOMER OR HIS CONTRACTORS.
- o 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.
- o 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

GE Healthcare
Healthcare Project Implementation - Design Center
Milwaukee, Wisconsin

SHEET TITLE: MECHANICAL LAYOUT
MODALITY TYPE: OPTIMA MR360 ADVANCE / BRIVO MR355 INSPIRE

PROJECT TITLE: 8-250F TYPICAL LAYOUT

PROJECT	REVISION
8-250f	00

DATE: 24.Sep.15
DRAWN BY: PMM
CHECKED BY: PMM

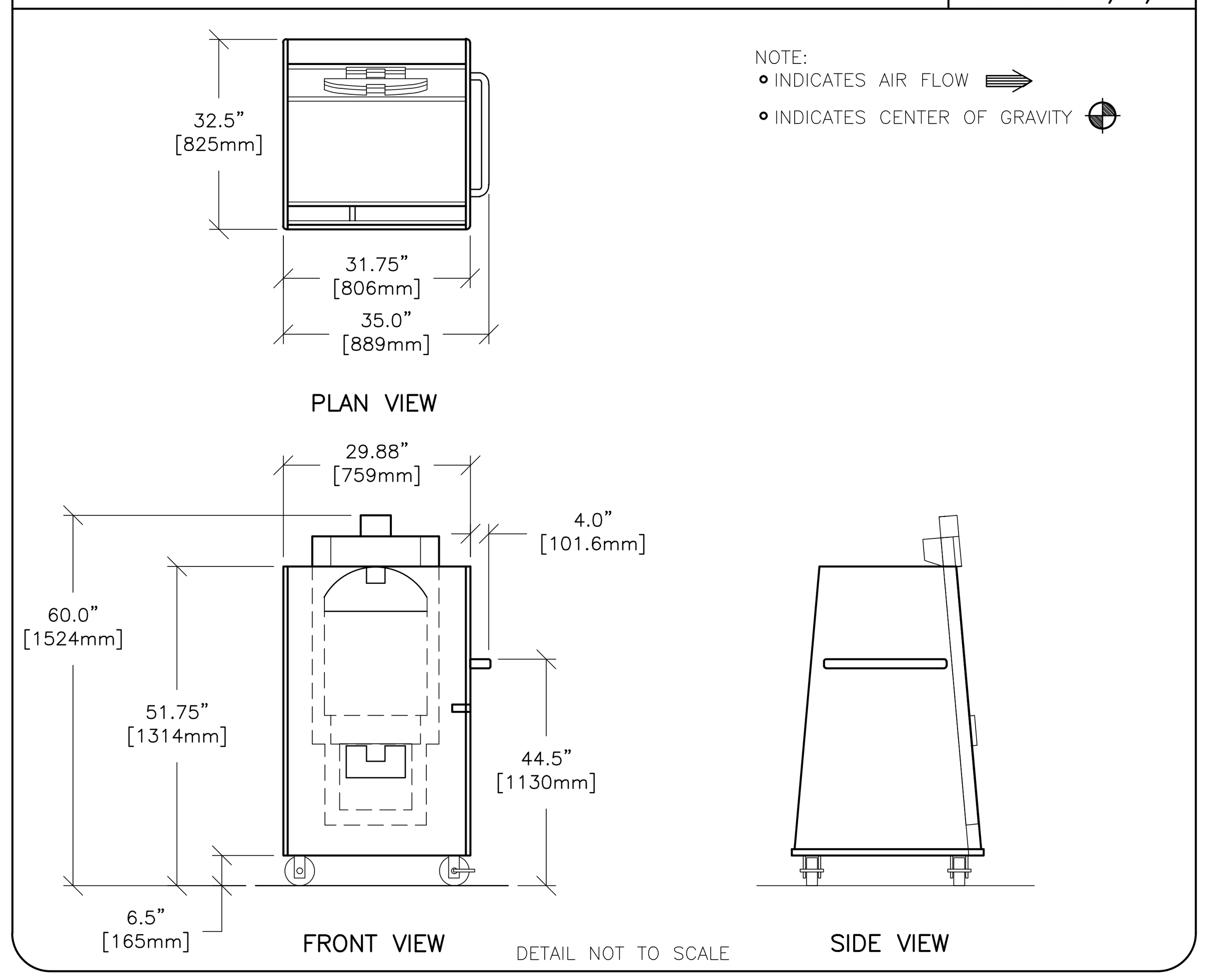
REVISION HISTORY:

RQ - 154968 PIM R6

SHEET
M1

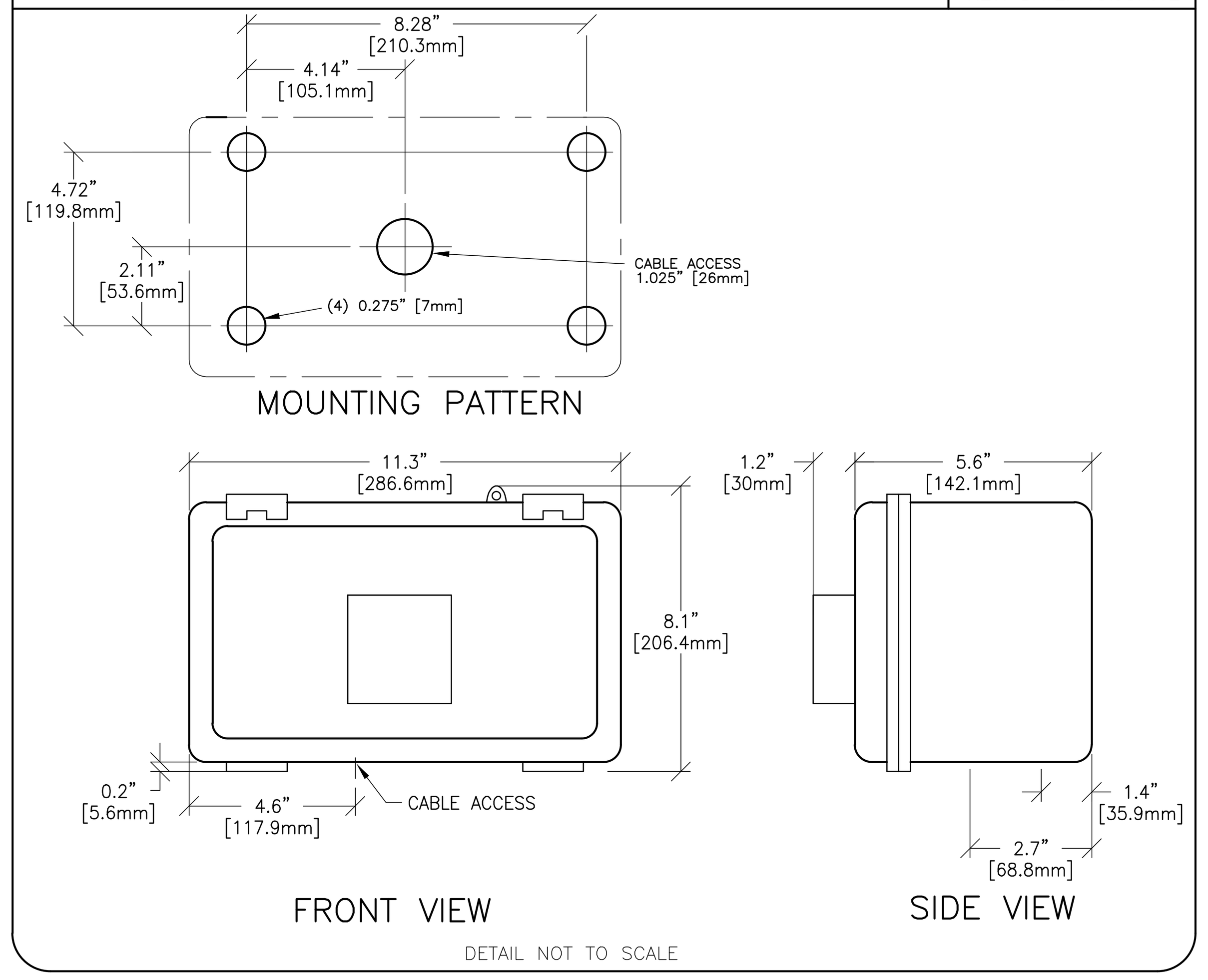
EQUIPMENT DETAIL
SPT PHANTOM STORAGE CABINET

