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Final Site Preparation Support Document

The equipment components shown in this drawing package are based on the current proposed purchase and are subject to change if modifications are made to the configuration.

*Photo shown is not site specific.

Revision History

Note for Architects and/or Contractors: If revisions are listed, these drawings must be thoroughly reviewed so that all changes can be incorporated into your project

Rev.	Date	Revision Descriptions	By
-	8/29/2019	Created preliminary site preparation support document	BN
A	10/15/2019	Created Final site preparation support document	BN
B	11/9/2020	Created preliminary site preparation support document for new system location.	BN
C	1/5/2021	Created Final site preparation support document	BN
01	1/25/2021	A2/SD9-SD11 - Added shielding calculations for 5 Gauss containment at back (plan west) wall.	JY

Table of Contents

PHILIPS

Project
Ingenia Ambition 1.5T X
Good Samaritan Hospital of Suffern
Community Medical Care
Suffern, NY
Room: MRI 1.5T (TMP 92)

Philips Contacts
Project Manager: Rich Halm
Contact Number: (860) 373-3707
Email: richard.halm@philips.com
Drawn By: Jonathan Yoo

Project Details
Drawing Number
N-EAS190432A .01
Date Drawn: 3/3/2021
Quote: 1-234MMCF Rev. 1
1-22J8ETR Rev. 3
Order: 6600448936.0100000
6600448836.0100000-.020000

C1

General Specifications

1. Responsibility
The customer shall be solely responsible, at their expense for preparation of site, including any required structural alterations. The site preparation shall be in accordance with plans and specifications provided by Philips. Compliance with all safety electrical and building codes relevant to the equipment and its installation is the sole responsibility of customer. The customer shall advise Philips of conditions at or near the site which could adversely affect the carrying out of the installation work and shall ensure that such conditions are corrected and that the site is fully prepared and available to Philips before the installation work is due to begin. The customer shall provide all necessary plumbing, carpentry work, or conduit wiring required to attach and install products ready for use.

2. Permits
Customer shall obtain all permits and licenses required by federal, state/provincial or local authorities in connection with the construction, installation and operation of the products and related rules, regulations, shall bear any expense in obtaining same or in complying with any ordinances and statutes.

3. Asbestos and Other Toxic Substances
Philips assumes no hazardous waste (i.e., PCB's in existing transformers) exists at the site. If any hazardous material is found, it shall be the sole responsibility of the customer to properly remove and dispose of this material at its expense. Any delays caused in the project for this special handling shall result in Philips time period for completion being extended by like period of time. Philips assumes that no asbestos material is involved in this project in any ceilings, walls or floors. If any asbestos material is found anywhere on the site, it shall be the customer's sole responsibility to properly remove and/or make safe this condition, at the customer's sole expense.

4. Labor
In the event local labor conditions make it impossible or undesirable to use Philips' regular employees for such installation and connection, such work shall be performed by laborers supplied by the customer, or by an independent contractor chosen by the customer at the customer's expense, and in such case, Philips agrees to furnish adequate engineering supervision for proper completion of the installation.

5. Schedule
The general contractor should provide Philips with a schedule of work to assist in the coordination of delivery of Philips supplied products which are to be installed by the contractor and delivery of the primary equipment.

6. Extended Installation or Turnkey Work by Philips
Any room preparation requirements for Philips equipment indicated on these drawings is the responsibility of the customer. If an extended installation or turnkey contract exists between Philips and the customer for room preparation work required by the equipment represented on these drawings, some of the responsibilities of the customer as depicted in these drawings may be assumed by Philips. In the event of a conflict between the work described in the turnkey contract workscope and these drawings, the turnkey contract workscope shall govern.

(14.0)

Ambient Experience Requirements

Supply Configuration: Single Phase, 3 wire power, neutral and ground

Nominal Line Voltage: 110 - 240 VAC, 60 Hz.

Circuit Breaker: 15 Amps, 110V
Dedicated neutral circuit required

(14.0)

Minimum Site Preparation Requirements

A smooth efficient installation is vital to Philips and their customers. Understanding what the minimum site preparation requirements are will help achieve this goal. The following list clearly defines the requirements which must be fulfilled before the installation can begin.

1. Walls to be painted or covered, baseboards installed, floors to be tiled and/or covered, ceiling shall have grid tiles and lighting fixtures installed and operational.

2. Doors and windows, especially radio frequency shielding, installed and finished with locksets operational.

3. All electrical convenience, conduit, raceway, knockouts, cable openings, chase nipples, and junction boxes installed and operational.

4. Incoming mains power operational and connected to room MR mains breaker.

5. 115V convenience outlets operational.

6. All support structure correctly installed. All channels, pipes, beams and/or other supporting devices should be level, parallel, and free of lateral or longitudinal movements.

7. All contractor supplied cables pulled and terminated.

8. A dust-free environment in and around the procedure room.

9. All HVAC (heating, ventilating and air conditioning) installed and operational as per specifications.

10. Architectural features such as computer floor, wood floor, casework, bulkheads, installed and finished.

11. All plumbing installed and finished.

12. Clear door openings and pathway leading up to and into the exam room are recommended to be 48" (1220mm) W x 84" (2135mm) H. Minimum 40" (1000mm) W x 81" (2050mm) H, contingent on an 8' - 0" (2440mm) corridor width.

13. The magnet is the only system part that in most cases cannot be transferred through the door of the RF enclosure. A special opening to allow its installation in the enclosure must therefore be made available. The recommended transfer opening dimensions are 7' - 10 $\frac{1}{2}$" (2400mm) H x 8' - 3" (2500mm) W.
Refer to Sheet AD2 for transport dimension details.

14. Internet access is required to be available in the control area prior to system delivery for Web FSE access. Refer to Sheet EL of the final drawing package for details.

15. Remote Service Diagnostics - Medical imaging equipment to be installed by Philips Medical is equipped with a service diagnostic feature which allows for remote and on site service diagnostics. To establish this feature, a RJ45 type ethernet 10/100/1000 Mbit network connector must be installed as shown on plan. Access to customer's network via their remote access server is needed for Remote Service Network (RSN) connectivity. All cost with this feature are the responsibility of the customer.

Note
Once Philips has moved equipment into the suite and started the installation, the contractor shall schedule his work around the Philips installation team on site.

All contractor work should be completed within 3 days of delivery to prepare for magnet ramping.

(19.0)

MRI Chiller Requirements

Chilled water is required for Magnet cooling. For chillers purchased from Philips, KKT chillers shall provide chiller commissioning and in-warranty chiller service. Philips can provide contractors who will perform turnkey installation of mechanical, electrical, and plumbing requirements for the chiller installation at an additional cost. Consult with Philips Sales to arrange for turnkey services.

Refer to Sheet MP2 of final drawing package for complete chiller requirements.

(16.0)

Electrical Requirements

Supply Configuration: 3 phase, 3 wire power, unity ground, and bonded ground

Nominal Line Voltage: 480 VAC, 60 Hz

Branch Power Requirement: 80 kVA(for MRI system)
125 kVA (for system UPS)

Circuit Breaker: 3 pole, 100 Amps (480 VAC)(for MRI system)
3 pole, 150 Amps (480 VAC) (nominal for UPS system)
or 3 pole, 200 Amps (480 VAC) (O.C.P. device rating per Staco UPS manual)

Note:
For voltages other than 480 VAC, customer must provide a PDU which is capable to meet system requirements.
Note: It is absolutely required to have the MDU connected to hospital power the first day of magnet delivery.
Refer to sheet ED1 of final drawing package for complete electrical requirements.

(20.0)

KKT Chiller Requirements

Supply Configuration Voltage: 460 VAC / 3 phase / 60Hz +/- 10%

Circuit Breaker: 60 Amps (for standard cBoxX60 chiller)
80 Amps (for high ambient cBoxX70 chiller used at sites with outdoor ambient air temperatures above 113F. Consult your local Philips Project Manager for confirmation.)

(17.0)

HVAC Requirements for General Equipment Locations

Heating, ventilation, air conditioning requirements concern all rooms (equipment room, magnet room, and control room) and must be maintained 24 hours a day, 7 days a week.

Examination Room
Temperature: 65° to 72° Fahrenheit (18° to 22° Celsius)
Maximum Temperature Rate of Change: 9° Fahrenheit (5° Celsius) per 10 minutes
Humidity: 40% to 70%, non-condensing
Air Conditioning Capacity: **7507 BTU/hr (2.2 kW)**
- Energy dissipated in the examination room will be removed from the room by an additional air exhaust system
- Gradient coil heat dissipation (3400 to 51200 BTU/hr [1 to 15 kW]) will be removed via liquid cooling of the gradient coil.
- Exam room temperature and humidity specifications are critical for the MR and must be met at all times. No exceptions are allowed.

Equipment Room
Temperature: 59° to 75° Fahrenheit (15° to 24° Celsius)
- The temperature of the conditioned air that enters the room must not be less than 42° Fahrenheit (6° Celsius) below the mean room temperature.

Maximum Temperature Rate of Change: 9° Fahrenheit (5° Celsius) per 10 minutes
Humidity: 30% to 70%, non-condensing
Air Conditioning Capacity:
- At Standby: 27297 BTU/hr (8 kW)
- Peak Dissipation Scanning: **28321 BTU/hr (8.3 kW)**

Note: Normal standby capacity is 6824 BTU/hr (2 kW). In case of emergency, hospital supplied air cooling must be able to deliver 8 kW cooling if the back up **air** cooled cryo cooler is activated.
Note: Full Load UPS heat dissipation may increase peak dissipation by 28900 BTU/hr (8.5 kW).

Control Room
Temperature: 50° to 95° Fahrenheit (10° to 35° Celsius)
Maximum Temperature Rate of Change: 9° Fahrenheit (5° Celsius) per 10 minutes
Humidity: 30% to 70%, non-condensing
Air Conditioning Capacity: **1024 BTU/hr (0.3 kW)**

Ambient Experience (Patient In-Bore Solution)
Temperature: 32° to 104° Fahrenheit (0° to 40° Celsius)
Humidity: 10% to 80%, non-condensing
- Patient In-bore Monitor is mounted outside of RF cage. PIB monitor may need special heating/coolling to maintain required temperature.

Refer to Sheet MP1 of final drawing package for completed HVAC requirements.

* Heat load indicated above and on Sheet MP1 will be less than the sum of the peak dissipation shown on Sheet AL due to the fact that not all cabinets will run peak heat loads at the same time. Sheet AL shows the peak dissipation for each cabinet measured individually.

(19.0)

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AN

Equipment Legend

A Furnished and installed by Philips
B Furnished by customer/contractor and installed by customer/contractor
C Installed by customer/contractor
D Furnished by Philips and installed by contractor
E Existing
F Future
G Optional
H Furnished by RF Enclosure Supplier and Installed by RF Enclosure Supplier
J Furnished by Philips and Installed by Rigging Company
K Furnished by Philips and Installed by LAP
L Provided by Philips and Installed by RF Enclosure Supplier

	Equipment Designation	Description	Max. Gauss	Weight (lbs)	Heat Load (btu/hr) *	Detail Sheet
A	AECC	Ambient Experience Control Cabinet	50	123	921	AD7
A	LED	LED Module (not shown)	150	24	600	AD7
A	ATSW	AE Touch Screen Elo 1515L (Wall mounted)	-	10.6	41	AD7
A	ATS	AE Touch Screen Elo 1515L	-	10.6	41	AD7
A/L	PIB	Patient In-Bore Solution Monitor	100	217	853	AD7
A	FT	HA FlexTrak	---	113	---	AD7
A	XI	MRXperion Injector	---	94	---	AD6
A	XD	Injector Display Control Unit	---	17.6	675	AD6
A	XPS	iCBC Power Supply Unit	50	6	660	AD6
A	PM	Expression Patient Monitor	---	---	---	AD8
D	UPS	125 kVA Staco UPS Cabinet	5	1742	28900	AD8
D	BC	Staco UPS Battery Cabinet	5	1950	-	AD8
B	CBU	Circuit Breaker (for UPS)	50	t.b.d.	t.b.d.	
D	RSP	Remote Status Monitoring Panel		5	-	AD8

Equipment Legend

A Furnished and installed by Philips
B Furnished by customer/contractor and installed by customer/contractor
C Installed by customer/contractor
D Furnished by Philips and installed by contractor
E Existing
F Future
G Optional
H Furnished by RF Enclosure Supplier and Installed by RF Enclosure Supplier
J Furnished by Philips and Installed by Rigging Company
K Furnished by Philips and Installed by LAP
L Provided by Philips and Installed by RF Enclosure Supplier

	Equipment Designation	Description	Max. Gauss	Weight (lbs)	Heat Load (btu/hr) *	Detail Sheet
A	OT	Operator's Table	-	220	0	AD3
D	ERB	Emergency Run-Down Button (Qty. = 2)	-	3	0	AD3
J	MAG	Magnet Assembly	-	8157	6800	AD3
A	PS	Patient Support (MT)	-	573	1025	AD3
A	GAC	Gradient Amplifier 787 Double Cabinet	150	2015	27900	AD4
A	DACC	Data Acquisition and Control Cabinet	50	787	3400	AD4
D	LCC	Liquid Cooling Cabinet	150	719	4095	AD4
D	ACCC	Air Cooled Cryo-cooler	150	243	19108	AD4
D	MDU	Mains Distribution Unit	150	605	1700	AD4
A	SFB	System Filter Box with Covers	70	175	3400	AD4
B	CBS	Circuit Breaker (For System)	50	t.b.d.	t.b.d.	
B	CBC	Circuit Breaker (For Chiller)	50	t.b.d.	t.b.d.	
D	CH	KKT cBoxX 60 Chiller	10	1477	139898	AD5
D	RDP	KKT Chiller Remote Controller	10	t.b.d.	0	AD5
D	CIP	KKT Chiller Interface Panel	-	132	0	AD5
A	SACU	System Air Cooling Unit	50	55	340	AD5
A	EA	e-Alert	-	1	0	
A	SR	Storage Rail	---	---	-	AD5
A	SP	Service Platform	-	t.b.d.	0	AD6
F	BCP	Backup Power Connection Panel	150	605	t.b.d.	AD6
D	TC	60Hz Transformer Cabinet	-	64	171	AD6
A	FC	Flex Caddy Coil Cart	-	t.b.d.	0	AD5

*** Heat load indicated is peak dissipation for each cabinet measured individually. Peak room heat dissipation as indicated on Sheet AN and MP5 will be different than the sum of each individual cabinet in a given room due to the fact that not all cabinets will run peak heat loads at the same time.**

***Ensure proposed locations shown on Sheet A2 for all components listed on the AL page is outside the Maximum Gauss restriction identified in the AL page.**

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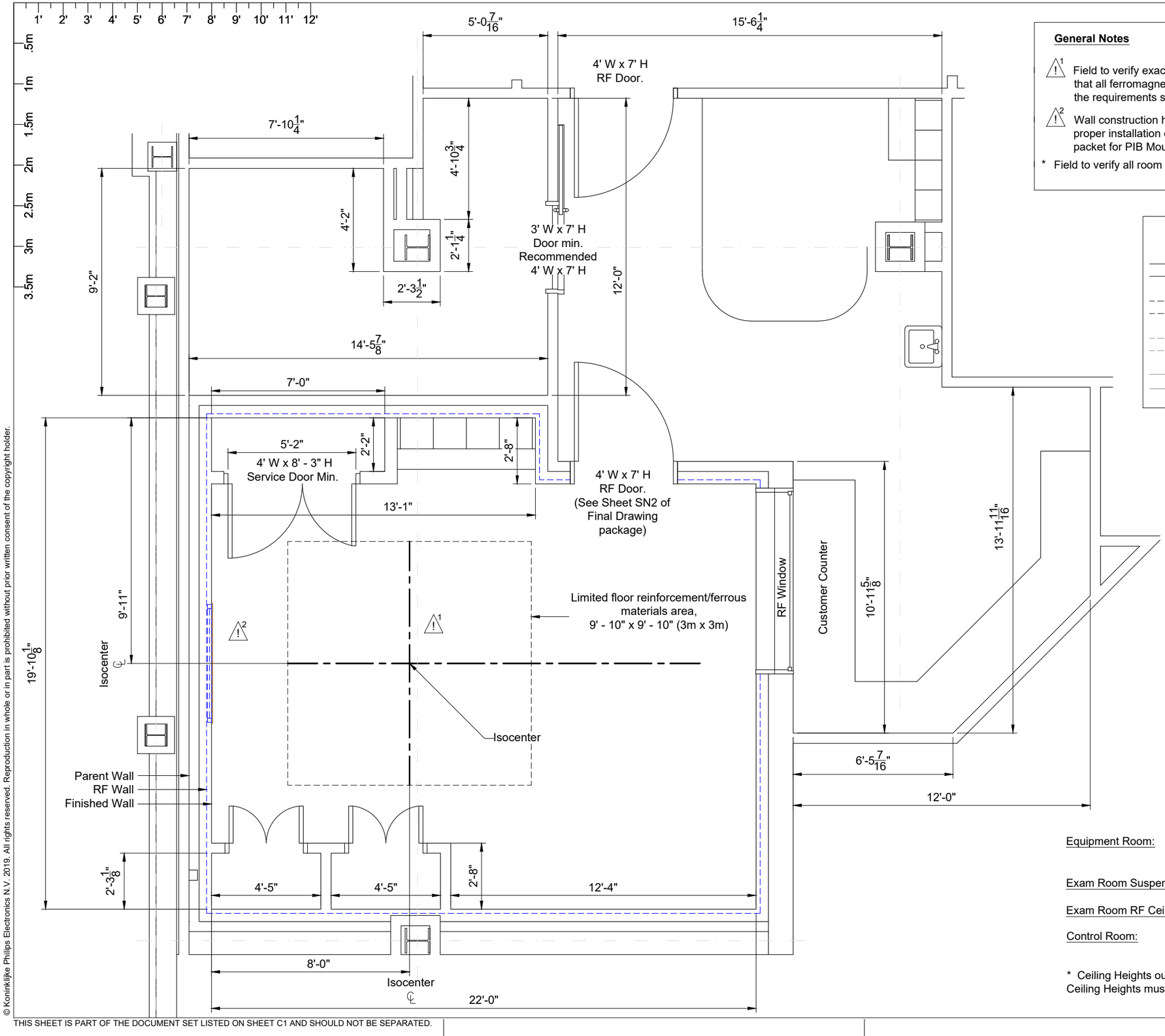
AL



General Notes

1. Field to verify exact location of existing beams inside the exam room. Verify that all ferromagnetic floor reinforcement and beams below the magnet meet the requirements shown on the SN1 page of the final drawing package.
2. Wall construction has been modified to incorporate RF Shield and allow for proper installation of PIB Monitor. Refer to SD pages in the final drawing packet for PIB Mounting details.

* Field to verify all room dimensions.

Legend

- Walls
- Soffit
- Existing (to be removed)
- Beams or other building construction elements

Reported Ceiling Heights from finished floor to bottom of :
Deck above : Unknown
RF Ceiling : Unknown
Exam Room Suspended Ceiling: Unknown
Equipment Room Ceiling: Unknown

Site Layout

1/4" = 1'-0"

Ceiling Height Guide

Equipment Room:	10' - 6" (3200mm)	Recommended
	9' - 2" (2795mm)	***Minimum****
Exam Room Suspended Ceiling:	8' - 3 1/4" (2520mm)	***Required***
Exam Room RF Ceiling:	9' - 9" (2970mm)	Recommended
Control Room:	9' - 10" (3000mm)	Recommended
	7' - 3" (2200mm)	***Minimum***

* Ceiling Heights outside the minimum dimensions may be possible. These Ceiling Heights must be reviewed and approved.

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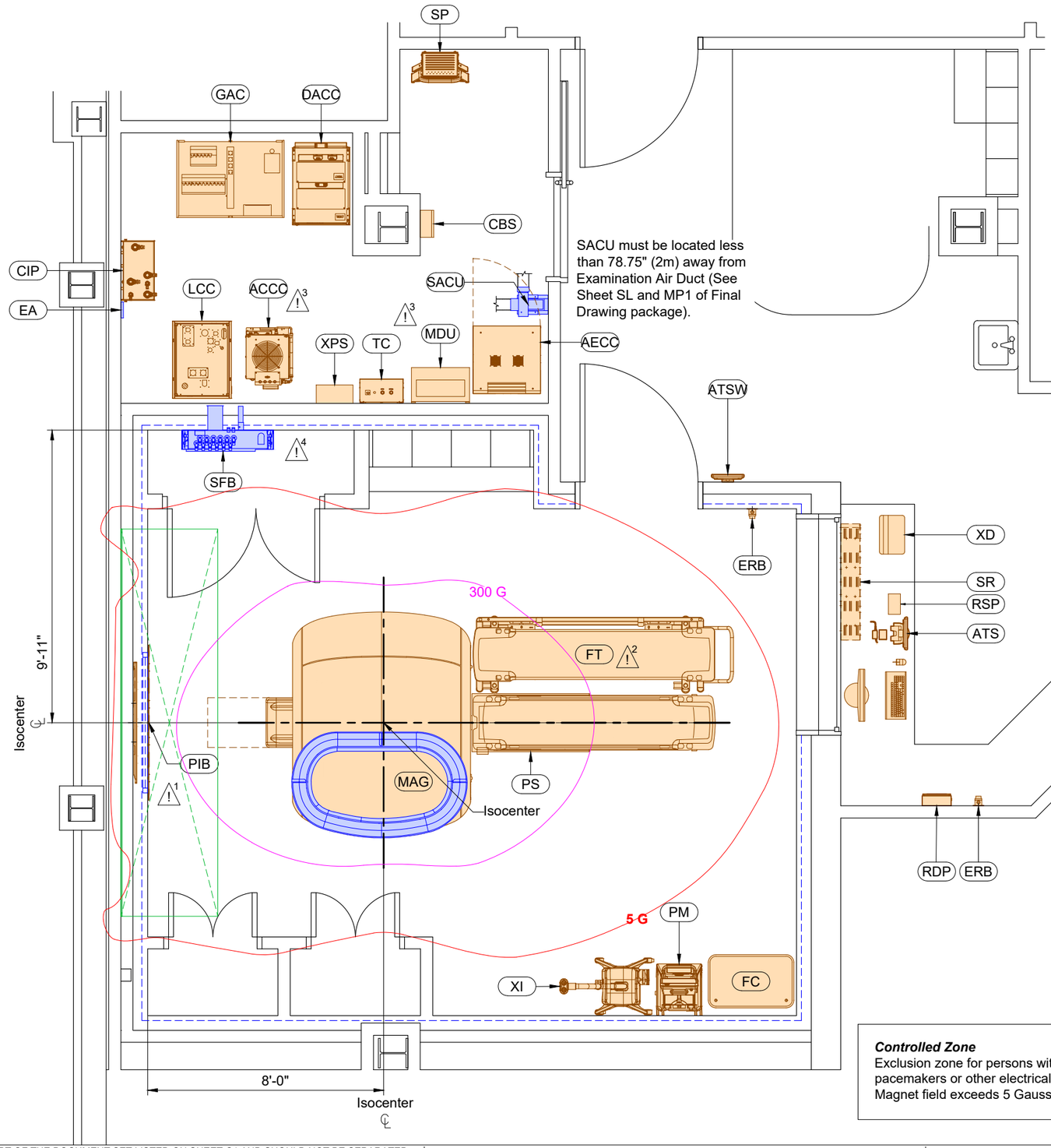
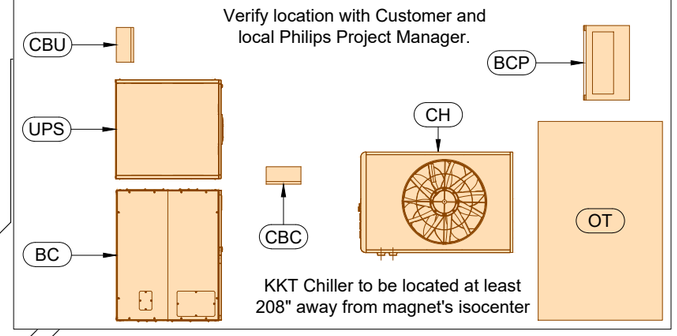
A1





Planning Issues and Considerations

1. Patient In-bore monitor may need special heating/cooling to maintain required temperature (See sheet AN and sheet MP4 of Final Drawing Package for details).
2. Transporting the patient trolley in and out of the room may be difficult / impossible due to the proximity of the RF entry door and the patient couch.
3. When mounting "ACCC, TC, MDU", ensure that RF cage will not be penetrated during installations.
4. 6" W x 8" H air grid to be installed on finished wall 5' - 6" A.F.F. with 6" W x 8" H air duct to the Air intake opening on the right side of SFB

* It is absolutely required to have the MDU connected to hospital power the first day of magnet delivery.

* All floor support below the magnet including floor reinforcement and beams must be verified to meet the requirements shown on the SN1 page of the final drawing package.

* If metal is needed inside the Examination room for air ducts, suspended ceiling, wall construction, cabinets, etc; they must be non-ferromagnetic. This is to avoid potential image quality issues and missile effects due to attraction forces of the magnetic field.

* Field to verify all existing Philips and/or third party equipment will not affect the functionality of the system and its components.

Controlled Zone
Exclusion zone for persons with cardiac pacemakers or other electrical implants - Magnet field exceeds 5 Gauss (0.5 mT).

Equipment Layout

1/4" = 1'-0"

Ceiling Height Guide

Equipment Room:	10' - 6" (3200mm)	Recommended
	9' - 2" (2795mm)	***Minimum****
Exam Room Suspended Ceiling:	8' - 3 1/4" (2520mm)	***Required***
Exam Room RF Ceiling:	9' - 9" (2970mm)	Recommended
Control Room:	9' - 10" (3000mm)	Recommended
	7' - 3" (2200mm)	***Minimum***

* Ceiling Heights outside the minimum dimensions may be possible. These Ceiling Heights must be reviewed and approved.

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A2

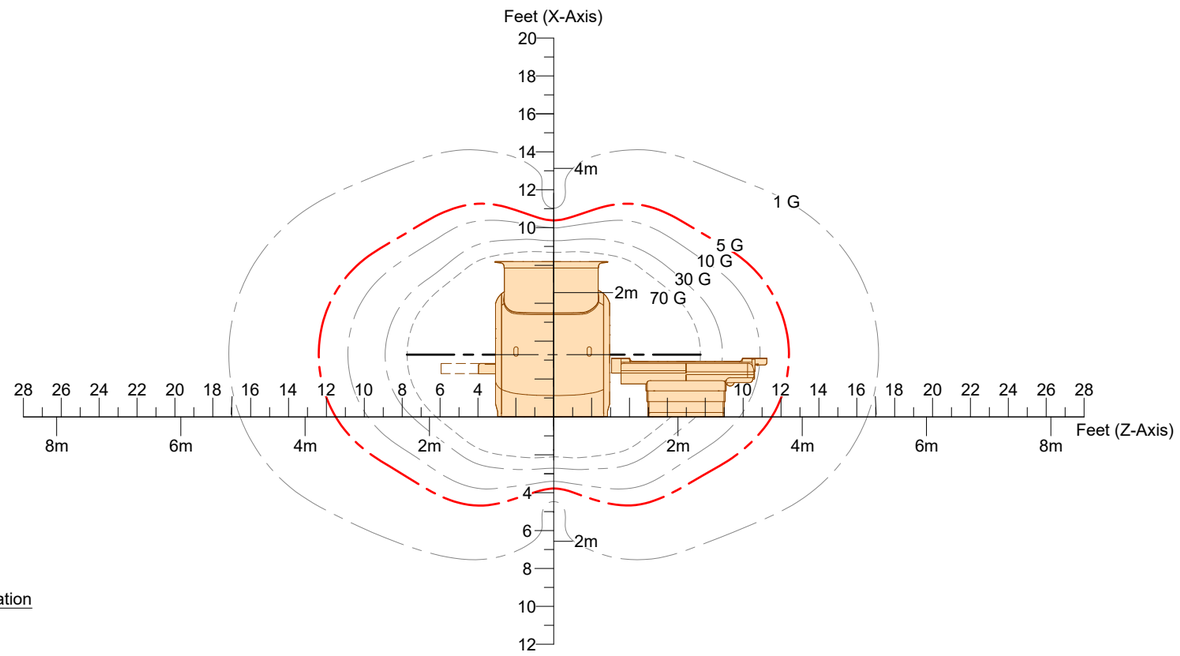
6.30.2020

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

THE INFORMATION IN THIS PACKAGE IS PROVIDED AS A CUSTOMER CONVENIENCE, AND IS NOT TO BE CONSTRUED AS ARCHITECTURAL DRAWINGS OR CONSTRUCTION DOCUMENTS. Philips assumes no liability nor offers any warranty for the fitness or adequacy of the premises or the utilities available at the premises in which the equipment is to be installed, used, or stored.

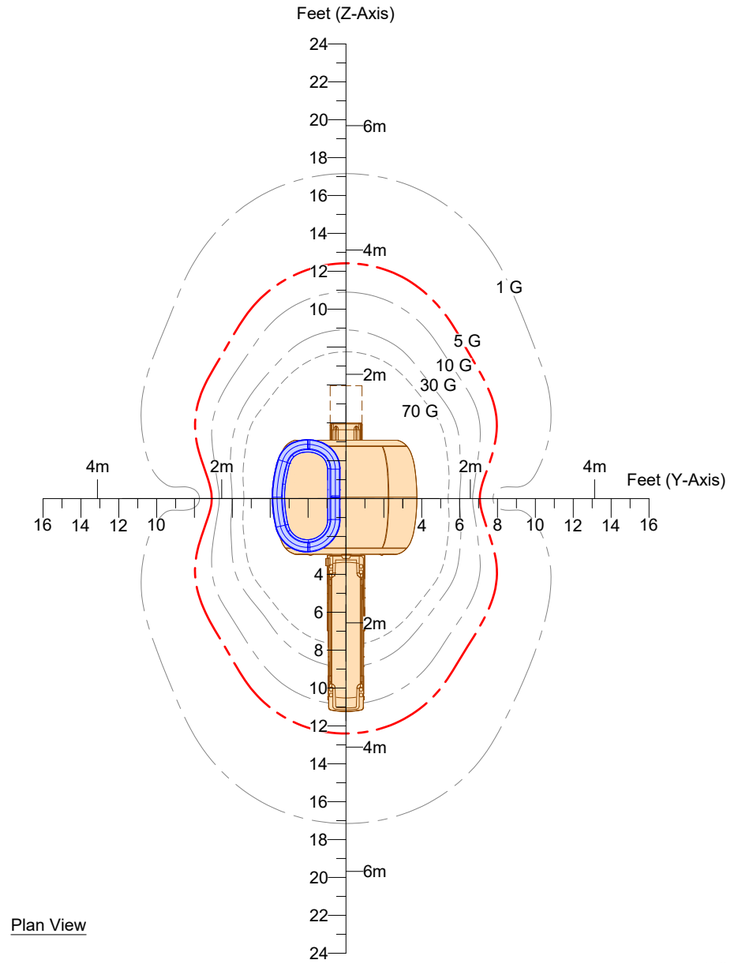
Detail - Magnetic Field Plot, without Magnet Shielding

(Static fringe field shown / Not to scale)



Side Elevation

(14.0)



Plan View

(18.0)

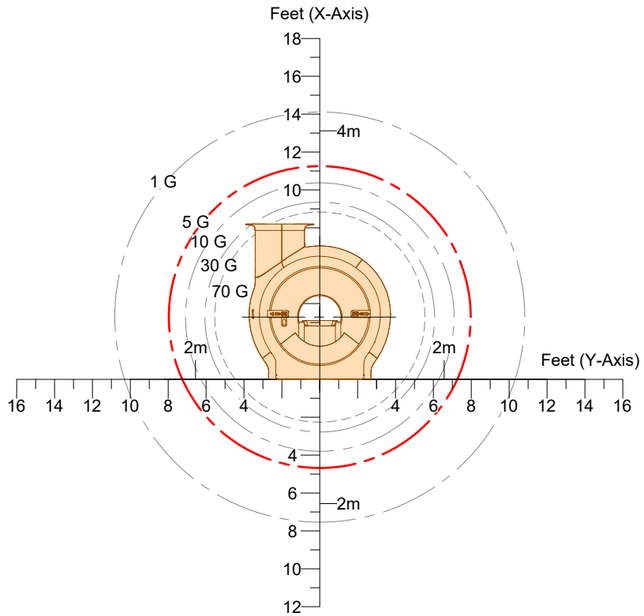
Typical Maximum Fringe Field

Equipment	
≤ 1.0 G (0.1 mT)	Nuclear Camera, PET Scanners, Linear Accelerators, Electron Microscopes, Gamma Camera, **Image Intensifiers**, Blood Chemistry Analyzers, Cyclotrons, X-ray CT Scanner with photo multipliers and **CRT Monitors**
2.0 G (0.2 mT)	CT Scanners manufactured after 2003
2.5 G (0.25 mT)	CT Scanners manufactured prior to 2003, Power and Main Distribution Transformers, and Ultrasound Machines
5.0 G (0.5 mT)	Neurostimulators, Biostimulation Devices, Power Conditioners, Flat Detectors, Video Monitor (monochrome), and **Pacemakers**
10.0 G (1.0 mT)	Computers, Tape Storage, Disc Drivers, HVAC Equipment, X-Ray Tubes, Emergency Generators, Food Prep Areas, Chillers, Telephone Switching, Credit Cards, Analog Watches and Clocks, Fuel Storage Tanks, ECG Equipment with LCD Display, and Motors/Pumps > 5 HP
15.0 G (1.5 mT)	Film Processors and Cardiac Recorders
25.0 G (2.5 mT)	Flat Panel (LCD) Monitors, Ultrasound with LCD
50.0 G (5.0 mT)	Laser Imagers, Telephones, X-Ray Electronics, Metal Detectors
100.0 G (10.0 mT)	Oxygen Monitor Sensor

Note:
The fringe field limits above are provided for preliminary planning purposes and represent the approximate exposure to magnet field acceptable for the type of instrument. It is the responsibility of the customer to have the vendor of the equipment in question set acceptable magnet field limits for proper operation of their equipment.

Valid for equipment located outside the RF Enclosure. In the examination room only MRI compatible equipment can be used. For specifications consult the supplier of the equipment.

(16.0)



Front Elevation

(14.0)

Notes:

1. The fringe field diagrams indicated have been empirically confirmed under unobstructed, greenfield conditions. Actual environmental parameters at this site may influence the true extent of the fringe field and affect the accuracy of the field shown.
2. Isocenter in the X-Axis is 39.53" (1004mm) above finished floor.
3. Magnet shielding requirements are to be determined on a site by site basis. If additional shielding is required, consult with Philips Project Manager. The customer accepts full responsibility for all cost associated with additional magnet shielding.
4. Due to variability in the orientation of the site with respect to the earth's magnetic field and construction of the site, the tolerances in Table 1 should be taken into account.

Table 1- Fringe Field Tolerances	
Fringe Field	**Tolerance**
1 Gauss	± 2' - 8" (± 800mm)
5 Gauss	± 8" (± 200mm)
10 Gauss	± 4" (± 100mm)

(19.0)

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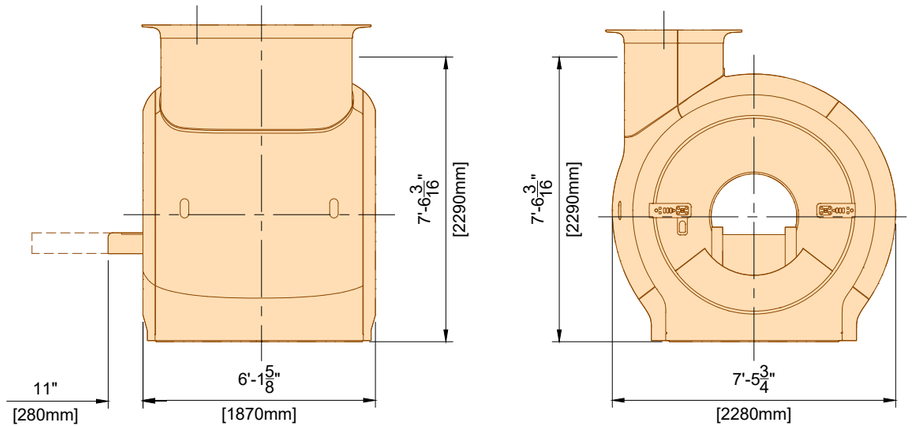
AD1

Detail - Magnet Rigging - Pre-assembled Magnet

Magnet assembly dimensions including transport frame and wheels	Length	Width	Height
Pre-assembled magnet assembly including covers	6' - 1 $\frac{1}{2}$" (1870mm)	7' - 6" (2280mm)	
If transport width is > 7' - 6" (2280mm)			7' - 6 $\frac{1}{4}$" (2290mm)
If transport width < 7' - 6" (2280mm) *			7' - 7 $\frac{1}{4}$" (2320mm)

* If transport width is < 7' - 6" (2280mm), the magnet needs to be transported sideways. Now the height increases due to a different location of the wheels under the magnet.

