## MAGNETOM AVANTO



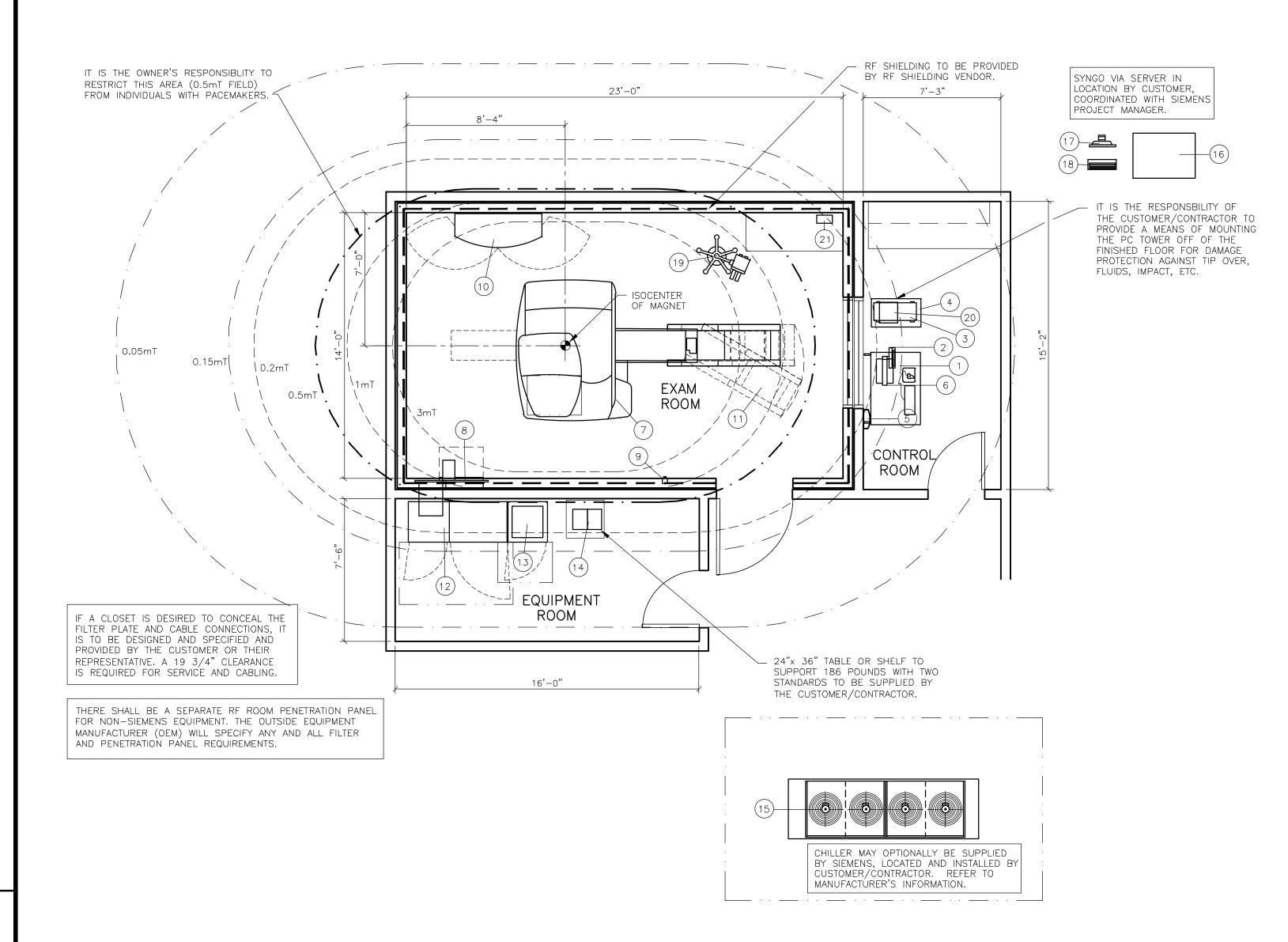
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Typical Drawing #: 03093

# SIEMENS MEDICAL SOLUTIONS

51 Valley Stream Parkway
Malvern, PA 19355
www.usa.siemens.com/medical



#### ARCHITECTURAL EQUIPMENT PLAN

#### ROOM MEASUREMENTS

ALL ROOM MEASUREMENTS AND ROOM DETAIL SPECIFICATIONS MUST BE VERIFIED ON SITE PRIOR TO BEGINNING ANY CONSTRUCTION WORK.

#### CONSTRUCTION REQUIREMENTS

THE CUSTOMER/CONTRACTOR IS RESPONSIBLE FOR SUPPLYING AND INSTALLING ALL CONSTRUCTION MATERIALS INCLUDING ELECTRICAL AND MECHANICAL DEVICES REQUIRED BY SIEMENS SPECIFICATIONS AND TO ENSURE THAT THE MATERIAL USED INSIDE THE RF-SHIELDING IS AS FREE OF FERROMAGNETIC PROPERTIES AS POSSIBLE.

#### DC LIGHTING

THE MAGNETIC FIELD ADVERSELY AFFECTS THE OPERATING LIFE OF LIGHT BULBS LOCATED IN THE IMMEDIATE VICINITY OF THE MAGNET. THE FILAMENT IN THE BULB OSCILLATES WITH THE FREQUENCY OF THE POWER SUPPLY. DURING SCANNING, IT IS RECOMMENDED THAT LIGHT FIXTURES IN THE VICINITY OF THE MAGNET BE CONNECTED TO A DC VOLTAGE SUPPLY.

#### ENVIRONMENTAL/POWER AUDIT

MAY, AT NO COST TO YOUR FACILITY, CHECK THE OPERATING ENVIRONMENT AFTER SYSTEM TURNOVER TO DETERMINE IF THE REQUIREMENTS FOR TEMPERATURE, HUMIDITY, POWER, AND GROUNDING ARE MET AS PER SIEMENS' PUBLISHED SPECIFICATIONS. SIEMENS WILL GENERATE A WRITTEN REPORT DETAILING THE ENVIRONMENTAL AND ELECTRICAL CONDITION OF THE SITE AFTER TURNOVER AND WILL SHARE THE REPORT WITH YOU. IN THE EVENT WE IDENTIFY ANY ENVIRONMENTAL/POWER DEFICIENCIES AT THE SITE, YOUR FACILITY WILL BE REQUESTED TO CORRECT DEFICIENCIES WITHIN THIRTY (30) DAYS. SHOULD ANY CORRECTIVE ACTIONS BE NECESSARY, AND UPON REQUEST SIEMENS WILL PROVIDE GUIDANCE IN AN EFFORT TO FACILITATE RESOLUTION. PLEASE BE ADVISED THAT AFTER 30 DAYS NOTICE ANY REPAIR OR MAINTENANCE SERVICES NECESSITATED BY SEVERE DEFICIENCIES WILL FALL OUTSIDE YOUR WARRANTY COVERAGE.

#### NOISE LEVELS

SYSTEM ROOM	NOISE LEVEL / dB(A)
CONTROL ROOM	= 55</th
EXAMINATION ROOM	= 75</th
EQUIPMENT ROOM	= 65</th
THE PHYSICAL CHARACTERISTICS OF CERTAIN AMOUNT OF NOISE. THIS T NOISE ATTENUATION TO MEET ANY S	ABLE HAS INFORMATION TO INSTALL

AS AN INDICATION OF OUR COMMITMENT TO QUALITY, SIEMENS

#### CASEWORK & ACCESSORY NOTES

MAGNETIC FIELD WARNING

PLEASE BE AWARE THAT DURING THE CALIBRATION PHASE OF THE

MRI INSTALLATION, THE MAGNET WILL BE AT FULL FIELD STRENGTH

OF STRONG MAGNETIC FIELDS MUST BE TAKEN. WHEN THE

AND ALL NECESSARY PRECAUTIONS WHEN WORKING IN THE VICINITY

CALIBRATION OF THE MAGNET OVERLAPS WITH FINAL CONSTRUCTION

ACTIVITIES, THERE IS THE POSSIBILITY OF THE INTRODUCTION OF

FERROUS MAGNETIC OBJECTS BY WORKERS INTO THE MR ROOM. IT

S THE RESPONSIBILITY OF THE CUSTOMER TO ENSURE THAT ALL

PRECAUTIONS ARE TAKEN TO ENSURE THAT THIS DOES NOT HAPPEN,

AS EQUIPMENT DAMAGE AND SERIOUS BODILY INJURY COULD OCCUR.

SCALE:  $1/4" = \overline{1'-0"}$ 

ALL CASEWORK IS EITHER EXISTING OR IS TO BE DESIGNED, DETAILED, FURNISHED AND INSTALLED BY THE CUSTOMER AND/OR CONTRACTOR, FOLLOW DESIGN RECOMMENDATIONS INCLUDED HEREWITH, AS THEY ARE ESSENTIAL FOR THE SUCCESSFUL INSTALLATION & OPERATION OF THE SIEMENS EQUIPMENT. ALL FURNITURE (CHAIRS, ETC.) FOR THE CONTROL ROOM ARE TO BE PROVIDED BY THE CUSTOMER.

#### STATIC DISSIPATIVE FLOORING

SIEMENS RECOMMENDS "STATIC DISSIPATIVE" FLOOR COVERING WITH AN LECTRICAL RESISTANCE OF  $\leq$ 10 $^{9}$  OHMS IN ALL AREAS WHERE SIEMENS. [QUIPMENT IS INSTALLED.  $oldsymbol{\mathsf{A}}$  STATIC DISSPITAVE FLOOR REDUCES THE RISK OF STATIC ELECTRIC DISCHARGES THAT MAY DAMAMGE SENSITVE EQUIPMENT AND COMPONENTS.

#### EQUIPMENT LEGEND SMS | WEIGHT | BTU/HR | DESCRIPTION DIMENSIONS (INCHES) REMARKS SYM (LBS) TO AIR 1) | MRC OPERATING CONSOLE AND KEYBOARD 132 35 1/4 28 3/8 COLOR MONITOR FOR MRC 16 15/16 | 4 3/4 | ON CONSOLE/COUNTER 18 5/16 22 239 HOST PC MRC 49 2,389 27 18 1/8 (4) | CONTAINER FOR HOST PC 500 238 19 5/8 31 1/2 | 28 3/8 ALARM BOX 4 9 (6) PATIENT MONITOR (OPTION) 13 12 1/2 AVANTO MAGNET WITH COVERS AND PATIENT TABLE 117 12,897 7,506 90 1/2 87 1/2 8) | RF—FILTER PLATE 287 853 46 1/2 35 1/8 | 21 5/8 ) | MAGNET STOP 110 21 1/4 53 1/2 50 WEIGHT WITHOUT COILS 10**)** | surface coil cart (option) 71 1/2 11) | PATIENT TRANSPORT TROLLEY (OPTION) 291 26 1/2 39 1/2 ) | ELECTRONICS CABINET 2,755 17,060 63 25 5/8 77 1/2 TOTAL OF GPA, ACC, CCS SEP CABINET 750 3,415 25 5/8 73 5/8 25 5/8 12 7/8 | 16 1/4 | \*1,755 ON BATTERIES (14) | POWERWARE 9130 UPS WITH EBM (OPTION) 186 16 7/8 ) KKT KRAUS KSC 215 CLOSED LOOP WATER CHILLER 2,425 CUST. TO LOCATE/INSTALL 16**) |** syngo.via server (rack version — option) 135 28 1/2 39 3/8 SYNGO VIA 19" MONITOR (OPTION 22 239 18 1/4 10 1/8 17 1/2 ON CUSTOMER'S COUNTER SYNGO VIA KEYBOARD (OPTION) 1 3/4 ON CUSTOMER'S COUNTER 52 1/4 | INJECTOR ON STAND 19) | MEDRAD ICBC INJECTOR STAND AND HEAD (OPTION) 37.5 19 1/4 ON CUSTOMERS COUNTER 7.9 20) | MEDRAD ICBC INJECTOR CRU (OPTION) 10 7/8 MEDRAD ICBC INJECTOR POWER SUPPLY (OPTION) 3.5 OUTSIDE 5mT FIELD

#### 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 D COMPENSATE AND MAY REQUIRE THE USE OF MAGNETIC SHIELDING.

#### 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 EXTRANEOUS FIELDS AND STATIC OR DYNAMIC FERROMAGNETIC OBJECTS.

X/Y AND Z AXIS	SOURCE OF INTERFERENCE
4'-2"	FLOOR STEEL REINFORCEMENT<20 LBS./ FT2 IRON BEAMS < 66 LBS./FT.
16'-0" / 19'-0"	STRETCHERS UP TO 110 LBS.
13'-1"	A/C CHILLERS
17'-4" / 21'-3"	TRANSPORT DEVICES UP TO 440 LBS.
18'-0 / 24'-7"	VEHICLES UP TO 2,000 LBS.
20'-4" / 29'-6"	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'-3"	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.

#### MAGNET CO-SITING

MINIMUM DISTANCE MAGNET-MAGNET (SIEMENS) 

	0.2T	0.35T	1.0T	1.5T	3.0T
0.2T	32'-9"	32'-9"	16'-5"	19'-9"	32'-9"
0.35T	32'-9"	32'-9"	16'-5"	19'-9"	32'-9"
1.0T	16'-5"	16'-5"	14'-10"	16'-5"	19'-9"
1 <i>.</i> 5T	19'-9"	19'-9"	16'-5"	16'-5"	19'-9"
3.0T	32'-9"	32'-9"	19'-9"	19'-9"	19'-9"

DO NOT RAMP ONE MAGNET WHILE THE OTHER IS RUNNING APPLICATIONS. SHIM IS ONLY OPTIMIZED WHEN BOTH MAGNETS ARE RAMPED UP DURING THE SHIMMING PROCEDURE.

WHEN CO-SITING AN MR SYSTEM WITH A MAGNETIC NAVIGATION SYSTEM THE MINIMUM DISTANCE FOR CLINICAL IMAGING IS 98'-6", FOR SPECTROSCOPY THE MINIMUM SEPARATION IS 121'-5".

#### CEILING HEIGHTS

EXAM ROOM 7'-9" MINIMUM CONTROL ROOM 6'-11 MINIMUM EQUIPMENT ROOM 7'-3" MINIMUM

#### 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.

#### MAGNETIC FRINGE FIELDS

MACINE!	WACKLIC INHOL HELDS					
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'-7" / 9'-3" <b>3.0m</b> T	SMALL MOTORS, WATCHES, CAMERAS, CREDIT CARDS, MAGNETIC DATA CARRIERS (SHORT— TERM EXPOSURE)					
7'-7" / 11'-6" 1.0mT	COMPUTERS, MAGNETIC DISK DRIVES, OSCILLOSCOPES, PROCESSORS					
8'-3" / 13'-2" <b>0.5mT</b>	CARDIAC PACEMAKERS, X—RAY TUBES, INSULIN PUMPS, B/W MONITORS, MAGNETIC DATA CARRIERS (LONG—TERM STORAGE)					
9'-10" / 16'-5" <b>0.2m</b> T	SIEMENS CT SCANNERS					
10'-10" / 17'-9" 0.15mT	COLOR MONITORS, SIEMENS LINEAR ACCELERATORS					
14'-10" / 23'-8" 0.05mT	X-RAY IMAGE INTENSIFIERS, GAMMA CAMERAS, PET/CYCLOTRON, ELECTRON MICROSCOPES, LINEAR ACCELERATORS					
	TO VERIFY THE LOCATION OF THE 0.5mT FIELD IS MAINTAINED AS A RESTRICTED AREA.					

#### TRANSPORTING REQUIREMENTS

\_argest item without packing material: magnet-12,897 pounds MINIMUM REQUIRED OPENING FOR MAGNET DELIVERY: WALL OPENING -7'-9" HIGH  $\times$  7'-11" WIDE WITH TRANSPORT ROLLERS FROM THE SIEMENS TOOL KIT

STANDARD ROOF OPENING  $-10'-5" \times 7'-11"$ \* FOR SPECIAL CASES THE TABLE MAY BE REMOVED \*
MINIMUM ROOF OPENING - 5'-11" x 7'-11" F TRANSPORTING THE MAGNET UP A RAMP, A 15° MAXIMUM ANGLE

MUST BE MAINTAINED. TO TRANSPORT THE GPA/ACC CABINET (63"  $\times$  27"  $\times$  78" HIGH; 3307 POUNDS ), A MINIMUM ROOM HEIGHT OF 6'-9" WITH TRANSPORT ROLLERS, OR 6'-5" WITHOUT ROLLERS IS REQUIRED.

#### STATE AGENCY REVIEW

DESCRIPTION

PRIOR TO SIEMENS EQUIPMENT INSTALLATION, APPROVAL OF CONSTRUCTION OR STRUCTURAL MODIFICATIONS FOR DIAGNOSTIC OR THERAPEUTIC PURPOSES, MUST BE OBTAINED BY THE CUSTOMER FROM THE APPROPRIATE STATE AGENCY, IF APPLICABLE.

#### ARCHITECTURAL NOTES

ALL PRELIMINARY EQUIPMENT LAYOUTS SUBMITTED BY SIEMENS MEDICAL SOLUTIONS, INC. (SMS HEREAFTER) ARE BASED ON THE RECOMMENDED SPACE NECESSARY FOR THE OPERATION AND SERVICEABILITY OF THE EQUIPMENT BEING PROPOSED. SMS WILL NOT SUBMIT AN EQUIPMENT LAYOUT THAT IS NOT IN THE BEST INTEREST OF BOTH THE CUSTOMER AND SMS, ALL EQUIPMENT LAYOUTS ARE BASED EITHER ON AN ACTUAL SITE LOCATION SURVEY OR ARCHITECTURAL DRAWINGS SUPPLIED TO SMS. SMS WILL NOT BE RESPONSIBLE FOR ANY ALTERATIONS THAT ENCROACH WITHIN

DESIGNATED SAFETY AND SERVICE CLEARANCE ZONES AS INDICATED ON DRAWINGS (IE. PIPE CHASES, VENTILATION DUCTS, CASEWORK, AND SOFFITS, ETC.) MADE BY THE CUSTOMER OR REQUIRED BY A CUSTOMER'S ARCHITECTURAL FIRM ONCE PRELIMINARY DRAWINGS HAVE BEEN SUBMITTED AND APPROVED. DO NOT ALTER ANY SPECIFICATIONS AND/OR DIMENSIONS WITHOUT CONTACTING AND RECEIVING WRITTEN CONFIRMATION FROM SMS PROJECT MANAGER.

2) SMS IS NOT AN ARCHITECTURAL OR ENGINEERING FIRM. DRAWINGS SUPPLIED BY SMS ARE NOT CONSTRUCTION DRAWINGS. THEREFORE, THESE DRAWINGS ARE TO BE USED ONLY FOR INFORMATION TO COMPLEMENT ACTUAL CONSTRUCTION DRAWINGS AVAILABLE FROM A CUSTOMER APPOINTED ARCHITECTURAL REPRESENTATIVE OR A CUSTOMER'S ENGINEERING DESIGN GROUP. THE CUSTOMER'S ARCHITECT AND GENERAL CONTRACTOR SHALL BE ULTIMATELY RESPONSIBLE FOR COMPLIANCE WITH ALL APPLICABLE CODES AND PROFESSIONAL DESIGN REQUIREMENTS.

3) THE CUSTOMER IS RESPONSIBLE FOR ALL ROOM AND AREA PREPARATION COSTS, PROFESSIONAL FEES, PERMITS, REPORTS, AND

EQUIPMENT WARRANTIES, EXPRESSED OR IMPLIED ON THE PART SMS SHALL BE CONTINGENT UPON STRICT COMPLIANCE WITH THE ARCHITECTURAL, STRUCTURAL, ELECTRICAL, MECHANICAL AND RECOMMENDATIONS AND REQUIREMENTS CONTAINED IN THESE DRAWINGS, UNLESS SPECIFIED OTHERWISE.

5) ALL DIMENSIONS SHOWN ARE TAKEN FROM FINISHED SURFACES

UNLESS SPECIFIED OTHERWISE. 6) THIS DRAWING DOES NOT PROVIDE RADIATION SHIELDING REQUIREMENTS FOR X-RAY AND ASSOCIATED EQUIPMENT. THE CUSTOMER IS RESPONSIBLE FOR CONSULTING WITH A REGISTERED RADIATION PHYSICIST. ACTUAL PROTECTION REQUIREMENTS SHALL BE SPECIFIED BY A REGISTERED RADIATION PHYSICIST AT CUSTOMER'S ENGAGEMENT AND EXPENSE. RESPONSIBILITY FOR ALL INFORMATION AS TO THE ROOM LOCATION, USE, AND NUMBER OF ANTICIPATED EXAMINATIONS TO BE PERFORMED PER TIME PERIOD SHALL BE PROVIDED TO THE PHYSICIST BY THE CUSTOMER. THE CUSTOMER SHALL FURTHER TAKE ALL RESPONSIBILITY IN THE COMMUNICATION

THE ARCHITECTURAL REPRESENTATIVE. 7) SMS SHALL BE RESPONSIBLE FOR SMS EQUIPMENT INSTALLATION AND CALIBRATION, CONNECTION AND INSTALLATION OF SMS PROVIDED CABLES, AND CONNECTION OF CONTRACTOR PROVIDED WIRES TO SMS EQUIPMENT. IN THE EVENT THAT SPECIFIC TRADE RULES OR LICENSE REQUIREMENTS PROHIBIT THIS, THE CUSTOMER SHALL INITIATE THE SERVICES OF APPROVED OTHER CONTRACTORS AND PAY FOR SELECTED, APPROVED PARTIES TO PERFORM THIS WORK WITH JOB SUPERVISION TO BE PROVIDED BY SMS. CALIBRATION WHEN ACCOMPLISHED OUTSIDE OF NORMAL INSTALLATION SEQUENCES DUE

AND COORDINATION OF ACTIVITIES OF THE RADIATION PHYSICIST AND

AS AN ADDITIONAL INSTALLATION EXPENSE. 3) THE CUSTOMER SHALL VERIFY WITH SMS PROJECT MANAGER FINAL INSTALLATION DRAWINGS THE LOCATIONS AND TRAVEL OF ALL ANCILLARY EQUIPMENT TO BE CEILING OR WALL MOUNTED (IE: O.R. LIGHTS, MEDICAL GAS COLUMNS, PHYSIOLOGICAL MONITORING INJECTORS, CRT PLATFORMS, SPRINKLER HEADS, SMOKE DETECTORS, ELECTRICAL OUTLETS, HVAC GRILLES, SPEAKERS, AND GENERAL ROOM

TO CONTRACTOR OR TRADE RULE ACTIONS OR REQUIREMENTS SHALL

BE SUPPORTED BY, CHARGED TO, AND ACCEPTED BY THE CUSTOMER

9) THE GENERAL CONTRACTOR/CUSTOMER SHALL BE RESPONSIBLE FOR ALL FINAL PAINT, TOUCH-UP AND ANY COSMETIC OR TRIM WORK WHICH NEEDS TO BE OR IS REQUIRED TO BE COMPLETED AFTER THE INSTALLATION OF THE SMS EQUIPMENT AND ANY ASSOCIATED SUPPORT APPARATUS.