M61–15
REV. DATE: 10/07/02



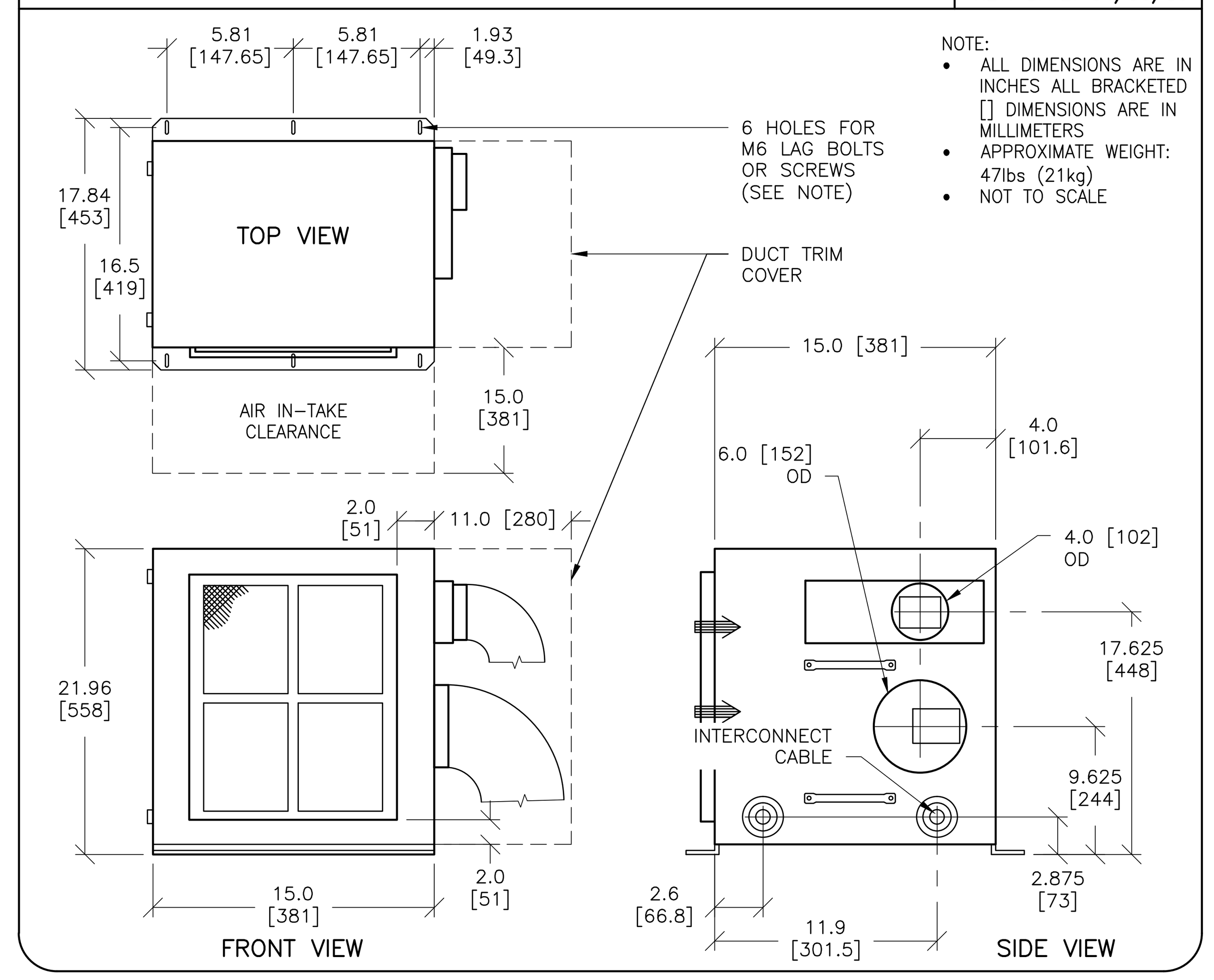
EQUIPMENT DETAIL
MAGNET RUNDOWN UNIT

M17–15C
REV. DATE: 19.JUN.12



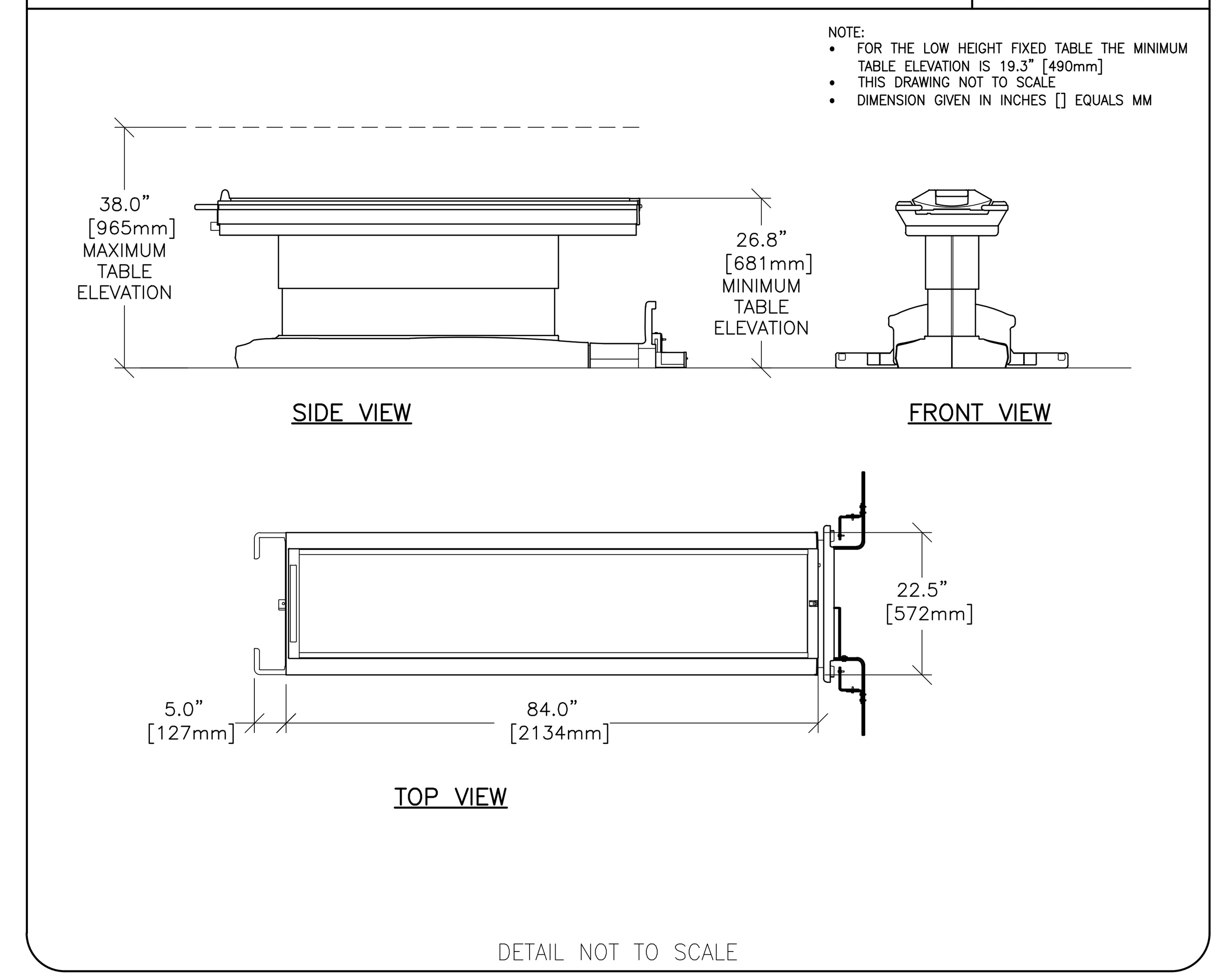
EQUIPMENT DETAIL
BLOWER BOX

M57–15
REV. DATE: 04/06/09



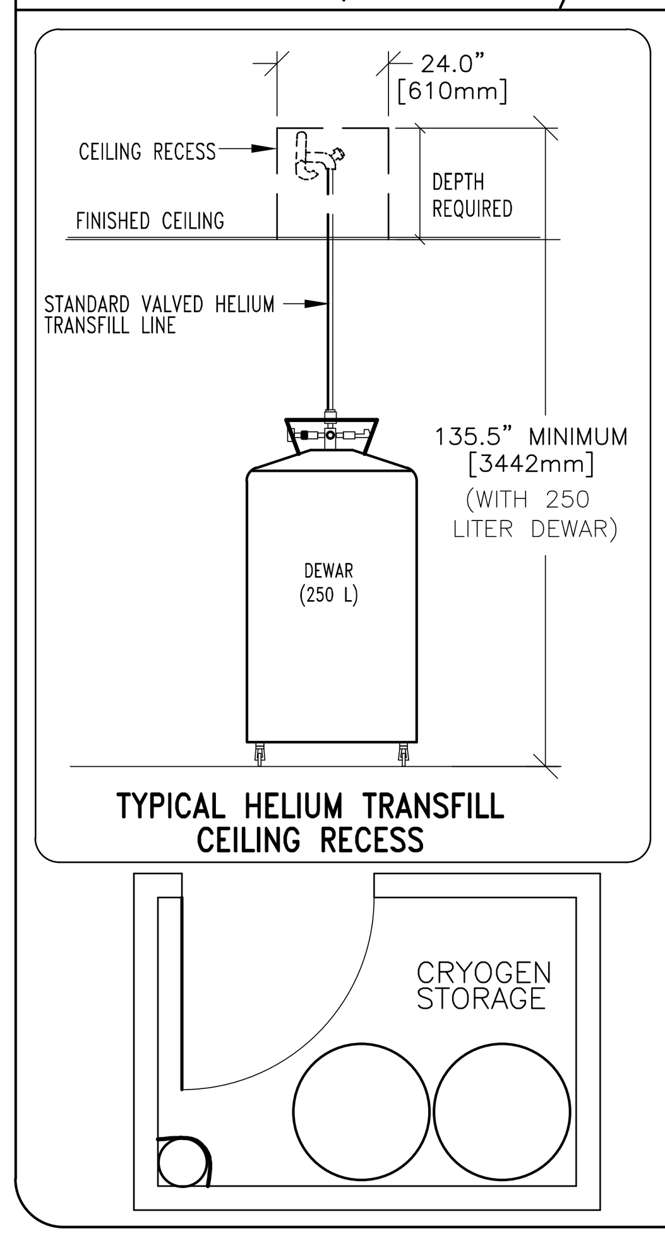
EQUIPMENT DETAIL
FIXED TABLE

B81–19
REV. DATE: 01.APR.14



EQUIPMENT DETAIL
TYPICAL ON-SITE CRYOGEN STORAGE REQUIREMENTS/RECOMMENDATIONS

M65–15
REV. DATE: 06/29/04



GENERAL CRYOGEN REQUIREMENTS

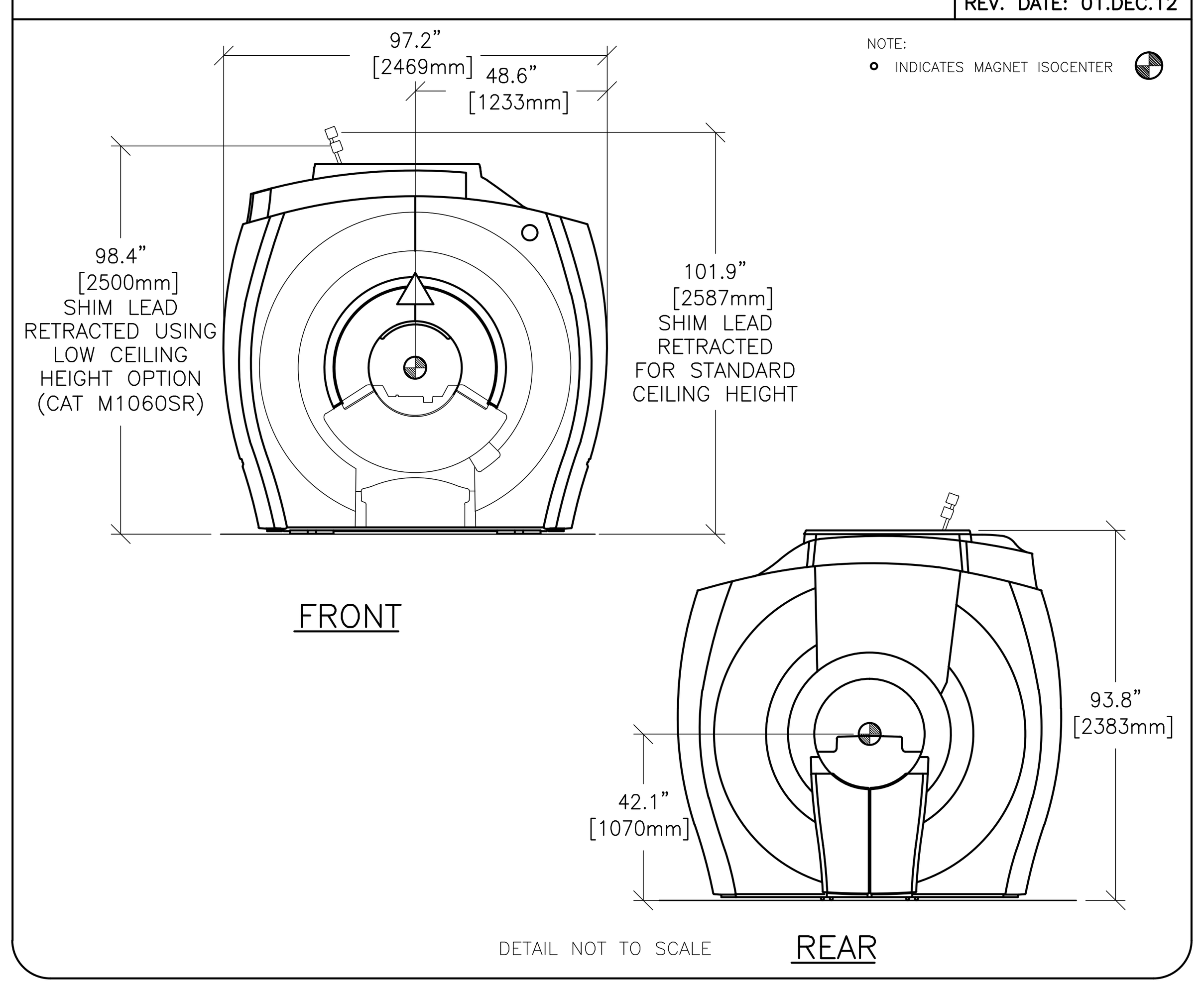
1) USE OF A STANDARD VALVED HELIUM TRANSFILL LINE AND A 250 LITER DEWAR, NOT MORE THAN 70 in. [1778mm] HIGH, REQUIRES A CEILING HEIGHT OF 135.5 in. [3442 mm)] NOTE: THAT THIS NEED ONLY BE A 24in. [610mm] SQUARE CEILING RECESS LOCATED EITHER IN THE MAGNET ROOM OR IN AN ACCESSIBLE AREA NEAR THE MAGNET ROOM.
2) A 500 LITER DEWAR, NOT MORE THAN 73 in. [1854mm] HIGH, REQUIRES A CEILING HEIGHT OF 138 in. [3505mm].
3) IF THE HELIUM TRANSFILL REQUIREMENTS CANNOT BE SATISFIED IN OR NEAR THE MAGNET ROOM, CONSIDER A LOCATION OUTSIDE THE BUILDING OR ON A LOADING DOCK. THE STANDARD VALVED TRANSFILL LINE, AFTER INSERTION INTO EITHER A 500 OR 250 LITER DEWAR, WILL FIT THROUGH 79 in. [2007 mm] BY 43 in. [1092 mm] WIDE HIGH DOORWAYS AND HALLWAYS. PROVIDE FREE ACCESS FROM THE DEWAR LOCATION TO THE MAGNET.
