

MAGNETOM AVANTO



Contents:

Sheet No.	Description
A-101	EQUIPMENT PLAN-DETAILS, LEGEND, AND NOTES
A-102	SAFETY/SERVICE CLEARANCE PLAN
A-501	DETAILS AND NOTES
A-502	DETAILS AND NOTES
S-101	STRUCTURAL PLAN-DETAILS AND NOTES
E-101	ELECTRICAL PLAN(S)-LEGEND AND NOTES
E-102	ELECTRICAL PLAN-LEGEND AND NOTES
E-501	ELECTRICAL DIAGRAMS AND NOTES
M-101	MECHANICAL PLAN-CHILLED WATER DETAILS AND NOTES
M-501	CRYOGEN NOTES AND DETAILS

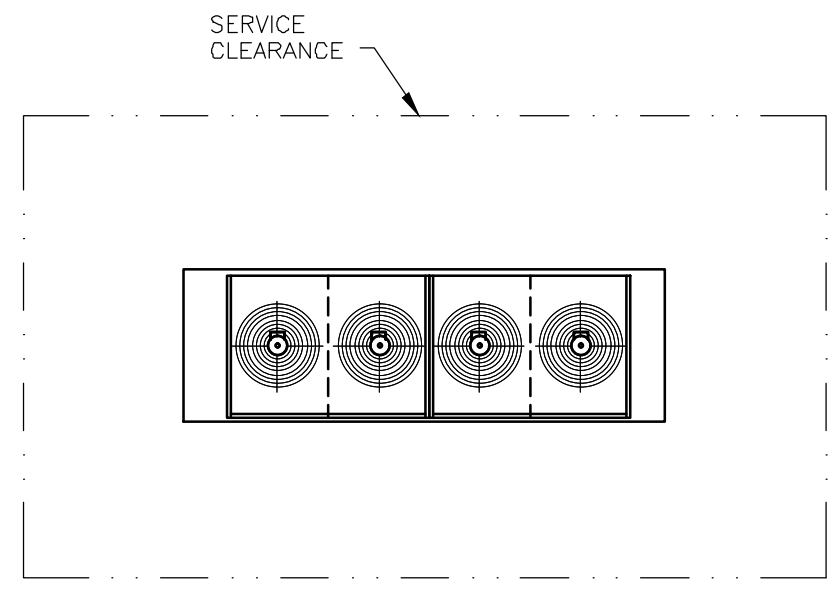
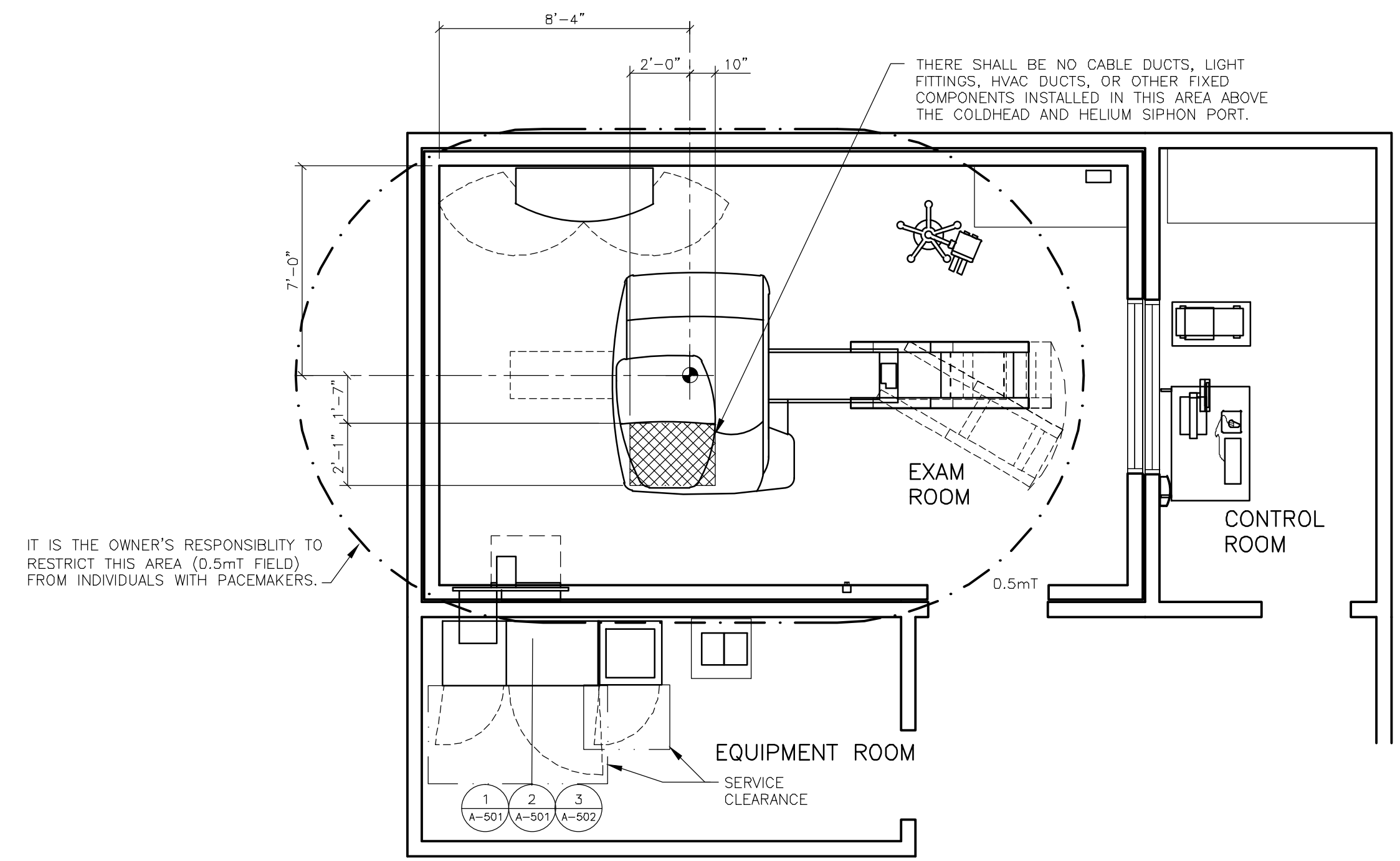
Typical Drawing #: 03093

SIEMENS
SIEMENS MEDICAL SOLUTIONS

51 Valley Stream Parkway

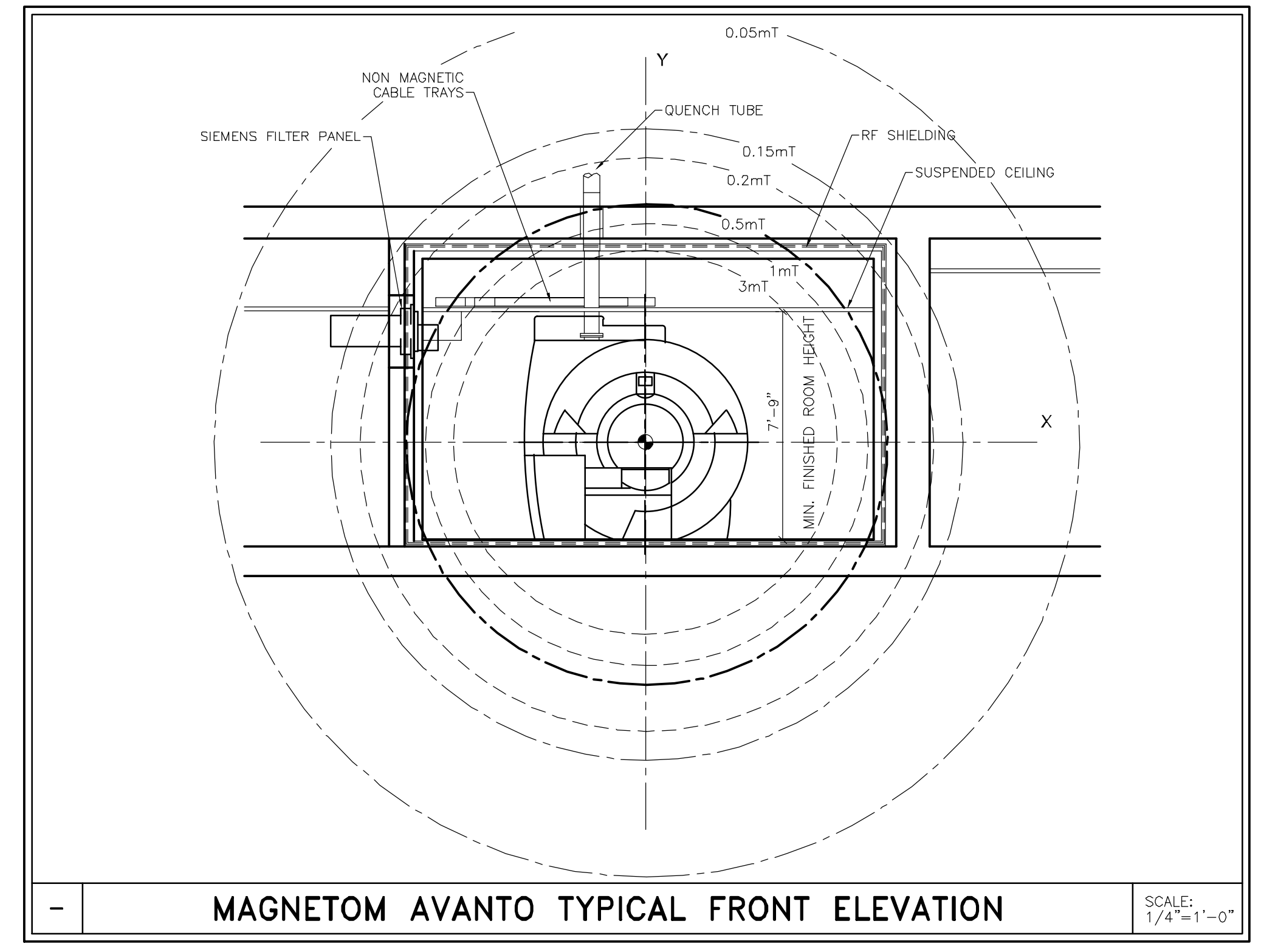
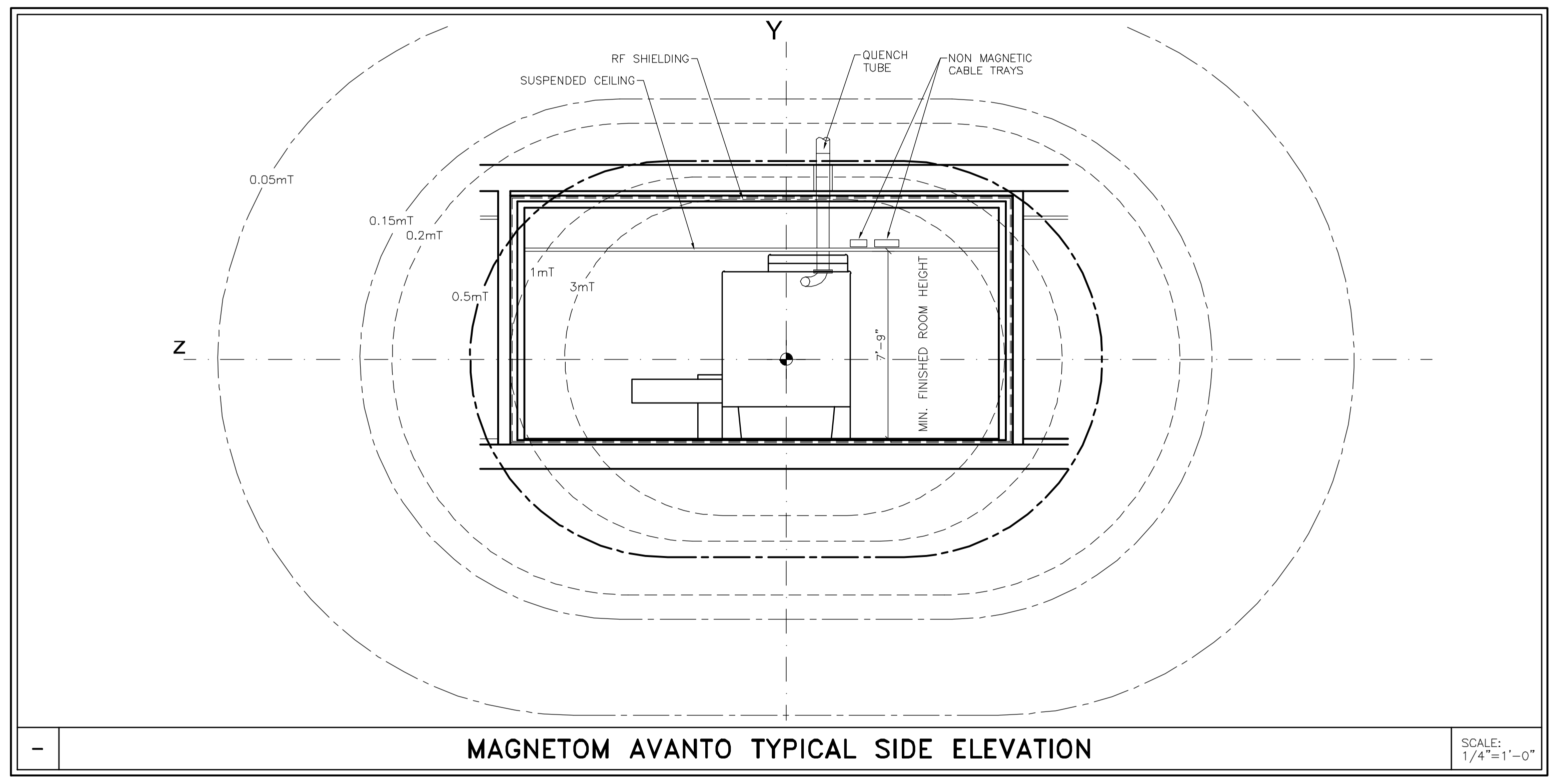
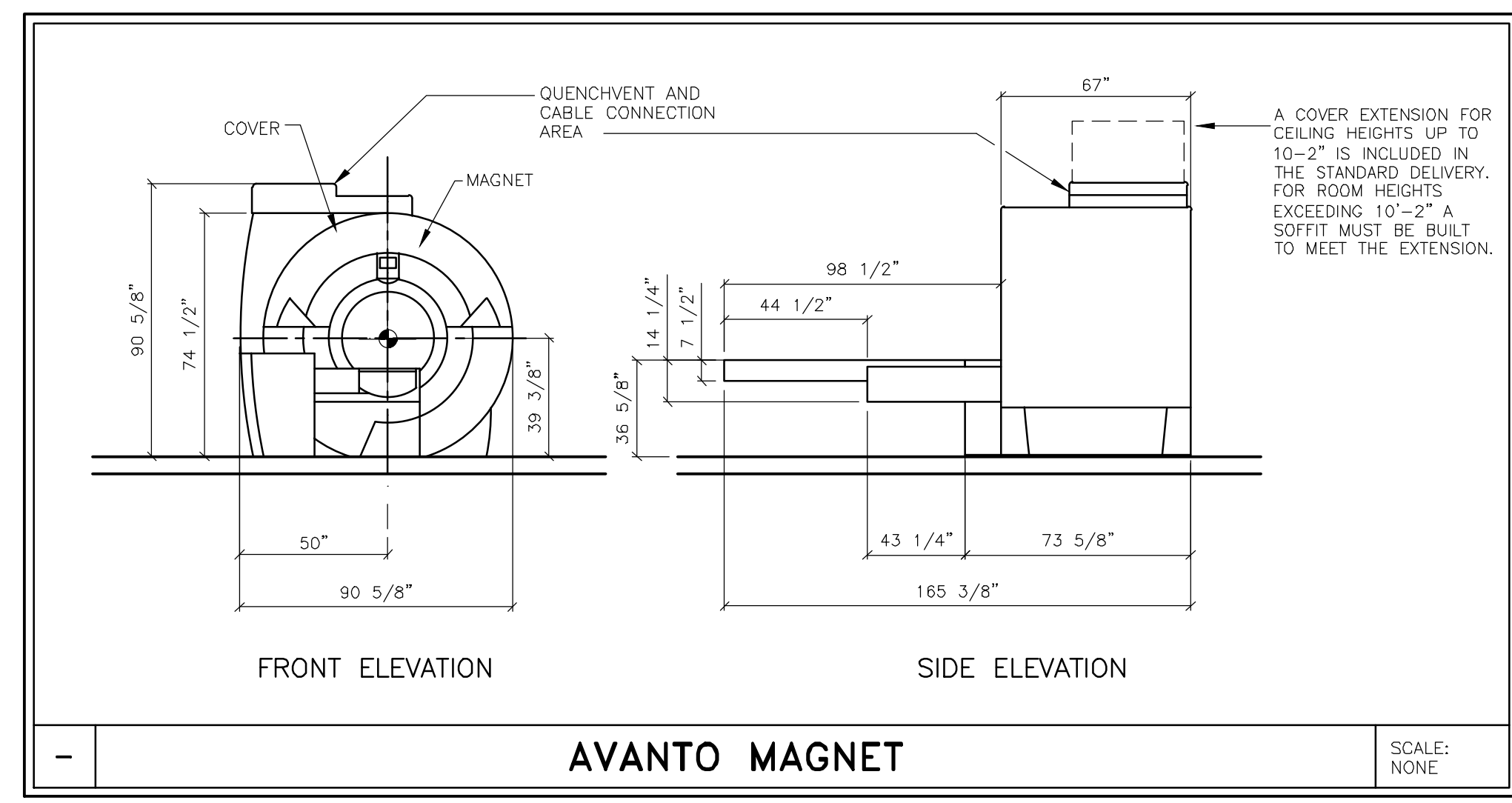
Malvern, PA 19355

www.usa.siemens.com/medical



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

<p>SIEMENS MAGNETOM AVANTO TYPICAL INSTALLATION DRAWINGS NOT FOR CONSTRUCTION</p>		PROJECT #:	SHEET:
		03093	A-102
<p>THE USE OR REPRODUCTION OF THIS TITLE BLOCK WITHOUT SIEMENS AUTHORIZATION WILL RESULT IN PROSECUTION UNDER FULL EXTENT OF THE LAW.</p>		<p>ALL RIGHTS ARE RESERVED.</p>	<p>DATE: 04/05/13</p>
<p>SCALE: AS NOTED</p>		<p>REF. #: ---</p>	<p>CHECKED:</p>
<p>SYMBOL</p>		<p>DATE</p>	<p>DESCRIPTION</p>
<p>—ISSUE BLOCK—</p>			

ATTENTION:

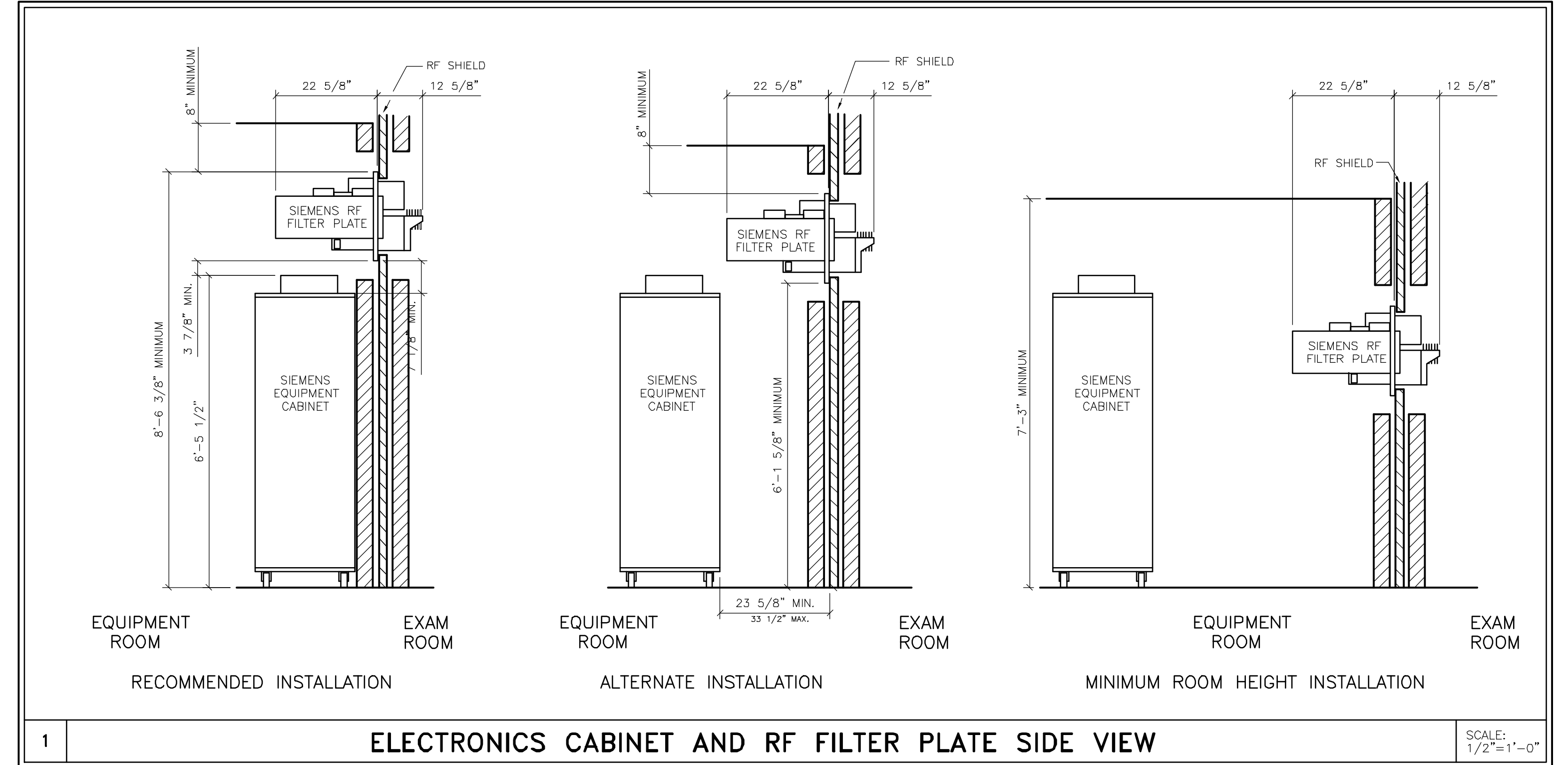
— THIS DRAWING IS DESIGNED TO CONFORM TO FEATURES AND EQUIPMENT REQUIREMENTS PRESENTED AT THE TIME OF THEIR PREPARATION. SINCE BOTH THESE FACTORS ARE SUBJECT TO DESIGN MODIFICATION, THEY ARE NOT TO BE USED FOR CONSTRUCTION PURPOSES.
— THIS SET OF PLANS REPRESENTS A COMPLETE SET OF DETAILS AND SHOULD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

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

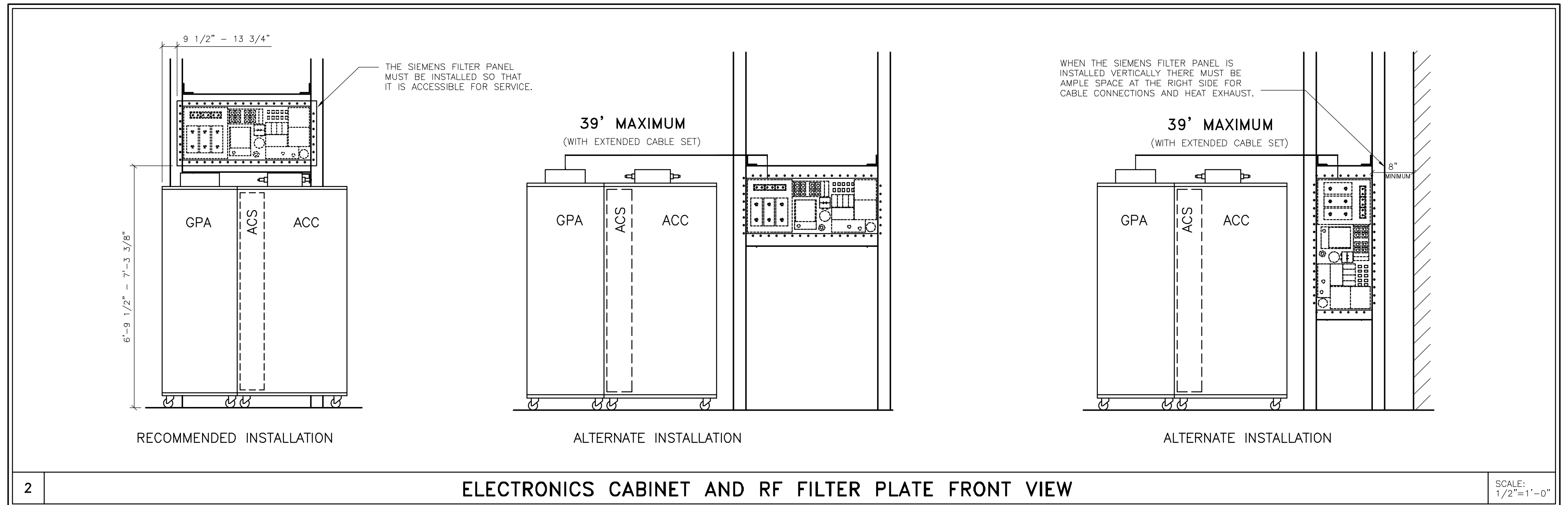
— ALL DIMENSIONS SHOWN ON THIS DRAWING ARE FROM FINISHED SURFACES.
— THIS DRAWING DOES NOT PROVIDE RADIATION SHIELDING REQUIREMENTS FOR X-RAY AND ASSOCIATED EQUIPMENT. THE CUSTOMER IS RESPONSIBLE FOR CONSULTING WITH A REGISTERED RADIATION PHYSICIST TO SPECIFY RADIATION PROTECTION.

AVANTO
03/13/13

SURFACE COIL SIZES					
COIL NAME	POUND WEIGHT	INCHES			
		LENGTH	WIDTH	HEIGHT	DIAMETER
HEAD MATRIX COIL	11	11 1/4	11 1/4	11	-
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



1 **ELECTRONICS CABINET AND RF FILTER PLATE SIDE VIEW** SCALE: 1/2"=1'-0"



2 **ELECTRONICS CABINET AND RF FILTER PLATE FRONT VIEW** SCALE: 1/2"=1'-0"

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- ISSUE BLOCK -		

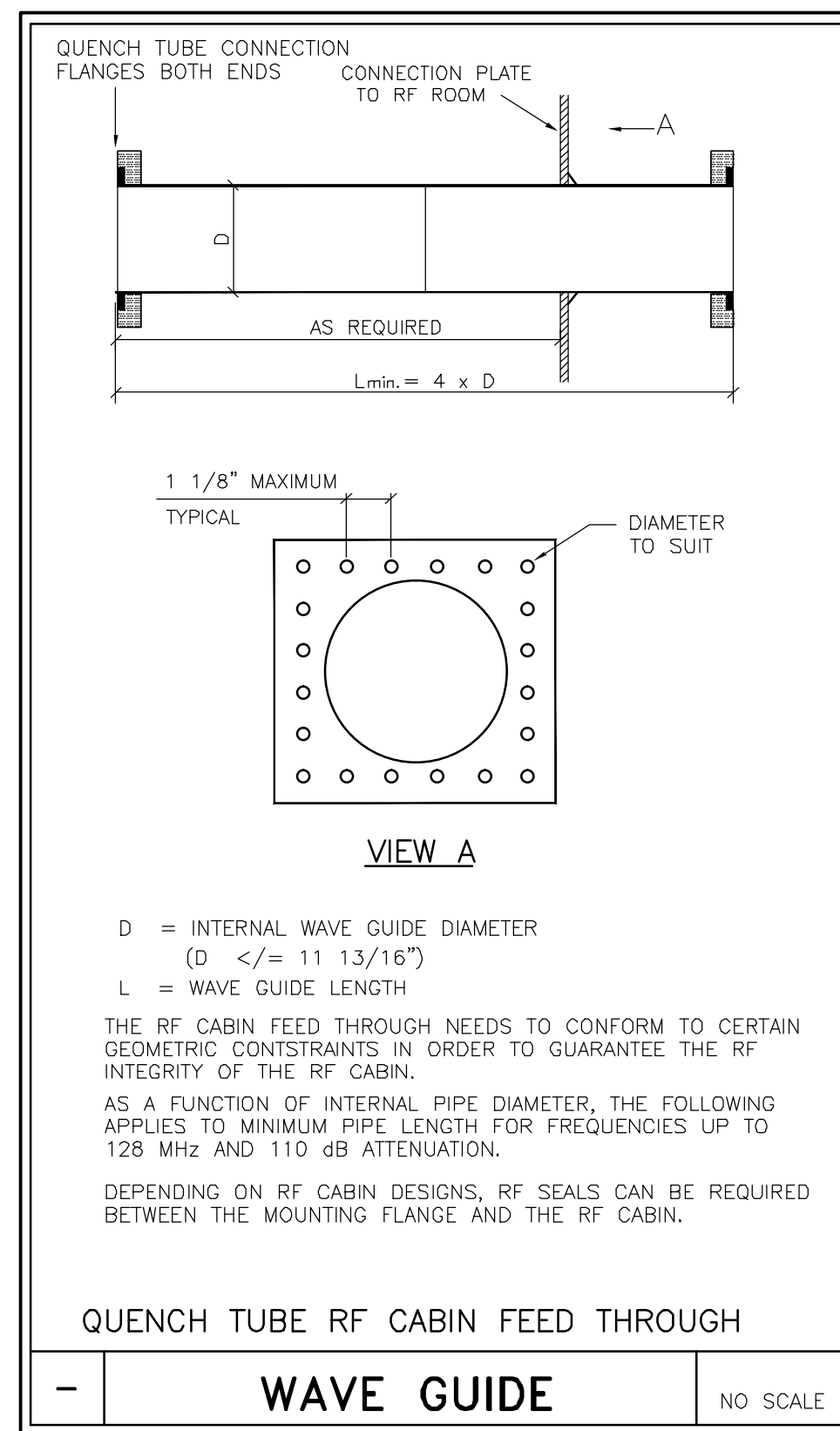
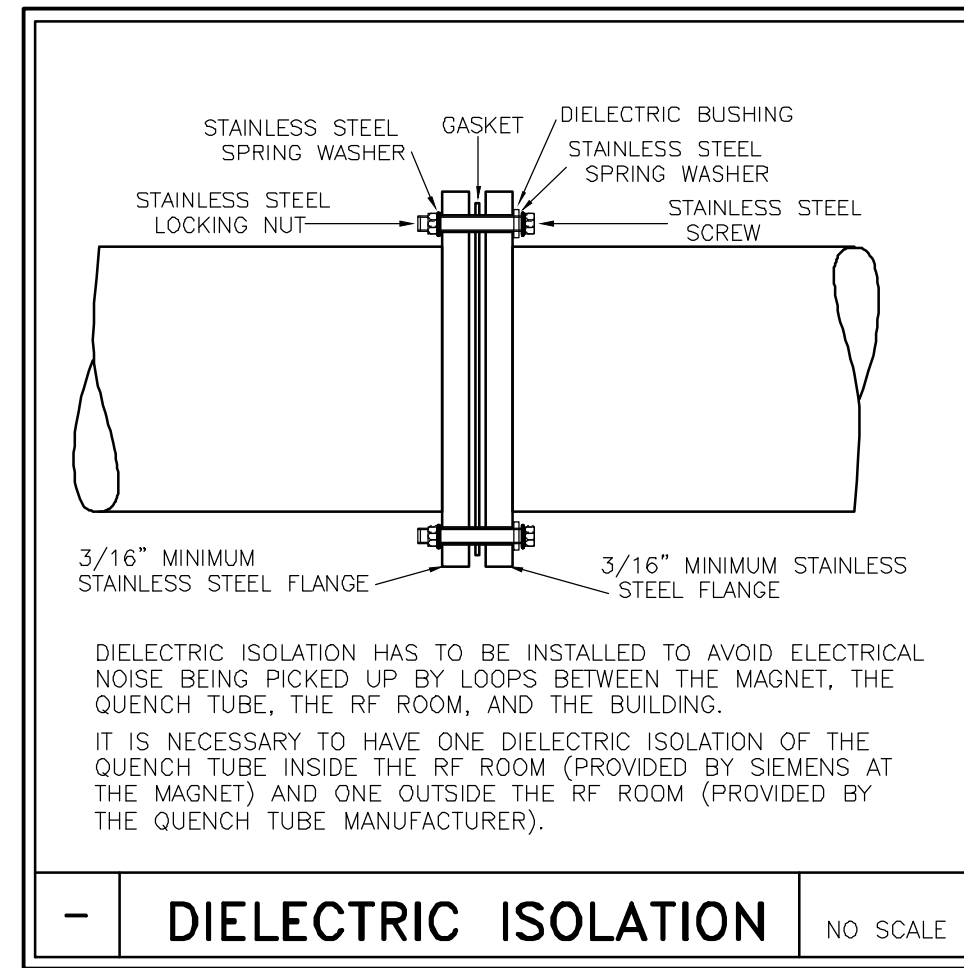
AVANTO
05/13/13

SIEMENS
MAGNETOM AVANTO
TYPICAL INSTALLATION DRAWINGS
NOT FOR CONSTRUCTION

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PROJECT #: 03093	SHEET: A-501
SHEET 3 OF 10	DRAWN BY: B. HERRMANN
DATE: 04/05/13	CHECKED:

SCALE: AS NOTED REF. #: ---



RF DOOR OPENING

IN THE EVENT OF A CATASTROPHIC 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.

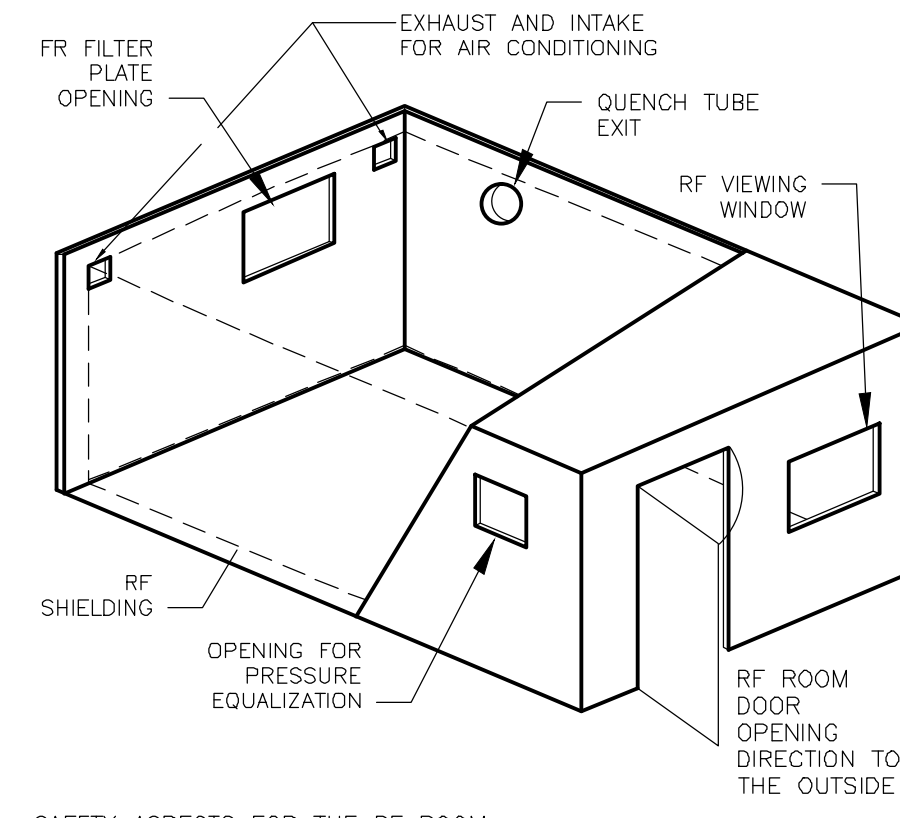
EASY REMOVAL OF THE PANEL BY A PERSON HAS TO BE ENSURED AND A MINIMUM DISTANCE OF 40" TO A FIXED OBJECT MUST BE MAINTAINED. THE PANEL SHOULD BE INSTALLED IN AN ACCESSIBLE LOCATION AND ALLOW ESCAPE OF THE LOW DENSITY HELIUM.

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 CLOSURES 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.

1 SAFETY INFORMATION – PRESSURE EQUALIZATION SCALE: NONE

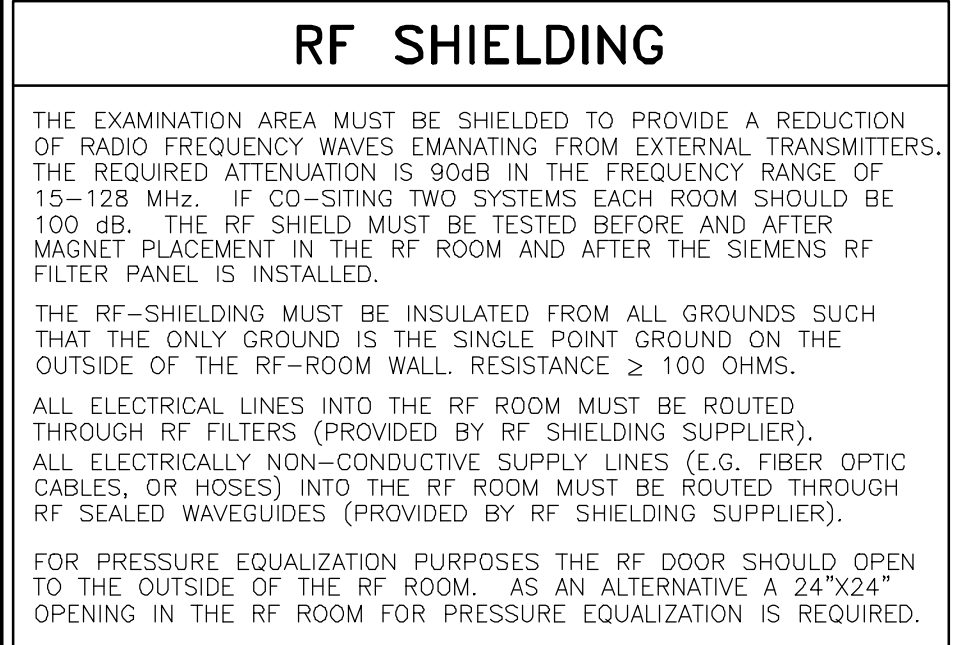


SAFETY ASPECTS FOR THE RF ROOM:
IT MUST BE POSSIBLE TO LOCK THE RF ROOM (EXAMINATION ROOM) DOOR FROM THE OUTSIDE. IT MUST ALSO BE POSSIBLE TO OPEN THE DOOR FROM THE INSIDE WITHOUT A KEY OR ADDITIONAL DEVICE.

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.

