North Carolina Department of Health and Human Services
Division of Health Service Regulation

Pat McCrory
Governor

Richard O. Brajer
Secretary DHHS

Mark Payne, Director
Health Service Regulation

December 9, 2016

Tiffany Brooks
3480 Preston Ridge Road, Suite 600
Alpharetta, Georgia 30005

Exempt from Review – Replacement Equipment

Record #:	**2110**
Facility Name:	Novant Health Imaging - Maplewood
FID #:	051068
Business Name:	Novant Health, Inc.
Business #:	1341
Project Description:	Replace existing MRI at Novant Health Imaging – Maplewood and relocate to Novant Health Forsyth Medical Center (Forsyth Campus) / FID 923174
County:	Forsyth

Dear Ms. Brooks:

The Healthcare Planning and Certificate of Need Section, Division of Health Service Regulation (Agency), determined that based on your letter of December 2, 2016 and supplemental information received December 9, 2016, the above referenced proposal is exempt from certificate of need review in accordance with G.S 131E-184(a)(7). Therefore, you may proceed to acquire without a certificate of need the Siemens Magnetom Aera 1.5T MRI scanner to replace the Siemens Espree 1.5T MRI scanner, acquired pursuant to the Certificate of Need for Project ID #G-7387-05, and relocate the replacement MRI to Novant Health Forsyth Medical Center (Forsyth Campus). This determination is based on your representations that the existing unit will be removed from North Carolina and will not be used again in the State without first obtaining a certificate of need.

Moreover, you need to contact the Agency's Construction and Acute and Home Care Licensure and Certification Sections to determine if they have any requirements for development of the proposed project.

It should be noted that the Agency's position is based solely on the facts represented by you and that any change in facts as represented would require further consideration by this office and a separate determination. If you have any questions concerning this matter, please feel free to contact this office.

Sincerely,

Celia C. Inman
Project Analyst

Martha J. Frisone
Assistant Chief, Certificate of Need

cc: Construction Section, DHSR
Paige Bennett, Assistant Chief, Healthcare Planning, DHSR
Acute and Home Care Licensure and Certification Section, DHSR

Healthcare Planning and Certificate of Need Section
www.ncdhhs.gov
Telephone: 919-855-3873 • Fax: 919-715-4413
Location: Edgerton Building • 809 Ruggles Drive • Raleigh, NC 27603
Mailing Address: 2704 Mail Service Center •Raleigh, NC 27699-2704
An Equal Opportunity/ Affirmative Action Employer

Rec'd by email 12/9/16 CK

MedQuest ASSOCIATES

December 8, 2016

VIA EMAIL

Celia Inman, Project Analyst
North Carolina Department of Health and Human Services
Division of Health Service Regulation
Certificate of Need Section
809 Ruggles Drive
Raleigh, North Carolina 27603

Re: Notice of Replacement Equipment for Health Service Area II, Forsyth County/Novant Health Imaging - Maplewood in Winston-Salem, North Carolina

Dear Celia:

In response to the Agency's request for additional information, Novant Health provides the following responses:

1. The existing equipment to be replaced was obtained pursuant to a certificate of need for Project ID No. G-7387-05.
2. The existing equipment will be permanently removed from North Carolina and will not be used in North Carolina without first obtaining a new certificate of need.

If you need any additional information, please let me know.

Sincerely,

Tiffany Brooks

Tiffany Brooks, Manager
Certificate of Need

cc: Denise Gunter
Per Normark
Barbara Freedy

Inman, Celia C

From: Inman, Celia C
Sent: Tuesday, December 06, 2016 11:53 AM
To: Tiffany Brooks (tbrooks@medquestmail.com)
Subject: Additional Information for Exemption Request
Attachments: NH Imaging Maplewood Replacement Equip More Info Request.doc

See attached letter. You can provide your response by email also.
Thanks,

Celia C. Inman
Project Analyst Certificate of Need
Division of Health Service Regulation, Healthcare Planning and Certificate of Need Section
North Carolina Department of Health and Human Services

919-855-3873 office
Celia.inman@dhhs.nc.gov

809 Ruggles Drive
2704 Mail Service Center
Raleigh, NC 27699-2704

Nothing Compares

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VIA EMAIL ONLY

Information Request for Replacement Equipment

Record #:	2110
Facility or Provider:	Novant Health Imaging – Maplewood
Project Description:	Replace existing MRI at Novant Health Imaging – Maplewood and relocate to Novant Health Forsyth Medical Center (Forsyth Campus) / FID 923174
County:	Forsyth
FID #:	051068

Dear Ms. Brooks:

The Healthcare Planning and Certificate of Need Section, Division of Health Service Regulation (Agency) received your correspondence of December 2, 2016, regarding acquisition of Siemens Magnetom Aera 1.5T MRI scanner to replace existing equipment. Additional information is needed to determine if the equipment to be acquired is consistent with the definition of replacement equipment in G.S. 131E-176(22a) and 10A NCAC 14C .0303. See the enclosed copy of the law and rule.

Please provide the following information to this office at your earliest convenience:

1. Clarification on the acquisition of the existing MRI to be replaced:
   a. Was the existing piece of equipment a grandfathered MRI or was it obtained pursuant to a certificate of need?
   b. If acquired through CON, what is the project identification number?
2. A statement documenting the existing equipment will be permanently removed from North Carolina and will not be used in North Carolina without first obtaining a new certificate of need.

If you have any questions concerning this request, please do not hesitate to call me.

Sincerely,

Celia C. Inman

Celia C. Inman
Project Analyst, Certificate of Need

Enclosure

G.S. 131E-176(22a)

"Replacement equipment" means equipment that costs less than two million dollars ($2,000,000) and is purchased for the sole purpose of replacing comparable medical equipment currently in use which will be sold or otherwise disposed of when replaced. In determining whether the replacement equipment costs less than two million dollars ($2,000,000), the costs of equipment, studies, surveys, designs, plans, working drawings, specifications, construction, installation, and other activities essential to acquiring and making operational the replacement equipment shall be included. The capital expenditure for the equipment shall be deemed to be the fair market value of the equipment or the cost of the equipment, whichever is greater.

10A NCAC 14C .0303

(a) The purpose of this Rule is to define the terms used in the definition of "replacement equipment" set forth in G.S. 131E-176(22a).

(b) "Activities essential to acquiring and making operational the replacement equipment" means those activities which are indispensable and requisite, absent which the replacement equipment could not be acquired or made operational.

(c) "Comparable medical equipment" means equipment which is functionally similar and which is used for the same diagnostic or treatment purposes.

(d) Replacement equipment is comparable to the equipment being replaced if:
   (1) it has the same technology as the equipment currently in use, although it may possess expanded capabilities due to technological improvements; and
   (2) it is functionally similar and is used for the same diagnostic or treatment purposes as the equipment currently in use and is not used to provide a new health service; and
   (3) the acquisition of the equipment does not result in more than a 10% increase in patient charges or per procedure operating expenses within the first twelve months after the replacement equipment is acquired.