4) IF ELEVATORS ARE TO BE USED FOR CRYOGEN DELIVERY ROUTE, VERIFY THAT ELEVATOR DIMENSIONS AND WEIGHT CAPACITY IS SUFFICIENT TO HANDLE THE CRYOGEN DEWARS. ALSO, ELEVATOR MUST BE DEDICATED WITH RESTRICTED ACCESS DURING CRYOGEN TRANSPORT (WILL NOT ALLOW STOPS BETWEEN INITIAL START AND FINAL FLOOR DESTINATION).
5) AN OPTIONAL CRYOGEN REFILL SERVICE IS OFFERED BY GEMS. (CHECK WITH CRYOGEN SUPPLIER FOR EXACT SIZES AND WEIGHT).
6) MAXIMUM ACCEPTABLE INCLINE IS 5° AND RECOMMENDED MINIMUM DOOR SIZE IS 48" [1219mm] ALONG THE ENTIRE DEWARS DELIVERY ROUTE.

ON-SITE CRYOGEN STORAGE ROOM RECOMMENDATIONS (IF NECESSARY)

1) CRYOGEN STORAGE TO BE LOCKABLE, WELL LIT, WELL VENTILATED WITH TEMPERATURES NOT TO EXCEED 100° F (37.8° C).
2) WALLS IN CRYOGEN STORAGE ROOM SHOULD BE 3/4" PAINTED PLYWOOD OR SUITABLE FINISH (NOT PLASTERBOARD) TO AVOID DAMAGE WHEN MOVING DEWARS.
3) ADEQUATE VENTILATION TO ENSURE 18% OXYGEN LEVEL IS MAINTAINED.
4) MEANS MUST BE PROVIDED TO SECURE CRYOGEN GAS CYLINDERS IN AN UPRIGHT POSITION USING A REMOVABLE CHAIN OR STRAP. THIS IS TO PREVENT THE CYLINDERS FROM FALLING, WHICH MAY CAUSE INJURY OR DAMAGE. PROVIDE WALL HOOKS FOR TRANSFER LINES AS REQUIRED.
5) CRYOGEN DEWARS MUST NOT BE STORED WITHIN THE MAGNET ROOM.

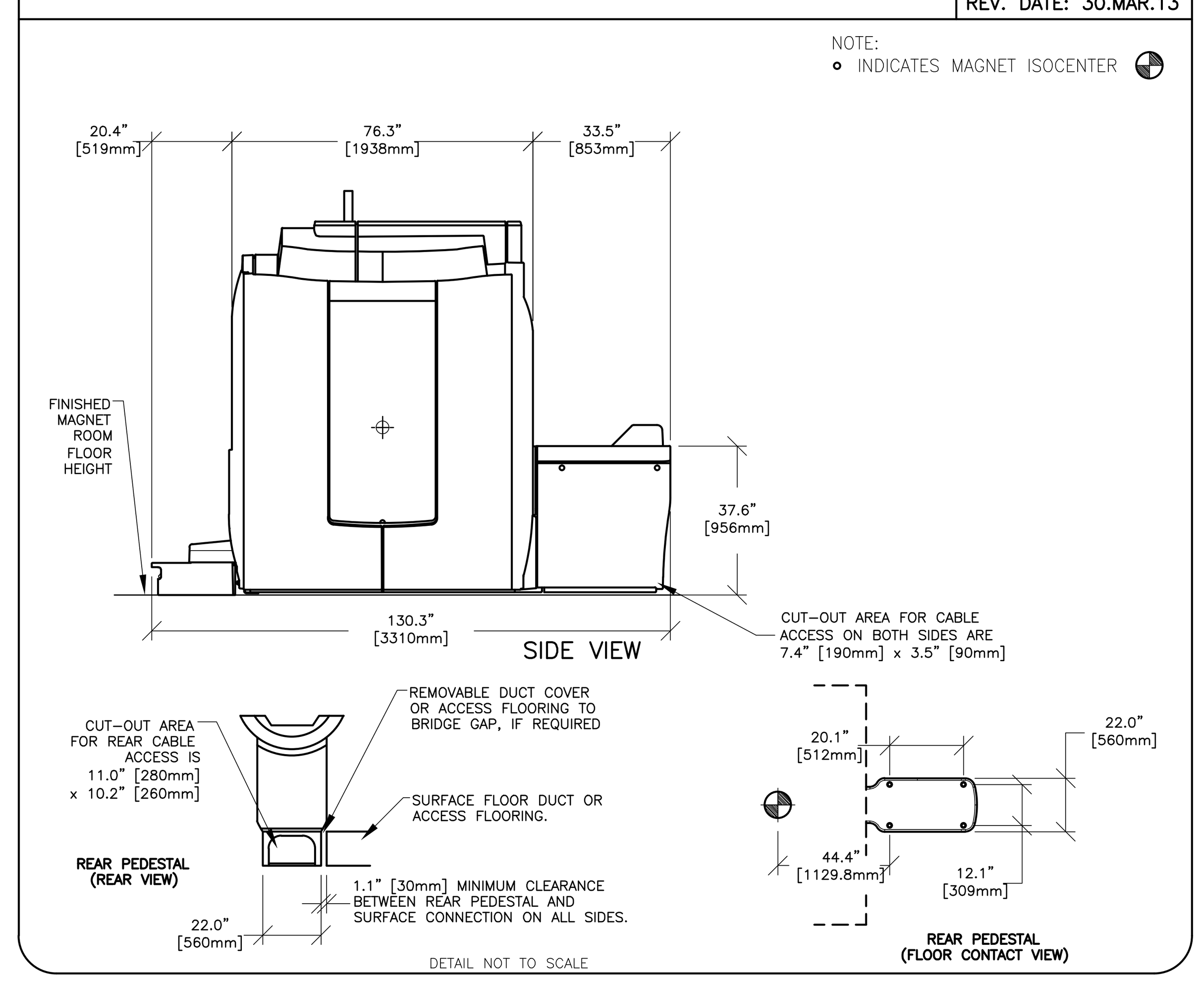
EQUIPMENT DETAIL
MAGNET – FRONT & REAR VIEW