#### SITE READINESS GUIDELINES

THE FOLLOWING GENERAL CONDITIONS ARE NECESSARY TO HAVE THE STATUS OF "READY SITE": PROPER POWER AVAILABLE AT SIEMENS EQUIPMENT POWER CABINET

LOCATION AND ALL POWER OUTLETS FUNCTIONING. AIR CONDITIONING/HUMIDIFICATION SYSTEMS COMPLETE, TESTED, AND FUNCTIONING PROPERLY ACCORDING TO SIEMENS SPECIFICATIONS.

PROPER LIGHTING INSTALLED AND FUNCTIONING. PLUMBING COMPLETE EXCEPT FOR ANY FINAL CONNECTIONS TO SIEMENS EQUIPMENT.

ALL CABLE TRAYS/DUCTS/CONDUITS CORRECTLY SIZED, LOCATED, AND INSTALLED ACCORDING TO THE SIEMENS DRAWINGS.

ALL REINFORCEMENT PLATES/UNISTRUT INSTALLED AS REQUIRED. ROOM FOR EQUIPMENT INSTALLATION AND IMMEDIATE VICINITY IS DUST-FREE AND IS TO REMAIN SO FOR THE DURATION OF THE

A SECURE AREA (APPROXIMATELY 10' x 10') IS AVAILABLE AT EQUIPMENT DELIVÈRY FOR PARTS AND INSTALLATION TOOLS.

CUSTOMER SUPPLIED CAMERAS AND PROCESSORS INSTALLED. )) CUSTOMER APPROVAL FOR SIEMENS REMOTE SERVICES (SRS) CONNECTION, AND CUSTOMER'S I.T. CONTACT INFORMATION AND IP ADDRESSES ESTABLISHED.

WALLS TO BE PRIMED AND PAINTED, FLOORS TO BE TILED EXCEPT IN AREAS OF THE EQUIPMENT BASE PLATES.

THESE CONDITIONS ARE NOT MET, THE SIEMENS PROJECT MANAGER AND THE DESIGNATED SIEMENS INSTALLATION SUPERVISOR SHALL RESCHEDULE THE INSTALLATION START DATE. NOTE: ADDITIONAL COST MAY BE INCURRED BY THE CUSTOMER/CONTRACTOR AND DELIVERY DATES MAY NEED TO BE RESCHEDULED, WHEN THE SIEMENS SITE READINESS GUIDELINES ARE NOT MET.

#### RESOURCE LIST (SMS USE ONLY) DESIGNATION

MAGNETOM AVANTO PLANNING GUIDE M6-020.891.01.08.02

AVANT 03/13/13

## **SIEMENS**

#### MAGNETOM AVANTO TYPICAL INSTALLATION DRAWIGNS

NOT FOR CONSTRUCTION THE USE OR REPRODUCTION OF |PROJECT #: THIS TITLE BLOCK WITHOUT

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ATTENTION:

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-IT IS RECOMMENDED THAT THE SIEMENS DRAWINGS BE INCORPORATED WITH THE CONSTRUCTION DOCUMENTS FOR REFERENCE.

- ALL DIMENSIONS SHOWN ON THIS DRAWING ARE FROM FINISHED SURFACES. -THIS DRAWING DOES NOT PROVIDE RADIATION SHIELDING REQUIREMENTS FOR X-RAY AND ASSOCIATED EQUIPMENT. THE CUSTOMER IS RESPONSIBLE FOR CONSULTING WITH A REGISTERED RADIATION PHYSICIST TO SPECIFY RADIATION PROTECTION.

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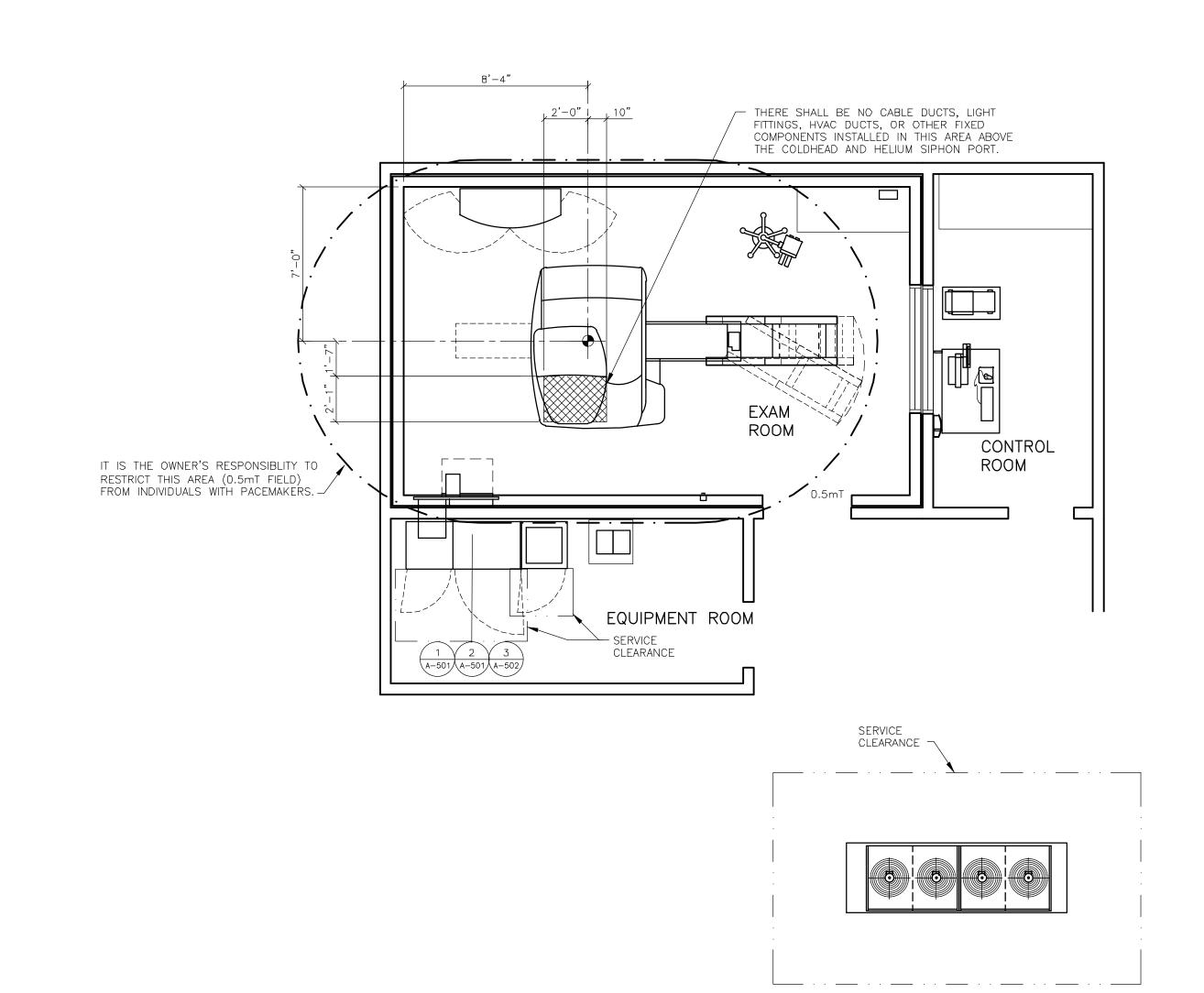
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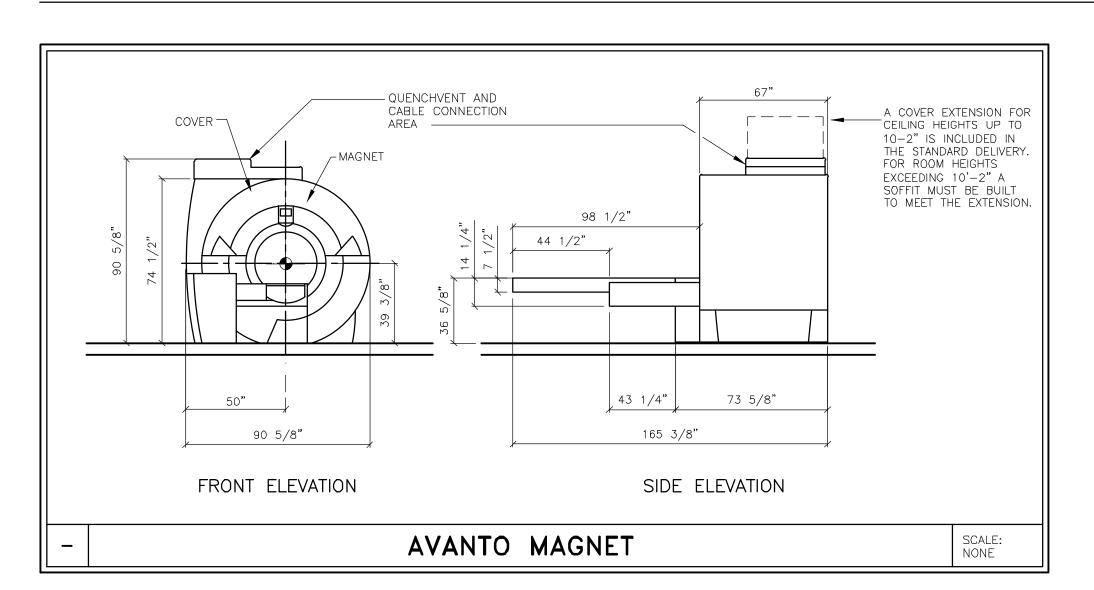
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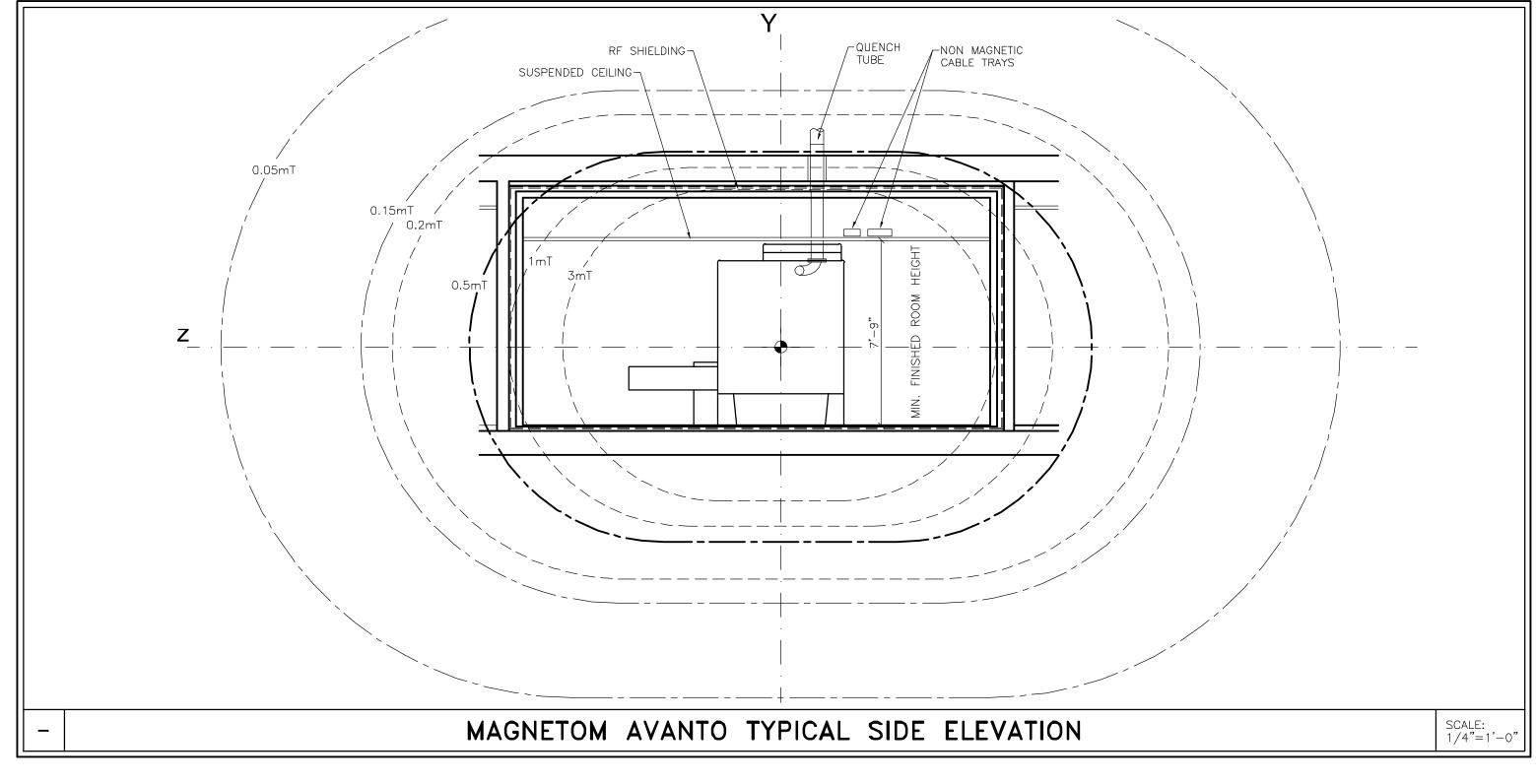
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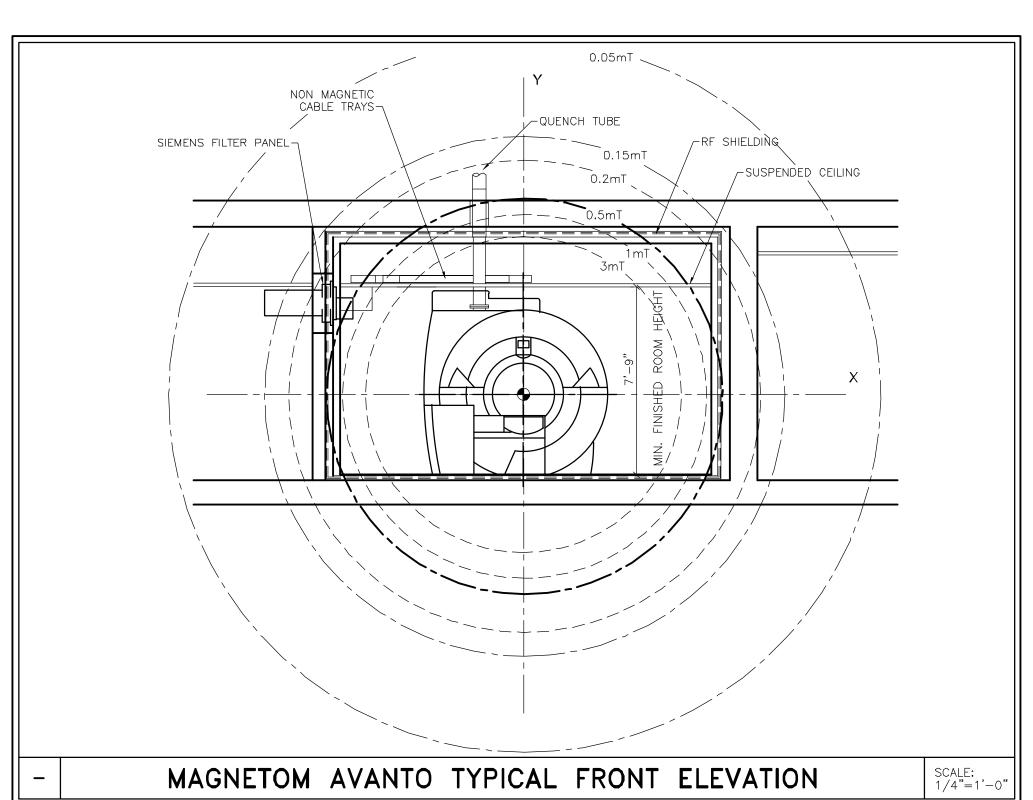
> B. HERRMANN CHECKED: 04/05/13



SAFETY/SERVICE CLEARANCE PLAN







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

CEILING HEIGHTS EXAM ROOM 7'-9" MINIMUM CONTROL ROOM 6'-11 MINIMUM EQUIPMENT ROOM 7'-3" MINIMUM

AVANTO 03/13/13 SIEMENS MAGNETOM AVANTO TYPICAL INSTALLATION DRAWIGNS NOT FOR CONSTRUCTION THE USE OR REPRODUCTION OF THIS TITLE BLOCK WITHOUT SIEMENS AUTHORIZATION WILL RESULT IN PROSECUTION UNDER FULL EXTENT OF THE LAW. 03093 ALL RIGHTS ARE RESERVED. DESCRIPTION 2 10 B. HERRMANN SCALE: **AS NOTED** -ISSUE BLOCK-04/05/13

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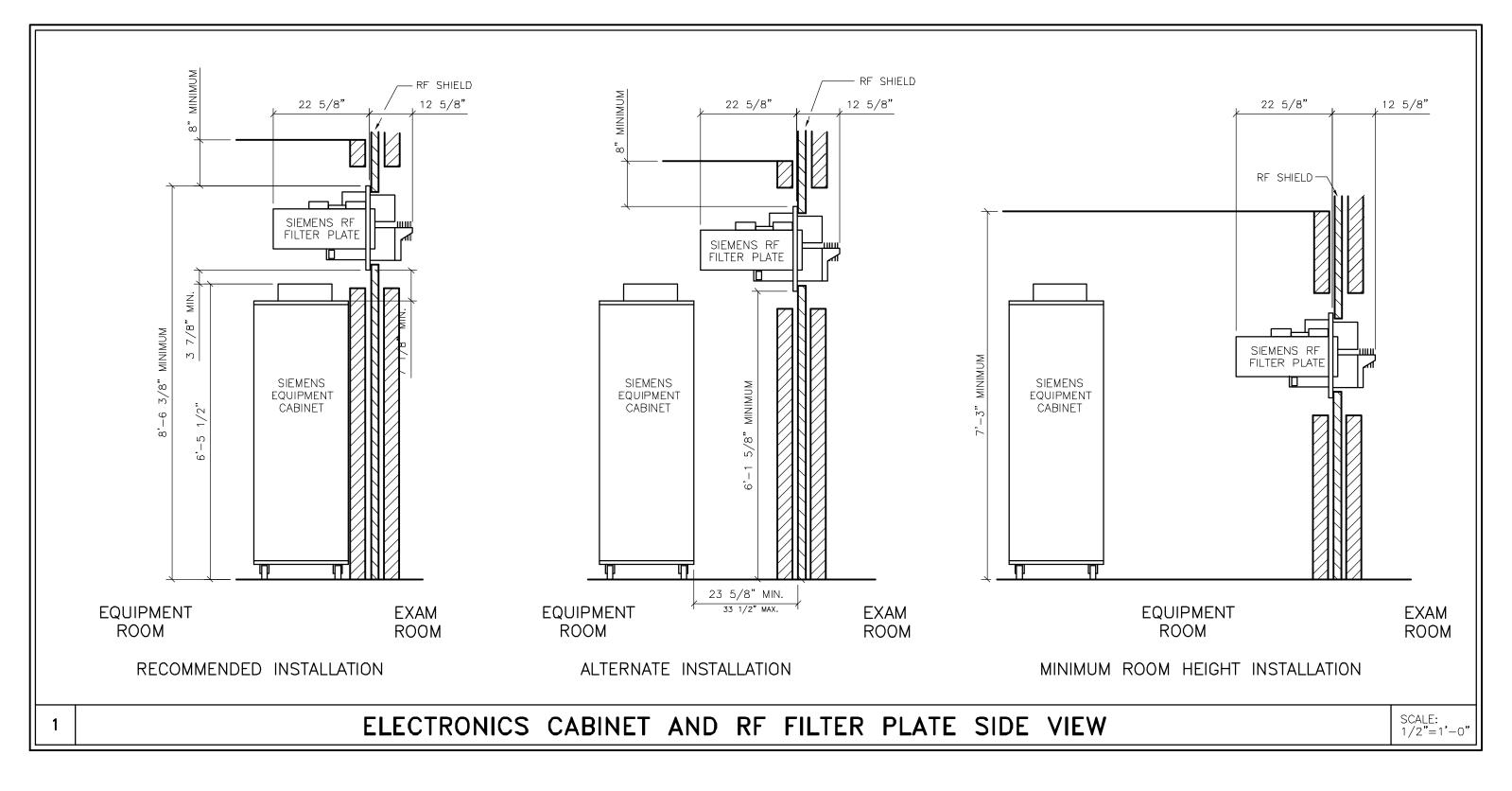
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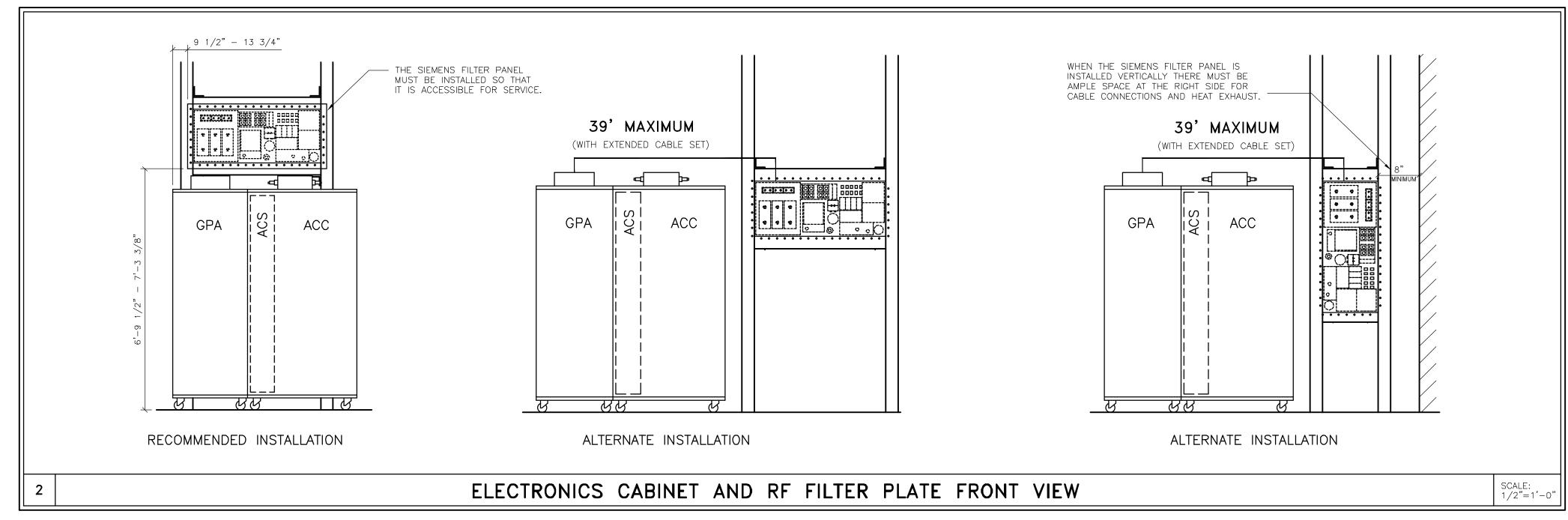
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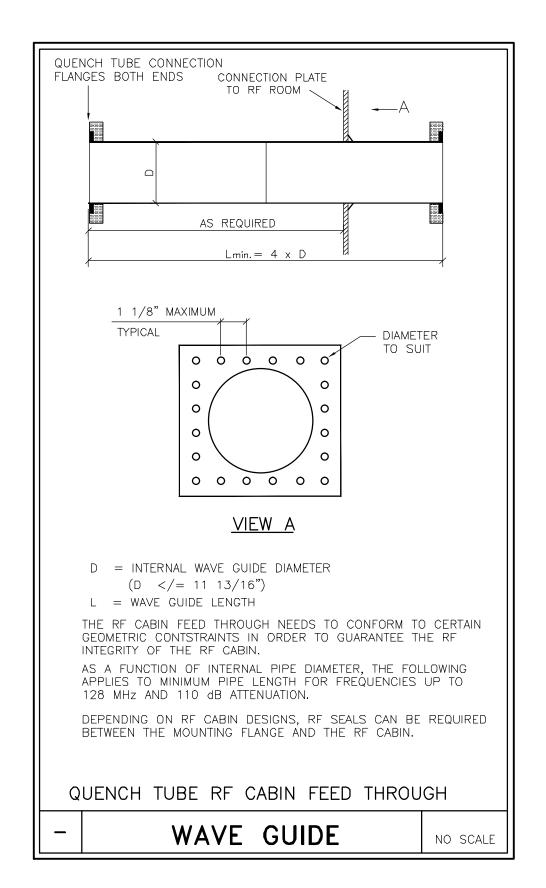
SURFAC	CE C	OIL	SIZI	ES	
COIL NAME	POUND WEIGHT	LENGTH	INCH WIDTH	HEIGHT	DIAMETER
HEAD MATRIX COIL	11		11 1/4		-
NECK MATRIX COIL	6	7 1/2	13	13 1/8	_
SPINE MATRIX COIL	24	46 3/4	19 1/8	1 1/4	_
BODY MATRIX COIL	2	11 1/4	11 1/4	11	_
PA MATRIX COIL	13	38 1/4	23 5/8	13	-
FLEX COIL INTERFACE	1	8 1/4	20 1/2	-	-
CP FLEX COIL, SMALL	3/4	6 3/4	14 1/4	-	-
LOOP FLEX COIL, LARGE	1	_	_	_	7 1/2
LOOP FLEX COIL, SMALL	1/4	_	_	_	1 3/8
ENDORECTAL INTERFACE	1/2	-	_		_
CP BREAST ARRAY	16	19 3/4	21	5 3/4	_
SHOULDER ARRAY BASE	11	17 5/8	19 3/8	-	_
LG SHOULDER ARRAY COIL	4	_	_	_	7 7/8
SM SHOULDER ARRAY COIL	3	_	_	_	6 1/2
CP EXTREMITY COIL	13	16	10 5/8	11 1/2	-
DOUBLE LOOP ARRAY COIL	1/2	3 1/4	5 3/8	3 1/4	_
CP HEAD ARRAY COIL	13	19	13	_	7 7/8
QUADRATURE Tx/Rx HEAD	15	15 3/4	14 1/4	14 1/4	6 1/2