Note: Part of the patient support that is sticking out at the rear of the assembly has to be removed on site. This is a 15 minute job.

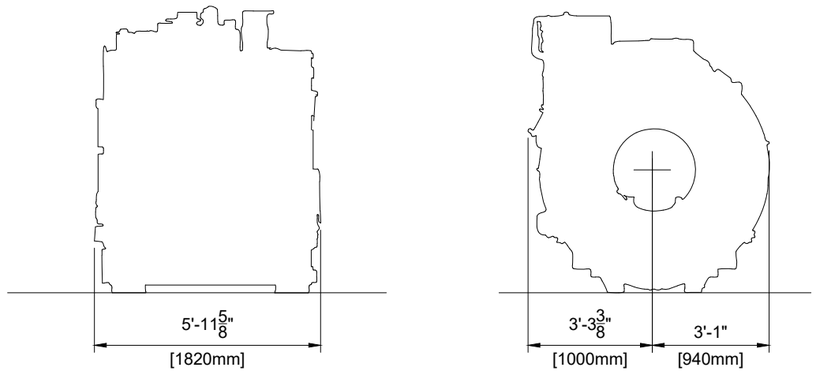


(14.0)

Detail - Magnet Rigging - With Covers Locally Removed

Magnet assembly dimensions including transport frame and wheels	Length	Width	Height
Pre-assembled magnet assembly with covers removed	6' - 0" (1820mm)	6' - 4 $\frac{3}{8}$" (1940mm)	
If transport width is > 6' - 4 $\frac{3}{8}$" (1940mm)			7' - 6 $\frac{1}{4}$" (2290mm)
If transport width < 6' - 4 $\frac{3}{8}$" (1940mm) *			7' - 7 $\frac{1}{4}$" (2320mm)

* If transport width is < 6' - 4 $\frac{3}{8}$" (1940mm), the magnet needs to be transported sideways. Now the height increases due to a different location of the wheels under the magnet.



(18.0)

General Delivery and Rigging Notes

1. Additional height for protective floor covering, and/or other site-specific restrictions must be added to the transport height.
2. All magnets are delivered pre-assembled.
3. The transport beams, wheels and hydraulic lifting tool will be delivered by the Transport and Installation team. An additional order is not needed.
4. It is the rigger's responsibility to provide a spreader bar if a crane will be used.
   a. Rigging is customer/contractor's responsibility unless specific arrangements have been made with Philips Sales/Service.
   b. Assembled magnet weight is 8157 lbs (3700kg).
   c. Transport via wall: A height of 7' - 10 $\frac{1}{2}$" (2400mm) and a width of 7' - 6 $\frac{9}{16}$" (2300mm) is recommended.
      Transport via roof: A length of 8' - 3" (2500mm) and width of 8' - 3" (2500mm) is recommended.
      Openings with smaller dimensions are possible, but are site situation depended. The tables above provide the minimum dimensions of the magnet assembly.
   d. The absolute minimum transport height is (2920mm)

Additional lifting detail to be provided upon request.

(18.0)

PHILIPS

Project
Ingenia Ambition 1.5T X
Good Samaritan Hospital of Suffern
Community Medical Care
Suffern, NY
Room: MRI 1.5T (TMP 92)

Philips Contacts
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Contact Number: (860) 373-3707
Email: richard.halm@philips.com
Drawn By: Jonathan Yoo

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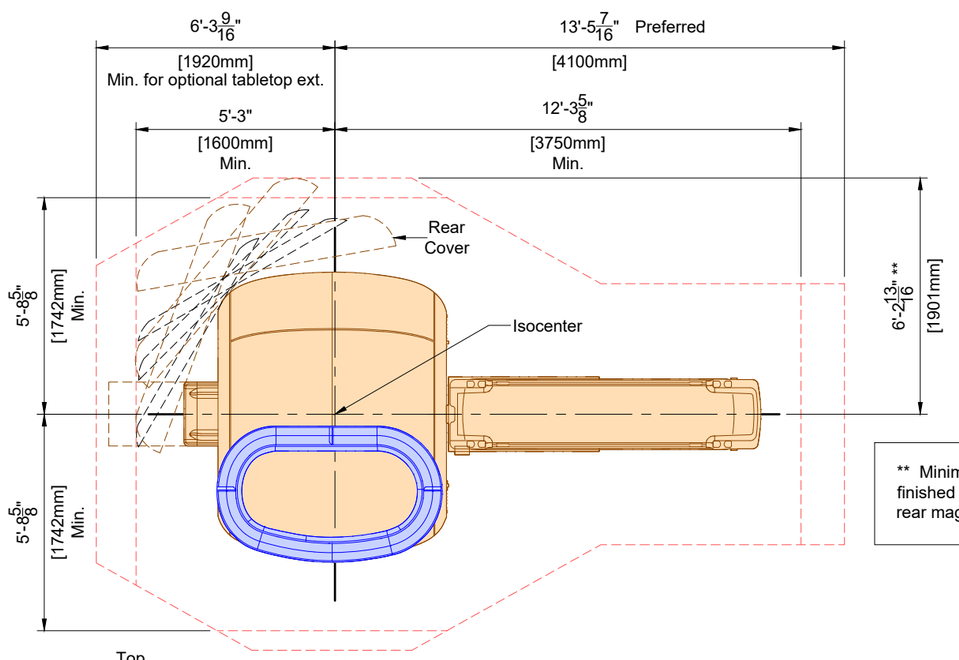
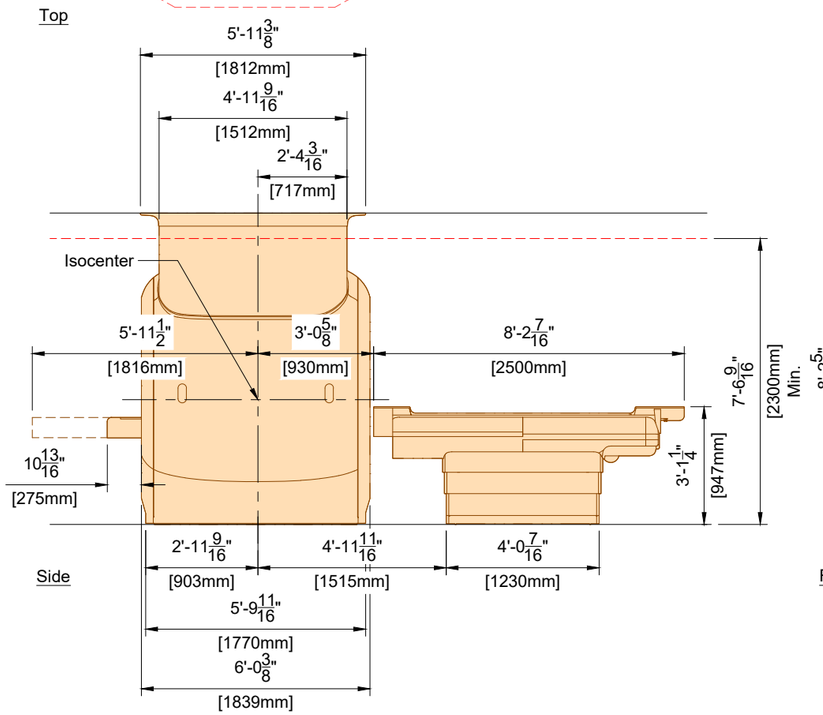
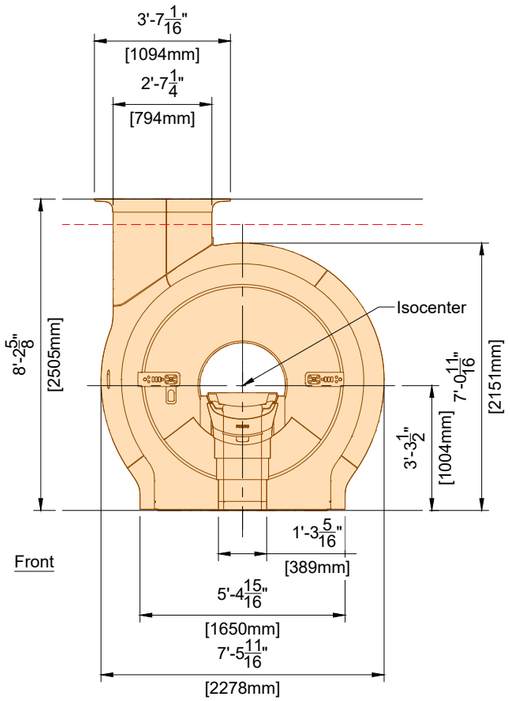
6600448836.010000-.020000

AD2



** Minimum 75" (1900mm) required on one side if Isocenter to finished rear wall is less than 79" (2000mm) in order to install rear magnet cover.





* For gradient coil, 3400 - 51200 btu/hr removed via water cooling system.

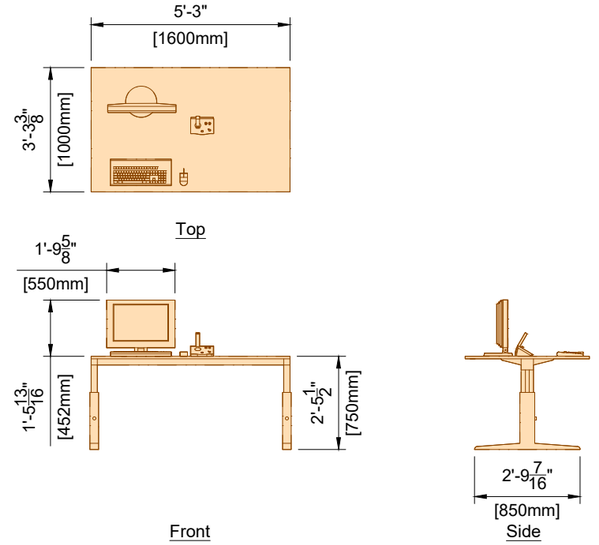
Maximum Patient Weight: 551 lbs (250 kg).

(18.0)

	Magnet Assembly	
MAG	Weight	Heat Dissipation
	8157 lbs	6800 btu/hr *

(19.0)

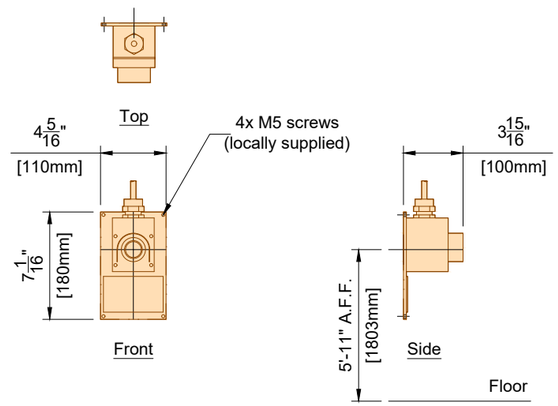
	Patient Support (MT)	
PS	Weight	Heat Dissipation
	573 lbs	1025 btu/hr



* Maximum distance between Monitor/Keyboard and Storage Rail is 1' - 8" (510mm) if Operator Console table is not ordered

(19.0)

	Operator's Table	
OT	Weight	Heat Dissipation
	220 lbs	0 btu/hr



(19.0)

	Emergency Run-Down Button	
ERB	Weight	Heat Dissipation
	3 lbs	0 btu/hr

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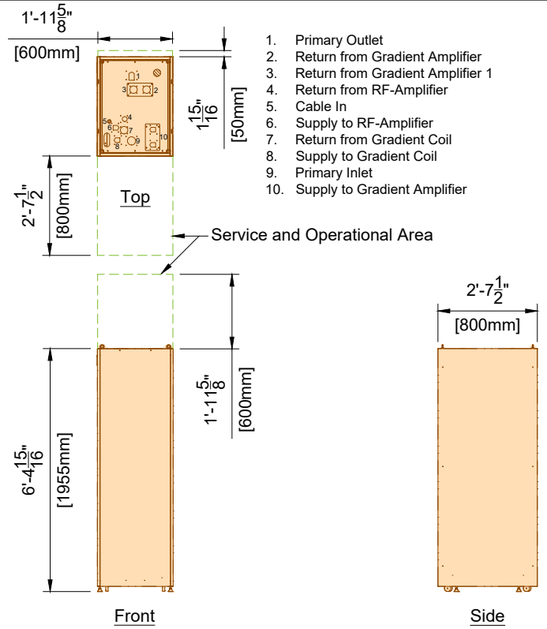
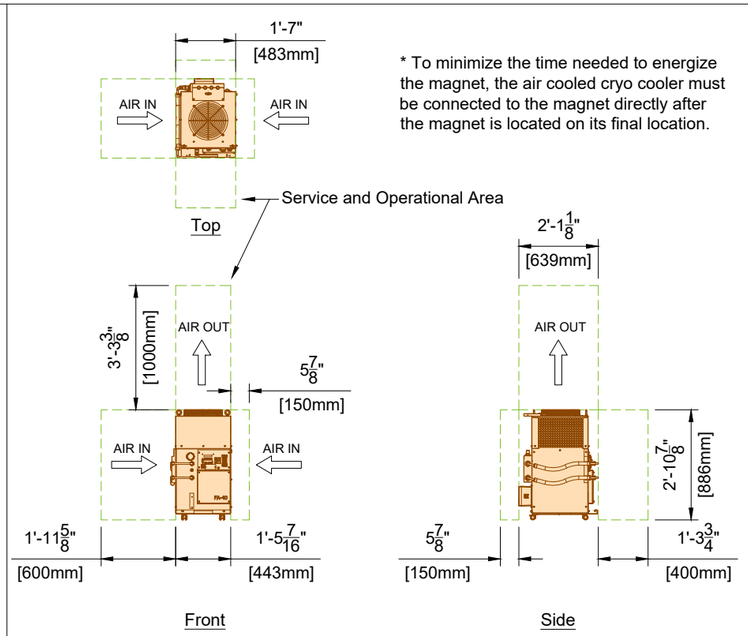
AD3

6.30.2020



(19.0)

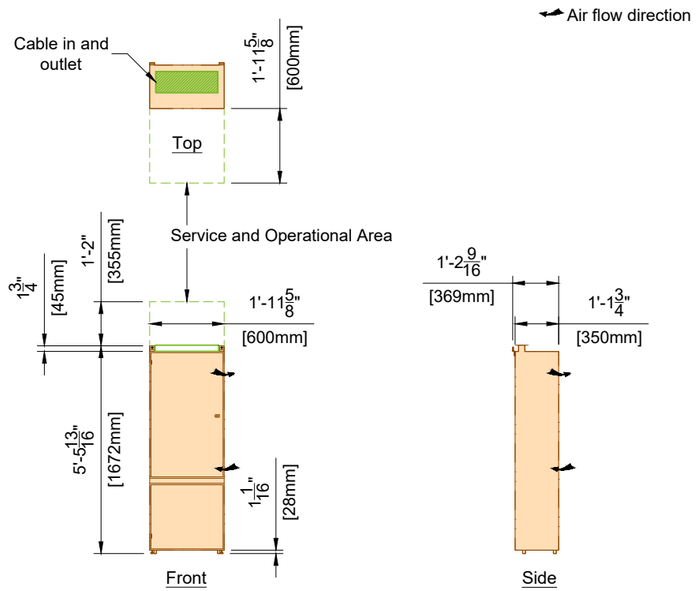
LCC	Liquid Cooling Cabinet	
	Weight	Heat Dissipation
	719 lbs	4095 BTU/hr



* To minimize the time needed to energize the magnet, the air cooled cryo cooler must be connected to the magnet directly after the magnet is located on its final location.

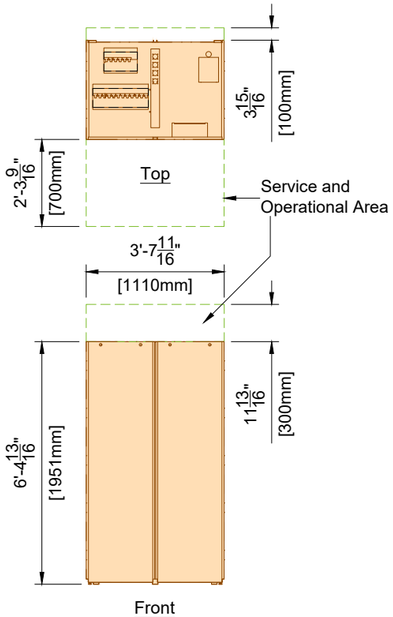
(19.0)

ACCC	Air Cooled Cryo Cooler	
	Weight	Heat Dissipation
	243 lbs	19108 BTU/hr



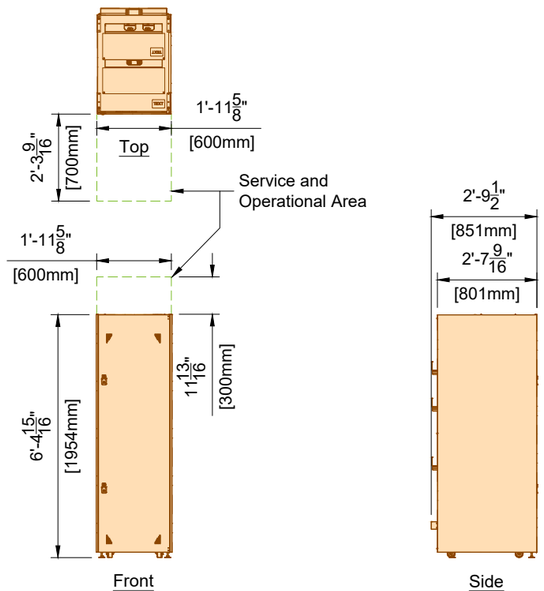
(19.0)

MDU	Mains Distribution Unit - 480V, 60Hz	
	Weight	Heat Dissipation
	605 lbs	1700 BTU/hr



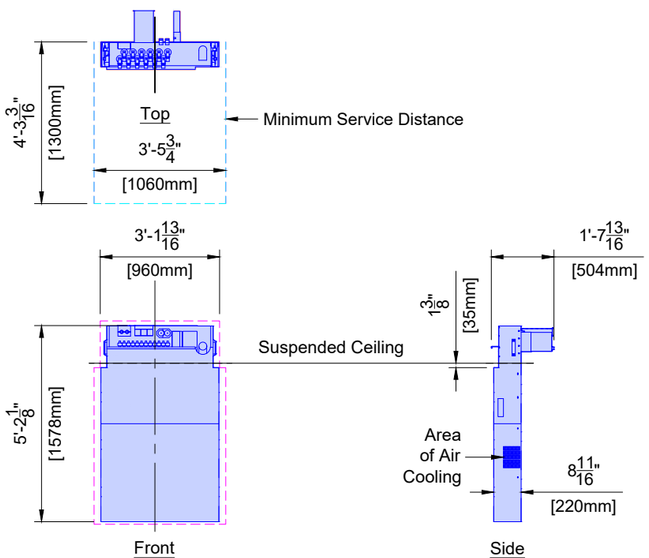
(19.0)

GAC	Gradient Amplifier 787 Double Cabinet	
	Weight	Heat Dissipation
	2015 lbs	27900 BTU/hr



(19.0)

DACC	Data Acquisition and Control Cabinet	
	Weight	Heat Dissipation
	787 lbs	3400 BTU/hr



(19.0)

SFB	System Filter Box	
	Weight	Heat Dissipation
	175 lbs	3400 BTU/hr

PHILIPS

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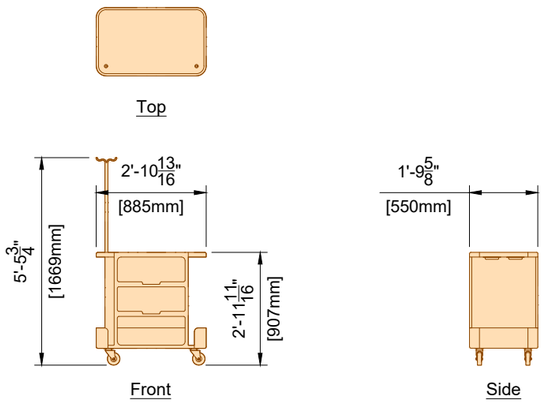
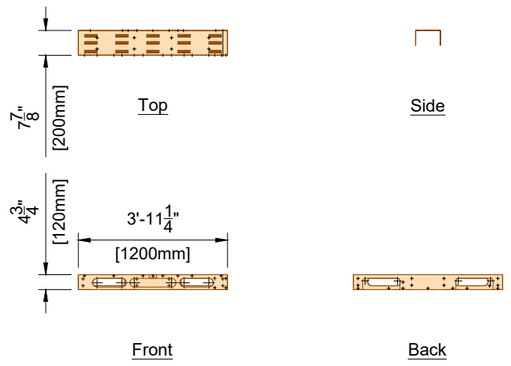
AD4

6.30.2020



(19.0)

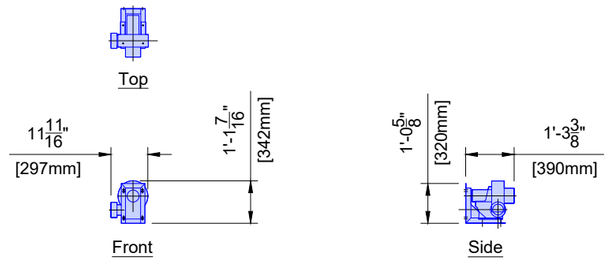
FC	Flex Caddy Coil Cart	
	Weight	Heat Dissipation
	t.b.d.	0 BTU/hr



* For Mounting methods, see SD4 Page.

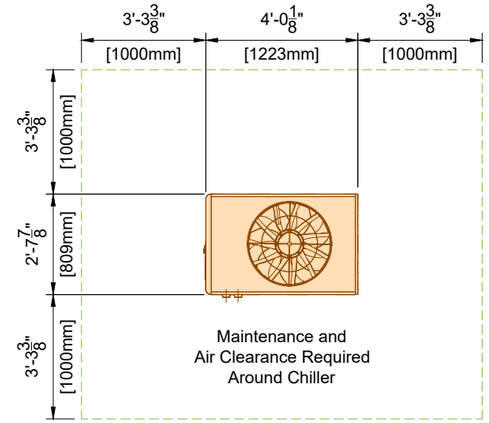
(19.0)

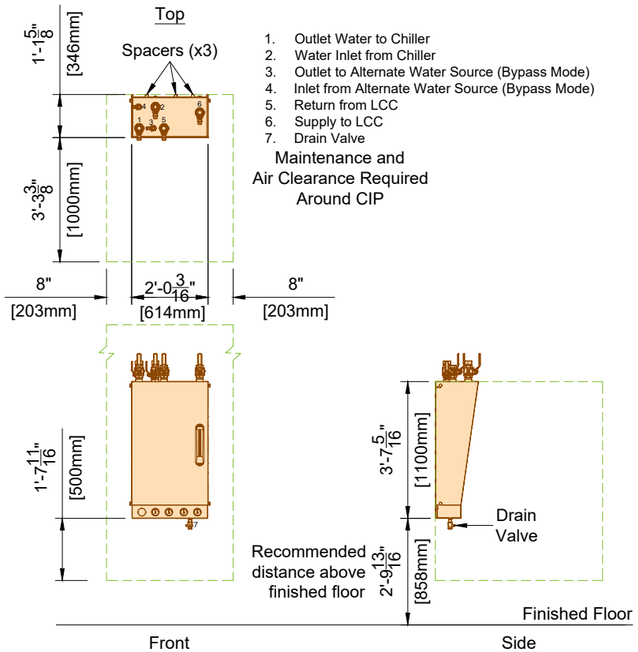
SR	Storage Rail	
	Weight	Heat Dissipation
	- lbs	- BTU/hr



(19.0)

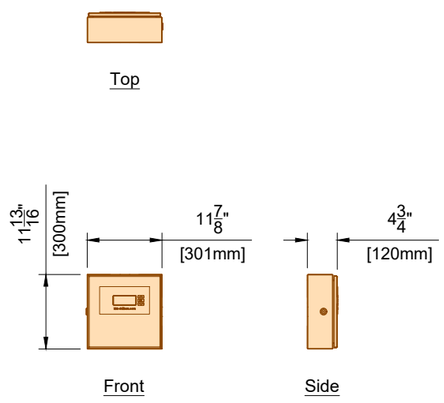
SACU	System Air Cooling Unit	
	Weight	Heat Dissipation
	55 lbs	340 BTU/hr





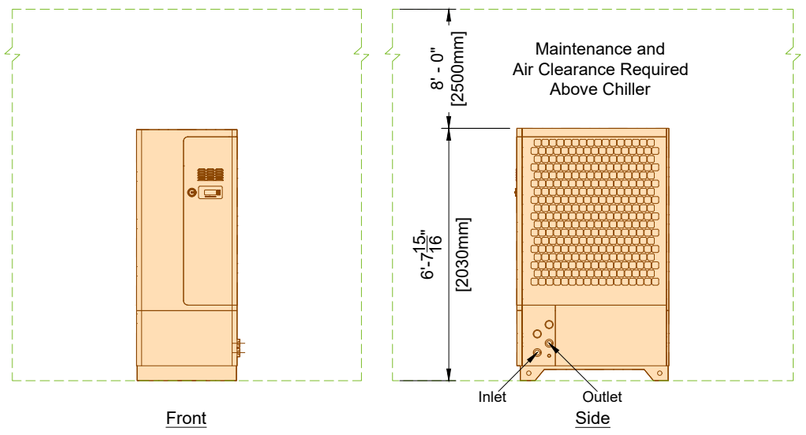
(19.0)

CIP	KKT Chiller Interface Panel	
	Weight	Heat Dissipation
	132 lbs	- BTU/hr



(19.0)

RDP	KKT Remote Display Panel	
	Weight	Heat Dissipation
	TBD	- BTU/hr



8' - 0" (2500mm) air clearance is required above the chiller. Refer to Sheet MP2 for additional notes and specifications regarding the chiller.

(19.0)

CH	KKT cBoxX 60	
	Weight	Heat Dissipation
	1,477 lbs	139898 BTU/hr

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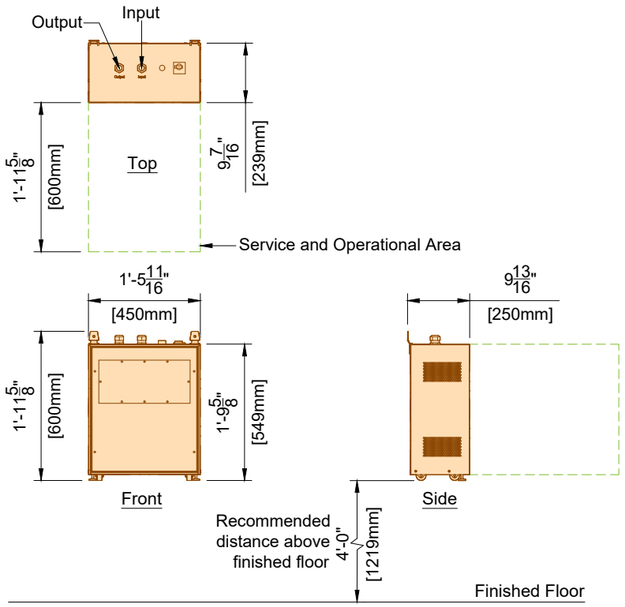
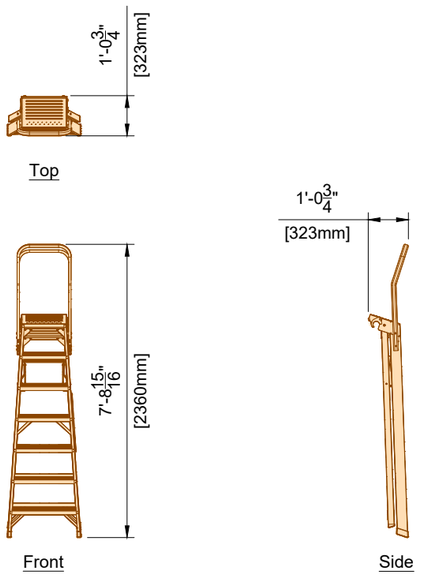
AD5



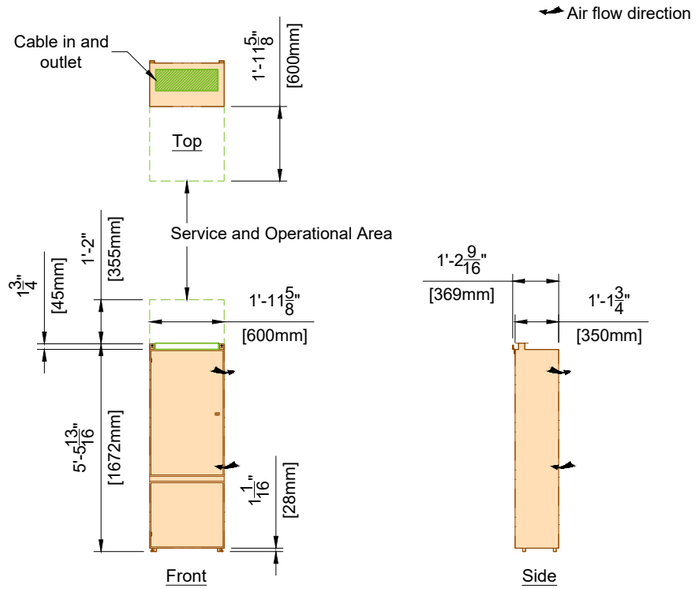
(19.0)

TC	Transformer Cabinet - 60Hz	
	Weight	Heat Dissipation
	64 lbs	171 BTU/hr



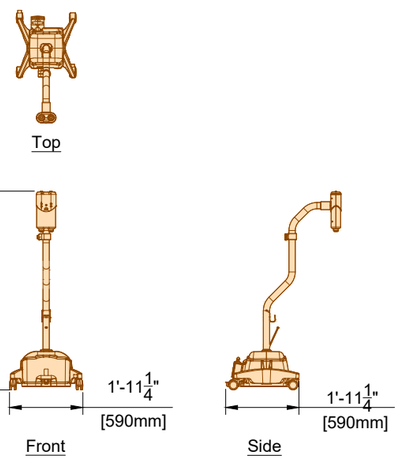
(19.0)

SP	Service Platform	
	Weight	Heat Dissipation
	t.b.d.	0 BTU/hr



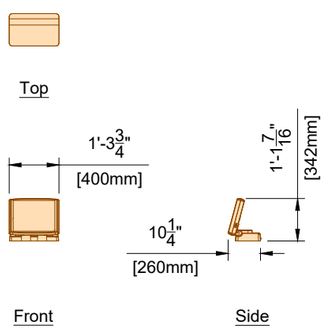
(19.0)

BCP	Backup Power Connection Panel	
	Weight	Heat Dissipation
	605 lbs	t.b.d.



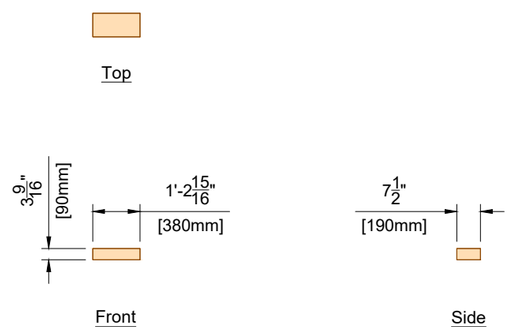
(17.0)

XI	MRXperion Injector	
	Weight	Heat Dissipation
	94 lbs	- btu/hr



(17.0)

XD	Injector Display Control Unit	
	Weight	Heat Dissipation
	17.6 lbs	675 btu/hr



(17.0)

XPS	iCBC Power Supply Unit	
	Weight	Heat Dissipation
	6 lbs	660 btu/hr

PHILIPS

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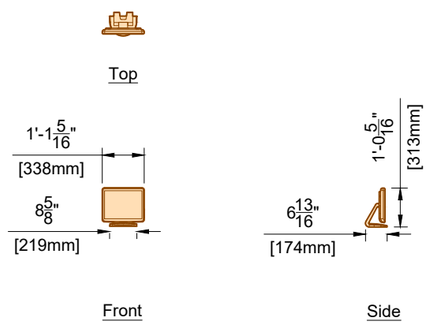
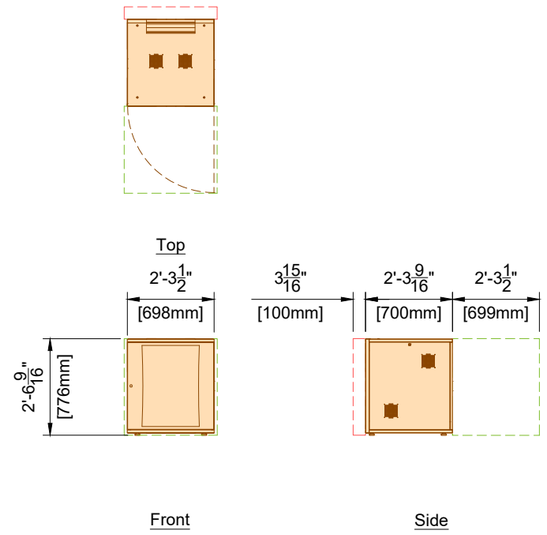
AD6



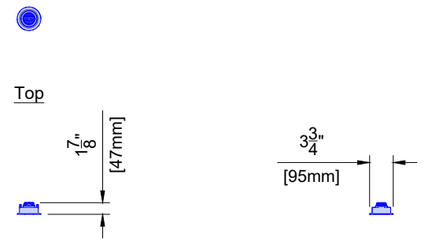
(15.0)

ATS	AE Touch Screen	
	Weight	Heat Dissipation
	10.6 lbs	41 BTU/hr



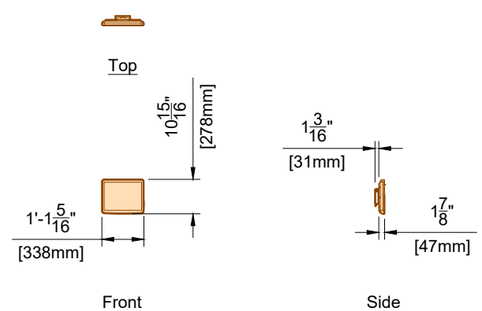
(15.0)

AECC	Ambient Experience Control Cabinet	
	Weight	Heat Dissipation
	123 lbs	921 BTU/hr



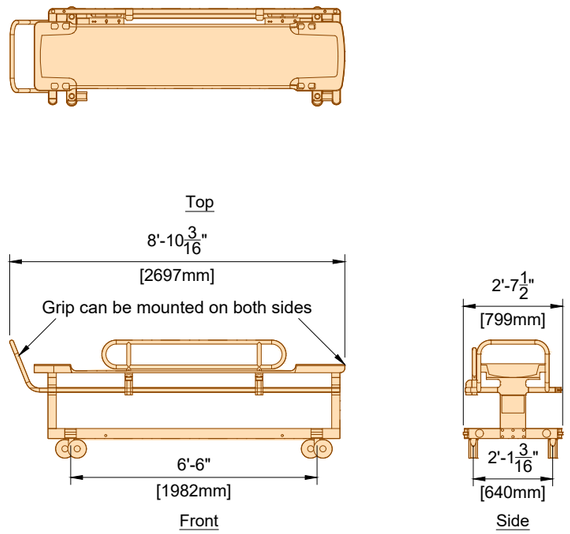
(15.0)

LED	LED Module	
	Weight	Heat Dissipation
	0.4 lbs	10 BTU/hr



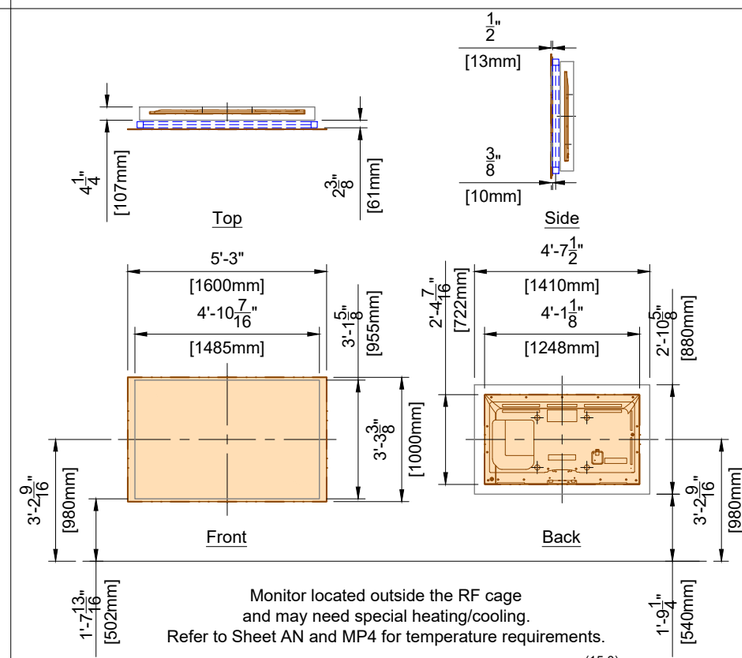
(15.0)

ATSW	AE Touch Screen (Wall Mounted)	
	Weight	Heat Dissipation
	10.6 lbs	41 BTU/hr



(19.0)

FT	HA FlexTrak	
	Weight	Heat Dissipation
	113 lbs	- BTU/hr



(15.0)

PIB	Patient In-Bore Monitor	
	Weight	Heat Dissipation
	217 lbs	853 BTU/hr

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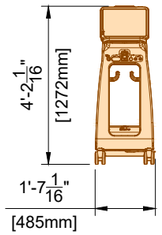
AD7

Top



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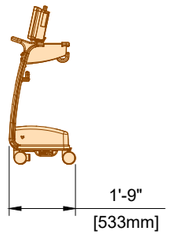
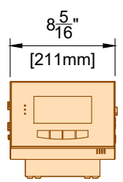


Side

(14.0)

PM	Expression Patient Monitor	
	Weight	Heat Dissipation
	- lbs	- BTU/hr



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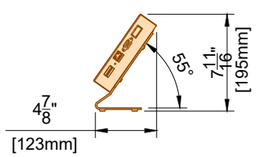
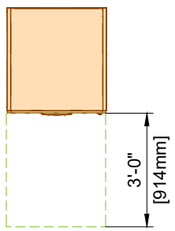


Right Side

Not to Scale

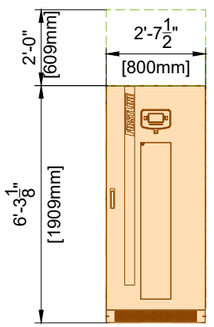
(13.0)

RSP	Remote Status Monitoring Panel (STACO UPS)	
	Weight	Heat Dissipation
	5 lbs	-- btu/hr

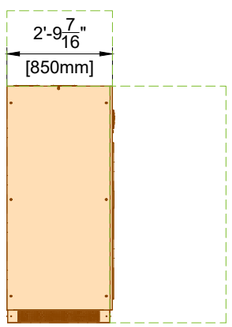


Top

UPS Cabinet needs a minimum clearance space of 36” on the front of the cabinet, and a clearance of 36" on at least one other side: back, left, or right



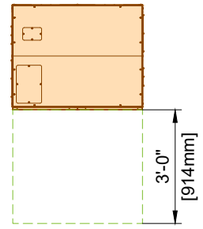
Front



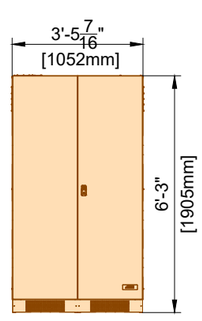
Side

(19.0)

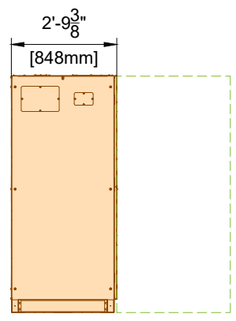
UPS	125 kVA Staco UPS Cabinet	
	Weight	Heat Dissipation
	1742 lbs.	28900 BTU/hr



Top



Front



Side

(19.0)

BC	Staco UPS Battery Cabinet	
	Weight	Heat Dissipation
	1950 lbs.	-

PHILIPS

Project
Ingenia Ambition 1.5T X
Good Samaritan Hospital of Suffern
Community Medical Care
Suffern, NY
Room: MRI 1.5T (TMP 92)

Philips Contacts
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Drawn By: Jonathan Yoo

Project Details
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1-22J8ETR Rev. 3
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6600448836.010000-.020000

AD8

6.30.2020

Magnet Field Homogeneity Explained

Image quality is dependant on the homogeneity and stability of the magnetic field (B0). The homogeneity of B0 can be distorted by static ferromagnetic objects such as floor reinforcement (rebar, structural beams, etc.). The stability of the magnetic field (B0) can be disrupted by moving ferromagnetic objects (cars, trains, elevators, etc.). These can cause variations of B0 which will produce image artifacts such as ghosting.

