

# SIEMENS

## MAGNETOM VERIO TYPICAL ROOM PLAN

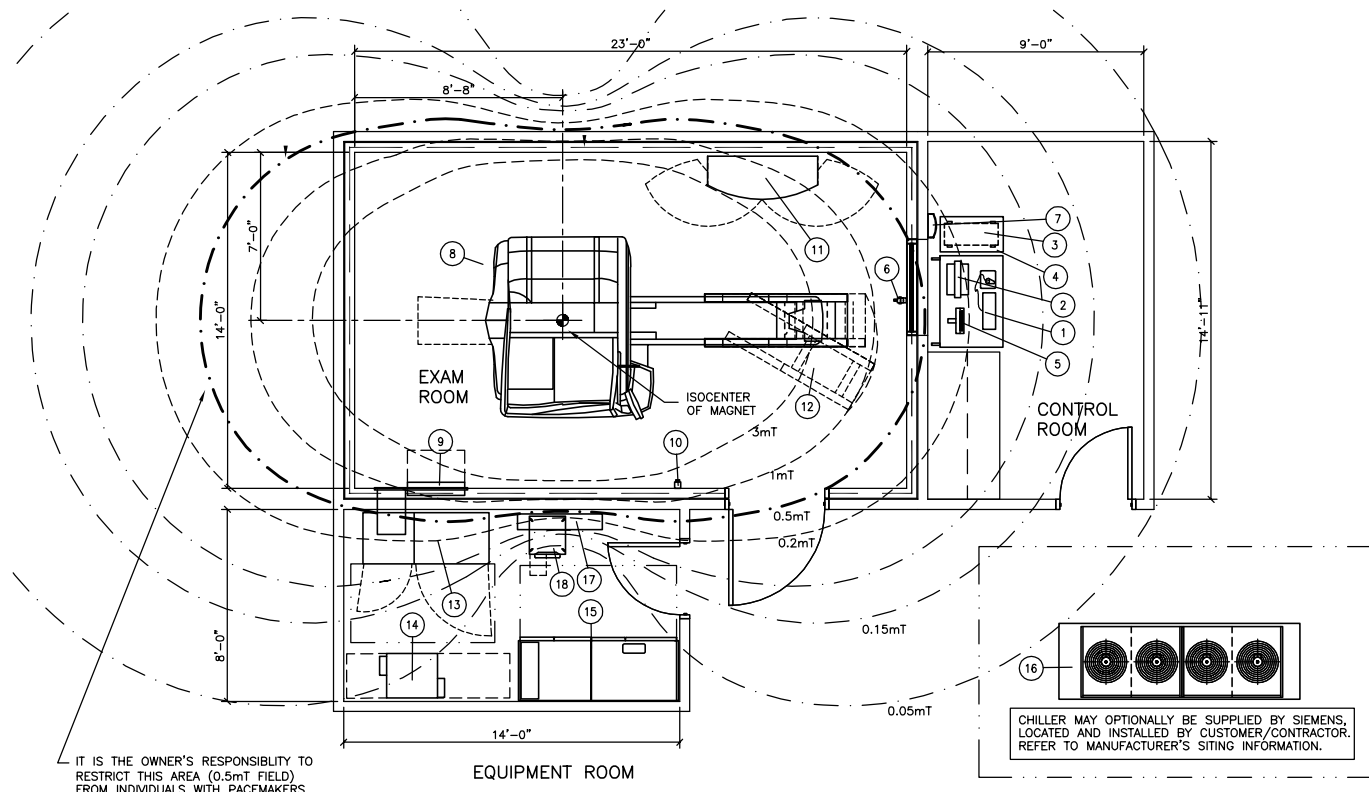
# MR



The intended use for this Cut Sheet is to communicate the spatial requirements as well as the basic architectural, electrical, structural, and mechanical requirements for this piece of imaging equipment. The information provided in this document is for reference only, during the pre-planning stage, and therefore does not contain any site specific detailed requirements. This information is subject to change without notice. Federal, state and/or local requirements may impact the final placement of the components. It is the customer's responsibility to ensure that the final layout and placement of the equipment complies with all applicable requirements.