AVANTO 03/13/13

								SIEMENS
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#### RF DOOR OPENING

IN THE EVENT OF A CATASTOPHIC FAILURE OF THE QUENCH VENT DURING A QUENCH, PRESSURE BUILT UP MAY PREVENT OPENING A DOOR THAT OPENS INTO THE RF ROOM, PREVENTING EVACUATION FROM LIFE THREATENING CONDITIONS.

FOR THIS REASON THE RF DOOR SHOULD OPEN TO THE OUTSIDE OF THE RF ROOM. IF THE DOOR CANNOT OPEN OUT FROM THE RF ROOM, OTHER APPROPRIATE MEANS HAVE TO BE PROVIDED SO THAT THE RF ROOM DOOR IS NOT PREVENTED FROM OPENING DUE TO PRESSURE.

IF THE DOOR OPENS INTO THE RF ROOM, A 24"x24" OPENING FOR PRESSURE EQUALIZATION INTO THE RF ROOM MUST BE INSTALLED. THIS IS MANDATORY. THIS IS NOT AN ESCAPE HATCH. THE PURPOSE OF THE OPENING IS TO RELIEVE PRESSURE AND ALLOW THE MAIN DOOR TO BE OPENED SO THAT OCCUPANTS CAN BE EVACUATED.

THE OPENINGS WILL HAVE PANELS INSTALLED IN THE RF ROOM OR THE DOOR THAT CAN BE UNLOCKED AND OPENED TO THE OUTSIDE IN CASE OF EMERGENCY. THESE PANELS REQUIRE AN RF SEALED INSTALLATION. AFTER OPENING THE PANEL, THE OUTLET SHOULD MEASURE AT LEAST 24"x24". WHEN USING RECTANGULAR PANELS, THE SHORTER SIDE SHOULD MEASURE OF MINIMUM OF 24".

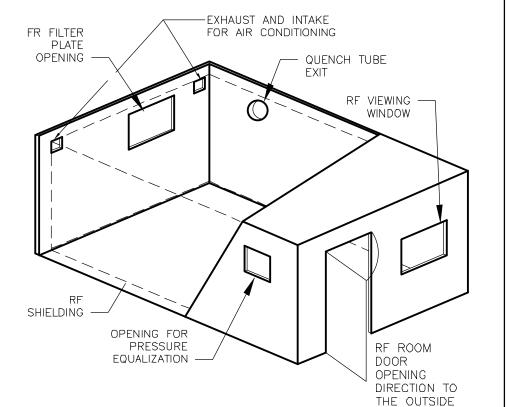
TO ENSURE UNOBSTRUCTED VENTING, THIS OPENING CANNOT BE SUBDIVIDED. THIS MEANS THAT, FOR EXAMPLE, RF SEALED HONEYCOMB GRIDS ARE NOT PERMITTED.

EASY REMOVAL OF THE PANEL BY A PERSON HAS TO BE ENSURED AND A MINIMUM DISTANCE OF 40" TO A FIXED OBJECT MUST BE MAINTAINED, THE PANEL SHOULD BE INSTALLED IN AN ACCESSIBLE LOCATION AND ALLOW ESCAPE OF THE LOW DENSITY HELIUM.

AS AN ALTERNATIVE TO AN OUTSWING DOOR, THE STATIONARY OBSERVATION WINDOW IS REPLACED BY A WINDOW OPENING INTO THE CONTROL AREA OR THE DOOR IS REPLACED WITH AN RF SEALED SLIDING DOOR. IT SHOULD BE ENSURED THAT THE DOOR CLOSES IN A WAY THAT ALLOWS IT TO MOVE AWAY FROM THE FRAME IN CASE OF OVERPRESSURE.

IF THE DOOR OPENS TO THE OUTSIDE, THE OPENING IN THE RF ROOM IS STILL RECOMMENDED.

THE RF ROOM MANUFACTURER CAN PROVIDE YOU WITH ADDITIONAL RF SEALED ROOM OPENINGS THAT LEAD DIRECTLY TO THE OUTSIDE. HOWEVER, THESE OPENINGS ARE ALSO CONDUITS FOR NOISE GENERATED OUTSIDE THE RF ROOM. UNOBSTRUCTED FLOW THROUGH THIS PIPE MUST BE GUARANTEED.



SAFETY ASPECTS FOR THE RF ROOM: IT MUST BE POSSIBLE TO LOCK THE RF ROOM (EXAMINATION ROOM) DOOR FROM THE OUTSIDE. IT MUST ALSO BE POSSIBLE TO OPEN THE DOOR FROM THE INSIDE WITHOUT A KEY OR ADDITIONAL DEVICE.

THE RF DOOR IS AN IMPORTANT COMPONENT FOR GOOD IMAGE QUALITY AS WELL AS SAFETY, THE OWNER/OPERATOR OF THE MR SYSTEM MUST MAINTAIN THE RF ROOM AS INSTRUCTED BY THE RF ROOM MANUFACTURER IN ORDER TO GUARANTEE CORRECT FUNCTION OF THE RF DOOR.

NO FERROMAGNETIC ITEMS CAN BE BROUGHT INTO THE RF ROOM AFTER THE MAGNET HAS BEEN RAMPED UP TO FIELD. MAGNETIC ITEMS WILL BECOME ATTRACTED TO THE MAGNET WITH NO WARNING AND DUE TO THE HIGH MAGNETIC FIELD, WILL BECOME MISSILES.

NOTE: FOR DOORS MOVED BY AN AUXILLARY DRIVES (ELECTRICAL OR PNEUMATIC), MANUAL OPERATION HAS TO BE ENSURED. AN OUTSIDE WINDOW SHOULD BE IN THE VICINITY TO ALLOW VENTING EXHAUSTED GAS TO THE OUTSIDE. THE INTEGRITY OF THE RF SHIELD MUST BE TESTED AFTER REMODELLING.

#### SAFETY INFORMATION - PRESSURE EQUALIZATION

THE EXAMINATION AREA MUST BE SHIELDED TO PROVIDE A REDUCTION OF RADIO FREQUENCY WAVES EMANATING FROM EXTERNAL TRANSMITTERS. HE REQUIRED ATTENUATION IS 90dB IN THE FREQUENCY RANGE OF 15-128 MHz. IF CO-SITING TWO SYSTEMS EACH ROOM SHOULD BE 100 dB. 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. FIBER OPTIC CABLES. OR HOSES) INTO THE RF ROOM MUST BE ROUTED THROUGH

RF SEALED WAVEGUIDES (PROVIDED BY RF SHIELDING SUPPLIER).

RF SHIELDING

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.

#### SHIELDING GENERAL NOTES

NONE

) SIEMENS REQUESTS THAT THE SHIELDING MANUFACTURER(S) SUBMIT FINAL SHOP DRAWINGS TO SIEMENS FOR REVIEW PRIOR TO THEIR INCLUSION IN CONSTRUCTION DOCUMENTS. SIEMENS SHALL BE COPIED ON ALL FIELD ORDER CHANGES CONCERNING CHANGES IN RF AND MAGNETIC SHIELDING CONDITIONS, CONFIGURATION AND SPECIFICATION. THE RF AND MAGNETIC SHIELDING CONTRACTOR(S) SHALL FURNISH "AS BUILT" SCALED AND DIMENSIONED PLANS REFLECTING ANY AND ALL FIELD ORDER CHANGES PRIOR TO THE COMPLETION OF THE CONSTRUCTION DOCUMENTS.

2) ALL CHANGES TO SIEMENS RECOMMENDED OPENINGS AND PENETRATIONS SHALL BE APPROVED BY THE SIEMENS PROJECT MANAGER PRIOR TO THE COMPLETION OF THE CONSTRUCTION DOCUMENTS.

3) THE SIZE, LOCATION, AND DIMENSIONS OF ANY MAGNETIC SHIELDING REQUIRED HAS BEEN DETERMINED BY SIEMENS. THIS INFORMATION HAS BEEN SUPPLIED TO THE MAGNETIC SHIELDING FABRICATOR TO DESIGN THE STRUCTURAL SUPPORT SYSTEM REQUIRED FOR THE MAGNETIC SHIELDING MATERIAL.

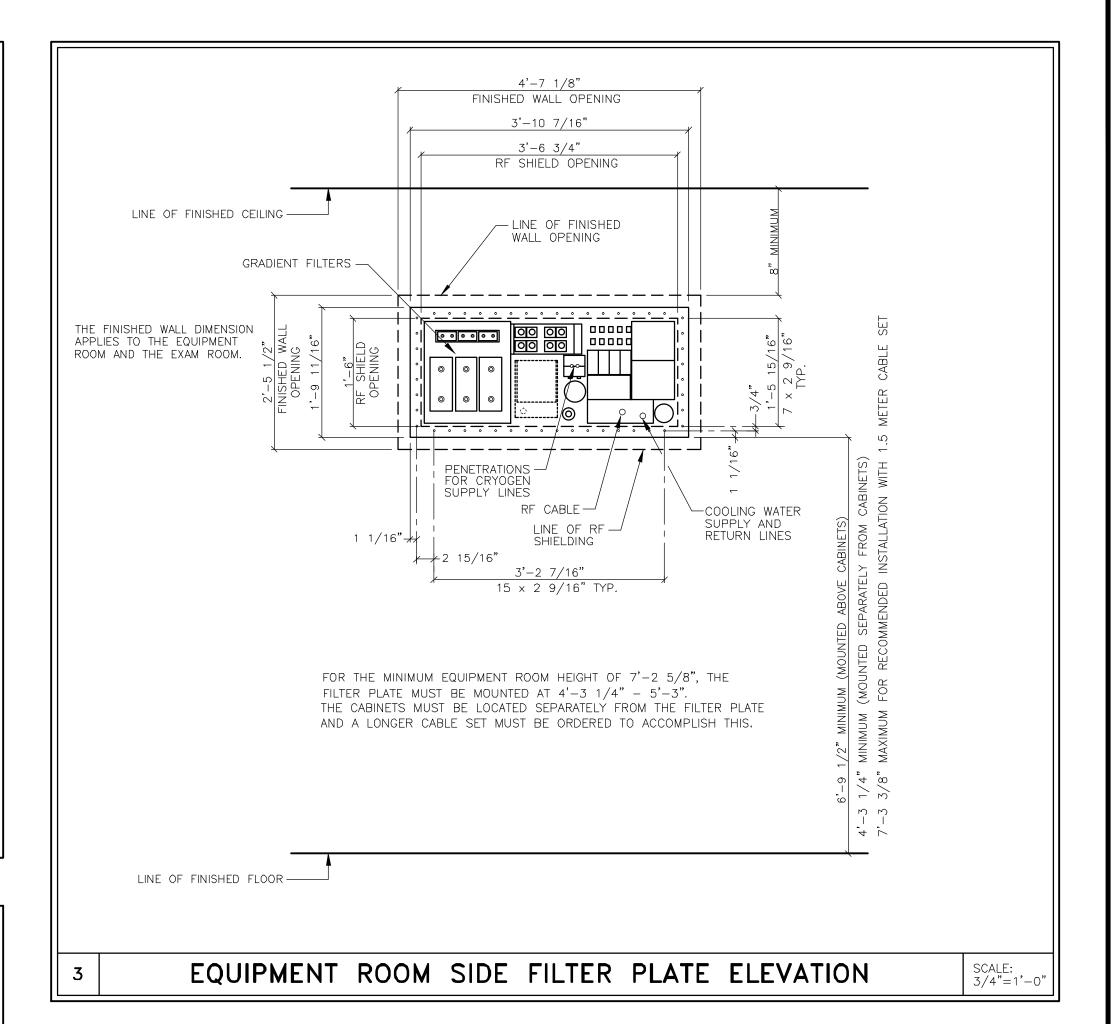
#### EXAM ROOM INTERIOR NOTES

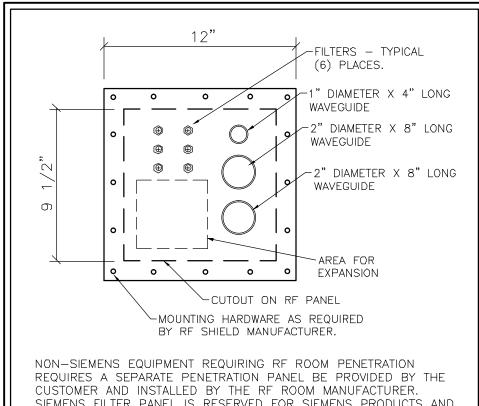
1) ONLY NON-MAGNETIC MATERIALS ARE TO BE USED AND INSTALLED IN THE RF ROOM.

2) A SUSPENDED CEILING MUST BE STATICALLY SUSPENDED, NOT SUSPENDED WITH MOVABLE CLAMPS, SPRINGS, ETC.

3) CORRUGATED RODS IN SUSPENDED CEILINGS MUST BE INSTALLED SÉCURELY. GALVANIC CONTENT BETWEEN THE CORRUGATED RODS MUST BE GUARANTEED, THEY MUST NOT JUST LIE ON TOP OF ONE ANOTHER. A WIRE JUMPER BETWEEN RODS MAY BE USEFUL.

4) ELECTRICAL WIRING, FOR AMBIENT LIGHTS FOR EXAMPLE, MUST NOT SIMPLY REST ON THE SUSPENDED CEILING, THEY MUST BE FASTENED OR INSIDE A CONDUIT TO PREVENT MOTION.

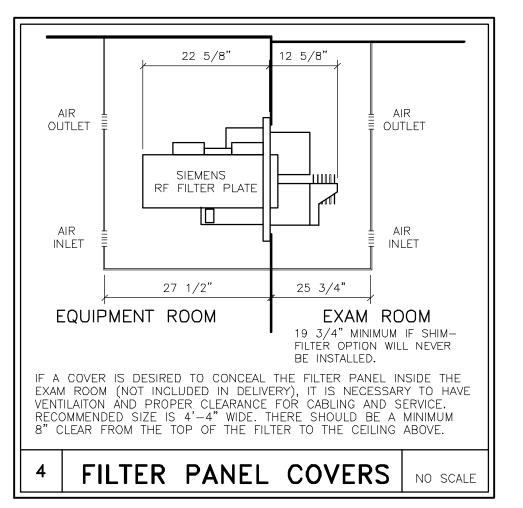




SIEMENS FILTER PANEL IS RESERVED FOR SIEMENS PRODUCTS AND FUTURE UPGRADES ONLY.

TYPICAL OEM (ORIGINAL EQUIPMENT MANUFACTURER) EQUIPMENT MAY INCLUDE, BUT NOT BE LIMITED TO, INJECTORS, fMRI, AND SAFETY RELATED ITEMS. SPECIFIC EQUIPMENT MANFACTURERS WILL HAVE DETAILED INFORMATION REGARDING REQUIRED PENETRATIONS. ABOVE IS AN EXAMPLE OF A PENETRATION PANEL THAT WILL MEET MANY REQUIREMENTS. THE PENETRATION PANEL SHALL BE LOCATED IN CLOSE PROXIMITY TO THE SIEMENS FILTER PANEL AND BE COMPLIANT WITH ALL SIEMENS RF ROOM REQUIREMENTS.

OEM FILTER PANEL NO SCALE



#### FILTER PLATE GENERAL NOTES

STRUCTURAL SUPPORT AND INTEGRATION OF THE SIEMENS SUPPLIED AND INSTALLED FILTER PLATE WITH MAGNETIC AND RF SHIELDING SHALL BE SPECIFIED, DETAILED AND NOTED BY THE RF AND MAGNETIC SHIELDING MANUFACTURER(S) WITH OVERALL COORDINATION WITH SIEMENS SITE SPECIFIC RECOMMENDATIONS TO BE THE RESPONSIBILITY OF THE ARCHITECT OF RECORD. 2) THE FILTER PLATE FRAME, RF FILTER PLATE BLANK, RF GASKET AND MOUNTING HARDWARE FOR THE PURPOSES OF TESTING THE INTEGRITY OF THE RF ENCLOSURE PRIOR TO THE INSTALLATION OF THE SIEMENS SUPPLIED AND INSTALLED RF FILTER PLATE SHALL BE PROVIDED AND INSTALLED BY THE SHIELDING CONTRACTOR(S) UNLESS SPECIFIED OTHERWISE.

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			-					SIEMENS
			MA	GN	TYPIC	AL INSTALL	ATION DRAWIGNS DINSTRUCTION	VANTO
$\triangle$			THIS TITLE B SIEMENS AUTH RESULT IN PROS	EPRODUCTION OF ILOCK WITHOUT ORIZATION WILL SECUTION UNDER OF THE LAW.	PROJEC	"	93	SHEET:  \$\lambda \bigcirc \bigcirc \lambda \la
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- THIS DRAWING IS DESIGNED TO CONFORM TO FEATURES AND EQUIPMENT REQUIREMENTS PRESENTED AT THE TIME OF THEIR PREPARATION. SINCE BOTH THESE FACTORS ARE SUBJECT TO DESIGN MODIFICATION, THEY ARE NOT TO BE USED FOR CONSTRUCTION PURPOSES. - THIS SET OF PLANS REPRESENTS A COMPLETE SET OF DETAILS AND SHOULD NOT BE SEPARATED.