M02–15N
REV. DATE: 01.DEC.12



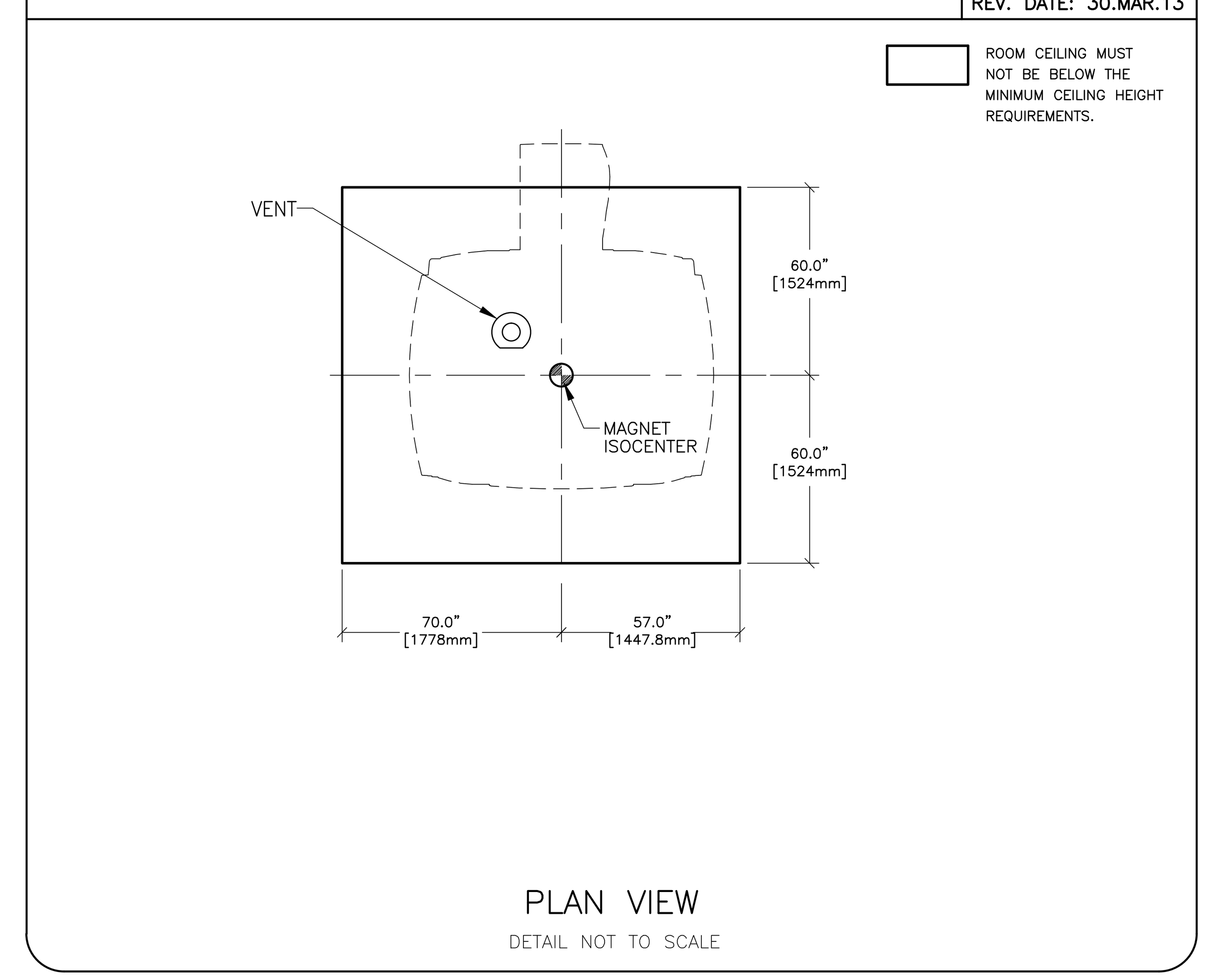
EQUIPMENT DETAIL
MAGNET SIDE VIEW & CABLE ACCESS

M03–15N
REV. DATE: 30.MAR.13



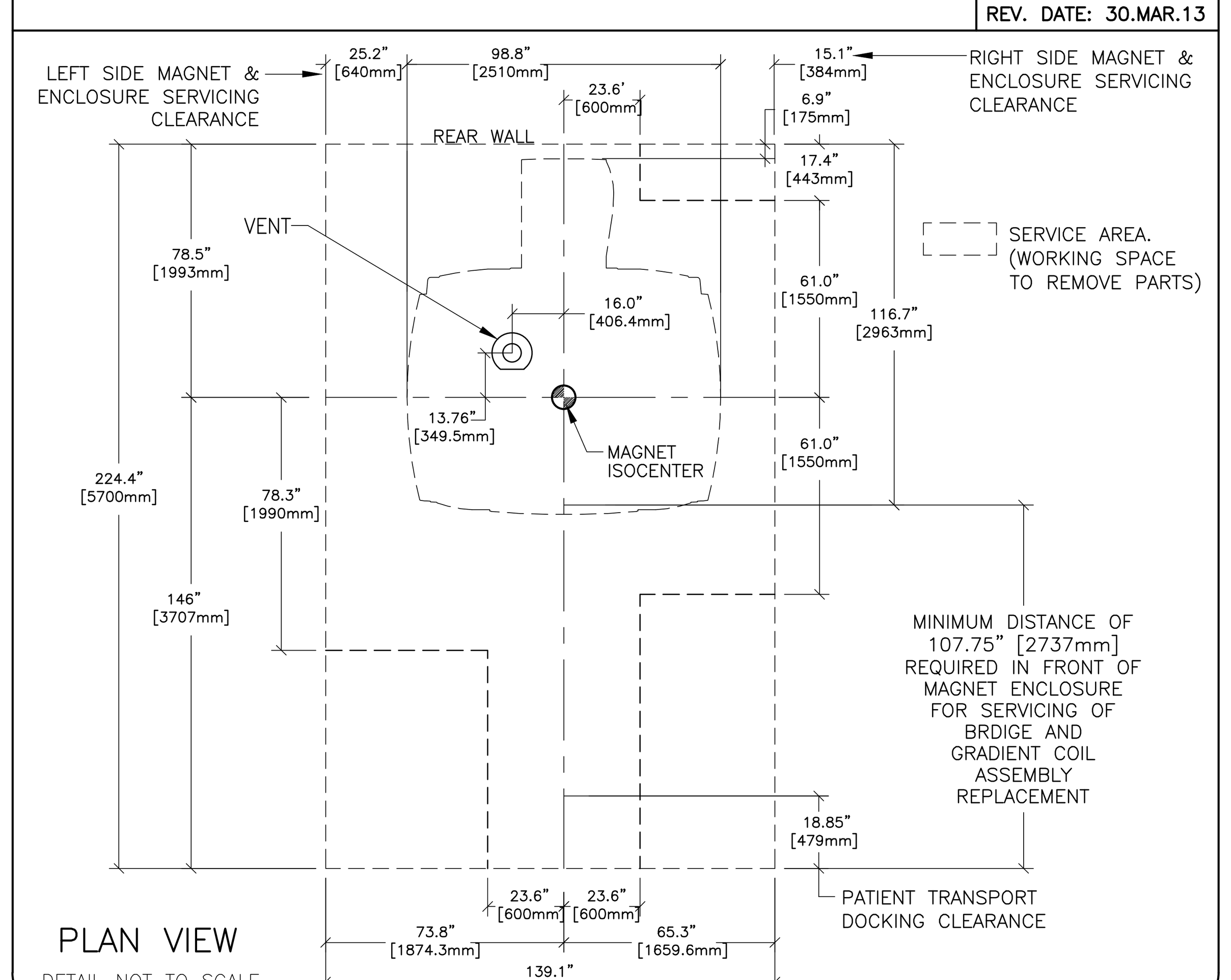
EQUIPMENT DETAIL
MAGNET – MINIMUM CEILING AREA

M01–15P
REV. DATE: 30.MAR.13



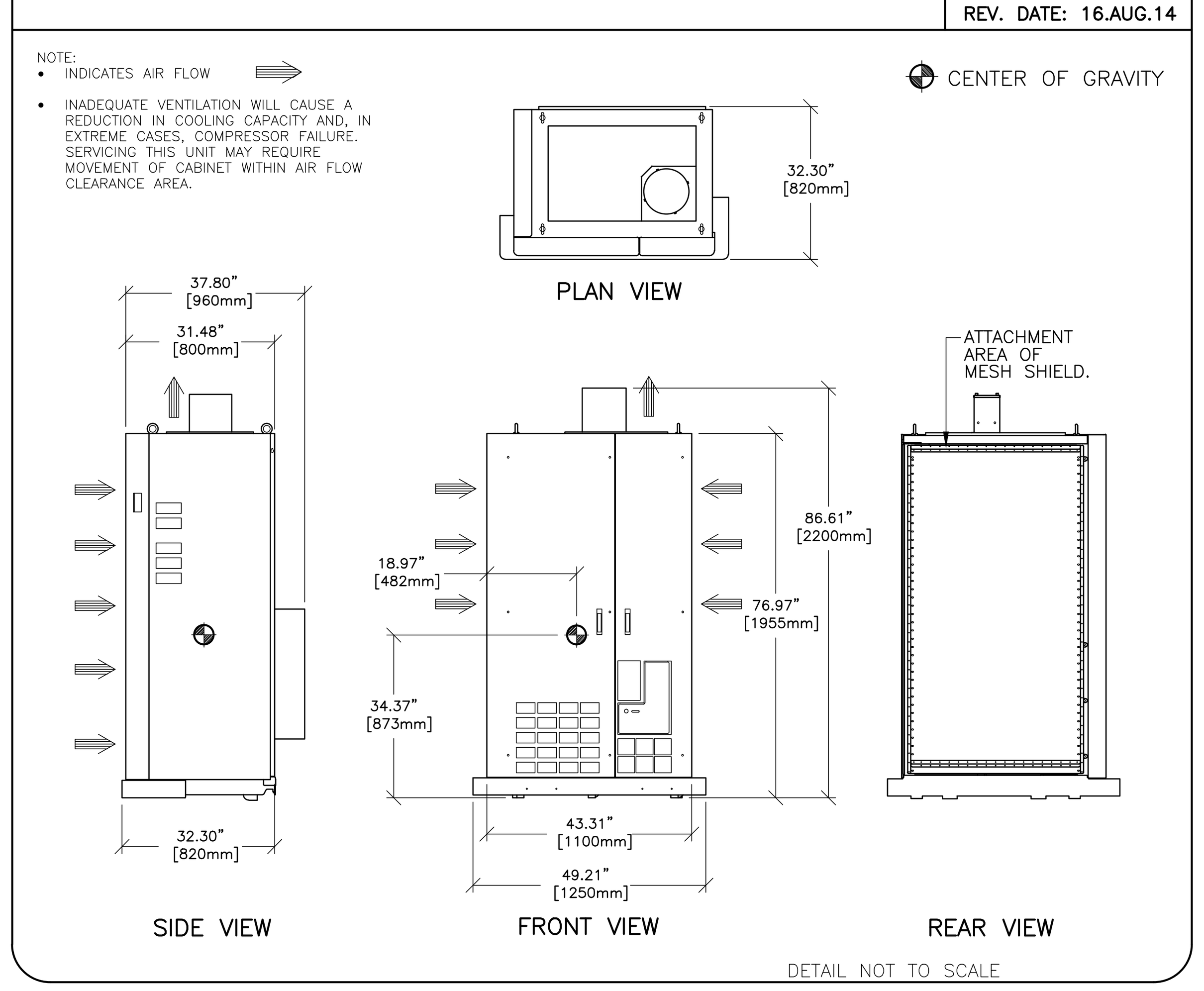
EQUIPMENT DETAIL
MAGNET – MINIMUM SERVICE AREA