(e) Replacement equipment is not comparable to the equipment being replaced if:
   (1) the replacement equipment is new or reconditioned, the existing equipment was purchased second-hand, and the replacement equipment is purchased less than three years after the acquisition of the existing equipment; or
   (2) the replacement equipment is new, the existing equipment was reconditioned when purchased, and the replacement equipment is purchased less than three years after the acquisition of the existing equipment; or
   (3) the replacement equipment is capable of performing procedures that could result in the provision of a new health service or type of procedure that has not been provided with the existing equipment; or
   (4) the replacement equipment is purchased and the existing equipment is leased, unless the lease is a capital lease; or
   (5) the replacement equipment is a dedicated PET scanner and the existing equipment is:
      (A) a gamma camera with coincidence capability; or
      (B) nuclear medicine equipment that was designed, built, or modified to detect only the single photon emitted from nuclear events other than positron annihilation.

MedQuest
ASSOCIATES

December 2, 2016

VIA HAND DELIVERY

Martha J. Frisone, Chief
North Carolina Department of Health and Human Services
Division of Health Service Regulation
Certificate of Need Section
809 Ruggles Drive
Raleigh, North Carolina 27603

Re: Notice of Replacement Equipment for Health Service Area II, Forsyth County/Novant Health Imaging - Maplewood in Winston-Salem, North Carolina

Dear Martha:

On behalf of Novant Health, Inc. ("Novant") and in accordance with N.C. Gen. Stat. § 131E-184(a)(7), I am writing to notify the Department of Novant 's intention to replace an existing MRI scanner currently located at Novant Health Imaging – Maplewood ("Maplewood") and relocate the replacement MRI scanner to Forsyth Medical Center's ("Forsyth") campus. Novant is the ultimate parent entity of Maplewood and Forsyth.

Maplewood currently operates two fixed MRI scanners, one of which is a Siemens Magnetom Espree 1.5T MRI scanner ("Espree") that was acquired in 2007. *See* Exhibit A, attached replacement equipment comparison form. This MRI scanner is the subject of this replacement request. Novant intends to replace the existing Espree with a Siemens Magnetom Aera 1.5T MRI scanner ("Magnetom"). Novant plans to install the replacement scanner at Forsyth in Winston-Salem. After the replacement is complete, Maplewood will have one fixed MRI scanner and there will be five fixed MRI scanners at Forsyth. There will be no change in the overall inventory of fixed MRI scanners in Forsyth County, and no overall increase in the number of scanners owned by Novant in Forsyth County.

The estimated construction costs, including architect's fees and project contingency, for the proposed replacement equipment total $688,450. The purchase price of the Magnetom is $1,300,000. The total capital expenditure for the proposed replacement equipment project is $1,988,450. *See* Exhibit B (capital cost form). Novant is not purchasing the options listed on the equipment quote. *See* Exhibit C (equipment quote).

This proposal meets the definition of "replacement equipment" as set forth in N.C. Gen. Stat. § 131E-176(22a) because:

1. The cost of the equipment and the cost of all activities essential to acquiring and making operational the replacement equipment are less than $2 million; and
2. The sole purpose of this proposal is to replace comparable medical equipment currently in use, which will be sold or otherwise disposed of when replaced.

Further, this proposal meets the requirements of 10A NCAC 14C .0303(d) because:

- The Magnetom has the same technology as the Espree although it may possess expanded capabilities due to technological improvements;

- The Magnetom is functionally similar and is used for the same diagnostic or treatment purposes as the Espree and is not used to provide a new health service; and

- The acquisition of the Magnetom will not result in more than a 10% increase in patient charges or per procedure operating expenses within the first twelve months after the replacement equipment is acquired.

None of the exclusions in 10A NCAC 14C .0303(e) applies here.

Based on the foregoing, Novant respectfully requests that the CON Section confirm in writing that the above referenced proposal is exempt from CON review pursuant to N.C. Gen. Stat. § 131E-184(a)(7).

Thank you for your time and attention.

Sincerely,

Tiffany Brooks

Tiffany Brooks
Manager, Certificate of Need

Enclosures
cc: Denise Gunter
Per Normark
Barbara Freedy

Exhibit A – Equipment Comparison Chart

EQUIPMENT COMPARISON – MR REPLACEMENT & RELOCATION
NOVANT HEALTH IMAGING - MAPLEWOOD

	EXISTING EQUIPMENT	**REPLACEMENT EQUIPMENT**
Type of Equipment (List Each Component)	MRI Scanner	MRI Scanner
Manufacturer of Equipment	Siemens	Siemens
Tesla Rating for MRIs	1.5T	1.5T
Model Number	Espree	Magnetom Aera
Serial Number	30386	TBD
Provider's Method of Identifying Equipment	Serial Number	Serial Number
Specify if Mobile or Fixed	Fixed	Fixed
Mobile Trailer Serial Number/VIN #	N/A	N/A
Mobile Tractor Serial Number/VIN #	N/A	N/A
Date of Acquisition of Each Component	2007	2017
Does Provider Hold Title to Equipment or Have a Capital Lease?	Title	N/A
Specify if Equipment Was/Is New or Used When Acquired	New	New
Total Capital Cost of Project (Including Construction, etc.) <Use Attached Form>	$1,750,768	$1,988,450
Total Cost of Equipment	$	$1,300,000
Fair Market Value of Equipment	$350,000	Same
Net Purchase Price of Equipment	Same	Same
Locations Where Operated	3155 Maplewood Ave, Winston-Salem, NC	3333 Silas Creek Pkwy, Winston-Salem, NC 27103
Number Days In Use/To Be Used in N.C. Per Year	255	255
Percent of Change in Patient Charges (by Procedure)	NA	NA
Percent of Change in Per Procedure Operating Expenses (by Procedure)	NA	NA
Type of Procedures Currently Performed on Existing Equipment	General MR Scans of the Body/ Extremities	General MR Scans of the Body/ Extremities + MRA Carotid, Renal, Faster Acquisition Times
Type of Procedures New Equipment is Capable of Performing	General MR Scans of the Body/ Extremities	General MR Scans of the Body/ Extremities + MRA Carotid, Renal, Faster Acquisition Times

Exhibit B – Capital Cost Form

PROJECT CAPITAL COST

Project Name: Novant Health– MRI Replacement and Relocation - FMC
Proponent: Novant Health, Inc.