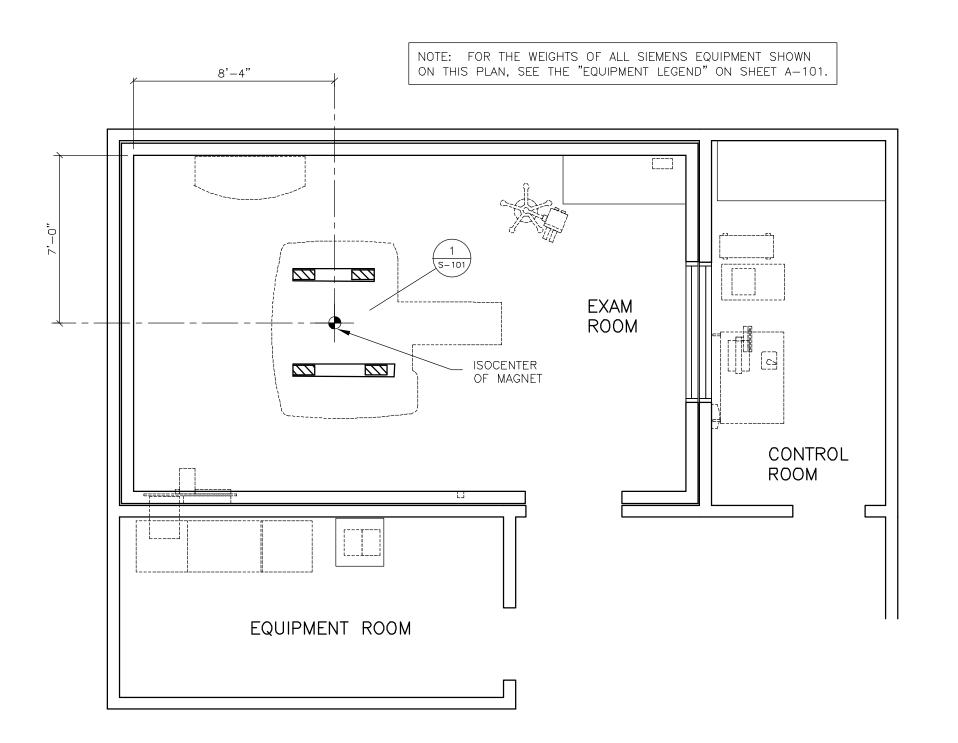
- IT IS RECOMMENDED THAT THE SIEMENS DRAWINGS BE INCORPORATED WITH THE CONSTRUCTION

- ALL DIMENSIONS SHOWN ON THIS DRAWING ARE FROM FINISHED SURFACES. - THIS DRAWING DOES NOT PROVIDE RADIATION SHIELDING REQUIREMENTS FOR X-RAY AND ASSOCIATED EQUIPMENT. THE CUSTOMER IS RESPONSIBLE FOR CONSULTING WITH A REGISTERED RADIATION

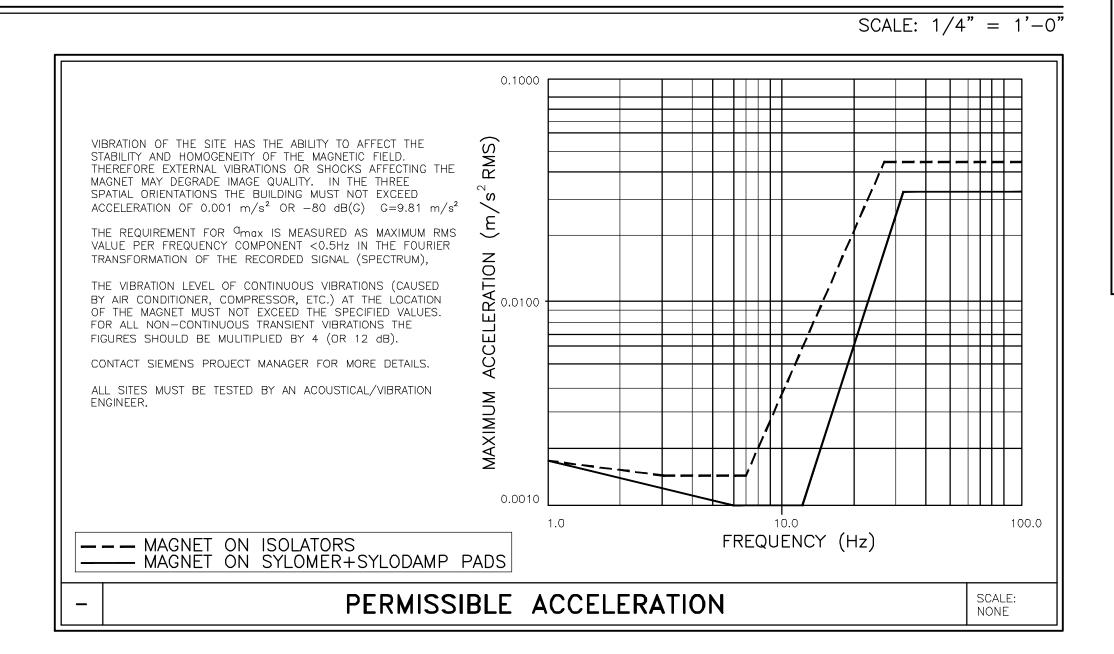
PHYSICIST TO SPECIFY RADIATION PROTECTION.

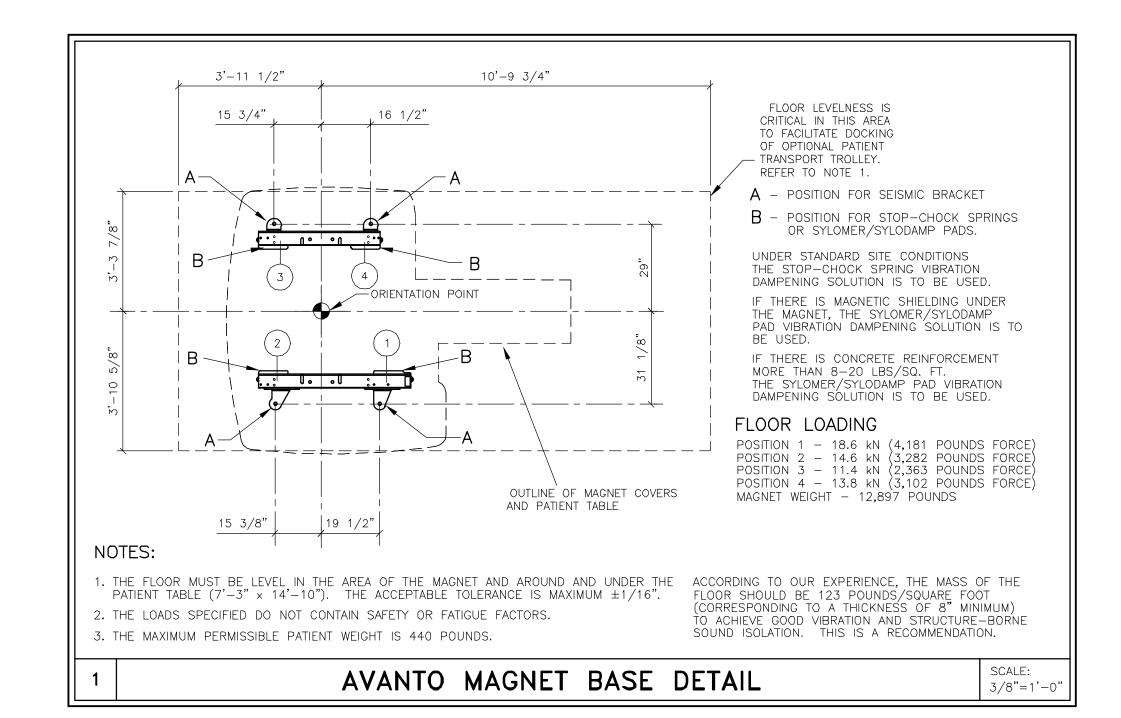
DOCUMENTS FOR REFERENCE.

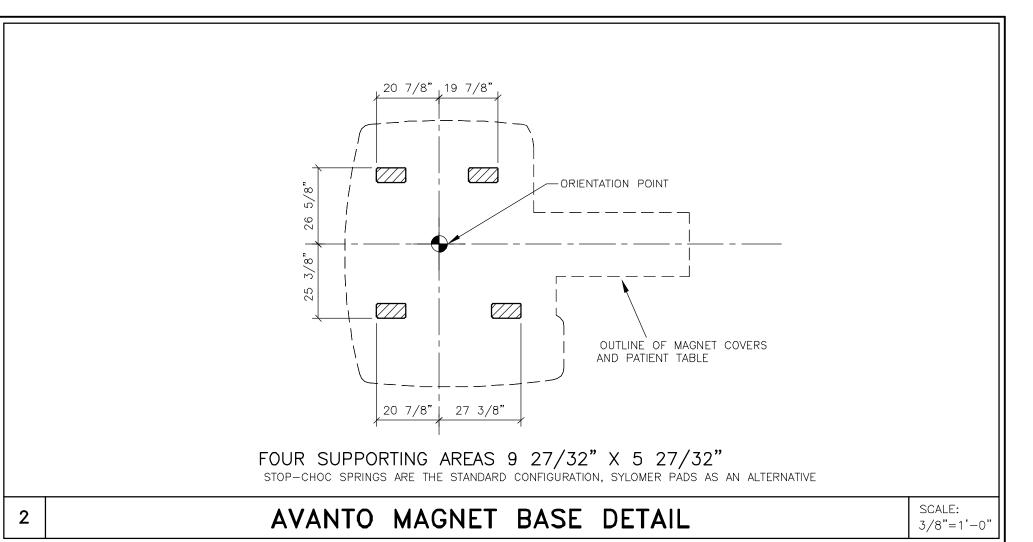
ATTENTION:



#### STRUCTURAL FLOOR PLAN







#### STRUCTURAL NOTES

- 1) THE CUSTOMER/CONTRACTOR SHALL FURNISH AND INSTALL ALL STRUCTURAL SUPPORT MEMBERS AND NEEDED HARDWARE FOR THE INSTALLATION OF THE SIEMENS EQUIPMENT.
- 2) THE OVERHEAD STRUCTURAL SUPPORT SYSTEM SHALL BE FIXED, RIGID AND BRACED FOR SWAY.
- 3) ALL STRUCTURAL SUPPORT MEMBERS SHALL BE TRUE, SQUARE, LEVEL, PARALLEL AND COPLANAR WITH RESPECT TO EACH OTHER, WITH A HORIZONTAL STRUCTURAL SUPPORT MEMBER TO BE LOCATED AND SET WITH A TRANSIT.
- 4) ALL STRUCTURAL SUPPORT DETAILS SHOWN ARE SAMPLE DETAILS BASED UPON TYPICAL AND STANDARD BUILDING PRACTICES AND ARE NOT INTENDED AS ACTUAL CONSTRUCTION DETAILS. ALL CONSTRUCTION DETAILS AND SUPPORT CALCULATIONS SHALL BE PREPARED BY A PROFESSIONAL STRUCTURAL ENGINEER AT THE CUSTOMER'S EXPENSE. IN THE EVENT AN EXISTING SUPPORT SYSTEM IS TO BE USED, IT WILL BE THE CUSTOMER'S RESPONSIBILITY TO VERIFY THE INTEGRITY OF THAT SYSTEM.
- 5) WHERE SHOWN ON THE 1/4" STRUCTURAL FLOOR PLAN, THERE ARE ON OCCASION MOUNTING FRAMES FURNISHED BY SMS, THESE FRAMES ARE TO BE SET BY THE CONTRACTOR, UNDER THE SUPER-VISION OF SMS PERSONNEL. THE CUSTOMER/CONTRACTOR IS RESPONSIBLE FOR ALL FRAMES INSTALLED BY HIM TO BE WATER LEVEL AND ANCHORED PROPERLY.
- 6) ALL CEILING FIXTURES (i.e. AIR SUPPLY GRILLES, AIR RETURN GRILLES, EXHAUST GRILLES, SPRINKLER HEADS, INCANDESCENT AND FLUORESCENT LIGHT FIXTURES, INTERCOM SPEAKERS, MEDICAL GAS COLUMNS, ETC.) SHALL BE INSTALLED FLUSH MOUNTED WITH THE FINISHED CEILING TO PROVIDE FREE AND UNRESTRICTED TRAVEL OF THE SMS CEILING MOUNTED EQUIPMENT.
- 7) THE BOTTOM SIDE OF THE UNISTRUT CEILING GRID AND ANY CÉILING MOUNTED SUPPORT PLATES ARE TO BE INSTALLED FLUSH WITH THE FINISHED CEILING. THE CUSTOMER/CONTRACTOR SHALL ALSO PROVIDE COVERSTRIPS FOR THE UNISTRUT.
- 8) THE STRUCTURAL PLANNING AS SHOWN ON THE 1/4" STRUC-TÚRAL PLAN HAS BEEN COORDINATED WITH THE EQUIPMENT LOCATION AS SHOWN ON THE 1/4" EQUIPMENT LAYOUT PLAN. FOR THIS REASON, ANY DEVIATIONS FROM THE STRUCTURAL PLANNING AS SHOWN MUST BE APPROVED BY SMS PLANNING DEPARTMENT.
- 9) THE STRUCTURAL ENGINEER OF RECORD SHALL BE RESPONSIBLE FÓR THE DESIGN AND DETAIL OF FLOOR, WALL AND CEILING STRUC-TURES IN ACCORDANCE WITH THE WEIGHTS, MOMENTS AND FORCES AS SHOWN ON OUR STRUCTURAL CALCULATIONS, OR INFORMATION, IN CONSIDERATION OF FORCES AS DETERMINED PER LOCAL GOVERNING BUILDING CODES.

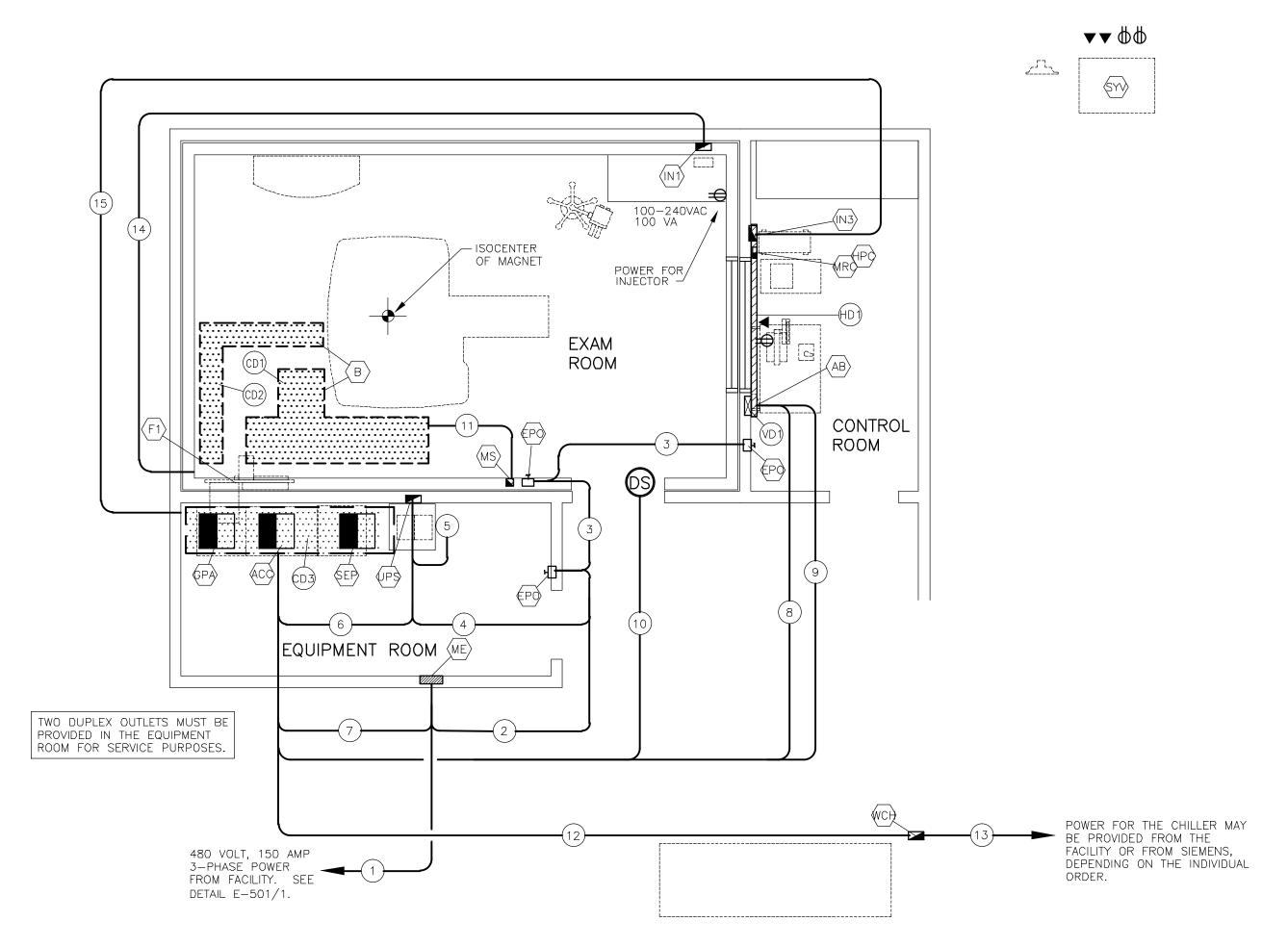
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CEILING HEIGHTS								SIEMENS
EXAM ROOM 7'-9" MINIMUM  CONTROL ROOM 6'-11 MINIMUM  EQUIPMENT ROOM 7'-3" MINIMUM				MA	GN	TYPICAL INSTALL	ATION DRAWIGNS DNSTRUCTION	VANTO
				SIEMENS AUTHO	ORIZATION WILL SECUTION UNDER	PROJECT #:	93	SHEET:
<ul> <li>ALL DIMENSIONS SHOWN ON THIS DRAWING ARE FROM FINISHED SURFACES.</li> <li>THIS DRAWING DOES NOT PROVIDE RADIATION SHIELDING REQUIREMENTS FOR X-RAY AND ASSOCIATED EQUIPMENT. THE CUSTOMER IS RESPONSIBLE FOR CONSULTING WITH A REGISTERED RADIATION PHYSICIST TO SPECIFY RADIATION PROTECTION.</li> </ul>	SYM	DATE —ISSUI	DESCRIPTION  E BLOCK—	ALL RIGHTS A  SCALE: NOTED	т	5 10	DRAWN BY: <b>B. HERRMANN</b> CHECKED:	<b>3-101</b>

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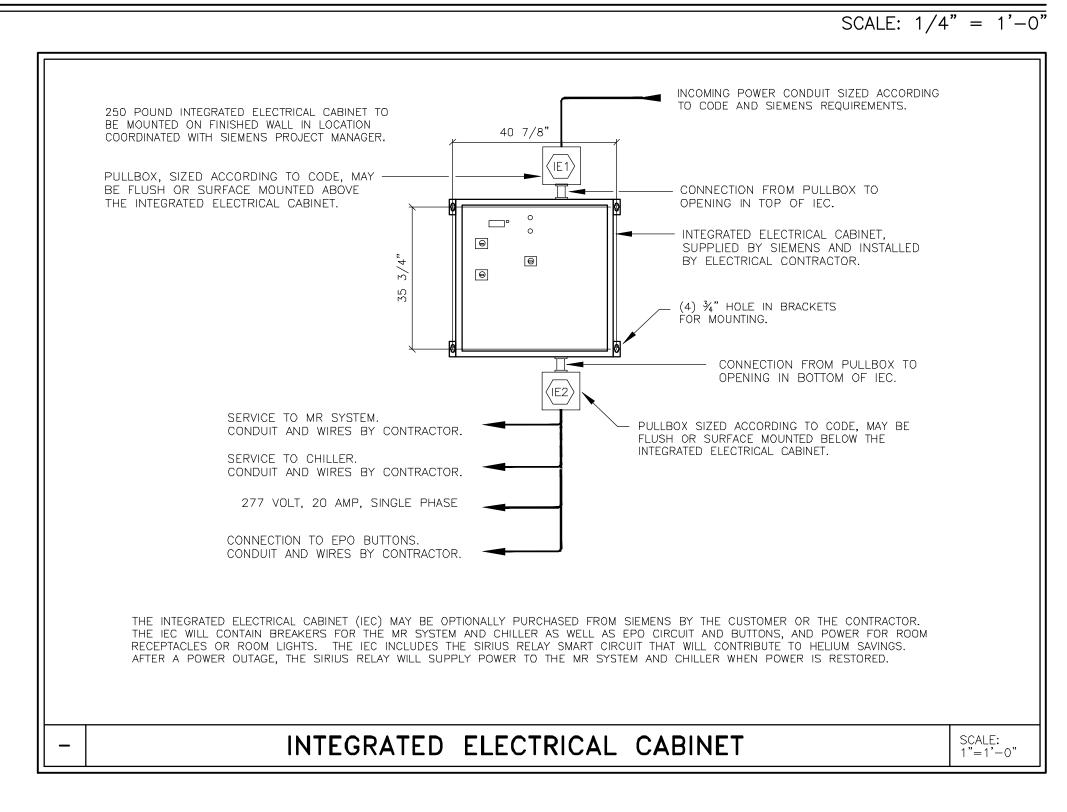
- IT IS RECOMMENDED THAT THE SIEMENS DRAWINGS BE INCORPORATED WITH THE CONSTRUCTION DOCUMENTS FOR REFERENCE.

ATTENTION:



#### ELECTRICAL RACEWAY PLAN

SYMBOLS  ALL MAY NOT APPLY					
Î	CRITICAL NOTE(S)				
	PANEL OR ENCLOSURE BY CUSTOMER/CONTRACTOR				
	OPENING IN RACEWAY OR TRENCHDUCT				
	PULLBOX IN (FLOOR/WALL/CEILING)				
	OPENING IN ACCESS FLOORING				
(DS)	RF DOOR SWITCH — MCMASTER—CARR SUPPLY ROLLER LIMIT SWITCH 7076k14 MOUNTED AT TOP OF DOOR. COORDINATE WITH SIEMENS PROJECT MANAGER.				
Н	(EPO) EMERGENCY POWER OFF BUTTON				
	CEILING DUCT				
	SURFACE MOUNTED DUCT				
$\bowtie$	VERTICAL DUCT				
<b>•</b>	ETHERNET CONNECTION TO CUSTOMER'S INFORMATION SYSTEMS NETWORK (VERIFY WITH SMS PROGRAM MANAGER).				
	110 VOLT, 20 AMP, HOSPITAL GRADE DUPLEX OUTLET LOCATED NEAR THE RDIAG PHONE LINE.				