M01–15R
REV. DATE: 30.MAR.13



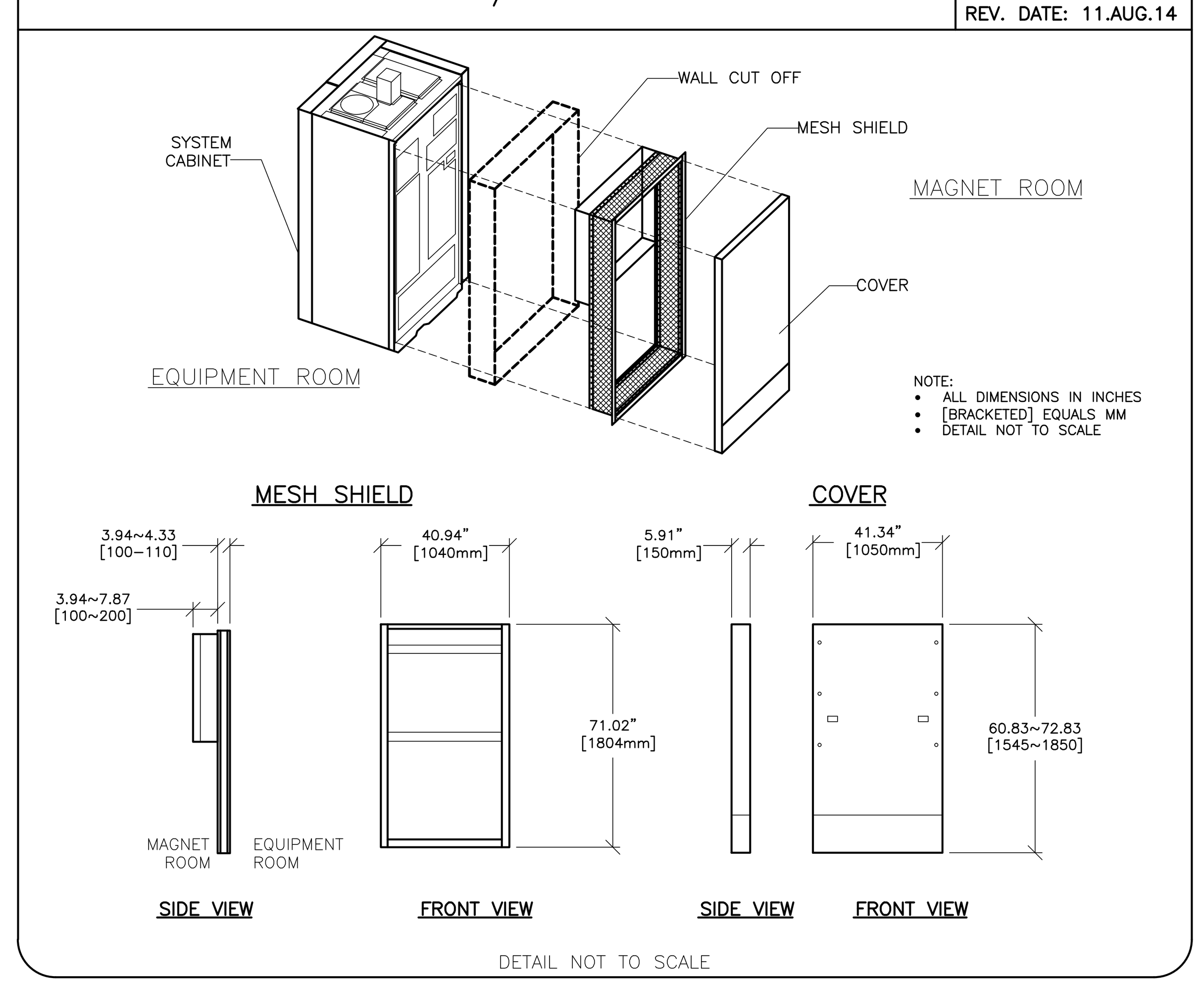
EQUIPMENT DETAIL
SYSTEMS CABINET

M08–15P
REV. DATE: 16.AUG.14



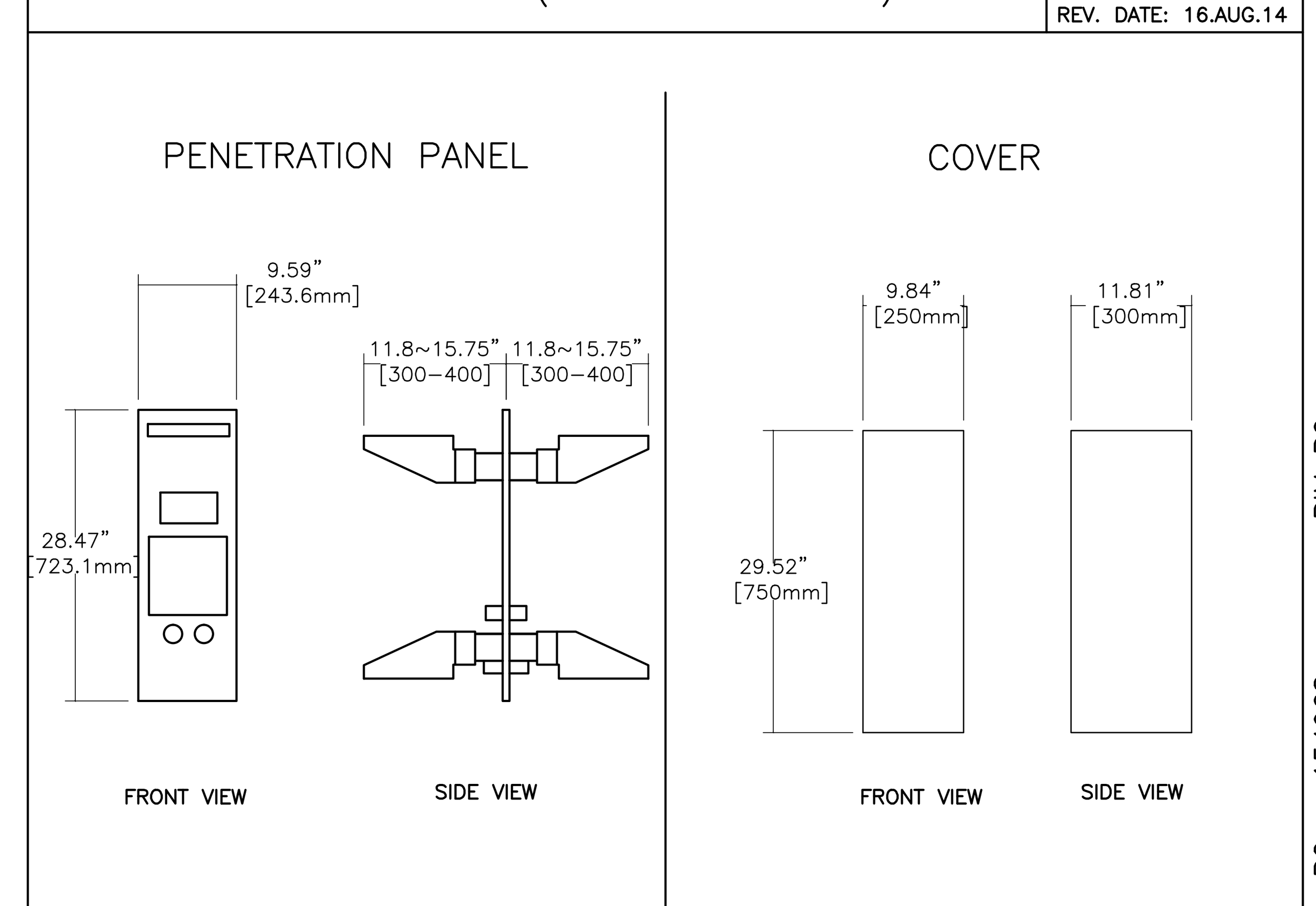
EQUIPMENT DETAIL
MESH SHIELD AND R/F SHIELD OPENING

M08–15L
REV. DATE: 11.AUG.14



EQUIPMENT DETAIL
PENETRATION PANEL (MAGNET ROOM SIDE)

M50–15G
REV. DATE: 16.AUG.14



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

DETAIL NOT TO SCALE

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

RQ – 154968 PIM R6

GE Healthcare
Healthcare Project Implementation – Design Center
Milwaukee, Wisconsin