A.	**Site Costs**				
	(1)	Full purchase price of land		$ N/A	
		# Acres ____ Price per Acre $_____			
	(2)	Closing costs		$_____	
	(3)	Site Inspection and Survey		$_____	
	(4)	Legal fees and subsoil investigation		$_____	
	(5)	Site Preparation Costs [Include]			
		Soil Borings			
		Clearing and Grading			
		Roads and Parking			
		Sidewalks			
		Water and Sewer			
		Excavation and Backfill			
		Termite Treatment			
		Sub-Total Site Preparation Costs	$_____		
	(6)	Other (Specify)		$_____	
	(7)	**Sub-Total Site Costs**			$_____
B.	**Construction Contract**				
	(8)	Cost of Materials [Include]			
		General Requirements			
		Concrete/Masonry			
		Woods/Doors & Windows/Finishes			
		Thermal & Moisture Protection			
		Equipment/Specialty Items			
		Mechanical/Electrical			
		Sub-Total Cost of Materials	$_____		
	(9)	Cost of Labor	$_____		
	(10)	Other	$_____		
	(11)	**Sub-Total Construction Contract**			$688,450
C.	**Miscellaneous Project Costs**				
	(12)	Building Purchase	$_____		
	(13)	Fixed Equipment Purchase/Lease	$1,300,000		
	(14)	Movable Equipment Purchase/Lease	$_____		
	(15)	Furniture	$_____		
	(16)	Landscaping	$_____		
	(17)	Consultant Fees			
		Architect/Engineering Fees	$_____		
		Legal Fees	$		
		Market Analysis	$		
		Other			
		Total Consultant Fees	$_____		
	(18)	Financing Costs			
		(e.g. Bond, Loan, etc.)	$Not Applicable		
	(19)	Interest During Construction	$Not Applicable		
	(20)	Other (Contingency)		$_____	
	(21)	**Sub-Total Miscellaneous**			$1,300,000
D.	**Total Capital Cost of Project (Sum A-C above)**				$1,988,450

I certify that to the best of my knowledge, the above construction related costs of the proposed project named above are complete and correct.

Nelson C Soggs - KSA design
(Signature of Licensed Architect or Engineer)

I assure that, to the best of my knowledge, the above capital costs for the proposed project are complete and correct and that it is my intent to carry out the proposed project as described.

(Proponent – signature of officer)

V.P. Professional Support Services
(Title of officer)

Exhibit C – Equipment Quote

Siemens Medical Solutions USA, Inc.
40 Liberty Boulevard, Malvern, PA 19355
Fax: (866) 309-6967

SIEMENS REPRESENTATIVE
Karen Dixon - (865) 360-8644

PRELIMINARY PROPOSAL

Customer Number: 0000006208

Date: 11/17/2016

FORSYTH MEDICAL CENTER
3333 SILAS CREEK PARKWAY
WINSTON-SALEM, NC 27103

Quote Nr: **1-CCUL7G Rev. 9**

MAGNETOM Aera - USA

All items listed below are included for this system: *(See Detailed Technical Specifications at end of Proposal.)*

Qty	Part No.	Item Description	Extended Price
1	14416900	**MAGNETOM Aera - System** MAGNETOM Aera is designed to provide you the versatility you need to meet the increasing demands in healthcare. Maximize 1.5T with its core technologies Tim(r) 4G and Dot(r), along with its comprehensive application portfolio and experience unique functionalities to increase patient comfort. Every case. Every day. System Design - Short and open appearance (145 cm system length and 70 cm Open Bore Design) to reduce patient anxiety and claustrophobia - Whole-body superconductive Zero Helium Boil-Off 1.5T magnet - Actively Shielded water-cooled Siemens gradient system for maximum performance - TrueForm Magnet and Gradient Design Tim 4G (Total imaging matrix in the 4th generation) for excellent image quality and speed - Siemens unique DirectRF(tm) technology enabling the all digital-in/ digital-out design - Dual-Density Signal Transfer Technology - Head/Neck 20 DirectConnect - Spine 32 DirectConnect - Body 18 - Flex Large 4 - Flex Small 4 - Flex Coil interface - Tim Coil interface Dot (Day optimizing throughput) for higher consistency, flexibility and efficiency - Dot Display - Dot Control Centers - Brain Dot Engine	$887,759

Siemens Medical Solutions USA, Inc.
40 Liberty Boulevard, Malvern, PA 19355
Fax: (866) 309-6967

SIEMENS REPRESENTATIVE
Karen Dixon - (865) 360-8644

PRELIMINARY PROPOSAL

Qty	Part No.	Item Description	Extended Price
		Tim Application Suite allowing excellent head-to-toe imaging - Neuro Suite - Angio Suite - Cardiac Suite - Body Suite - Onco Suite - Breast Suite - Ortho Suite - Pediatric Suite - Scientific Suite Further included - High performance host computer and measurement and reconstruction system - Siemens uniqueTimCT FastView localizer and CAIPIRINHA - syngo MR software including - 1D/2D PACE - BLADE - iPAT² - Phoenix - Inline Diffusion - WARP - MDDW (Multiple Direction Diffusion Weighting) - CISS - DESS The system (magnet, electronics and control room) can be installed in 30sqm space. For system cooling either the Eco Chiller options or the Separator is required.	
1	14416901	**Tim [204x48] XJ Gradients #Ae** Tim [204x48] XJ-gradient performance level Tim 4G with it's newly designed RF system and innovative coil architecture enables high resolution imaging and increased throughput. Up to 204 simultaneously connected coil elements in combination with the standard 48 independent RF channels, allow for more flexible parallel imaging. Maximum SNR through the new Tim 4G matrix coil technolgy. XJ - gradients The XJ- gradients are designed combining high performance and linearity to support clinical whole body imaging at 1.5T. The force compensated gradient system minimizes vibration levels and accoustic noise. The XJ gradients combine 33 mT/m peak amplitude with a slew rate of 125 T/m/s.	$0
1	08464872	**PC Keyboard US english #Tim** Standard PC keyboard with 101 keys.	$0
1	14416914	**Pure White Design #T+D** The MAGNETOM Aera / MAGNETOM Skyra design is available in different light and appealing variants which perfectly integrates into the different environments. The color of the main face plate cover of the Pure White Design Variant with the integrated Dot Control Centers and the unique Dot Display is brilliant white surrounded by a brilliant silver trim. The asymetrical deco area on the left side is colored white matte and also with a brilliant surrounding silver trim. The table cover is presented also in the same color and material selection.	$0
1	14416906	**Tim Dockable Table #Ae** The Tim Dockable Table is designed for maximum patient comfort and smooth patient preparation. Tim Dockable Table can support up to 250 kg (550 lbs) patients without restricting	$35,586