		ELECTRICAL LEGEND	1
SYM	SIZE	DESCRIPTION  SUPPLIED AND INSTALLED BY CUSTOMER/CONTRACTOR	REMARKS
(AB)	AS REQUIRED	PULL BOX MOUNTED FLUSH WITH FINISHED WALL AT 5'-0" ABOVE FINISHED FLOOR. PROVIDE FINISHED AND REMOVABLE COVER WITH CABLE EXIT. LOCATION IS TO BE COORDINATED WITH THE ARCHITECT.	ALARM BOX
	18" x 18"	LOCATION FOR CABLES TO DROP OUT OF BOTTOM OF RACEWAY.	ELECTRONICS CABINETS
B	AS REQUIRED	LOCATION FOR CABLES TO DROP OUT OF BOTTOM OF RACEWAY.	MAGNET CABLE ACCESS
€PO>		EMERGENCY POWER OFF BUTTONS TO PREVENT RESETTING OF BREAKER WHEN IN "OFF" POSITION, MOUNTED WITH CENTERLINE AT 5'-0" ABOVE FINISHED FLOOR. ALL PARTS ARE TO BE NONFERROUS INSIDE THE RF ROOM. EXACT LOCATIONS ARE TO BE VERIFIED WITH THE ARCHITECT OF RECORD.	SEE POWER SCHEDULE, SHEET E-102
FI		SIEMENS RF FILTER PANEL TO BE MOUNTED ON RF SHIELDED WALL	FILTER PANEL
<b>₽</b>	4" x 4"	OPENING IN FACE OF RACEWAY IN SHOWN LOCATION.	HOST COMPUTER
(N)	AS REQUIRED	NON-FERROUS PULLBOX MOUNTED FLUSH WITH FINISHED WALL MOUNTED 2'-0" ABOVE FINISHED FLOOR. PROVIDE NEATLY FINISHED AND REMOVABLE COVER WITH CABLE EXIT. EXACT LOCATION TO BE COORDINATED WITH THE ARCHITECT.	INJECTOR — MUST BE LOCATED OUTSIDE OF 5m FIELD
(NS)	AS REQUIRED	PULLBOX MOUNTED FLUSH WITH FINISHED WALL IN CONTROL AREA, MOUNTED 2'-0" ABOVE FINISHED FLOOR. PROVIDE NEATLY FINISHED AND REMOVABLE COVER WITH CABLE EXIT. EXACT LOCATION TO BE COORDINATED WITH THE ARCHITECT.	INJECTOR CONTROL CONS
₩.	3-PHASE	MAIN ENCLOSURE MOUNTED 5'-0" ABOVE FINISHED FLOOR, EXACT LOCATION TO BE DETERMINED BY CUSTOMER/CONTRACTOR.	SEE POWER SCHEDULE, SHEET E-102
<b>⟨</b> R⟩	4" × 4"	FIXPOINT DESIGNATION, SAME PULLBOX/OPENING AS HPC.	MAIN CONSOLE
<b>(</b> (S)	AS REQUIRED	SINGLE GANG BOX MOUNTED FLUSH WITH FINISHED WALL MOUNTED 6'-0" ABOVE FINISHED FLOOR. PROVIDE NEATLY FINISHED AND REMOVABLE COVER WITH CABLE EXIT. LOCATION TO BE WITHIN 30 FEET CABLE LENGTH TO THE BACK OF THE MAGNET. ALL ITEMS INSIDE THE RF ROOM MUST BE NON-FERROUS.	MAGNET STOP
♠		SYNGO VIA SERVER LOCATION PROVIDED WITH (2)ETHERNET CONNECTIONS TO FACILITY NETWORK AND (2) 110 VOLT DUPLEX OUTLETS	SYNGO VIA SERVER
(P)	AS REQUIRED	PULL BOX MOUNTED FLUSH WITH FINISHED WALL AT FLOORLINE IN SHOWN LOCATION PROVIDED WITH 2"0 OPENING IN FINISHED COVER.	POWERWARE 9130
	AS REQUIRED	PULLBOX MOUNTED ADJACENT TO WATER CHILLER PROVIDED WITH FLEX-TITE CONDUIT FROM PULLBOX TO KNOCK OUT PANEL ON CHILLER. COORDINATE WITH SIEMENS PROJECT MANAGER.	WATER CHILLER
	24"x4"	ALUMINUM LADDER TRAY, MOUNTED AT HEIGHT COORDINATED WITH SIEMENS PROJECT MANAGER, IN THE EXAM ROOM, MAINTAINING 12" CLEARANCE ABOVE THE TRAY FOR ACCESS. CABLE LADDER IS REQUIRED TO SUPPORT INTERCONNECTING CABLES BETWEEN THE FILTER PANEL AND THE MAGNET. A 15" MINIMUM CLEARANCE IS REQUIRED BETWEEN THE LADDER TRAY AND THE RF FILTER PANEL (F1) IF THEY ARE AT THE SAME HEIGHT. WHEN ROUTING ALL RACEWAYS REFER TO DETAIL E-501/2 TAKING CARE SO THAT MAXIMUM CABLE LENGTHS ARE NOT EXCEEDED. DO NOT LOCATE THIS CABLE TRAY ABOVE THE MAGNET.	CABLE TRAY SEE DETAIL E-501/2
(D2)	12" x4"	ALUMINUM LADDER TRAY MOUNTED AT HEIGHT COORDINATED WITH SIEMENS PROJECT MANAGER IN THE EXAM ROOM. A 12" SEPARATION BETWEEN CD1 AND CD2 MUST BE MAINTAINED, DO NOT LOCATE THIS CABLE TRAY ABOVE THE MAGNET.	CABLE TRAY SEE DETAIL E-501/2
	24"×4"	ALUMINUM LADDER TRAY, MOUNTED AT HEIGHT COORDINATED WITH SIEMENS PROJECT MANAGER IN EQUIPMENT ROOM MAINTAINING 12" CLEARANCE ABOVE THE TRAY FOR ACCESS. CABLE LADDER IS REQUIRED TO SUPPORT INTERCONNECTING CABLES BETWEEN THE EQUIPMENT ROOM AND THE RF FILTER PANEL (F1). AN 18" MINIMUM CLEARANCE IS REQUIRED BETWEEN THE LADDER TRAY AND THE FILTER PANEL IF THEY ARE AT THE SAME HEIGHT.	CABLE TRAY SEE DETAIL E-501/2
(HD1)	4" × 2"	WIREMOLD SURFACE MOUNTED ON WALL IN CONTROL AREA AT FLOORLINE AS SHOWN, FINISHED TO MATCH WALLS.	
(VD)	10" x 3-1/2"	ELECTRICAL DUCT MOUNTED FLUSH WITH FINISHED WALL IN CONTROL AREA FROM ABOVE FINISHED COVERS.	
1	AS PER NEC	CONDUIT FROM FACILITY POWER TO MAIN ENCLOSURE (ME).	SEE POWER SCHEDULE, SHEET E-102
2	AS PER NEC	CONDUIT FROM "ME" TO "EPO".	SEE POWER SCHEDULE, SHEET E-102
3	AS PER NEC	CONDUIT FROM "EPO" TO "EPO" TO BE NON-FERROUS WHEN INSIDE THE RF ROOM. CUSTOMER/CONTRACTOR IS TO PROVIDE RF FILTERS FOR ALL NON-SIEMENS WIRING.	SEE POWER SCHEDULE, SHEET E-102
4	(1) 3/4"ø	CONDUIT FROM "EPO" TO "UPS".	SEE POWER SCHEDULE, SHEET E-102
5	(1) 3/4"ø	SURFACE MOUNTED FLEX CONDUIT FROM "UPS" TO SIEMENS PROVIDED UPS/EPO CONTROL BOX,	MAXIMUM LENGTH 4 FEET
6	(1) 1 <b>"</b> ø	CONDUIT FROM "UPS" TO "CD3" (ACC).	MAXIMUM LENGTH 29 FEE
7	(1) 2"ø	CONDUIT FROM "ME" TO END AT "CD3" (ACC) VIA FLEX CONDUIT. THERE MUST BE A DIELECTRIC SEPARATION BETWEEN THE CONDUIT AND THE CONNECTION AT THE SIEMENS ACC CABINET.	
8	(2) 2 1/2 <b>"</b> ø	CONDUIT FROM "MRC" TO "CD3" (ACC).	
9	(1) 1 1/2"ø	CONDUIT FROM "AB" TO "CD3" (ACC).	
10)	(1) 1/2"ø	CONDUIT FROM "DS" TO "CD3" (ACC).	
11)	(1) 3/4"ø	CONDUIT FROM "MS" TO "CD1" (WIRES TO MAGNET) TO BE NON-FERROUS WHEN INSIDE THE RF ROOM.	
12	(1) 2"ø	CONDUIT FROM "WCH" TO "ACC".	NOT TO EXCEED 164 FEE
13	(1) 2"ø	CONDUIT FROM FACILITY POWER TO "WCH".	
14)	(2) 2 <b>"</b> ø	NON-FERROUS CONDUITS FROM NEAR "F1" TO "IN1" FOR INJECTOR CABLES.	NOT TO EXCEED 50 FEET
(5)	(1) 1"ø	CONDUIT FROM NEAR FILTER LOCATION TO "IN3".	NOT TO EXCEED 2

CONTRACTOR SUPPLIED CABLES						
FROM	VIA	то	DESCRIPTION	REMARKS		
SOURCE	1	ME	(3) PHASE CONDUCTORS, (1) FULL SIZE EQUIPMENT GROUND WIRE AND (1) NEC SIZED SAFETY GROUND WIRE TO BE SIZED BY ELECTRICAL CONTRACTOR/ENGINEER.			
ME	2	EP0	DETERMINED BY ELECTRICAL CONTRACTOR.			
EP0	3	EP0	DETERMINED BY ELECTRICAL CONTRACTOR.			
EP0	4	UPS	DETERMINED BY ELECTRICAL CONTRACTOR.	6 FOOT TAILS		
ME	7	ACC	(3) 2/0 AND (1) 2/0 EQUIPMENT GROUND. TO REDUCE EMI (INTERFERENCE) THE POWER CABLES MUST BE SHIELDED, THIS CAN BE ACHIEVED BY USING EMT, WHICH IS CONSIDERED A SHIELDING DEVICE. IF CABLES ARE RUN IN FREE AIR SHIELDED CONDUCTORS MUST BE USED.			
WCH	12	ACC	DATA CABLE PROVIDED BY SIEMENS, INSTALLED BY CONTRACTOR.			
SOURCE	13	WCH	(3) PHASE CONDUCTORS, (1) FULL SIZE EQUIPMENT GROUND WIRE, AND (1) FULL SIZE CONDUIT GROUND TO BE SIZED BY ELECTRICAL CONTRACTOR/ENGINEER.	MAX SIZE #2		

#### **ELECTRICAL NOTES**

1) COMPLIANCE: ELECTRICAL WORK SHALL BE IN COMPLIANCE WITH THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE (NFPA-70), O.S.H.A. REGULATIONS, AS WELL AS APPLICABLE REGULATIONS OF CITY, COUNTY, STATE AND FEDERAL AGENCIES. PROVIDE MATERIALS AND EQUIPMENT THAT COMPLY TO ANSI, IEEE AND NEMA STANDARDS. WHERE APPLICABLE, PROVIDE ONLY MATERIALS AND PRODUCTS THAT ARE U.L. LISTED AND LABELED. CUSTOMER'S/CONTRACTOR'S WORK SHALL COMPLY WITH THE LATEST EDITION OF NECA STANDARD OF INSTALLATION.

2) QUALITY ASSURANCE: THE CONTRACTOR SHALL VERIFY EXISTING CONDITIONS IN THE FIELD TO INSURE THAT THE NEW WORK WILL FIT TO THE EXISTING STRUCTURE AS SHOWN ON THE DRAWINGS. SHOULD ANY CONDITIONS EXIST OR BE DISCOVERED THAT PREVENT THE INSTALLATION OF WORK AS SHOWN, THE CONTRACTOR SHALL NOTIFY THE OWNER'S REPRESENTATIVE PRIOR TO FABRICATION OF EQUIPMENT, OR THE PERFORMANCE OF ANY WORK THAT MAY BE AFFECTED. DO NOT ALTER DRAWINGS, DIMENSIONS, OR SPECIFICATIONS IN ANY WAY WITHOUT CONTACTING AND RECEIVING WRITTEN CONFIRMATION FROM SIEMENS PROJECT MANAGER. ALL DIMENSIONS ARE FROM FINISHED SURFACES. CONDUIT AND PULL BOXES TO BE INSTALLED BY THE CUSTOMER/CONTRACTOR WITH LOCATIONS BEING FIELD VERIFIED BY SIEMENS PROJECT MANAGER.

3) WORK FURNISHED BY CUSTOMER/CONTRACTOR: WORK NOT PROVIDED BY SIEMENS MEDICAL SYSTEMS BUT SHOWN ON DRAWINGS TO BE FURNISHED AND INSTALLED BY CUSTOMER/CONTRACTOR INCLUDES THE FOLLOWING BUT IS NOT LIMITED TO UNLESS NOTED OTHERWISE: ELECTRICAL RACEWAYS AND DUCTS, WIRING TROUGHS, PULL BOXES, CONDUITS, CIRCUIT BREAKERS, EMERGENCY OFF BUTTONS, DOOR SWITCHES, WARNING LIGHTS, WIRING, WIRING DEVICES, CONNECTORS, LIGHTING EQUIPMENT AND GROUNDING.

4) RACEWAY AND CONDUIT NOTES: RACEWAY SHALL BE ELECTRIC METALLIC TUBING (EMT) FOR RIGID CONDUIT WORK, OR WHERE SHORT OFF—SET CONNECTIONS ARE REQUIRED LIQUIDTIGHT FLEXIBLE METAL CONDUIT SHALL BE USED. FIELD BENDS SHALL NOT BE LESS THAN AS SHOWN IN TABLE 346—10 OF THE NATIONAL ELECTRICAL CODE. PROVIDE A JETLINE "SUPER TRUE TAPE", OR EQUIVALENT CONDUIT MEASURING TAPE FISH LINE IN ALL RACEWAYS AND

CONDUIT BODIES SHALL NOT BE USED. WHERE A CONDUIT

ENTERS A BOX, FITTING, OR OTHER ENCLOSURE, AN INSULATED THROAT CONNECTOR SHALL BE PROVIDED TO PROTECT THE WIRE FROM ABRASION. CONNECTORS SHALL BE DOUBLE SET SCREW TYPE, STEEL CONCRETE TIGHT. KEEP RACEWAYS AT LEAST 6 INCHES AWAY FROM PARALLEL RUNS OF FLUES OR STEAM AND HOT WATER PIPES. INSTALL RACEWAY RUNS ABOVE WATER AND STEAM PIPES PROVIDED THAT CABLE RUN DISTANCES ARE MAINTAINED. USE TEMPORARY CLOSURES TO PREVENT FOREIGN MATTER FROM ENTERING RACEWAY. CONDUIT RUNS ARE SHOWN SCHEMATICALLY. INSTALL CONDUIT WITH A MINIMUM OF BENDS IN THE SHORTEST PRACTICAL DISTANCE CONSIDERING THE BUILDING CONSTRUCTION AND OBSTRUCTIONS, EXCEPT AS OTHERWISE INDICATED. THE CONTRACTOR SHALL MAKE CERTAIN THAT ANY CONDUIT/RACEWAY RUNS CONTAINING SIEMENS MEDICAL SYSTEMS CABLES DO NOT EXCEED THE SPECIFIED MAXIMUM DISTANCES AS SHOWN ON THE ELECTRICAL DETAILS. FOR UL CERTIFIED SYSTEMS, THE CABLE TO CABLE AS WELL AS

THE CIRCUIT TO CIRCUIT SEPARATION REQUIREMENT WAS EVALUATED DURING THE UL SYSTEM INVESTIGATION OF THIS EQUIPMENT. ADDITIONAL SEPARATION OF THE SYSTEM CABLE ASSEMBLIES INTO SEPARATE OR PARTITIONED RACEWAYS, UNLESS OTHERWISE NOTED, IS NOT NECESSARY TO INSURE SEPARATION OF CIRCUITS AS THEY CAN BE IN THE SAME RACEWAY. PROVIDE WIRE DUCT/RACEWAY WITH ACCESSIBLE REMOVABLE

COVERS WHERE APPROPRIATE. LOCATIONS OF OPENINGS TO BE CU IN FIELD ARE TO BE COORDINATED WITH SIEMENS PROJECT MANAGER. ELECTRICAL PULL-BOXES AND RACEWAY COVERS SHALL BE INSTALLED IN A MANNER TO ALLOW ACCESSIBILITY FOR INSTALLATION AND MAINTENANCE, SIEMENS CABLES ARE NOT PLENUM RATED. 5) IN ADDITION TO THE CIRCUIT BREAKER LOAD CURRENT RATING, CONSIDERATION MUST ALSO BE GIVEN TO SELECTING CIRCUIT BREAKERS THAT HAVE A HIGH ENOUGH SHORT CIRCUIT CURRENT WITHSTAND RATING TO SAFELY COORDINATE WITH THE POWER SYSTEM AVAILABLE SHORT CIRCUIT CURRENT. GENERALLY, WHEN THE 480 VOLT, 3 PHASE, MR SYSTEM IS SERVED FROM A POWER SUPPLY SYSTEM THAT IS PROVIDED WITH A 500 KVA OR SMALLER TRANSFORMER, A STANDARD 14,000 RMS AMPERE WITHSTAND RATED CIRCUIT BREAKER WILL BE ADEQUATE. HOWEVER, IF THE POWER SUPPLY SYSTEM TRANSFORMER IS LARGER THAN 500 KVA. THEN THE CIRCUIT BREAKERS HAVING A SHORT CIRCUIT WITHSTAND RATING GREATER THAN 14,000 RMS AMPERES MAY BE REQUIRED.

AVANTO 03/13/13

CEILING HEIGHTS		SIEMENS		
EXAM ROOM 7'-9" MINIMUM  CONTROL ROOM 6'-11 MINIMUM  EQUIPMENT ROOM 7'-3" MINIMUM		MAGNETOMAVANTO  TYPICAL INSTALLATION DRAWIGNS NOT FOR CONSTRUCTION		
		THE USE OR REPRODUCTION OF THIS TITLE BLOCK WITHOUT SIEMENS AUTHORIZATION WILL RESULT IN PROSECUTION UNDER FULL EXTENT OF THE LAW.  PROJECT #:  SHEET:  A 1		
<ul> <li>ALL DIMENSIONS SHOWN ON THIS DRAWING ARE FROM FINISHED SURFACES.</li> <li>THIS DRAWING DOES NOT PROVIDE RADIATION SHIELDING REQUIREMENTS FOR X-RAY AND ASSOCIATED EQUIPMENT.</li> <li>THE CUSTOMER IS RESPONSIBLE FOR CONSULTING WITH A REGISTERED RADIATION</li> </ul>	SYM DATE DESCRIPTION	ALL RIGHTS ARE RESERVED.  SCALE:  REFE #:  DATE:  CHECKED:		

ATTENTION:

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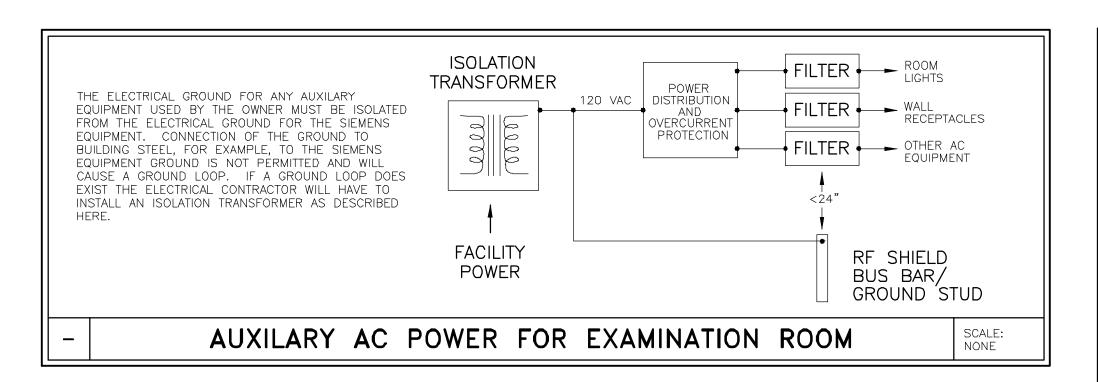
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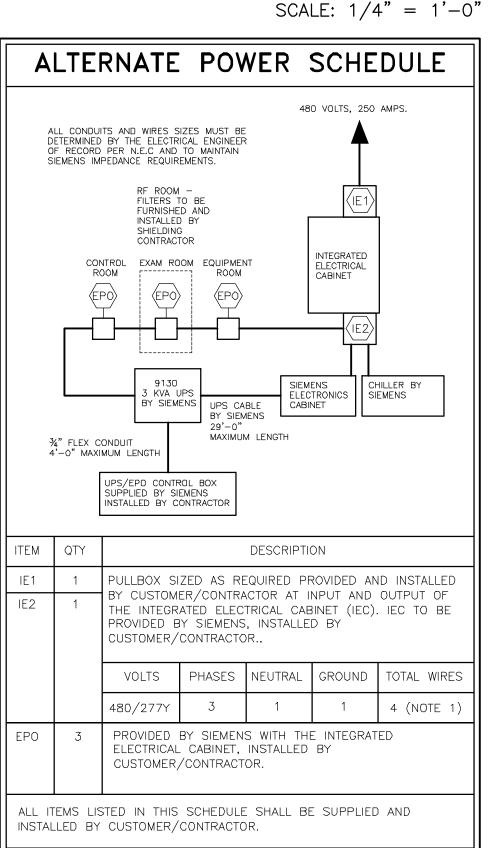
PHYSICIST TO SPECIFY RADIATION PROTECTION.

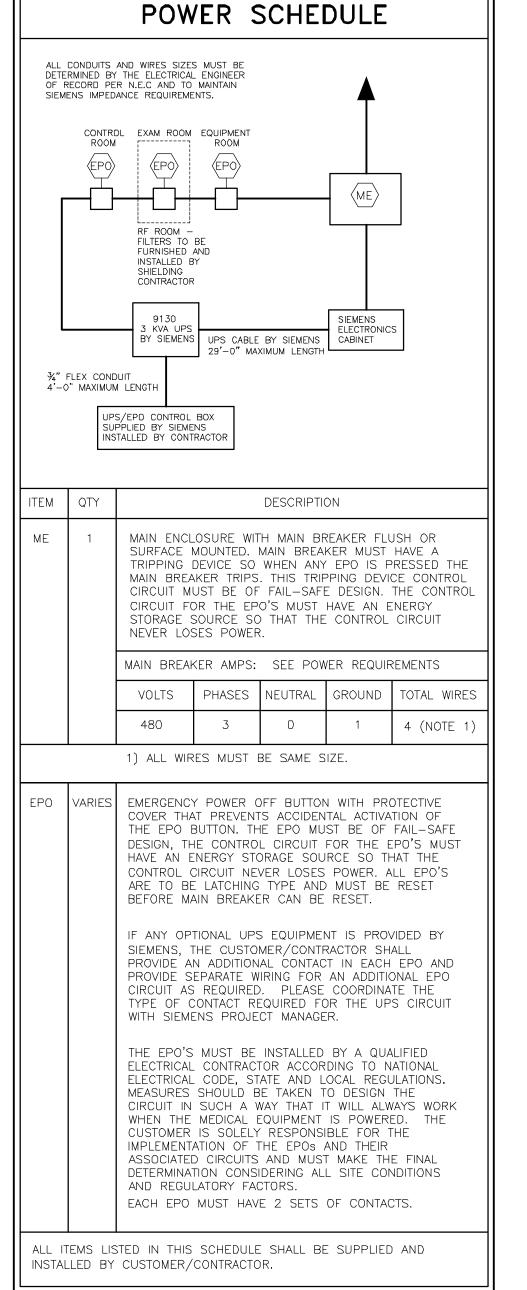
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#### ELECTRICAL DIMENSION PLAN







#### POWER REQUIREMENTS VOLTAGE UNBALANCE: 2% MAXIMUM DIFFERENCE BETWEEN PHASES < 95 m0hms LINE IMPEDENCE: STAND BY POWER: 8.4 KW HIGHEST AVERAGE POWER 50 KW CONNECTION VALUE 110 KVA MOMENTARY POWER (LESS THAN 5 SEC.) 125 KVA MR SYSTEM BREAKER SIZE 150 A RECOMMENDED UPS EATON 9390 160 KVA JPS BREAKER SIZE 250 A ALL BREAKERS ARE RATED AT 100%

#### POWER QUALITY

POOR POWER WILL ALTER EQUIPMENT PERFORMANCE

IT IS IN THE CUSTOMER'S INTEREST THAT THE ELECTRICAL CONTRACTOR BE RESPONSIBLE FOR TESTING AND VERIFYING THAT THE EQUIPMENT POWER SUPPLY COMPLIES WITH THE SIEMENS SPECIFICATIONS.