SHEET TITLE: EQUIPMENT DETAILS
MODALITY TYPE: OPTIMA MR360 ADVANCE / BRIVO MR355 INSPIRE

PROJECT TITLE: 8–250F TYPICAL LAYOUT

PROJECT	REVISION
8–250f	00

DATE: 24.Sep.15
DRAWN BY: PMM
CHECKED BY: PMM

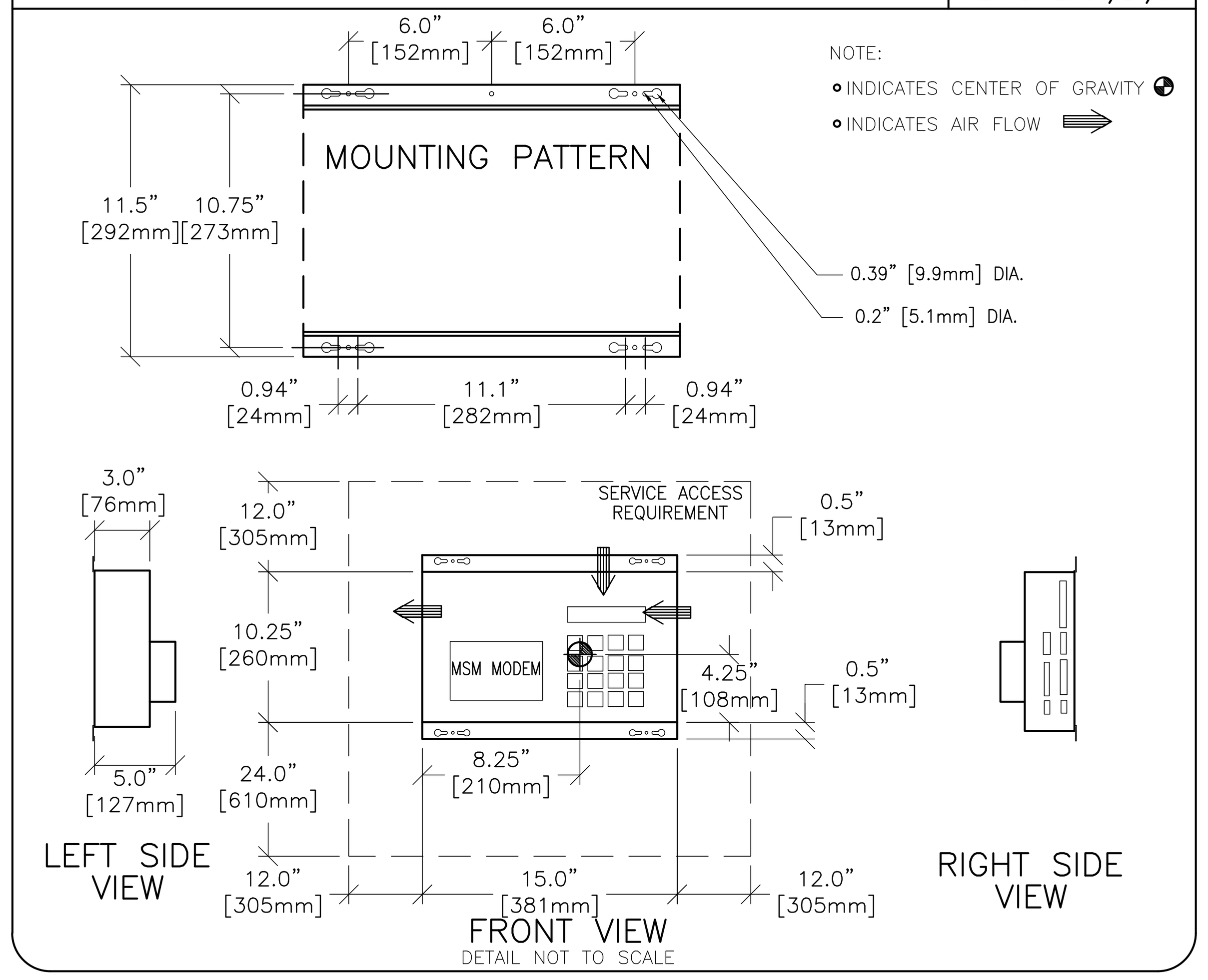
REVISION HISTORY:

SHEET
D1

NFSH-1002

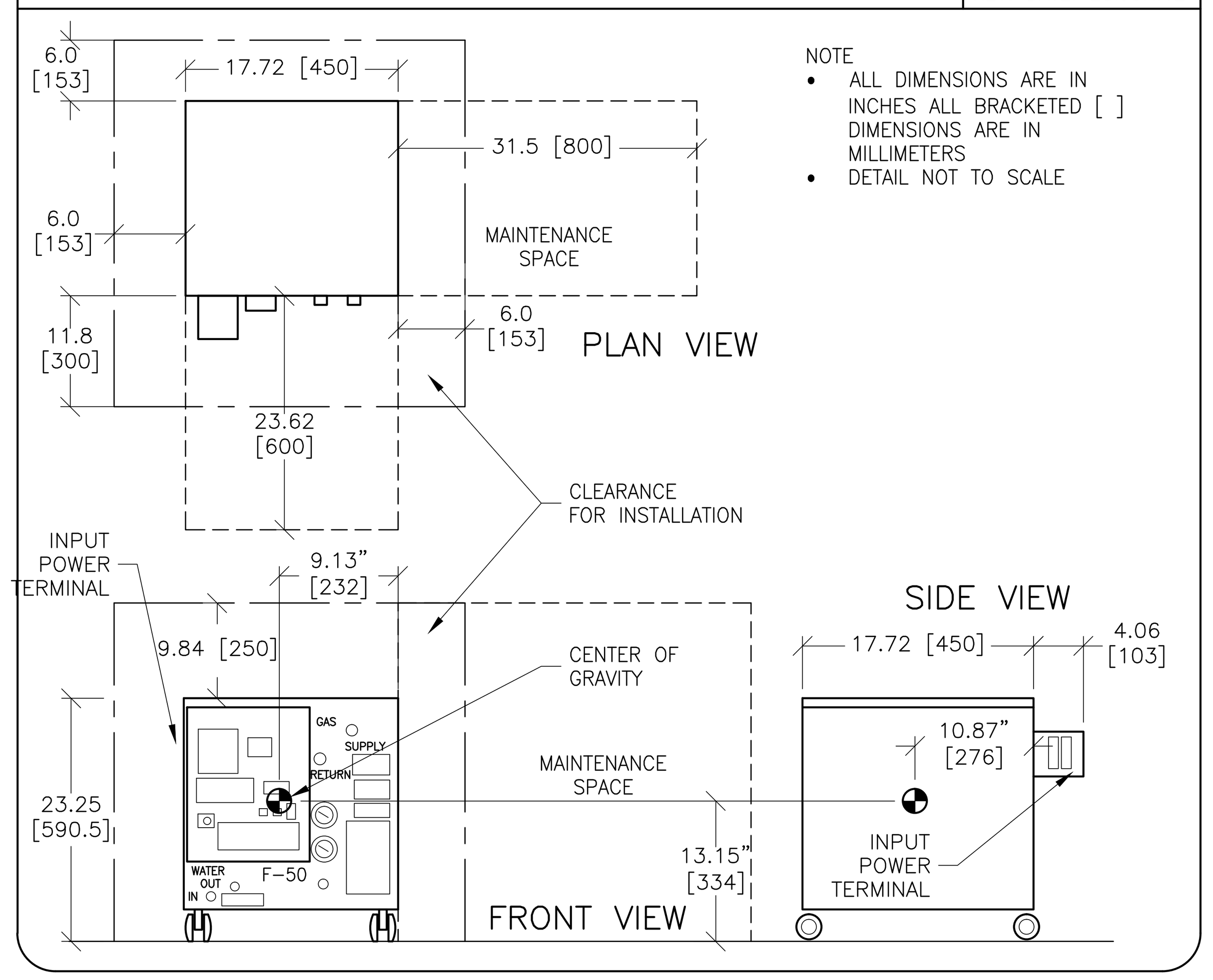
EQUIPMENT DETAIL — MAGNET MONITOR

M16–15C
REV. DATE: 04/24/07



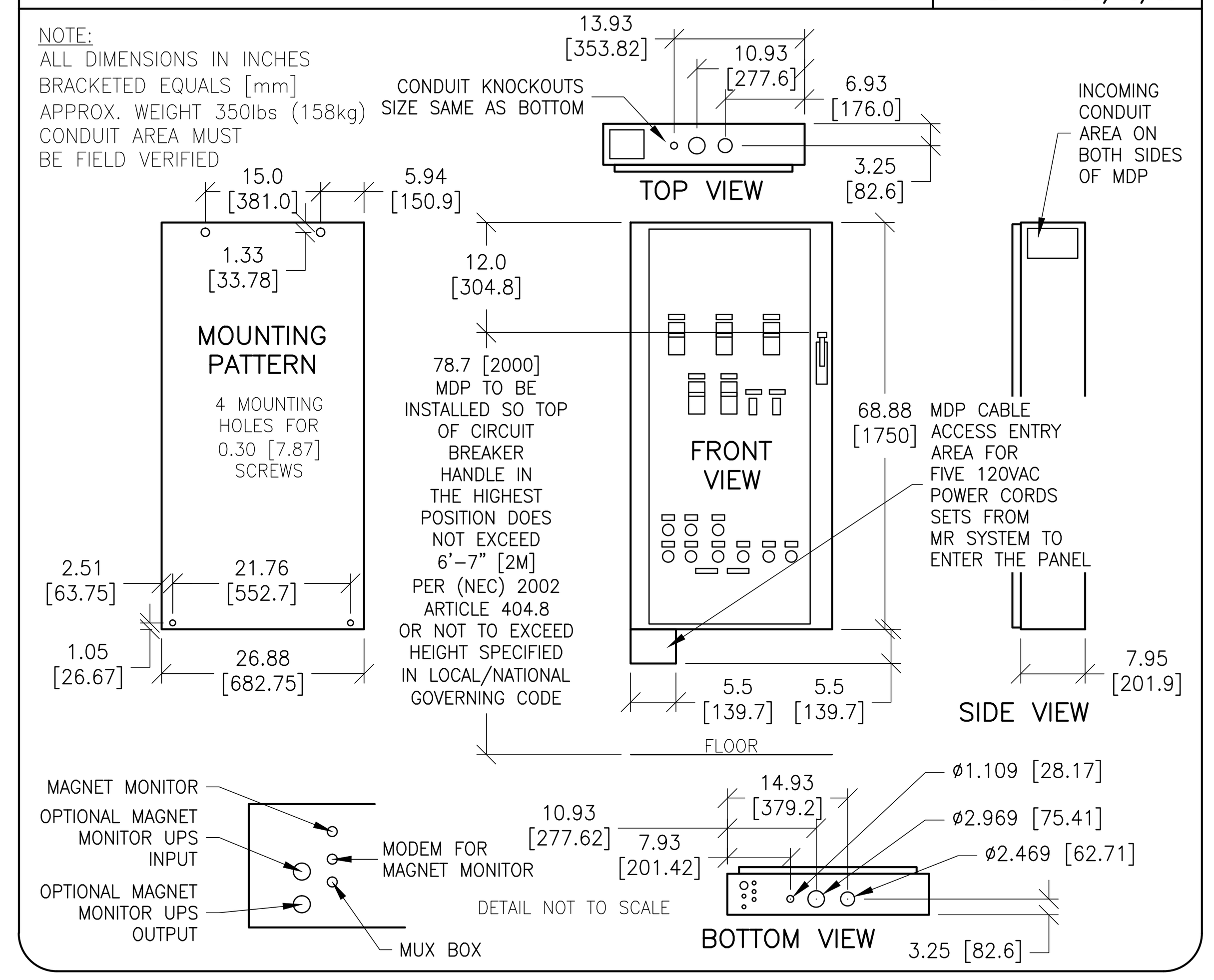
EQUIPMENT DETAIL — CRYOCOOLER COMPRESSOR F50