## MAGNETOM VERIO TYPICAL ROOM PLAN

# MR



**TYPICAL PLAN**

SCALE: 1/8" = 1'-0"

### EQUIPMENT LEGEND

NO	DESCRIPTION	SMS SYM	WEIGHT (LBS)	BTU/HR TO AIR	DIMENSIONS (INCHES)			REMARKS
					W	D	H	
①	MRC OPERATING CONSOLE AND KEYBOARD		132	---	45 11/16	35 1/4	28 3/8	
②	COLOR MONITOR FOR MRC		22	239	18 5/16	16 15/16	4 3/4	ON CONSOLE/COUNTER
③	HOST PC MRC		49	2389	11	27	18 1/8	
④	CONTAINER FOR HOST 450		230	---	17 3/4	31 1/2	27 5/8	
⑤	PATIENT MONITOR (OPTION)		30	---	13	8	12 1/2	
⑥	PATIENT SUPERVISION CAMERA (OPTION)		TBA	TBA	TBA	TBA	TBA	WALL MOUNTED
⑦	ALARM BOX		2	---	9	4	9	
⑧	3.0T AS-MAGNET WITH COVERS AND PATIENT TABLE		18298	9383	90 1/2	168 5/8	87 3/8	
⑨	RF-FILTER PLATE		285	853	46 1/2	21 3/4	21 1/2	
⑩	MAGNET STOP		1	---	3	5	3	
⑪	SURFACE COIL CART (OPTION)		110	---	55 1/8	21 1/8	47 5/8	WEIGHT WITHOUT COILS
⑫	PATIENT TRANSPORT TROLLEY (OPTION)		291	---	26 1/2	71 1/2	39 1/2	
⑬	ELECTRONICS CABINET (GPA/ACC CABINET)		2756	13649	61 1/2	26	77 1/2	
⑭	RF CABINET		1102	25591	22 1/8	25 5/8	60 5/8	
⑮	POWERWARE 9390 U.P.S. WITH BATTERY (OPTION)		5880	43800	78 3/8	32	74	
⑯	KKT KRAUS KCC 215 CLOSED LOOP WATER CHILLER		2425	---	120 1/2	37 7/8	72	CUST. TO LOCATE/INSTALL
⑰	KKT KRAUS INTERFACE PANEL		88	---	41 3/8	7 7/8	31 1/2	WALL MTD. IN EQUIP. ROOM
⑱	COLD HEAD COMPRESSOR		284	---	17 3/4	21 5/8	20 7/8	

## MAGNETOM VERIO SPECIFICATIONS

# MR

POWER REQUIREMENTS	
VOLTAGE RANGE: 480 VAC ±10% FOR ALL LINE AND LOAD CONDITIONS. VOLTAGE BALANCE: 2% MAXIMUM DIFFERENCE BETWEEN PHASES	
FREQUENCY:	60 Hz ± 1.0 Hz
LINE IMPEDENCE:	0.20 OHMS
STAND BY POWER:	13 kVA
HIGHEST AVERAGE POWER (6)	56 kVA
CONNECTION VALUE (LESS THAN 5 MINUTES) (1)	110 KVA
MOMENTARY POWER (4)	140 KVA
RECOMMENDED TRANSFORMER (1)	150 KVA
RECOMMENDED UPS (1)	160 KVA
MR SYSTEM OVERCURRENT PROTECTION (3)	175 A
UPS SYSTEM OVERCURRENT PROTECTION (7)	200 A
MAX. ALLOWABLE VOLTAGE DROP AT MAX. POWER (5)	6.0%

NOISE LEVELS	
SYSTEM ROOM	NOISE LEVEL / dB(A)
CONTROL ROOM	<55
EXAMINATION ROOM	89.6 dB(A) AVERAGE VALUE 115 dB(A) WITH MAXIMUM GRADIENT AND MAXIMUM GRADIENT SLEW RATE.
EQUIPMENT ROOM	<65

IT IS THE CUSTOMER'S RESPONSIBILITY TO ENSURE THAT ALL LOCAL/  
STATE/OSHA NOISE REGULATIONS ARE ADHERED TO. ADDITIONAL NOISE  
DATA MAY BE PROVIDED BY SIEMENS PROJECT MANAGER UPON REQUEST.