Electromagnetic fields such as current in power lines, motors, generators, and transformers can also cause B0 variation. The magnitude of the variation will decrease as the source gets farther away from the magnet. As such, there are minimum required distances to the magnet for every type of disturbance, depending upon its properties (weight, current, etc.). Disturbances measured in the Z-axis (direction of the patient table) are most critical for image quality.

Solutions for sites violating requirements will depend on the source of disturbance and construction of the site. To help identify potential disturbances, sources can be classified into seven categories:

1. Static ferromagnetic objects (beams, stirrups, rebar, etc.)
2. Moving ferromagnetic objects (cars, trucks, etc.)
3. Moving magnetized objects
4. Electrically Powered Rail Systems (trains, trams, subways)
5. Electromagnetic fields (power lines, transformers, motors)
6. Static magnetic fields (other magnets)
7. Coherent and non-coherent vibrations

1. Static Ferromagnetic Objects - (see Figure 1)

a. Floor Reinforcement (i.e. rebar, stirrups, etc.):
For the square area of 9' - 10" x 9' - 10" (3 m x 3 m) symmetrically around magnet isocenter, ferromagnetic reinforcement must be:
- **NOT allowed** between the finished floor level and 1-15/16" (50mm) below the finished floor level.
- **NO greater** than 25 kg/m^2 average concentration between 1-15/16" (50mm) and 9-13/16" (250mm) below the floor slab, Ferromagnetic reinforcement in this area must be evenly distributed. Reinforcement below 9-13/16" (250mm) can be ignored.

b. Ferromagnetic beams perpendicular to the Z-axis of the magnet must be located at least 9-13/16" (250mm) below the finished floor level.

c. All other ferromagnetic beams must be located at least 1' - 11-5/8" (600mm) below the finished floor level.

d. Substantial ferro-magnetic objects or structures outside of the RF enclosure must be located at a minimum of 8' - 3" (2.5m) from magnet isocenter.

e. Inside the Examination Room, all metal must be non-ferromagnetic. This is to avoid potential image quality issues and missile effects due to attraction forces of the magnet field.

2. Moving Ferromagnetic and Magnetized Objects - (see Figure 2)

a. Minimum Distances: Ferromagnetic objects such as trucks, cars, and trolleys can be magnetized by the Earth's magnetic field and by the magnet's fringe field. Figure 2 shows the minimum distances moving ferromagnetic objects must be from isocenter.

b. Minimum Distances: Some ferromagnetic objects are magnetized because of high currents repeatedly entering the fringe field of the magnet (e.g. elevators). The safety distance for these objects can be calculated by multiplying their weight by 10 and using the chart in Figure 2.

3. Electrically Powered Rail Systems - (see Table 1)

a. Minimum Distances: Electric trains, tramways, and subways are typically powered by electrical traction. For railways with overhead power lines, the current through the power lines (and the returning current through the rails) will induce high magnetic field variations that will extend over a large region. These fields will have a small variation in the direction perpendicular to the power lines. Therefore, B0 variation depends on the distance from the power line to the isocenter, the current, and the angle between the power line and the magnet's Z-axis (0° is parallel to Z-axis). Table 1 shows the minimum distance allowed for electrically powered rail systems versus current and its angle to the magnet Z-axis.

4. Electromagnetic Fields - (see Table 2)

a. Minimum Distances: Currents in power lines, large transformers or electric motors near an MR system can affect the stability of the magnetic field since they also produce electromagnetic fields. Table 2 shows the minimum distances allowed.

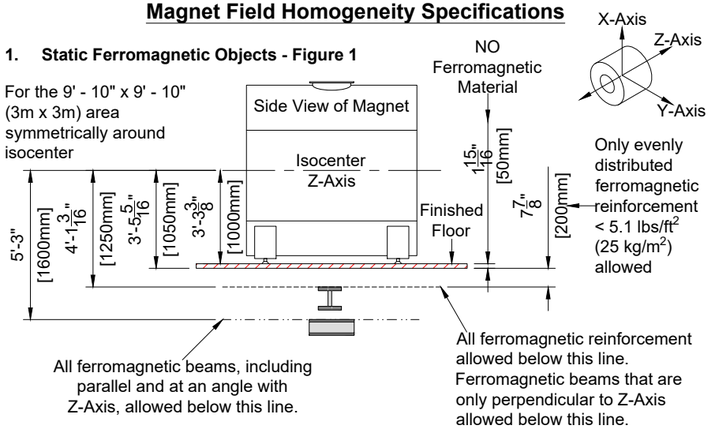
5. Static Magnetic Fields - (see Table 3)

a. Minimum Distances: If an MR system is installed next to another MR system, ensure that the strength of the magnet field from the other system does not exceed the specified values at isocenter of the future system. If the field is between certain values, then the magnet must be re-shimmed when the other system's field goes on or off. Table 3 shows the maximum gauss field allowed.

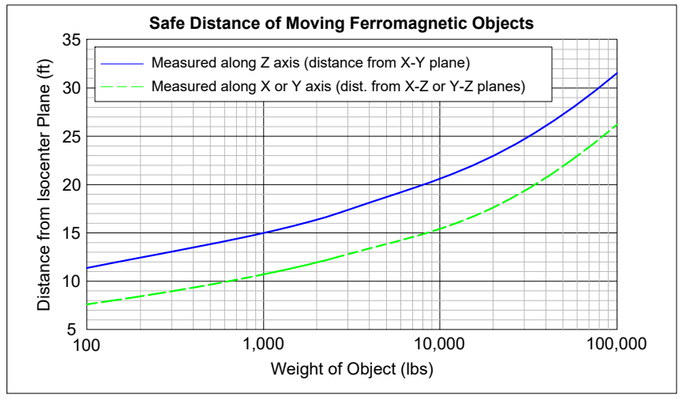
Possible Counter Measures:
If minimum distances are not met, image quality problems are likely to occur. B0 variations can be measured at various angles to find the most optimum angle to site the future Z-axis of the MR system if the distances or the angle to the isocenter are not exactly known. If minimum distances are not met, contact local Philips service to test and evaluate the site.

Magnet Field Homogeneity Specifications

1. Static Ferromagnetic Objects - Figure 1



2. Moving Ferromagnetic Objects - Figure 2



3. Moving Magnetized Objects
For magnetized objects (because of high currents or repeatedly entering the fringe field of the magnet, e.g. elevators), multiply the weight by 10 to obtain a safety distance from Figure 2.

4. Electrically Powered Rail Systems - Table 1

Distance (ft) for Electrically Powered Subway and Trains *	Angle (degrees), 0° is parallel to Z-Axis						
	0°	15°	30°	45°	60°	75°	90°
Current = 750 Amps	46' (14m)	62' (19m)	69' (21m)	75' (23m)	79' (24m)	82' (25m)	82' (25m)
Current = 2000 Amps	59' (18m)	105' (32m)	115' (35m)	125' (38m)	131' (40m)	135' (41m)	135' (41m)
* Note that for short distances, the weight of the trains must also be considered.							

5. Electromagnetic Fields - Table 2

Object with Electromagnetic Field	Safety Distanced from Magnet Isocenter (in)
Power Line	8.8 √ Amperage (A)
Transformer	15.5 √ Power (kVA)
Motor/Generator	36 √ Power (kVA)

6. Static Magnet Fields - Table 3

Allowed Field Strength of Another MR System at Magnet Isocenter	
Field Strength of Other System *	**Result**
< 0.5 Gauss (0.05 mT)	Always Possible
> 0.5 Gauss (0.05 mT) AND < 3 Gauss (0.3 mT)	Re-shimming Required
> 3 Gauss (0.3 mT)	Not Allowed
* Note that these values are for Philips magnets only.	

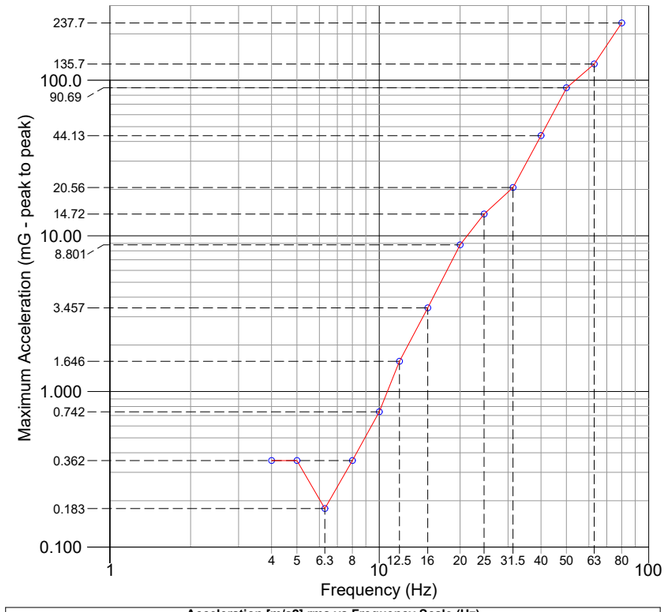
Magnetic Field Homogeneity - Vibration Specifications

7. Coherent and Non-Coherent Vibrations

a. Mandatory Floor Vibration Testing: Floor vibrations can affect the stability of the magnetic field which leads to poor image quality. In order to evaluate the acceptance of a site, environmental testing is mandatory. Measurements are to be completed by local Philips service and evaluations are completed by Philips Site Planning department. Contact local Philips service to arrange an environmental test and evaluation.

b. Specifications:
- Coherent Vibration: Coherent vibrations have a signal with a constant amplitude and frequency. Typical sources are electrical powered motors, air handling systems, etc. These vibrations provide a constant disturbance during the entire measurement period (scan). Coherent signals result in distinct artifacts which are the main source of image quality problems. However, disturbing sources can typically be handled once the source is found. Solutions involve re-balancing, isolating on springs, or re-installing the source on vibration pads.
- Non-Coherent Vibration: Non-coherent vibrations can be categorized into pulse, transient, or noise-like vibrations. Pulse and transient vibrations are single events, and will decrease in a short time. Noise-like vibrations have no specific frequency and are broadband. Typical noise-like vibrations are caused by vehicular traffic, people walking, or the resonance of the building structure. These sources are difficult to eliminate. Furthermore, the building structure can have a negative response on the vibration induced. The only possible solution is to change the construction of the building (i.e. isolate MR floor slab). In this case, the customer must consult with a third party vibration and structural engineer.
- Settings for Fast Fourier Transformer Analyzer shown in table below:

Maximum Allowed Acceleration in Terts Band



Acceleration [m/s2] rms vs Frequency Scale (Hz)					
Acceleration	Frequency	Acceleration	Frequency	Acceleration	Frequency
0.001256	4.0	0.005709	12.5	0.153029	40.0
0.001256	5.0	0.011990	16.0	0.314500	50.0
0.000637	6.3	0.030520	20.0	0.470690	63.0
0.001256	8.0	0.051033	25.0	0.824273	80.0
0.002573	10.0	0.071302	31.5		

c. Third Party Consultation: Third party vibrations pads are not allowed under the feet of the magnet. All other third party solutions to external vibration disturbances (i.e. pneumatic isolated floors, etc.) must be designed to encompass the whole exam room floor and must meet all of the MR system's specifications (vibration specification, shimming requirements, proximity of ferromagnetic material, etc.). In addition, long term affects (such as creeping), must be considered since the magnet's relationship with the patient table is extremely critical. Philips does not review or approve any third party designed solutions.

(18.0)

PHILIPS

Project
Ingenia Ambition 1.5T X
Good Samaritan Hospital of Suffern
Community Medical Care
Suffern, NY
Room: MRI 1.5T (TMP 92)

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Drawn By: Jonathan Yoo

Project Details
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Quote: 1-234MMCF Rev. 1
Order: 1-22J8ETR Rev. 3
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SN1

MRI Support Notes

1. Door(s)
For convenient and safe transport of patients on trolleys, and for installation and maintenance actions, a minimum clearance of 48" W x 84" H (1220mm W x 2130mm H) is recommended. Smaller doors may hinder facility staff in getting access to the patient and in transferring the patient to a place where life saving actions can be performed in an emergency situation. For safety reasons the door(s) should comply with the following:

a. To be opened or closed within 3 sec., and with a force < 22.5 lbs (100 N).
b. Manual operator action required to close the door (not automatic).
c. Threshold no more than 0.8" (20mm), or 2.4" (60mm) if provided with ramps no
d. Steeper than 10%.
e. Simple to operate.
f. A power-assisted door must, in the event of a failure, be opened within 10 seconds with a force no greater than 56.2 lbs (250 N).
g. The design of the door posts should be such that they are not damaged by typical contact with patient gurneys.

2. Magnet Transfer Opening
The magnet is the only system part that in most cases cannot be transferred through the door of the RF enclosure. A special opening to allow its installation in the enclosure must therefore be made available. **Refer to Sheet AD2** for required dimensions. The underside of the magnet transfer opening should be flush with the floor. If building constraints make this impossible, the RF enclosure supplier must deliver ramp(s) with slopes no steeper than 5% and a maximum height of 4.75" (120mm). The location of the transfer opening will naturally be site dependent. It should, however, comply with the following conditions:

a. Preferably be accessible through existing hospital corridor(s), provided these meet other other necessary requirements (i.e. floor loading, corridor width and height).
b. It should be accessible from outside through a wall or the roof.

If re-opening of magnet transfer opening is needed, it must be possible for Philips service to re-open the magnet transfer opening without invalidating the RF enclosure guarantee. Should specialist servicing be required, this should be done only by the RF shielding manufacturer's own personnel and any special tools used should be supplied by the RF shielding manufacturer.

3. RF Viewing Window
The recommended window size is 48" W x 40" H (1200mm W x 1000mm H) with the window base no more than 39" (1000mm) above finished floor level. The minimum window size is 36" W x 24" H (900mm x 600mm H). The transparency of window material (i.e. the mesh) must be better than:

a. 30% for an angle between 40 and 140°.
b. 50% for an angle between 70 and 110°.

The windowpane must be made of tempered safety glass. The window material must have an attenuation factor less than 2 in the light color range of 2600 to 4200 K. Moreover, it must cause no color change in the transmitted light to allow the operator to get an accurate impression of the patient's complexion. The window shielding material (mesh) must be sandwiched between two panes of glass. All parts of the window (e.g. the mesh) that contribute to the attenuation must be made of non ferro-magnetic material. For optional sound damping the two window panes should have a different thickness (e.g. 0.24" and 0.31" [6 and 8mm]).

4. Floor - Covering Material
To avoid electrostatic discharge problems, the floor must have a resistively of less than 1 x 10^9 Ω / square or it must comply with NEN EN IEC 61340-4. Verify local codes before installing any flooring that is not rated as static dissipative.

5. Foundation of Magnet and Patient Support
Shocks and vibrations up to 0.1 g, in all directions, have to be anticipated. The friction between magnet and floor will normally be great enough to keep the magnet in place (friction factor > 0.1) so no fixing measures are required unless in a seismic area. The patient support is subject to forces induced by operators and patients. To prevent tilting, the patient support must be fastened to the floor.

6. Suspension Provisions
The provisions for system wiring and suspended ceiling are not part of the RF enclosure delivery by Philips. However, fixing points for the suspension of these items must be available in the enclosure ceiling. Requirements are determined by the local situation. In addition, suspension points for the lighting, air-conditioning equipment, etc. maybe required. Finally, the suspension provisions must not affect RF enclosure integrity. The responsibility for ensuring this integrity lies with the manufacturer of the RF enclosure.

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General Equipment Support Notes

1. General
The customer shall be solely responsible, at their expense, for preparation of the site, including any required structural alterations. The site preparation shall be in accordance with this plan and specifications, the architectural/construction drawings, and in compliance with all safety and building codes. The customer shall be solely responsible for obtaining all construction permits from jurisdictional authority.

2. Equipment Anchorage
Philips provides, with this plan and specifications, information relative to equipment size, weight, shape, anchoring hole locations and forces which may be exerted on anchoring fasteners. The customer shall be solely responsible, through the engineer of record for the building, to provide on the architectural/construction drawings, information regarding the approved method of equipment anchoring to floors, walls and/or ceiling of the building. Any anchorage test required by local authority shall be the customer's responsibility. Stud type anchor bolts should not be specified as they hinder equipment removal for service.

3. Floor Loading and Surface
Philips provides, with this plan and specifications, information relative to size, weight and shape of floor mounted equipment. The customer shall be solely responsible, through the engineer of record for the building, to provide on the architectural/construction drawings confirmation of the structural adequacy of the floor upon which the equipment will be placed. Any load test required by local authority, shall be the customer's responsibility. The floor surface upon which Philips equipment and floor plates are to be placed/anchored shall be super flat and level to within +0" / - $\frac{1}{8}$" (2.5mm).

4. Ceiling Support Apparatus (If Applicable)
Philips provides, with this plan and specifications, information relative to size, weight and shape of ceiling supported equipment. The customer shall be solely responsible, through the engineer of record for the building, to provide on the architectural/construction drawings, information regarding the approved method of structural support apparatus, fasteners and anchorage to which Philips will attach equipment. Any anchorage and/or load test required by local authority shall be the customer's responsibility.

The structural support apparatus surface to which Philips equipment is to be attached, shall have horizontal equipment attachment surfaces parallel, square and level to within plus or minus $\frac{1}{16}$" (2mm) for the area the system covers.

Contractor to clearly mark Philips equipment longitudinal centerline on bottom of each structural support.

Any drilling and/or tapping of holes required to attach Philips equipment to the structural support apparatus shall be the responsibility of the customer.

Fasteners/anchors (i.e., bolts, spring nuts, lock and flat washers) and strip closures shall be provided by the customer.

5. Suspended Ceiling
Special requirements for the suspended ceiling within the RF enclosure:

a. It must be constructed from non-ferrous material. Tiles composed of high recycle metal composition (ie. USG490) are not allowed as they often contain ferrous ferromagnetic metal.
b. It is recommended to have sound damping
c. No hanging objects such as spot lamps are to hang lower than 8' - 3 $\frac{1}{4}$" (2520mm) in order to give clearance for the removal of the magnet covers for servicing.
d. The access panel or opening in the ceiling to enable a cold head change shall comply with specifications given on SD1.
e. Ceiling grid hangers must be made of non-ferromagnetic material and must be insulated.
f. Any loose hardware or tools should not be installed or left above suspended ceiling. If the hardware vibrates it could cause image quality issues and if it is ferrous it could eventually end up inside the magnet gantry.

- To avoid spikes, (non ferromagnetic) metal e.g. aluminum strips, aluminum light fixtures, air handling grids etc. must be connected to the RF-enclosure grounding point. Beware of metal-on-metal connections where two metal parts rub against one another. This could cause image artifacts.
- In case of aluminum strips used for the suspended ceiling grid; each individual strip must be connected. In case aluminum tiles, each individual tile must be connected to the RF-enclosure grounding point.
- It is allowed to connect all individual parts to each other and finally to the RF-enclosure grounding point.
- For good electrical connection of the grounding wire a tooth washer is required.
- Before connection is made, coating / insulating finishing must be removed.
- The volume above the suspended ceiling above the magnet and service area must be free of obstacles for service activities. No third party equipment / installations are allowed here.
- The impedance between any conductive part and the central PE bus-bar/terminal must not exceed 100 Ω.

6. Lighting
Lighting fixtures shall be placed in such a position that they are not obscured by any equipment or its movement, nor shall they interfere with Philips ceiling service clearances. Such lighting fixture locations shall be the sole responsibility of the customer. Recommend plastic conduit when it does not interfere/violate with local codes.

7. Ceiling Obstructions
There shall be no obstructions that project below the finished ceiling in the area covered by ceiling suspended equipment travel (if applicable).

8. Floor Obstructions
There shall be no obstructions on the floor (sliding door tracks, etc.) in front of the Philips technical cabinets. Floor must be clear to allow cabinets to be pulled away from the wall for service.

9. Seismic Anchorage (For Seismic Zones Only)
All seismic anchorage hardware, including brackets, backing plates, bolts, etc., shall be supplied and installed by the customer/contractor unless otherwise specified within the support legend on these drawings.

Installation of electronic cabinets to meet seismic anchorage requirements must be accomplished using expansion type (HILTI HDI, or eq.) anchor/bolt systems to facilitate the removal of a cabinet for maintenance. Do not use threaded rod/adhesive anchor systems for the cabinets. Consult with Philips regarding any anchor system issues.

10. Sprinkler System
All sprinkler pipes and sprinkler heads inside the RF-enclosure to be made of non-ferrous material. Supplier of sprinkler system must declare that the system works in high magnetic environments. The sprinkler pipe must enter the RF-enclosure via one feedthrough and sprinkler heads must be located outside of the magnet's body. Philips strongly suggests installation of dry sprinkler system to avoid possible attenuation of the RF enclosure due to contaminated water standing inside the pipes.

(18.0)

PHILIPS

Project
Ingenia Ambition 1.5T X
Good Samaritan Hospital of Suffern
Community Medical Care
Suffern, NY
Room: MRI 1.5T (TMP 92)

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Drawn By: Jonathan Yoo

Project Details
Drawing Number
N-EAS190432A .01
Date Drawn: 3/3/2021
Quote: 1-234MMCF Rev. 1
1-22J8ETR Rev. 3
Order: 6600448936.010000
6600448836.010000-.020000

SN2

MRI Safety

1. Safety with Magnetic Fields
It is the responsibility of the customer to satisfy the following safety requirements:

a. Controlled Zone:
- During the siting of a Philips MR system, a controlled access area around the MR system must be defined where the field strength will exceed 5 Gauss (0.5 mT). Warning signs "CAUTION" - Magnetic field permanently switched on" should be used to indicate this area. The area must be clearly visible, e.g. by markings on the floor, barriers or other means to control access to this area by unauthorized persons.
- Persons having pacemakers, neuro-stimulators, insulin pumps or similar devices, or implants of ferromagnetic material (i.e. surgical clips, artificial cardiac valves, prostheses or metal splinters) must stay outside the controlled access zone.
- The security procedures at the entrances of the examination room should prevent prohibited objects from being brought into the examination room. Metal detection equipment can be used.
- No medical gas containers may be brought into the exam room area unless it has been determined that the container is made of non-ferrous material. Special non-ferrous containers are available from liquid gas suppliers and must be appropriately labeled.
- Ferromagnetic objects, such as scissors, tools, gas bottles, vacuum cleaners and stretchers, must be kept outside the examination room. Such objects will be pulled to the magnet, and may cause injury to patients and staff, or may damage the equipment.
- Magnetic shielding requirements to minimize the controlled zone, or contain it within the exam room are to be determined on a site by site basis. If additional shielding is required, consult with Philips service. The customer accepts full responsibility for all costs associated with additional magnetic shielding.

b. Emergency Magnet Run-down:
- The MR system is provided with two magnet emergency run-down remote push buttons to terminate the magnetic field. This should only be used in case of an emergency.
- If in a medical emergency, non MRI-safe instruments must be used, the patient must be removed from the examination room first.
- In case of a deliberate quench (magnet run-down) by the operator to implement life supporting and other safety procedures, the magnet field strength at the isocenter is reduced to a value below 200 G (20 mT) within 30 seconds.

2. Safety Zones
MRI safety guidelines recommend that facilities be zoned to ensure patient safety. It is the sole responsibility of the customer to regulate and/or restrict staff and patient flow within the MR environment as necessary. MR safety zones are described as follows:

Zone I - Entrance to facility, reception and waiting areas. No restrictions to patient access.
Zone II - Patient holding area and/or dressing rooms. Patient access may be restricted, or staff supervision may be required.
Zone III - MR control area and equipment room. Accessible only by authorized or properly trained MR personnel. It is recommended that a card-key locking device be used to gain access to these areas.
Zone IV - Scanner room. This area should be accessible solely from Zone III, and access to the scanner room should be observed and control by authorized MR personnel. It is recommended that a warning light be illuminated at all times, with a 24-hour backup power system in the event of a power outage.

(18.0)

Safety Marking Plate

An Examination / RF-door provide access to high static magnetic fields and RF-fields.

To guard against accidents and injuries to patients and others as well as damage to the MR scanner, warning signs are required to exclude:
- People who may have pace makers, implants, neuro-stimulators, etc.
- Ferromagnetic objects to avoid missile effects.
- Sensitive electronic devices.

The safety marking plate should be placed to be viewed if the door is closed, but especially also if the door is opened. Due to that, it is better to locate the sign near the door frame and not on the door.

An alternative is to locate adhesive signs on the floor in front of the door.

Presence of a safety marking plate will be checked as a part of the installation procedure and hand over. Is is not allowed to bring the magnet on field if safety marking plates are not installed.

Please check with local code and consult local end-users and safety-officers about the layout of Safety Marking Plate and if possible multiple languages are needed.

Please contact local Philips Project Manager for sample.

(14.0)

RF Enclosure Requirements

1. RF Shielding Effectiveness
The room has to be built and tested to the following specifications that apply to all parts of the shielded enclosure, including seams, doors, windows, vents and mechanical penetrations:

Values Measured Analogue to MIL-STD-285		
H Field	0 MHz - 10 MHz	Irrelevant
	10 MHz - 15 MHz	90 dB
	15 MHz - 130 MHz	100 dB
E Field and Plane Wave	5 MHz - 130 MHz	100 dB

These requirements are valid for Philips parts not installed and are subject to the following:
a. The RF shielding is completely installed.
b. Foundation provisions for the magnet and patient support are installed.
c. Protective earth wiring (inside and outside the RF Enclosure) is installed.
d. All components/equipment to be located inside the enclosure are installed and operational (including all external facilities and their interfaces to systems inside the enclosure, excluding Philips parts).
e. All RF enclosure feedthrough frames covered with blind plates (provided by RF vendor).

2. RF Enclosure Materials

a. Copper RF Enclosures:
Philips recommends copper RF enclosures due to its shielding effectiveness, long term stability, flexible design capabilities, availability, and cost.

b. Ferrous Material RF Enclosures:
RF enclosures made of ferrous material may be acceptable, but are subject to restrictions:
- The floor of the RF Enclosure must be made of non-ferrous material (i.e. copper) within a 9' - 10" x 9' - 10" (3m x 3m) box from magnet isocenter.
- The total combined thickness of the ferrous material must achieve the specified shielding effectiveness with the magnetic field on.
- All walls must be at least 63" (1600mm) from magnet isocenter. The walls do not need to be symmetrically located around isocenter.
- The RF enclosure must not vibrate. This can introduce B0 variations, especially at the RF enclosure ceiling.

c. Aluminum RF Enclosures:
Aluminum RF enclosures are acceptable, but require special attention. Over time, a layer of aluminum oxide will form. This causes electrical contact between RF enclosure parts to degrade, especially around doors, feedthroughs, and windows. As such, extra measures (such as special coating) must be taken. Also, the RF enclosure quality between moving contact points (doors) will rapidly degrade. To reduce degradation, a thin sheet of brass can be used between such surfaces. If the connection is made by an appropriate screw connection, the electrical resistance between the brass and the aluminum must be less than 10 Ohms. The use of gaskets for the door, in addition to the issues mentioned above must not degrade the RF enclosure such that it no longer meets the shielding requirements. Therefore, Philips strongly recommends the use of "finger stocks".

3. Environmental Conditions
The shielding must operate effectively and not suffer damage under the following conditions:

Temperature Range		50° to 104° F (10° to 40° C)	
Humidity		20% to 90% non-condensing	
Air Pressure		7.25 to 16.0 PSI (50 to 110 kPa)	
Frequency		Drip	
Mechanical Vibration		**Mechanical Shocks**	
Water/Damp/Liquid	0 - 150 Hz	G-Value	0 - 0.1 g
G-Value	0 - 0.1 g	Pulse Duration	6 - 10 ms

These conditions also apply for the system wiring, ducts, gas exhausts and other interface provisions. During and shortly after installation, the shielding may be subject to extreme conditions due to construction activities. Power loss or temperature control failure can also cause extreme environmental conditions. Local earthquake regulations must be followed. Special measures may be required to fasten the magnet and patient support to the building.

4. Reliability / General Policy
a. Specifications listed are MANDATORY REQUIREMENTS for the proper functionality of the MR system.
b. Philips accepts no responsibility for correct operation of the RF enclosure. The performance of the MR system is only guaranteed if mandatory requirements are met.
c. The RF enclosure effectiveness must be tested by the RF vendor, and the results accepted by Philips. If requested by the customer, a Philips representative can be present to witness the testing. The shielding effectiveness must be tested according to the following codes and standards applicable to the extent indicated:
   - MIL-STD-285: Method of attenuation measurements for electromagnetic shielding enclosures for electronic test purposes.
   - MIL-STD-220A: Standard of safety of electromagnetic interference filters.
   - UL 1283: Standard for safety of electromagnetic interference filters.
d. The shielding must be designed for 100% operation throughout the year.
e. There must be a a gap between the RF Shield and finished wall in the exam room to ensure proper shielding grounding and isolation.
   - The gap prevents contractors from accidentally puncturing the shield with screws or nails.
   - The gap will ensure the shield stays electrically isolated except for approved connections

(14.0)

PHILIPS

Project
Ingenia Ambition 1.5T X
Good Samaritan Hospital of Suffern
Community Medical Care
Suffern, NY
Room: MRI 1.5T (TMP 92)

Philips Contacts
Project Manager: Rich Halm
Contact Number: (860) 373-3707
Email: richard.halm@philips.com
Drawn By: Jonathan Yoo

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6600448836.010000-.020000

SN3

Acoustical Noise and Vibration Forces

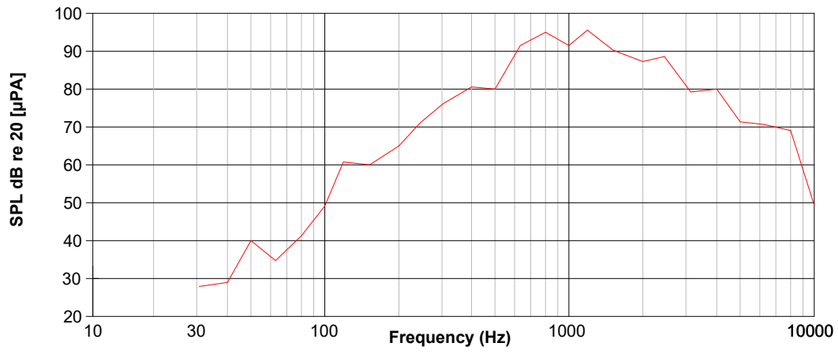
Acoustical noise produced is related to clinical use and the gradient system applied. During scanning acoustical noise originates from the gradient coil. Acoustical noise can vary.

To avoid possible acoustical nuisance the worst case situations must be considered for site design.
The use of sound absorbent materials in the examination room is required.

Below a figure that shows peak hold SPL of each of > 30 clinical scans made.

Note: There is no individual/single scan that produces this SPL for the frequencies displayed.

Dynamic Forces Applied to floor in $\frac{1}{3}$ Octave Bands, envelop of all sequences



To avoid possible acoustical nuisance the worst case situations must be considered for site design. The use of sound absorbent materials in the examination room is required. It is recommended to make the wall between the examination and control room of two panels. Sound absorbent materials can be mounted between these panels. Some RF Enclosure suppliers already use double-panel walls, one panel for RF shielding and one panel for room finishing. Contact an architect to determine which of the following acoustical noise means can be provided, if needed. Depending on the building construction additional acoustical noise suppression to the same floor level or to other floor levels can be achieved via the following means:

- Additional brick wall between the RF enclosure and technical/operator room or other room. Thickness: $4\frac{3}{8}$" to $4\frac{3}{4}$" (110mm to 120mm). Specific weight: 1.8, 250 kg/m2 R'w > 52 dB
- A double wooden wall (0.08" x 0.50" [2mm x 12.5mm] thick) with 3.15" (80mm) thick mineral fiber material in between, type W-w according DIN 18165 Teil 1.
- The RF door and RF window can be assembled to a construction with sufficient attenuation for acoustical noise:
- RF door : R'w > 32 dB
- RF window : R'w > 40 dB (panes of different thickness)
- The ceiling inside the RF-Enclosure can be finished with a 4" (100 mm) thick mineral fiber material, type W-w according DIN 18165 Teil 1.
- Avoid openings from examination room to other rooms (except needed openings to technical room).