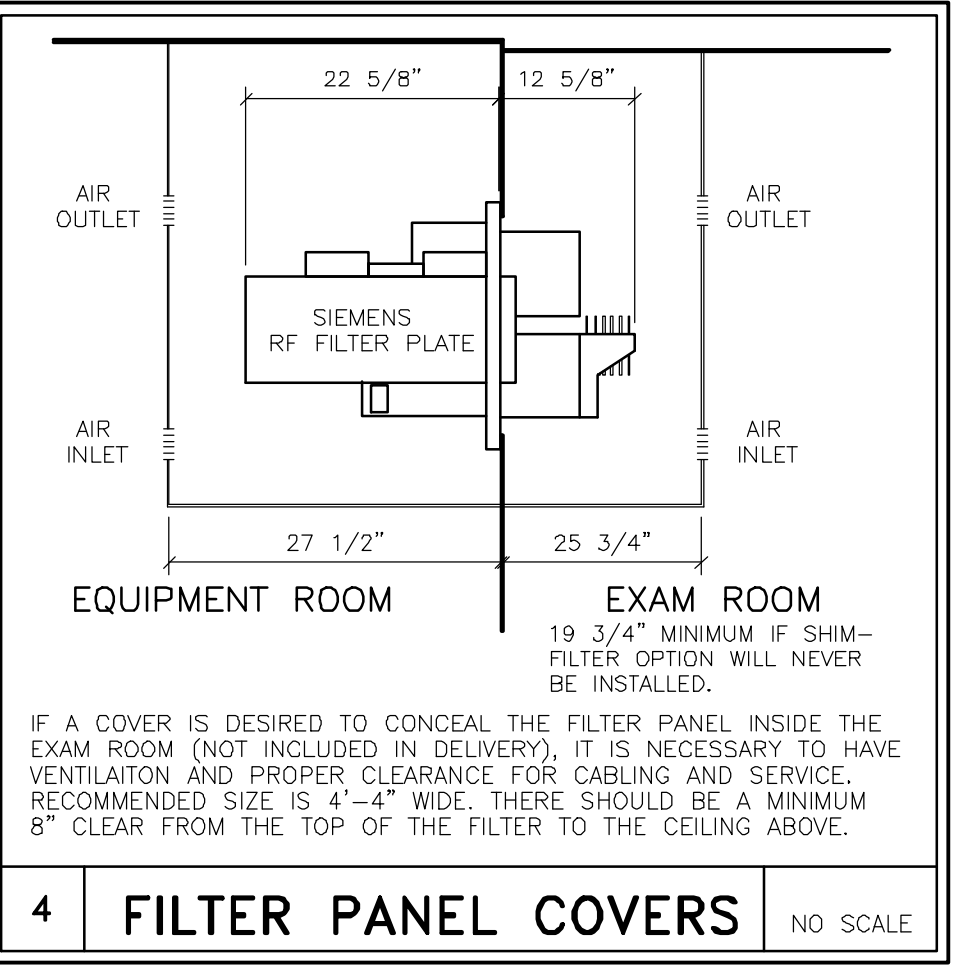
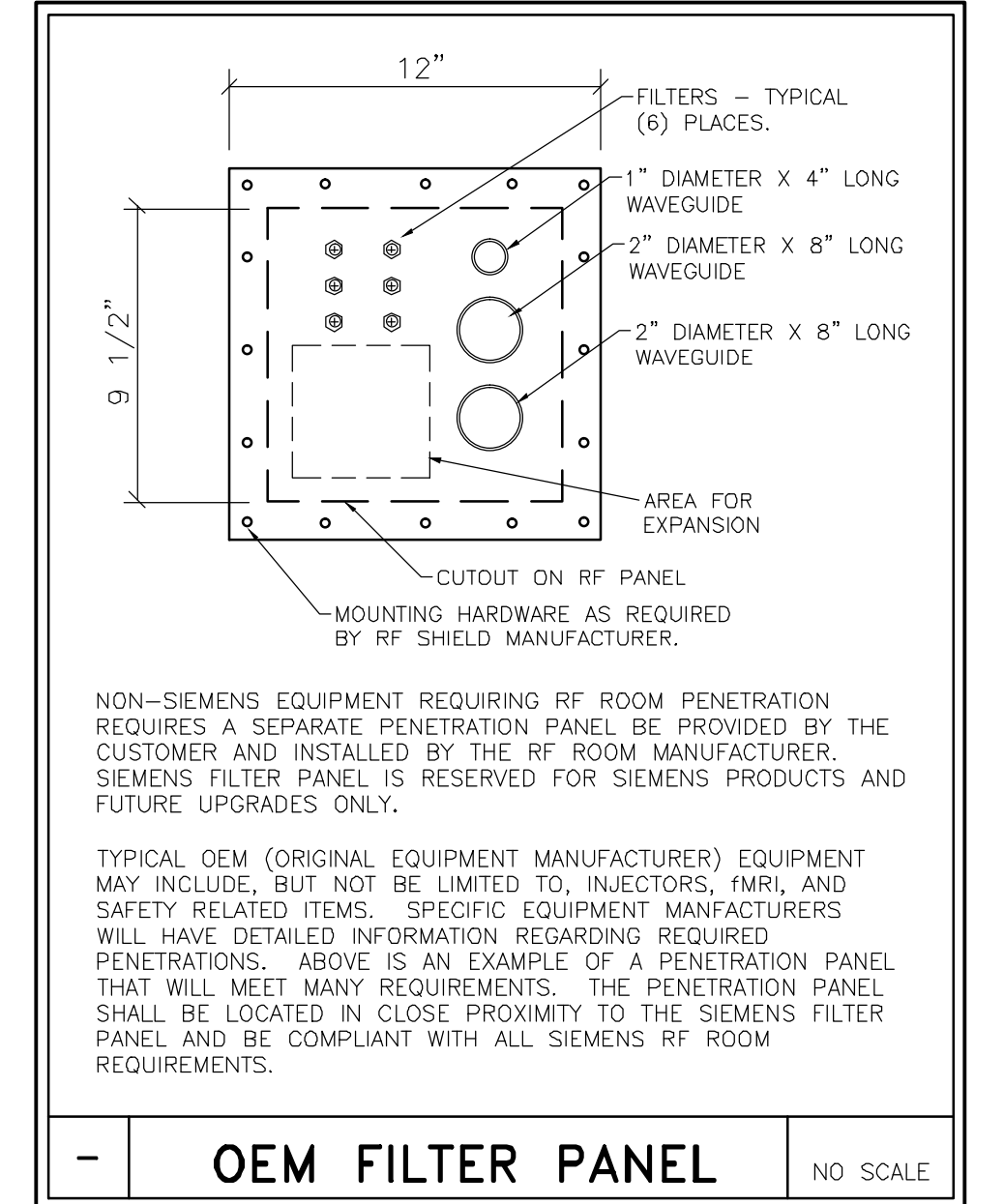
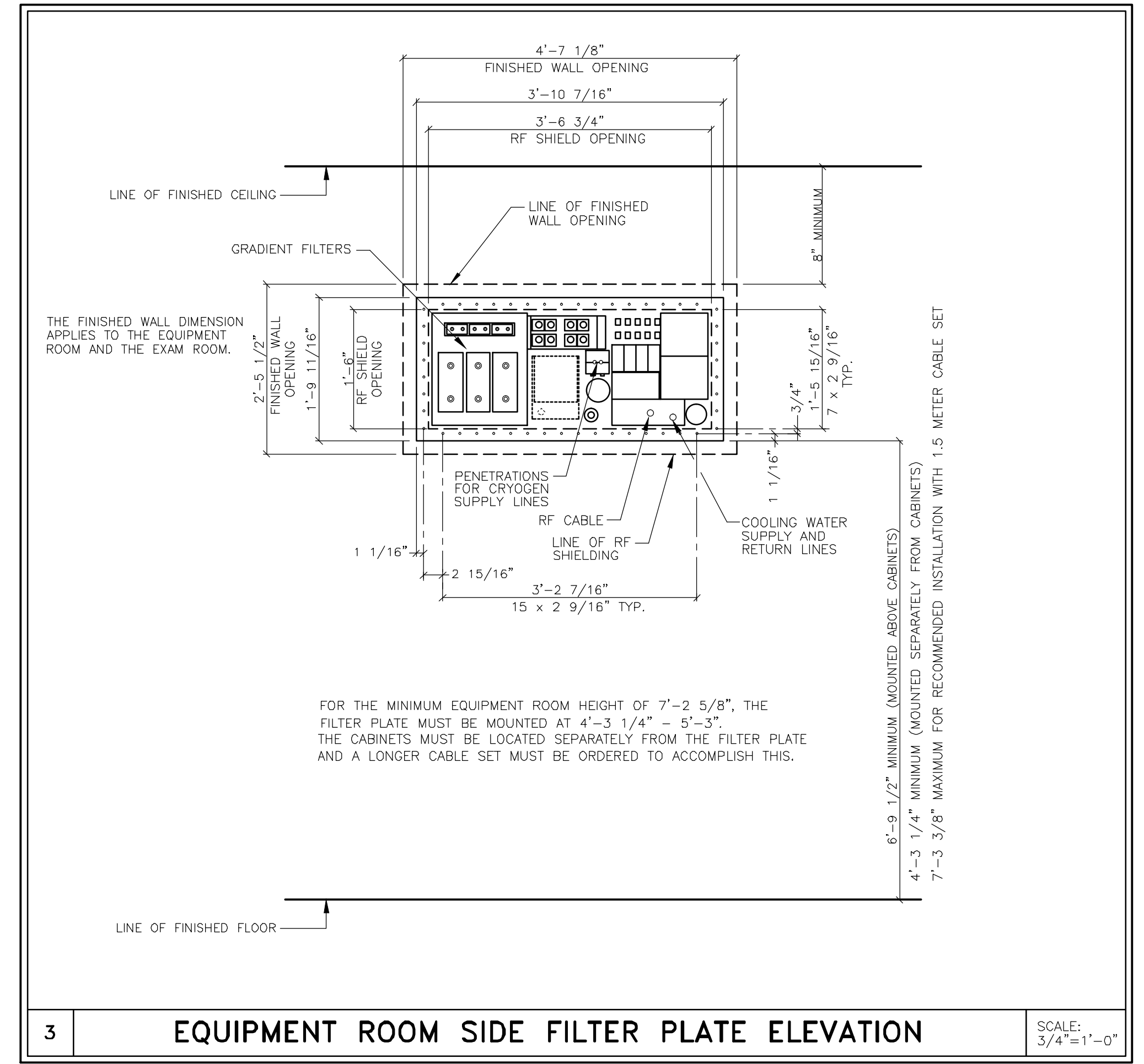
NO FERROMAGNETIC ITEMS CAN BE BROUGHT INTO THE RF ROOM AFTER THE MAGNET HAS BEEN RAMPED UP TO FIELD. MAGNETIC ITEMS WILL BECOME ATTRACTED TO THE MAGNET WITH NO WARNING AND DUE TO THE HIGH MAGNETIC FIELD, WILL BECOME MISSILES.

NOTE: FOR DOORS MOVED BY AN AUXILIARY 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.



- SHIELDING GENERAL NOTES**
- 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.
 - ALL CHANGES TO SIEMENS RECOMMENDED OPENINGS AND PENETRATIONS SHALL BE APPROVED BY THE SIEMENS PROJECT MANAGER PRIOR TO THE COMPLETION OF THE CONSTRUCTION DOCUMENTS.
 - 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**
- ONLY NON-MAGNETIC MATERIALS ARE TO BE USED AND INSTALLED IN THE RF ROOM.
 - A SUSPENDED CEILING MUST BE STATICALLY SUSPENDED, NOT SUSPENDED WITH MOVABLE CLAMPS, SPRINGS, ETC.
 - CORRUGATED RODS IN SUSPENDED CEILINGS MUST BE INSTALLED SECURELY. GALVANIC CONTACT 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.
 - 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.



- 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.
 - 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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AVANTO 03/13/13

SIEMENS MAGNETOM AVANTO
TYPICAL INSTALLATION DRAWINGS NOT FOR CONSTRUCTION

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PROJECT #: **03093**
SHEET 4 OF 10
DRAWN BY: B. HERRMANN
CHECKED: _____
DATE: 04/05/13

SHEET: **A-502**

SCALE: AS NOTED REF. #: ---

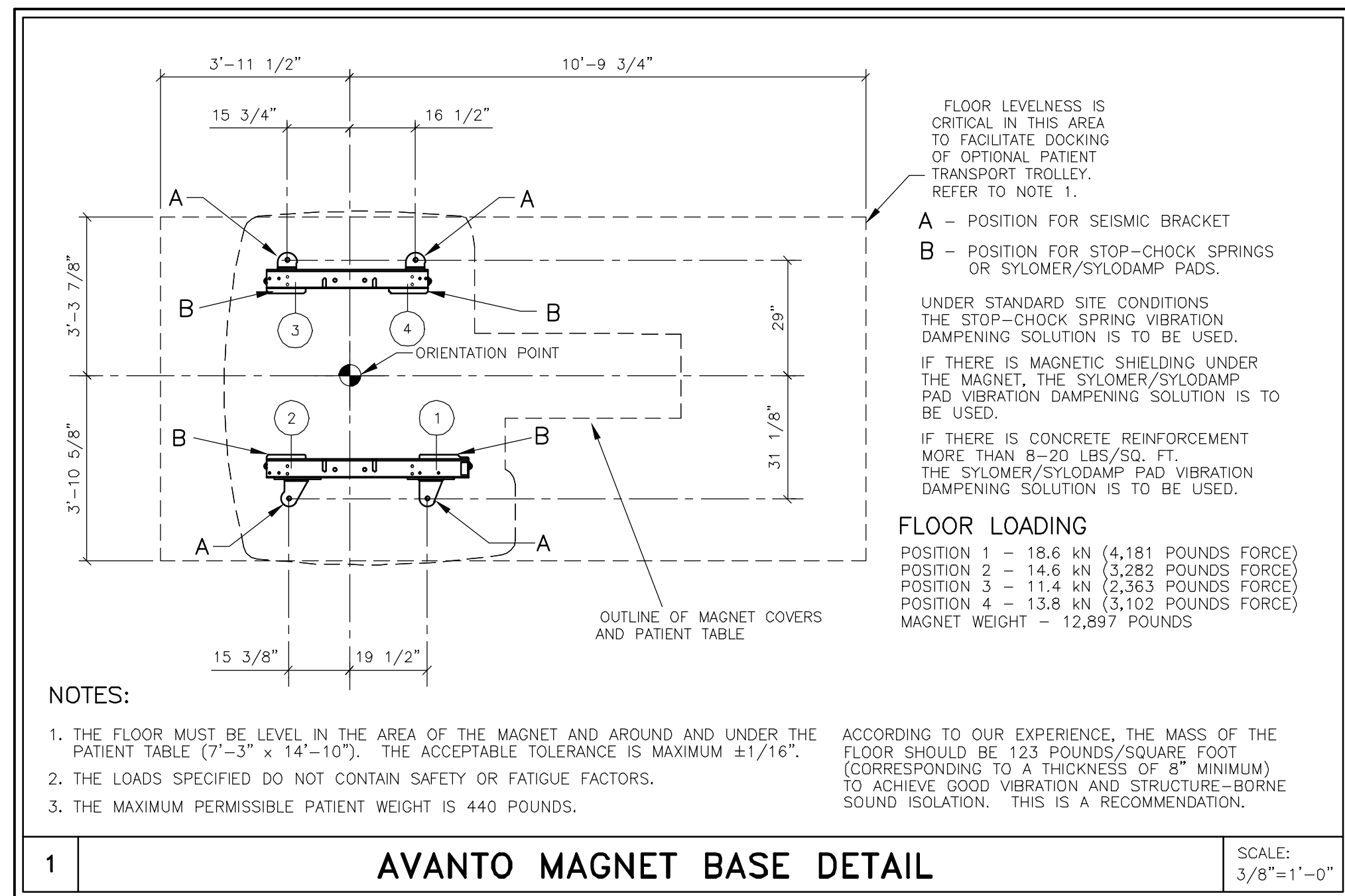
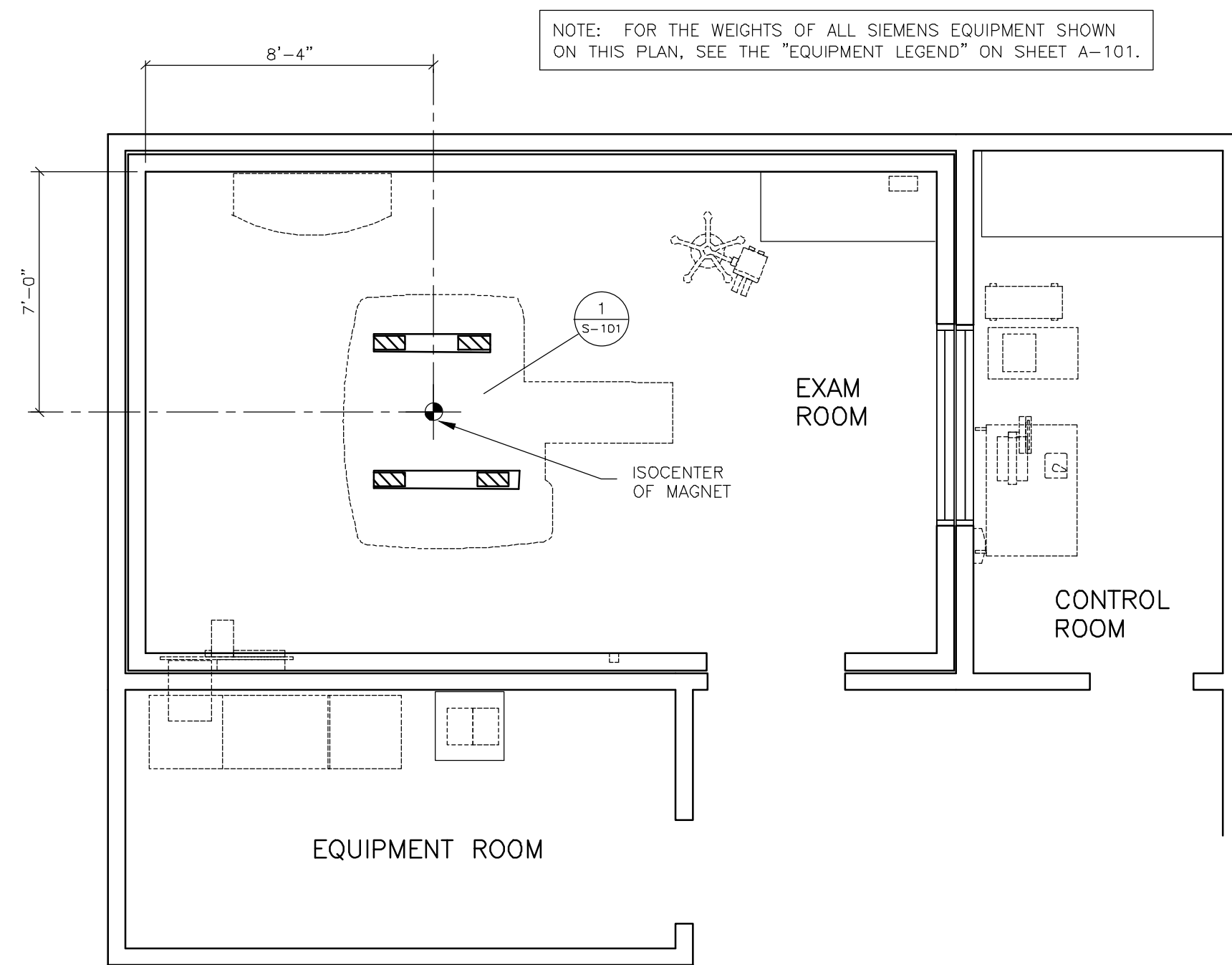
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SYMBOLS: [Triangle] [Square]