POWER REQUIREMENTS	
DEMAND AND CAPACITY REQUIREMENTS NOTES	
<p>1) IF EQUIPMENT UPGRADE IS ANTICIPATED, INSTALLING ELECTRICAL POWER TO MEET THE REQUIREMENTS OF THE HIGHER POWER GRADIENT PACKAGE AT THE TIME OF INITIAL INSTALLATION WILL REDUCE THE COST TO UPGRADE THE ELECTRICAL SYSTEM LATER.</p> <p>2) RECOMMENDED TRANSFORMER SIZE (SYSTEM WITHOUT UPS) IS BASED ON INDUSTRY STANDARD ISOLATION TRANSFORMER KVA RATINGS. SOURCE IMPEDANCE FEEDING THE MAGNETOM SYSTEM, INCLUDING ANY ISOLATION TRANSFORMERS, MUST MEET EQUIPMENT REQUIREMENTS AS LISTED HERE. SIEMENS RECOMMENDS A TRANSFORMER WITH COPPER WINDINGS, AN ELECTRO-STATIC SHIELD, AND A LOW IMPEDANCE (&lt;3%) TO ENSURE THAT SOURCE IMPEDANCE REQUIREMENTS ARE MET.</p> <p>3) OVERCURRENT PROTECTION IS SPECIFIED FOR SYSTEMS WITHOUT AN UNINTERRUPTIBLE POWER SUPPLY (UPS). ADDITION OF A UPS REQUIRES A HIGHER CAPACITY MAINS CONNECTION (DEPENDENT UPON UPS MODEL AND SIZE). MAXIMUM FAULT CURRENT IS DEPENDENT UPON THE IMPEDANCE OF THE FACILITY ELECTRICAL SYSTEM. CUSTOMER'S ARCHITECT OR ELECTRICAL CONTRACTOR TO SPECIFY AIC RATING OF OVERCURRENT PROTECTION BASED ON FACILITY IMPEDANCE CHARACTERISTICS.</p> <p>4) MOMENTARY POWER IS BASED ON A MAXIMUM RMS VALUE FOR A PERIOD NOT TO EXCEED FIVE (5) SECONDS, AS DEFINED IN NEC 517.2. STAND-BY AND AVERAGE CURRENT ARE SUBSTANTIALLY LOWER.</p> <p>5) THE CONDUCTOR SIZE SHOULD BE SELECTED TO MEET THE VOLTAGE DROP REQUIREMENTS, TAKING INTO CONSIDERATION THE MAINS CAPACITY, RUN LENGTH, AND ANY ADDITIONAL TRANSFORMERS USED TO OBTAIN THE PROPER EQUIPMENT VOLTAGE LEVEL. NEMA STANDARD XR-9-1989 (R1994,R2000) PROVIDES GENERAL GUIDELINES FOR SIZING CONDUCTORS, TRANSFORMERS, AND ELECTRICAL SYSTEMS FOR MEDICAL IMAGING SYSTEMS.</p> <p>6) LONG-TIME POWER IS BASED ON THE HIGHEST AVERAGE RMS VALUES FOR A PERIOD EXCEEDING 5 MINUTES DURING CLINICAL SYSTEM OPERATION, AS DEFINED IN NEC 517.2.</p> <p>7) A CIRCUIT BREAKER WITH A HIGH INRUSH RATING (&gt;8x RATED CURRENT) IS REQUIRED TO PERMIT SWITCH-ON OF THE UPS SYSTEM WITHOUT SPURIOUS TRIPPING. CIRCUIT BREAKERS WITH AN ADJUSTABLE MAGNETIC TRIP (SIEMENS FD6 SERIES OR SIMILAR) ARE HIGHLY RECOMMENDED.</p>	