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PRELIMINARY PROPOSAL

Qty	Part No.	Item Description	Extended Price
		the vertical or horizontal movement. The one step docking mechanism and the innovative multi-directional navigation wheel ensure easy maneuvering and handling. Critically ill or immobile patients can now be prepared outside the examination room for maximum patient care, flexibility and speed.	
1	14446650	**SW syngo MR E11C** syngo MR E11C software with new features and applications. GOBrain protocols (for Aera and Skyra with 48 or more rf-channels).	$0
1	14441748	**Quiet Suite #T+D** Quiet Suite enables complete, quiet examinations for neurology and orthopedics with at least 70% reduction in sound pressure levels.	$0
1	14441866	**DotGO Routine Package #T+D** The DotGO Routine Package includes both: - Spine Dot Engine and - Large Joint Dot Engine. As a package they offer a comprehensive set of workflows with guidance and automation, for standardized image quality in Spine and MSK MR imaging. The Spine Dot Engine provides the functionality of Inline Composing and Tim Planning Suite for streamlining workflows in all spine imaging. Tools, such as auto-positioning and vertebral recognition with AutoAlign Spine, AutoCoverage and Spine Labelling support and optimize reproducibility for your cervical, thoracic and lumbar spine imaging for all clinical indications. The Large Joint Dot Engine enhances standardization of the knee, hip and shoulder workflows and optimizes reproducible image quality by incorporating automation tools, such as anatomically based auto-positioning (AutoAlign). Dedicated imaging techniques, such as Advanced WARP, are included and can help to expand the access of diagnostic MRI to a broader range of patient types.	$27,500
1	14405224	**Composing syngo #Tim** This application provides dedicated evaluation software for creation of full-format images from overlapping MR volume data sets and MIPs (starting from syngo MR B13) acquired at multiple stages.	$7,117
1	14409198	**Native syngo #Tim** Integrated software package with sequences and protocols for non-contrast enhanced 3D MRA with high spatial resolution. syngo NATIVE particularly enables imaging of abdominal and peripheral vessels and is an alternative to MR angiography techniques with contrast medium, especially for patients with severe renal insufficiency.	$23,724
1	14441759	**FREEZEit Body MRI Package #T+D** FREEZEit Body Package contains two robust sequences for advanced body imaging: TWIST VIBE and StarVIBE. - TWIST VIBE is a new fast, high-resolution 4D imaging sequence for multi-arterial liver imaging. - StarVIBE is a motion insensitive VIBE sequence using a stack-of-stars trajectory.	$26,097
1	08464740	**Flow Quantification #Tim** Special sequences for quantitative assessment of flow.	$9,490
1	14416946	**Neuro Perfusion Package #T+D** The Neuro Perfusions Package helps to streamline the clinical workflow by inline post-processing in dynamic susceptibility contrast (DSC) based perfusion imaging. This makes it possible to see perfusion maps immediately.	$7,117

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PRELIMINARY PROPOSAL

Qty	Part No.	Item Description	Extended Price
		Perfusion parameter maps are based on a Local Arterial Input function. A corrected relCBV map calculation and motion correction is provided.	
1	14426290	**Neuro Perfusion Eval #T+D** Neuro Perfusion Evaluation syngo provides a task card for detailed post-processing of brain perfusion data sets. Color display of the relative Mean Transit Time (relMTT), relative Cerebral Blood Volume (relCBV), corrected rel CBV, and relative Cerebral Blood Flow (relCBF) is supported. Flexible selection of the Arterial Input Function (AIF) for more reliable analysis taking into account the dynamics over time of the contrast agent enhancement. Furthermore a calculation of maps using automatically selected local Arterial Input Functions (AIF) is provided to reduce the amount of user interactions. The detailed evaluation of brain perfusion data sets generates parameter maps for TTP and PBP and for the hemodynamic parameters relMTT, relCBV, rel CBVcor and relCBF. These may show perfusion deficits and assist in the diagnosis and grading of e.g. vascular deficiencies and brain tumors.	$7,117
1	14401503	**Diffusion Tensor Imaging #Tim**	$11,862
1	14446591	**Advanced Diffusion #T+D** Advanced Diffusion is a package consisting of the diffusion-weighted, readout-segmented EPI sequence RESOLVE and the noise reduced QuietX DWI sequence.	$7,117
1	14416965	**Arterial Spin Labeling 3D #T+D** 3D acquisition of non-contrast enhanced brain perfusion with a TGSE sequence for mininal susceptibility and full brain coverage. Higher SNR, optimized contrast uniformity and reduced motion sensitivity. Inline calculation of PWI (perfusion weighted images) for a qualitative assessment of brain perfusion.	$18,979
1	14416908	**Tim Whole Body Suite #T+D** Tim Whole Body Suite puts it all together. This suite enables table movement for imaging of up to 205 cm (6' 9") FoV without compromise. In combination with Tim's newly designed ultra highdensity array higher spatial and temporal resolution can be achieved along with unmachted flexibility of any coverage up to Whole Body. For faster exams and greater diagnostic confidence.	$16,607
1	14405328	**TWIST syngo #Tim** This package contains a Siemens unique sequence and protocols for time-resolved (4D) MR angiographic and dynamic imaging in general with high spatial and temporal resolution. syngo TWIST supports comprehensive dynamic MR angio exams in all body regions. It offers temporal information of vessel filling in addition to conventional static MR angiography, which can be beneficial in detecting or evaluating malformations such as shunts. In case of general dynamic imaging, for example an increase in spatial resolution by a factor of up to 2 at 60 seconds temporal resolution (compared to conventional dynamic imaging) is possible due to intelligent k-space sampling strategies. Alternatively, increased temporal resolution at constant spatial resolution is possible.	$14,235
1	14416960	**Shoulder 16 Coil Kit #Ae** The new Tim 4G coil technology with Dual Density Signal Transfer and SlideConnect Technolgy combines key imaging benefits: excellent image quality, high patient comfort, and unmatched flexibility. The Shoulder 16 Coil Kit for examinations of the left or right shoulder consists of a base plate and two different sized iPAT compatible 16 channel coils (Shoulder Large 16 and Shoulder Small 16). These will be attached and can be relocated on the base plate.The 16-element coils with 16 integrated pre-amplifiers ensure maximimum signal-to-noise ratio. Shoulder Large 16 and Shoulder Small 16 will be connected via a SlideConnect plug for fast and easy coil set-up and patient preparation.	$28,469
1	14416962	**Foot/Ankle 16 #Ae** The new Tim 4G coil technology with Dual Density Signal Transfer and DirectConnect Technolgy combines key imaging benefits: excellent image quality, high patient comfort, and unmatched flexibility.	$35,586

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40 Liberty Boulevard, Malvern, PA 19355
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SIEMENS REPRESENTATIVE
Karen Dixon - (865) 360-8644