#### POWER REQUIREMENTS

DEMAND AND CAPACITY REQUIREMENTS NOTES

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. RECOMMENDED TRANSFORMER SIZE (SYSTEM WITHOUT UPS) IS BÁSED ON INDUSTRY STANDARD ISOLATION TRANSFORMER KVA ŔATINGS. SOURCE IMPEDANCE FEEDING THE MAGNETOM SYSTEM, INCLUDING ANY ISOLATION TRANSFORMERS, MUST MEET EQUIPMENT REQUIREMENTS AS ISTED HERE. SIEMENS RECOMMENDS A TRANSFORMER WITH COPPER WINDINGS. AN ELECTRO-STATIC SHIELD, AND A LOW IMPEDANCE (<3%) TO ENSURE THAT SOURCE IMPEDANCE REQUIREMENTS ARE MET. 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 FACILTY IMPEDANCE CHARACTERISTICS. 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

) THE CONDUCTOR SIZE SHOULD BE SELECTED TO MEET THE VÓLTAGE DROP REQUIREMENTS, TAKING INTO CONSIDERATION THE MAINS CAPACITY, RUN LENGTH, AND ANY ADDITIONAL TRANSFORMERS JSED TO OBTAIN THE PROPER FOUIPMENT VOLTAGE LEVEL. NEMA STANDARD XR-9-1989 (R1994,R2000) PROVIDES GENERAL GUIDELINES FOR SIZING CONDUCTORS, TRANSFORMERS, AND ELECTRICAL SYSTEMS FOR MEDICAL IMAGING SYSTEMS.

LONG-TIME POWER IS BASED ON THE HIGHEST AVERAGE RMS VÁLUES FOR A PERIOD EXCEEDING 5 MINUTES DURING CLINICAL SYSTEM OPERATION, AS DEFINED IN NEC 517.2. A CIRCUIT BREAKER WITH A HIGH INRUSH RATING (>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

### POWER QUALITY NOTES

I) IT IS THE CUSTOMER'S RESPONSIBILITY TO COMPLY WITH THE POWER QUALITY REQUIREMENTS FOR SIEMENS MEDICAL SYSTEMS

) THE ELECTRICAL FEEDER TO THE SIEMENS MEDICAL SYSTEMS EQUIPMENT MUST FEED ONLY THE IMAGING SYSTEM AND BE KEPT SEPARATE FROM ELECTRICAL FEEDERS TO HVAC, MOTORS, PUMPS, COMPRESSORS, ELEVATORS, AND OTHER POTENTIAL SOURCES OF ELECTRICAL INTERFERENCE

(5) THE ELECTRICAL FEEDER TO THE IMAGING SYSTEM MUST BE RUN DÍRECTLY TO A MAIN FACILITY DISTRIBUTION PANEL OR TO THE FACILITY SERVICE ENTRANCE, WITH NO OTHER LOADS POWERED FROM 4) IN ORDER TO COMPLY WITH IMAGING SYSTEM POWER QUALITY

REQUIREMENTS, ADDITIONAL POWER CONDITIONING DEVICES MAY BE REQUIRED. EXAMPLES INCLUDE VOLTAGE REGULATORS, TRANSFORMERS, SURGE PROTECTIVE DEVICES, FILTERS, AND/OR UNINTERRUPTIBLE POWER SUPPLIES (UPS). RECOMMENDED FOR THE INSTALLATION OF ELECTRONIC EQUIPMENT CAN BE FOUND IN IEEE STANDARD 1100-1999 "POWERING AND GROUNDING ELECTRONIC **EQUIPMENT:** 

5) POWER CONDITIONING DEVICES NOT APPROVED BY SIEMENS MÉDICAL SYSTEMS MAY NOT BE COMPATIBLE WITH THE MAGNETOM SYSTEM. "FERRORESONANT" POWER CONDITIONING EQUIPMENT RE-APPLIED FROM PREVIOUS GENERATION SYSTEMS IS ALSO GENERALLY EXCLUDED DUE TO HIGHER POWER REQUIREMENTS OF THE NEWER SYSTEMS. 6) INCOMING SOURCE POWER WIRES MUST BE SEPARATED FROM

#### ||ELECTRICAL INSTALLATION NOTES

INSTALL THE MR SYSTEM CIRCUIT BREAKER IN OR NEAR THE EQUIPMENT ROOM. THE PERMITTED FRINGE FIELD FOR THE PANEL IS UP TO 3mT. IF THE FRINGE FIELDS HAVE HIGHER VALUES, MAGNETIC SHIELDING MUST BE PROVIDED OR THE DISTANCE FROM THE MAGNET MUST BE INCREASED.

2) AN ACCEPTABLE MEANS FOR SWITCHING MAIN POWER ON AND OFF SHOULD BE INSTALLED IN THE MAIN BREAKER PANEL. INSTALL EMERGENCY SHUTDOWN BUTTONS IN EACH ROOM WHERE THERE IS SIEMENS EQUIPMENT.

3) THE ELECTRICAL FEEDER TO THE SIEMENS EQUIPMENT MUST FEED ONLY THE IMAGING SYSTEM AND BE KEPT SEPARATE FROM ELECTRICAL FEEDERS TO HVAC, MOTORS, PUMPS, COMPRESSORS, ELEVATORS AND OTHER POTENTIAL SOURCES OF ELECTRICAL

4) THE EMERGENCY POWER OFF (EPO) BUTTONS ARE TO BE MUSHROOM TYPE WITH PUSH LOCK AND PULL TO RELEASE.

5) WALL RECEPTACLES MADE OF FERROMAGNETIC MATERIALS ARE NOT PERMITTED IN THE EXAM ROOM, PERIPHERAL UNITS (SUCH AS VENTILATORS) NOT APPROVED FOR USE IN A HIGH MAGNETIC FIELD ENVIRONMENT CAN INFLUENCE THE MAGNETIC FIELD, COMPROMISING IMAGE QUALITY. THE CUSTOMER IS RESPONSIBLE FOR INSTALLATION AND USE OF RECEPTACLES IN THE EXAM ROOM. INSTALLATION OF RECEPTACLES AND THE FILTERS REQUIRED ARE TO BE COORDINATED WITH THE RF SHIELDING SUPPLIER.

6) THE RF SHIELD MUST BE FITTED WITH A GROUND STUD OR BUS BAR, LOCATED WITHIN 24" OF THE AUXILIARY FILTERS FOR ROOM LIGHTS AND OUTLETS, SUPPLIED AND INSTALLED BY THE RF SHIELD SUPPLIER.

7) IN ORDER TO PREVENT GROUND LOOPS, ALL CUSTOMER OR CUSTOMER/CONTRACTOR SUPPLIED AC POWER ENTERING THE EXAMINATION ROOM (I.E. OUTLETS, EPO, ETC.) SHOULD BE SUPPLIED VIA AN ISOLATION TRANSFORMER. THE ISOLATION TRANSFORMER SECONDARY WINDING GROUND CONDUCTOR SHOULD BE CONNECTED TO THE RF SHIELD GROUND STUD OR BUS BAR. SEE NOTE 6 ABOVE AND THE AUXILIARY AC POWER FOR EXAMINATION ROOM DETAIL.

#### **GROUNDING NOTES**

EQUIPMENT GROUND CONDUCTOR TO COMPLY WITH THE FOLLOWING:

1) SIZED EQUIVALENT TO THE PHASE CONDUCTORS (FULL SIZED GROUND). 2) DERIVED FROM THE ELECTRICAL SERVICE, TRANSFORMER OR MAIN DISTRIBUTION PANEL FEEDING THE SIEMENS

3) RUN IN THE SAME CONDUIT, TROUGH OR RACEWAY AS THE PHASE CONDUCTORS.

EQUIPMENT.

4) CONTINUOUS, WITH NO BREAKS OR USE OF CONDUIT, CHASSIS OR EARTH AS THE SOLE GROUNDING PATH. 5) BONDED TO CHASSIS AND/OR CONDUIT IN ACCORDANCE WITH THE NEC REQUIREMENTS.

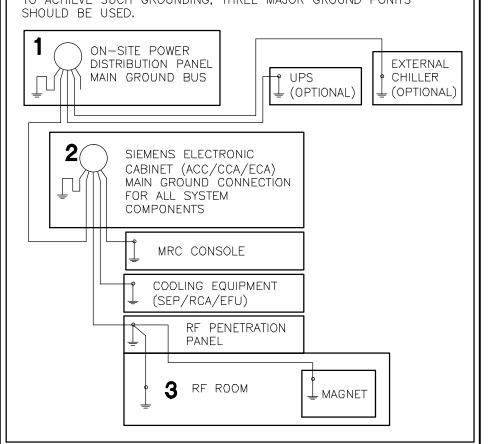
6) MINIMIZE CONNECTIONS OR TERMINALS TO ENSURE CONTINUITY OVER THE LIFE OF THE INSTALLATION. 7) AS A NORM, THERE SHOULD NOT BE ANY CURRENT PRESENCE ON THE GROUND CONDUCTOR, BUT IT IS ACCEPTABLE TO HAVE <500mA DURING OPERATION OF THE IMAGING EQUIPMENT.

8) THERE MAY BE SOME APPLICATIONS WHICH REQUIRE AN ISOLATED GROUND AS PER NEC 250-96B.

#### MR GROUNDING NOTES

THE INTERNAL GROUND WIRING OF THE MR SYSTEM MUST BE INSTALLED WITH MINIMUM GROUND LOOPS. THIS IS TO PREVENT NOISE CURRENTS AND GENERAL DISTURBANCES FROM FLOWING THROUGH THE GROUNDING PATH.

TO ACHIEVE SUCH GROUNDING. THREE MAJOR GROUND PONITS



AVANTO 03/13/13

#### CEILING HEIGHTS

EXAM ROOM 7'-9" MINIMUM CONTROL ROOM 6'-11 MINIMUM EQUIPMENT ROOM 7'-3" MINIMUM

RECOMMENDED.

# MAGNETOM AVANTO DESCRIPTION

ANY SIEMENS CABLING BY A MINIMUM OF 12".

NOT FOR CONSTRUCTION THE USE OR REPRODUCTION OF THIS TITLE BLOCK WITHOUT SIEMENS AUTHORIZATION WILL 03093 RESULT IN PROSECUTION UNDER

TYPICAL INSTALLATION DRAWIGNS

CHECKED:

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04/05/13

B. HERRMANN

SIEMENS

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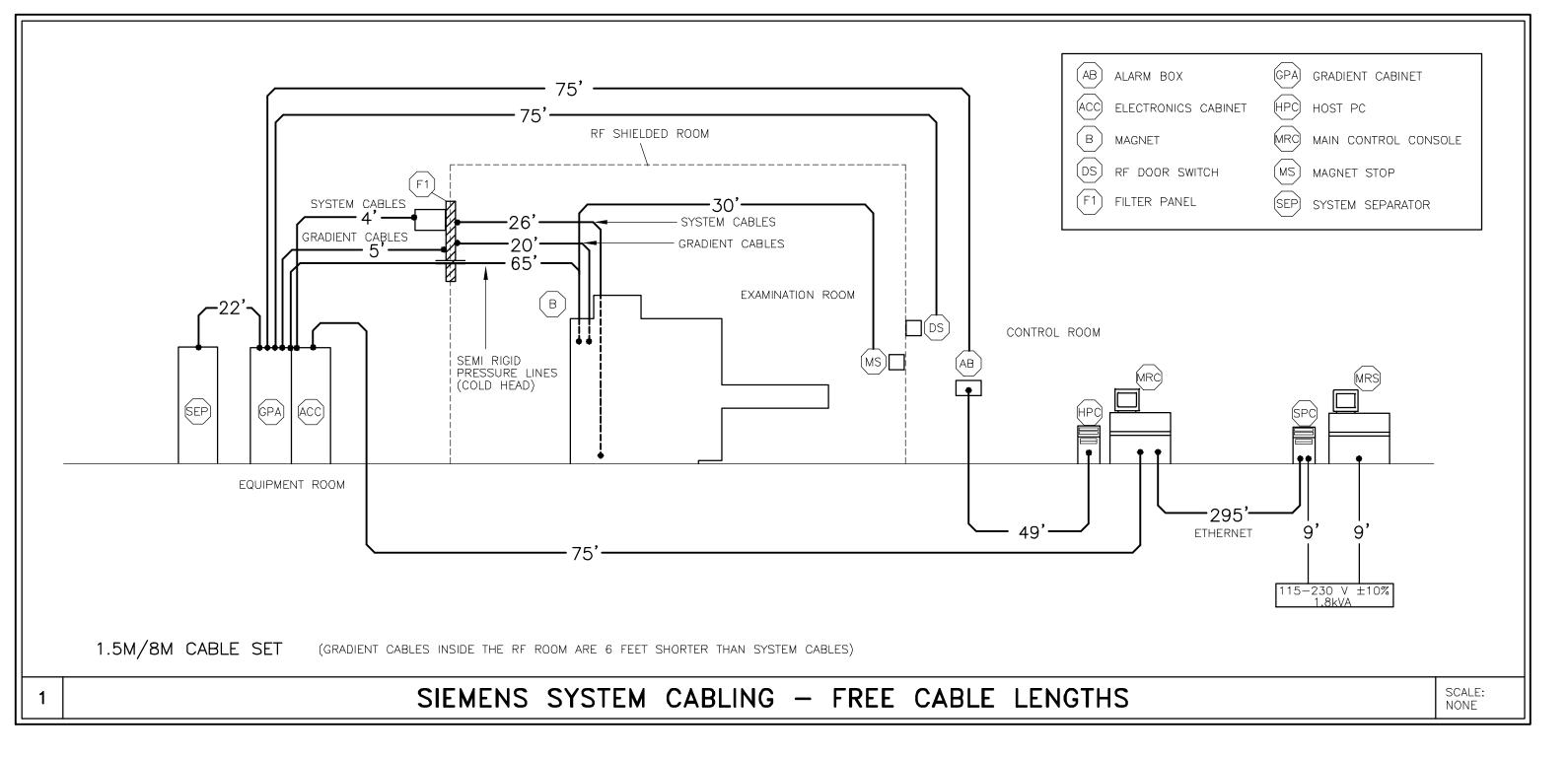
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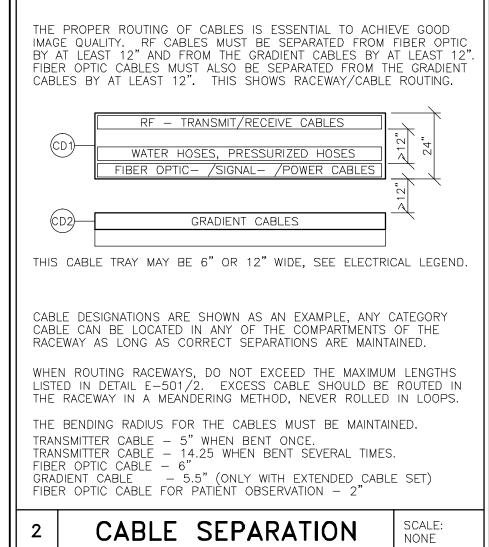
- ALL DIMENSIONS SHOWN ON THIS DRAWING ARE FROM FINISHED SURFACES.

- THIS DRAWING DOES NOT PROVIDE RADIATION SHIELDING REQUIREMENTS FOR X-RAY AND ASSOCIATED EQUIPMENT. THE CUSTOMER IS RESPONSIBLE FOR CONSULTING WITH A REGISTERED RADIATION PHYSICIST TO SPECIFY RADIATION PROTECTION.

FULL EXTENT OF THE LAW. ALL RIGHTS ARE RESERVED. CALE: **AS NOTED** -ISSUE BLOCK-

ATTENTION:





#### CONDUITS AND RACEWAYS

ALL POWER CONDUCTORS SUPPLIED BY THE CUSTOMER/ CONTRACTOR SHALL BE INSTALLED IN METAL RACEWAY, 600 VOLT CLASS, STRANDED TYPE THHN-THWN, RATED FOR 75°C (165°F) OPERATION. RECOMMEND MINIMUM 5 FEET WIRE TAILS AT ALL DUTLET POINTS WITH WIRE IDENTIFCATION TAGGED AT BOTH ENDS FOR FINAL CONNECTION BY SIEMENS MEDICAL SYSTEMS. 2) THE CABLE GROUPS INCLUDED WITH THE MAGNETOM SYSTEM MAY BE ROUTED IN THE SAME CABLE TRAY IF PROVIDED WITH AN B" SEPARATION BETWEEN SMALL SIGNAL LINES, GRADIENT CABLES, AND THE RF TRANSMIT CABLE. A 24" WIDE LADDER TYPE CABLE TRAY IS RECOMMENDED. CABLES SHOULD NOT BE BUNDLED TOGETHER.

NOTE THE CABLE CONNECTOR SIZES (LARGEST CONNECTOR SIZE IS 2 1/2" x 2 1/2") FOR CABLE FEED—THROUGHS AND CABLE DUCTS.

4) THE CABLE LENGTHS SPECIFIED ARE THE STANDARD LENGTHS. 5) THE SIEMENS SYSTEM CABLES ARE NOT PLENUM RATED AND SHOULD NOT BE RUN UNPROTECTED IN AN AIR PLENUM UNLESS ENCLOSED IN A SEALED CABLE TRAY OR CONDUIT.

#### CABLE LENGTH RESTRICTIONS

THIS IS THE LENGTH FROM CONNECTION POINT TO CONNECTION POINT. THE CABLE LENGTH IS NOT THE DISTANCE BETWEEN COMPONENTS. 2) THE GRADIENT CABLES INSIDE THE RF SHIELDED ROOM ARE 6'-0 SHORTER THAN THE OTHER SYSTEM CABLES. THIS MEANS THAT IF THE 22' CABLE SET IS SELECTED, THE GRADIENT CABLES WILL BE 16' IN LENGTH. THE GRADIENT CABLES NEED TO GO UP INTO THE CABLE TRAY IN THE CEILING AT THE FILTER PLATE AND DOWN AT THE MAGNET. THESE VERTICAL RUNS MUST BE DEDUCTED FROM THE TOTAL CABLE LENGTH OF 16'.

#### SIEMENS REMOTE SERVICES (SRS)

TO ENSURE THE UPTIME OF YOUR SYSTEM DURING THE WARRANTY PERIOD (AND BEYOND WITH A SERVICE AGREEMENT), SIEMENS REMOTE SERVICES (SRS) REQUIRES REMOTE LOCAL AREA NETWORK ACCESS TO SIEMENS SYSTEMS.

SRS REQUIRES ONE OF THE FOLLOWING CONNECTION METHODS:

#### (PREFERRED) VPN CONNECTION

THE PREFERRED CONNECTION METHOD IS (VPN) VIRTUAL PRIVATE NETWORK (WHERE THE CUSTOMER HAS AVAILABLE A VPN CAPABLE FIREWALL OR OTHER VPN APPLIANCE). THIS METHOD PROVIDES THE POSSIBILITY FOR REMOTE SYSTEM DIAGNOSTICS WITHOUT ADDITIONAL HARDWARE. PLEASE CONTACT SIEMENS REMOTE SERVICES (800-888-SIEM) TO DETERMINE IF THIS METHOD IS SUITABLE FOR

#### (OPTIONAL) SRS ROUTER CONNECTION

THE SRS ROUTER IS SUPPLIED BY SIEMENS AND INSTALLED AT THE CUSTOMER'S SITE, WHILE STILL REMAINING THE PROPERTY OF SIEMENS. THE CUSTOMER'S NETWORK ADMINISTRATOR AND SIEMENS REMOTE SERVICES SHALL DETERMINE THE TYPE AND LOCATION OF THE SRS ROUTER REQUIRED.

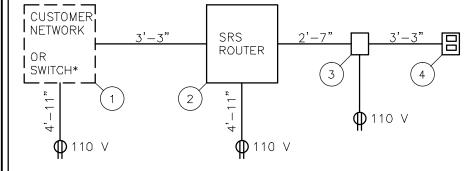
SUPPLIED BY SIEMENS, WHICH THEN IN TURN IS CONNECTED TO AN ANALOG PHONE LINE THAT IS SUPPLIED BY THE CUSTOMER. ONE SRS ROUTER ALLOWS REMOTE DIAGNOSTICS TO MULTIPLE MEDICAL SYSTEMS. - THE SRS ROUTER SHOULD BE INSTALLED IN A SECURE LOCATION (CUSTOMER'S NETWORK COMPUTER ROOM) THAT HAS LIMITED ACCESS. T CAN BE LOCATED ON A SHELF, TABLE, OR IN A CABINET. THE

CONNECTION CABLES (WITH INDICATED LENGTHS BELOW) ARE INCLUDED

- THE SRS ROUTER IS CONNECTED TO AN ANALOG MODEM THAT IS

#### SRS ROUTER CONNECTION DIAGRAM

WITH DELIVERY.



NOTE: ALL POWER OUTLETS ARE SUPPLIED/INSTALLED BY CUSTOMER.

- SRS ROUTER, SUPPLIED BY SIEMENS
- $\binom{2}{}$  (SIZE: 11.2"W X 8.7"D X 5.5"H, WEIGHT: 2 LBS.)

(1) ETHERNET SWITCH OR HUB, SUPPLIED BY CUSTOMER

(3) ANALOG MODEM, SUPPLIED BY SIEMENS

(4) ANALOG PHONE LINE, SUPPLIED BY CUSTOMER

\* OPTIONAL SWITCH AND CABLES ARE NOT INCLUDED, BUT CAN BE ORDERED FROM SIEMENS.

| SIEMENS REMOTE SERVICE | SCALE NONE

#### LIGHTING GUIDELINES

#### EXAM, CONTROL, AND EVALUATION ROOMS:

1) THE ROOM LIGHTING MUST REMAIN FUNCTIONAL WHEN THE MR SYSTEM IS SWITCHED OFF AND/OR WHEN EMERGENCY SHUTDOWN BUTTONS ARE ACTIVATED. 2) IT MUST BE POSSIBLE TO CONTROL THE INTENSITY OF

ILLUMINATION OF APPROXIMATELY 46 FOOT-CANDLES THROUGH GROUP CONNECTION. ALL LIGHTS IN THE EXAMINATION ROOM ARE CONNECTED TO A COMMON SWITCH IN THE CONTROL ROOM. THERE SHOULD BE SEPARATE SWITCHES IN THE EXAMINATION ROOM FOR THE GROUPS OF LIGHTS ABOVE AND NEAR THE PATIENT TABLE, AS WELL AS FOR THE GROUP OF LIGHTS ABOVE THE MAGNET. THE LOCATION OF THESE SWITCHES IS AT THE OWNER'S DISCRETION.