TRANSPORTING REQUIREMENTS	
LARGEST ITEM - MAGNET - 18,298 LBS.	
MAGNET DIMENSIONS: 7'-4" HIGH x 7'-7" WIDE x 10'-5" LONG FOR STANDARD DELIVERY. BY REMOVING THE TABLE, THE LENGTH CAN BE REDUCED TO 6'-5". THE ROOF HATCH OPENING SHOULD BE 4" LARGER THAN THE MAGNET DIMENSIONS.	
TO TRANSPORT THE GPA/ACC CABINET (2,756 POUNDS) A MINIMUM ROOM HEIGHT OF 6'-9" WITH TRANSPORT ROLLERS, OR 6'-5" WITHOUT TRANSPORT ROLLERS IS REQUIRED.	

CEILING HEIGHTS	
MAGNET EXAMINATION ROOM:	7-11" MINIMUM
EQUIPMENT ROOM:	7'-3" MINIMUM WITH RESTRICTION
ALL ANCILLARY AREAS:	6'-11" MINIMUM

REMOTE SYSTEM DIAGNOSTICS	
SIEMENS REMOTE SERVICES (SRS) REQUIRES A CONNECTION BETWEEN THE SRS REMOTE SERVER AND SIEMENS SYSTEMS VIA REMOTE LOCAL AREA NETWORK ACCESS, TO ENSURE THE UPTIME OF YOUR SYSTEM.	
THIS SERVICE REQUIRES ONE OF THE FOLLOWING CONNECTION METHODS:	
1. (PREFERRED) VPN - WHERE THE CUSTOMER HAS AVAILABLE A VPN CAPABLE FIREWALL OR OTHER VPN APPLIANCE.	
2. (OPTIONAL) *SRS ROUTER* - CONNECTED TO ANALOG PHONE LINE VIA *ANALOG MODEM*, ETHERNET CONNECTION TO CUSTOMER'S LAN, AND A POWER OUTLET. NOTE: = *SUPPLIED BY SIEMENS*	

FOR MORE INFORMATION	
FOR MORE DETAILED PLANNING REQUIREMENTS FOR THIS SYSTEM, SEE THE TYPICAL FINAL DRAWING SET NUMBER: 07137	

## MAGNETOM VERIO SPECIFICATIONS

# MR

### CHILLED WATER SUPPLY

A CHILLED WATER SUPPLY IS REQUIRED TO THE MRI SYSTEM 24 HOURS A DAY, YEAR ROUND FOR THE COLD HEAD AND GRADIENT SYSTEMS. THIS CAN BE PROVIDED BY A CENTRAL CHILLED WATER SUPPLY OR A SEPARATE STAND ALONE CHILLER THAT MEETS THE STATED REQUIREMENTS. THE CHILLED WATER CAN ALSO BE SUPPLIED BY A DEDICATED KRAUS KSC 215 CHILLER AND INTERFACE PANEL.

WITHOUT THE USE OF A DEDICATED KRAUS CHILLER, A SEP (SYSTEM SEPARATOR CABINET), MUST BE INCLUDED WITH THE SIEMENS ORDER. THE PIPE SIZE BETWEEN THE KRAUS CHILLER AND INTERFACE PANEL, OR BETWEEN THE WATER SUPPLY AND SEP MUST BE 2 INCH UP TO 82 FEET, 2-1/2 INCH UP TO 148 FEET, CONSULT FOR LONGER PIPE. PERMISSIBLE MATERIALS THAT CAN BE USED FOR THE PIPING ARE: STAINLESS STEEL (V2A, V4A), NON-FERROUS METAL (COPPER, BRASS), SYNTHETIC MATERIAL, PLASTICS, BRAZING SOLDER, HARD SOLDER, OR FITTING SOLDER TYPE 3 AND 4. THERE ARE MATERIALS THAT MAY CAUSE DAMAGE TO THE COOLING SYSTEM AND CANNOT BE USED, THESE MATERIALS ARE ALUMINUM, IRON, CARBON STEEL, ZINC, ZINC PLATED STEEL, OR STANDARD STEEL PIPES.