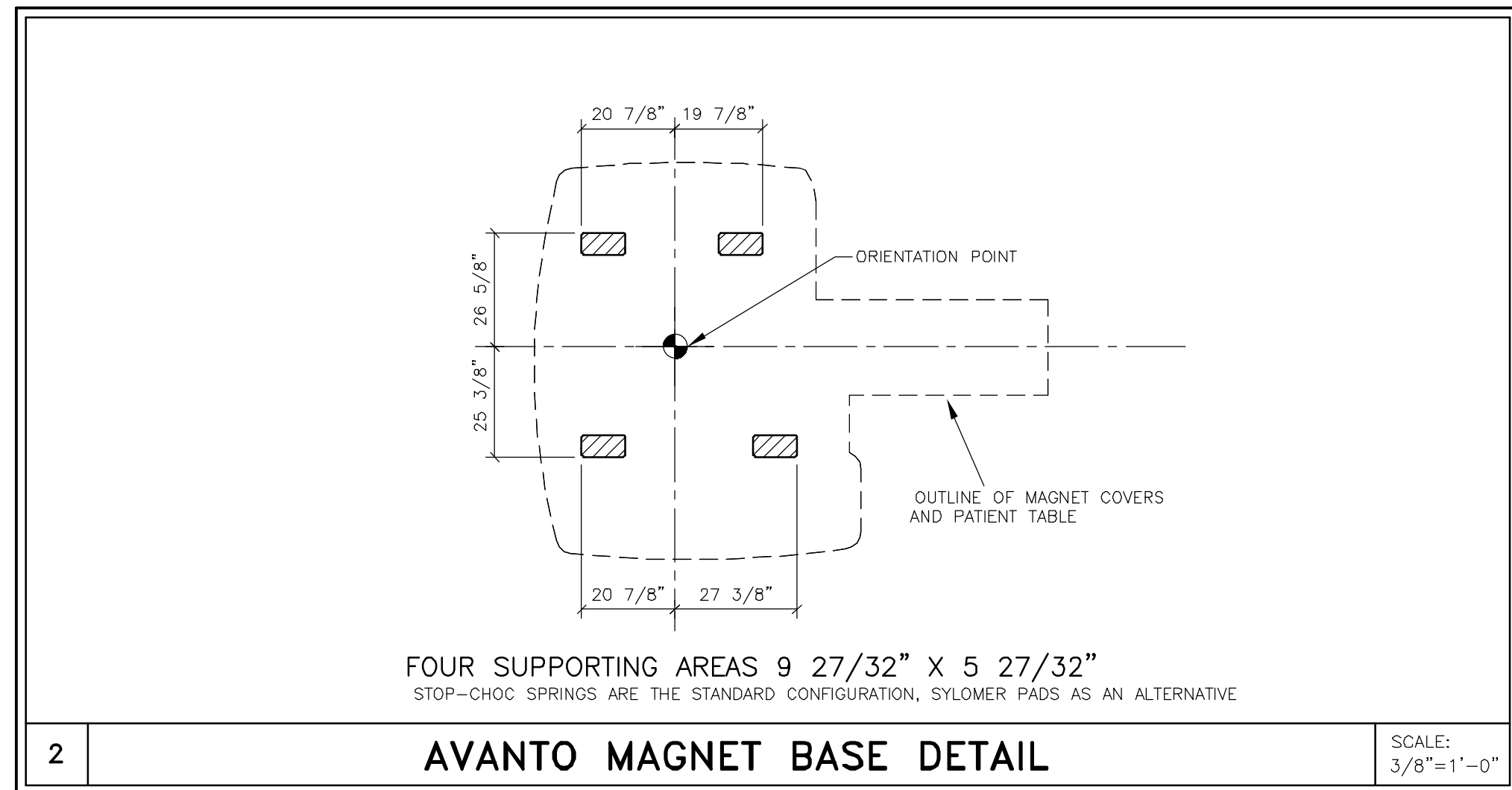
DATE DESCRIPTION

- ISSUE BLOCK -

REFERENCE DOCUMENT - NOT FOR CONSTRUCTION

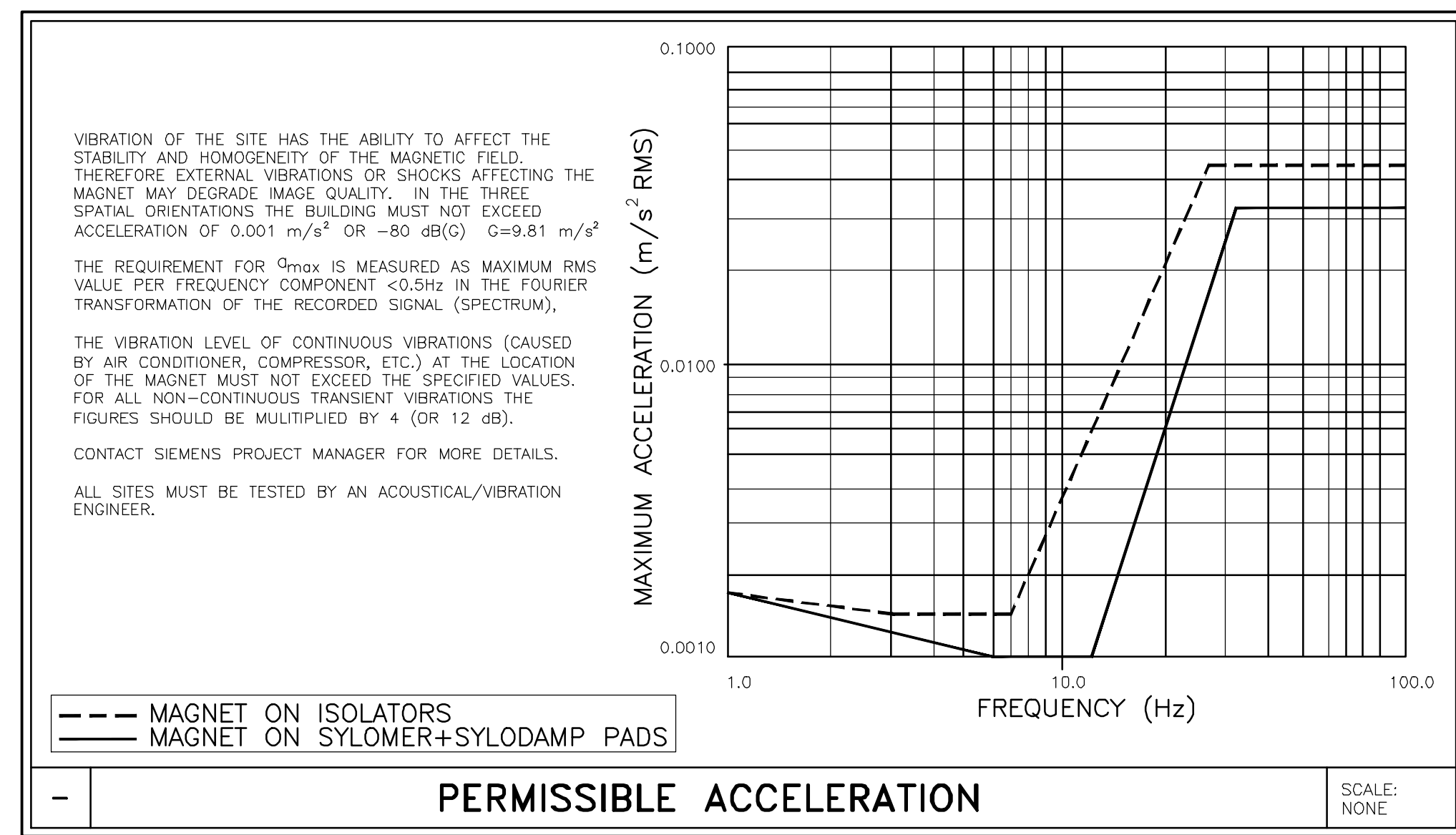


- STRUCTURAL NOTES**
- 1) THE CUSTOMER/CONTRACTOR SHALL FURNISH AND INSTALL ALL STRUCTURAL SUPPORT MEMBERS AND NEEDED HARDWARE FOR THE INSTALLATION OF THE SIEMENS EQUIPMENT.
 - 2) THE OVERHEAD STRUCTURAL SUPPORT SYSTEM SHALL BE FIXED, RIGID AND BRACED FOR SWAY.
 - 3) ALL STRUCTURAL SUPPORT MEMBERS SHALL 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, THESE ARE ON OCCASION MOUNTING FRAMES FURNISHED BY SMS. THESE FRAMES ARE TO BE SET BY THE CONTRACTOR, UNDER THE SUPERVISION 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 CEILING 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" STRUCTURAL 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 FOR THE DESIGN AND DETAIL OF FLOOR, WALL AND CEILING STRUCTURES 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.



STRUCTURAL FLOOR PLAN

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



CEILING HEIGHTS

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

SYM	DATE	DESCRIPTION
- ISSUE BLOCK -		

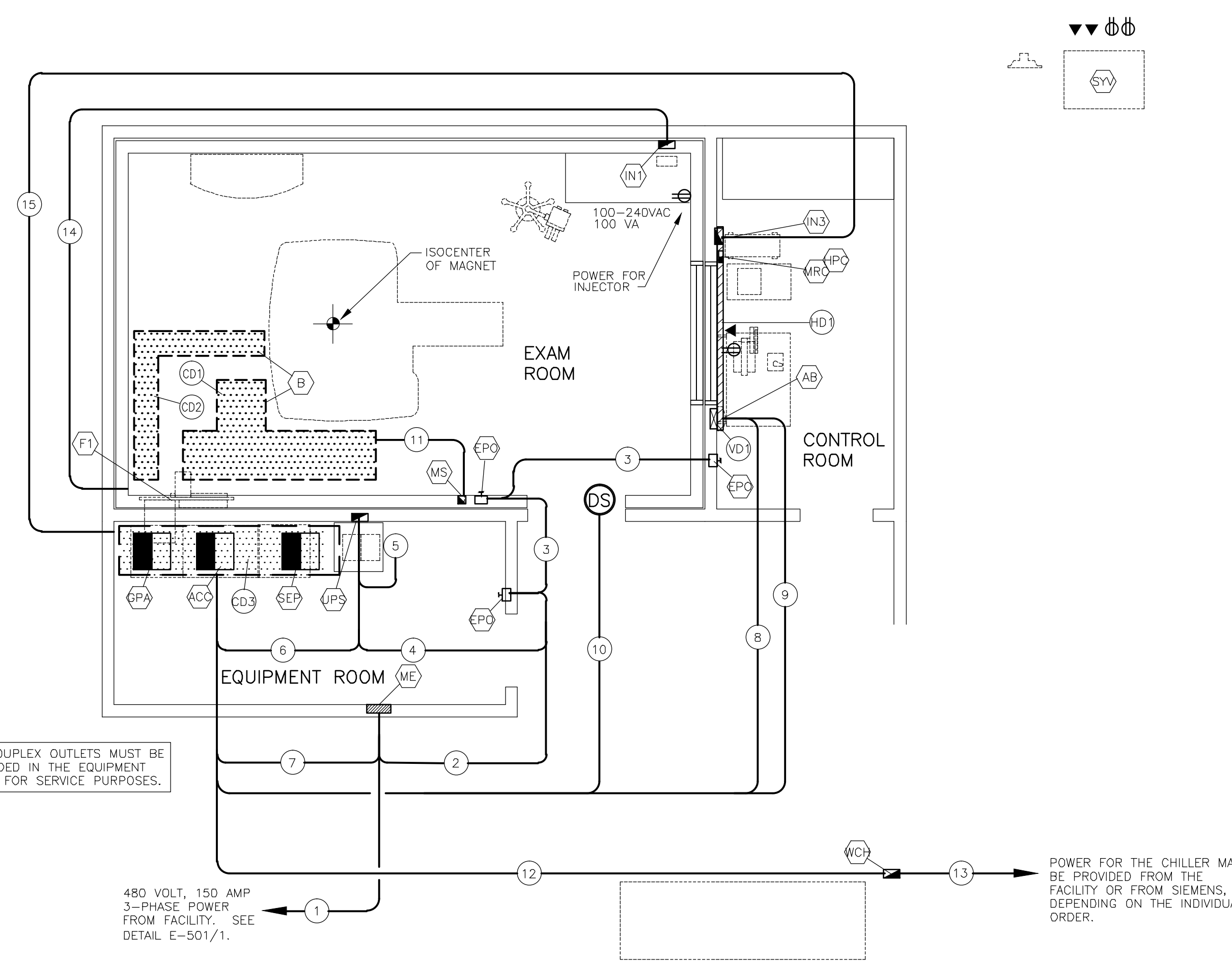
AVANTO
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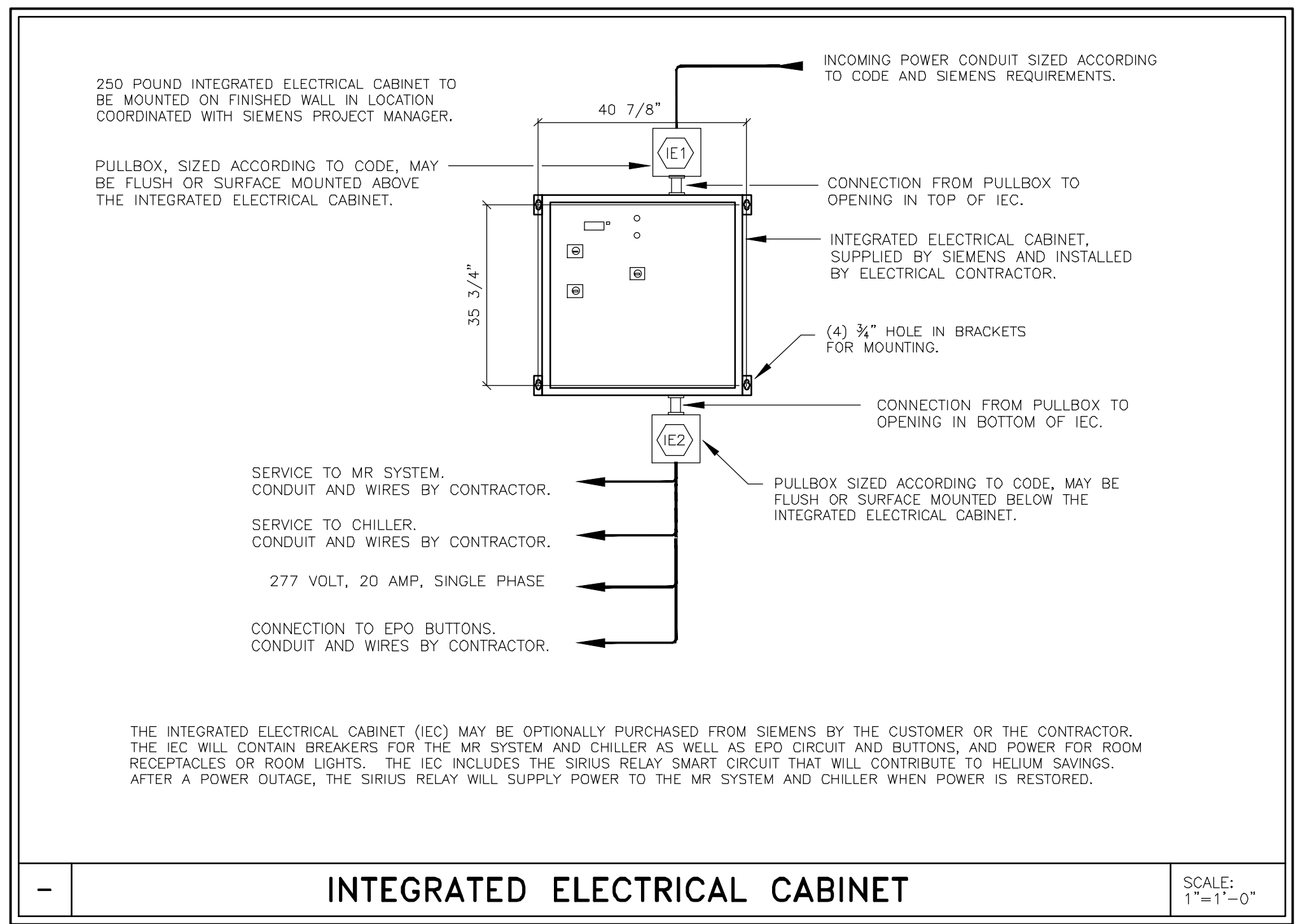
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ELECTRICAL RACEWAY PLAN

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

SYMBOLS	
ALL MAY NOT APPLY	
	CAUTION OR WARNING
	CRITICAL NOTE(S)
	PANEL OR ENCLOSURE BY CUSTOMER/CONTRACTOR
	OPENING IN RACEWAY OR TRENCH/DUCT
	PULLBOX IN (FLOOR/WALL/CEILING)
	OPENING IN ACCESS FLOORING
	RF DOOR SWITCH - MCMASTER-CARR SUPPLY ROLLER LIMIT SWITCH 7078414 MOUNTED AT TOP OF DOOR. COORDINATE WITH SIEMENS PROJECT MANAGER.
	(EPO) EMERGENCY POWER OFF BUTTON
	CEILING DUCT
	SURFACE MOUNTED DUCT
	VERTICAL DUCT
	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.



INTEGRATED ELECTRICAL CABINET

SCALE: 1"=1'-0"

ELECTRICAL LEGEND			
SYM	SIZE	DESCRIPTION	REMARKS
AS	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"	18" x 18"	LOCATION FOR CABLES TO DROP OUT OF BOTTOM OF RACEWAY.	ELECTRONICS CABINETS
AS	AS REQUIRED	LOCATION FOR CABLES TO DROP OUT OF BOTTOM OF RACEWAY.	MAGNET CABLE ACCESS
---	---	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 NON-FERROUS INSIDE THE RF ROOM. EXACT LOCATIONS ARE TO BE VERIFIED WITH THE ARCHITECT OF RECORD.	SEE POWER SCHEDULE, SHEET E-102
---	---	SIEMENS RF FILTER PANEL TO BE MOUNTED ON RF SHIELDED WALL.	FILTER PANEL
4"	4" x 4"	OPENING IN FACE OF RACEWAY IN SHOWN LOCATION.	HOST COMPUTER
AS	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 5mT FIELD
AS	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 CONSOLE
3-PHASE	3-PHASE	MAIN ENCLOSURE MOUNTED 5'-0" ABOVE FINISHED FLOOR, EXACT LOCATION TO BE DETERMINED BY CUSTOMER/CONTRACTOR.	SEE POWER SCHEDULE, SHEET E-102
4"	4" x 4"	FIXPOINT DESIGNATION, SAME PULLBOX/OPENING AS HPC.	MAIN CONSOLE
AS	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
AS	AS REQUIRED	PULL BOX MOUNTED FLUSH WITH FINISHED WALL AT FLOORLINE IN SHOWN LOCATION PROVIDED WITH 2"Ø OPENING IN FINISHED COVER.	POWERWARE 9130
AS	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"	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
12" x4"	12" x4"	ALUMINUM LADDER TRAY MOUNTED AT HEIGHT COORDINATED WITH SIEMENS PROJECT MANAGER IN THE 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
4" x 2"	4" x 2"	WIREMOLD SURFACE MOUNTED ON WALL IN CONTROL AREA AT FLOORLINE AS SHOWN, FINISHED TO MATCH WALLS.	
10" x 3-1/2"	10" x 3-1/2"	ELECTRICAL DUCT MOUNTED FLUSH WITH FINISHED WALL IN CONTROL AREA FROM ABOVE FINISHED CEILING TO FLOORLINE PROVIDED WITH REMOVABLE FINISHED COVERS.	
AS PER NEC	AS PER NEC	CONDUIT FROM FACILITY POWER TO MAIN ENCLOSURE (ME).	SEE POWER SCHEDULE, SHEET E-102
AS PER NEC	AS PER NEC	CONDUIT FROM "ME" TO "EPO".	SEE POWER SCHEDULE, SHEET E-102
AS PER NEC	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
(1) 3/4"	(1) 3/4"	CONDUIT FROM "EPO" TO "UPS".	SEE POWER SCHEDULE, SHEET E-102
(1) 3/4"	(1) 3/4"	SURFACE MOUNTED FLEX CONDUIT FROM "UPS" TO SIEMENS PROVIDED UPS/EPO CONTROL BOX.	MAXIMUM LENGTH 4 FEET
(1) 1"	(1) 1"	CONDUIT FROM "UPS" TO "CD3" (ACC).	MAXIMUM LENGTH 29 FEET
(1) 2"	(1) 2"	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.	
(2) 2 1/2"	(2) 2 1/2"	CONDUIT FROM "MRC" TO "CD3" (ACC).	
(1) 1 1/2"	(1) 1 1/2"	CONDUIT FROM "AB" TO "CD3" (ACC).	
(1) 1/2"	(1) 1/2"	CONDUIT FROM "DS" TO "CD3" (ACC).	
(1) 3/4"	(1) 3/4"	CONDUIT FROM "MS" TO "CD1" (WIRES TO MAGNET) TO BE NON-FERROUS WHEN INSIDE THE RF ROOM.	
(1) 2"	(1) 2"	CONDUIT FROM "WCH" TO "ACC".	NOT TO EXCEED 164 FEET
(1) 2"	(1) 2"	CONDUIT FROM FACILITY POWER TO "WCH".	
(2) 2"	(2) 2"	NON-FERROUS CONDUITS FROM NEAR "F1" TO "N1" FOR INJECTOR CABLES.	NOT TO EXCEED 50 FEET
(1) 1"	(1) 1"	CONDUIT FROM NEAR FILTER LOCATION TO "IN3".	NOT TO EXCEED 200 FEET

CONTRACTOR SUPPLIED CABLES				
FROM	VIA	TO	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	EPO	DETERMINED BY ELECTRICAL CONTRACTOR.	
EPO	3	EPO	DETERMINED BY ELECTRICAL CONTRACTOR.	
EPO	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