#### **EXAMINATION ROOM:**

1) THE MAGNETIC FIELD ADVERSELY AFFECTS THE OPERATING LIFE OF LIGHT BULBS LOCATED IN THE IMMEDIATE VICINITY OF THE MAGNET, THE FILAMENT IN THE BULB OSCILLATES WITH THE FREQUENCY OF THE POWER SUPPLY. DURING SCANNING, IT IS RECOMMENDED THAT LIGHT FIXTURES IN THE VICINITY OF THE MAGNET (IN EXAMINATION ROOM) BE CONNECTED TO A DC VOLTAGE SUPPLY. THE RESIDUAL RIPPLE OF THE DIRECT VOLTAGE SHOULD BE ±5%. WHEN INSTALLING THE LIGHT SOCKET, ENSURE THAT THE POLARITY IS CORRECT

ARE NOT PERMITTED.

CONTROL AND EVALUATION ROOM: FOLLOW THE APPROPRIATE GUIDELINES FOR LIGHTING IN ROOMS WITH

2) FLUORESCENT LIGHTS, ENERGY—SAVING LIGHTS, AND DIMMERS

MONITOR WORKSTATIONS. **EQUIPMENT ROOM:** 

ILLUMINATION INTENSITY SHOULD BE APPROXIMATELY 46 FOOT-CANDLES.

AVANTO 03/13/13

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PHYSICIST TO SPECIFY RADIATION PROTECTION.

#### MECHANICAL PLAN

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

#### ENVIRONMENTAL REQUIREMENTS

1) AIR CONDITIONING IS TO PROVIDE A TEMPERATURE OF 70°F ±5°F IN THE EXAM ROOM, 70°F±10°F IN THE EQUIPMENT & CONTROL AREAS, 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 AIR EXCHANGE RATE OF 6 TIMES PER HOUR FOR THE EXAM ROOM IS REQUIRED.

50% FRESH AIR INTAKE 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.

IT IS RECOMMENDED TO INSTALL A FRESH AIR SYSTEM WITH 30%-

3) THE HEAT INTO THE EXAM ROOM IS LESS THAN 10,236 BTU/HR. THE HEAT INTO THE EQUIPMENT ROOM IS 17,060 MAXIMUM, BUT IS TYPICALLY 8,530 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

5) THE AIR INTAKE OF THE AIR CONDITIONING SYSTEM MUST NOT

AÍR 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.

BÉ 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

7) DO NOT LOCATE ANY HVAC DIFFUSERS ABOVE THE MAGNET. THERE SHALL NOT BE AIR BLOWING DIRECTLY ON THE MAGNET.

PARTICLES GREATER THAN 10 MICRONS.

#### 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 MATERIÀL, PLASTÍCS, 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.

#### COMPRESSOR LINE INSULATION

COMPRESSOR LINES RUNNING FROM THE COMPRESSOR (OR SEP CABINET) TO THE MAGNET ARE INSULATED BY SIEMENS. ADDITIONAL INSULATION (ARMAFLEX OR EQUIVALENT) FOR NOISE REDUCTION (CHIRPING) MAY BE REQUIRED. ADDITIONAL INSULATION NOT PROVIDED BY SIEMENS.

#### 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

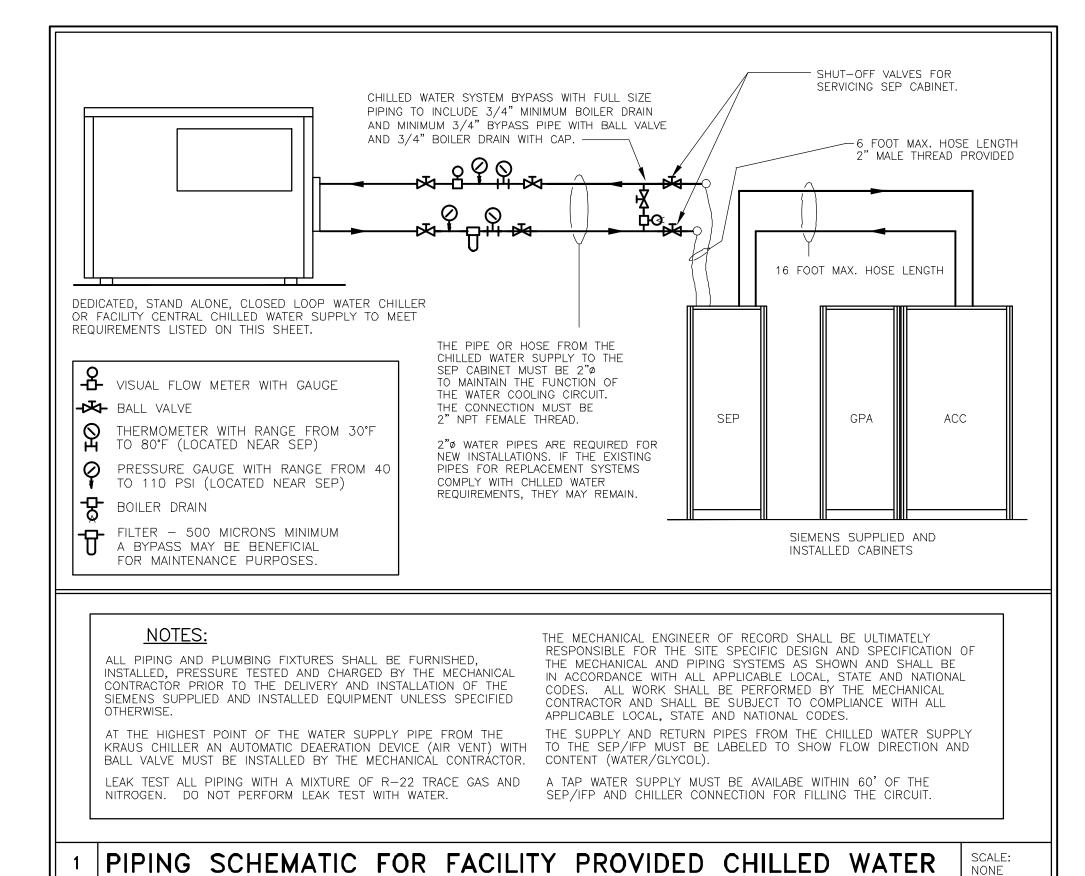
FOR INSTALLATION OF A KRAUS KSC 215 CHILLER, IT IS THE RESPONSIBILIT OF THE CUSTOMER/MECHANICAL CONTRACTOR TO PROVIDE A MIXTURE OF WATER WITH 35%-38% ETHYLENE GLYCOL PRIOR TO CHILLER START UP. DO NOT USE PROPYLENE GLYCOL OR AUTOMOTIVE ANTI-FREEZE. THE AMOUNT OF THE MIXTURE MUST FILL THE CHILLER, MR SYSTEM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

XTURE VOLUME INCLUDING SUPPLY & RETURN+15 GAL. CHILLER & MR						
IPE 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 =  $3.14 \times (PIPE RADIUS)^2 \times PIPE LENGTH + 15 GALLONS$ . GLYCOL AMOUNT = 35-38% OF MIXTURE VOLUME.



#### CHILLED WATER SYSTEM BYPASS WITH FULL SIZE PIPING TO INCLUDE 3/4" MINIMUM BOILER DRAIN AND MINIMUM 3/4" BYPASS SHUT-OFF VALVES INSTALLED PIPE WITH BALL VALVE AND 3/4" BOILER DRAIN WITH CAP. WITHIN 18" OF IFP, AUTOMATIC AIR BLEEDS WITH BALL VALVES ----INSTALLED AT THE HIGHEST POINT OF THE PLUMBING PIPE -16 FOOT MAX. HOSE LENGTH SIEMENS PROVIDES 2" MALE NPT AT IFP. 32 FOOT MAX, ONE WAY PIPE LENGTH FOR 2" DIAMETER PIPE. 148 FOOT MAX. ONE WAY MAXIMUM PIPE LENGTH FOR 2 1/2" ACC DIAMETER PIPE. LENGTH A MAXIMUM OF 25 LONG RADIUS ELBOWS ARE ALLOWED OR TOTAL RUN. -BOILER DRAIN INSTALLED AT CHILLER BY MECHANICAL CONTRACTOR. SIEMENS SUPPLIED AND KKT KRAUS KSC 215 CHILLER HFIIUM CAN BE INSTALLED MAXIMUM 32 FEET ABOVE MR SYSTEM COMPRESSOR INSTALLED CABINETS CAN BE INSTALLED MAXIMUM 82 FEET BELOW MR SYSTEM

ALL PIPING AND PLUMBING FIXTURES SHALL BE FURNISHED,

INSTALLED, PRESSURE TESTED AND CHARGED BY THE MECHANICAL CONTRACTOR PRIOR TO THE DELIVERY AND INSTALLATION OF THE SIEMENS SUPPLIED AND INSTALLED EQUIPMENT UNLESS SPECIFIED

AT THE HIGHEST POINT OF THE WATER SUPPLY PIPE FROM THE BALL VALVE MUST BE INSTALLED BY THE MECHANICAL CONTRACTOR. CONTENT (WATER/GLYCOL). LEAK TEST ALL PIPING WITH A MIXTURE OF R-22 TRACE GAS AND A TAP WATER SUPPLY MUST BE AVAILABE WITHIN 60' OF THE NITROGEN. DO NOT PERFORM LEAK TEST WITH WATER.

CODES. ALL WORK SHALL BE PERFORMED BY THE MECHANICAL CONTRACTOR AND SHALL BE SUBJECT TO COMPLIANCE WITH ALL APPLICABLE LOCAL, STATE AND NATIONAL CODES. THE SUPPLY AND RETURN PIPES FROM THE CHILLED WATER SUPPLY KRAUS CHILLER AN AUTOMATIC DEAERATION DEVICE (AIR VENT) WITH TO THE SEP/IFP MUST BE LABELED TO SHOW FLOW DIRECTION AND

THE MECHANICAL ENGINEER OF RECORD SHALL BE ULTIMATELY

SEP/IFP AND CHILLER CONNECTION FOR FILLING THE CIRCUIT.

RESPONSIBLE FOR THE SITE SPECIFIC DESIGN AND SPECIFICATION OF

THE MECHANICAL AND PIPING SYSTEMS AS SHOWN AND SHALL BE

IN ACCORDANCE WITH ALL APPLICABLE LOCAL, STATE AND NATIONAL

PIPING SCHEMATIC FOR CHILLED WATER - KRAUS CHILLER SCALE: NONE

#### MECHANICAL NOTES

1) THE AIR H.V.A.C. SYSTEM MUST OPERATE FOR A MINIMUM OF 48 CONSECUTIVE HOURS PRIOR TO THE DELIVERY OF THE EQUIPMENT. 2) THE FILTERS MUST BE CHANGED IMMEDIATELY PRIOR TO THE DELIVERY OF THE EQUIPMENT.

3) SMS REQUIRES THE USE OF A DEDICATED H.V.A.C. SYSTEM FOR THE EQUIPMENT ROOM TO BE LOCATED, SIZED AND SPECIFIED BY THE MECHANICAL ENGINEER OF RECORD AND TO BE SUPPLIED AND INSTALLED BY THE MECHANICAL CONTRACTOR.

4) SMS RECOMMENDS THAT THE CUSTOMER PROVIDE AND INSTALL AN OXYGEN MONITORING SYSTEM WITH VISUAL AND AUDIBLE ALARMS TO INDICATE WHEN THE OXYGEN CONTAINED IN AMBIENT AIR FALLS BELOW PRE-PROGRAMMED SAFETY LEVELS WITH THE SENSOR TO BE LOCATED IN THE SCAN ROOM IN THE AREA DESIGNATED FOR CRYOGEN FILLING.

5) THE SIEMENS ACTIVE SHIELDED MAGNET RECIRCULATES LIQUID HELIUM, ELIMINATING THE NEED FOR A DEDICATED CRYOGEN STORAGE AREA. THE RECIRCULATING SYSTEM SIGNIFICANTLY REDUCES THE HELIUM "BOIL OFF". THE MAGNET WILL REQUIRE OCCASIONAL FILLING, A DELIVERY ROUTE FOR CRYOGEN DEWARS MUST BE ESTABLISHED. A MINIMUM 36" CLEARANCE IS REQUIRED.

#### FIRE CONTROL NOTES

1) SIEMENS HAS NO SPECIFIC REQUIREMENT FOR FIRE PROTECTION FIRE PROTECTION REQUIREMENTS SHALL BE IN ACCORDANCE WITH LOCAL CODES AND CUSTOMER'S INSURANCE REQUIREMENTS. ALL FIRE PROTECTION SYSTEMS SHALL BE DEFINED BY THE ARCHITECT OF RECORD WITH DESIGN, SPECIFICATION AND DETAILING OF THE FIRE PROTECTION SYSTEM BY THE MECHANICAL ENGINEER OF RECORD IN ACCORDANCE WITH SIEMENS GUIDELINES AS STATED HEREIN.

THE ELECTRONIC EQUIPMENT OF THE MR SYSTEMS WILL BE DAMAGED BY WATER, REDUCTION OR ELIMINATION OF WATER USED FOR FIRE SUPPRESSION WILL REDUCE POTENTIAL WATER DAMAGE. PRE-ACTION INERT GAS, OR HALOCARBONS OR OTHER METHODS CAN REDUCE OR ELIMINATE WATER. REFER TO YOUR FIRE PROTECTION PROFESSIONAL

2) THE USE OF SMOKE DETECTORS INSIDE OF THE MR EXAMINATION ROOM IS NOT RECOMMENDED. SMOKE DETECTORS, BY DESIGN, CAN GENERATE NOISE THAT MAY INTERFERE WITH THE MRI EXAMINATION AND CAUSE IMAGE ARTIFACTS. IF THE USE OF A SMOKE DETECTOR IN THE EXAMINATION ROOM IS MANDATED BY LOCAL REQUIREMENTS, SPECIAL NOISE TESTS MUST BE PERFORMED BY SIEMENS SERVICE AFTER THE MRI IS OPERATIONAL. MRI EQUIPMENT PERFORMANCE PROBLEMS DUE TO SMOKE DETECTORS ARE THE RESPONSIBILITY OF THE CUSTOMER AND ARE NOT COVERED UNDER WARRANTY OR SERVICE AGREEMENT.

3) ALL MATERIAL USED INSIDE THE MAGNET ROOM SHALL BE NON-MAGNETIC.

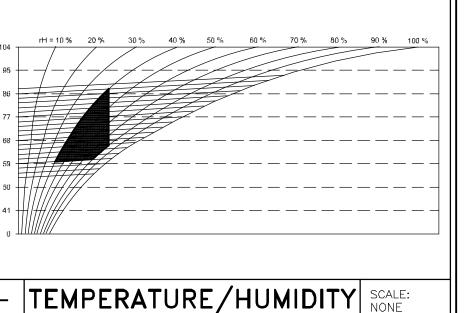
4) ALL PENETRATIONS IN THE RF CABIN/SHIELD SHALL BE THROUGH A WAVEGUIDE TO BE EQUIPPED WITH A SIEMENS APPROVED DIELECTRIC COUPLER ON BOTH ENDS OF THE WAVEGUIDE. ALL WAVEGUIDES SHALL BE DESIGNED, DETAILED AND SPECIFIED BY THE RF CABIN/ SHIELD CONTRACTOR WITH ALL LOCATIONS TO BE DETERMINED BY THE ARCHITECT AND MECHANICAL ENGINEER OF RECORD TO BE ESTABLISHED IN A PRE-PLANNING MEETING PRIOR TO THE DESIGN, SPECIFICATION, AND FABRICATION OF THE RF CABIN/SHIELD. 5) EACH ELECTRICAL PENETRATION OF THE RF CABIN/SHIELD FOR ELECTRICAL SERVICING OF THE FIRE PROTECTION SYSTEM SHALL BE IROUGH AN REL FILTER TO RE SUPPLIED RY THE RE SHIFLD CONTRACTOR WITH FILTER LOCATIONS TO BE DETERMINED BY THE ARCHITECT AND THE ELECTRICAL ENGINEER OF RECORD TO BE ESTABLISHED IN A PRE-PLANNING MEETING PRIOR TO THE DESIGN,

SPECIFICATION AND FABRICATION OF THE RF CABIN/SHIELD. 6) IT IS PERMISSIBLE TO RUN "BLACK PIPE" UP TO THE DIELECTRIC

COUPLER ON THE OUTSIDE OF THE RF SHIELD. 7) THERE MUST BE NO GROUND CONNECTIONS MADE DURING THE THE INSTALLATION OF EITHER THE PIPING OR ELECTRICAL FOR THE FIRE PROTECTION SYSTEM.

8) THE USE OF HALON IS NOT ACCEPTABLE.

9) THE LOCATION OF FIRE CONTROL SYSTEM COMPONENTS SHALL BE COORDINATED THROUGH THE ARCHITECT OF RECORD WITH ALL LOCATIONS TO BE COORDINATED WITH SIEMENS EQUIPMENT LOCATIONS AS SHOWN ON THE 1/4" SCALE EQUIPMENT LOCATION PLAN. 10) THE FIRE CONTROL CONTRACTOR SHALL VERIFY EQUIPMENT MOUNTING PROCEDURES AND LOCATIONS ON ANY WALLS CONTAINING RF SHIELDING WITH THE SIEMENS PROJECT MANAGER PRIOR TO THE COMMENCEMENT OF WORK.



AVANT 03/13/13

SIEMENS



EXAM ROOM 7'-9" MINIMUM CONTROL ROOM 6'-11 MINIMUM EQUIPMENT ROOM 7'-3" MINIMUM

**MAGNETOM AVANTO** 

TYPICAL INSTALLATION DRAWIGNS NOT FOR CONSTRUCTION |PROJECT #

THE USE OR REPRODUCTION OF THIS TITLE BLOCK WITHOUT SIEMENS AUTHORIZATION WILL RESULT IN PROSECUTION UNDER FULL EXTENT OF THE LAW. ALL RIGHTS ARE RESERVED. DESCRIPTION

CALE: **AS NOTED** 

03093 B. HERRMANN CHECKED:

ATTENTION:

-THIS DRAWING IS DESIGNED TO CONFORM TO FEATURES AND EQUIPMENT REQUIREMENTS PRESENTED AT THE TIME OF THEIR PREPARATION. SINCE BOTH THESE FACTORS ARE SUBJECT TO DESIGN MODIFICATION, THEY ARE NOT TO BE USED FOR CONSTRUCTION PURPOSES. - THIS SET OF PLANS REPRESENTS A COMPLETE SET OF DETAILS AND SHOULD NOT BE SEPARATED.

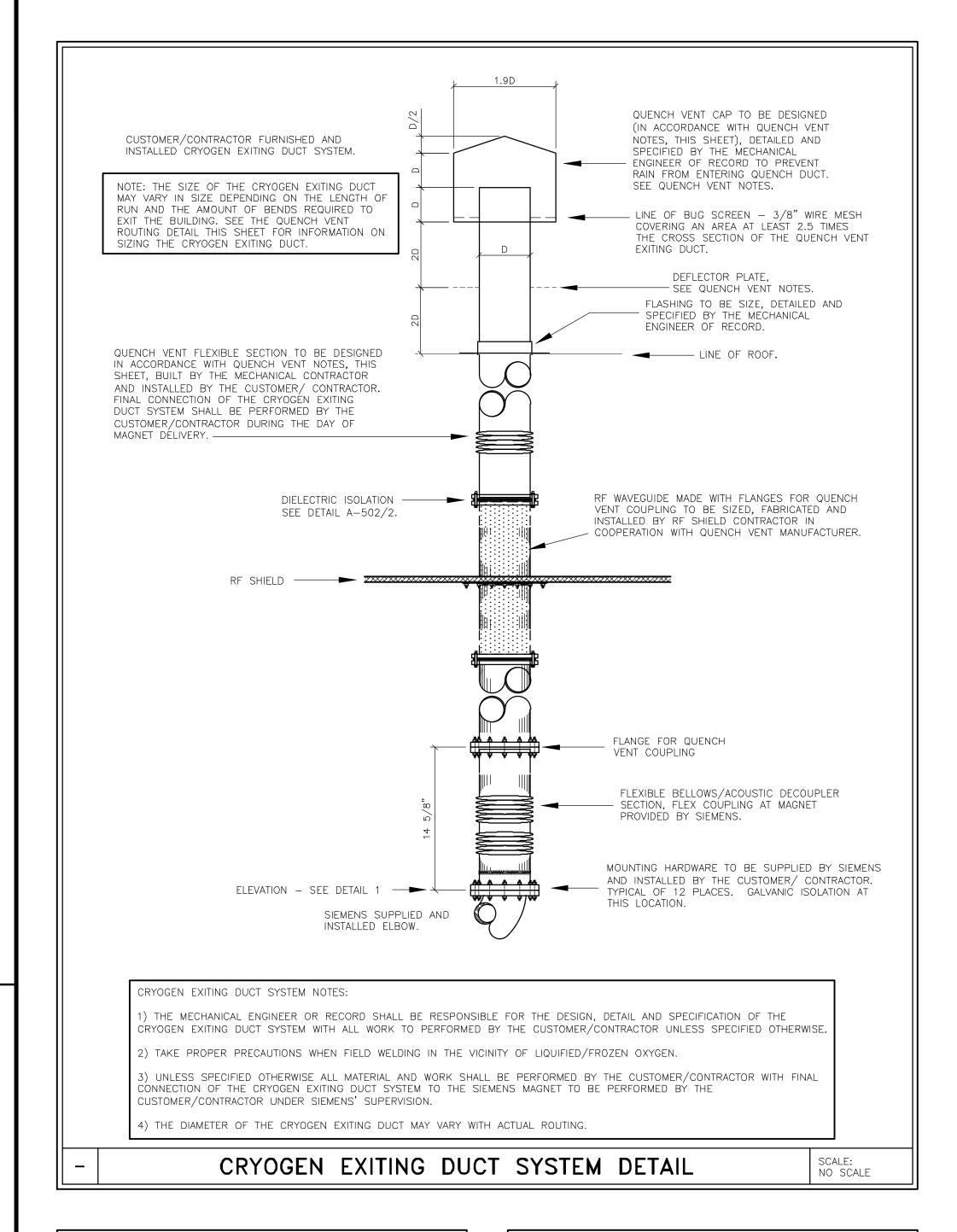
-IT IS RECOMMENDED THAT THE SIEMENS DRAWINGS BE INCORPORATED WITH THE CONSTRUCTION DOCUMENTS FOR REFERENCE.