THESE REQUIREMENTS ARE REQUIRED FOR NEW INSTALLATIONS, IF EXISTING WATER PIPES COMPLY WITH SIEMENS WATER SPECIFICATIONS, THEY DO NOT NEED TO BE REPLACED.

NORMAL TAP WATER MUST BE AVAILABLE FOR FILLING THE SECONDARY WATER CIRCUIT. THERE SHALL BE A HOSE BIB LOCATED WITHIN 65' OF THE SEP, IFP, ACC OR THE KRAUS CHILLER.

THE SUPPLY AND RETURN CHILLED WATER PIPES MUST BE LABELED. THE LOCATION OF THE LABELS MUST BE AT ALL CONNECTION AND REFILLING POINTS AND MUST CONTAIN FLOW DIRECTION AND CONTENTS.

### ENVIRONMENTAL REQUIREMENTS

1) AIR CONDITIONING IS TO PROVIDE A TEMPERATURE OF 70°F ±5°F IN THE CONTROL & EQUIPMENT ROOMS 65°F-71°F IN EXAM ROOM. RELATIVE HUMIDITY OF 40-60% (NON-CONDENSING) IS REQUIRED EXAMINATION ROOM AND 40-80% (NON-CONDENSING) IN ALL OTHER AREAS WHERE SIEMENS EQUIPMENT IS INSTALLED. THESE CONDITIONS ARE TO BE MET AT ALL TIMES; 24 HOURS A DAY, 7 DAYS A WEEK.

2) A DEDICATED AIR CONDITIONING AND HUMIDIFICATION SYSTEM IS RECOMMENDED FOR THE EXAM ROOM. A MINIMUM FRESH AIR EXCHANGE RATE OF 6 TIMES PER HOUR FOR THE EXAM ROOM IS REQUIRED. AIR SUPPLY AND RETURN ABOVE THE FINISHED CEILING IN THE EXAM ROOM IS RECOMMENDED. EACH ROOM SHOULD HAVE A DEDICATED CONTROL AND SENSOR TO MONITOR AND ADJUST THE AIR.

3) THE HEAT INTO THE EXAM ROOM IS LESS THAN 10,236 BTU/HR. THE HEAT INTO THE EQUIPMENT ROOM IS TYPICALLY 32,415 BTU/HR, MAXIMUM 40,946 BTU/HR. THIS HEAT DISSIPATION IS FROM THE SIEMENS EQUIPMENT ONLY. AUXILIARY SUPPORT EQUIPMENT (ie UPS) AND LIGHTING MUST BE CONSIDERED FOR TOTAL HEAT LOADS.

4) IT IS IMPORTANT FOR FRESH AIR INTAKE SYSTEMS TO EXHAUST AIR DIRECTLY OUT OF THE BUILDING. THE EXHAUST AIR MUST NOT BE DEFLECTED INTO ANOTHER ROOM. THE MAGNET ROOM EXHAUST AIR SHOULD BE INSTALLED AT LEAST 6'-6" ABOVE FINISHED FLOOR.

5) THE AIR INTAKE OF THE AIR CONDITIONING SYSTEM MUST NOT BE LOCATED IN THE VICINITY OF THE QUENCH VENT EXHAUST.

6) IF THE INPUT DRAWS UPON AIR FROM OUTSIDE THE BUILDING, IT IS RECOMMENDED TO INSTALL AN ON-SITE FILTER TO REMOVE DUST PARTICLES GREATER THAN 10 MICRONS.

### QUENCH VENT NOTES

LIQUID AND GASSEOUS HELIUM ARE USED IN THE OPERATION OF A SUPERCONDUCTING MRI SYSTEM. THE MECHANICAL CONTRACTOR SHALL PROVIDE A VENT, ACCORDING TO SIEMENS SPECIFICATIONS, TO EXHAUST GASSEOUS HELIUM FROM THE MAGNET TO OUTSIDE THE BUILDING. PLEASE SEE THE SIEMENS TYPICAL DRAWINGS FOR DETAILS.