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

SYM	DATE	DESCRIPTION
-ISSUE BLOCK-		

AVANTO
03/13/13

SIEMENS

MAGNETOM AVANTO

TYPICAL INSTALLATION DRAWINGS
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 #: 03093	SHEET: E-101
ALL RIGHTS ARE RESERVED.	DRAWN BY: B. HERRMANN	CHECKED:
SCALE: AS NOTED	DATE: 04/05/13	

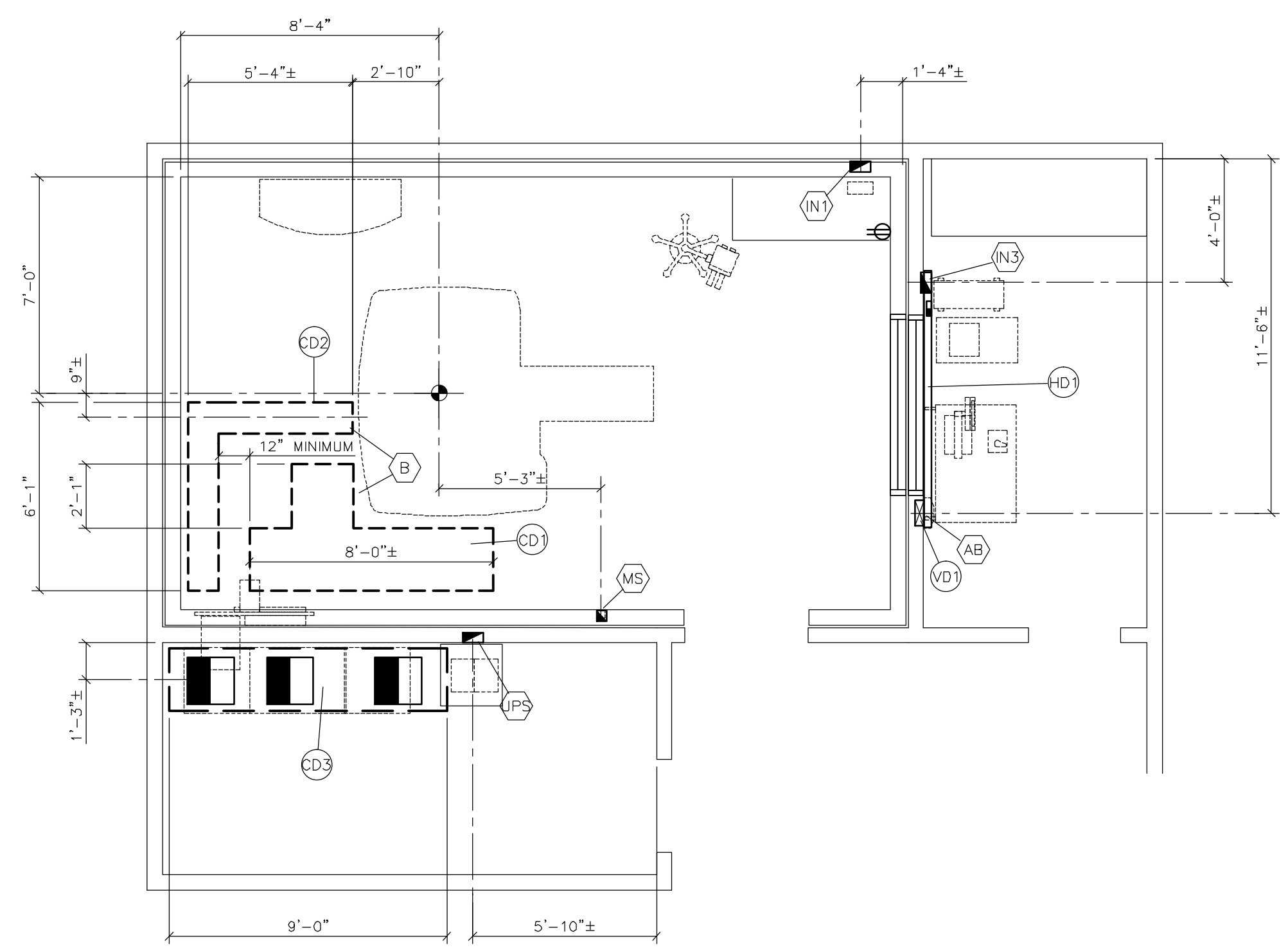
ATTENTION:

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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.

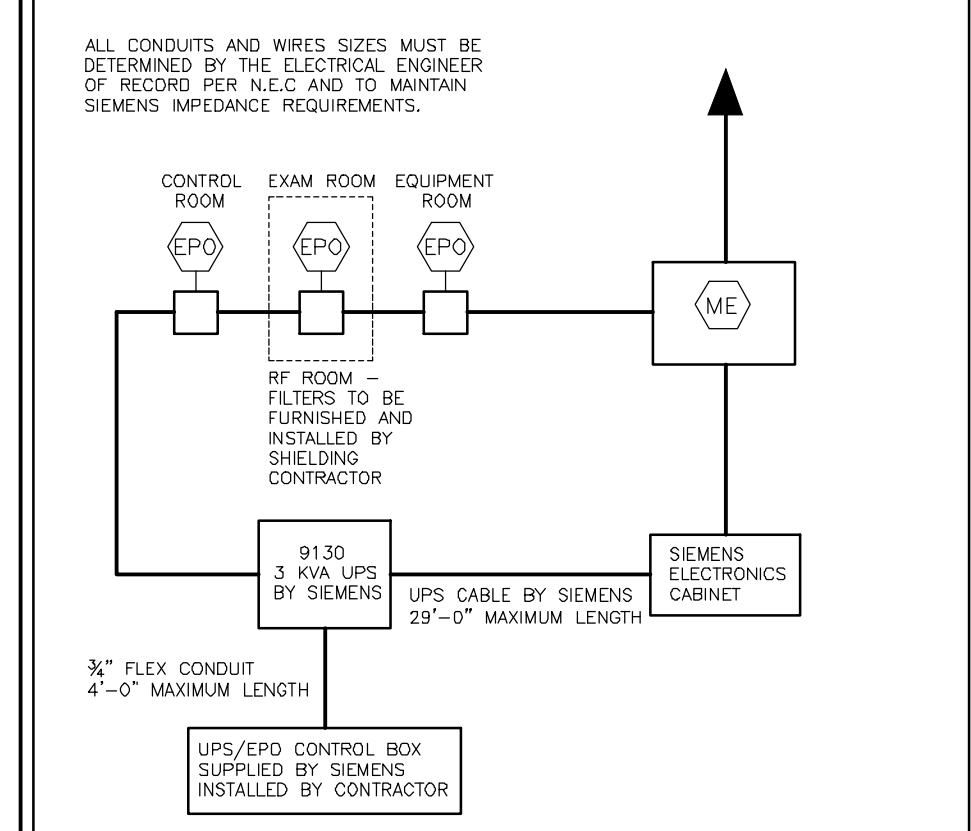
- THIS DRAWING DOES NOT PROVIDE RADIATION SHIELDING REQUIREMENTS FOR X-RAY AND ASSOCIATED EQUIPMENT. THE CUSTOMER IS RESPONSIBLE FOR CONSULTING WITH A REGISTERED RADIATION PHYSICIST TO SPECIFY RADIATION PROTECTION.



ELECTRICAL DIMENSION PLAN

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

POWER SCHEDULE



ITEM	QTY	DESCRIPTION
ME	1	MAIN ENCLOSURE WITH MAIN BREAKER FLUSH OR SURFACE MOUNTED. MAIN BREAKER MUST HAVE A TRIPPING DEVICE SO WHEN ANY EPO IS PRESSED THE MAIN BREAKER TRIPS. THIS TRIPPING DEVICE CONTROL CIRCUIT MUST BE OF FAIL-SAFE DESIGN. THE CONTROL CIRCUIT FOR THE EPO'S MUST HAVE AN ENERGY STORAGE SOURCE SO THAT THE CONTROL CIRCUIT NEVER LOSES POWER.
MAIN BREAKER AMPS: SEE POWER REQUIREMENTS		
		VOLTS PHASES NEUTRAL GROUND TOTAL WIRES
		480 3 0 1 4 (NOTE 1)

1) ALL WIRES MUST BE SAME SIZE.

ITEM	QTY	DESCRIPTION
EPO	VARIES	EMERGENCY POWER OFF BUTTON WITH PROTECTIVE COVER THAT PREVENTS ACCIDENTAL ACTIVATION OF THE EPO BUTTON. THE EPO MUST BE OF FAIL-SAFE DESIGN. THE CONTROL CIRCUIT FOR THE EPO'S MUST HAVE AN ENERGY STORAGE SOURCE SO THAT THE CONTROL CIRCUIT NEVER LOSES POWER. ALL EPO'S ARE TO BE LATCHING TYPE AND MUST BE RESET BEFORE MAIN BREAKER CAN BE RESET.

ITEM	QTY	DESCRIPTION
IE1	1	PULLBOX SIZED AS REQUIRED PROVIDED AND INSTALLED BY CUSTOMER/CONTRACTOR AT INPUT AND OUTPUT OF THE INTEGRATED ELECTRICAL CABINET (IEC). IEC TO BE PROVIDED BY SIEMENS, INSTALLED BY CUSTOMER/CONTRACTOR.
IE2	1	INTEGRATED ELECTRICAL CABINET (IEC)
EPO	3	PROVIDED BY SIEMENS WITH THE INTEGRATED ELECTRICAL CABINET, INSTALLED BY CUSTOMER/CONTRACTOR.

ALL ITEMS LISTED IN THIS SCHEDULE SHALL BE SUPPLIED AND INSTALLED BY CUSTOMER/CONTRACTOR.

CEILING HEIGHTS

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

POWER REQUIREMENTS

VOLTAGE VARIATION: 480 VAC ±10% FOR ALL LINE AND LOAD CONDITIONS. VOLTAGE UNBALANCE: 2% MAXIMUM DIFFERENCE BETWEEN PHASES	
FREQUENCY:	60 Hz ± 1.0 Hz
LINE IMPEDANCE:	< 95 mOhms
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
UPS 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

- 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 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 (<3%) TO ENSURE THAT SOURCE IMPEDANCE REQUIREMENTS ARE MET.
- 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.
- 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.
- 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.
- LONG-TIME POWER IS BASED ON THE HIGHEST AVERAGE RMS VALUES FOR A PERIOD EXCEEDING 5 MINUTES DURING 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 RECOMMENDED.

POWER QUALITY NOTES

- IT IS THE CUSTOMER'S RESPONSIBILITY TO COMPLY WITH THE POWER QUALITY REQUIREMENTS FOR SIEMENS MEDICAL SYSTEMS EQUIPMENT.
- 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.
- THE ELECTRICAL FEEDER TO THE IMAGING SYSTEM MUST BE RUN DIRECTLY TO A MAIN FACILITY DISTRIBUTION PANEL, OR TO THE FACILITY SERVICE ENTRANCE, WITH NO OTHER LOADS POWERED FROM THIS FEEDER.
- 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".
- POWER CONDITIONING DEVICES NOT APPROVED BY SIEMENS MEDICAL 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.
- INCOMING SOURCE POWER WIRES MUST BE SEPARATED FROM ANY SIEMENS CABLING BY A MINIMUM OF 12".

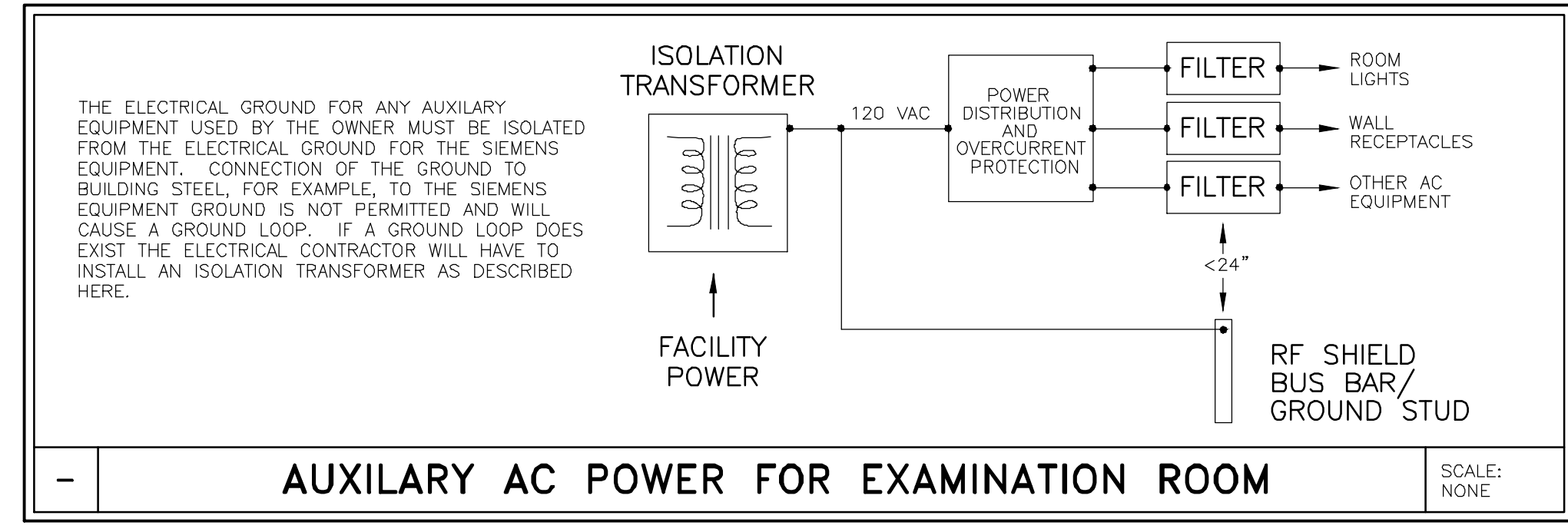
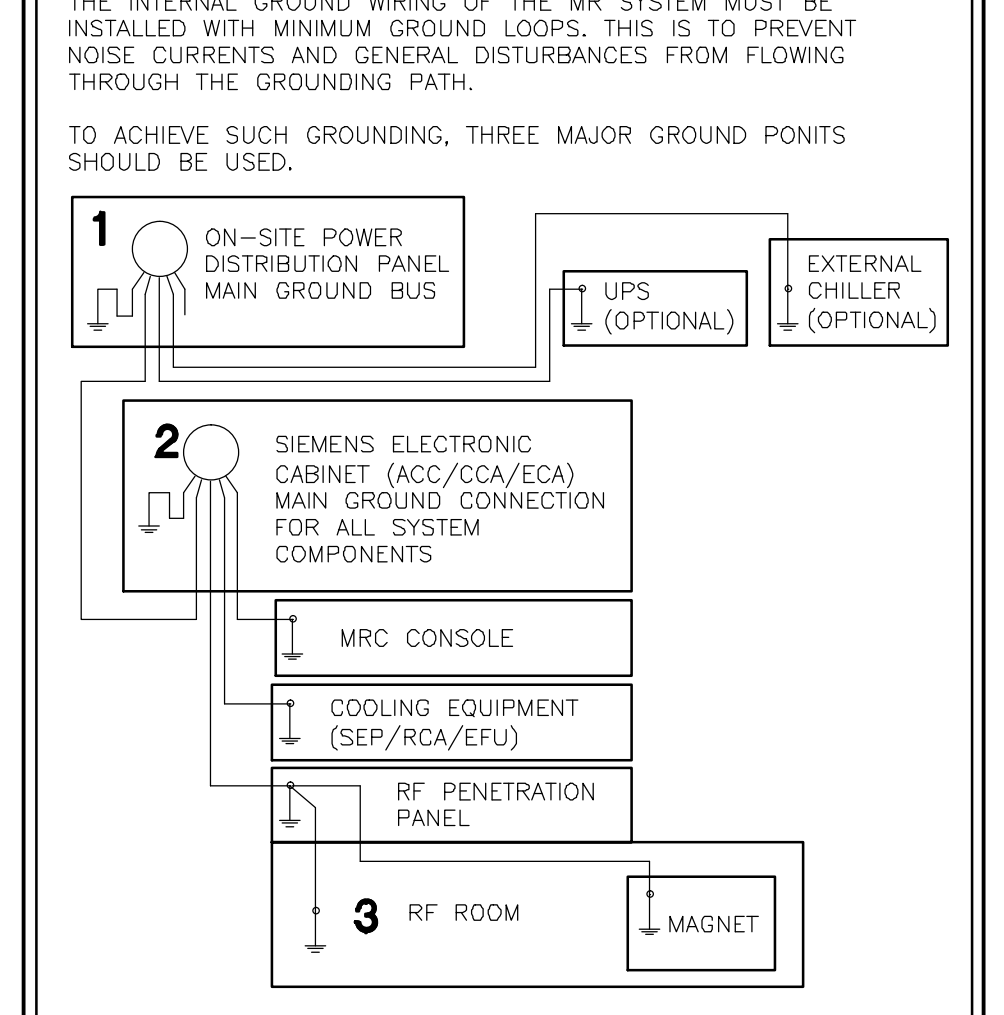
ELECTRICAL INSTALLATION NOTES

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

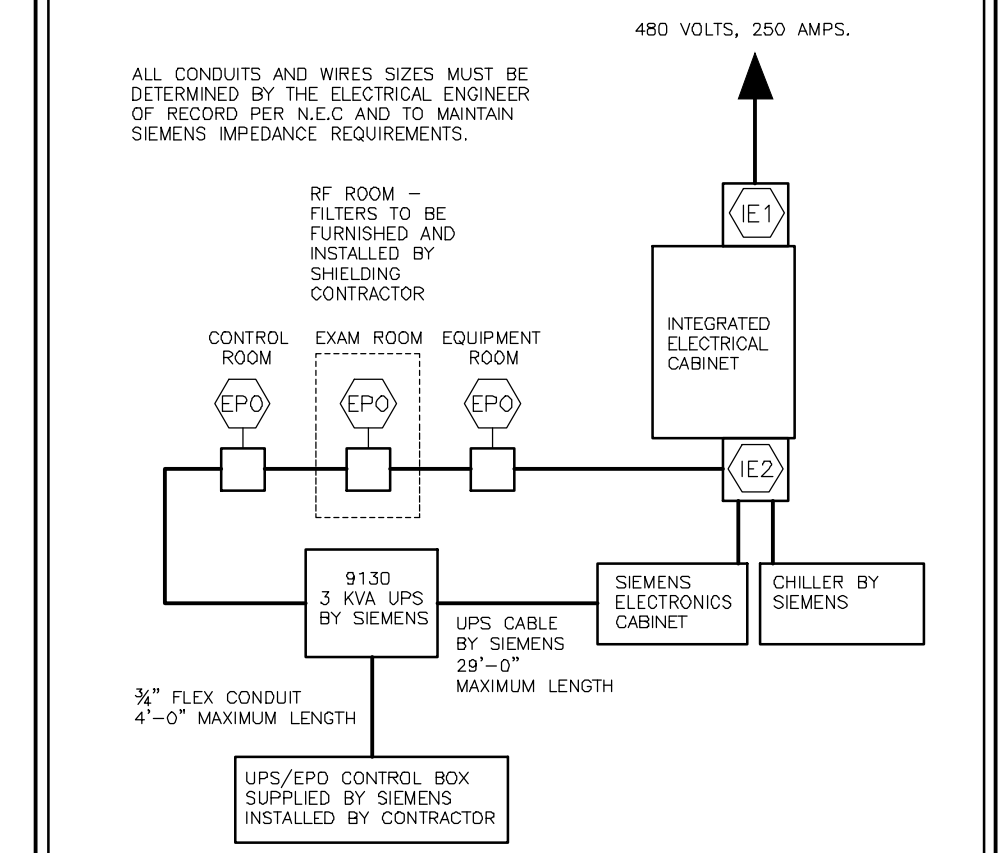
- EQUIPMENT GROUND CONDUCTOR TO COMPLY WITH THE FOLLOWING:
- SIZED EQUIVALENT TO THE PHASE CONDUCTORS (FULL SIZED GROUND).
 - DERIVED FROM THE ELECTRICAL SERVICE, TRANSFORMER OR MAIN DISTRIBUTION PANEL FEEDING THE SIEMENS EQUIPMENT.
 - RUN IN THE SAME CONDUIT, TROUGH OR RACEWAY AS THE PHASE CONDUCTORS.
 - CONTINUOUS, WITH NO BREAKS OR USE OF CONDUIT, CHASSIS OR EARTH AS THE SOLE GROUNDING PATH.
 - BONDED TO CHASSIS AND/OR CONDUIT IN ACCORDANCE WITH THE NEC REQUIREMENTS.
 - MINIMIZE CONNECTIONS OR TERMINALS TO ENSURE CONTINUITY OVER THE LIFE OF THE INSTALLATION.
 - AS A NORM, THERE SHOULD NOT BE ANY CURRENT PRESENCE ON THE GROUND CONDUCTOR, BUT IT IS ACCEPTABLE TO HAVE $\leq 500\text{mA}$ DURING OPERATION OF THE IMAGING EQUIPMENT.
 - THERE MAY BE SOME APPLICATIONS WHICH REQUIRE AN ISOLATED GROUND AS PER NEC 250-96B.