Additional acoustical contact noise suppression can be achieved via the following means:

- Free standing RF enclosure.
- No other coupling to the building than the floor of the RF-Enclosure.
- All other interfaces off the RF enclosure to the building (wall and ceiling) must be de-coupled for to avoid noise (flexible connection of air conditioning pipes etc.).

Typical Acoustical Noise Levels*

39.37" (1m) from equipment room cabinet	75 dBA
39.37" (1m) from Operator's Console	40 dBA

Acoustical Noise Suppression

Sound Absorption Coefficient of Materials to be Used	
Suspended Ceiling - Control and Equipment Room	> 0.6
Main Frequency to be Attenuated	600 to 1000 Hz

* Maximum levels can increase by 4 dBA during various sequences and do not include noise produced by third party equipment.
* The SACU is normally installed inside the equipment room. Anticipate 72 dBA acoustical noise generated by the SACU. Never install SACU in the Operators or Reporting Room.

(18.0)

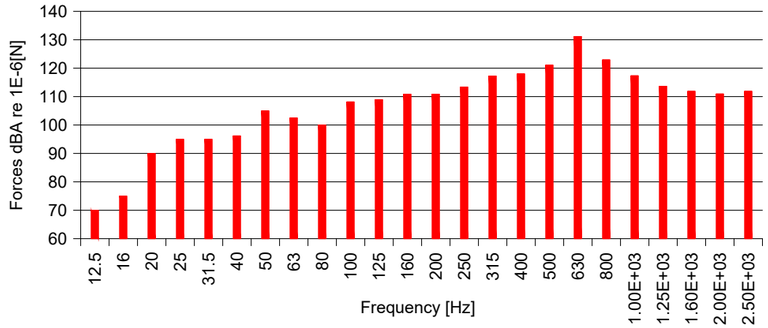
Contact Noise

Due to mechanical vibration of the scanner during clinical use the building floor can start to vibrate and transport the acoustic energy through the floor to surrounding areas. This energy in the hospital structure will generate acoustic noise in the adjoining spaces. Depending on the building structure the energy can travel across large areas.

If needed an acoustic consultant can investigate if the contact noise could be a problem.

Below a figure that shows peak hold of each of > 30 clinical scans made. This is no representation of one individual clinical protocol, but an envelope of cumulative forces.

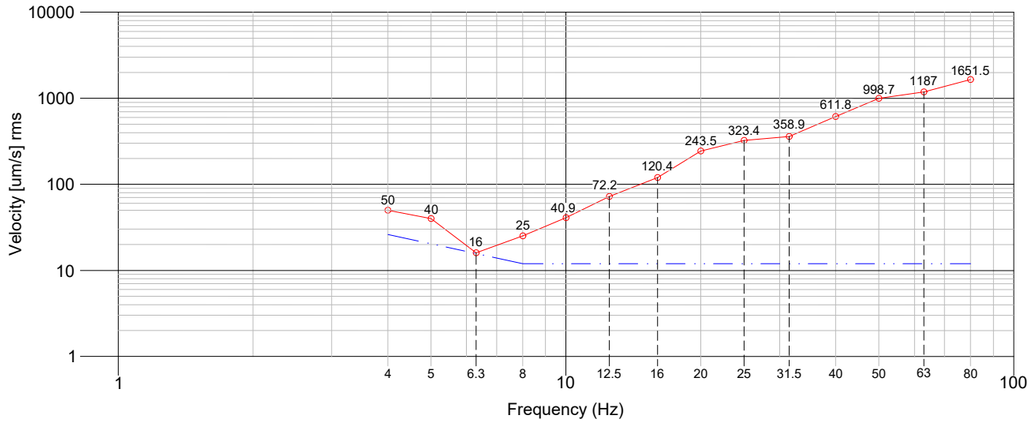
Forces acting on floor



Third party delivered vibration pads are no longer allowed. Philips Healthcare newly designed vibration pads are now delivered and shall be used. Typical contact noise reduction is 20 dB compared to Achieva systems. Use of third party pads could interfere with the vibration specification of the magnet and the shimming of the magnet due to sinking. Weak pads can also affect the correct alignment of the magnet and patient table.

(14.0)

Typical floor design in relation to MR Vibration Requirements



Vibration of the site has the ability to affect the stability of the magnetic field and because of this image quality.

A typical example of a good floor design is a so called VC-C type. Above you find a figure of the floor design in relation to the vibration requirements of the MR system

(18.0)

PHILIPS

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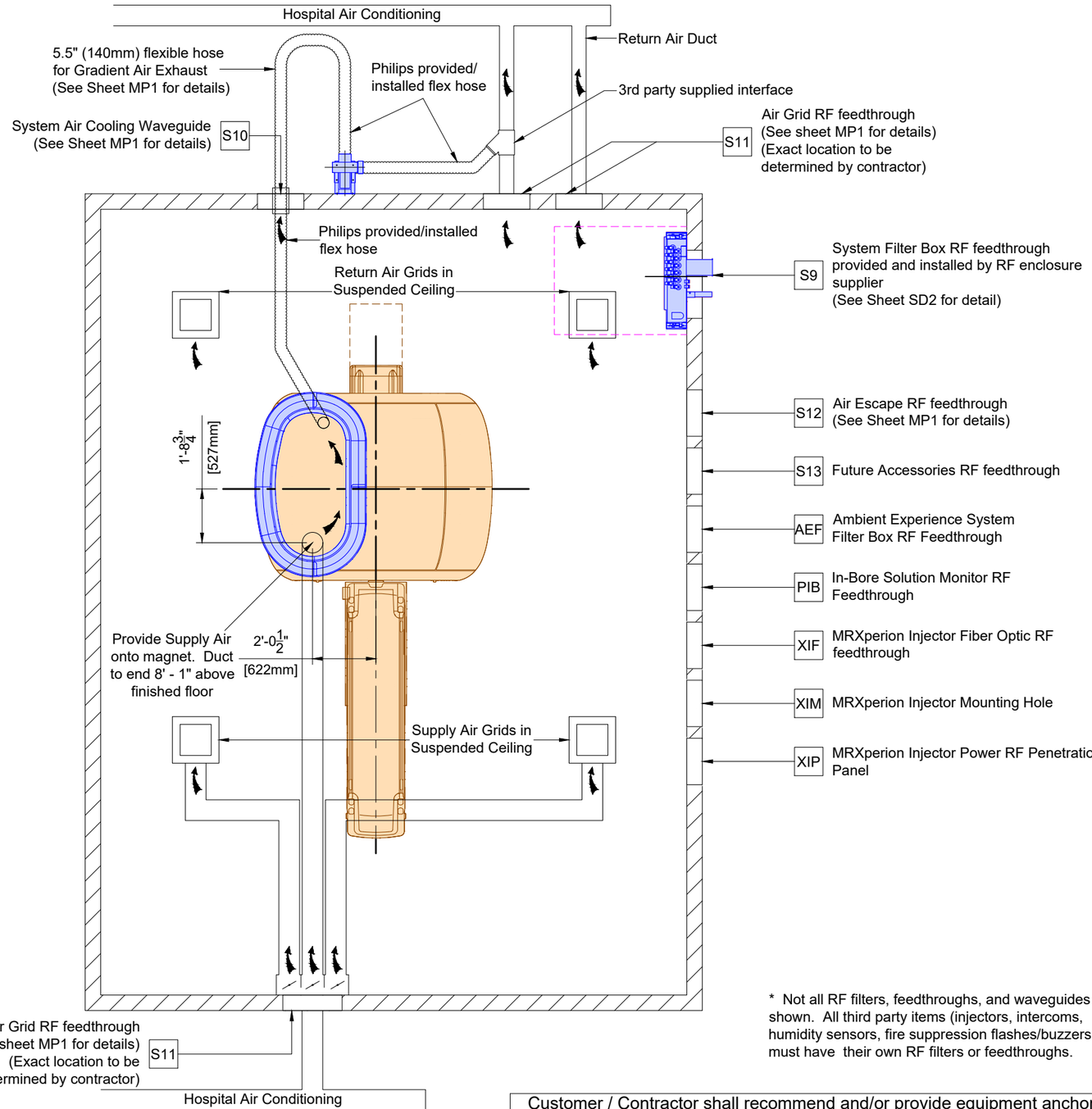
SN4

Waveguide/Feedthrough Summary

For reference only. Exact locations to be determined by customer/contractor/RF Vendor



* Not all RF filters, feedthroughs, and waveguides are shown. All third party items (injectors, intercoms, humidity sensors, fire suppression flashes/buzzers, etc.) must have their own RF filters or feedthroughs.

Customer / Contractor shall recommend and/or provide equipment anchoring systems (i.e. "HILTI", "REDHEAD", etc.) based upon specified "pull" forces and wall/ceiling composition.

Floor & Wall Support Legend

A Furnished and installed/anchored by Philips (exceptions may exist, see Note 2)
B Furnished and installed by customer/contractor and installed/anchored by customer/contractor
C Furnished by Philips and installed by RF Enclosure Supplier
D Furnished by Philips and installed/anchored by contractor
E Existing
F Future
G Optional
H Furnished by RF Enclosure Supplier and installed by RF Enclosure Supplier

	Item Number	Description	Detail Sheet
H	S1	Aluminum magnet support pads (4x) by RF enclosure supplier.	SD1
H	S2	Aluminum patient support pads (2x) by RF enclosure supplier.	SD1
B	S3	Limited floor reinforcement/ferrous materials area, 9' - 10" x 9' - 10" (3m x 3m).	S1 / SN1
B / H	S4	No false ceiling (tile or grid) in this area, 28" x 56" (700mm x 1400mm). This service area must be clear of obstructions from top of magnet to 10' - 0" above finished floor except for the Supply Air exhaust duct. (See Waveguide/Feedthrough Summary for the location of duct).	SD1
B / H	S5	Removable ceiling area 23.75" x 46" (600mm x 1170mm) for servicing equipment. Grid work must be easily removed for access.	SD1
B	S6	Wall anchorage for Mains Distribution Unit. Not to penetrate RF shield.	
B	S7	Wall anchorage for Emergency Run-Down Button mounted 71" (1805mm) A.F.F. Not to penetrate RF shield.	AD3
B / H	S8	Opening in suspended ceiling for ceiling speakers - exact location to be determined. (Not shown on plan)	SD1
H	S9	System Filter Box RF feedthrough (frame to mount System Filter Box must be flush with finished wall).	SD2
H	S10	System Air Cooling Waveguide, 6.25" (160mm) dia., do NOT use honeycomb-type wave guide. Must be located < 78.75" (2m) from exam room air out duct - exact location to be determined by customer.	SD3 / MP1
H	S11	Air Grid RF feedthrough for conditioned air entering/exiting exam room - exact location to be determined. (Not shown on plan)	MP1
H	S12	Air Escape RF feedthrough (optional - for pressure balancing between magnet room and adjacent room) - exact location and size to be determined. (Not shown on plan)	MP1
H	S13	12" (300mm) x 12" (300mm) RF panel with 3" (75mm) diameter waveguide for future accessories - exact location to be determined. (Not shown on plan)	
B	CIP	Wall anchorage for KKT Chiller Interface Panel.	SD4
B	RDP	Wall anchorage for KKT Chiller Remote Display Panel.	SD4
B	SR	Storage Rail Mounting (Mounting option to be determined. Reference SD4 page.)	SD4
F	BCP	Wall anchorage for Backup Power Connection Panel. Not to penetrate RF shield.	
B	TC	Wall anchorage for 60Hz Transformer Cabinet mounted 4' - 0" (1.2m) from finished floor to the bottom of the cabinet. Not to penetrate RF shield.	
H	AEF	Ambient Experience System Filter Box RF Feedthrough located above suspended ceiling. Mounting plate provided by Philips and installed by RF enclosure supplier.	SD5
A	DB	Distribution Box mounted to RF wall above suspended ceiling with two non-magnetic screws or double-sided adhesive tape.	SD5
B	ATSW	Anchorage for face plate required to flush-mount wall box for Touch Screen Monitor.	SD6
B / H	PIB	In-Bore Solution Monitor RF Feedthrough (See SD sheet for detail for the opening sizes in the RF and finished wall). InBore interface frame will be supplied by Philips, but installed by RF enclosure supplier.	SD7 / SD8
H	XIF	MRXperion Injector Fiber Optic RF feedthrough. 2" Dia., location t.b.d. by RF enclosure supplier to provide the best cable path between XI and XD (not shown).	
H	XIM	MRXperion Injector Mounting Hole. 2 1/2" Dia., location t.b.d. by RF enclosure supplier to provide the best cable path between XI and XPS (not shown).	SD4
A	XIP	MRXperion Injector Power RF Penetration Panel (not shown). Bayer to provide and install filter panel on to XIM.	

PHILIPS

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Drawn By: Jonathan Yoo

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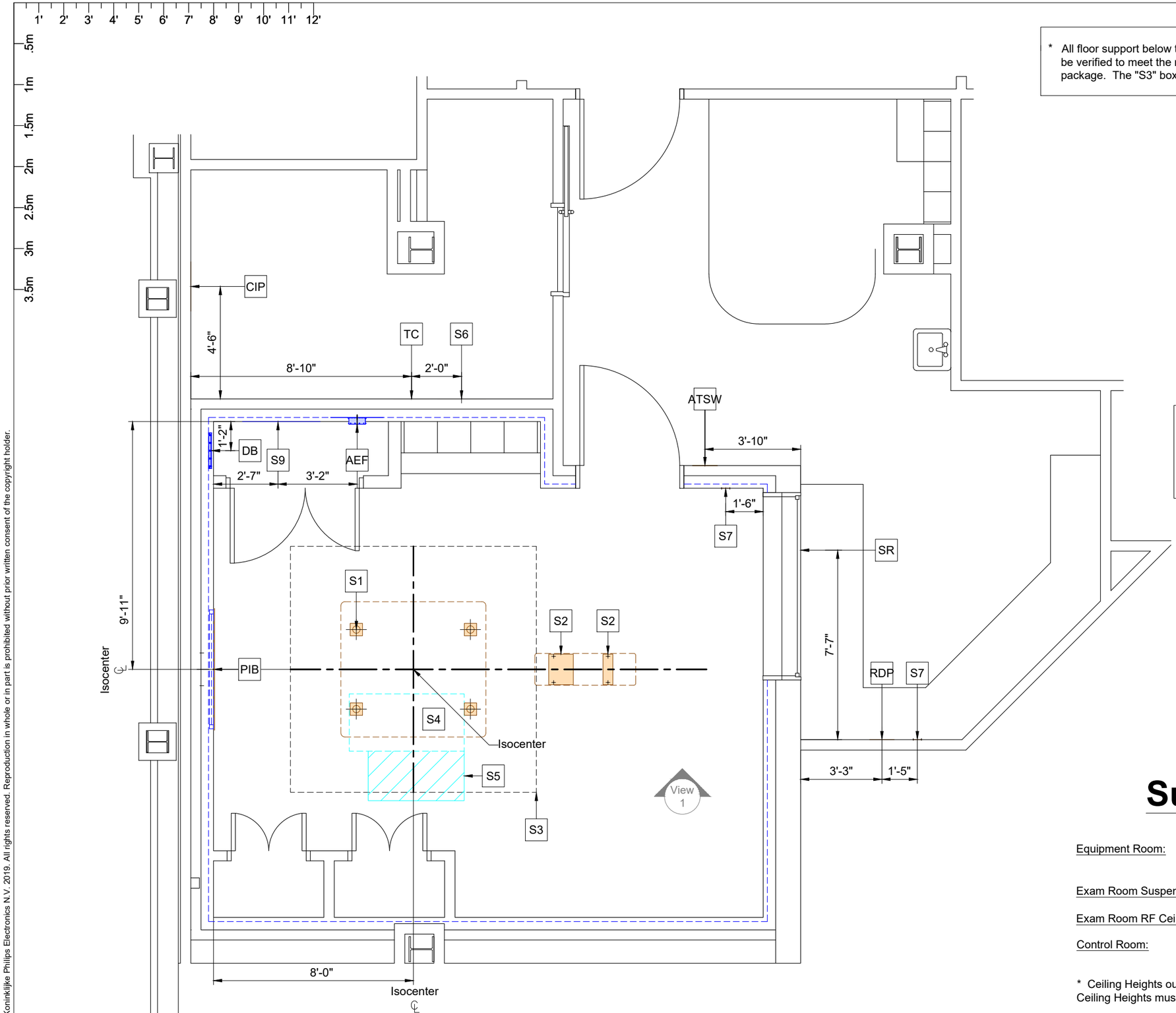

* All floor support below the magnet including floor reinforcement and beams must be verified to meet the requirements shown on the SN1 page of the final drawing package. The "S3" box shows the critical area below the magnet.

All wall anchorages are dimensioned to centerlines.

Verify location with Customer and local Philips Project Manager.

BCP

Support Layout

1/4" = 1'-0"

Ceiling Height Guide

Equipment Room:	10' - 6" (3200mm)	Recommended
	9' - 2" (2795mm)	***Minimum****
Exam Room Suspended Ceiling:	8' - 3 1/4" (2520mm)	***Required***
Exam Room RF Ceiling:	9' - 9" (2970mm)	Recommended
Control Room:	9' - 10" (3000mm)	Recommended
	7' - 3" (2200mm)	***Minimum***

* Ceiling Heights outside the minimum dimensions may be possible. These Ceiling Heights must be reviewed and approved.

PHILIPS

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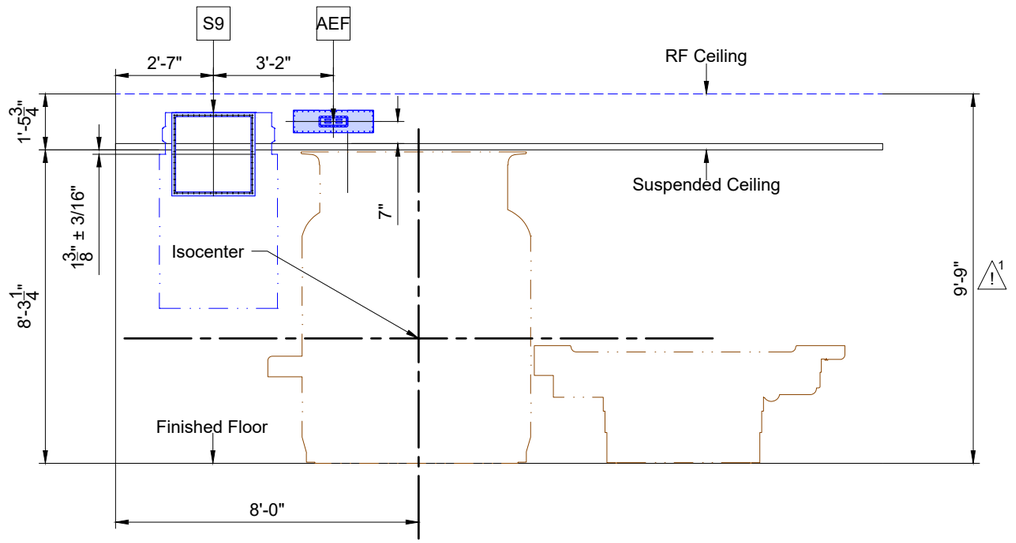
S1

Detail - System Filter Box and AEF RF Feedthrough (View 1)



Note:
Wall and location shown are preferred/recommended. If there are existing obstructions, alternate routing plans, more suitable options, please consult with your Philips Project Manager to investigate a more suitable location and have these details revised.

S9 AEF

General Notes:
RF and Suspended ceiling heights are shown using the best data available at the time. If actual or planned heights differ, please consult with your Philips Project Manager to have these details revised.

Reported Ceiling Heights from finished floor to bottom of :
Deck above : Unknown
RF Ceiling : Unknown
Exam Room Suspended Ceiling: Unknown
Equipment Room Ceiling: Unknown

Planning Issues and Considerations

1 Recommended Ceiling Heights shown. Plans must be revised to reflect the site specific ceiling heights.

Gradient Exhaust Waveguide for System Air Cooling Unit (SACU) location to be determined based on final location of SACU. SACU must be located less than 78.75" (2m) away from Examination Air Out Duct (See Sheet MP1).

S10

PHILIPS

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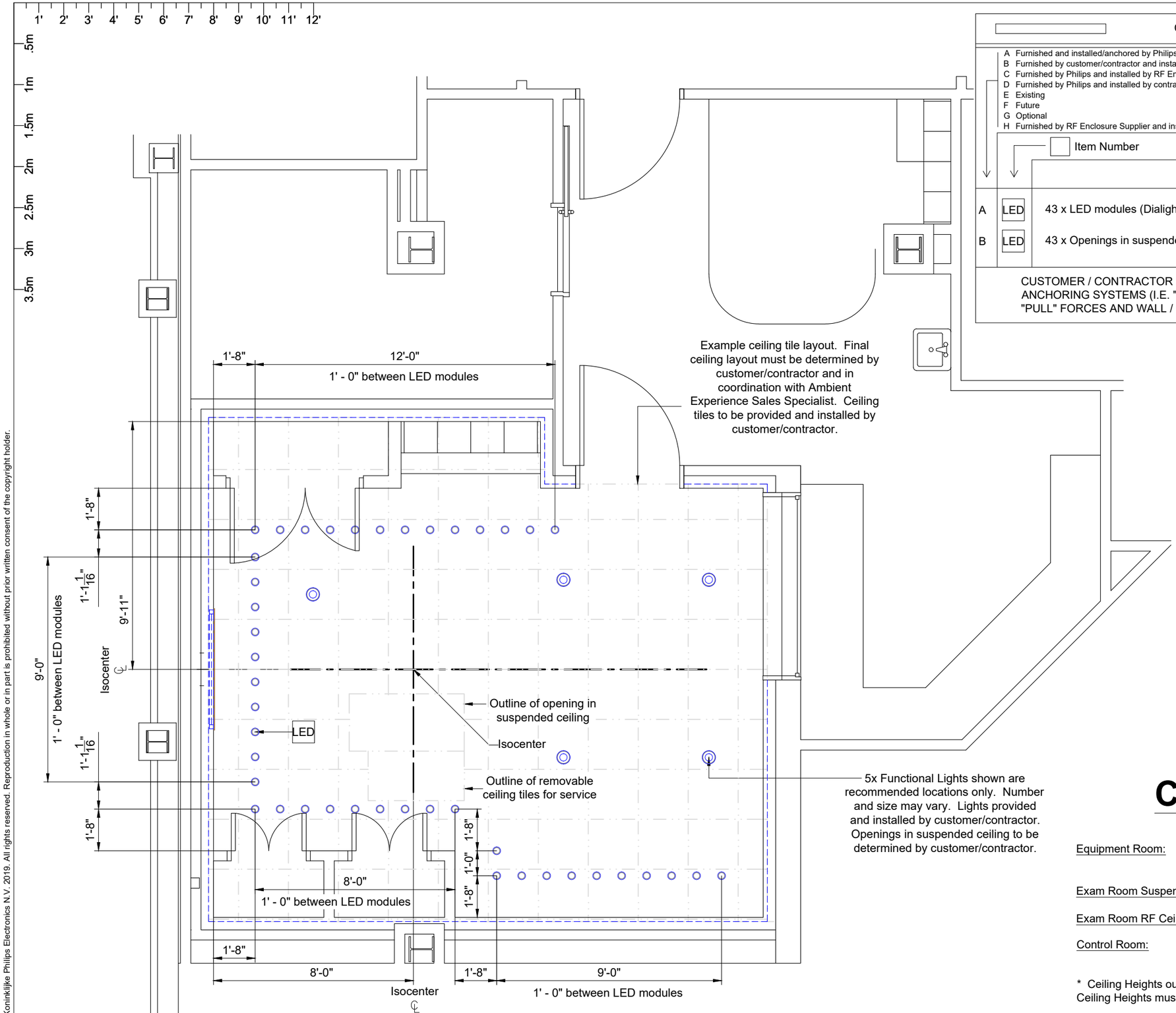
S2



Example ceiling tile layout. Final ceiling layout must be determined by customer/contractor and in coordination with Ambient Experience Sales Specialist. Ceiling tiles to be provided and installed by customer/contractor.

5x Functional Lights shown are recommended locations only. Number and size may vary. Lights provided and installed by customer/contractor. Openings in suspended ceiling to be determined by customer/contractor.

Ceiling Support Legend

A Furnished and installed/anchored by Philips (exceptions may exist, see Note 2)
B Furnished by customer/contractor and installed by customer/contractor
C Furnished by Philips and installed by RF Enclosure Supplier
D Furnished by Philips and installed by contractor
E Existing
F Future
G Optional
H Furnished by RF Enclosure Supplier and installed by RF Enclosure Supplier

	Item Number	Description	Detail Sheet
A	LED	43 x LED modules (Dialight H16-RGB) and cabling.	AD7 / ED2
B	LED	43 x Openings in suspended ceiling, 3.07" (78 mm) diameter	AD7 / ED2

CUSTOMER / CONTRACTOR SHALL RECOMMEND AND /OR PROVIDE EQUIPMENT ANCHORING SYSTEMS (I.E. "HILTI", "REDHEAD", ETC.) BASED UPON SPECIFIED "PULL" FORCES AND WALL / CEILING COMPOSITIONS.

Ceiling Layout

1/4" = 1'-0"

Ceiling Height Guide

Equipment Room:	10' - 6" (3200mm)	Recommended
	9' - 2" (2795mm)	***Minimum****
Exam Room Suspended Ceiling:	8' - 3 1/4" (2520mm)	***Required***
Exam Room RF Ceiling:	9' - 9" (2970mm)	Recommended
Control Room:	9' - 10" (3000mm)	Recommended
	7' - 3" (2200mm)	***Minimum***

* Ceiling Heights outside the minimum dimensions may be possible. These Ceiling Heights must be reviewed and approved.

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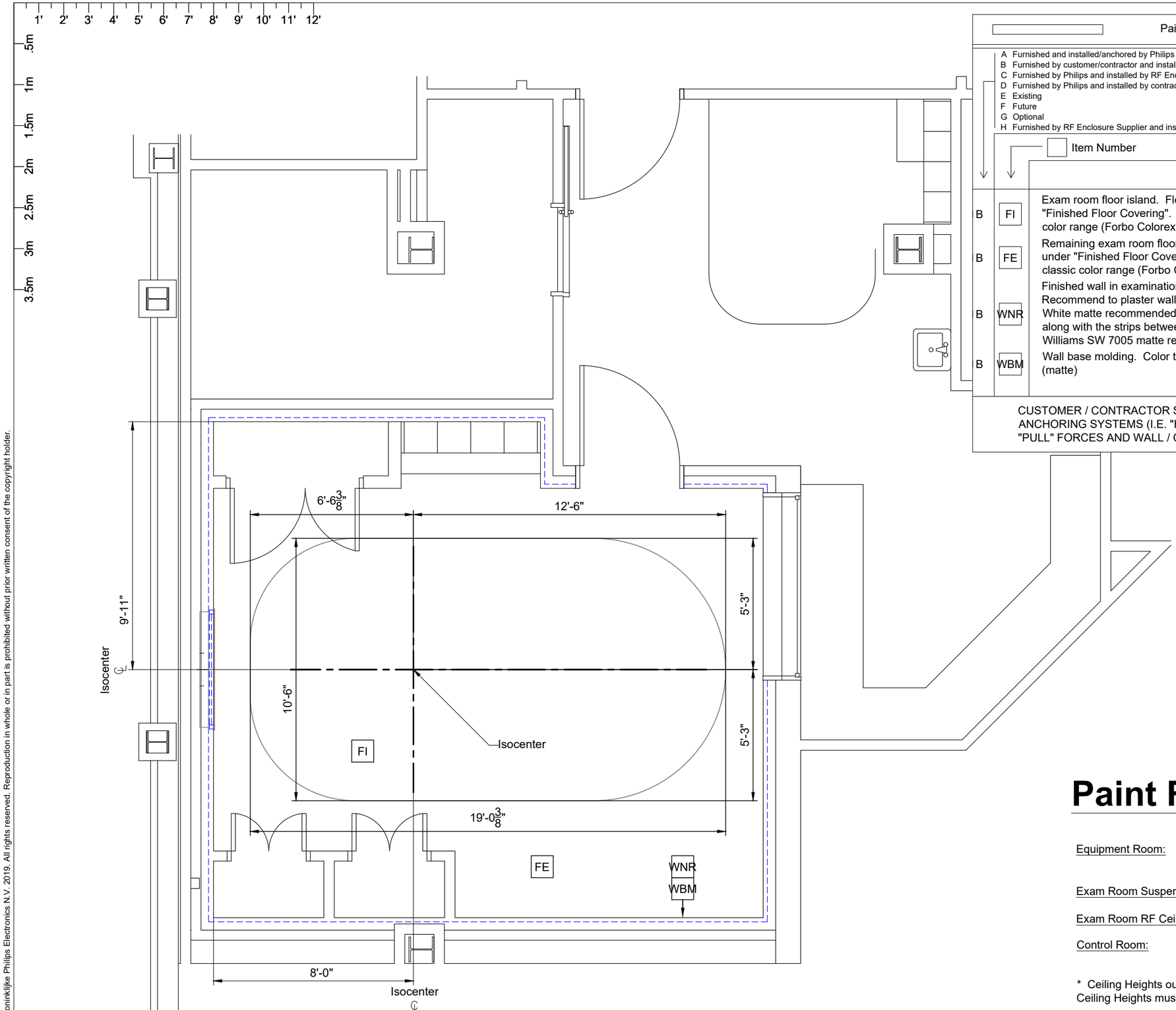
S3



Paint Requirements Legend

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B Furnished by customer/contractor and installed by customer/contractor
C Furnished by Philips and installed by RF Enclosure Supplier
D Furnished by Philips and installed by contractor
E Existing
F Future
G Optional
H Furnished by RF Enclosure Supplier and installed by RF Enclosure Supplier

	Item Number	Description
B	FI	Exam room floor island. Floor must meet specifications stated on SN1 under "Finished Floor Covering". Recommend "Forbo Colorex EC" out of the classic color range (Forbo Colorex Quartz EC).
B	FE	Remaining exam room floor. Floor must meet specifications stated on SN1 under "Finished Floor Covering". Recommend "Forbo Colorex EC" out of the classic color range (Forbo Colorex Montblanc EC).
B	WNR	Finished wall in examination room to be made out of non-reflecting material. Recommend to plaster wall and paint white (Sherwin Williams SW 7005 Pure White matte recommended). If walls are currently made from "wood", paint them along with the strips between them using non-reflecting white paint (Sherwin Williams SW 7005 matte recommended). Walls must have a level 5 finish.
B	WBM	Wall base molding. Color to match Sherwin Williams SW 7005 Pure White (matte)

CUSTOMER / CONTRACTOR SHALL RECOMMEND AND /OR PROVIDE EQUIPMENT ANCHORING SYSTEMS (I.E. "HILTI", "REDHEAD", ETC.) BASED UPON SPECIFIED "PULL" FORCES AND WALL / CEILING COMPOSITIONS.

Paint Recommendations

1/4" = 1'-0"

Ceiling Height Guide

Equipment Room:	10' - 6" (3200mm)	Recommended
	9' - 2" (2795mm)	***Minimum****
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Exam Room RF Ceiling:	9' - 9" (2970mm)	Recommended
Control Room:	9' - 10" (3000mm)	Recommended
	7' - 3" (2200mm)	***Minimum***

* Ceiling Heights outside the minimum dimensions may be possible. These Ceiling Heights must be reviewed and approved.

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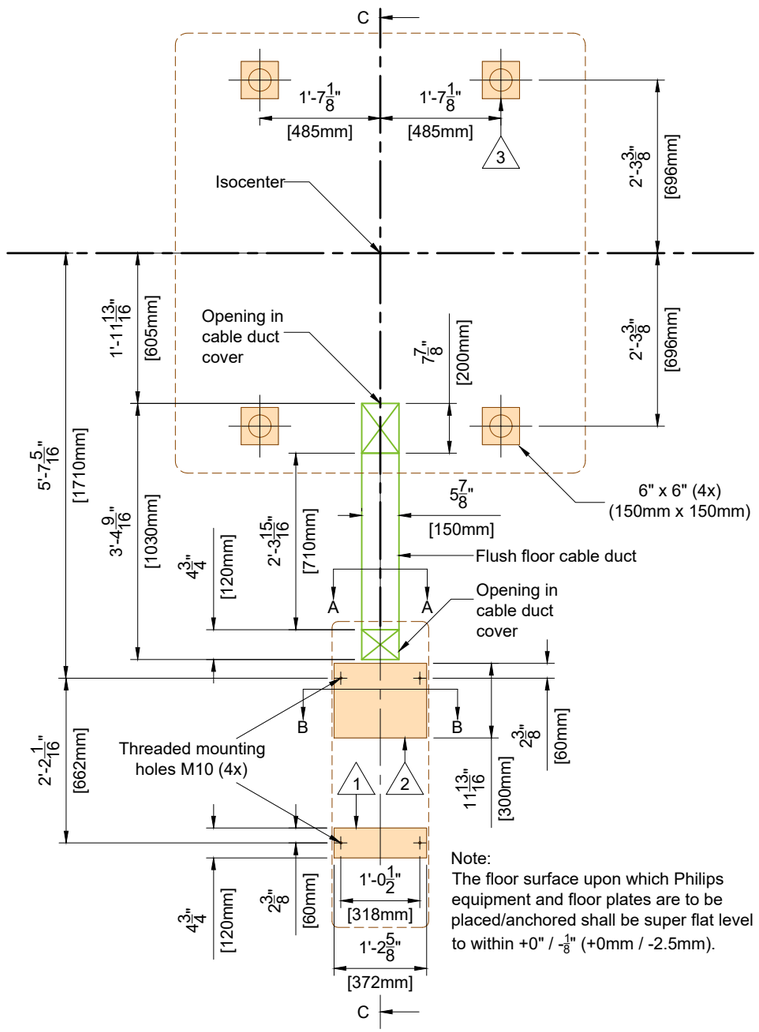
S4

Detail - Magnet and Patient Support

(Not to scale)



Note:
The floor surface upon which Philips equipment and floor plates are to be placed/anchored shall be super flat level to within +0" / -1/8" (+0mm / -2.5mm).

Floor Pads - Minimum Thickness

Pad 3	0.4" (10mm) for stainless steel for 0.6" (15mm) for aluminum
Pad 1 & 2	0.6" (15mm) for stainless steel or aluminum

Floor Pads - Floorload Forces

	Pad 1 & 2	Pad 3
Horizontal	900 lbs (4 kN)	340 lbs (1.5 kN)
Upwards	2250 lbs (10 kN) per bolt or 3600 lbs (16 kN) per pad	N/A
Downwards	560 lbs (2.5 kN) per pad	2810 lbs (12.5 kN) per foot 10115 lbs (45 kN) in total for 4 feet

Threaded mounting holes must have at least 0.6" (15mm) thread. Bolts must be electrically isolated and anchored through the RF floor to a medium that can support above mentioned forces.

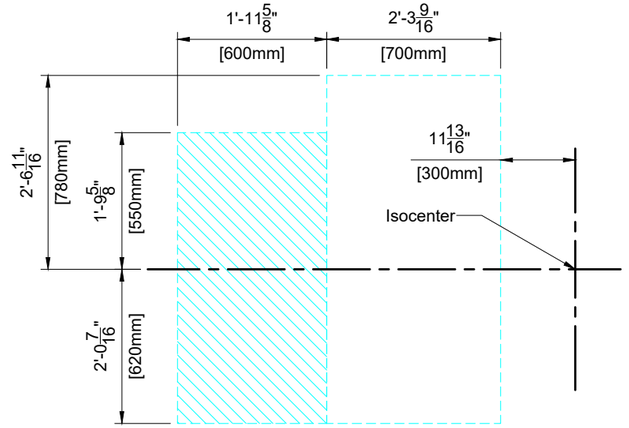
Customer / Contractor shall recommend and/or provide equipment anchoring systems (i.e. "HILTI", "REDHEAD", etc.) based upon specified "pull" forces and wall/ceiling composition.

S1 S2 FR1

(14.0)

Detail - Suspended Ceiling Magnet Service Area

(Not to scale)



Removable suspended ceiling in this area.
Grid work must be easily removed for access.

Clear opening in suspended ceiling.
No tiles or grid work in this area.