PRELIMINARY PROPOSAL

Qty	Part No.	Item Description	Extended Price
		Foot/Ankle 16 for examinations of the left or right foot and ankle region consists of a base plate and an iPAT compatible 16-channel coil and allows high resolution imaging of the foot and ankle within one examination. Foot/Ankle 16 is a cable-less coil and will be connected via DirectConnect for fast and easy patient preparation.	
1	14416955	**Body 18 #Ae** The Tim 4G coil technology with Dual Density Signal Transfer and SlideConnect Technolgy combines key imaging benefits: excellent image quality, high patient comfort, and unmatched flexibility: - 18 channels (inherent) or up to 30 (in combination with the Spine 32) - Dual Density Signal Transfer - Ultra light-weight - SlideConnect Technology The Body 18 is part of the standard configuration. The 18-channel coil with its 18 intergrated pre-amplifiers ensures excellent signal-to-noise ratio. The 18 coil elements provide extensive coverage in all directions. The single SlideConnect plug allows for fast and easy patient preparation. The light-weight coil ensures highest patient comfort. The Body 18 Coil features: - 18-element design with 18 integrated preamplifiers (3 clusters of 6 elements each) - Operates in an integrated fashion with the Spine 32 as an 30 channel body coil - Can be combined with further Body 18 coils for larger coverage - Can be positioned in different orientations (0°, 90°, 180°, 270°) for patient specific adaptations - No coil tuning - iPAT compatible in all directions The highly flexible design enables a wide variety of applications including: - Thorax (incl. heart) - Abdomen - Pelvis - Hip Typically combined with: - Head / Neck 20 - Spine 32 - Additional Body 18 coil(s) (optional) - Peripheral Angio 36 (optional) - Flex Large 4 - Flex Small 4 - Loop coils (optional) - Endorectal coil (optional)	$35,586
1	14407261	**MR Workplace Container, 50cm** 50 cm wide extra case for the syngo host computer with sliding front door to allow change of storage media (CD/DVD/USB).	$949
1	08857828	**UPS Cable #Tim** Power cable for connecting the UPS Powerware PW 9130-3000i (14413662) to the ACC of MAGNETOM Tim and MAGNETOM Tim+Dot systems for backing up the computer. Standard cable length: 9 m.	$1,500

Siemens Medical Solutions USA, Inc.
40 Liberty Boulevard, Malvern, PA 19355
Fax: (866) 309-6967

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Karen Dixon - (865) 360-8644

PRELIMINARY PROPOSAL

Qty	Part No.	Item Description	Extended Price
1	14413662	**UPS Powerware PW9130G-3000T-XLEU** UPS system Eaton PW9130G-3000T-XLEU for MAGNETOM Tim, MAGNETOM Tim+Dot and MAGNETOM Symphony systems for safeguarding computers. Power output: 3.0 kVA / 2.7 kW Bridge time: 5 min full load / 14 min half load Input voltage: 230 VAC	$2,700
1	14413663	**UPS Battery module** UPS battery module Eaton PW 9130N-3000T-EBM for all MAGNETOM Tim, MAGNETOM Tim+Dot and MAGNETOM Symphony systems for safeguarding computers. Extension for: PW9130i-3000T Battery type: Closed, maintenance-free Extension of the bridge time to: 24 minutes with a module Dimensions (H x W x D): Battery module: 346 x 214 x 412 mm incl. bracket set Weight: approx. 50 kg	$1,000
1	MR_STD_RIG_INST	**MR Standard Rigging and Installation** MR Standard Rigging and Installation This quotation includes standard rigging and installation of your new MAGNETOM system Standard rigging into a room on ground floor level of the building during standard working hours (Mon. - Fri./ 8 a.m. to 5 p.m.) It remains the responsibility of the Customer to prepare the room in accordance with the SIEMENS planning documents Any rigging requiring a crane over 80 tons and/or special site requirements (e.g. removal of existing systems, etc.) is an incremental cost and the responsibility of the Customer. All other "out of scope" charges (not covered by the standard rigging and installation) will be identified during the site assessment and remain the responsibility of the Customer.	$0
1	MR_BTL_INST ALL	**MR Standard Rigging & Install**	$15,000
1	MR_BUDG_ADDL_RIG	**Budgetary Add'l/Out of Scope Rigging**	$10,000
1	MR_PREINST_DOCK	**T+D Preinstall kit for dockable table**	$550
1	MR_CRYO	**Standard Cryogens**	$8,000
1	MR_PM	**MR Project Management** A Siemens Project Manager (PM) will be the single point of contact for the implementation of your Siemen's equipment. The assigned PM will work with the customer's facilities management, architect or building contractor to assist you in ensuring that your site is ready for installation. Your PM will provide initial and final drawings and will coordinate the scheduling of the equipment, installation, and rigging, as well as the initiation of on-site clinical education.	$0
1	MR_INITIAL_32	**Initial onsite training 32 hrs** MR_INITIAL_32 Up to (32) hours of on-site clinical education training, scheduled consecutively (Monday - Friday) during standard business hours for a maximum of (4) imaging professionals. Training will cover agenda items on the ASRT approved checklist. Uptime Clinical Education phone support is provided during the warranty period for specified posted hours. This educational offering must be completed (12) months from install end date. If training is not completed within the applicable time period, Siemens obligation to provide the training will expire without refund.	$7,800

Siemens Medical Solutions USA, Inc.
40 Liberty Boulevard, Malvern, PA 19355
Fax: (866) 309-6967

SIEMENS REPRESENTATIVE
Karen Dixon - (865) 360-8644

PRELIMINARY PROPOSAL

Qty	Part No.	Item Description	Extended Price
1	MR_FOLLOWUP_24	**Follow-up training 24 hrs** Up to (24) hours of follow-up on-site clinical education training, scheduled consecutively (Monday - Friday) during standard business hours for a maximum of (4) imaging professionals. Uptime Clinical Education phone support is provided during the warranty period for specified posted hours. This educational offering must be completed (12) months from install end date. If training is not completed within the applicable time period, Siemens obligation to provide the training will expire without refund.	$6,300
1	MR_INT_DOT_BCLS	**MR Dot Training Class** Tuition for (1) imaging professional to attend Classroom Course at Siemens Training Center. The objectives of this class are to introduce the user interface of the common syngo platform, including Dot, and instructions on building protocols, demonstration of software functions, and hands-on sessions. This class includes lunch, economy airfare, and lodging for (1) imaging professional. All arrangements must be arranged through Siemens designated travel agency. This educational offering must be completed (12) months from install end date. If training is not completed within the applicable time period, Siemens obligation to provide the training will expire without refund.	$4,500
1	KKTECOMR_60	**KKT ECOCHILLER 133L** The KKT ECO 133 -L chiller is a dedicated 20°C cooling system for MAGNETOM Aera and MAGNETOM Skyra which automatically adapts to the different cooling requirements (e.g. system in operation, standby, ...) to reduce the energy consumption for cooling. The cooling system must be used in combination with the IFP (Interface Panel), if there is no on-site chilled water supply at all. The IFP is included in the scope of supply.	$38,000
1	CHILINST_AVTSY_PR_TEAMPLAY	**Chiller Start-up and Warranty for TIM**	$3,750
1		**teamplay Welcome & Registration Package** teamplay is a cloud-based network that brings together your imaging modality users, the systems' dose and utilization data, and the users' expertise to help you improve the delivery of care to your patients. Basic features are provided free of charge. Premium features (benchmarking, non-Siemens devices) are provided on a trial basis for three months at no charge, and may be used thereafter on a subscription fee basis. To register: http://teamplay.siemens.com/#/institutionRegistration/1	$0
		System Total:	**$1,300,000**