MR GROUNDING NOTES



AUXILIARY AC POWER FOR EXAMINATION ROOM

ALTERNATE POWER SCHEDULE



ITEM	QTY	DESCRIPTION
IE1	1	PULLBOX SIZED AS REQUIRED PROVIDED AND INSTALLED BY CUSTOMER/CONTRACTOR AT INPUT AND OUTPUT OF THE INTEGRATED ELECTRICAL CABINET (IEC). IEC TO BE PROVIDED BY SIEMENS, INSTALLED BY CUSTOMER/CONTRACTOR.
IE2	1	INTEGRATED ELECTRICAL CABINET (IEC)
EPO	3	PROVIDED BY SIEMENS WITH THE INTEGRATED ELECTRICAL CABINET, INSTALLED BY CUSTOMER/CONTRACTOR.

ALL ITEMS LISTED IN THIS SCHEDULE SHALL BE SUPPLIED AND INSTALLED BY CUSTOMER/CONTRACTOR.

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SYM	DATE	DESCRIPTION

AVANTO
03/13/13

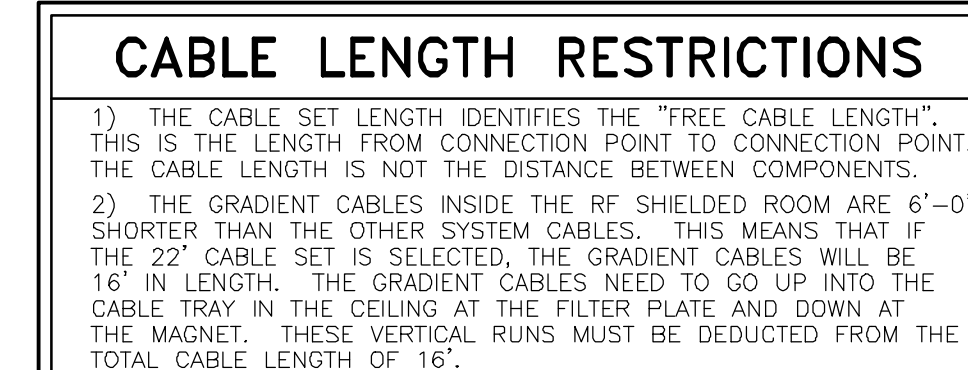
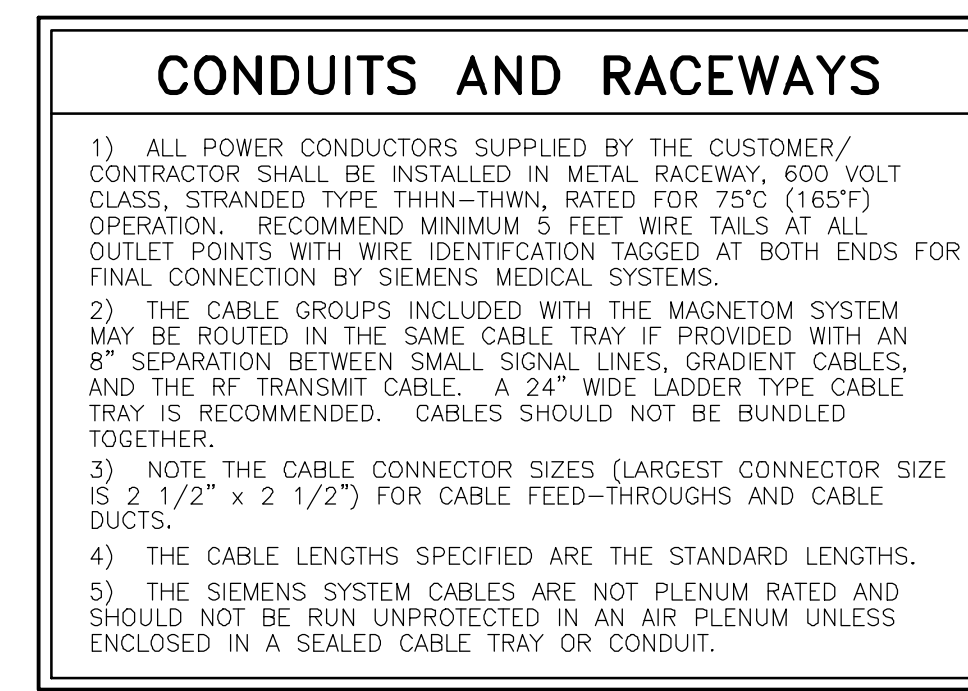
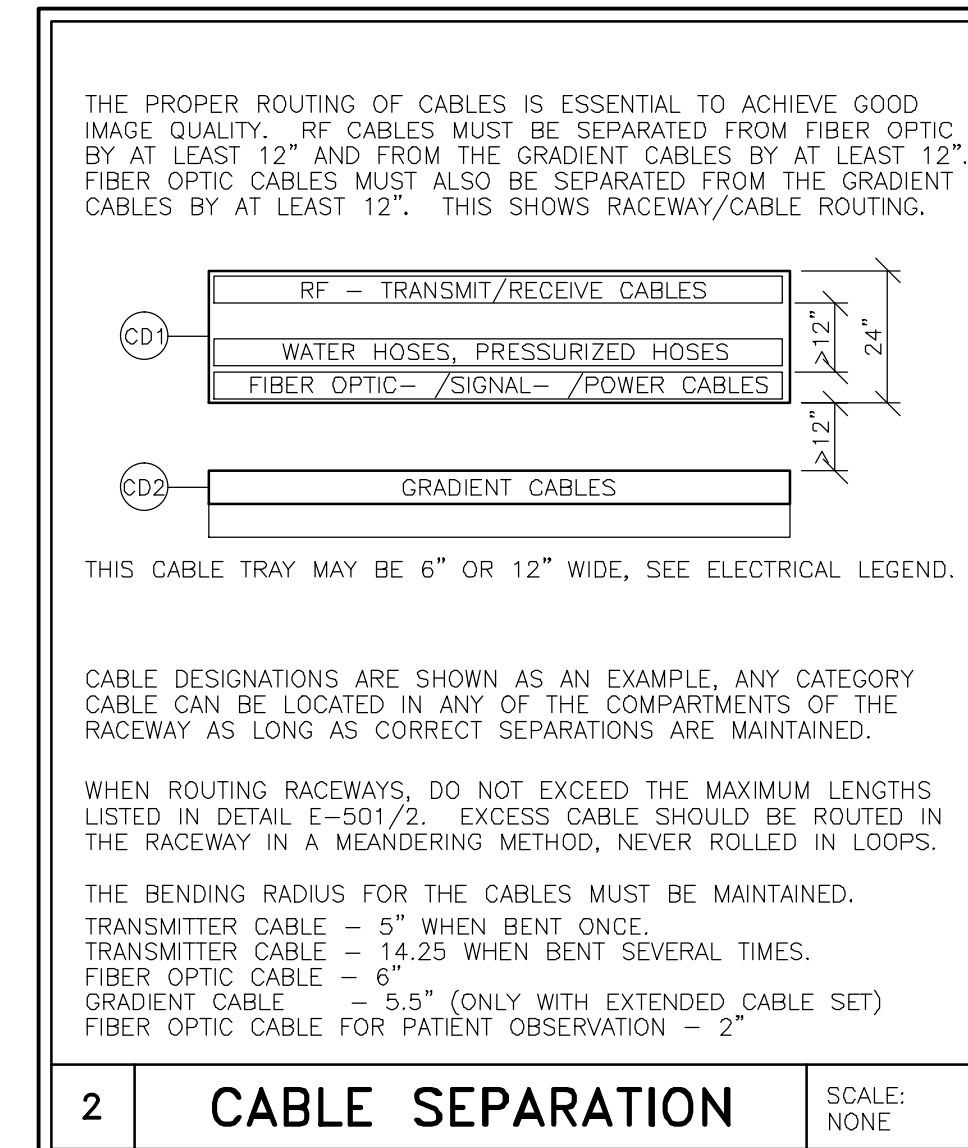
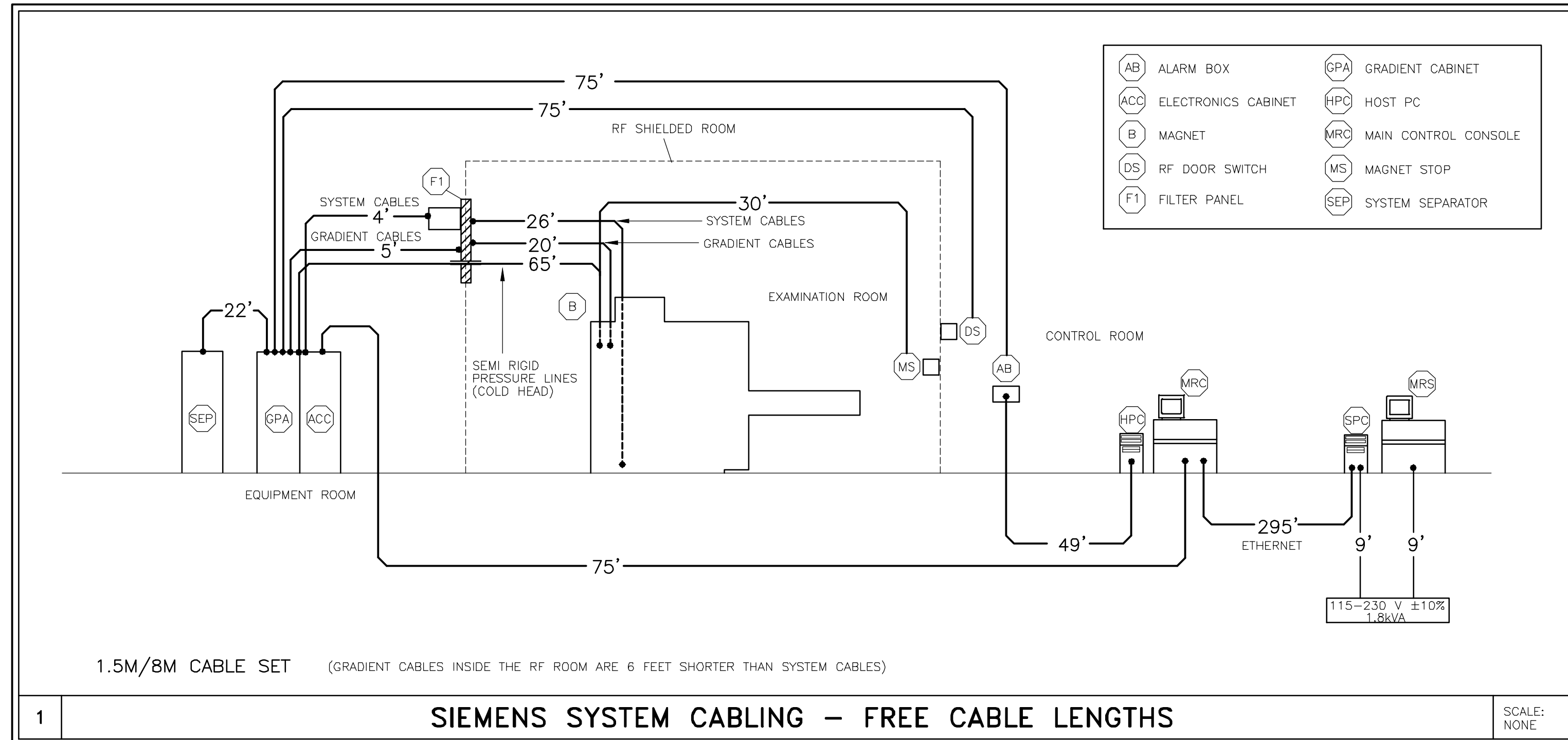
SIEMENS
MAGNETOM AVANTO
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PROJECT #: **03093**
SHEET: **E-102**

DATE: 04/05/13
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CHECKED:

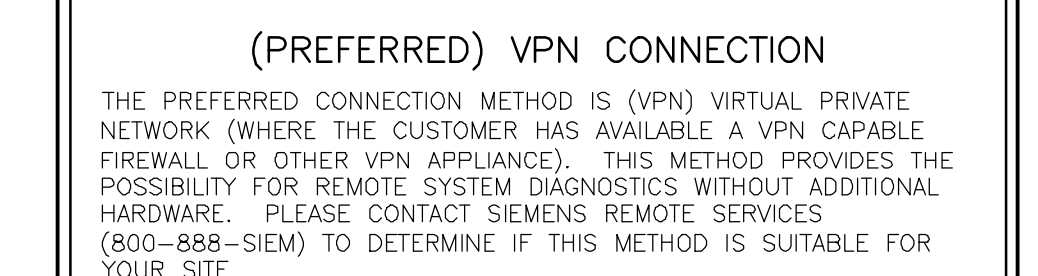
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SIEMENS REMOTE SERVICES (SRS)

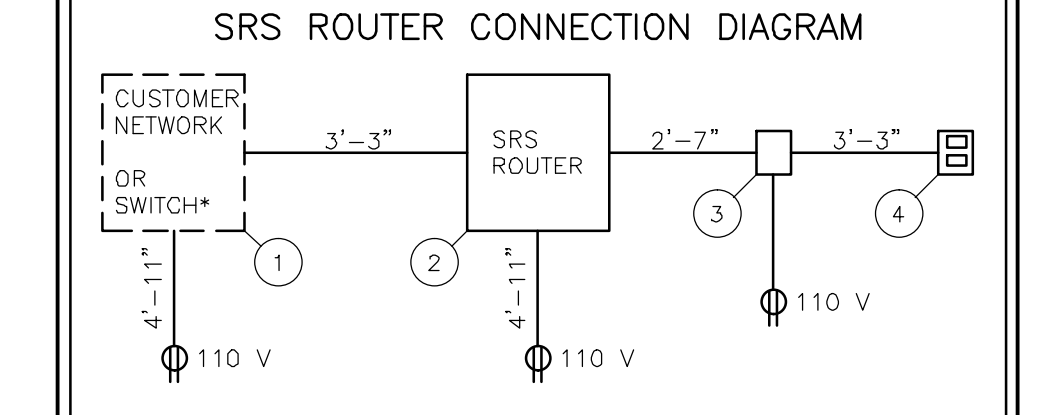
TO ENSURE THE UPTIME OF YOUR SYSTEM DURING THE WARRANTY PERIOD (AND BEYOND WITH A SERVICE AGREEMENT), SIEMENS REMOTE SERVICES (SRS) REQUIRES REMOTE LOCAL AREA NETWORK ACCESS TO SIEMENS SYSTEMS.

SRS REQUIRES ONE OF THE FOLLOWING CONNECTION METHODS:



(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.
- THE SRS ROUTER IS CONNECTED TO AN ANALOG MODEM THAT IS 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. IT CAN BE LOCATED ON A SHELF, TABLE, OR IN A CABINET. THE CONNECTION CABLES (WITH INDICATED LENGTHS BELOW) ARE INCLUDED WITH DELIVERY.



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

- 1) ETHERNET SWITCH OR HUB, SUPPLIED BY CUSTOMER
- 2) SRS ROUTER, SUPPLIED BY SIEMENS (SIZE: 11.2"W X 8.7"D X 5.5"H, WEIGHT: 2 LBS.)
- 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-CANDELES 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.
- 2) FLUORESCENT LIGHTS, ENERGY-SAVING LIGHTS, AND DIMMERS ARE NOT PERMITTED.

CONTROL AND EVALUATION ROOM:

FOLLOW THE APPROPRIATE GUIDELINES FOR LIGHTING IN ROOMS WITH MONITOR WORKSTATIONS.

EQUIPMENT ROOM:

ILLUMINATION INTENSITY SHOULD BE APPROXIMATELY 46 FOOT-CANDELES.

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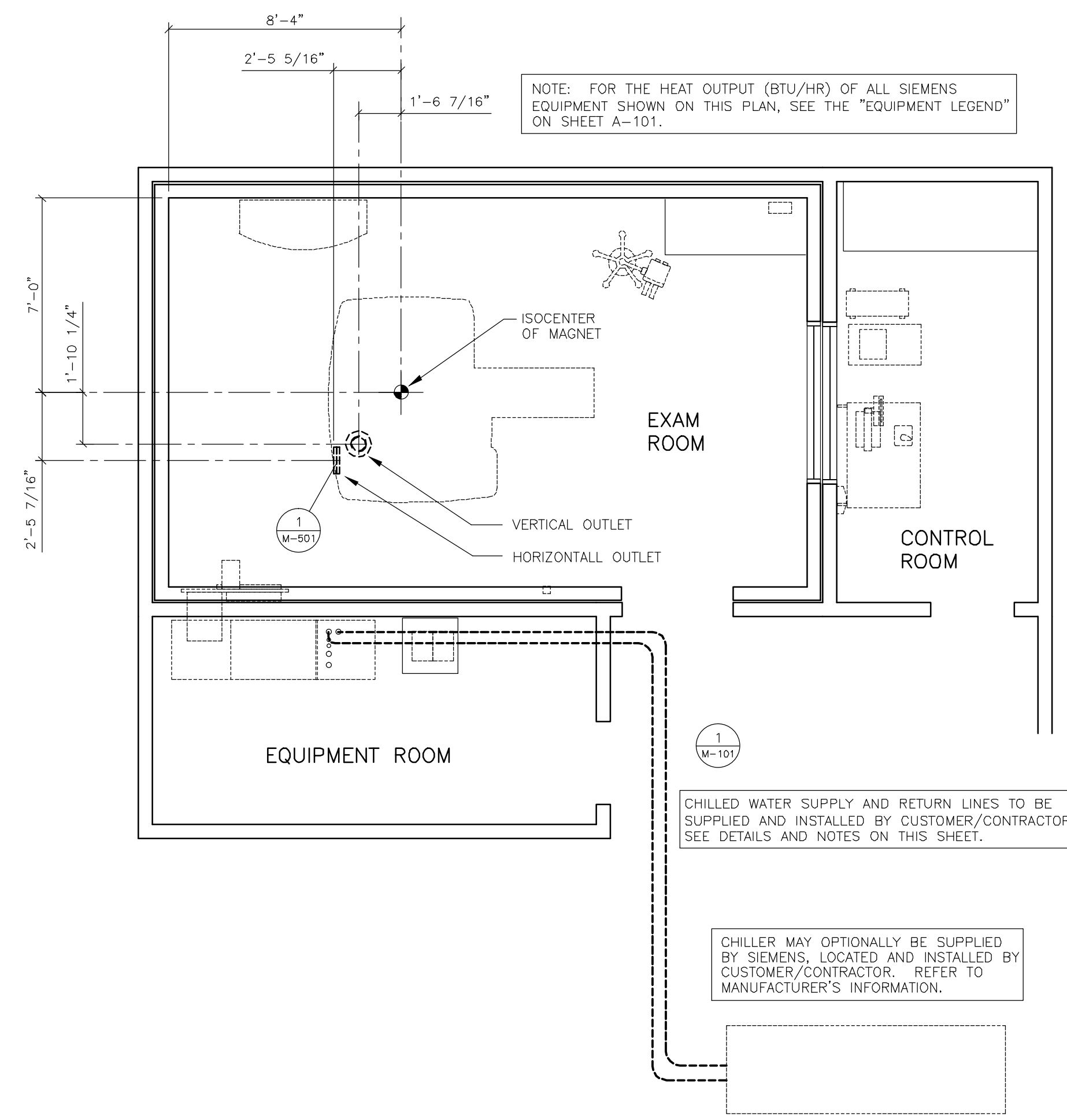
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		<p>SIEMENS</p> <p>MAGNETOM AVANTO</p> <p>TYPICAL INSTALLATION DRAWINGS NOT FOR CONSTRUCTION</p>		
				<p>THE USE OR REPRODUCTION OF THIS TITLE BLOCK WITHOUT SIEMENS' AUTHORIZATION WILL RESULT IN PROSECUTION UNDER FULL EXTENT OF THE LAW.</p> <p>ALL RIGHTS ARE RESERVED.</p>
<p>SYMBOL</p>		<p>DATE</p>	<p>DESCRIPTION</p>	<p>SCALE: AS NOTED</p> <p>REF. #: ---</p>

AVANTO 05/13/13

REFERENCE DOCUMENT - NOT FOR CONSTRUCTION



MECHANICAL PLAN

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

ENVIRONMENTAL REQUIREMENTS

- 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.
- 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. IT IS RECOMMENDED TO INSTALL A FRESH AIR SYSTEM WITH 30%-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.
- 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.
- 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.
- THE AIR INTAKE OF THE AIR CONDITIONING SYSTEM MUST NOT BE LOCATED IN THE VICINITY OF THE QUENCH VENT EXHAUST.
- 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.
- DO NOT LOCATE ANY HVAC DIFFUSERS ABOVE THE MAGNET. THERE SHALL NOT BE AIR BLOWING DIRECTLY ON THE MAGNET.