S4 S5

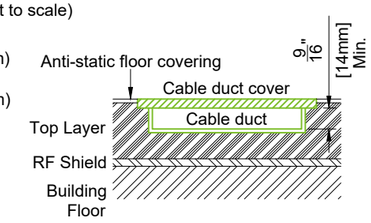
(14.0)

Detail - Cross Section A-A

(Not to scale)

Cable Duct Cover Requriements

1. 1 cover with length of 27.94" (710mm)
2. Pressure force: 2000N
3. Max. bending-through: 0.02" (0.4mm)
4. Removable
5. Smooth and well rounded edges
6. Non-magnetic material
7. Flush with finished floor

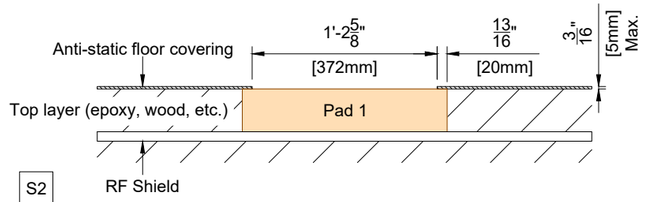


FR1

(14.0)

Detail - Cross Section B-B

(Not to scale)



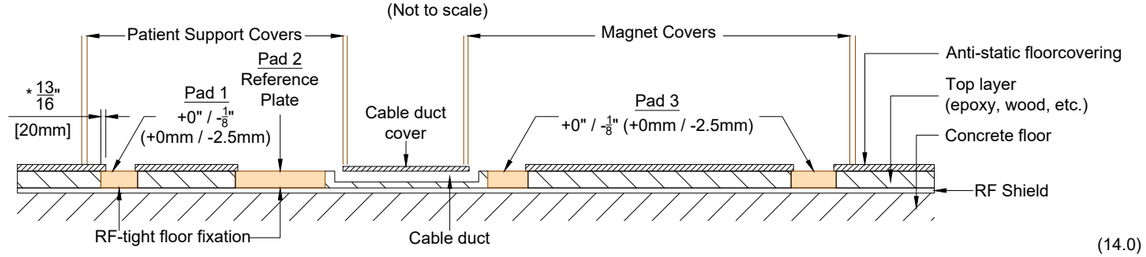
S2

(14.0)

* The magnet and patient table mounting plates must be covered with 0.80" (20mm) overlapping final floor covering. The magnet feet must not be placed on the floor covering but directly on the floor plates.

Detail - Cross Section C-C

(Not to scale)

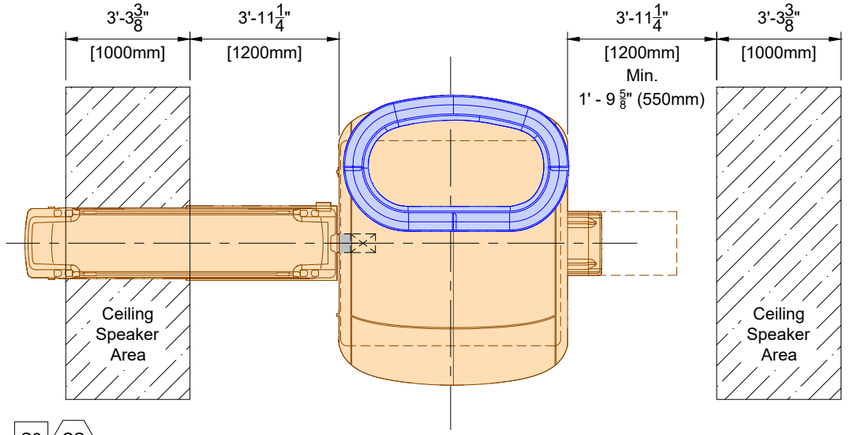


S1 S2

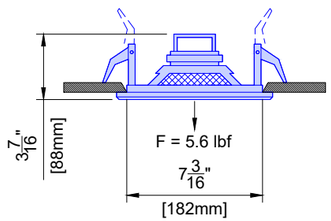
(14.0)

Detail - Ceiling Speakers in Exam Room

(Not to scale)



S8 CS



Notes:

1. Two communication speakers are supplied by Philips. Customer/contractor to flush mount one speaker in the suspended ceiling in the rear of the magnet and on in the front of the magnet.
2. Speakers must be located outside 100 Gauss line.
3. The speaker must be mechanically attached to the underside of the RF-ceiling via an attachment point located above the suspended ceiling. This attachment point is to be supplied by a 3rd party, and it is strongly recommended that it be installed by the RF vendor. This attachment point must be able to hold 250N (56.2 lbf) impact in case the fixation of the loudspeaker in the suspended ceiling fails.
4. An interconnecting cable kit (ceiling speaker grip_ will be supplied and installed by Philips. This extra ceiling speaker grip is required to handle possible unintended loss of fixation of the ceiling speaker and subsequent attraction by the MR magnet.

(20.0)

PHILIPS

Project
Ingenia Ambition 1.5T X
Good Samaritan Hospital of Suffern
Community Medical Care
Suffern, NY
Room: MRI 1.5T (TMP 92)

Philips Contacts
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Email: richard.halm@philips.com
Drawn By: Jonathan Yoo

Project Details
Drawing Number
N-EAS190432A .01
Date Drawn: 3/3/2021
Quote: 1-234MMCF Rev. 1
1-22J8ETR Rev. 3
Order: 6600448936.010000
6600448836.010000-.020000

SD1

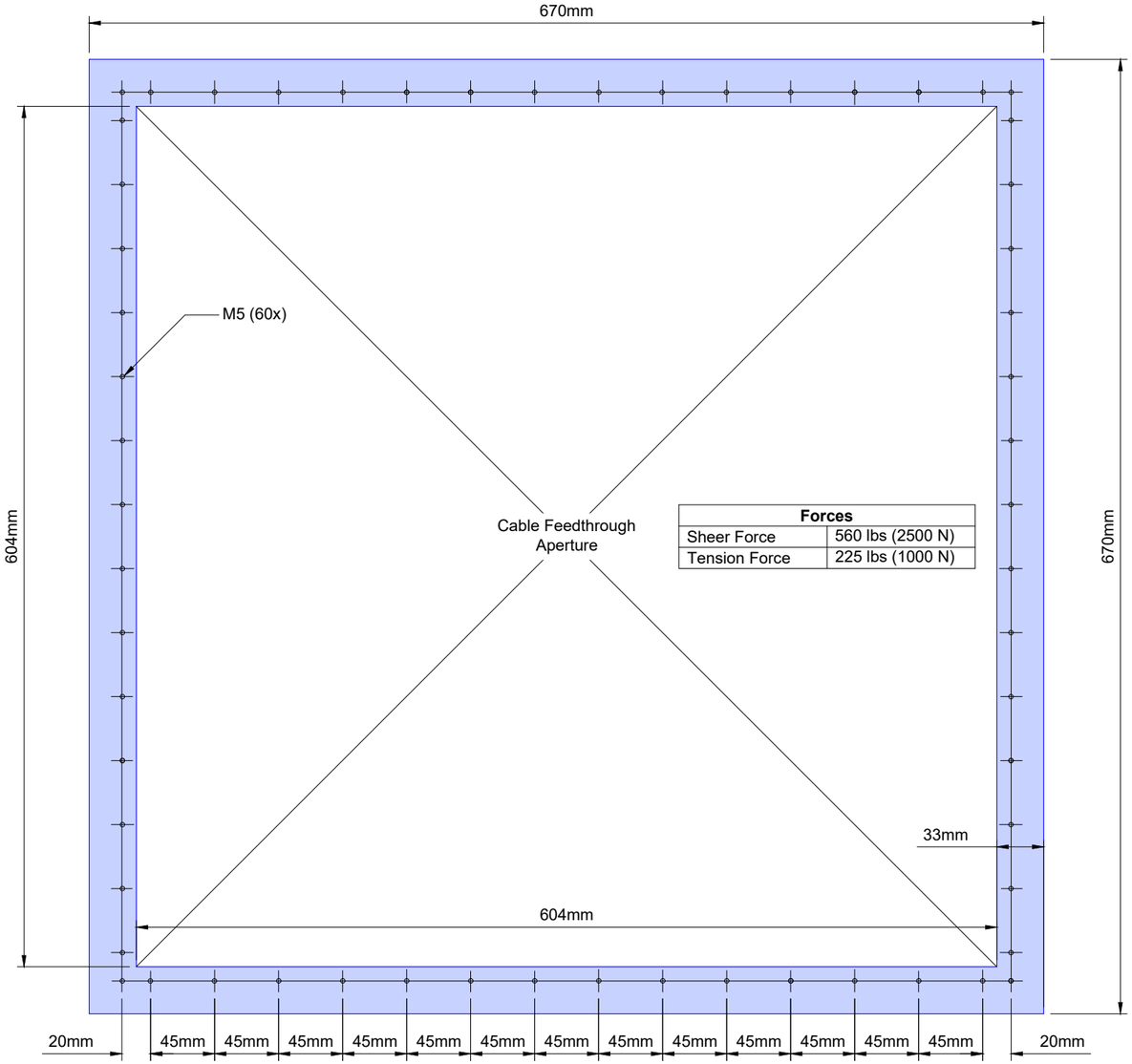
Detail - System Filter Box - RF Feedthrough

(Not to scale)

Notes:

1. 60 M5 threaded holes included 60 stainless steel screws (10mm L) and washers (M5) to be provided by RF Enclosure supplier.
2. Mounting holes to be unblocked to ensure screws can fully penetrate frame. Leave a minimum 5mm clearance around mounting holes.
3. Cable feedthrough reinforcement/height adaptation dimensions * to be determined by RF Enclosure supplier.
4. Mounting Frame to be flush with finished wall.
5. Mounting Frame to be flush with finished wall.
   a. *Aluminum shield + intermediate layer + copper or brass RF-frame by the RF-enclosure supplier.
   b. *Galvanized shield + intermediate layer + copper or brass RF-frame by the RF-enclosure supplier
   c. Copper shield + copper or brass RF-frame by the RF-enclosure supplier.

* For an aluminum or galvanized steel RF shielding material you need an intermediate metal to avoid galvanic corrosion between the brass/copper RF frame and the RF enclosure material. This it the responsibility of the RF enclosure supplier.



Forces	
Sheer Force	560 lbs (2500 N)
Tension Force	225 lbs (1000 N)

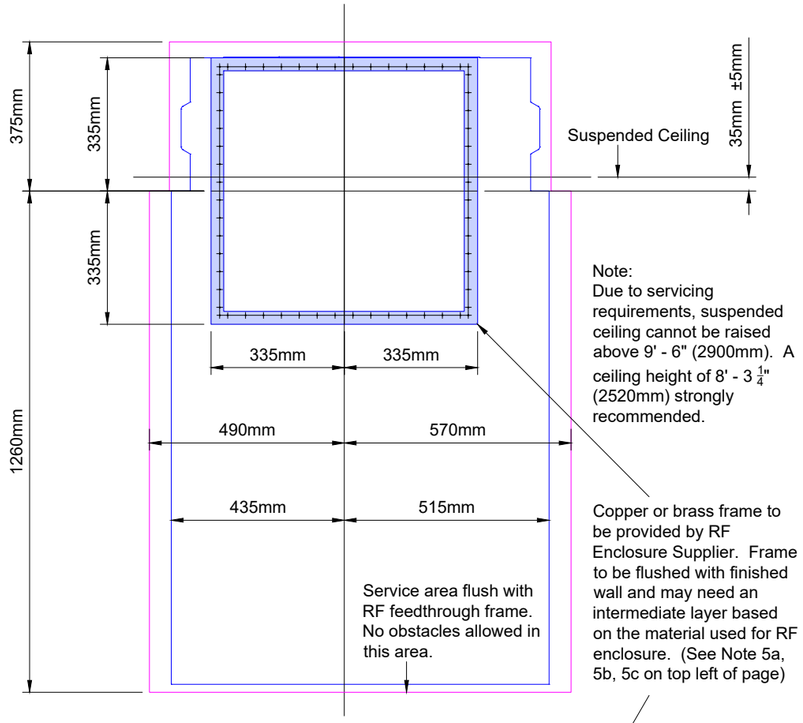
Dimensions shown are to be used on all sides of panel.

S9

(18.0)

Detail - System Filter Box - Service Clearance

(Not to scale)



Note:
Due to servicing requirements, suspended ceiling cannot be raised above 9' - 6" (2900mm). A ceiling height of 8' - 3 $\frac{1}{4}$" (2520mm) strongly recommended.

Copper or brass frame to be provided by RF Enclosure Supplier. Frame to be flushed with finished wall and may need an intermediate layer based on the material used for RF enclosure. (See Note 5a, 5b, 5c on top left of page)

View from Exam Room side of penetration.

S9

(18.0)

Detail - System Filter Box - Cross Section

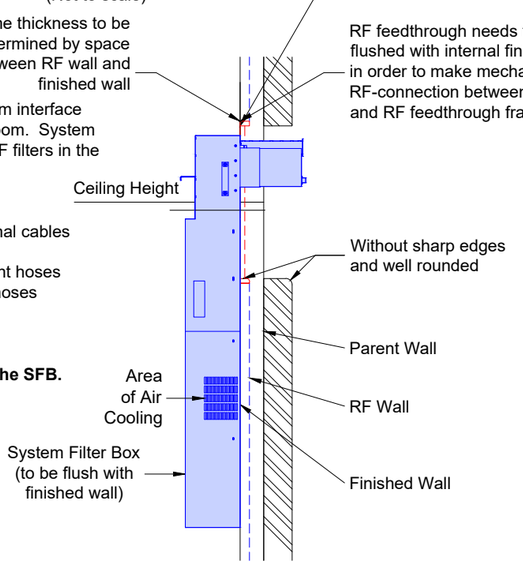
(Not to scale)

The System Filter Box (SFB) is the MR system interface between equipment room and examination room. System cables are mounted and connected via the RF filters in the SFB.

The SFB consists of the following parts:

1. Feed through for System power and signal cables
2. Feed through for helium gas lines
3. Feed through for gradient coil and coolant hoses
4. Feed through for the patient ventilation hoses
5. Feed through for HOS filters
6. System Filter Box covers

*** No Third-Party cables allowed through the SFB.**



S9

(18.0)

PHILIPS

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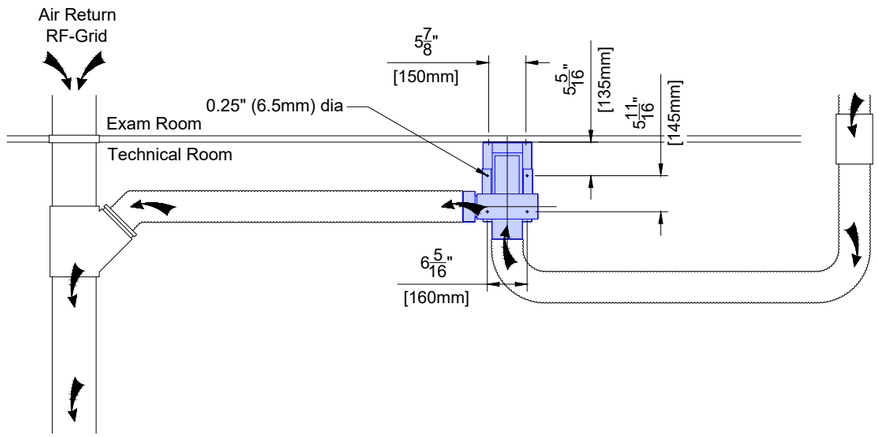
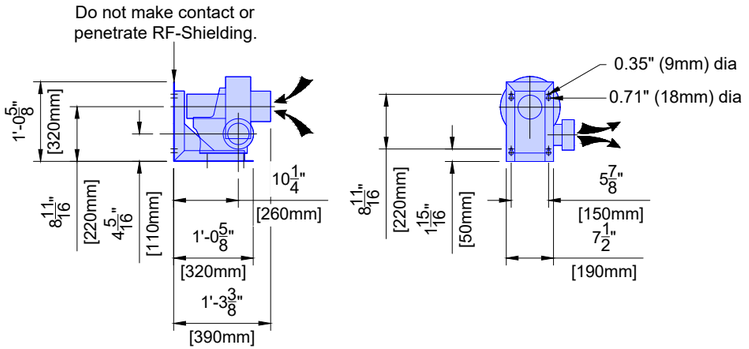
SD2

6.30.2020

Detail - System Air Cooling Unit Mounting

(Not to scale)





(18.0)

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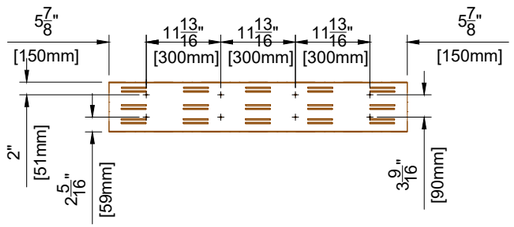
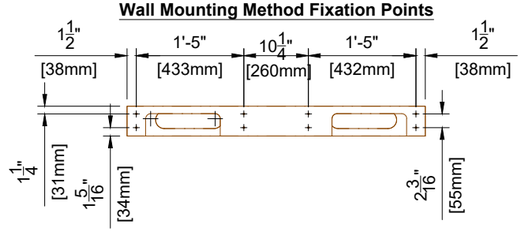
SD3

Detail - Storage Rail Mounting

Counter/Table Mounting Method Fixation Points



Wall Mounting Method Fixation Points



Mounting Methods

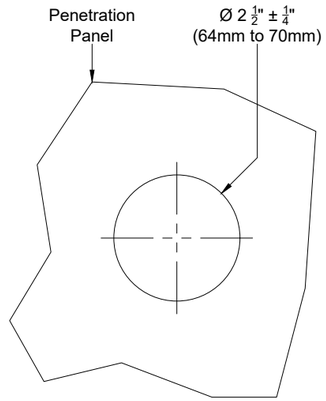
1. Mounted to wall using 8 fixation points*.
2. Mounted to underside of counter/table using 8 fixation points*.
3. Suspended from counter/table using clamps
   a. Clamps (provided by Philips) can only be used when counter/table thickness is 1 1/8" (28mm) or less.

* Fixation points have a 1/4" (6mm) diameter

SR

(16.0)

Detail - MRXperion Mounting Hole



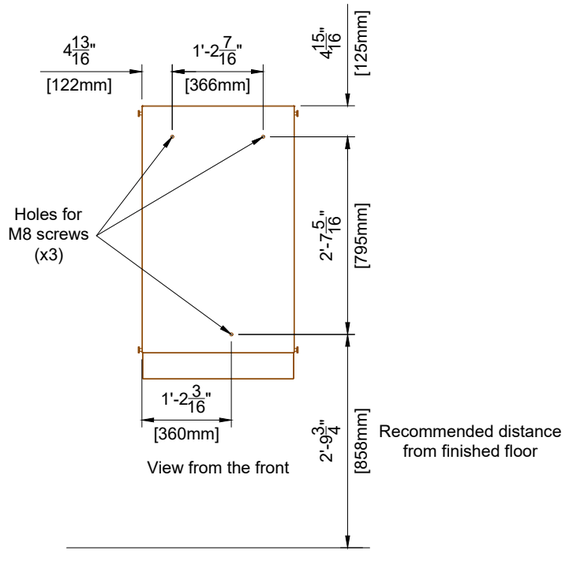
Mounting Hole Specifications

- 2 1/2" ± 1/4" (64mm to 70mm) mounting hole using a 2 9/16" (67mm) max drill diameter.
- Do not use a 2 3/4" (70mm) drill, as the final hole dimension may end up oversized.

XIM

(17.0)

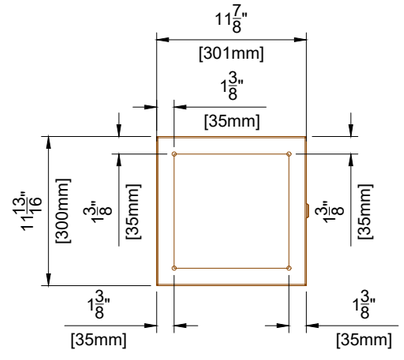
Detail - KKT Chiller Interface Panel Mounting



CIP

(16.0)

Detail - KKT Chiller Remote Display Panel Mounting



Notes:
1. Use of proper screw type designed for your specific mounting surface (wood, concrete, etc.) is required.
2. Recommended screw size M8.

RDP

(16.0)

PHILIPS

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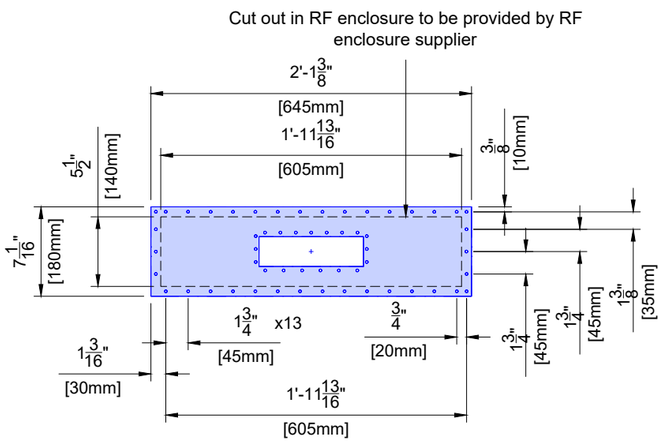
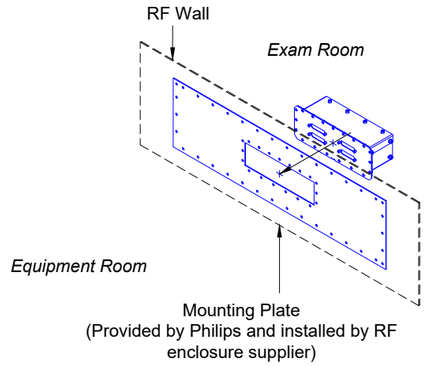
SD4

Detail - Ambient Experience System Filter Box Mounting Plate

(Not to scale)



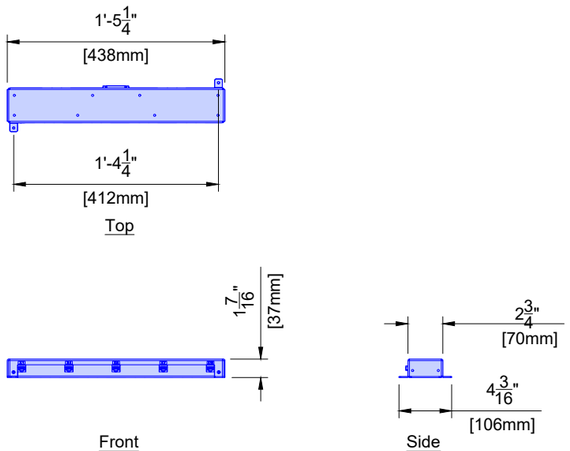


AEF

(15.0)

Detail - Distribution Box

(Not to scale)



DB

(15.0)

PHILIPS

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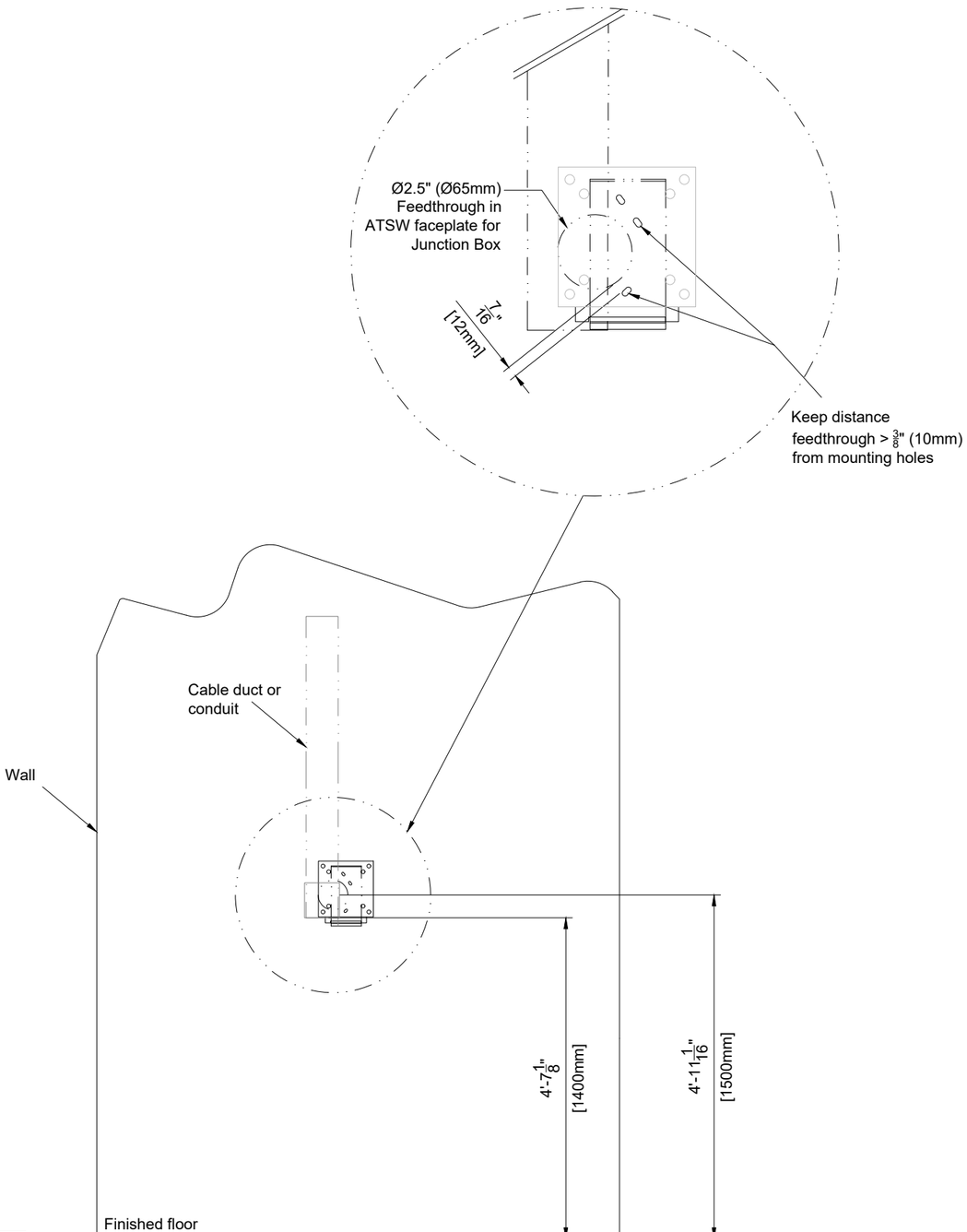
SD5

Detail - Wall Mounting for Touch Screen Monitor Elo 1515L

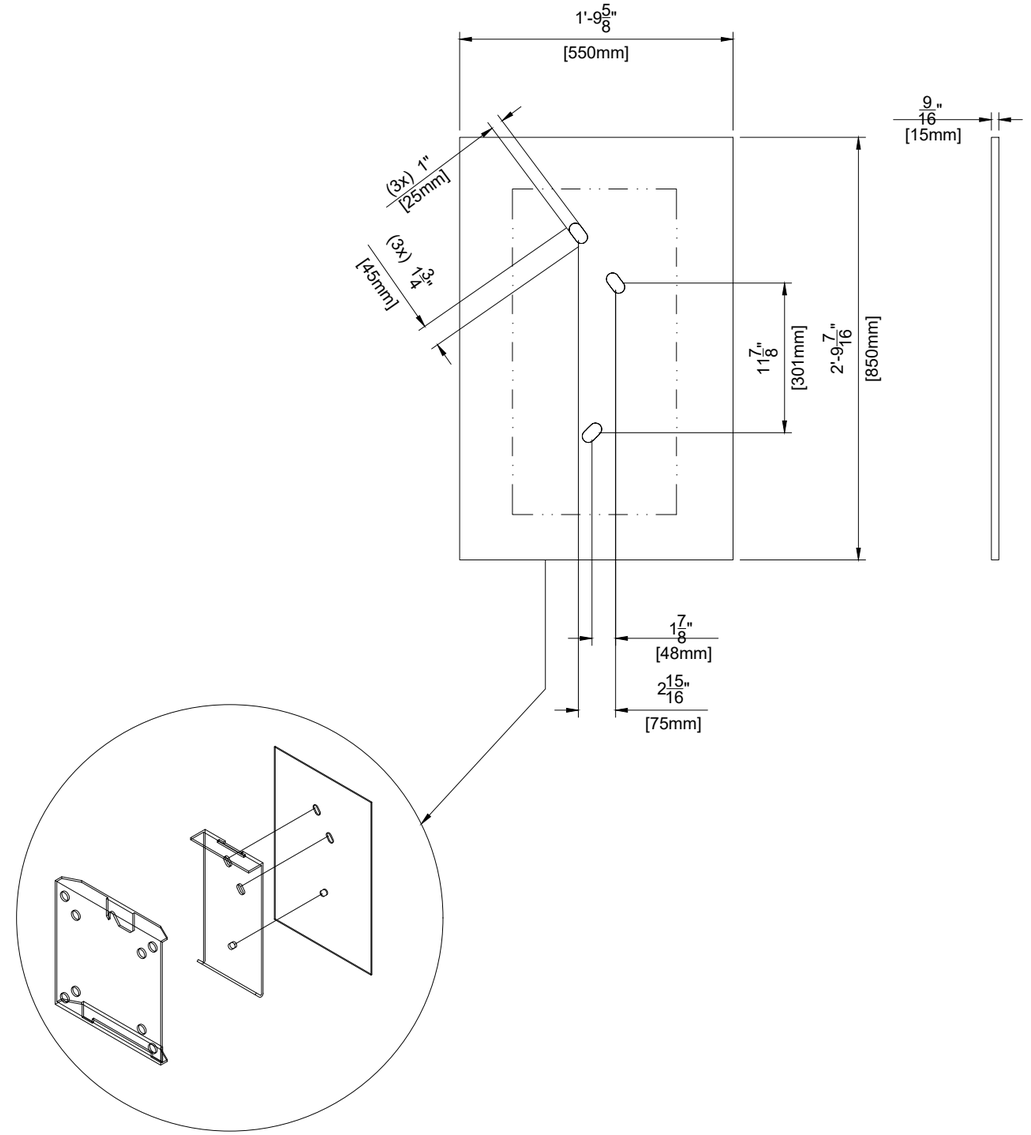
(Not to scale - Not site specific)



(14.0)

Detail - Wall Mounting Template for Touch Screen Monitor Elo 1515L

(Not to scale)



(14.0)

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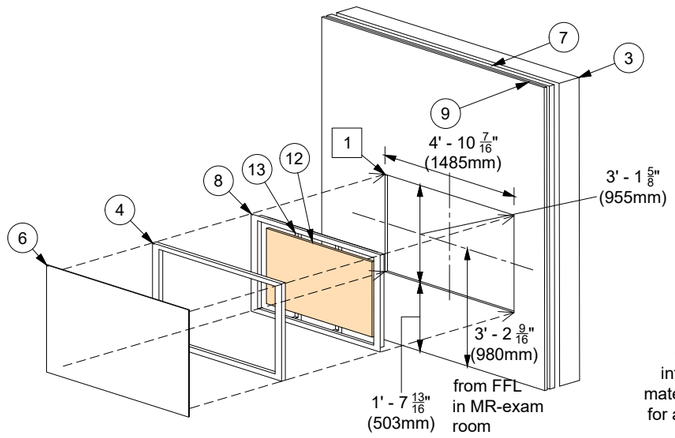
SD6

Detail - Patient In-Bore Solution Wall Mounting Frame

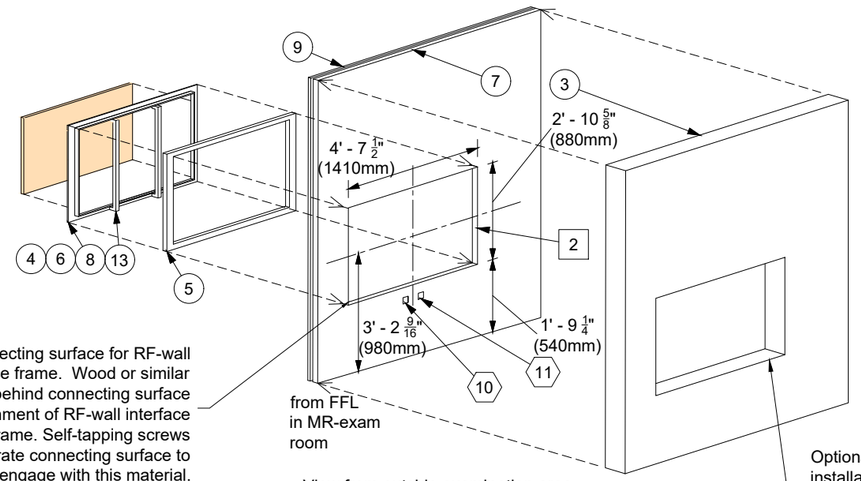
(Not to scale)

Exam Room Wall Window Opening



View from inside examination area

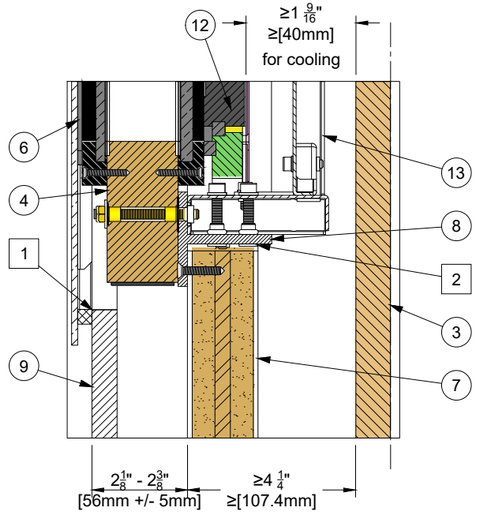
RF Wall Window Opening



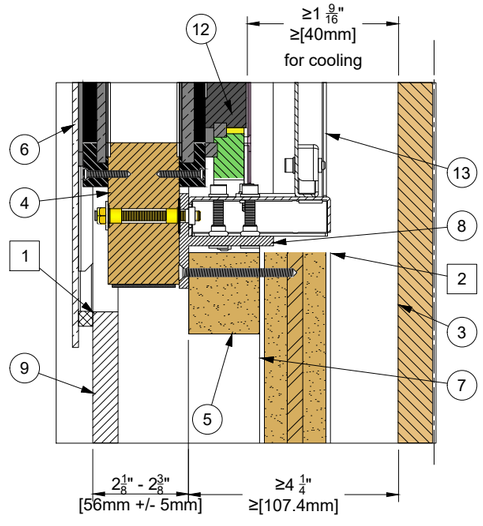
Connecting surface for RF-wall interface frame. Wood or similar material behind connecting surface for attachment of RF-wall interface frame. Self-tapping screws penetrate connecting surface to engage with this material.

View from outside examination area
(Rear side of RF-cage)

Optional preferred way of installation and servicing of the Inbore flatscreen: Make a hole in the structural wall behind the RF-wall with the same dimensions as the hole in the RF-wall-opening.