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PRELIMINARY PROPOSAL

OPTIONS on Quote Nr: **1-CCUL7G Rev. 9**

OPTIONS for MAGNETOM Aera - USA

All items listed below are OPTIONS:

Qty	Part No.	Item Description	Extended Price
1	14441813	**QISS #T+D** Software package with QISS sequence, protocols and Dot AddIn for non-contrast enhanced peripheral MRA. QISS particularly enables higher reproducibility than existing methods and is an alternative to MR angiography techniques with contrast medium, especially for patients with severe renal insufficiency.	+ $13,400
1	14413612	**Tissue 4D syngo #Tim** Tissue 4D is an application for visualizing and post-processing dynamic contrast-enhanced 3D datasets. This card provides two evaluation options: - Standard curve evaluation - Curve evaluation according to a pharmacokinetic model	+ $35,000
1	14416929	**Advanced Cardiac Package #T+D** This package contains special sequences and protocols for advanced cardiac imaging including 3D and 4D syngo BEAT functionalities. It supports advanced techniques for ventricular function imaging, dynamic imaging, tissue characterization, coronary imaging, and more.	+ $50,000
1	14402527	**SWI #Tim** Susceptibility Weighted Imaging is a high-resolution 3D imaging technique for the brain with ultra-high sensitivity for microscopic magnetic field inhomogeneities caused by deoxygenated blood, products of blood decomposition and microscopic iron deposits. Among other things, the method allows for the highly sensitive proof of cerebral hemorrhages and the high-resolution display of venous cerebral blood vessels.	+ $16,750
1	14416941	**Spectroscopy Package #T+D** The Spectroscopy Package is a comprehensive software package which bundles Single Voxel Spectroscopy, 2D Chemical Shift Imaging, 3D Chemical Shift Imaging and syngo Spectroscopy Evaluation. Sequences and protocols for proton spectroscopy, 2D and 3D proton chemical shift imaging (2D CSI and 3D CSI) to examine metabolic changes in the brain (e.g. in tumors and degenerative diseases) and in the prostate are included. Furthermore included is the comprehensive syngo Spectroscopy Evaluation Software which enables fast evaluation of spectroscopy data on the syngo Acquisition Workplace.	+ $33,500
1	14416958	**Peripheral Angio 36 #Ae** The new Tim 4G coil technology with Dual Density Signal Transfer and SlideConnect Technolgy combines key imaging benefits: excellent image quality, high patient comfort, and unmatched flexibility: - 36 channels - Dual Density Signal Transfer - Ultra light-weight - SlideConnect Technology The 36-channel coil includes 36 integrated pre-amplifiers for excellent signal-to-noise ratio.	+ $40,200

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PRELIMINARY PROPOSAL

Qty	Part No.	Item Description	Extended Price
		The single SlideConect Plug allows for fast and easy patient preparation. The Peripheral Angio 36 features: - 36-element design with 36 integrated preamplifiers, distributed over 6 planes with 6 elements each - Operates in an integrated fashion with Body 18 coils and with the Spine 32 . For Whole-Body examinations also with the Head/ Neck 20 - Automatic table feed and active coil switch - Can be utilized head and feet first - Both legs are independently covered with coil elements, maximizing the coil filling factor and the signal-to-noise ratio - No coil tuning - iPAT-compatible - Dual-Density Signal Transfer enables ultra-high density coil designs by integrating key RF components into the local coil - SlideConnect technology for easy coil set up - One cable only for easy handling - Includes special non-ferromagnetic coil cart for safe, user-friendly storage Applications: - High-resolution angiography of both legs incl. Pelvis (by additional use of the Body 18) with highest signal-to-noise ratio - Visualization of the iliac arteries and aorta in combinaton with Body 18 - Bilateral examinations of long bones of the legs Typically combined with: Head/ Neck 20, Body 18, Spine 32, and all flexible coils such as Flex Large 4 or Flex Small 4	

FINANCING: The equipment listed above may be financed through Siemens. Ask us about our full range of financial products that can be tailored to meet your business and cash flow requirements. For further information, please contact your local Sales Representative.

Siemens Healthcare is pleased to submit this Preliminary Pricing Proposal. A Preliminary Pricing Proposal is provided for planning purposes only; it is not contractually binding. To receive a contractually binding proposal for the Products listed above, inclusive of Terms, Conditions, and Warranty coverage, please contact your Siemens Healthcare Sales Representative.

Siemens Healthcare

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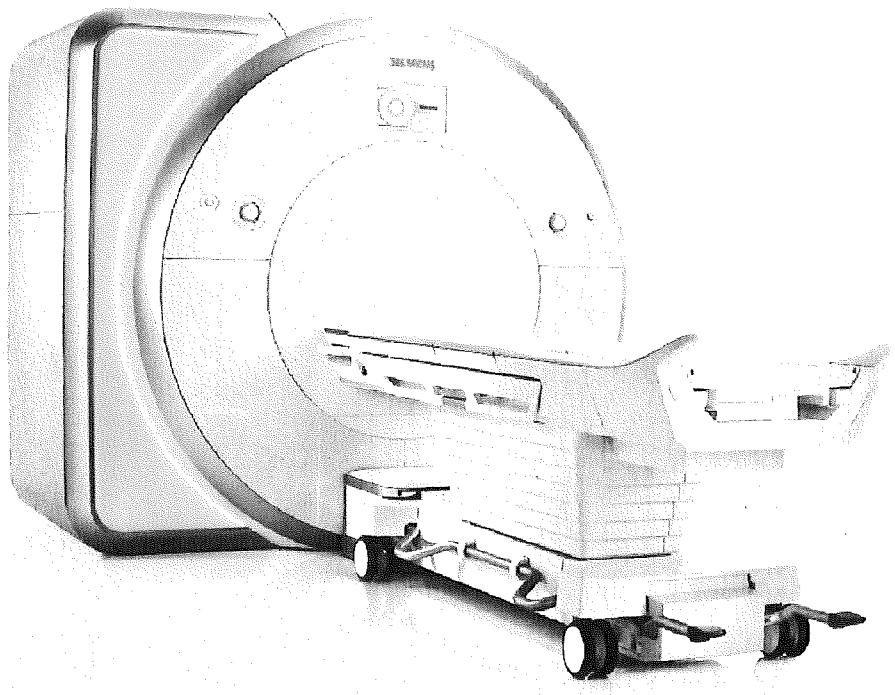
MAGNETOM AERA 1.5T