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 BID LOCATED WITHIN 85' 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
CHLORINE GAS CONCENTRATION	<200 ppm
FILTRATION	500 µm

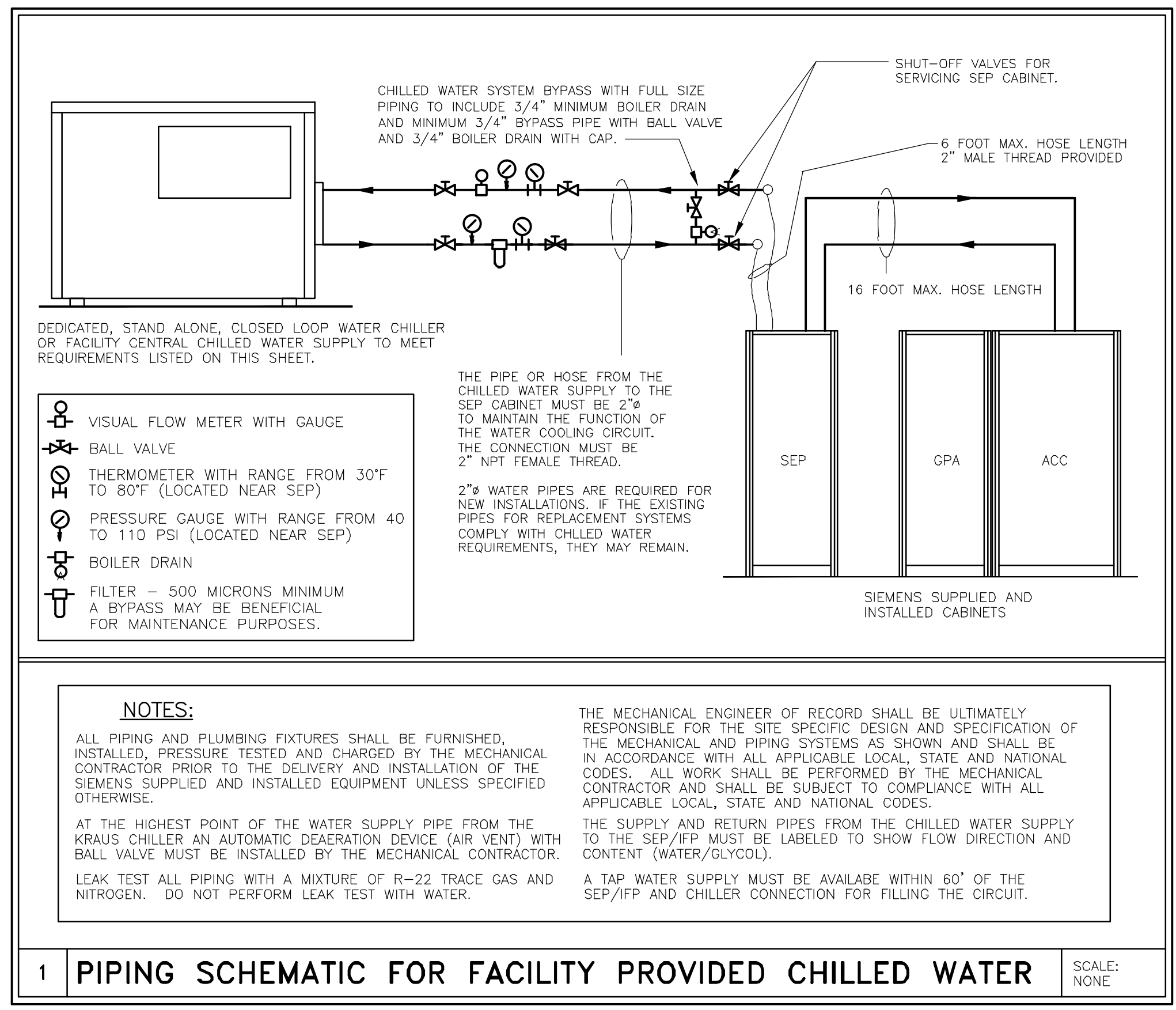
FOR INSTALLATION OF A KRAUS KSC 215 CHILLER, IT IS THE RESPONSIBILITY OF THE CUSTOMER/MECHANICAL CONTRACTOR TO PROVIDE A MIXTURE OF WATER WITH 35%-38% ETHYLENE GLYCOL PRIOR TO CHILLER START UP. DO NOT USE PROPYLENE GLYCOL OR AUTOMOTIVE ANTI-FREEZE.

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

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

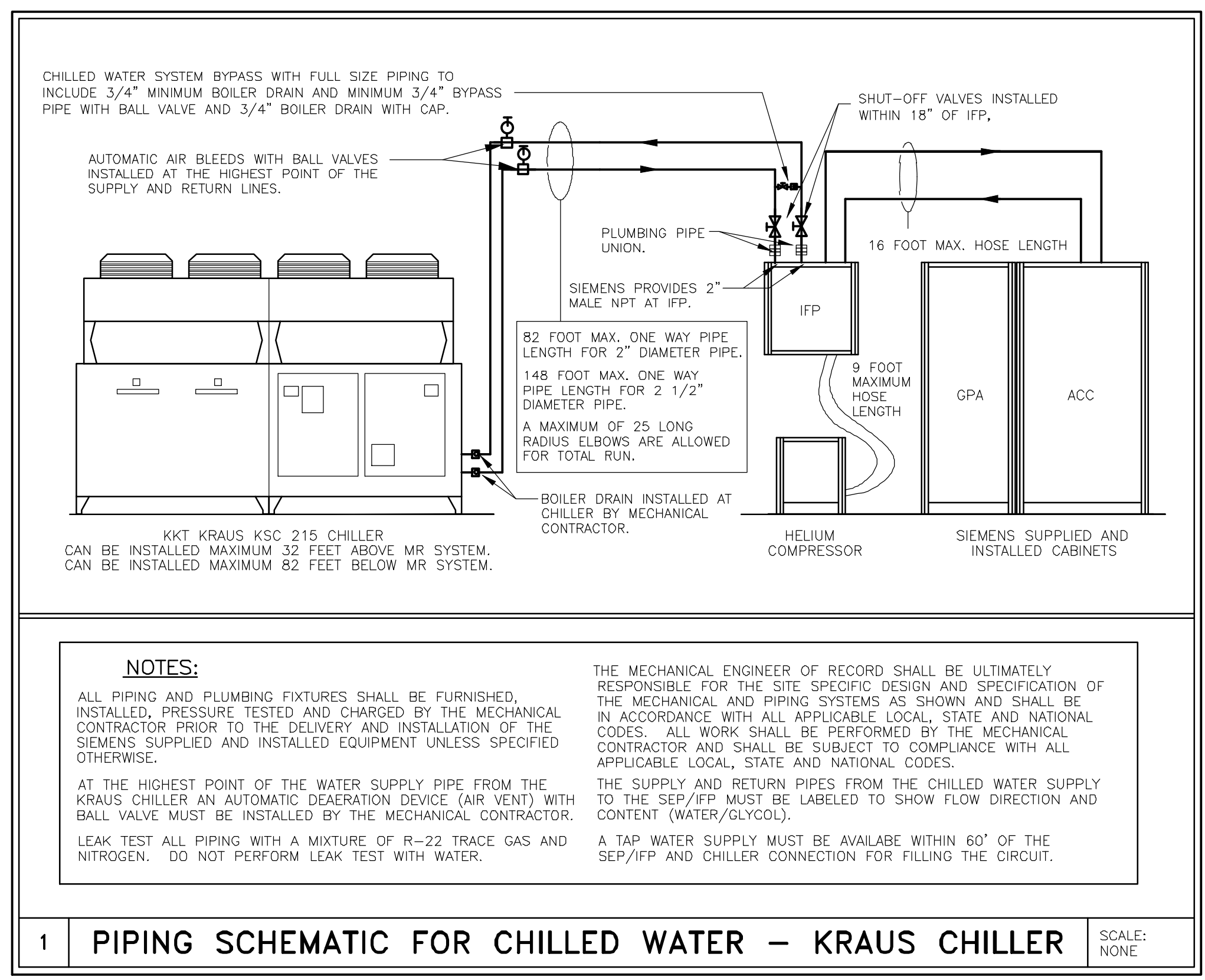
PIPE DIAMETER	TOTAL LENGTH	MIXTURE VOLUME	GLYCOL NEEDED
2"	100'	31.3 GALLONS	11.9 GALLONS
2"	200'	47.6 GALLONS	18.1 GALLONS
2.5"	100'	40.5 GALLONS	15.4 GALLONS
2.5"	200'	66.0 GALLONS	25.1 GALLONS

MIXTURE VOLUME = 3.14 x (PIPE RADIUS)² x PIPE LENGTH + 15 GALLONS.
GLYCOL AMOUNT = 35-38% OF MIXTURE VOLUME.



1 PIPING SCHEMATIC FOR FACILITY PROVIDED CHILLED WATER

SCALE: NONE



1 PIPING SCHEMATIC FOR CHILLED WATER - KRAUS CHILLER

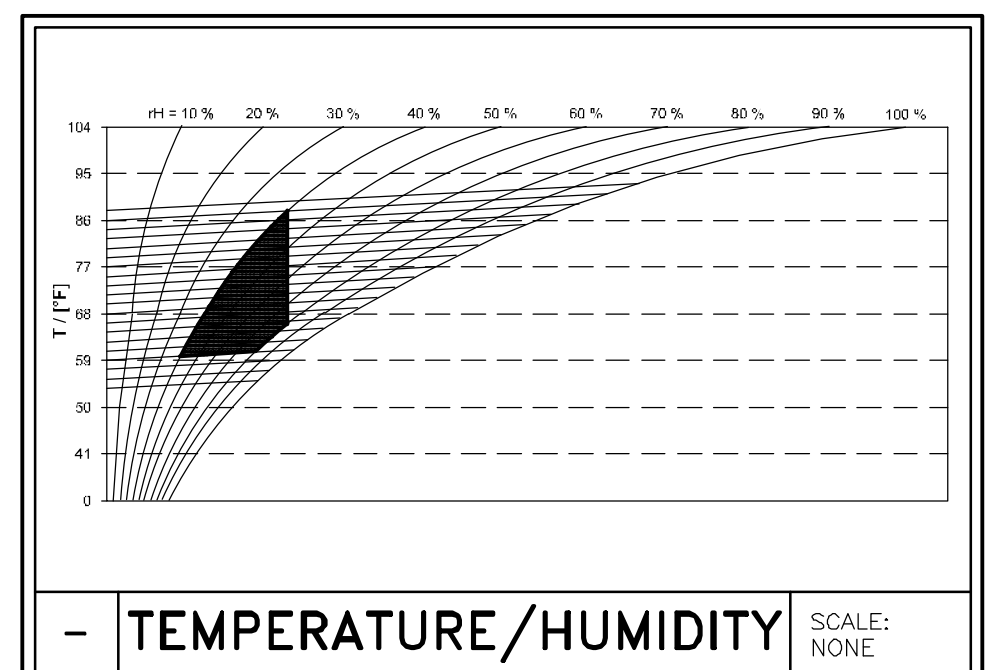
SCALE: NONE

CEILING HEIGHTS

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

- MECHANICAL NOTES**
- THE AIR H.V.A.C. SYSTEM MUST OPERATE FOR A MINIMUM OF 48 CONSECUTIVE HOURS PRIOR TO THE DELIVERY OF THE EQUIPMENT.
 - THE FILTERS MUST BE CHANGED IMMEDIATELY PRIOR TO THE DELIVERY OF THE EQUIPMENT.
 - 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.
 - 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.
 - 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 DEWAR'S MUST BE ESTABLISHED. A MINIMUM 36" CLEARANCE IS REQUIRED.

- FIRE CONTROL NOTES**
- 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.
 - 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.
 - ALL MATERIAL USED INSIDE THE MAGNET ROOM SHALL BE NON-MAGNETIC.
 - 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.
 - EACH ELECTRICAL PENETRATION OF THE RF CABIN/SHIELD FOR ELECTRICAL SERVICING OF THE FIRE PROTECTION SYSTEM SHALL BE THROUGH AN RFI FILTER TO BE SUPPLIED BY THE RF SHIELD 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.
 - IT IS PERMISSIBLE TO RUN "BLACK PIPE" UP TO THE DIELECTRIC COUPLER ON THE OUTSIDE OF THE RF SHIELD.
 - THERE MUST BE NO GROUND CONNECTIONS MADE DURING THE INSTALLATION OF EITHER THE PIPING OR ELECTRICAL FOR THE FIRE PROTECTION SYSTEM.
 - THE USE OF HALON IS NOT ACCEPTABLE.
 - 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.
 - 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.



TEMPERATURE/HUMIDITY SCALE: NONE

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SYM	DATE	DESCRIPTION
- ISSUE BLOCK -		

SIEMENS

MAGNETOM AVANTO

TYPICAL INSTALLATION DRAWINGS
NOT FOR CONSTRUCTION

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PROJECT #: **03093**

SHEET: **M-101**

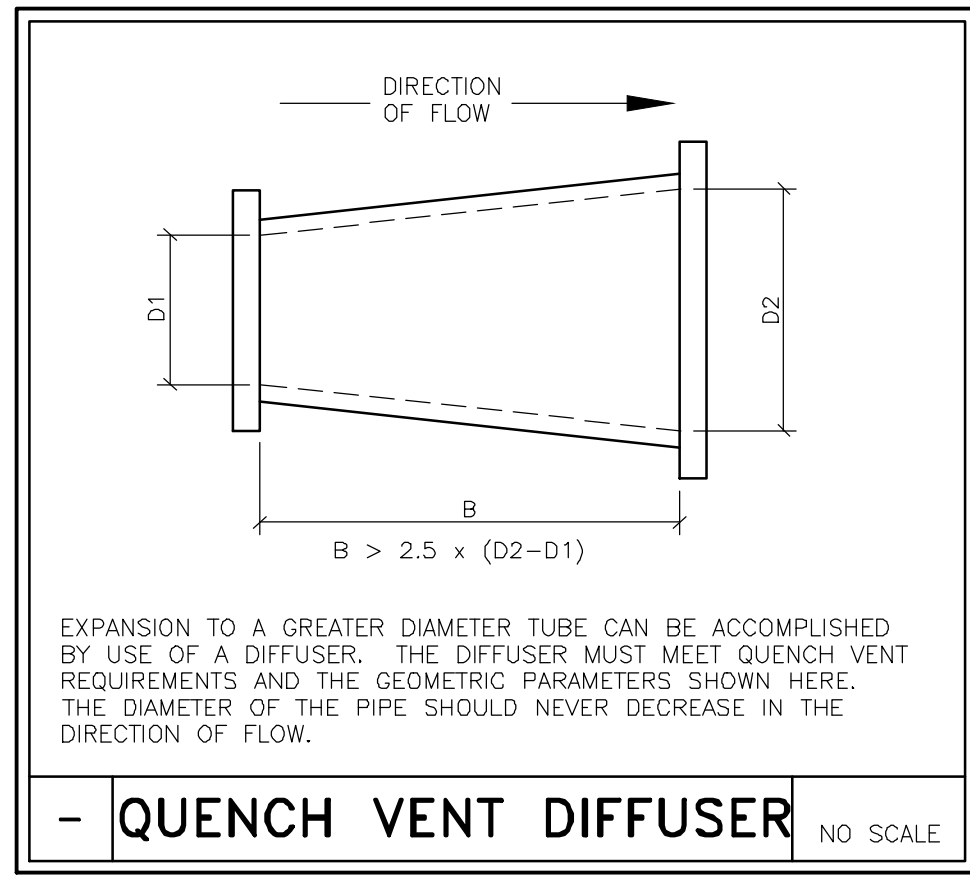
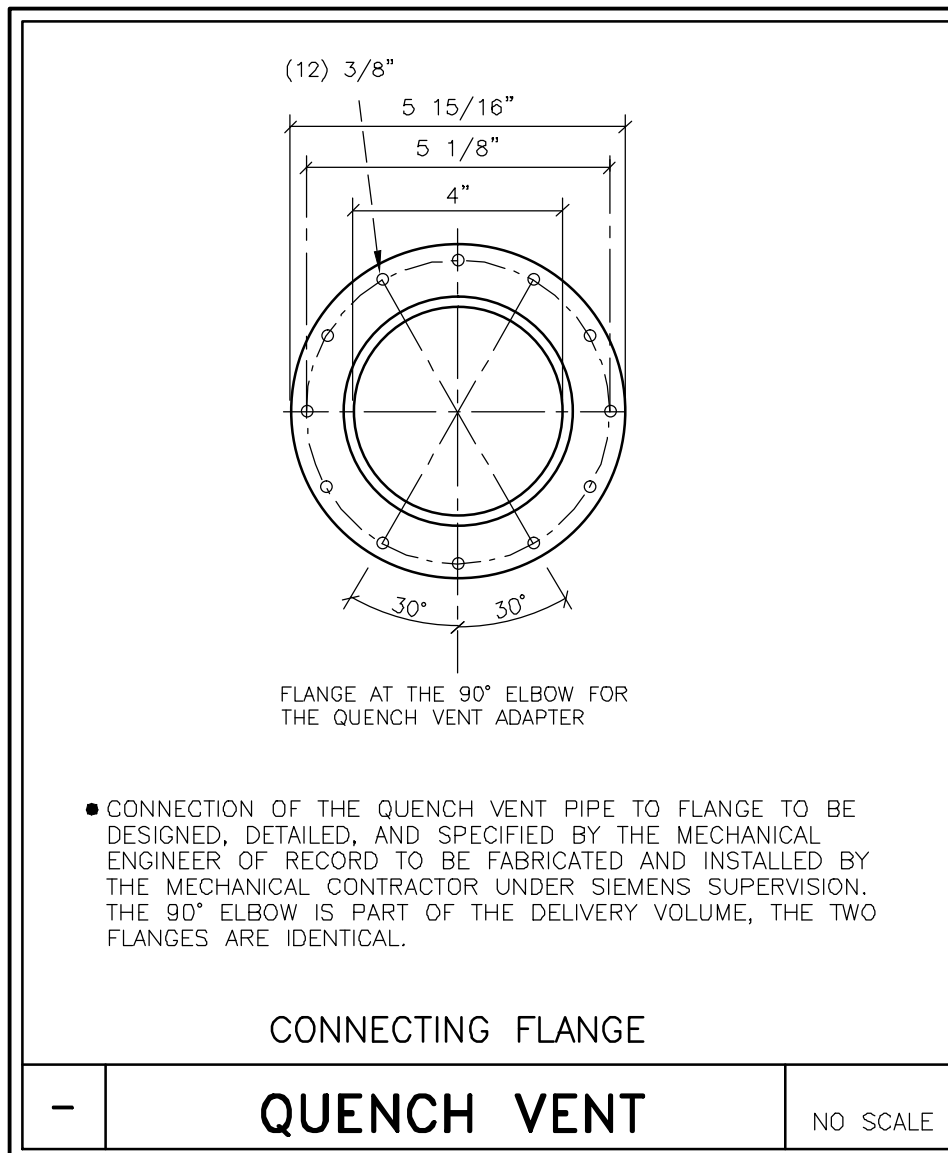
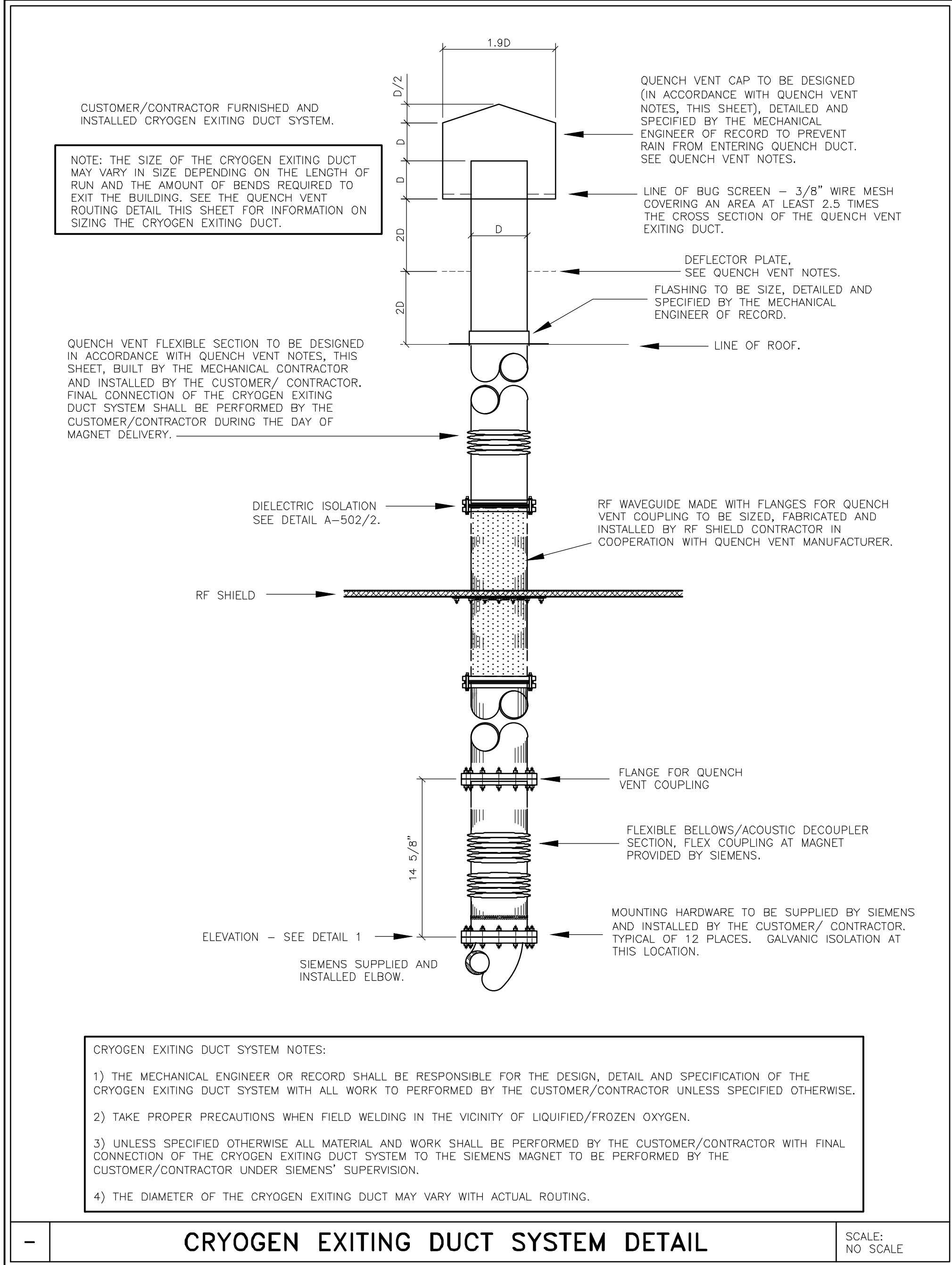
DATE: 04/05/13