M33004
REV. DATE: 20.JUN.12



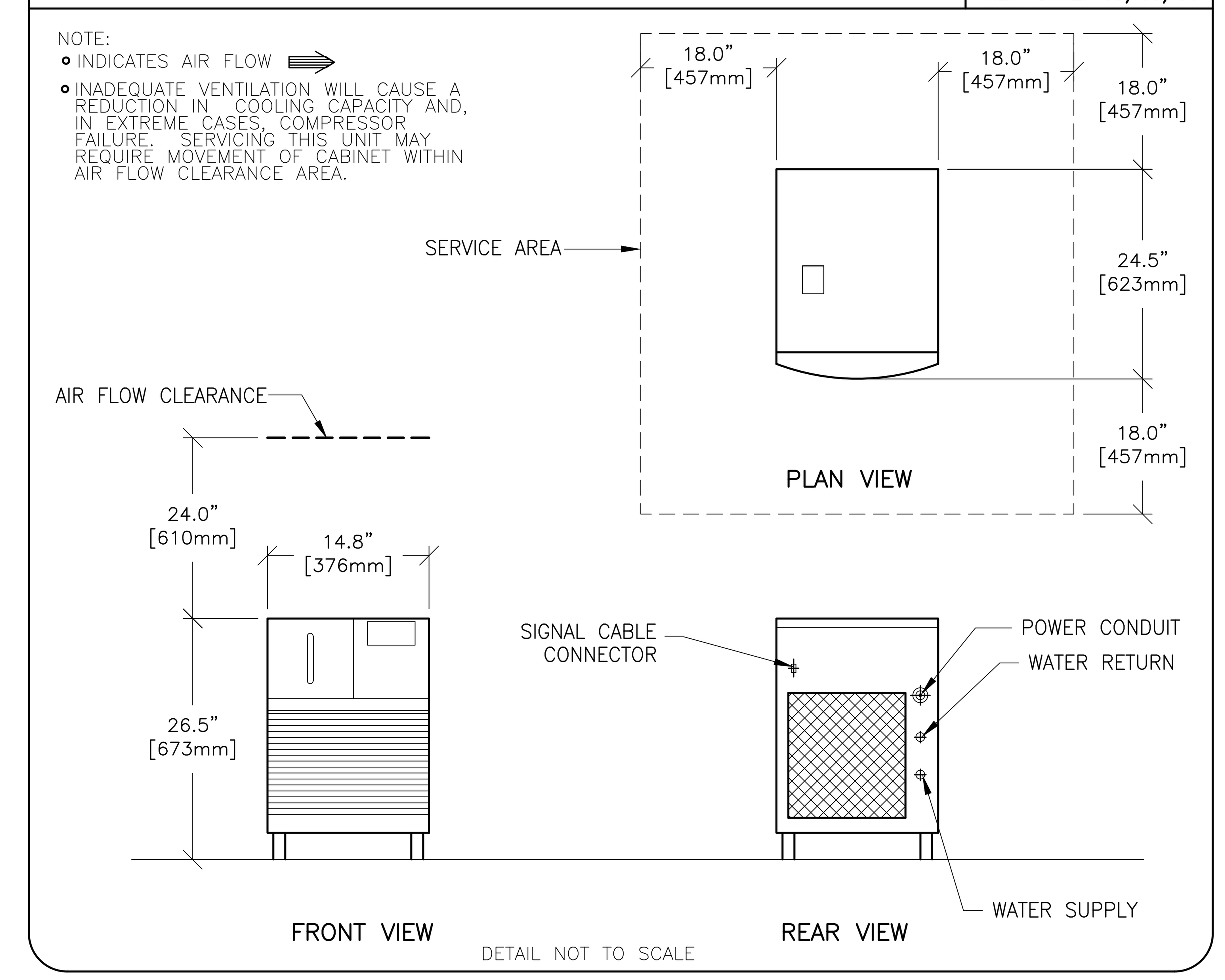
EQUIPMENT DETAIL — MAIN DISCONNECT PANEL