Requirements for wall with Inbore solution
(without RF adaptive frame)



RF adaptive frame required if distance between RF shield and Finished wall is greater than $2\frac{1}{8}$" - $2\frac{3}{8}$"

Can also be used when distance between Finished wall and RF shield is less than $2\frac{1}{8}$"

Item list:

Resp	No	Description	Qty
B	1	Wall opening in finished wall	1
B	2	Wall opening in RF-wall	1
E	3	Structural wall behind RF-wall	1
A/C	4	RF-window	1
B	5	RF-wall adaptive frame (if required - not included)	1
A	6	Inbore decorative bezel	1
E	7	RF-wall	1
C	8	Aluminium T-frame for mounting RF window	1
E	9	Finished wall inside examination room	1
B	10	AE Power outlet 120 VAC (Philips dedicated)	2
B	11	AE Network connection 100Mbps, RJ45	1
A	12	Display 55"	1
A	13	Mounting plate for 55" display	1

Responsibilities:

A	Delivered and installed by Philips
B	Delivered and installed by customer
C	Delivered by Philips and installed by customer
D	Delivered by customer and installed by Philips
E	Existing

Works symbology
- □ Construction works
- ◯ Electrical works
- ◇ Mechanical works
- ○ Equipment works

(15.0)

PIB

SD7

Project
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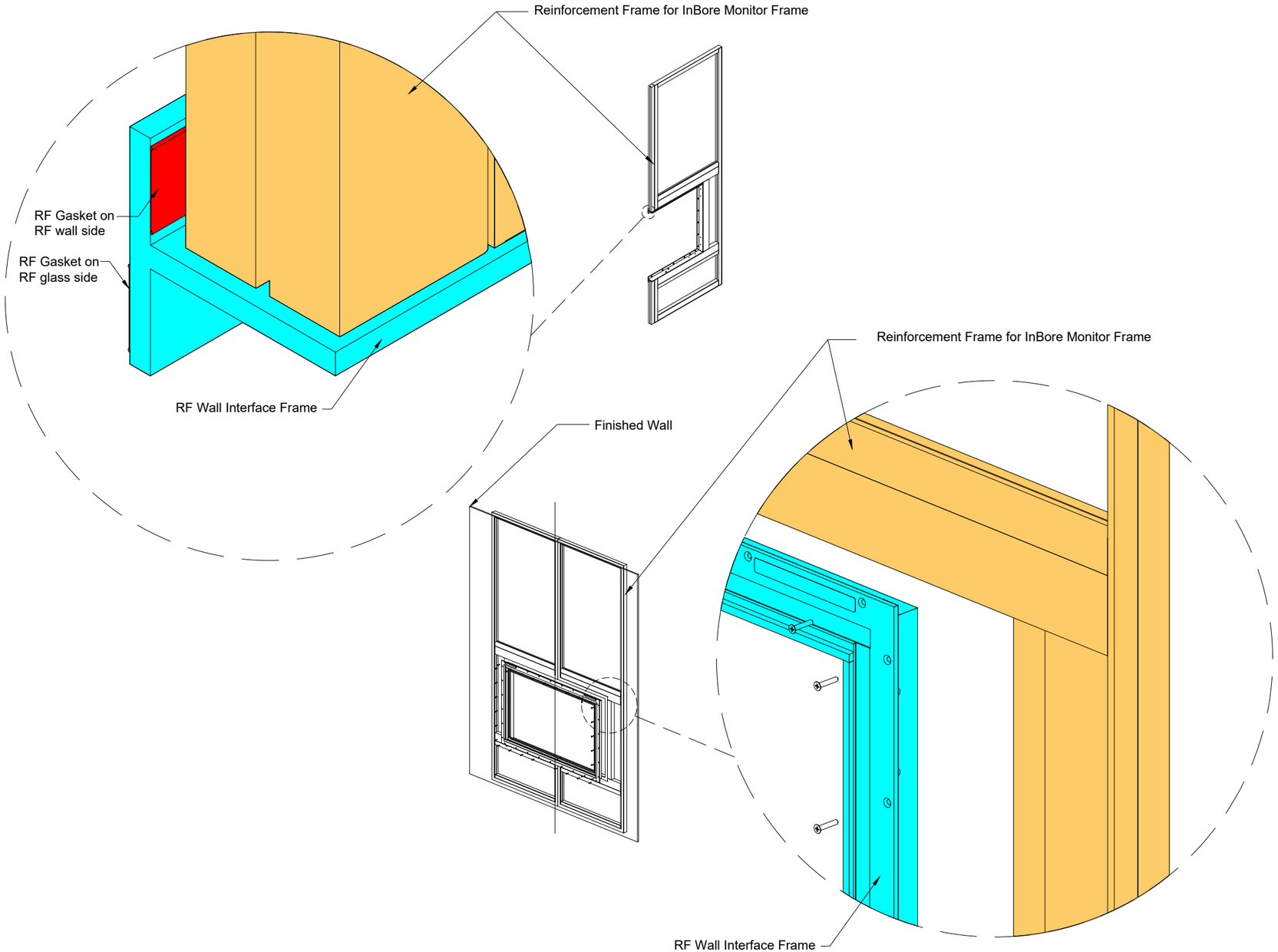
Detail - Patient In-Bore Solution Wall Interface Frame

(Not to scale)



PIB

(15.0)

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

PHILIPS

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SD8

6.30.2020

Shielding Design

Disclaimer

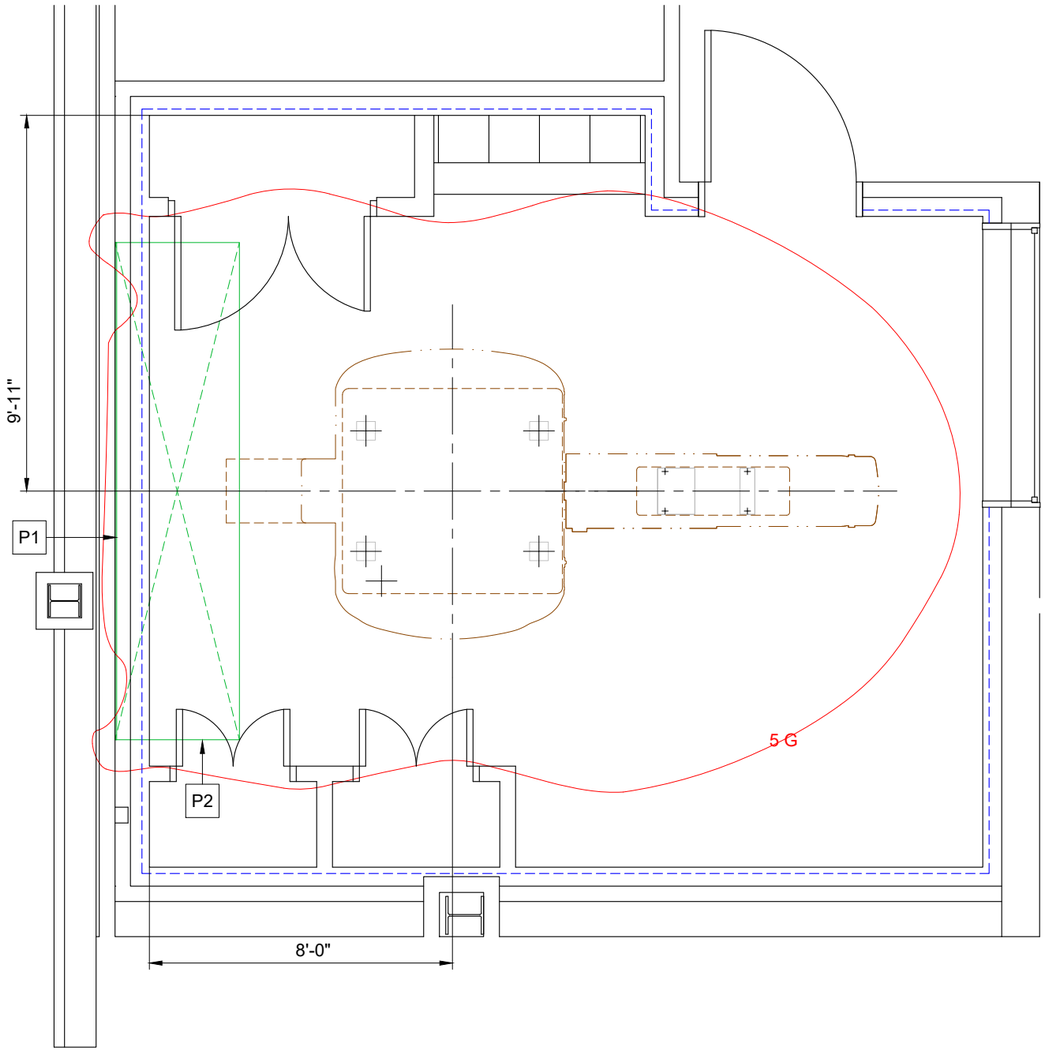
Although the fringe field data has been calculated with high accuracy, due to local ferromagnetic objects, Earth's magnetic filed and unavoidable, local, and unpredictable circumstances, the actual measured fringe field may differ from the computed fringe field.

For this reason, Philips Healthcare cannot be held responsible for the performance of the actual fringe field when the shielding has been installed.

0 1' 2' 4' 8'

0 .5m 1m 2m

Plan View



Floor & Wall Support Legend

A Furnished and installed/anchored by Philips (exceptions may exist, see Note 2)
B Furnished and installed by customer/contractor and installed/anchored by customer/contractor
C Installed/anchored by customer/contractor
D Furnished by Philips and installed/anchored by contractor
E Existing
F Future
G Optional
H Furnished by RF Enclosure Supplier and installed by RF Enclosure Supplier

	Item Number	Description	Attraction Force (N)	Detail Sheet
B	P1	Rear Shielding Plate	<34	SD11
B	P2	Floor Toe Shielding Plate	<34	SD11

5 Gauss Tolerance: +/- 4"

MATERIAL (all plates): M22 or M36 Silicon Steel, 90 A/m or less, Non grain oriented electrical low carbon (<0.006%) silicon iron

The design is only valid if the magnetic shielding supplier provides a certification providing a sample of the material used has been tested and meets the requirements after installation.

Notes

- Measurements taken within 3 $\frac{7}{8}$" (10mm) of a plate may give higher readings due to the shield being magnetized.
- Shielding is optimized. Thickness specified is minimum needed with the magnetic quality mentioned. A maximum 10% thicker plate can be used if due to commercial availability.
- Shielding calculations sees each shielding plate as a single, solid mass. In reality plates are made of smaller multi-layered sheets. Maximum $\frac{3}{32}$" (2mm) gaps are allowed between adjacent plates.
- For single and dual layered shielding: To cover a seam, a patch can be used. Minimum width of the patch must be 20 times the width of the seam and with the same thickness as calculated in the shielding calculation.
- Triple or more layered /thickness shielding: the seams must be overlapped with minimum 66% thickness as given in the passive shielding design. This can be achieved with a 3 layered thick shield.
- No seams are allowed in corners. A corner piece patch can be used. The angled piece must have the same thickness as given in the passive shielding design.
- Make sure fringe field measurements are performed after the MR is energized to investigate if the location of the fringe field due to the installation of the passive shielding is acceptable.

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SD9

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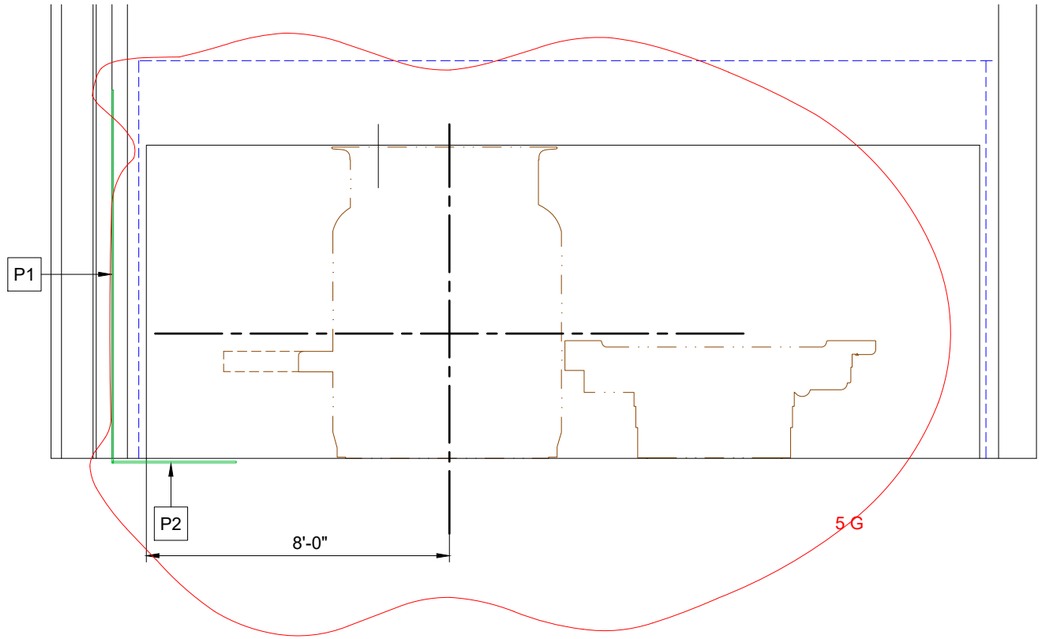
0 1' 2' 4' 8'

0 .5m 1m 2m

Left View



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	Item Number	Description	Attraction Force (N)	Detail Sheet
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5 Gauss Tolerance: +/- 4"

MATERIAL (all plates): M22 or M36 Silicon Steel, 90 A/m or less, Non grain oriented electrical low carbon (<0.006%) silicon iron

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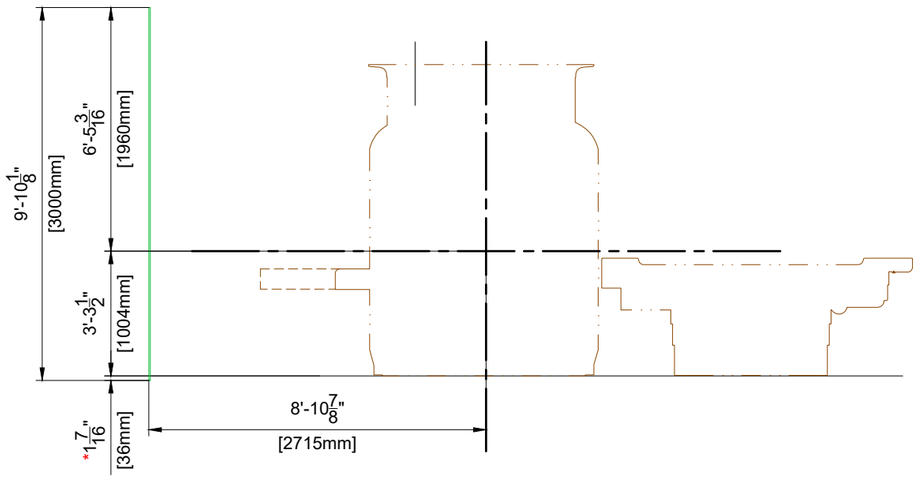
SD10

Rear Plate Detail (Exterior Left View)



Rear Plate Detail (Plan View)

P1

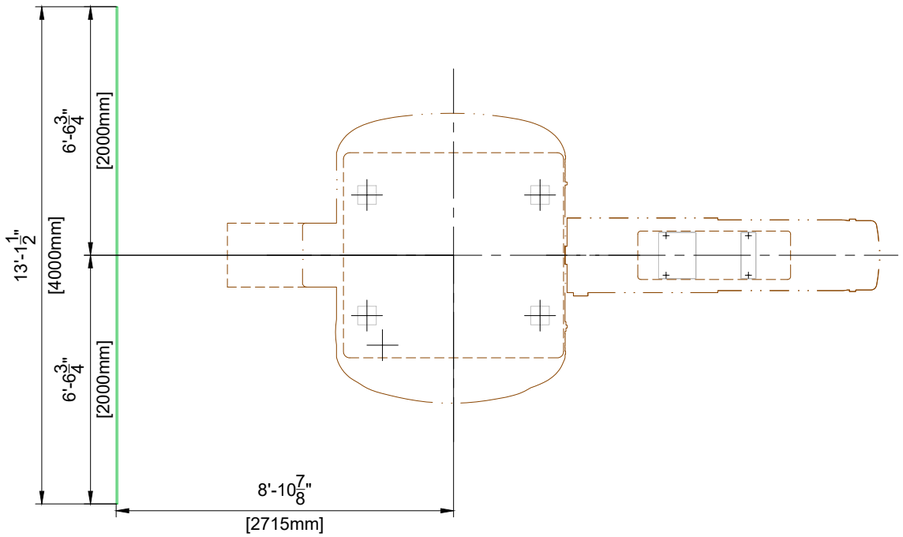
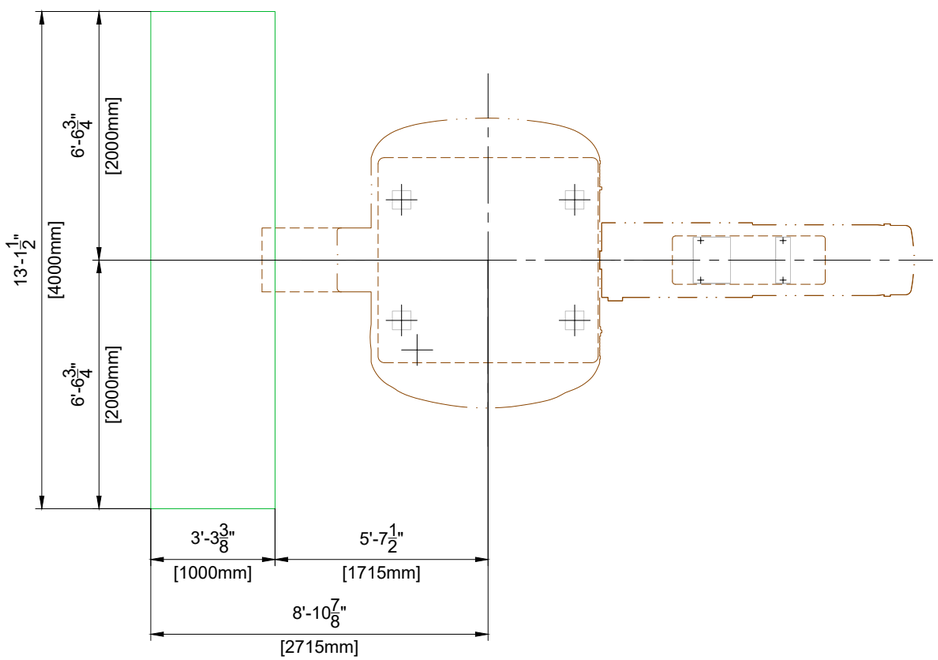


Plate Specifications:

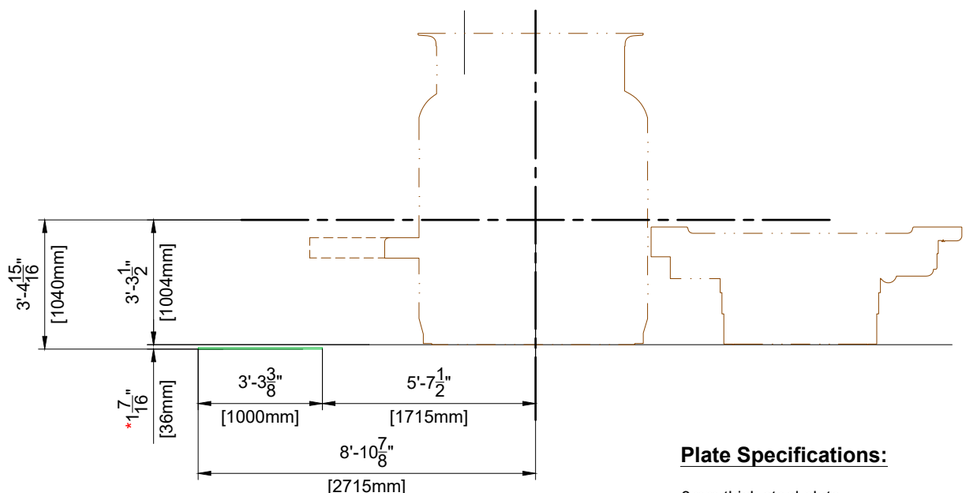
3mm thick steel plate
Plate to be positioned in between parent and RF wall

Floor Toe Plate Detail (Plan View)



Floor Toe Plate Detail (Exterior Left View)

P2



* Dimension can vary depending on the thickness of the RF enclosure and the finished floor. Plate must be outside RF enclosure.

Plate Specifications:

3mm thick steel plate
Plate to be positioned in between parent and RF wall

PHILIPS

Project
Ingenia Ambition 1.5T X
Good Samaritan Hospital of Suffern
Community Medical Care
Suffern, NY
Room: MRI 1.5T (TMP 92)

Philips Contacts
Project Manager: Rich Halm
Contact Number: (860) 373-3707
Email: richard.halm@philips.com
Drawn By: Jonathan Yoo

Project Details
Drawing Number
N-EAS190432A .01
Date Drawn: 3/3/2021
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1-22J8ETR Rev. 3
Order: 6600448936.010000
6600448836.010000-.020000

SD11

6.30.2020

General Electrical Information

1. General
The customer shall be solely responsible, at thier expense, for preparation of the site, including any required electrical alterations. The site preparation shall be in accordance with this plan and specifications, the architectural/construction drawings and in compliance with all safety and electrical codes, the customer shall be solely responsible for obtaining all electrical permits from jurisdictional authority.

2. Materials and Labor
The customer shall be solely responsible, at its expense, to provide and install all electrical ducts, boxes, conduit, cables, wires, fittings, bushings, etc., as separately specified herein.

3. Electrical Ducts and Boxes Outside the RF Enclosure
Electrical ducts and boxes shall be accessible and have removable covers. Floor ducts and boxes shall have watertight covers. Ducts shall be divided into as many as three separate channels by metal dividers, separately specified herein, to separate wiring and/or cables into groups as follows: Group a: power wiring and/or cables. Group b: signal and/or data and protective ground wiring and/or cables. The use of 90° ells is not acceptable. On ceiling duct and wall duct use 45° bends at all corners. All intersecting points in duct to have cross over tunnels supplied and installed by contractor to maintain separation of cables.

4. Conduit Outside RF Enclosure
Conduit point-to-point runs shall be as direct as possible. Empty conduit runs used for cables may require pull boxes located along the run. Consult with Philips. A pull wire or cord shall be installed in each conduit run. All conduits which enter duct prior to their termination point must maintain separation from other cables via use of dividers, cross over tunnels, or flex conduit supplied and installed by contractor from entrance into duct to exit from duct. Maximum conduit lengths shown on these plans are calculated from electrical box entrance to electrical box entrance. Any conduit installed below grade must be water tight.

5. Conduits Inside RF Enclosure
Conduits point-to-point runs shall be as direct as possible. Conduits to be made of non-ferromagnetic material and to be installed securely. If aluminum flex conduit is used, it needs to be secured so that it is not touching any other metal in the room. Common items that loose flex might rub against are ceiling grids and hangers, HVAC ducts, Ladder Tray, and cryogen gas lines. Metal-on-metal situations can cause artifacts that make patient images un-diagnostic.

6. Conductors / Earth Conductor
All conductors, separately specified, shall be 75° C stranded copper, rung out and marked. Do not use metal conduit or raceway as a ground conductor. The earth conductor for the MRI system must be dedicated and totally separate from the conduit, raceway, or structural ground. This is required to maintain the MR system "Quiet Ground" as permitted by NFPA 99. The earth conductor to be the same size as incoming phase conductor wires.

7. Disconnecting Means
A disconnecting means shall be provided as separately specified.

8. Grounding
Grounding must conform with current requirements for electrically susceptible patient areas. See Article 517, National Electrical code.

9. Lighting and Wall Sockets Inside the RF Enclosure
Incandescent AC lamps with reinforced filaments or quartz (halogen) lamps are acceptable. The use of linear fluorescent lamps, compact fluorescent lamps (CFL), energy saving lamps, electronic light dimmers and low voltage track lighting are strictly prohibited to avoid RF interference.

- LED light fixtures are acceptable inside the RF enclosure, only if, they are non-ferrous low voltage DC LED light fixtures with their electronics (driver, power supply, power source, convertor) outside the RF enclosure. It is the LED supplier's responsibility to ensure their LED solution will not cause any interference for the magnet. If for whatever reason the LEDs negatively influence the magnet, the LED lighting supplier must be responsible for removing or correcting the issue.

The magnetic field may shorten the lifetime of the light bulb. For patient comfort, avoid direct light above the patient support and the rear of the magnet. A spotlight with a separate switch to assist the doctor during intervention procedures is recommended. Two lighting levels (separate control) are required around the magnet:

a. 200 lux for patient examination
b. 500 lux for servicing

Wall outlets should be located inside the RF enclosure for use of MRI compatible third party equipment. A duplex outlet (20 Amp) and a light with switch for servicing purposes must be provided above the suspended ceiling in the RF enclosure in the vicinity of the magnet turret. The location of the light switch must be reachable by the engineer when he/she opens the removable part of the suspended ceiling.

(18.0)

RF Enclosure Electrical Notes

1. Mains Safety Switches - Mains safety switches may be installed inside the RF enclosure. Installation must follow all local regulations. There are no RF filters in the System Filter Box provided for this purpose.

2. Door Open / Closed Switch - Each door into the exam room must be provided with a switch that signals the open/closed status of the door to the system. The switch(es) must be mounted (mechanically or electrically) outside the RF enclosure and have a contact that closes when the door is closed. Switches must be wired in series with screened cable, and the wire must be rated at a minimum of 30 V DC, 100 mAmps. Use Grainger item 4B811, Telemecanique model XCKJ10541 or equivalent.

3. Protective Earth - The RF enclosure requires one central protective earth (PE) bus-bar/terminal. This PE point must be connected to the Hospital Earth Ground supplied near the Hospital Mains by a conductor at least #1 AWG. Refer to sheet ED1 for details. The central PE bus-bar/terminal must be located as close as possible to the earth point inside the System Filter Box (< 39.4" [< 1000mm]) and there cannot be any seams in the shielding between the two points. The MR system parts connect to the earth point inside the System Filter Box while all other items, (facilities heating and water supply, receptacles, etc.) must be connected to the central PE bus-bar/terminal. The following requirements apply:

a. The impedance between any conductive part and the central PE bus-bar/terminal cannot exceed 100 mOhms.
b. All PE conductors used must be at least #8AWG. An earth leakage switch is not required.
c. For optimum shielding performance, "loops" inside the RF enclosure must be minimized.
d. A galvanic isolation layer between the RF enclosure and the building is recommended. Local regulations or the the RF vendor may require the enclosure be isolated from the building.
e. Isolated in this context means DC impedance greater than 3 kOhms.

4. Auxiliary Electrical Filters - Any electrical interconnection, that are not part of the MR system entering the RF enclosure requires an electrical filter. These filters may give rise to earth leakage currents in the RF enclosure, which could present a safety hazard. For complete safety, the total of all the earth leakage currents generated by all auxiliary electrical filters must not exceed 5 mAmps. If necessary, use an isolation transformer with the filters to minimize the effects of current leakage. Electrical filters are to be placed near the System Filter Box and they should be easily accessible. Beware of metal-on-metal connections that can occur near electrical filters which can cause imaging issues for the system. All 3rd party items (injectors, intercoms, humidity sensors, fire suppression flashers/buzzers, Invivo Esys, etc.) must have their own RF filters or feedthroughs. The filters and feedthrough of the PHILIPS System Filter Box cannot be used for these 3rd party items. RF Enclosure provider to verify that they have installed enough RF Filters for all the 3rd party items

(14.0)

General Electrical Notes

1. The contractor will supply and install all breakers, shunt trips and incoming power to the breakers. The exact location of the breakers and shunt trips will be determined by the architect/contractor.
2. The contractor shall supply and install all pull boxes, raceways, conduit runs, stainless steel covers, etc. Conduit/raceways must be free from burrs and sharp edges over its entire length. A Greenlee pull string/measuring tape (part no. 435, or equivalent) shall be provided with conduit runs.
3. All pre-terminated, cut to length cables, will be supplied and installed by Philips service. All cables to the breakers, will be supplied and installed by the contractor, subject to local arrangements.
4. Electrical raceway shall be installed with removable covers. The raceway should be accessible for the entire length. In case of non-accessible floors, walls and ceilings, an adequate number of access hatches should be supplied to enable installation of cabling. Approved conduits may be substituted. All raceways must be designed in a manner that will not allow cables to fall out of the raceway when the covers are removed. In most cases, this will require above-ceiling raceway to be installed with the covers removable from the top. Any raceway system(s) illustrated in these drawings are based on length of furnished cables, and any changes in routing could exceed maximum allowable length. Conduit or raceway above ceiling must be kept as near to finished ceiling as possible.
5. Conduit sizes shall be verified by the architect, electrical engineer or contractor, in accordance with local or national electrical codes, whichever govern. Conduit sizes shown on these plans are minimum sizes. This is based on fill factor and cable connector size. Substituting smaller conduits is not permitted.
6. Convenience outlets are not illustrated. Their number and location are to be specified by the customer/architect.
7. All sections of raceway and conduit shall be grounded with an independent #6 AWG green wire that is to be attached using solderless lugs. All ceiling mounted structural support members and ceiling plates shall also be grounded. All grounding connections, terminals, etc. shall be installed in a manner to provide accessibility for inspection, maintenance, repair, etc.

(14.0)

Electrical Power Distribution Requirement Notes

Electrical power distribution at the facility shall comply with:

- Utilization voltages per ANSI C84.1 - 1982 range A.
- ANSI / NFPA 70 - National Electrical Code
  - Article 250 - Grounding
  - Article 517 - Healthcare facilities
- ANSI / NFPA 99 - Healthccare facilities
- NEMA standard XR9 - Power supply guideline for x-ray machines

Phase conductors to be sized for instantaneous voltage drop per NEC 517 - 73 and Philips recommendations.

On sites without a PDU (typical case for 480V branch supply), the ground conductor for the power feeder shall be the same size as the phase conductor wires. The separate ground wire connections from building steel to the ground busbar shall be sized per NEC at a minimum of #1 AWG.

(20.0)

Power Quality Guidelines

1. Power supplied to medical imaging equipment must be separate from power feeds to air conditioning, elevators, outdoor lighting, and other frequently switched or motorized loads. Such loads can cause waveform distortion and voltage fluctuations that can affect MR image quality.
2. Equipment that utilizes the facility power system to transmit control signals (especially clock systems) may interfere with medical imaging equipment, thus requiring special filtering.
3. Static UPS systems, Series filters, Power conditioners, and Voltage regulators provide a high impedance, nonlinear voltage source, which may affect image quality. Do not install such devices at the mains supply to medical imaging equipment without consulting Philips installation or service personnel.
4. Line impedance is the combined resistance and inductance of the electrical system and includes the impedance of the power source, the facility distribution system, and all phase conductors between the source and the imaging equipment. Philips publishes recommended conductor sizes based on equipment power requirements, acceptable voltage drops, and assumptions about the facility source impedance. The minimum conductor size is based on the total line impedance and NEC requirements. Unless impedance calculations are performed by an electrical engineer, the recommended values must be used.

(14.0)

Hospital Mains Switch

According to IEC, the hospital mains switch:

- shall switch all 3 phases simultaneously.
- shall be capable of being locked in the OFF position.
- shall comply with creepage distance and air clearance as specified in IEC 61058 -1 for Mains Transient Voltage of 4 kV.
- shall have an actuator that comply with IEC 60447.

(14.0)

PHILIPS

Project
Ingenia Ambition 1.5T X
Good Samaritan Hospital of Suffern
Community Medical Care
Suffern, NY
Room: MRI 1.5T (TMP 92)

Philips Contacts
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Email: richard.halm@philips.com
Drawn By: Jonathan Yoo

Project Details
Drawing Number
N-EAS190432A .01
Date Drawn: 3/3/2021
Quote: 1-234MMCF Rev. 1
1-22J8ETR Rev. 3
Order: 6600448936.010000
6600448836.010000-.020000

EN

Electrical Legend

A Furnished and installed by Philips
B Furnished by customer/contractor and installed by customer/contractor
C Installed by customer/contractor
D Furnished by Philips and installed by contractor
E Existing
F Future
G Optional

Item Number | Description | Detail Sheet

Duplexes

		Description	Detail Sheet
B	WS	Wall Socket (duplex, single phase) above finished ceiling. See Sheet EN for details.	EN
B	S	120V/20A dedicated duplex outlet for service in the equipment room and control room. Additional outlets may be desired by customer or required by code. (Not shown on plan)	
B	EA	120V/20A dedicated duplex outlet for "EA".	
B	A_W	120V/20A dedicated duplex outlet for ATSW. Outlet to be located inside ATSW wall box. Outlet to be facing toward the center of the box to allow faceplate to be added.	
B	A_T	120V/20A dedicated quad outlet for ATS, USB Extenders.	
B	AE	120V/20A dedicated duplex outlet for Patient In-Bore Solution Monitor (To be located outside the RF cage), Ambient Experience Cabinet, and external audio source.	
B	F	120V/20A dedicated duplex outlet for "XD" and iCBC Power Supply Unit ("XPS"). To be located within 10' (3050mm) of equipment ("XPS"/"XD").	
B	E	120V/20A dedicated duplex outlet for Expression Patient Monitor "PM" and Expression Display Control Unit "ECU".	
B	RSP	120V/20A dedicated duplex outlet for RSP (Remote Status Panel). To be located within 5' (1525mm) from RSP.	

Network Connectors

		Description	Detail Sheet
B	N1	RJ45 type ethernet 10/100/1000 Mbit network connector. Access to customer's network via their remote access server is needed for Remote Service Network (RSN) connectivity.	N1
B	N2	RJ45 type ethernet 10/100/1000 Mbit network connector with access to customer's network. Locate within 10' of network. Network fiber optic and ethernet cabling, connectors, wall boxes, patch panels, etc. are the responsibility of the purchaser. Philips assumes no responsibility for procurement, installation, or maintenance of these components.	N1
B	N3	RJ45 type ethernet 10/100/1000 Mbit network connector with access to customer's network. Locate within 9' - 10" of "EA". Network fiber optic and ethernet cabling, connectors, wall boxes, patch panels, etc. are the responsibility of the purchaser. Philips assumes no responsibility for procurement, installation, or maintenance of these components.	N1
B	e	RJ45 type ethernet 10/100/1000 Mbit network connector with internet access for Philips Field Service Engineer connectivity to on-line system documentation.	
B	N4	RJ45 type ethernet 10/100/1000 Mbit network connector. Access to customer's network via their remote access server is needed for Remote Status Monitoring Panel.	

Electrical Legend

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Item Number | Description | Detail Sheet

Floor

		Description	Detail Sheet
B	FR1	Flush mounted floor duct. Refer to Sheet SD1 for details.	SD1

Ceiling

		Description	Detail Sheet
B	CR1	4" (100mm) H x 24" (600mm) W non-ferro magnetic cable ladder tray mounted above suspended ceiling from "SFB" to behind magnet. "CR1" must be between 13' (4m) and 30' (9m) in length and divided into 3 compartments: 8" (200mm) W, 10" (250mm) W, and 6" (150mm) W. Cable tray must be non-ferro magnetic material, such as aluminum or glass-reinforced plastic (GRP). GRP material is recommended and wooden trays are not allowed. Must be a minimum of 2" (50mm) above the top of suspended ceiling.	
B	CR2	Upper Tray - 4" (100mm) H x 18" (460mm) W cable ladder tray mounted 4" (100mm) above "CR3", from "SFB" to above equipment cabinets. "CR2" must be at least 10' (3m) in length and divided into 2 compartments. Maximum cable weight will be 34 lbs/linear foot.	ED2
B	CR3	Lower Tray - 4" (100mm) H x 18" (460mm) W cable ladder tray mounted 7' - 6" (2285mm) a.f.f. to bottom of tray, from "SFB" to above equipment cabinets. "CR3" must be at least 10' (3m) in length.	ED2
B	JB	10" (250mm) W x 10" (250mm) H x 6" (150mm) D wall box with removable screw-type coverplate. Surface mounted above "CR2".	
D	CS	Flush mounted ceiling speakers. (Not shown on plan)	SD1
B	ISL	Incandescent Service Light (AC, 500 lux) above finished ceiling.	EN
B	LS	Electrical switch for service light (ISL) above finished ceiling.	
B	CZ	Patient comfort zone. No direct lighting in this area.	

See E1 - E2 sheets for conduit and raceway requirements.

PHILIPS

Project
Ingenia Ambition 1.5T X
Good Samaritan Hospital of Suffern
Community Medical Care
Suffern, NY
Room: MRI 1.5T (TMP 92)

Philips Contacts
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Drawn By: Jonathan Yoo

Project Details
Drawing Number
N-EAS190432A .01
Date Drawn: 3/3/2021
Quote: 1-234MMCF Rev. 1
1-22J8ETR Rev. 3
Order: 6600448936.010000
6600448836.010000-020000

EL1

Electrical Legend

A Furnished and installed by Philips
B Furnished by customer/contractor and installed by customer/contractor
C Installed by customer/contractor
D Furnished by Philips and installed by contractor
E Existing
F Future
G Optional

	Item Number	Description	Detail Sheet
B	AECC	12" (300mm) W x 12" (300mm) H x 4" (100mm) D wall box with removable screw-type cover plate, flush mounted. Location as shown or near AE Control Cabinet.	
D	AEF	Ambient Experience System Filter Box	
B	WR1	4" (100mm) H x 2" (50mm) D non-ferro magnetic wall raceway mounted above suspended ceiling and along perimeter of exam room for LED chains connecting to distribution box, "DB". J Hooks can be used instead of raceway, if local code allows.	ED2
B	AUD	4" (100mm) W x 4" (100 mm) H x 4" (100 mm) D wall box with removable screw-type coverplate. "AUD" flush mounted 12" A.F.F. to bottom of box. Locate "AUD" as shown, below the Operator's table near the external radio, or near location of Storage Rail.	
B	ATSW	8" (200mm) W x 8" (200mm) H x 4" (100mm) D wall box flush mounted to wall located 57" (1450mm) A.F.F. with grommet opening in face plate 2.5" (60mm) off center 1" (25mm) from center. Duplex main outlet located inside the wall box.	
B	ATS	4" (100mm) W x 4" (100mm) H x 4" (100mm) D wall box with removable screw-type cover plate, surface mounted 12" (300mm) A.F.F. to bottom of box. Location shown is recommended and may be changed - verify relocation with local Philips Service.	
B	PIBS	Electrical switch to power off Patient In-Bore Solution Monitor. Location shown is recommended and may be changed - verify relocation with local Philips Service.	
B	PIB	Patient In-Bore Solution Monitor. 4" (100mm) W x 4" (100mm) D wall box located behind the monitor and outside the RF cage.	
D	UPS	125 kVA Staco UPS Cabinet	ED1
D	BC	Staco UPS Battery Cabinet	ED1
B	CBU	480 V, 3 phase, 150 Amp circuit breaker nominal for UPS system; or 480V, 3 phase, 200 Amp O.C.P. device rating per Staco UPS manual	ED1
B	RSP	4" (102mm) W x 4" (102mm) L x 4" (102mm) D surface mounted wall box. Removable cover plate shall contain a grommeted notch for cable access as required. Exact location to be determined by Philips Service.	