### CHILLED WATER REQUIREMENTS

WATER REQUIREMENTS TO BE MEASURED AT THE SEP CABINET.

FLOW RATE:	23.78-29.05 GPM
WATER TEMPERATURE:	48°F ±4°F
BTU DISCHARGE TO THE WATER	214,964 BTU/HR
WATER PRESSURE	MAXIMUM 87 PSI
LOSS OF PRESSURE FOR SEP CABINET	14.5 PSI MAXIMUM
CHILLED WATER ACIDITY RANGE	6 pH TO 8 pH
CHILLED WATER HARDNESS	<250 ppm CALCIUM CARBONATE
CHLORINE GAS CONCENTRATION	<200 ppm
FILTRATION	500 µm

FOR INSTALLATION OF A KRAUS KSC 215 CHILLER, IT IS THE RESPONSIBILITY OF THE CUSTOMER/MECHANICAL CONTRACTOR TO PROVIDE A MIXTURE OF WATER WITH 35%-38% ETHYLENE GLYCOL PRIOR TO CHILLER START UP. DO NOT USE PROPYLENE GLYCOL OR AUTOMOTIVE ANTI-FREEZE.

THE AMOUNT OF THE MIXTURE MUST FILL THE CHILLER, MR SYSTEM AND PIPING (SUPPLY AND RETURN), SEE EXAMPLES BELOW.

(1) GALLON OF UNDILLUTED GLYCOL, OR (2) GALLONS OF WATER/GLYCOL MIXTURE MUST REMAIN ON SITE FOR USE AFTER START UP.

MIXTURE VOLUME INCLUDING SUPPLY & RETURN+15 GAL. CHILLER & MR

PIPE DIAMETER	TOTAL LENGTH	MIXTURE VOLUME	GLYCOL NEEDED
2"	100'	31.3 GALLONS	11.9 GALLONS
2"	200'	47.6 GALLONS	18.1 GALLONS
2.5"	100'	40.5 GALLONS	15.4 GALLONS
2.5"	200'	66.0 GALLONS	25.1 GALLONS

MIXTURE VOLUME =  $3.14 \times (\text{PIPE RADIUS})^2 \times \text{PIPE LENGTH} + 15$  GALLONS.  
GLYCOL AMOUNT = 35-38% OF MIXTURE VOLUME.

### BUILDING VIBRATIONS

VIBRATION OF THE SITE HAS THE ABILITY TO AFFECT THE STABILITY AND HOMOGENEITY OF THE MAGNETIC FIELD. THEREFORE EXTERNAL VIBRATIONS OR SHOCKS AFFECTING THE MAGNET MAY DEGRADE IMAGE QUALITY. IN THE THREE SPATIAL ORIENTATIONS THE BUILDING MUST NOT EXCEED ACCELERATION OF  $0.001\text{m/s}^2$  or  $-80\text{dB}(g)$   $g=9.81\text{ m/s}^2$

THE REQUIREMENT FOR  $a_{\text{max}}$  IS MEASURED AS MAXIMUM RMS VALUE PER FREQUENCY COMPONENT  $<0.5\text{Hz}$  IN THE FOURIER TRANSFORMATION OF THE RECORDED SIGNAL (SPECTRUM).

THE VIBRATION LEVEL OF CONTINUOUS VIBRATIONS (CAUSED BY AIR CONDITIONER, COMPRESSOR, ETC.) AT THE LOCATION OF THE MAGNET MUST NOT EXCEED THE SPECIFIED VALUES.

FOR ALL NON-CONTINUOUS TRANSIENT VIBRATIONS THE FIGURES SHOULD BE MULTIPLIED BY 4 (OR 12dB).

CONTACT SIEMENS PROJECT MANAGER FOR MORE DETAILS.

ALL SITES MUST BE TESTED BY AN ACOUSTICAL/VIBRATION ENGINEER.