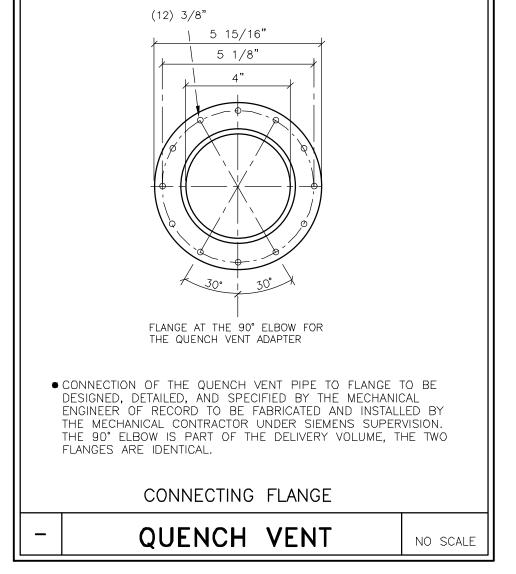
EQUIPMENT. THE CUSTOMER IS RESPONSIBLE FOR CONSULTING WITH A REGISTERED RADIATION PHYSICIST TO SPECIFY RADIATION PROTECTION.

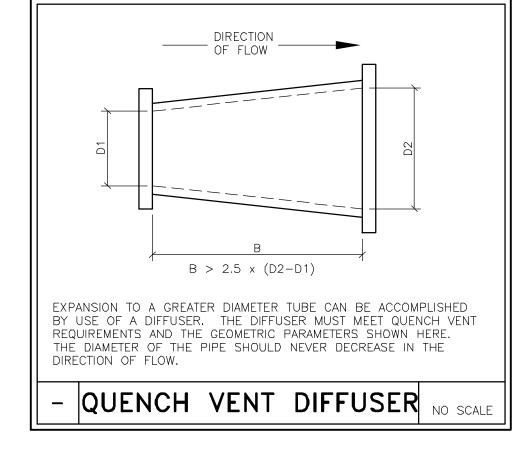
-ALL DIMENSIONS SHOWN ON THIS DRAWING ARE FROM FINISHED SURFACES. -THIS DRAWING DOES NOT PROVIDE RADIATION SHIELDING REQUIREMENTS FOR X-RAY AND ASSOCIATED

-ISSUE BLOCK-

04/05/13







#### CRYOGEN NOTES

) "CRYOGENS" IS A TERM USED TO IDENTIFY THE REFRIGERANT USED TO MAGE THE MAGNET "SUPER-CONDUCTING", IN THIS APPLICATION, LIQUID AND GASEOUS HELIUM. SPECIAL CARE MUST BE TAKEN DURING THE TRANSFILLING OF THE MAGNET WITH CRYOGENS AND NORMAL EXHAUST OF CRYOGENS FROM THE SYSTEM. ASIDE FROM THE OBVIOUS DANGER OF FREEZING, HELIUM GAS WILL ALSO DISPLACE THE OXYGEN IN THE ROOM. THE INSTALLATION OF AN APPROVED TOXGARD MONITORING SYSTEM IS RECOMMENDED.

) THERE SHALL BE A TRANSPORT ROUTE FOR DELIVERY OF CRYOGENS TO THE EXAM ROOM. SPECIAL VESSELS CALLED DEWARS ARE USED TO TRANSPORT HELIUM. A 250 LITER DEWAR WEIGHS 335 POUNDS AND HAS A 32" DIAMETER, A 500 LITER IS 540 POUNDS, AND IS 42" IN DIAMETER.

3) HELIUM GAS CYLINDERS MAY BE USED DURING THE INITIAL FÍLLING OF HELIUM INTO THE MAGNET. THE FACILITY IN WHICH THESE MAY BE USED NEEDS TO HAVE THE ABILITY TO TEMPORARILY STORE AND SECURE THESE CYLINDERS THAT WILL PREVENT THEM FROM INADVERTENTLY FALLING OVER.

4) OUTSIDE VENTING OF THE HELIUM IS TO BE PROVIDED BY MEANS OF A VENT PIPE OF NON-MAGNETIC MATERIAL CALLED A QUENCH

#### QUENCH VENT NOTES

I) IN THE EVENT OF A QUENCH, THE THERMAL ENERGY DISSIPATED CAUSES AN EXTREMELY RAPID BOIL OFF OF THE LIQUID HELIUM. THE SYSTEM MUST BE CAPABLE OF VENTING THE LARGE VOLUME OF GAS GENERATED AT THE APPROXIMATE EXPANSION RATIO OF 1:700 FROM LIQUID AT 4.2°K TO ROOM TEMPERATURE GAS. THE EXHAUST SYSTEM S CRITICAL FOR THE SAFE OPERATION OF THE MAGNET, THE DATA IN HIS DOCUMENT MUST BE FOLLOWED. SINCE HELIUM VENTED IN A QUENCH IS AN ASPHYXIANT & AN EXTREMELY COLD GAS, THE QUENCH TUBE MUST ALWAYS END AT A POINT WHERE ACCESS BY PEOPLE IS NOT POSSIBLE. QUENCH TUBE PLANNING MUST ONLY BE DONE BY QUALIFIED PERSONNEL. IT IS THE OWNER'S RESPONSIBILITY TO ENSURE HAT THE QUENCH TUBE IS MAINTAINED IN AN OPERABLE STATE. 2) IF THE QUENCH VENT IS NOT CONFIGURED CORRECTLY THERE IS A RISK OF DANGER THAT MAY LEAD TO DEATH OR SERIOUS INJURY AND CAN RESULT IN STRUCTURAL DAMAGE. THE EXHAUST MUST NOT BE VENTED IN AN ENCLOSED SPACE. THE OPERATOR OF THE SYSTEM MUST PREPARE AN EMERGENCY PLAN IN THE EVENT OF A QUENCH. 3) THE QUENCH TUBE CONSISTS OF STRAIGHT, HYDRAULICALLY SMOOTH SECTIONS, BENDS UP TO 90° AND A DIFFUSER, IF REQUIRED THE END OF THE TUBE MUST BE PROTECTED FROM RAIN, SNOW, AND FOREIGN OBJECTS. ROUND SECTIONS ONLY, NO SQUARE SECTIONS.

4) THE SIEMENS MAGNET HAS A QUENCH VALVE ASSEMBLY FOR CONNECTION TO THE TUBE LOCATED AT THE TOP LEFT SIDE OF THE MAGNET (SEE MAGNET ELEVATION). THE MECHANICAL CONTRACTOR WILL SUPPLY AND INSTALL A QUENCH VENT TUBE WITH CAP, TO BE NON-MAGNETIC STAINLESS STEEL (≥22 GAUGE RECOMMENDED). GRADES AISI304, 309, 316, OR 321 ONLY. THERMAL CONDITIONS MAY CAUSE THE TUBE TO CONTRACT UP TO 3mm/METER SO A STAINLESS STEEL BELLOWS OR FLEXIBLE SECTION MUST BE INSTALLED A MINIMUM OF EVERY 32'-9" NOT TO EXCEED 2% OF THE OVERALL LENGTH. THE QUENCH TUBE MAY ALSO BE MADE OF ALUMINUM, EXTRUDED TUBE ALUMINUM GRADES 6063 AND 6082 ONLY MUST BE USED. ROLLED AND WELDED TUBE FROM SHEET ALUMINUM GRADE 5083 ONLY MUST BE USED. THE WALL SECTIONS OF ALUMINUM TUBE MUST BE A MINIMUM 14 GAUGE. THERMAL CONTRACTION OF 4.5 MM/METER MUST BE CONSIDERED FOR ALUMUNIUM QUENCH TUBES. THE MOVEMENT OF HE BELLOWS MUST BE RESTRICTED TO PREVENT EXCESSIVE EXPANSION DUE TO PRESSURE, THE WEIGHT OF THE TUBE MUST BE SUPPORTED BY THE BUILDING AND BE FLEXIBLE ENOUGH TO ALLOW MOVEMENT FROM THERMAL CONTRACTION. THE WALL EXIT SHOULD ALSO BE FLEXIBLE.

) THE MAXIMUM INTERNAL PRESSURE IS CALCULATED AT 1.45 PSI. THE MAXIMUM PRESSURE SHOULD BE ENGINEERED FOR 6.5 PSI. 3) USE THE QUENCH VENT CALCULATOR PROVIDED BY SIEMENS TO DESIGN A QUENCH VENT THAT MEETS DESIGN REQUIREMENTS FOR DIAMETER, LENGTH, NUMBER OF ELBOWS AND PRESSURE DROP. ALL BENDS MUST BE SMOOTH WALLED AND HAVE A CENTERLINE TO INTERNAL PIPE DIAMETER RATIO OF 1.5 TO 5.0. EXPANSIONS TO PIPE DIAMETER CAN BE DONE WITH A DIFFUSER. ONLY ROUND TUBE SECTIONS MAY BE USED, RECTANGULAR SECTIONS ARE NOT ALLOWED. 7) THERE MUST BE A 12-19 INCH FLEXIBLE SECTION OF PIPE FOR CONNECTION TO THE QUENCH VALVE AT THE MAGNET WITH AN INSIDE DIAMETER GREATER THAN 4" (1.5T) OR 6" (3.0T) AND ABLE TO WITHSTAND 6.5 PSI.

8) SECTIONS OF THE PIPE CAN ONLY BE JOINED BY WELDING OR BOLTED FLANGES WITH FIBER GASKETS. ROTARY FLANGES ARE PERMITTED, VEE CLAMPED FLANGES MAY NOT BE USED.

9) THE PROTECTION AT THE END OF THE TUBE SHALL BE 3/8" WIRE MESH COVERING AN AREA AT LEAST 2.5 TIMES THE CROSS SECTION AREA OF THE QUENCH PIPE.

10) WHERE THE QUENCH TUBE EXITS THROUGH A FLAT ROOF, THE THE OUTLET MUST BE ABOVE A LEVEL WHERE WATER COULD ENTER IN THE EVENT THAT THE ROOF DRAINS BECOME BLOCKED. IN THE CASE OF A HORIZONTAL EXIT THROUGH A WALL, THE OUTLET SHOULD BE ANGLED DOWNWARD NOT LESS THAN 1 PIPE DIAMETER TO PREVENT RAIN INGRESS. THE EXIT SHOULD BE LOCATED ABOVE THE LEVEL OF DRIFTING SNOW.

11) WHERE THE QUENCH TUBE EXITS VERTICALLY, A RAIN COVER MUST ALSO BE FITTED WITH THE DIAMETER TO BE TWO TIMES THE DIAMETER OF THE QUENCH TUBE. THE CLEARANCE BETWEEN THE RAIN GUARD AND THE MESH SHOULD 2 TIMES THE DIAMETER OF THE TUBE. A DEFLECTOR PLATE SHOULD BE WELDED TO THE TUBE WHERE IT EXITS THE ROOF TO PREVENT HELIUM FROM RE-ENTERING THE BUILDING. THE DEFLECTOR SHOULD BE AT LEAST THE DIAMETER OF THE RAIN GUARD AND LOCATED TWO PIPE DIAMETERS ABOVE THE ROOF AND TWO PIPE DIAMETERS BELOW THE RAIN GUARD. 12) TO AVOID INJURY FROM COLD BURNS AND ASPHYXIATION ACCESS TO THE QUENCH VENT MUST BE RESTRICTED BY 9'-11" ON EACH SIDE AND BELOW, AND 19'-9" ABOVE WITH WARNING SIGNS, THE EXIT MUST NOT LOCATED WHERE HELIUM GAS COULD BE DRAWN INTO AN AIR INLET OR OPEN WINDOW. 3) THE QUENCH TUBE MUST HAVE MINIMUM 1" INSULATION FOR THE

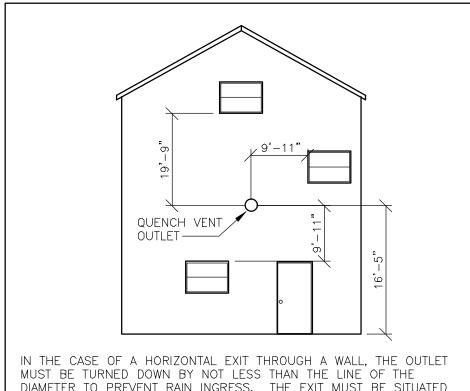
FULL LENGTH, WITHIN THE RF ROOM THERE SHOULD BE A 1" LAYER OF MINERAL FIBER INSULATION WITH A VAPOR BARRIER AND 1" CLASS OR CLASS AP ARMAFLEX. OUTDOOR PIPES MUST BE WEATHERPROOF THE TUBE MUST HAVE A WARNING POSTED ALONG IT'S ENTIRE LENGTH FOR EXTREMELY COLD HELIUM GAS - AUTHORIZED PERSONNEL ONLY. THE INSULATION MUST NOT TOUCH THE MAGNET COVERS. 14) GALVANIC SEPARATION MUST BE PROVIDED BETWEEN THE MR SYSTEM, THE RF ROOM, AND THE BUILDING, TWO SEPARATIONS ARE REQUIRED USING STAINLESS STEEL BOLTS, INSULATING BUSHES AND LOCKING NUTS. NO OTHER DESIGNS ARE PERMITTED FOR SAFETY. 15) THE DESIGN AND CONSTRUCTION OF THE QUENCH PIPE MUST BE DOCUMENTED WITH DRAWINGS AND CALCULATIONS THAT ARE KEPT WITH

INSTALLATION DOCUMENTS. IT MUST COMPLY WITH THE REQUIREMENTS

IN THIS DOCUMENT BEFORE BEING CONNECTED TO THE MAGNET.

#### HELIUM CONTENT LITERS AT 100% 1400

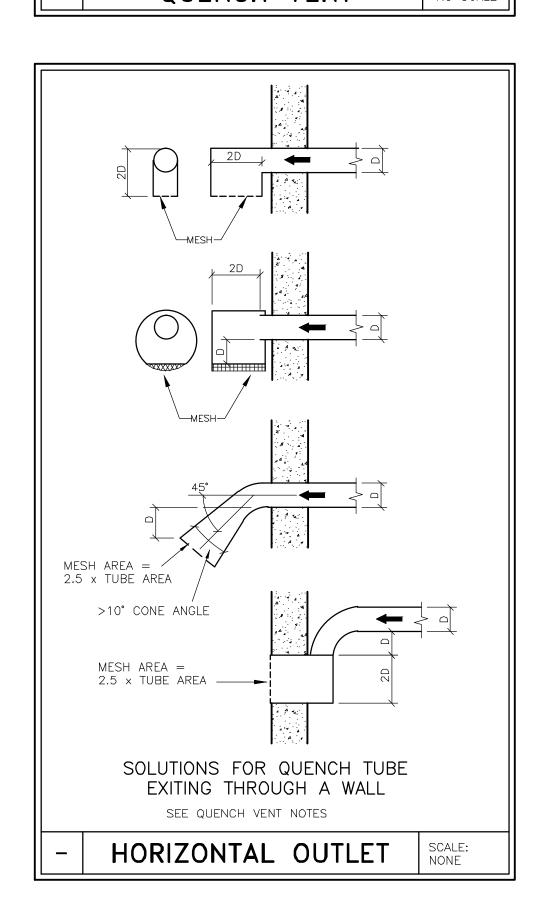
FOR TYPICAL CLINICAL USE, YPICAL BOIL OFF RATE 0.0 L/HR DEPENDING ON SEQUENCES TYPICAL REFILL INTERVAL 10 YEARS AND OPERATING TIME. WITHOUT THE COLDHEAD RUNNING THE LIQUID HELIUM WILL BOIL OFF FROM 70% TO 0% IN APPROX 20 DAYS AT A RATE OF 3.5% (49 LITERS) PER DAY. THE LOSS DURING SHIPPING IS APPROX. 4.5% (63 LITERS) PER DAY.

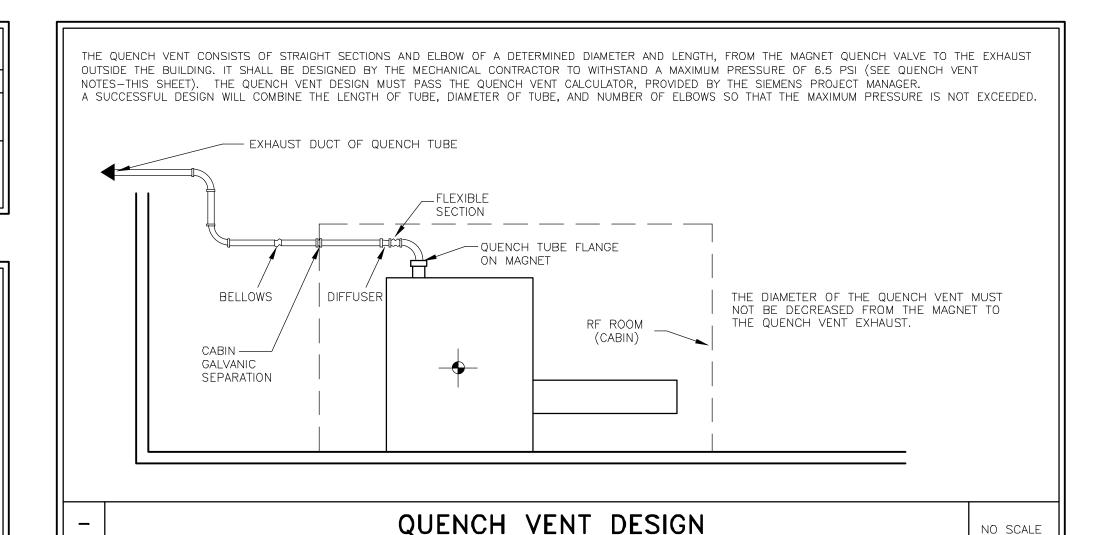


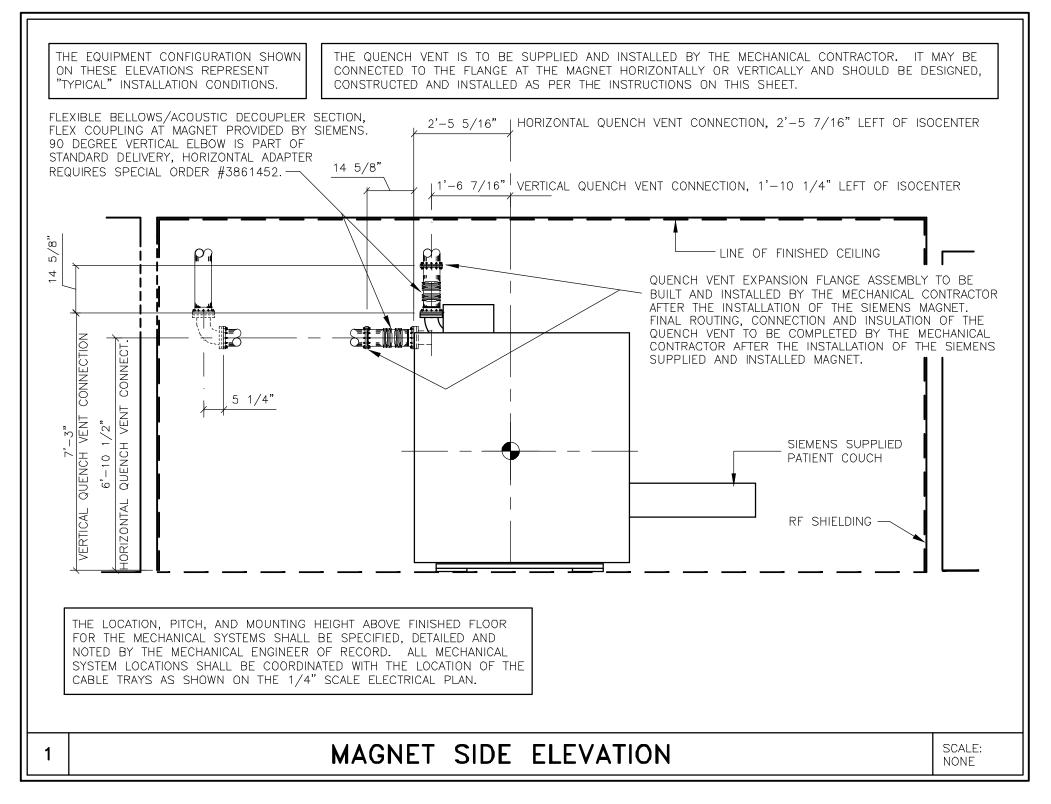
DIAMETER TO PREVENT RAIN INGRESS. THE EXIT MUST BE SITUATED WHERE IT CANNOT BE BLOCKED BY DRIFTING SNOW. TO AVOID RISK OF INJURY FROM COLD BURNS AND ASPYXIATION. ACCESS TO THE QUENCH VENT OUTLET MUST BE RESTRICTED AS SHOWN. THE OUTLET MUST NOT BE SITUATED WHERE, IN THE EVENT OF A QUENCH, HELIUM GAS COULD BE DRAWIN INTO AN AIR INLET OR OPEN WINDOW. WHERE WINDOWS ARE WITHIN THE RESTRICTED AREA, THEY MUST BE PERMANENTLY CLOSED.

OUTLET SAFETY CLEARANCES

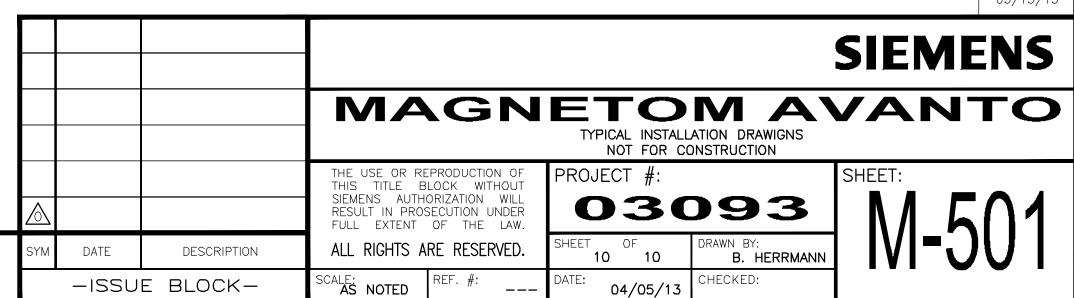
QUENCH VENT NO SCALE







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ATTENTION:

PHYSICIST TO SPECIFY RADIATION PROTECTION.