TYPICAL ROOM PLAN



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

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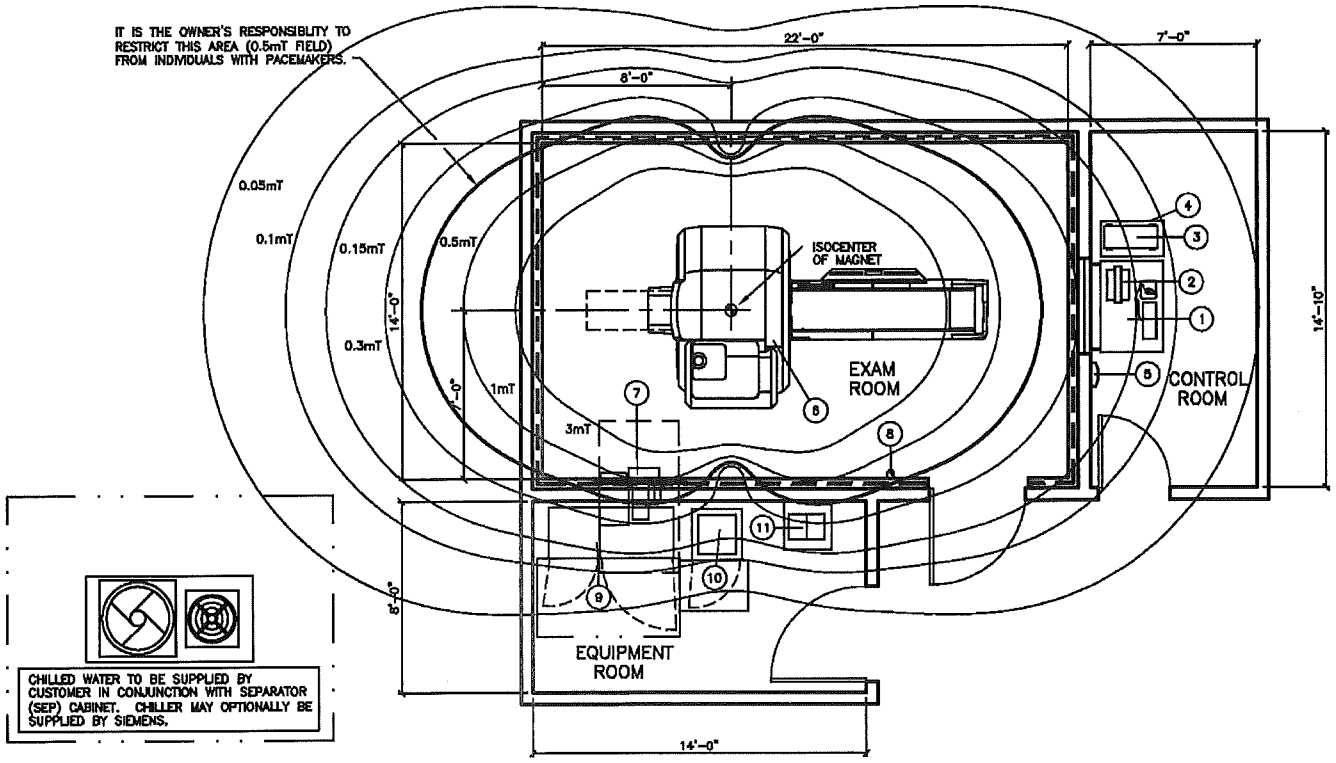
MAGNETOM AERA 1.5T

TYPICAL ROOM PLAN



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

EQUIPMENT LEGEND

NO	DESCRIPTION	SMS SYM	WEIGHT (LBS)	BTU/HR TO AIR	DIMENSIONS (INCHES) W	D	H	REMARKS
1	MRC OPERATING CONSOLE AND KEYBOARD	MK	132	---	45 11/16	35 1/4	28 3/8	
2	COLOR MONITOR FOR MRC	M	22	239	18 5/16	16 15/16	4 3/4	ON CONSOLE/COUNTER
3	HOST PC MRC	PC	49	2,389	11	27	18 1/8	
4	CONTAINER FOR HOST 500	C	238	---	19 5/8	31 1/2	28 3/8	
5	ALARM BOX	AB	2	---	9	4	9	
6	1.5T MAGNET WITH COVERS AND PATIENT TABLE	B	10,093	3,415	91	170	86	
7	RF-FILTER PLATE	FI	285	853	46 1/2	21 3/4	21 1/2	
8	MAGNET STOP	MS	1	---	3	5	3	
9	ELECTRONICS CABINET (GPA/EPC CABINET)	GPA	3,307	13,649	61 1/2	26	77 1/2	
10	SEP CABINET	SEP	750	3,415	25 5/8	25 5/8	73 5/8	
11	POWERWARE 9130 UPS WITH EBM (OPTION)	UPS	186	1,257*	16 7/8	12 7/8	16 1/4	*1,755 ON BATTERIES

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MAGNETOM AERA 1.5T

SPECIFICATIONS

POWER REQUIREMENTS

VOLTAGE RANGE: 480 VAC ±10% FOR ALL LINE AND LOAD CONDITIONS.
VOLTAGE BALANCE: 2% MAXIMUM DIFFERENCE BETWEEN PHASES

FREQUENCY:	60 Hz ± 1.0 Hz
LINE IMPEDENCE:	95 mOHMS
STAND BY POWER CONSUMPTION	9.0 kW
TYPICAL POWER CONSUMPTION DURING EXAM	20.1 KW
CONNECTION VALUE (LESS THAN 5 MINUTES)	110 KVA
MOMENTARY POWER	140 KVA
RECOMMENDED TRANSFORMER	150 KVA
MR SYSTEM OVERCURRENT PROTECTION	150 AMPS
RECOMMENDED UPS	160 KVA
UPS SYSTEM OVERCURRENT PROTECTION	250 AMPS
MAX. ALLOWABLE VOLTAGE DROP AT MAX. POWER	6.0%

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.

2) RECOMMENDED TRANSFORMER SIZE (SYSTEM WITHOUT UPS) IS BASED ON INDUSTRY STANDARD ISOLATION TRANSFORMER KVA RATINGS. SOURCE IMPEDANCE FEEDING THE MAGNETOM SYSTEM, INCLUDING ANY ISOLATION TRANSFORMERS, MUST MEET EQUIPMENT REQUIREMENTS AS LISTED HERE. SIEMENS RECOMMENDS A TRANSFORMER WITH COPPER WINDINGS, AN ELECTRO-STATIC SHIELD, AND A LOW IMPEDANCE (<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 LOWER.

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

6) LONG-TIME POWER IS BASED ON THE HIGHEST AVERAGE RMS VALUES FOR A PERIOD EXCEEDING 5 MINUTES DURING CLINICAL SYSTEM OPERATION, AS DEFINED IN NEC 517.2.

7) 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.

NOISE LEVELS

SYSTEM ROOM	NOISE LEVEL / dB(A)
CONTROL ROOM	<55
EXAMINATION ROOM	86.1 dB(A) – 8 HOUR AVERAGE 108.2 dB(A) MAXIMUM
EQUIPMENT ROOM	<65

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

CEILING HEIGHTS

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

REMOTE SYSTEM DIAGNOSTICS

SIEMENS REMOTE SERVICES (SRS) REQUIRES A CONNECTION BETWEEN THE SRS REMOTE SERVER AND SIEMENS SYSTEMS VIA REMOTE LOCAL AREA NETWORK ACCESS, TO ENSURE THE UPTIME OF YOUR SYSTEM.