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	Item Number	Description	Detail Sheet
		Wall	
B	CBS	480V, 3 phase, 100 Amp circuit breaker. See Sheet ED1 for details.	ED1
B	CBC	460V, 3 phase, 60 Amp circuit breaker for KKT cBoxX 60 Chiller or 80 Amp circuit breaker for KKT cBoxX 70 Chiller. Run power from breaker to chiller, refer to Sheet ED1. Exact location to be determined. (Not shown on plan)	ED1
B	R1	12" (300mm) W x 4" (100mm) H cable ladder tray mounted from "CR3" to "MDU".	ED2
B	R2	8" (200mm) W x 2" (50mm) H cable ladder tray mounted from "CR3" to "ACCC".	ED2
F	R3	12" (300mm) W x 4" (100mm) H cable ladder tray mounted from "CR3" to "BCP".	ED2
B	R4	12" (300mm) W x 4" (100mm) H cable ladder tray mounted from "CR3" to "TC".	ED2
B	SR	10" (250mm) W x 10" (250mm) H x 6" (150mm) D wall box with removable screw-type coverplate. Surface mounted near Storage Rail "SR".	
B	ERB	2" (50mm) W x 4" (100mm) H x 2" (50mm) D wall box with removable screw-type coverplate. Flush mounted 70" (1800mm) above finished floor to bottom of box.	
B	DS	RF Door Open Switch - 120 V, 5 Amp switch limited to open when door is open. Mounted in upper corner on strike side of entry door. Use Grainger item 4B811, Telemecanique model XCKJ10541 or equivalent.	
D	SFB	Wall mounted System Filter Box.	
D	RDP	KKT Chiller Remote Display Panel with flush mounted Gang box placed in a landscape orientation. Exact height to be determined by local Philips Service.	
B	EA	e-Alert box. Final location of "EA", to be determined and installed by Philips.	

See E1 - E2 sheets for conduit and raceway requirements.

PHILIPS

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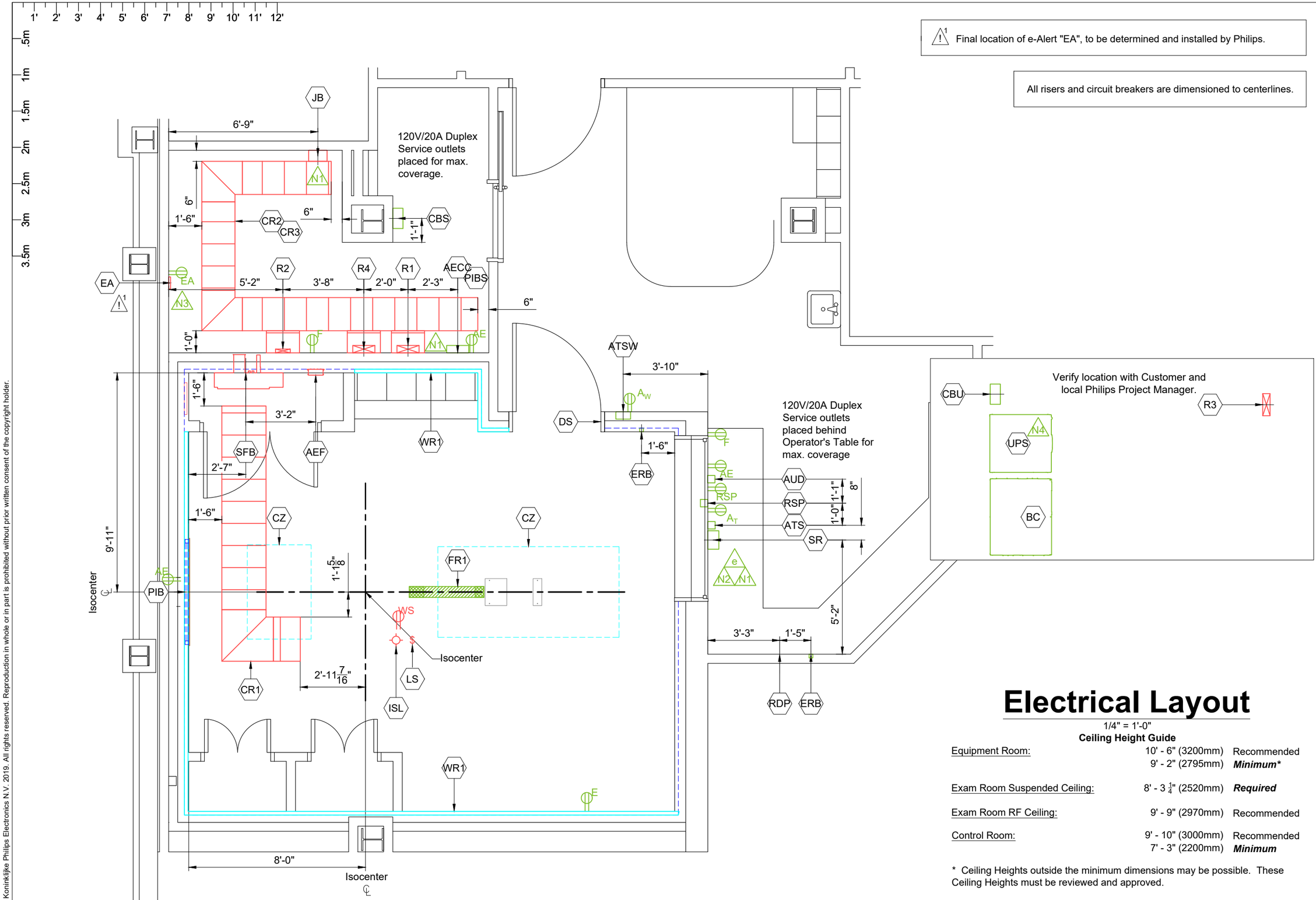
EL2



1 Final location of e-Alert "EA", to be determined and installed by Philips.

All risers and circuit breakers are dimensioned to centerlines.

120V/20A Duplex Service outlets placed behind Operator's Table for max. coverage

Electrical Layout

1/4" = 1'-0"

Ceiling Height Guide

Equipment Room:	10' - 6" (3200mm)	Recommended
	9' - 2" (2795mm)	***Minimum****
Exam Room Suspended Ceiling:	8' - 3 ¼" (2520mm)	***Required***
Exam Room RF Ceiling:	9' - 9" (2970mm)	Recommended
Control Room:	9' - 10" (3000mm)	Recommended
	7' - 3" (2200mm)	***Minimum***

* Ceiling Heights outside the minimum dimensions may be possible. These Ceiling Heights must be reviewed and approved.

PHILIPS

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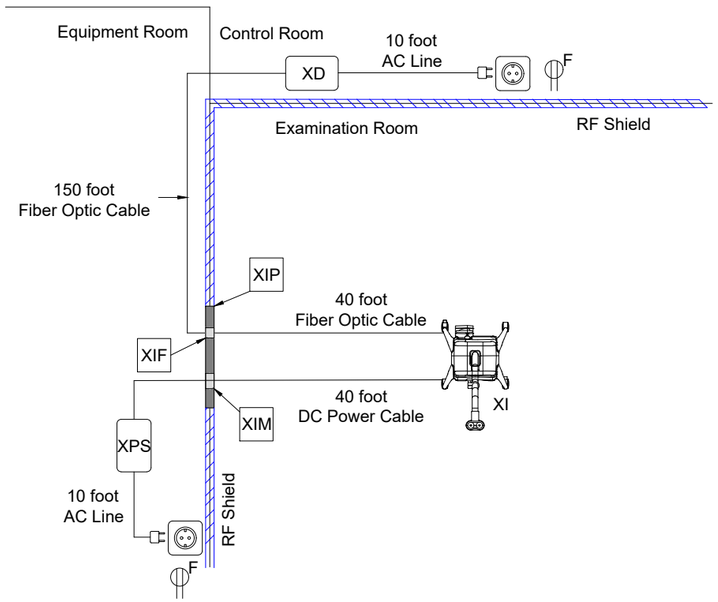
E1

MRXperion Injector Cable Routing Schematic



Standard Ingenia Ambition 1.5T Cable Lengths Inside Equipment Room		
From	**To**	**Distance**
SFB	DACC	22' - 11 ¾" (7m)
SFB	LCC	22' - 11 ¾" (7m)
SFB	GAC*	49' - 3" (15m)
DACC	GAC	22' - 11 ¾" (7m)
DACC	LCC	22' - 11 ¾" (7m)
GAC	LCC	22' - 11 ¾" (7m)
MDU	DACC	32' - 9 ¾" (10m)
MDU	GAC	26' - 3" (8m)
MDU	LCC	42' - 7 ¾" (13m)
MDU**	TC**	22' - 11 ¾" (7m)
TC**	ACCC	22' - 11 ¾" (7m)
* Gradient cables are supplied in one set with a length of 49' - 3" to run from magnet interface to GAC cabinet. Cable length can be divided / cut between length needed inside the Equipment room and length need inside the Exam room.		
** 60 Hz countries		

Conduit Required

General Notes

1. All conduit runs must take most direct route point to point.
2. All conduit runs must have a pull string.

A Conduit supplied/installed by contractor - Philips cables installed by Philips
B Conduit supplied/installed by contractor - Philips cables installed by contractor
C Conduits and cables supplied and installed by contractor
D Conduit existing - cables supplied and installed by Philips
E Conduit existing - cables supplied by Philips and installed by contractor
F Conduit existing - cables supplied and installed by contractor
G Optional equipment, verify with local Philips Service

* **P** Power (AC), **D** Power (DC), **G** Ground, **S** Signal, **H** High Tension, **C** Cooling Hose, **A** Air Supply Hose

	Conduit			Conduit Quantity	Cable Type (*)	Minimum Conduit Size	Maximum Conduit Length	Special Requirements
	Run No.	From	To					
C	1	Hosp. Power	RF Filters	Per N.E.C.	P	Per N.E.C.	Per N.E.C.	See ED1 sheet for more information.
C	2	Hosp. Power	CBS	Per N.E.C.	P	Per N.E.C.	Per N.E.C.	See ED1 sheet for more information.
C	3	CBS	MDU	1	P	Per N.E.C.	25'	See ED1 sheet for more information.
A	4	ERB	"SFB"	1	P	¾"	80'	ERB in control room.
A	5	ERB	"SFB"	1	P	¾"	49'	ERB in exam room.
C	6	"DACC"	DS	1	S	1"	75'	
A	7	SR	JB	1	S	3"	65'	Conduits to be routed outside RF enclosure.
A	8	SR	JB	1	P	2"	65'	Conduits to be routed outside RF enclosure.
C	9	Hosp. Power	CBC	Per N.E.C.	P	Per N.E.C.	Per N.E.C.	See ED1 sheet for more information.
C	10	CBC	Chiller	1	P	Per N.E.C.	Per N.E.C.	See ED1 sheet for more information.
B	11	Chiller	RDP	1	S	1"	164'	Conduit for transfer cable only and not for power supply.
A	12	"SACU"	"LCC"	1	P	1 ½"	45'	Cable to routed from "SACU" to "JB" to "CR3" to "LCC". Conduit not needed if "SACU" is close enough for cable to be directly routed onto "CR3". Refer to Sheet MP1 for more details.
A	13	AECC	AEF	1	S	2 1/2"	32.8'	
A	14	AECC	AUD	1	S	1"	98'	For audio output cable from AECC to MR system audio switch in Control Room.
A	15	ATSW	AECC	1	S	2"	65'	For DVI Connection between wall mounted Touch Screen and AECC and an additional USB network cable.
A	16	ATS	AECC	1	S	2"	65'	For DVI Connection between Touch Screen and AECC and an additional USB network cable
A	17	AECC	PIB	1	S	2"	72'	For DVI Connection between AECC and In-Bore Solution Monitor and an additional network cable.
B	18	SR	JB	1	(P/S)	1"	See Note	Fiber optic cable to be routed from "XI" to XD" through Injector Fiber Optic RF feedthrough (XIF) (See MRXperion Injector Cable Routing Schematic). Recommended conduit length to be a maximum of 150' (45m).
C	19	Hosp. Power	CBU	Per N.E.C.	P	Per N.E.C.	Per N.E.C.	See ED1 sheet for more information.
C	20	CBU	UPS	1	P	Per N.E.C.	Per N.E.C.	See ED1 sheet for more information.
C	21	UPS	BC	2	P	Per N.E.C.	Per N.E.C.	See ED1 sheet for more information.
C	22	RSP	UPS	1	S	Per N.E.C.	Per N.E.C.	See ED1 sheet for more information.
C	23	UPS	Terminal Block	Per N.E.C.	P	Per N.E.C.	Per N.E.C.	Customer to provide terminal block when connecting to system and chiller. See ED1 sheet for more information.
C	24	Terminal Block	CBS	1	P	Per N.E.C.	Per N.E.C.	Customer to provide terminal block when connecting to system and chiller. See ED1 sheet for more information.
C	25	Terminal Block	CBC	Per N.E.C.	P	Per N.E.C.	Per N.E.C.	Customer to provide terminal block when connecting to system and chiller. See ED1 sheet for more information.

PHILIPS

Project
Ingenia Ambition 1.5T X
Good Samaritan Hospital of Suffern
Community Medical Care
Suffern, NY
Room: MRI 1.5T (TMP 92)

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Drawn By: Jonathan Yoo

Project Details
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1-22J8ETR Rev. 3
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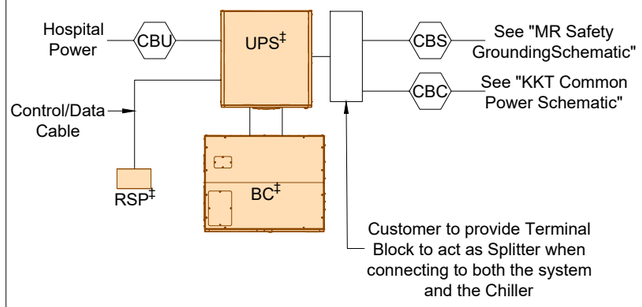
6600448836.010000-.020000

E2

Power Quality Requirements (Incoming power to UPS)

Supply Configuration	3 Phase + isolated ground + equipment grounding conductor
Nominal Input Voltage	480 VAC
Circuit Breaker (3ϕ, 60 Hz, 3 pole)	150 Amps (CBU)
Power Factor	>0.99
Feeder Wire Size (Min)	350 kcmil
Equipment Grounding Conductor	Per NEC, #4 AWG minimum



For UPS purchased from PHILIPS, refer to Installation and Operation manual from the manufacturer for all detailed specification and installation requirements. Wiring and circuit sizes at supply and load side of UPS to meet UPS requirements and verified by contractor to meet building conditions and local codes.

Maximum Cable Length per Wire Size (Between Hospital Power and CBS)

(Based on 20° C copper ambient temperature)

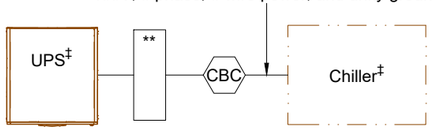
< 190'	#3/0 AWG
< 242'	#4/0 AWG
< 283'	250 MCM
< 340'	300 MCM

The ground conductor for the power feeder shall be the same size as the phase conductor wires. Ground conductor must be dedicated and totally separate from conduit, raceway, or structural ground. (17.0)

Diagram - Common KKT Chiller Power Schematic

(Not to scale)

460V, 3 phase, 3 wire power, and unity ground



Provided and installed by customer/contractor.

** Customer to provide Terminal Block to act as Splitter when connecting to both the system and the Chiller

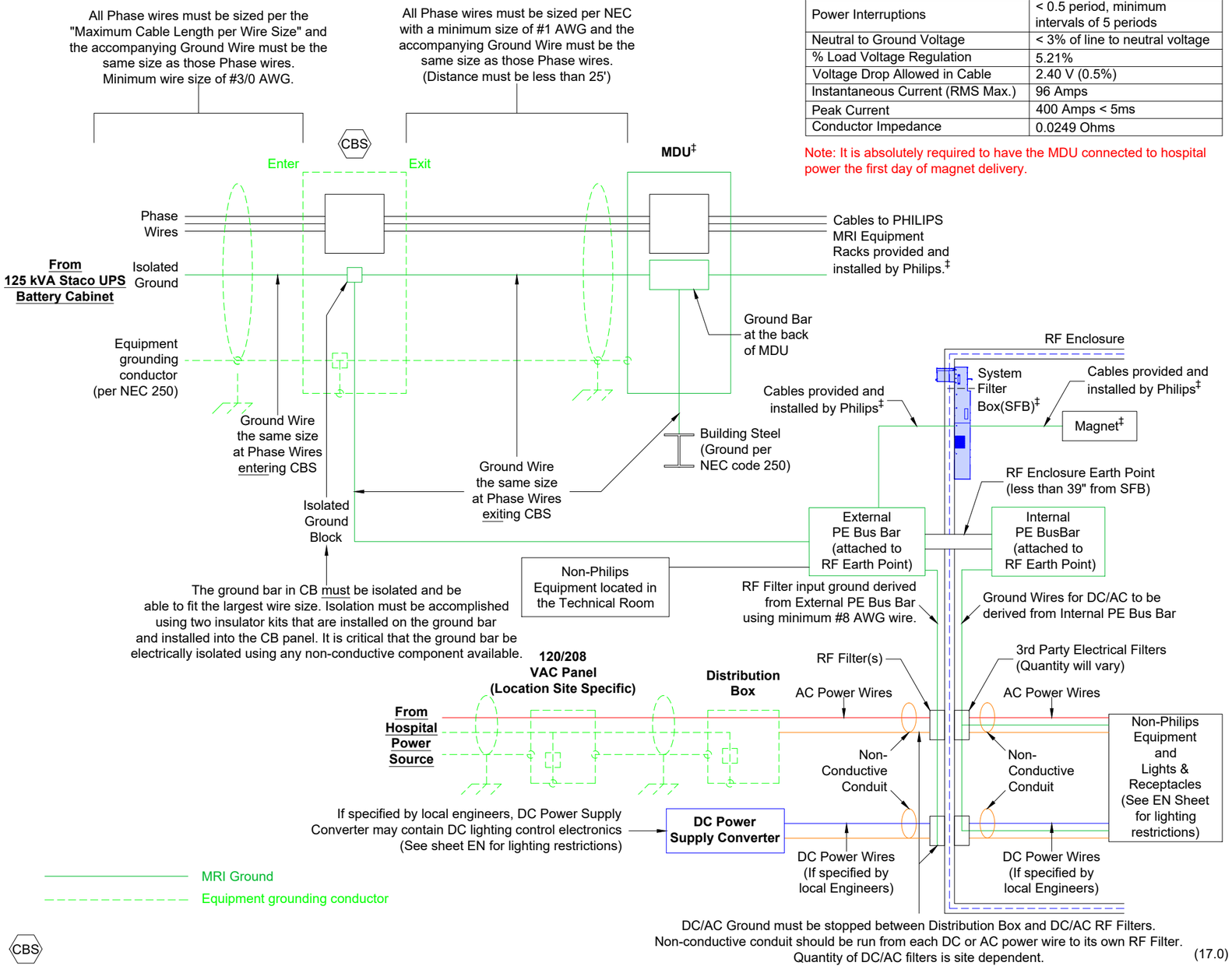
Circuit Breaker for Chiller
KKT cBoxX60 Chiller: 460V, 60 Hz, 3ϕ + ground, 60 Amps.
KKT cBoxX70 Chiller: 460V, 60 Hz, 3ϕ + ground, 80 Amps. cBoxX70 Chiller used at sites with outdoor ambient air temperatures above 113F. Consult your local Philips Project Manager for confirmation).

CBC (17.0)

Diagram - MR Safety Grounding Schematic

(Not to scale)

Notes:
1. All items shown are to be provided and installed by contractor unless otherwise specified.
2. Philips provided equipment designated with ‡.
3. All ground conductors for power feeders must be the same size as the phase conductor wires.
4. All non-power feeder ground wires must be sized per NEC without going below the minimum size shown.
5. All wires and conduits must be insulated per NEC.
6. For additional notes, see Sheet EN (section "RF Enclosure Electrical Notes").



Power Quality Requirements into MDU

Branch/Max. Power Required	80 kVA
Supply Configuration	3 Phase + Ground
Nominal Input Voltage	480 VAC
Circuit Breaker (3ϕ, 60 Hz, 3 pole)	100 Amps
Mains Impedance	< 0.150 Ohms
Distortion Power Factor	> 0.9
Cos phi	> 0.98
Total Harmonic Distortion (THD)	< 45%
K-factor	< 10
Crest Factor	< 3
Power Interruptions	< 0.5 period, minimum intervals of 5 periods
Neutral to Ground Voltage	< 3% of line to neutral voltage
% Load Voltage Regulation	5.21%
Voltage Drop Allowed in Cable	2.40 V (0.5%)
Instantaneous Current (RMS Max.)	96 Amps
Peak Current	400 Amps < 5ms
Conductor Impedance	0.0249 Ohms

Note: It is absolutely required to have the MDU connected to hospital power the first day of magnet delivery.

PHILIPS

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Ingenia Ambition 1.5T X
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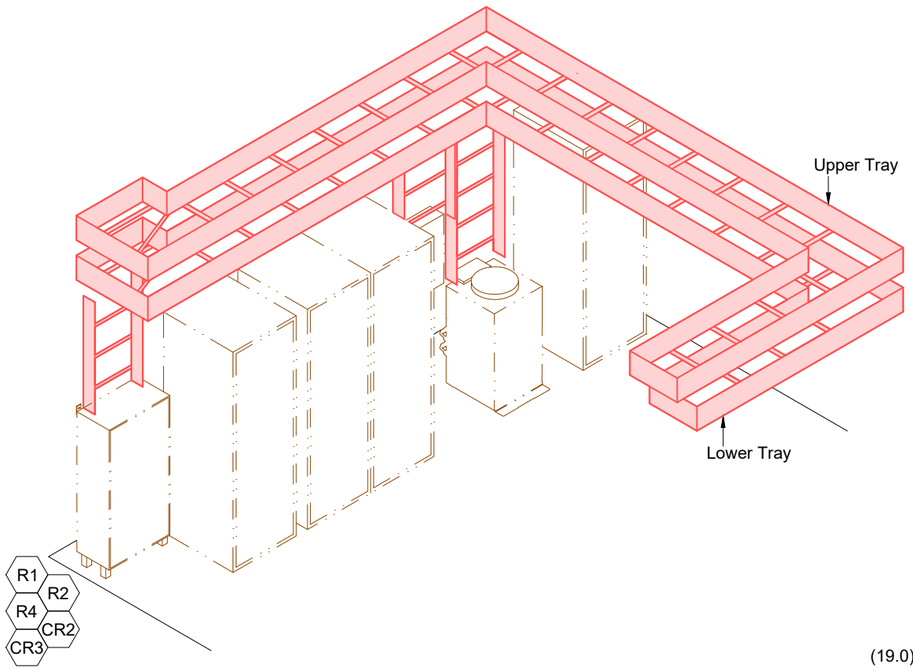
6600448836.010000- 020000

ED1

Detail - Equipment Room Isometric

(Not to scale - Not site specific)



(19.0)

USB Extender for Touch Screen Monitor

The USB Extender is required for each Touch Screen Monitor located >18' away from Ambient Experience AECC Cabinet.

It is composed of two units:

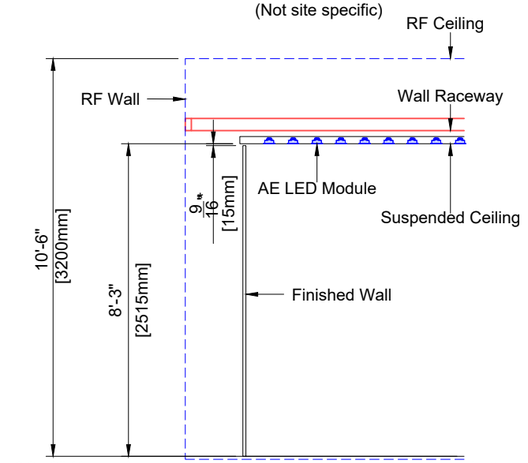
a. LEX - Local Unit:
   - Located within 5m of the AE Server.
   - Receives power from the AE server via USB connection.

b. REX - Remote Unit:
   - Located within 5m of the Touch Screen Monitor.
   - Receives power from the supplied 5 VCD power supply unit.
   - Installed inside ATSW junction box for the wall mounted Touch Screen Monitor, or on/under desk/counter for the Touch Screen Monitor in the control room.

c. LEX and REX connected via a UTP (Cat 5e or better) cable.

Detail - Exam Room

(Not to scale)
(Not site specific)

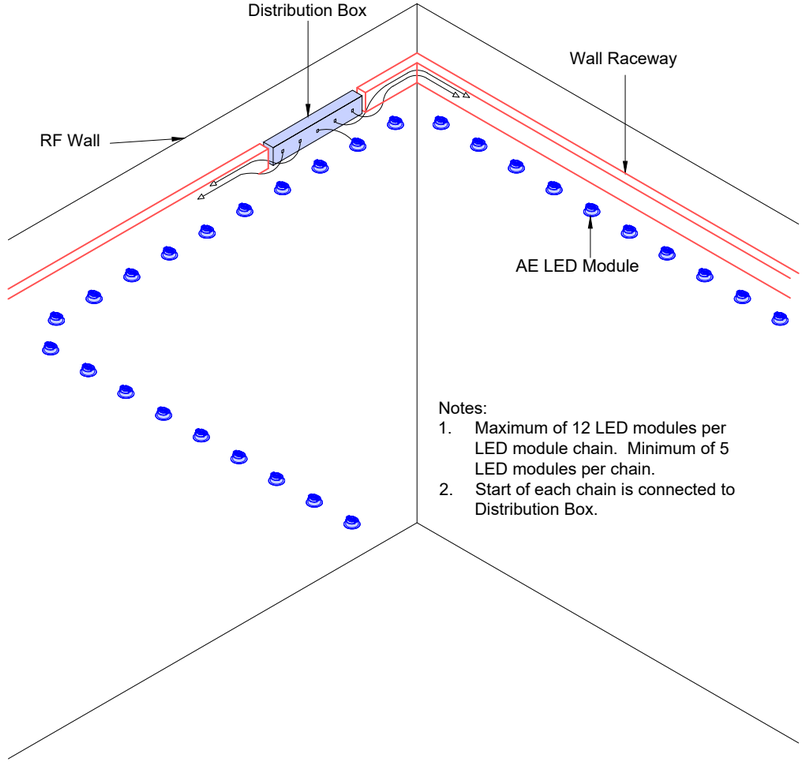


* 0.59" (15 mm) gap needed between top of finished wall and bottom of ceiling tile. Ceiling tile must go over and past the finished wall.

(15.0)

Detail - Isometric Diagram of Distribution Box and AE LED Modules

(Not to scale / Not site specific)



Notes:
1. Maximum of 12 LED modules per LED module chain. Minimum of 5 LED modules per chain.
2. Start of each chain is connected to Distribution Box.

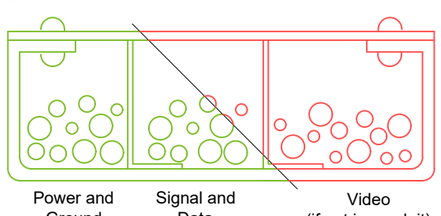
(15.0)

Detail - Cable Trough Divisions Outside of RF Enclosure (Or as directed by local code)

(Not to scale)

Ducts must be separated by metal barriers into three sections.

1. Power cables and ground cables can be run together.
2. Signal cables and data cables can be run together but must be separated from power cables.
3. Video cables must be run separately from all other cables.
4. It is important that all cables are placed in the appropriate through and at no given point do any cables from division cross with cables from another. Trough separation must be continuous from the beginning to the end of the run.
5. Trough or ducts: Steel with steel dividers grounded per local code.
6. Contractor to provide cable restraints in all troughs.
7. Low cable duct is for signal cables.
8. High cable duct is for:
   - Gradient cables (not allowed to route patient ventilation hose in gradient cable section)
   - RF send cable
   - Helium Gas Lines
   - Hoses for gradient coil cooling liquid
   - Power cables



CR2 CR3

(14.0)

PHILIPS

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Ingenia Ambition 1.5T X
Good Samaritan Hospital of Suffern
Community Medical Care
Suffern, NY
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ED2

Air Conditioning Requirements

1. Equipment Room Specifications

Ambient Requirements *	
Temperature	59° - 75° F (15° - 24° C)
Maximum Temperature Change	9° F (5° C) per 10 min.
Relative Humidity	30% to 70%, no condensation
Total Heat Dissipation to Air	
Dissipation Standby	27297 BTU/hr (8 kW) ***
Peak Dissipation Scanning	**28321 BTU/hr (8.3 kW)**

* Requirements given are specified at the cabinet air intake.
** The temperature of the conditioned air that enters the room must not be less than 42° Fahrenheit (6° Celsius) below the mean room temperature.
***Note: Normal standby capacity is 6824 BTU/hr (2 kW). In case of emergency, hospital supplied air cooling must be able to deliver 8 kW cooling if the back up **air** cooled cryo cooler is activated.

Note: Full Load UPS heat dissipation may increase peak dissipation by 28900 BTU/hr (8.5 kW).

a. The MR system heat dissipation is dependant on the type and duration of the acquisition. Therefore, actual heat dissipation will vary greatly. Equipment room air conditioning provided at average heat dissipation will result in dangerously high temperatures during peak loads, causing permanent damage and voiding system warranty. As such, air conditioning must be designed to handle peak loads.
b. Heat dissipation of an optional chiller, if installed in the equipment room, is not included.
c. A slight air overpressure is recommended to avoid dust build-up.
d. The HVAC system must be designed around equipment cabinet air flow/circulation. Modifying the room layout is allowed only after consulting the HVAC provider to avoid "hot spots".
e. Pollution: The equipment room is equipped with highly technical medical electronics. To avoid any potential failures due to pollution, dust containment should be considered (despite individual system parts having air filters). Ceilings walls and floors must be sealed to prevent dust particles from releasing into the air. Special attention shall also be considered when there is a cement floor slab under raised computer floors. Before the delivery of any equipment and after any construction, the site must be cleaned before turning on the MR system. The air conditioning system must be equipped with 90% less than 10 micron particles and 80% less than 5 micron particles filters.

2. Control Room Specifications

a. Comfort depends on local practice and preferences. For this reason, it is the responsibility of the customer to define the appropriate conditions of the control room for human comfort.

Ambient Requirements		
Temperature	MRI Equipment	50° - 95° F (10° - 35° C)
Maximum Temperature Change		9° F (5° C) per 10 min.
Relative Humidity		30% to 70%, no condensation
Total Heat Dissipation to Air		
Peak Dissipation Scanning		1024 btu/hr (0.3 kW)

3. Exam Room Specifications

Scan procedures involves the emission of RF energy. This can raise patient temperature. The amount of energy absorption (Specific Absorption Rate) is directly related to the ambient conditions. Therefore, the ambient requirements for the exam room are mandatory for safety.

Ambient Requirements	
Temperature ***	65° - 72° F (18° - 22° C) Preferred for patient comfort: 70° F (21° C)
Maximum Temperature Change	9° F (5° C) per 10 min.
Relative Humidity ***	40% to 70%, no condensation
Total Heat Dissipation to Air	
Dissipation **	7507 BTU/hr (2.2 kW)

** Philips LCC to remove gradient coil heat dissipation (3400 - 51200 BTU/hr [1 - 15 kW]) by liquid cooling.
*** Exam room temperature and humidity specifications are critical for the MR and must be met at all times. No exceptions are allowed.

a. The air under the suspended ceiling must be routed via an air grill (opening) in the suspended ceiling to the void above the suspended ceiling but remain inside of the RF enclosure.
b. A slight overpressure is required to avoid dust penetration
c. The air exchange rate in the examination room (for equipment under the suspended ceiling) must minimally be 5 times per hour at a minimum air flow of 235 CFM (400 m^3/h). The air inflow under the suspended ceiling must disperse evenly to ensure comfort and avoid "hot spots". Additional 235 CFM (400 m^3/h) must be supplied above the suspended ceiling in the top covers near the magnet shroud.
d. The conditioned air must enter the examination room through RF feedthrough wave guides.
e. If a dedicated HVAC system is used in the exam room, it is recommended that a system be designed to provide malfunction warnings, since excessive over/under temperatures or high/low relative humidity may damage the MR system.
f. The air flow through the magnet assembly must always be maintained while the system is in use.
g. Installation of Temperature and Humidity sensors in the RF-enclosure can be a problem due to the RF-filters required for each electrical cable entering and leaving the RF-enclosure and possible electrical interference. Best solution is to locate the sensors directly outside the RF Enclosure in the HVAC air return.
h. Smoke / fire detection system to be installed according to local code, fire and smoke detection common for medical devices and equipment with corresponding power rating. The use of these detectors inside the RF-enclosure is limited due to possible RF-interferences. A possible alternative is to install the detection device inside the air out / return duct located outside the RF-enclosure. Another alternative is to install an Aspirating Smoke Detector.
i. Smoke detection, temperature sensing, thermostats, humidity sensors, fire suppression duct control units, fire flashers/buzzers/annunciators and O2 Sensors, etc. inside exam room, MUST have a MR compatibility certification document. They must have NO INTELLENGENCE: No micro-processor control, no oscillators, no stepper motors, and no source of clock signal at all. If they do, and there is no MR compatibility certificate, it means that the device is disqualified for use inside the RF room.
j. System Air Cooling Unit
- Heat from the magnet gradient coil will be removed via the SACU (System Air Cooling Unit). The SACU and ventilation hose are delivered by Philips.
- The necessary 6.25" (160mm) System Air Cooling waveguide is to be provided by the RF enclosure supplier.
- 235 CFM (400 m3/ /h) of the inlet air will be directed through the magnet shroud. This will be pulled through the magnet by the SACU via the Gradient Exhaust RF Feedthrough and a Philips provided 5.5" hose (140mm).
- The exhaust air from the SACU must be directed back into the return air by a customer/contractor provided interface.

(19.0)

Additional Exam Room Air Feedthrough Requirements

1. Air Escape RF Feedthrough

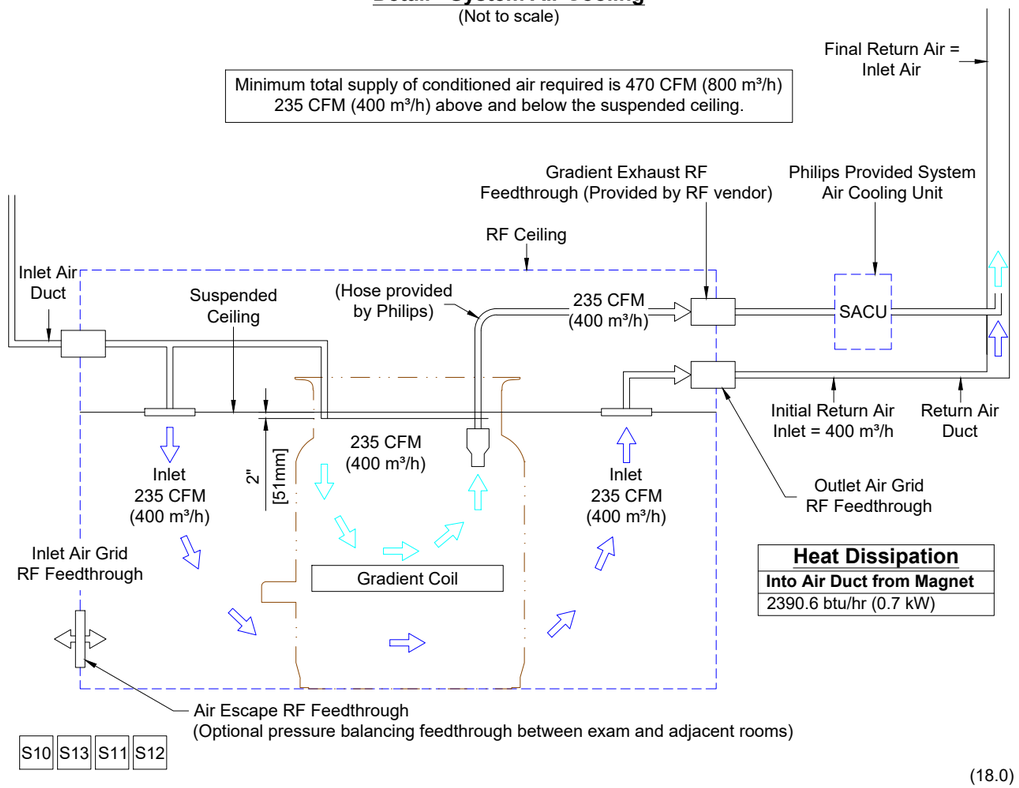
To ease the opening and closing of exam room entry doors, and prevent ceiling tiles from shifting when doors are opened or closed, an optional pressure balancing feedthrough can be installed between the exam room and adjacent room. Placing this feedthrough at the control room wall may lead to an increase in noise and affect comfort level.