## MAGNETOM VERIO SPECIFICATIONS

# MR

### PROTECTING THE ENVIRONMENT

PROTECTING THE IMMEDIATE ENVIRONMENT FROM THE EFFECT OF THE MAGNETIC FIELD REQUIRES CONSIDERATION. INFORMATION STORED ON MAGNETIC DATA CARRIERS SUCH AS DISKS, TAPES, AND CREDIT CARDS MAY BE ERASED IF IN CLOSE PROXIMITY. CAUTION WITH REGARD TO HEART PACEMAKERS MUST BE EXERCISED. MOST PACEMAKER UNITS EMPLOY A REED RELAY WHICH MAY CHANGE OPERATING MODE WHEN EXPOSED TO AN EXTERNAL MAGNETIC FIELD. THEREFORE, PACEMAKER USERS MUST BE KEPT AT A SPECIFIED DISTANCE FROM THE MAGNET WHICH IS DETERMINED BY THE MAGNETIC FIELD STRENGTH.

### PROTECTING THE MAGNETIC FIELD

THE SIEMENS MAGNETOM UTILIZES A SUPERCONDUCTIVE MAGNET WITH AN EXTREMELY HOMOGENEOUS FIELD WITHIN THE MAGNET TO PROVIDE DISTORTION-FREE IMAGING. THE PRESENCE OF FERROMAGNETIC MATERIAL WITHIN THE VICINITY OF THE MAGNET CAN ADVERSELY AFFECT THE UNIFORMITY OF THE USEFUL MAGNETIC FIELD. THIS APPLIES TO STATIONARY FERROUS MATERIAL (STRUCTURAL STEEL) WHICH IS TO BE MINIMIZED. STATIONARY STEEL COMPENSATION MAY BE ACHIEVED BY MAGNET POSITIONING AND SELECTIVE USE OF SHIMS. FIELD DISTORTION ENCOUNTERED BY MOVING FERROMAGNETIC OBJECTS IS MORE DIFFICULT TO COMPENSATE AND MAY REQUIRE THE USE OF MAGNETIC SHIELDING.

### MAGNETIC FRINGE FIELDS

MAGNETIC FIELDS MAY AFFECT THE FUNCTION OF DEVICES IN THE VICINITY OF THE MAGNET. THESE DEVICES MUST BE OUTSIDE CERTAIN MAGNETIC FIELDS. THE DISTANCES LISTED ARE FROM THE MAGNET ISOCENTER AND DO NOT CONSIDER ANY MAGNETIC ROOM SHIELDING.

X/Y AND Z AXIS	DEVICES
6'-11" / 10'-6" 3.0mT	SMALL MOTORS, WATCHES, CAMERAS, CREDIT CARDS, MAGNETIC DATA CARRIERS (SHORT-TERM EXPOSURE)
7'-7" / 13'-2" 1.0mT	COMPUTERS, MAGNETIC DISK DRIVES, OSCILLOSCOPES, PROCESSORS
8'-7" / 15'-2" 0.5mT	CARDIAC PACEMAKERS, X-RAY TUBES, INSULIN PUMPS, B/W MONITORS, MAGNETIC DATA CARRIERS (LONG-TERM STORAGE)
11'-2" / 20'-1" 0.15mT	COLOR MONITORS, SIEMENS CT SCANNERS
12'-6" / 22'-4" 0.1mT	SIEMENS LINEAR ACCELERATORS
16'-1" / 26'-11" 0.05mT	X-RAY IMAGE INTENSIFIERS, GAMMA CAMERAS, PET/CYCLOTRON, ELECTRON MICROSCOPES, LINEAR ACCELERATORS

THE OWNER/USER IS TO VERIFY THE LOCATION OF THE 0.5mT FIELD AND ENSURE THAT IT IS MAINTAINED AS A RESTRICTED AREA.

### MAGNET SITING REQUIREMENTS

IT MUST BE ENSURED THAT THE MAGNET IS LOCATED SO THAT THE STABILITY AND HOMOGENEITY OF THE MAGNETIC FIELD ARE NOT ADVERSELY AFFECTED BY EXTRANEIOUS FIELDS AND STATIC OR DYNAMIC FERROMAGNETIC OBJECTS.