DRAWN BY: B. HERRMANN

CHECKED:

SCALE: AS NOTED

REF. #: ---



CRYOGEN NOTES

- "CRYOGENS" IS A TERM USED TO IDENTIFY THE REFRIGERANT USED TO MAKE THE MAGNET "SUPER-CONDUCTING". IN THIS APPLICATION, LIQUID AND GASEOUS HELIUM. SPECIAL CARE MUST BE TAKEN DURING THE TRANSFERRING 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.
- HELIUM GAS CYLINDERS MAY BE USED DURING THE INITIAL FILLING 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.
- OUTSIDE VENTING OF THE HELIUM IS TO BE PROVIDED BY MEANS OF A VENT PIPE OF NON-MAGNETIC MATERIAL CALLED A QUENCH VENT.

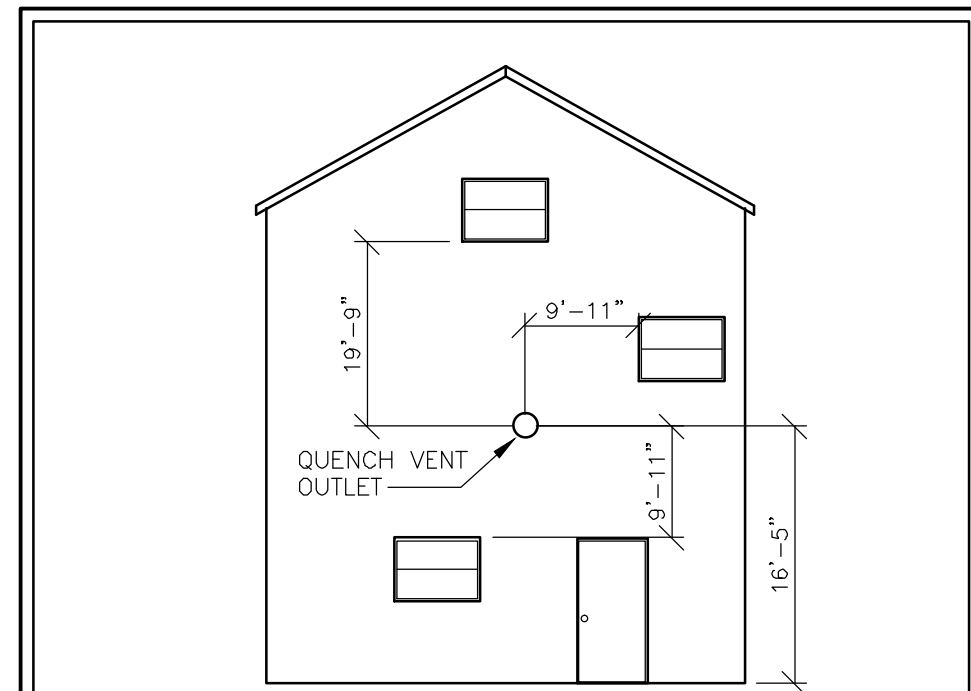
QUENCH VENT NOTES

- 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 4.2K TO ROOM TEMPERATURE GAS. THE EXHAUST SYSTEM IS CRITICAL FOR THE SAFE OPERATION OF THE MAGNET, THE DATA IN THIS 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 THAT THE QUENCH TUBE IS MAINTAINED IN AN OPERABLE STATE.
- 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.
- 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.
- 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 6062 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 ALUMINUM QUENCH TUBES. THE MOVEMENT OF THE 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.
- 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.
- 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" (1.57) OR 6" (3.07) AND ABLE TO WITHSTAND 6.5 PSI.
- 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.
- 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.
- WHERE THE QUENCH TUBE EXITS THROUGH A FLAT ROOF, 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.
- 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.
- 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 BE LOCATED WHERE HELIUM GAS COULD BE DRAWN INTO AN AIR INLET OR OPEN WINDOW.
- 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 0 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.
- 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.
- 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

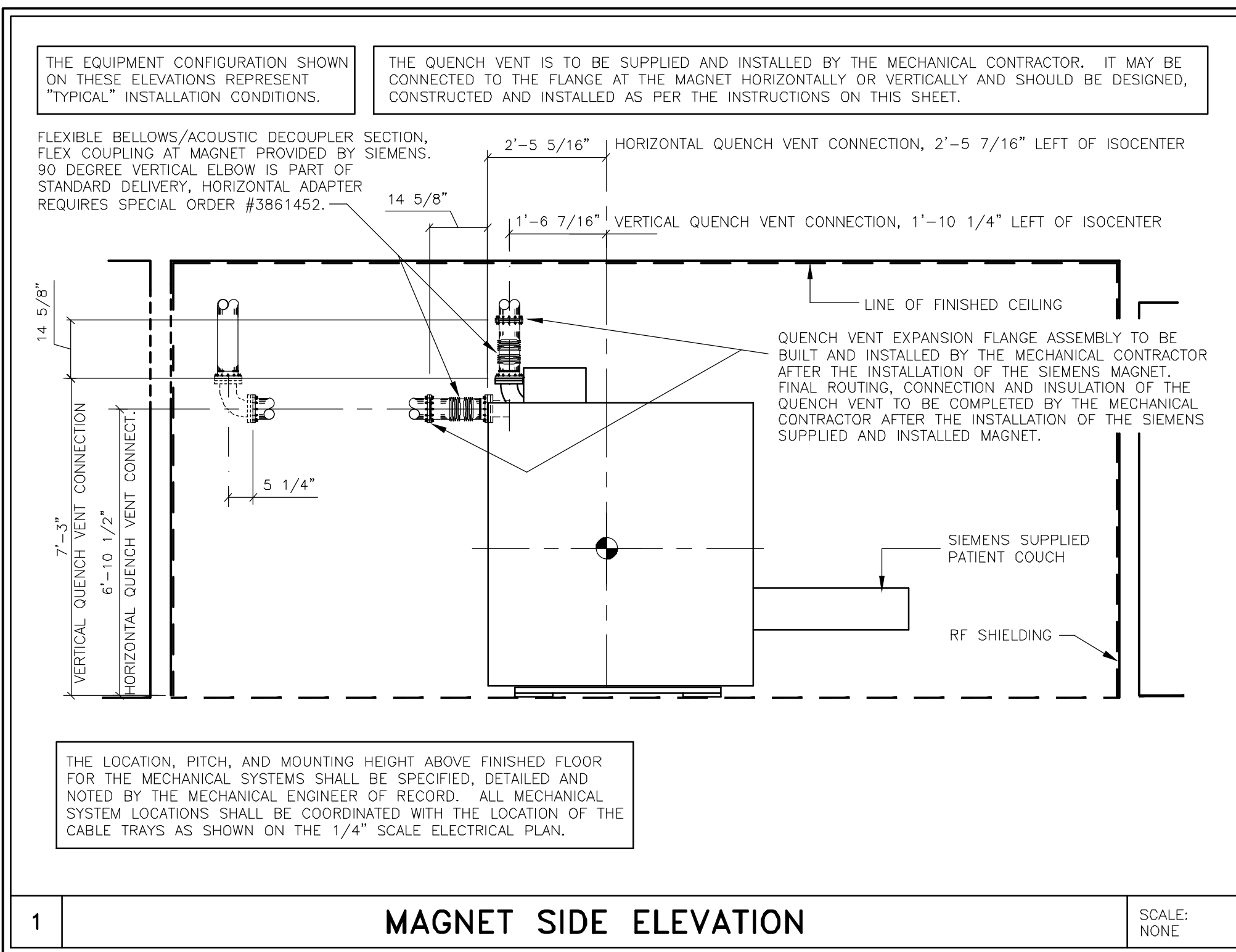
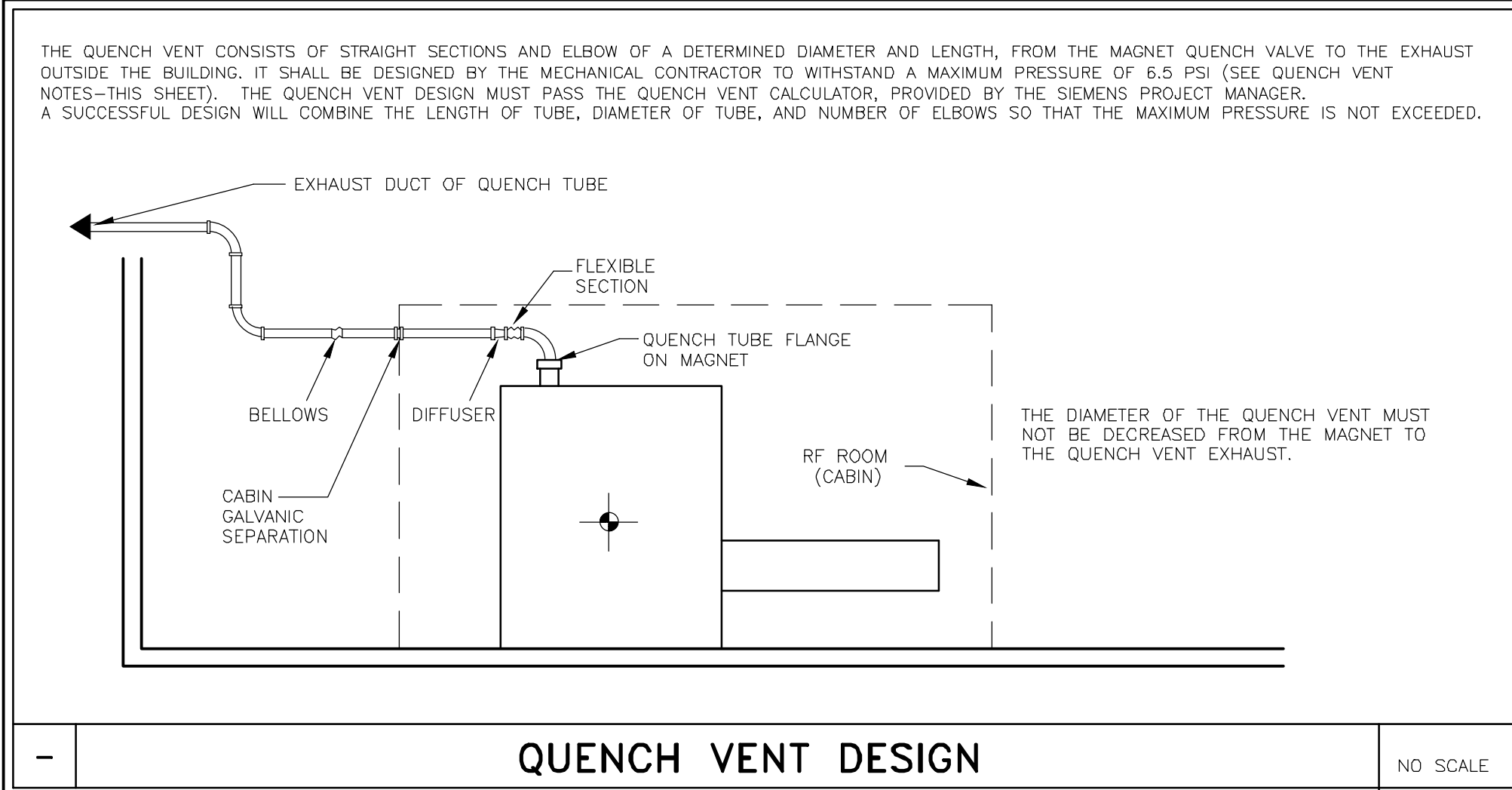
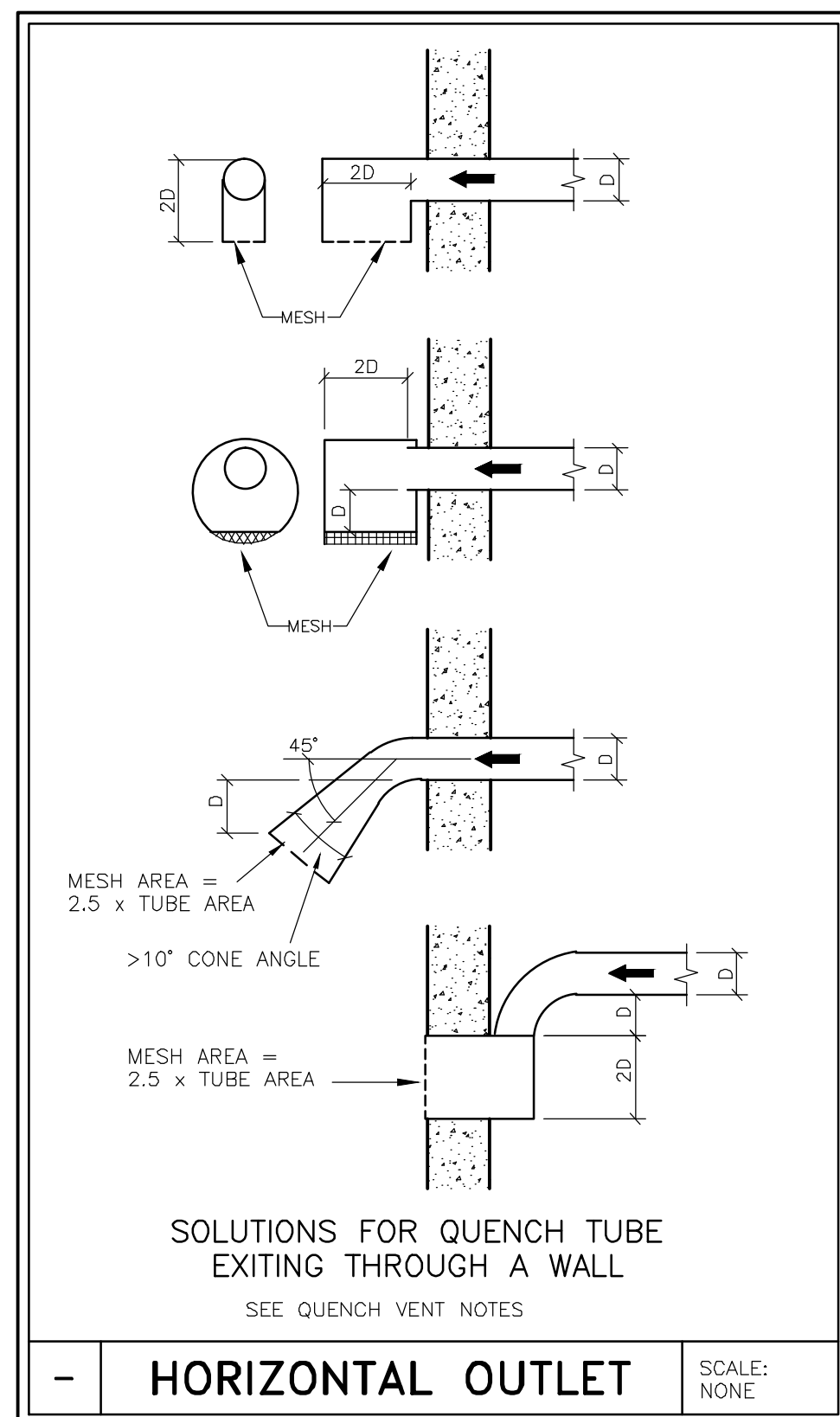
LITERS AT 100%	1400	
TYPICAL BOIL OFF RATE	0.0 L/HR	FOR TYPICAL CLINICAL USE, DEPENDING ON SEQUENCES AND OPERATING TIME.
TYPICAL REFILL INTERVAL	10 YEARS	

WITHOUT THE COLDFEED 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.



IN THE CASE OF A HORIZONTAL EXIT THROUGH A WALL, THE OUTLET MUST BE TURNED DOWN BY NOT LESS THAN THE LINE OF THE 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 ASPHYXIATION, 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 DRAWN INTO AN AIR INLET OR OPEN WINDOW. WHERE WINDOWS ARE WITHIN THE RESTRICTED AREA, THEY MUST BE PERMANENTLY CLOSED.

QUENCH VENT NO SCALE



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AVANTO
05/13/13

SIEMENS
MAGNETOM AVANTO
TYPICAL INSTALLATION DRAWINGS
NOT FOR CONSTRUCTION

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	SHEET OF 10 DRAWN BY: B. HERRMANN	DATE: 04/05/13 CHECKED:

- ISSUE BLOCK -