THIS SERVICE REQUIRES ONE OF THE FOLLOWING CONNECTION METHODS:
1. (PREFERRED) VPN – WHERE THE CUSTOMER HAS AVAILABLE A VPN CAPABLE FIREWALL OR OTHER VPN APPLIANCE.
2. (OPTIONAL) *SRS ROUTER* – CONNECTED TO ANALOG PHONE LINE VIA *ANALOG MODEM*, ETHERNET CONNECTION TO CUSTOMER'S LAN, AND A POWER OUTLET. NOTE: = *SUPPLIED BY SIEMENS*

FOR MORE INFORMATION

FOR MORE DETAILED PLANNING REQUIREMENTS FOR THIS SYSTEM, SEE THE TYPICAL FINAL DRAWING SET NUMBER: 10023

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MAGNETOM AERA 1.5T

SPECIFICATIONS

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 ECO CHILLER AND INTERFACE PANEL.

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

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

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

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

ENVIRONMENTAL REQUIREMENTS

1) AIR CONDITIONING IS TO PROVIDE A TEMPERATURE OF 70°F ±5°F IN THE 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. 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.

3) THE HEAT INTO THE EXAM ROOM IS LESS THAN 10,236 BTU/HR. THE HEAT INTO THE EQUIPMENT ROOM IS LESS THAN 3,412 BTU/HR. THIS HEAT DISSIPATION IS FROM THE SIEMENS EQUIPMENT ONLY, AUXILIARY SUPPORT EQUIPMENT (ie UPS) AND LIGHTING MUST BE CONSIDERED FOR TOTAL HEAT LOADS.

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

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

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

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

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	204,729 BTU/HR
WATER PRESSURE	MAXIMUM 87 PSI
LOSS OF PRESSURE FOR SEP CABINET	14.5 PSI MAXIMUM
CHILLED WATER ACIDITY RANGE	6 pH TO 8 pH
CHILLED WATER HARDNESS	<250 ppm CALCIUM CARBONATE
CHLORINE GAS CONCENTRATION	<200 ppm
FILTRATION	500 µm

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

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

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

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

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

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

QUENCH VENT NOTES

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

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MAGNETOM AERA 1.5T

SPECIFICATIONS

PROTECTING THE ENVIRONMENT

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

PROTECTING THE MAGNETIC FIELD

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

MAGNETIC FRINGE FIELDS

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

X/Y AND Z AXIS	DEVICES
6'-1" / 9'-2" 3.0mT	SMALL MOTORS, WATCHES, CAMERAS, CREDIT CARDS, MAGNETIC DATA CARRIERS (SHORT-TERM EXPOSURE)
7'-3" / 11'-6" 1.0mT	COMPUTERS, MAGNETIC DISK DRIVES, OSCILLOSCOPES, PROCESSORS
8'-3" / 13'-2" 0.5mT	CARDIAC PACEMAKERS, X-RAY TUBES, INSULIN PUMPS, B/W MONITORS, MAGNETIC DATA CARRIERS (LONG-TERM STORAGE)
9'-9" / 16'-1" 0.2mT	SIEMENS CT SCANNERS
10'-4" / 17'-1" 0.15mT	COLOR MONITORS, SIEMENS LINEAR ACCELERATORS
13'-1" / 22'-3" 0.05mT	X-RAY IMAGE INTENSIFIERS, GAMMA CAMERAS, PET/CYCLOTRON, ELECTRON MICROSCOPES, LINEAR ACCELERATORS

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

MAGNET SITING REQUIREMENTS

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

X/Y AND Z AXIS	SOURCE OF INTERFERENCE
3'-6"	STEEL REINFORCEMENT RODS IN FLOOR - MAXIMUM 20 LBS/SQ. FT.
18'-1" / 21'-4"	STRETCHERS UP TO 110 LBS.
13'-1"	A/C CHILLERS
19'-9" / 23'-0"	TRANSPORT DEVICES UP TO 440 LBS.
21'-4 / 26'-3"	VEHICLES UP TO 2,000 LBS.
23'-0" / 31'-3"	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.

MAXIMUM CABLE LENGTH

THERE ARE 3 DIFFERENT LENGTHS OF CABLE THAT ARE AVAILABLE FOR THE MRI SYSTEM DIFFERENTIATED BY MAXIMUM LENGTHS FROM THE MAGNET TO THE FILTER PANEL (INSIDE) AND FROM THE FILTER PANEL TO THE ELECTRONICS (OUTSIDE).

INSIDE	OUTSIDE
20'	4'
20'	32'
20'	39'

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

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

SIEMENS

FOR REFERENCE ONLY,
NOT FOR CONSTRUCTION.

MAGNETOM AERA 1.5T

SPECIFICATIONS

RF SHIELDING

THE EXAMINATION AREA MUST BE SHIELDED TO PROVIDE A REDUCTION OF RADIO FREQUENCY WAVES EMANATING FROM EXTERNAL TRANSMITTERS. THE REQUIRED ATTENUATION IS 90dB IN THE FREQUENCY RANGE OF 15–128 MHz. 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).

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.

BUILDING VIBRATIONS

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

THE REQUIREMENT FOR a_{max} IS MEASURED AS MAXIMUM RMS VALUE PER FREQUENCY COMPONENT <0.5Hz IN THE FOURIER TRANSFORMATION OF THE RECORDED SIGNAL (SPECTRUM).
THE VIBRATION LEVEL OF CONTINUOUS VIBRATIONS (CAUSED BY AIR CONDITIONER, COMPRESSOR, ETC.) AT THE LOCATION OF THE MAGNET MUST NOT EXCEED THE SPECIFED VALUES.
FOR ALL NON–CONTINOUS TRANSIENT VIBRATIONS THE FIGURES SHOULD BE MULTIPLIED BY 4 (OR 12dB).

CONTACT SIEMENS PROJECT MANAGER FOR MORE DETAILS.

TRANSPORTING REQUIREMENTS

LARGEST ITEM – MAGNET – 9,566 LBS.

MINIMUM MAGNET DIMENSIONS WITH TRANSPORT WHEELS UNDER MAGNET:

7'–7" HIGH X 7'–7" WIDE X 5'–2" DEEP WITHOUT TABLE SUPPORT, 6'–0" DEEP WITH TABLE SUPPORT.

THE ROOF HATCH/DELIVERY OPENING SHOULD BE 4" LARGER.

TO TRANSPORT THE GPA/EPC CABINET (3,307 POUNDS) A MINIMUM ROOM HEIGHT OF 6'–9" IS REQUIRED, 6'–3" WITH WHEELS REMOVED, 6'–1" WITH WHEELS AND MAINS CONNECTION REMOVED.