X/Y AND Z AXIS	SOURCE OF INTERFERENCE
4'-0"	FLOOR STEEL REINFORCEMENT < 20 LBS./ FT <sup>2</sup> IRON BEAMS < 66 LBS./FT.
18'-0" / 21'-3"	STRETCHERS UP TO 110 LBS.
13'-1"	A/C CHILLERS
19'-8" / 22'-11"	TRANSPORT DEVICES UP TO 440 LBS.
21'-3" / 26'-2"	VEHICLES UP TO 2,000 LBS.
22'-11" / 31'-2"	ELEVATORS, TRUCKS UP TO 10,000 LBS.
39'-4"/26'-2"	AC TRANSFORMERS LESS THAN 100 KVA
41'-0"/32'-9"	AC TRANSFORMERS LESS THAN 250 KVA
42'-7"/39'-4"	AC TRANSFORMERS LESS THAN 650 KVA
45'-11"/49'-2"	AC TRANSFORMERS LESS THAN 1600 KVA
9'-10"/6'-6"	AC CABLES, MOTORS LESS THAN 100 AMPS
22'-11"/9'-10"	AC CABLES, MOTORS LESS THAN 250 AMPS
131'-2"	ELECTRIC RAILWAY SYSTEMS

FOR IRON OBJECTS LOCATED UP TO 45' FROM THE Z AXIS, THE DISTANCES FOR THE Z AXIS MUST BE USED.  
REDUCTION IS POSSIBLE WITH STEEL SHIELDING.

### MAXIMUM CABLE LENGTH

THERE ARE 6 DIFFERENT CABLE SETS THAT ARE AVAILABLE FOR THE MRI SYSTEM DIFFERENTIATED BY MAXIMUM LENGTHS FROM THE MAGNET TO THE FILTER PANEL (INSIDE) AND FROM THE FILTER PANEL TO THE ELECTRONICS (OUTSIDE).

	INSIDE	OUTSIDE
SET 1	20'	4'
SET 2	20'	32'
SET 3	20'	39'
SET 4	30'	4'
SET 5	30'	29'
SET 6	46'	13'

THE VERTICAL DISTANCE FOR CABLE TRAVEL FROM THE FILTER PANEL TO THE CABLE TRAY, AND FROM THE CABLE TRAY TO THE MAGNET MUST BE CONSIDERED.

THE MAXIMUM DISTANCE FROM THE ACC CABINET TO THE CONTROL CONSOLE IS 75 FEET.

### RF SHIELDING

THE EXAMINATION AREA MUST BE SHIELDED TO PROVIDE A REDUCTION OF RADIO FREQUENCY WAVES EMANATING FROM EXTERNAL TRANSMITTERS. THE REQUIRED ATTENUATION IS 90dB IN THE FREQUENCY RANGE OF 15-128 MHZ. THE RF SHIELD MUST BE TESTED BEFORE AND AFTER MAGNET PLACEMENT IN THE RF ROOM AND AFTER THE SIEMENS RF FILTER PANEL IS INSTALLED.

THE RF-SHIELDING MUST BE INSULATED FROM ALL GROUNDS SUCH THAT THE ONLY GROUND IS THE SINGLE POINT GROUND ON THE OUTSIDE OF THE RF-ROOM WALL. RESISTANCE ≥ 100 OHMS.

ALL ELECTRICAL LINES INTO THE RF ROOM MUST BE ROUTED THROUGH RF FILTERS (PROVIDED BY RF SHIELDING SUPPLIER). ALL ELECTRICALLY NON-CONDUCTIVE SUPPLY LINES (E.G. OXYGEN) INTO THE RF ROOM MUST BE ROUTED THROUGH RF SEALED WAVE GUIDES (PROVIDED BY RF SHIELDING SUPPLIER).

FOR PRESSURE EQUALIZATION PURPOSES THE RF DOOR SHOULD OPEN TO THE OUTSIDE OF THE RF ROOM. AS AN ALTERNATIVE A 24"x24" OPENING IN THE RF ROOM FOR PRESSURE EQUALIZATION IS REQUIRED.