M30–88TM
REV. DATE: 3/10/09



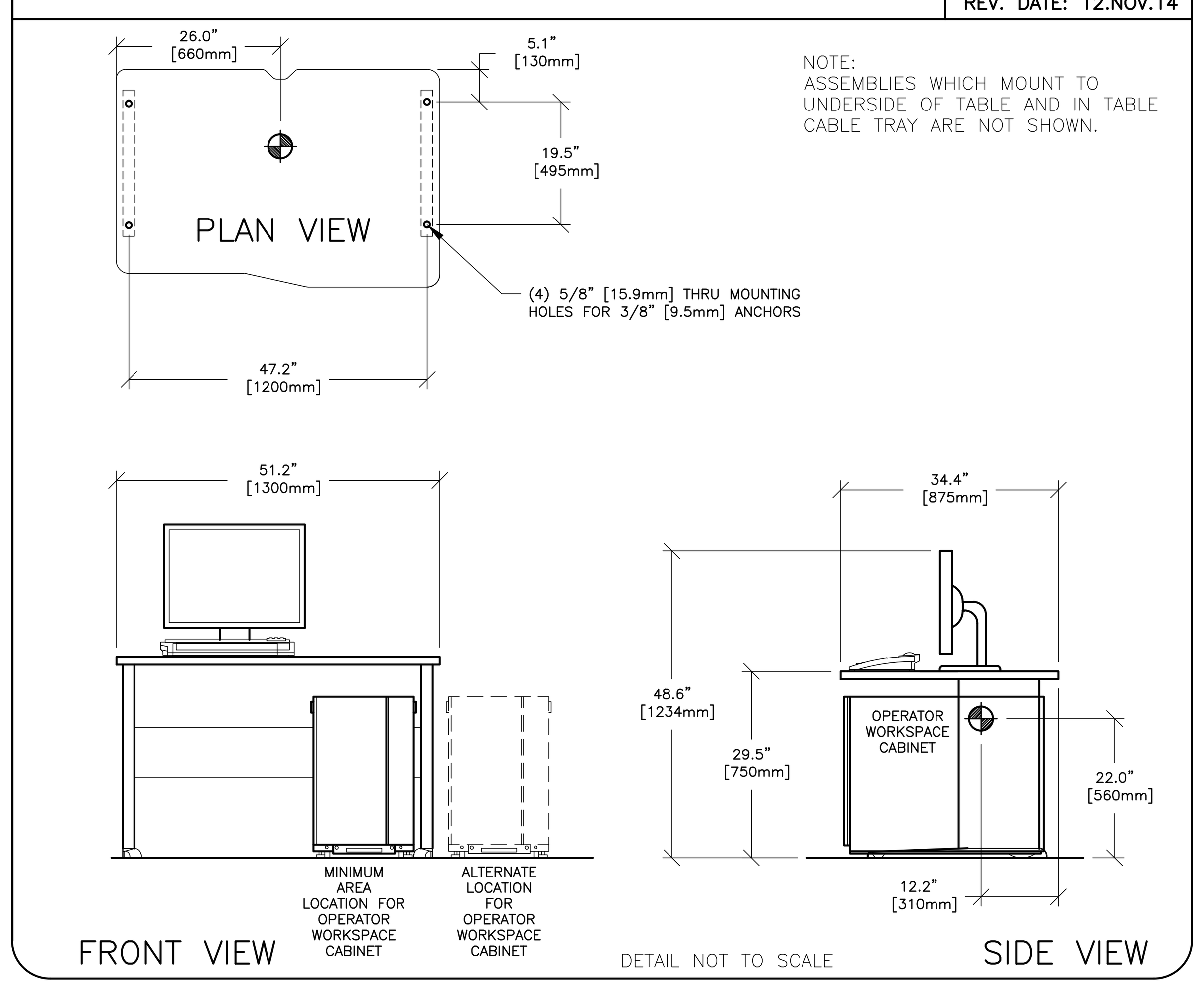
EQUIPMENT DETAIL — WATER CHILLER FOR SYSTEMS CABINET–LCS

M60–15E
REV. DATE: 05/03/06



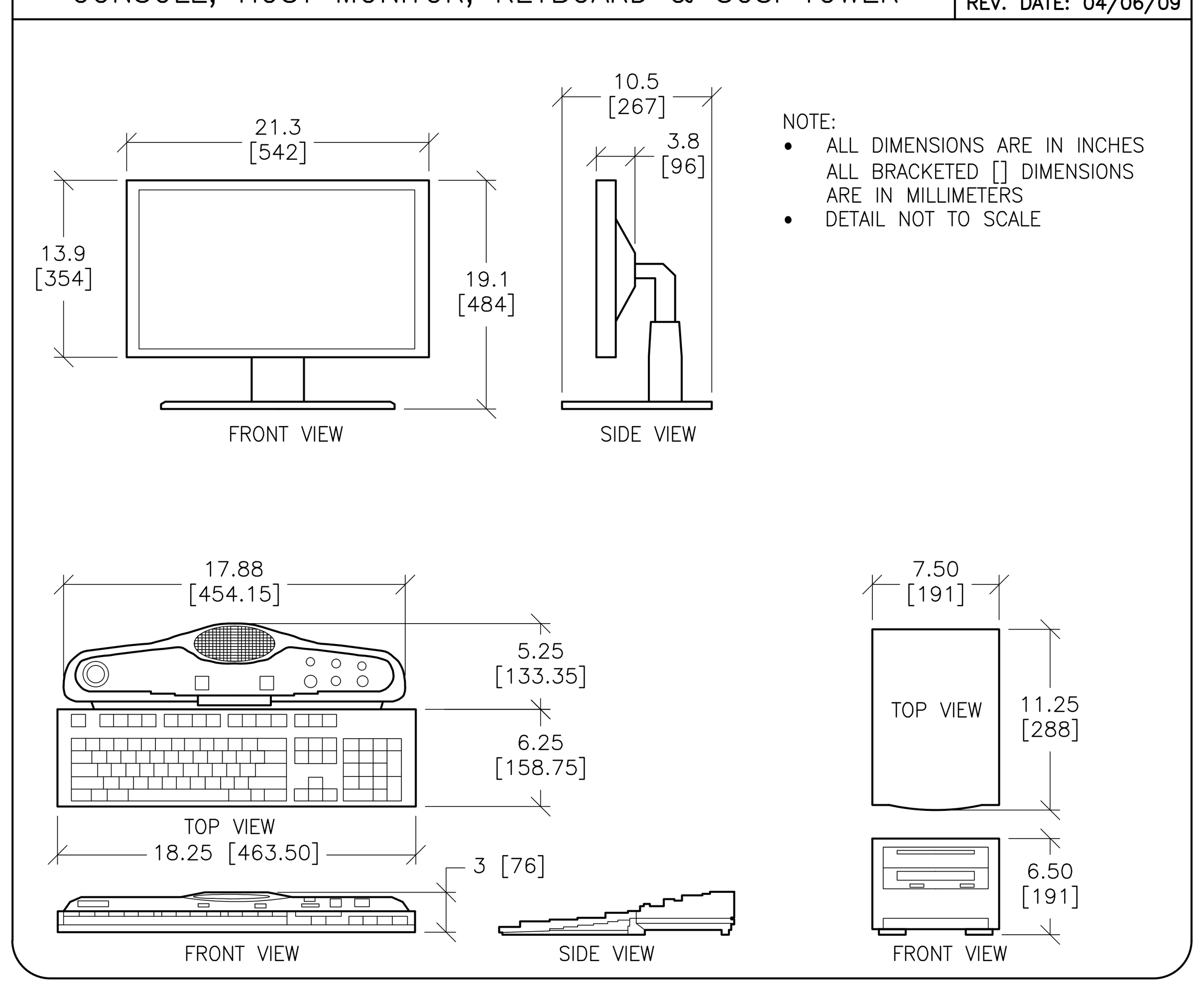
EQUIPMENT DETAIL — OPERATOR WORKSPACE

M05–15E
REV. DATE: 12.NOV.14



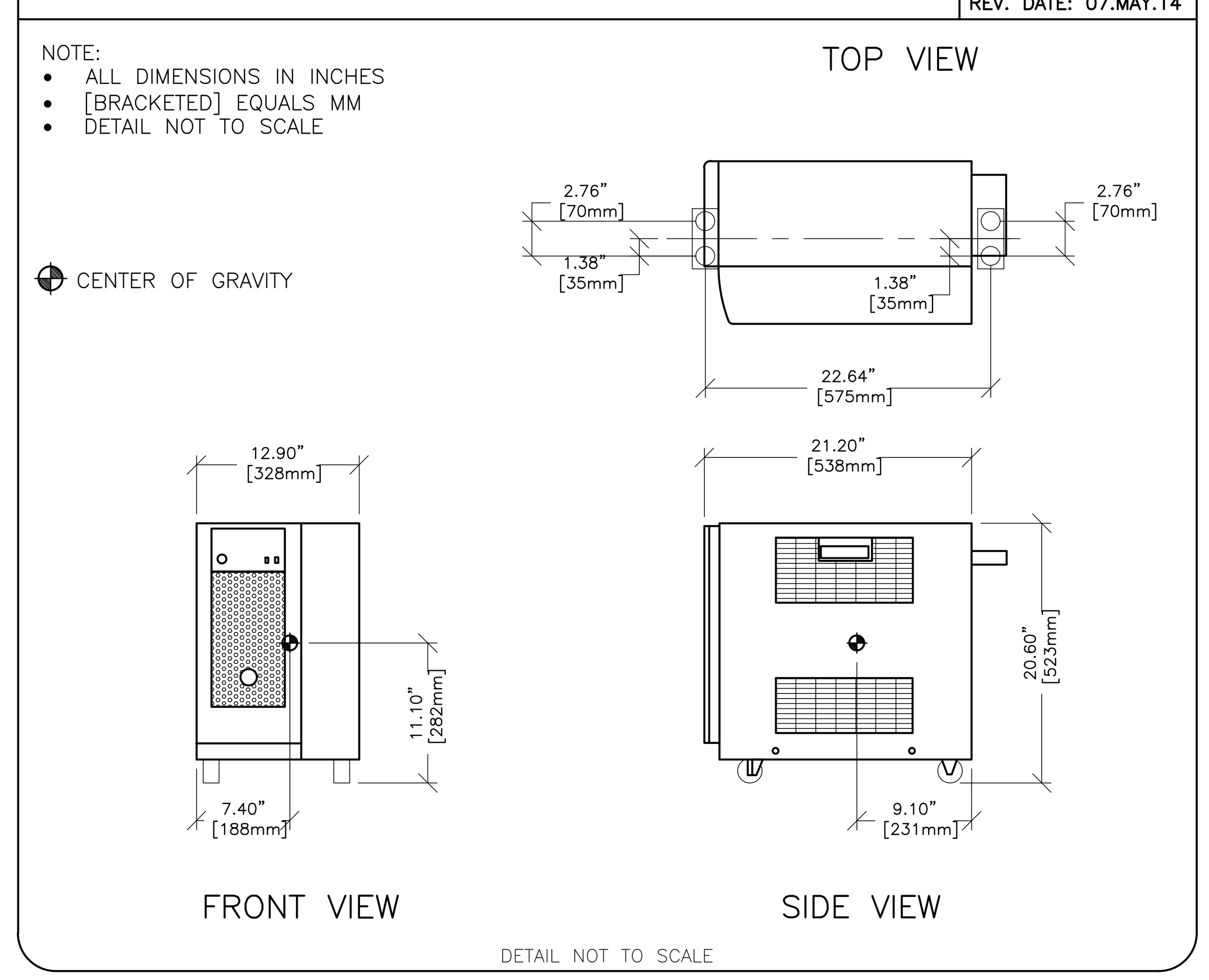
EQUIPMENT DETAIL — CONSOLE, HOST MONITOR, KEYBOARD & SCSI TOWER

M30–15R
REV. DATE: 04/06/09



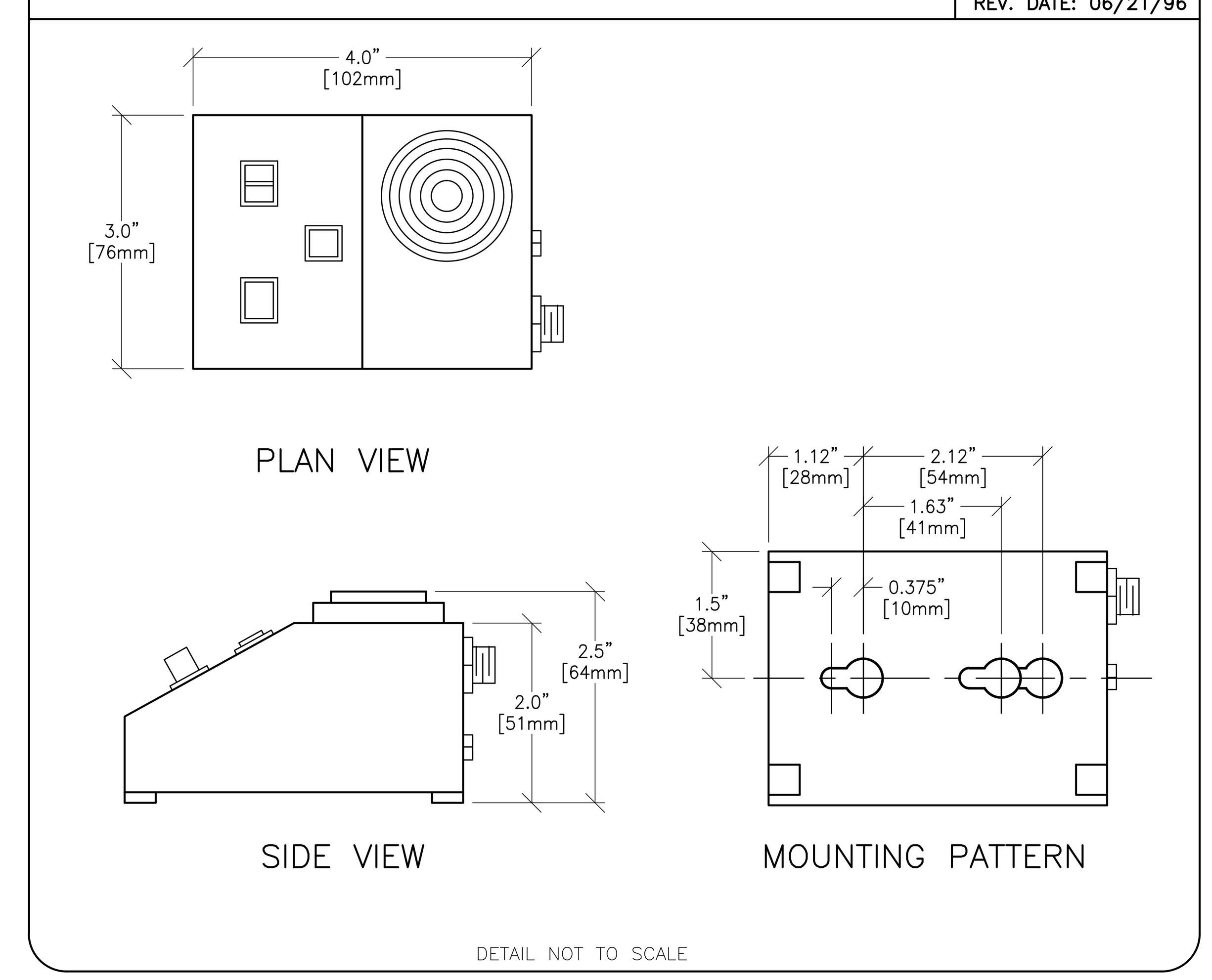
EQUIPMENT DETAIL — OPERATOR WORKSPACE CABINET

M06–15F
REV. DATE: 07.MAY.14



EQUIPMENT DETAIL — PNEUMATIC PATIENT ALERT CONTROL BOX

M48–15
REV. DATE: 06/21/96



GE Healthcare

Healthcare Project Implementation – Design Center
Milwaukee, Wisconsin

SHEET TITLE: EQUIPMENT DETAILS

MODALITY TYPE: OPTIMA MR360 ADVANCE / BRIVO MR355 INSPIRE

PROJECT TITLE: 8–250F TYPICAL LAYOUT

PROJECT	REVISION
8–250f	00

DATE: 24.Sep.15
DRAWN BY: PMM
CHECKED BY: PMM

REVISION HISTORY:

PIM R6

RQ – 154968

SHEET
D2