S12

(18.0)

Detail - System Air Cooling

(Not to scale)



Heat Dissipation
Into Air Duct from Magnet
2390.6 btu/hr (0.7 kW)

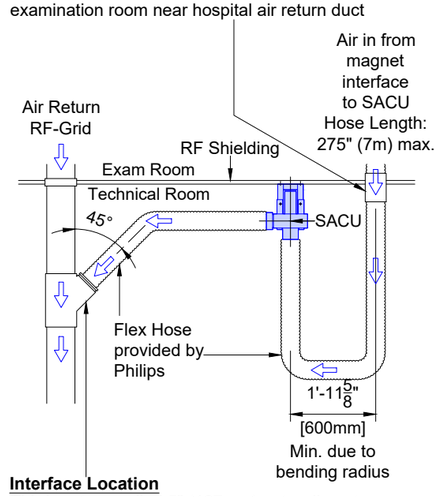
S10 S13 S11 S12

(18.0)

Detail - System Air Cooling Unit - Air Flow

(Not to scale)

RF Feedthrough
Philips supplied hose through
Wave guide inner diameter min. 6.3" (160mm)
Typical location above suspended ceiling of examination room near hospital air return duct



Interface Location
Third party supplied 5" (127mm) outer diameter interface.
Hose Length: 78.7" (2m) max. distance from SACU
Airflow: 235 CFM (400 m^3/h)
Heat Load: 2390 btu/hr (0.7 kW) during scanning

(16.1)

PHILIPS

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MP1

KKT cBoxX60/70 Chiller - Specifications/Notes

1. KKT cBoxX60/70 AC Chiller Siting Requirements

a. Customer/contractor required to flush out (with water) all piping prior to connecting to chiller. There must be no debris in the piping when final connections are made.

b. Mechanical contractors must supply and fill all chilled water systems, prior to "commissioning", with ethylene/propolene glycol and water solution. cBoxX chillers require a water/glycol mixture of 35% glycol to water for regions with ambient temperatures greater than -13°F (-25°C). Regions with colder temperatures require a low ambient chiller model and higher glycol concentrations (up to 50%). Use Distilled, Demineralized, or Reverse Osmosis water. Customer/contractor responsible for providing and installing glycol.

c. Chiller must have a minimum of 8' (2.5m) overhead clearance in order to allow proper discharge of warm air from the chiller. Siting must be such that the condenser constantly receives fresh outside air. In addition, chiller must be located such that there is no possibility of condenser fans ingesting lint (from hospital industrial dryers), leaves, sand, dirt or any other materials that can quickly obstruct the condenser fans.

d. The chiller cannot be located in any fully enclosed area (e.g. pits, unused stairwells, closets).

e. Chiller cannot be located next to other heat generating devices or systems (i.e. condenser exhaust, veneration ducts, heating exhaust, etc.). Chiller must be positioned such that it avoids other systems hot air discharge.

f. Any actions and/or add-ons for noise abatement beyond what is provided with the chiller (if any) is solely and exclusively the responsibility of the customer/contractor and must not violate any service clearances or chiller warranty.

g. Maximum allowed elevation above sea level is 6562' (2000m).

h. Ambient temperature range must be between (-13° F to 122° F [(-25° C) to 55° C]).

i. Liquid feed temperature range is 46.4° F to 86° F (8° C to 30° C).

j. Use only the following materials for the pipes: Copper (recommended); Stainless steel; PE or PVC (ensure that the appropriate steps are taken to protect the pipe along its length.) Never use galvanized piping.

k. The maximum one-way linear piping distance between chiller and CIP is 328' (100m). (See table)

l. The maximum allowed long radius elbows in total piping run is 20 pieces.

m. Long radius elbows must be used.

n. Maximum height difference between chiller and LCC is 82' (25m).

o. Chiller must be located a minimum 208" from magnet isocenter to avoid Electromagnetic Field interference from the motor. Refer to Sheet SN1 for details.

2. KKT cBoxX60/70 Chiller Commissioning Notes

a. KKT chillers shall commission the chiller. A completed "Pre-Startup Checklist" shall be forwarded to your Philips Project Manager prior to commissioning. Items incomplete at the time of the commissioning will generate delays and additional commissioning costs to be incurred by the installer. Philips Project Manager to schedule Startup with KKT.

b. Mandatory Commissioning Conditions:

- The Startup must be scheduled no less than 10 business days in advance of the requested startup date. The "Pre-Startup Checklist" must be completed and returned prior to scheduling.
- The Startup visit will be conducted within standard business hours. Weekends and after hours Startup service may be available at an additional charge.
- 4 hours is allotted for the completion of this service. If the Startup is delayed due to the site not being adequately prepared, additional charges may apply. Automatic air bleeders must be installed as detailed in the KKT installation manual.
- The Mechanical Contractor responsible for Electrical and Piping installation must be on site during the Startup visit.
- The site's plumbing lines must be flushed before connecting to the chiller. Additionally, all lines must be leak checked with pressurized air (no water) prior to the arrival of KKT technician. All wiring must be installed and connection made prior to KKT technician's arrival. Additionally, safety disconnects must be installed and tested.
- A water sources must be available within close proximity (i.e. garden hose attached to a building water supply) for maintenance purposes.
- The KKT technician will verify the chiller installation was completed per manufacturer's guidelines, and will complete the Startup Checklist while onsite.

c. Commission Summary - The commissioning technician will:

- Verify: inlet voltage, proper pump, compressor, and condenser fan rotation, clearances, control voltage (adjust primary multi-tap as required), water levels in tank.
- Start unit and check: refrigerant operation, pumps and water hose connections for leaks, operation of remote controller (per customer's requirements), amperage of compressor/pump/condenser fans, correct minor installation problems, review proper operation with maintenance personnel, provide report to Philips.

* Installation, rigging, and support (i.e. concrete pad or roof curbing) of Chiller to be provided by customer/contractor. Installation and support of Chiller to follow local codes.

(19.2)

Mechanical / Plumbing Layout

All piping to be minimum 1-1/2" (40mm) copper (recommended), stainless steel, PE or schedule 80 PVC with long radius bends, provided and installed by customer/contractor. All Full port ball valves and branching tees to be provided and installed by customer/contractor.

Customer/contractor to insulate all piping to prevent condensation and to minimize heat gain from ambient air.

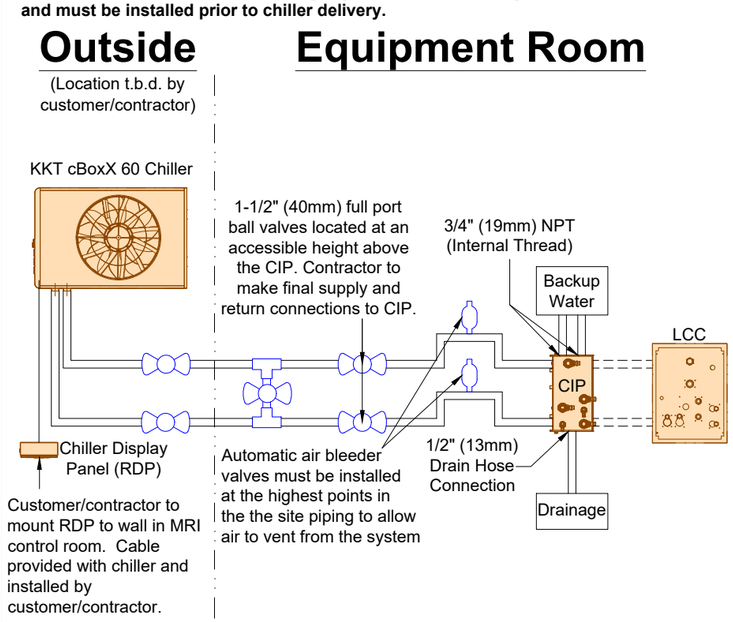
Maximum long radius 90° elbows: 10 long radius elbows one way (or 20 round trip). Maximum elevation above sea level is 6562' (2000m).

Relation of Pipe Diameter to Distance between Chiller and CIP		
Chiller to CIP Elevation	**Connections at Chiller**	**Max Allowed One Way Piping**
cBoxX 60 Below/Equal to CIP	1-1/2" RP	<=328' (100m) @ 1-1/2" Pipe
cBoxX 60 Above CIP	1-1/2" RP	<=164' (50m) @ 1-1/2" Pipe
		<=328' (100m) @ 2" Pipe
cBoxX 70 Below/Equal to CIP	2" RP	<=328' (100m) @ 1-1/2" Pipe
cBoxX 70 Above CIP	2" RP	<=164' (50m) @ 1-1/2" Pipe
		<=328' (100m) @ 2" Pipe

For distances exceeding 328' (100m) of straight pipe one way, e-mail actual pipe length, the difference in height, and the required pipe elbows to support@kkt-chillerusa.com.

For CIP purchased from PHILIPS, refer to Installation and Operation manual from the manufacturer for all detailed specification and installation requirements.

All flow, temperature, and pressure gauges shown on the diagram below are required and must be installed prior to chiller delivery.



Plumbing provided and installed by customer/contractor.

Plumbing provided and installed by Philips.

*** Because the "LCC" is delivered with the magnet, customer/contractor must provide a closed loop system so the Chiller can be tested prior to magnet delivery.**

**** If a chilled water system is used, it is the customer/contractor responsibility to meet all codes concerning the dumping of glycol. The amount of glycol (by volume) drained during a switch-over is the total volume of piping between the CIP and LCC multiplied by the concentration.**

(19.1)

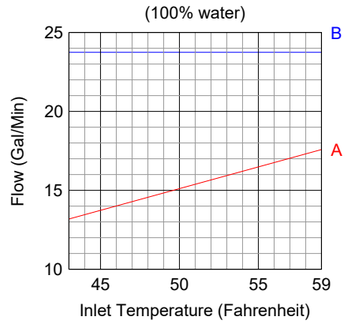
Mechanical / Plumbing Notes

1. Liquid cooling is required 24 hours / 7 days a week. It is the customer/contractor's responsibility to ensure the water source meets the Primary Coolant, Flow, and Pressure Drop Requirements below. Failure of the cold water distribution system will result in a shutdown of the MR system. If Water cooled cryo cooler fails, the Air cooled cryo cooler would need to take over cooling of the magnet but clinical use is not possible.

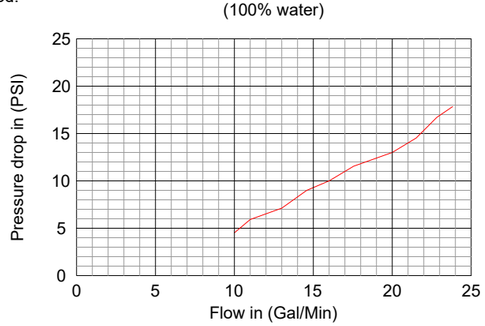
2. Primary Coolant Requirements to the Liquid Cooling Cabinet (LCC):

Inlet Water Quality	Potable Distilled Water
Inlet Water Acidity	6.0 - 8.0 pH
$CaCO_3$	< 250 ppm
Hardness	< 14 (degrees German hardness)
Chlorine	< 200 ppm
Maximum Suspended Matter	< 10 mg/L, <100 micron particle size
Inlet Water Temperature	43° - 61° F (6° - 16° C), 54° F (12° C) preferred
Maximum Flow	23.8 GPM
Maximum Inlet Pressure	87 PSI (6 Bar)
Inlet Water Temperature Stability	± 3.6° F (± 2° C) per 10 minutes
Ethylene/Propolene Glycol Concentration	MRI Chiller: Minimum 35% - Maximum 50%. Hospital Chilled Water: Minimum 0% - Maximum 50%.
Heat Dissipation to Liquid	17,061 - 153,550 btu/hr (5 - 45 kW)

3. Flow Requirements to the Liquid Cooling Cabinet (LCC):
- Flow in gallons per minute versus inlet temperature in Fahrenheit of the chilled water needs to fall into the area on or between curves A and B for each of the graphs in order to maintain enough cooling capacity.
- Maximum flow not to be exceeded to avoid temperature instability in the secondary circuit.
- If needed due to local requirements, it is allowed to use a mixture of maximum 50% of Glycol. Make sure that the supplier of the chilled water calculates the correct flow needed.



4. Pressure drop through Liquid Cooling Cabinet (LCC):
- If needed due to local requirements, it is allowed to use a mixture of maximum 50% of Glycol. Make sure that the supplier of the chilled water calculates the correct flow needed.



5. It is recommended to provide a water back-up system in case the cold water supply to the LCC is down (due to servicing or failure) to reduce the amount of liquid helium evaporating. **(Clinical use/scanning is not possible on tap/domestic water because it does not meet cooling requirements.)** Maximum allowed time of tap/domestic water cooling is 2 weeks.

6. A minimum 66 gallon (250 liter) water buffer in the chilled water system is recommended to be installed to smooth out the dynamic behavior of the MR heat load. A dedicated MR chiller can accommodate this requirement. Contact Philips for more information. (20.0)

PHILIPS

Project
Ingenia Ambition 1.5T X
Good Samaritan Hospital of Suffern
Community Medical Care
Suffern, NY
Room: MRI 1.5T (TMP 92)

Philips Contacts
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Drawn By: Jonathan Yoo

Project Details
Drawing Number
N-EAS190432A .01
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1-22J8ETR Rev. 3
Order: 6600448936.010000
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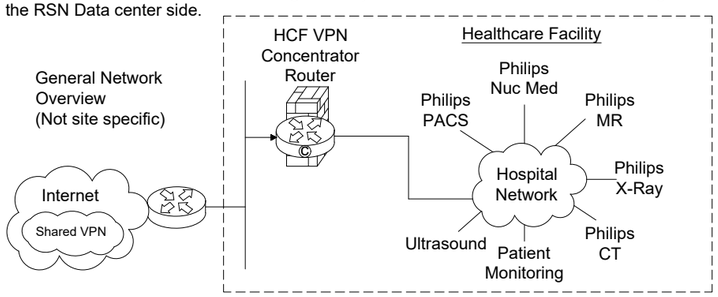
MP2

Philips Healthcare Remote Services Network (RSN)

Secure broadband connection required for Philips remote technical support, diagnostics, and applications assistance

Broadband Site-to-Site Connectivity (Preferred)
This connectivity method is designed for customers who prefer a connection from the RSN Data Center to the Health Care Facility (HCF) utilizing their existing VPN equipment.

Connectivity Details:
- A Site-to-Site connection from the RSN data center's Cisco router will be established to the HCF's VPN concentrator.
- The VPN Tunnel will be an IPSEC, 3DES encrypted Tunnel using IKE as standard, but alternative standards are also available, such as AES, MD5, SHA, Security Association lifetime and Encryption Mode.
- Every system that we will be servicing remotely will have a static NAT IP that we configure on the RSN Data center side.

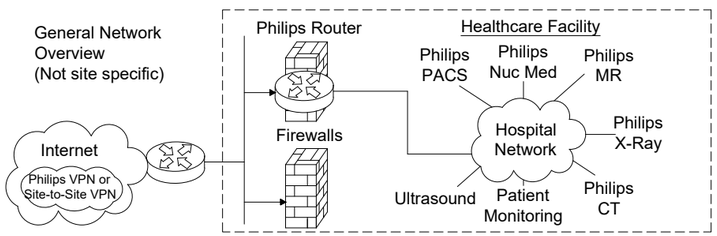


Action Required by Hospital:
- Review and approve connection details.
- Complete appropriate Site Checklist.
- Configure and allow Site-to-Site access prior to setting up connectivity depending on the access criteria that the HCF decides to implement (ex: Source IP filtering, destination IP filtering, NAT assignment, etc.).
- Route traffic from within the hospital network with destination addresses 192.68.48.0/22 to the designed IP provided by Philips.

Broadband Router Installed at Health Care Facility
This connectivity method is designed for customers who have a dedicated high speed connection for Philips equipment.

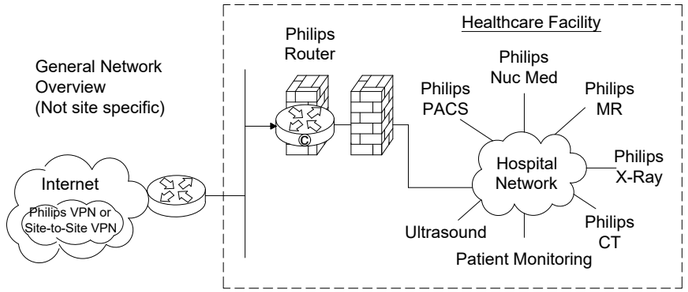
Connectivity Details:
- An RSN Cisco 1711 or 1712 router will be preconfigured and installed at the HCF by Philips in conjunction with the HCF IT representative.
- The VPN Tunnel will be an IPSEC, 3DES encrypted Tunnel using IKE and will be established from the RSN-DC and terminated at the RSN Router on-site.
- One to One NAT is used to limit access to Philips equipment only.
- Router Config and IP auditing is enabled for Customer IT to view via website 24/7.
- Dedicated DSL connections are also supported.

Option 1: Parallel to HCF Firewall Connectivity Method
This connectivity method is designed for customers who prefer a Philips RSN Router installed on site utilizing all the security features provided and managed by Philips.



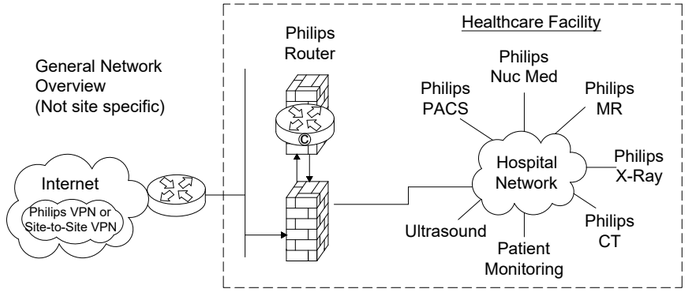
Action Required by Hospital:
- Assign a fixed public IP Address from the ISP to be configured on the Philips router. This is the DOTTED link on the picture connected to the firewall.
- Assign a Back end IP for the Philips router on the Hospital Network.
- Complete appropriate Site Checklist.
- Route traffic from within the hospital network with destination addresses 192.68.48.0/22 to internal Philips router Ethernet interface. This is the DASHED line connected to the firewall.

Option 2: Back End Connected to the HCF Firewall Connectivity Method
This connectivity method is designed for customers who prefer a Philips RSN Router installed on site by setting up an IP-Based policy allowing access thru existing HCF Firewall to Philips equipment.



Action Required by Hospital:
- Assign a fixed public IP Address from the ISP to be configured on the Philips router. This is the DOTTED link on the picture connected to the firewall.
- Assign a Back end IP for the Philips router on the Hospital Network.
- Complete appropriate Site Checklist.
- Route traffic from within the hospital network with destination addresses 192.68.48.0/22 to internal Philips router Ethernet interface. This is the DASHED line connected to the firewall.
- Configure and allow on the firewall on the DASHED line interface access between the IP address allocated by the hospital to the Philips internal Ethernet router interface and the target modality IP address.

Option 3: Router Installed Inside the HCF's DMZ
This connectivity method is designed for customers who prefer the RSN Router installed inside an existing, or new DMZ, allowing access to Philips equipment.



Action Required by Hospital:
- Assign a fixed public IP Address from the ISP to be configured on the Philips router. This is the DOTTED link on the picture connected to the firewall.
- Assign a Back end IP for the Philips router on the Hospital Network.
- Complete appropriate Site Checklist.
- Route traffic from within the hospital network with destination addresses 192.68.48.0/22 to internal Philips router Ethernet interface. This is the DASHED line connected to the firewall.
- Configure and allow on the firewall on the DASHED line interface IPSec protocol communication by opening protocol 500, 50, 51, 47 and port 23 + TACACS. Traffic should be between external IP Address located on the Philips router and the RSN Data center IP address 192.68.48/24 and IP address AOSN TACAS.
- Configure and allow on the firewall on the DASHED line interface access between the IP address allocated by the hospital to the Philips internal Ethernet router interface and the target modality IP address.

(14.0)

System Network Information

IMPORTANT NOTE:
It is the customer's responsibility to coordinate with the local Philips Engineer to provide ALL required network information and install ALL required network and cabling & drops according to Philips specifications PRIOR to the scheduled installation start date. Failure to do so may delay system installation and jeopardize the customer hand over date.

MRI Scanner		
	Default	**Hospital Preference**
AE Title:	MR1	
Port Number:	104 >= R2.6.3 3010 < R2.6.3	
IP Address:		
Subnet Mask:		
Default Gateway:		

Extended Work Station (EWS)		
	Default	**Hospital Preference**
AE Title:	EWS1	
Port Number:	3010	
IP Address:		

Hospital Network				
	RIS	**PACS (STORE)**	**PACS (Q/R)**	**DICOM PRINTER**
AE Title:				
Port Number:				
IP Address:				

RSN Ports	
Application	**Port**
Field Service Framework for MR	4440 and 80 (TCP)
McAfee ePolicy Orchestrator	80 (TCP)
Remote Desktop Sharing (Lots/To)	5900 (TCP)
Secure FTP (Passive)	22 (TCP)
Telnet SSH2	22 (TCP)
Philips Service Agent (Outbound)	443 (TCP)

(14.0)

PHILIPS

Project
Ingenia Ambition 1.5T X
Good Samaritan Hospital of Suffern
Community Medical Care
Suffern, NY
Room: MRI 1.5T (TMP 92)

Philips Contacts
Project Manager: Rich Halm
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Drawn By: Jonathan Yoo

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N1

Chiller Installation Checklist

It is the responsibility of the customer/contractor to ensure that this unit is properly installed before Philips begins installation and commissioning of your chiller. Philips can provide at additional charge, contractors who can install this system and/or glycol in premixed concentrations if you so desire. Please contact your Project Manager for assistance.

By signing the following checklist, you agree that all of the below steps have been properly completed before the commissioning begins. Additional charges may apply if any of the below are not completed properly. The unit must be powered (in operation) and meet all of the below a minimum of 8 hours before KKT arrives on site to commission the chiller system.

- ☐ Chiller has been offloaded, uncrated, and rigged into position. This is the contractor's responsibility and usually requires a forklift (terrain dependent).
- ☐ Chiller has not been damaged during shipment (i.e. damaged crating, bent panels, fluid leaks, etc.). If damage is observed, please notify the Philips Project Manager.
- ☐ Chiller install location meets all air and service clearance requirements (refer to AD Sheet).
- ☐ Chiller has been mounted, anchored, and supported per specifications in chiller manual.
- ☐ Chiller is not located near any other heat sources (i.e. condenser exhaust, ventilation ducts, heating exhaust, etc.).
- ☐ Incoming power to the chiller (phase, voltage, and current rating) has been recorded and confirmed with the installation guide and chiller specification tag to meet all requirements. Safety disconnects must be installed and tested.
- ☐ All field wiring connections verified and match prints. All wiring terminations are tight. All wiring must be installed and connections made prior to KKT technician's arrival.
- ☐ Power supplied to crankcase heaters for minimum of 8 hours prior to arrival of Service Tech for start-up. Note: Power must be supplied to the unit and main chiller disconnect must remain in the ON position.
- ☐ Piping to be Copper (recommended), stainless steel, PE or Schedule 80 PVC (with long radius bends), insulated to prevent condensation and heat gain from ambient air.
- ☐ Piping (plumbing) has been tested, free of leaks and free of air. All lines must be leak checked with pressurized air (not water) prior to the arrival of KKT technician.
- ☐ The site's plumbing lines must be flushed before connecting to the chiller. The recommended glycol/water must be at the filling point. Extra water and glycol should be on hand during startup to ensure the reservoir level maintained after the chiller is operational.
- ☐ Piping is terminated to the medical equipment and is not leaking. Field piping sized and installed according to specs.
- ☐ Automatic air-bleeder valves must be installed at the highest point of the site piping to allow for air to escape from the system.
- ☐ The chiller has been filled (after flushing any particulate matter) Glycol must be maintained at a minimum level of 35% Glycol to water. Tap water is NEVER recommended as minerals and contaminants may pose potential problems. Use Distilled, Demineralized, or Reverse Osmosis water. If the water is not distilled, it must meet the requirements on the MP6 sheet. Water can freeze inside the chiller and algae can form in the system if it is not followed.
- ☐ A water sources must be available within close proximity (i.e. garden hose attached to a building water supply) for maintenance purposes.
- ☐ Chiller Interface Panel (CIP) has been installed and plumbing connections completed.
- ☐ All permits completed and installation approved by proper governing authorities.

Chiller Installation Checklist One Week Prior to Delivery

- ☐ All criteria on Chiller Pre-Startup Checklist for commision completed and commissioning service scheduled.
- ☐ If a water bypass system is incorporated into the design, all associated plumbing completely installed.

Customer/Contractor Signature	Date	Print Name	Date
Title		Accepted By (Philips)	Date

Site Readiness Checklist

Instructions:
- This form is to be used by Project Manager and Customer/Contractor.
- Information is used to develop and determine site ready date.
- Be sure to contact Zone Installation Specialist (ZIS), Field Service Engineer (FSE), or National Support Specialist (NSS) if you have questions concerning any of these checklist items.

Required Prior to Delivery

- ☐ Cable Trough/Raceway/Conduit: Installed, cleaned and locations checked per Philips Final Drawings. Duct covers in place. Cable openings are clear, without sharp edges. Greenlee pull strings/measuring tape, (Part # 435,or equivalent) are in place.
- ☐ Ceiling (Hard): Installed and painted.
- ☐ Ceiling (Drop-In): Installed.
- ☐ Customer Site Preparation: Verified per Philips Final Drawings.
- ☐ Delivery Path and Truck Parking: Has been checked with the customer and Lead FSE including verifying floor loading, delivery route, elevator capacity, height, width and depth clearances, and a plan for bad weather.
- ☐ Doors: Installed.
- ☐ Drawings (Final): Shows all room obstacles to include millwork, lighting overlay, structure overlay, med gases and plumbing.
- ☐ Flooring: Installed and covered with protective covering (i.e. scratch protection).
- ☐ Glass: Installed.
- ☐ HVAC (Climate Equipment): Installed and operational. Humidity and temperature requirements per Philips Final Drawings.
- ☐ Installation Team: Has received the room drawings and necessary contact phone numbers.
- ☐ Millwork: Completely installed in all rooms.
- ☐ Parking: Parking area identified for installers.
- ☐ Performance Testing Requirements Identified: Determine if Certificate of Compliance is required, (i.e. NEMA, OSHPD, AHCA).
- ☐ Permits and Inspections: Completed by applicable governing authorities. Method statement available and safety meetings attended (OSHPD, AHCA).
- ☐ Philips Project Space: Is clean, free of dust, all construction-related debris and tools have been removed.
- ☐ Restroom Facilities: Toilet facilities, including area to wash up, are available.
- ☐ Room Lighting: Installed and operational.
- ☐ Room Security: Room is secure, with keys and alarm codes provided.
- ☐ Site Access: Is available for after hours. Storage for tools, parts, covers and packing material has been arranged.
- ☐ Site Is Safe To Work: PPE requirements identified (Construction and Hospital). No open Mains, slippery floors, sharp edges, or hazardous goods on site.
- ☐ Sprinklers: Installed.
- ☐ Transport & Handling Tools: Crane, forklift, wheels and trolleys have been specified with the LMP/rigging company. NOTE: If rigging provided by Philips, verify the vendor is on the Philips' Approved Suppliers list.
- ☐ Walls: Installed and final finished, (i.e. final coat painted and/or tiled).
- ☐ Existing equipment: is dismantled and removed from the site.
- ☐ Floor Levelness: Checked with Laser Level and is level per Philips Final Drawings.
- ☐ System Orientation: Verified per Philips Final Drawings.
- ☐ Table Isocenter: Verified per Philips Final Drawings.
- ☐ ERB Conductor Bar: Installed per Philips final drawings. All Philips-provided electrical boxes and contractor-provided raceway are grounded to the ERB.
- ☐ Mains Power Supply: Installed per Philips Final Drawings. (Including impedance, isolated grounds, wire size verified, and distribution unit has been installed).
- ☐ UPS: Fully installed per Philips Final Drawings, and startup has been scheduled with vendor.
- ☐ Ceiling Ladder Trays: Installed and grounded, per Philips Final Drawings.
- ☐ Ceiling: Ceiling grid installed, (ceiling tile may be excluded around the magnet and System Filter Box (SFB)). Sprinklers, lighting, HVAC ducts, and all other 3rd party items above suspended ceiling are positioned correctly.
- ☐ Chiller Startup: Chiller is required to be operational 2 wks prior to magnet delivery, (water, plumbing and valves are installed, flushed, leak tested, free of air and functionally verified). If required, facility water connections are prepared for LCC.
- ☐ Delivery Route: Route is prepared as committed, checked for size, max floor load and all obstacles have been removed. Check on forecasted weather conditions. PM to have an optional plan.
- ☐ Rigging: Plan is approved and Rigger is scheduled.
- ☐ Passive Shielding Installed (if applicable): Verify per the Philips Final Drawing, the distance between the rear wall and the rear magnet feet, (use the middle point of the thread of the height adjustable foot).
- ☐ Door Interlock Switch: Installed per Philips Final Drawings.
- ☐ Environmental Survey: Completed. (Required for 3.0T and applicable for 1.5T if known disturbances are near the magnet).
- ☐ Ferro-Magnetic Reinforcement and Structural Beams: Have been verified and meet specifications per Philips Final Drawings.
- ☐ Magnet and Table Mounting Pads: Have been checked for level, and location, per Philips Final Drawings.
- ☐ Material within RF Enclosure: Is non-ferrous, to include ceiling raceway, ceiling tile grid, hangers, diffusers, nuts and bolts.
- ☐ Metals: (e.g. aluminum strips, light fixtures, air handling grids, supports, etc.) are connected to the central RF Enclosure grounding point using a toothed washer.
- ☐ RF Enclosure: Has been certified by RF Vendor, per Philips Final Drawings.
- ☐ Service Light, Switch, and Receptacle: Installed above the ceiling, per Philips Final Drawings.
- ☐ Suspended Ceiling Magnet Service Area: Installed and unobstructed, per Philips Final Drawings.
- ☐ Electrician: Is scheduled to connect facility Mains to gMDU/uMDU on delivery day.
- ☐ Gradient Air Cooling, (Achieva and Ingenia CX only): Available and operational, per Philips Final Drawing.
- ☐ Mains Power and PE: Ready for connection to gMDU/uMDU on delivery day, per Philips Final Drawings.
- ☐ RF Cage Grounding: Connected from Protective Earth (PE) Bus Bar to the facility PE point. Responsibility of the local electrical contractor.

Required Prior to Philips System Power Up

- ☐ Wall Outlets: Installed and functional.
- ☐ Chiller Commissioning: Has been scheduled.
- ☐ Delivery Path Closure: Is planned to close the RF cage and complete cable ducts, wave guides, ceiling, floor, walls, PE, lights and electricity. Ceiling may be left open around the magnet, SFB and cable duct. All work to be done 2 days after magnet delivery.
- ☐ Ferro-Magnetic Materials: Have been removed from the examination room.

Required Prior to Install Complete

- ☐ Physicist: If required, verify the Physicist has been scheduled.
- ☐ Network Connections: Hardware is installed and active per Philips Final Drawings. All network information provided by facility IT, i.e. IP addresses (static IPs only), AE Titles, SNM, GTWY and DNS server are available.
- ☐ UPS: Commissioned and certified by UPS vendor.

Site Requirements/Readiness - Signature
Approved for Delivery

Customer/Contractor	Date	Project Manager (Philips)	Date

PHILIPS

Project
Ingenia Ambition 1.5T X
Good Samaritan Hospital of Suffern
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CHK1

AE MR Installation Responsibilities, Tier 1

AE MR Installation Responsibilities, Tier 1

Installation Item	Supplied by Philips	Installed by Philips	Supplied by Shield Vendor	Installed by Shield Vendor	Supplied by Contractor	Installed by Contractor	Category	Notes
RF Cage, door, window			X	X			Basic	
Magnetic Shielding					X	X	Basic	If required; Site planning to check InBore specs
Floor covering					X	X	Basic	
Floor island					X	X	Basic	If to be included
Exam room walls (including projection wall)					X	X	Basic	
Rounded corners					X	X	Basic	If to be included
All conduits/boxes/trays specified for AE cables					X	X	Basic	Listed below
Exam room functional lighting					X	X	Basic	
AE AECC cabinet	X	X					AECC Cabinet	Built on site
Location of AE AECC Cabinet in technical room					X	X	AECC Cabinet	
Mains electrical duplex outlet for AECC Cabinet					X	X	AECC Cabinet	
Junction box for AECC conduits					X	X	AECC Cabinet	
Wireless access point (optional)	X	X					AECC Cabinet	Included with InBore
External audio input cable	X	X					Audio	Included with InBore
AE audio output cable to MR system	X	X					Audio	Included with InBore. Connects to MR AiBo
Power outlet for external audio source					X	X	Audio	Included with InBore
Coil cabinet(s)	X					X	Cabinets	Optional - if purchased from Philips
Opening in wall for Coil Cabinets					X	X	Cabinets	Optional
Ceiling Tiles					X	X	Ceiling	
Antumbra Light Controller	X	X					ANT	Not used if InBore Monitor included
Power over Ehternet supply for ANT	X	X					ANT	Not used if InBore Monitor included.
Conduit run from AECC to ANT					X	X	ANT	Not used if InBore Monitor included
1-gang junction box for ANT					X	X	ANT	Not used if InBore Monitor included
Raceway/J Hooks or equivalent above ceiling to support LED lighting cables					X	X	Lighting	Local code determines what can be used
RF Shield penetration opening for AE RF Filter			X	X			Lighting	
AE RF Filter and mounting plate	X			X			Lighting	RF Vendor to install the Filter plate
Perimeter LED ceiling holes					X	X	Lighting	3" holes around perimeter of room
Perimeter LED modules	X	X					Lighting	
Conduit run from AECC to AE RF Filter					X	X	Lighting	2.5" Conduit
Cable from AECC to AE RF Filter	X	X					Lighting	
AE distribution box, lighting	X	X					Lighting	
Cabling from AE RF filter to LED distribution box	X	X					Lighting	
Cabling from distribution boxes to LED modules	X	X					Lighting	
Cabling between LED modules	X	X					Lighting	
Terminator on LED module string	X	X					Lighting	
ELO Touch Screens (wall and desk)	X	X					Touchscreen	
Conduit runs from AECC to ATSW (wall mount touchscreen) and ATS junction box for video and USB					X	X	Touchscreen	Can combine the two conduit runs for each touchscreen to one if local code allows. One 2" conduit per touchscreen
Power for the touchscreens and USB extender (In ATSW junction box and under operator's console					X	X	Touchscreen	For ATSW, power located inside the ATSW box facing toward the center of the box.
Power cables for touchscreens	X	X					Touchscreen	
Remote USB extender for touchscreens (In ATSW JB and attached to operators touchscreen)	X	X					Touchscreen	
Junction box for ATSW and ATS					X	X	Touchscreen	
Cables for USB and video for touchscreens	X	X					Touchscreen	
InBore Monitor	X	X					InBore Monitor	
Opening in finished examination room wall centered on iso-center on rear wall						X	InBore Monitor	Dimensions on Philips site plans
Opening in RF wall for the RF wall interface frame centered on iso-center on rear wall				X			InBore Monitor	Dimensions on Philips site plans
Distance between exam room wall and RF wall = 61mm					X		InBore Monitor	If greater, then need RF Adapative frame built. Not provided by Philips
RF Adaptive Frame			X	X			InBore Monitor	Optional - Only needed if distance between RF Wall and Exam room wall is greater than 2 3/8"
Electrically conductive material around opening in RF wall			X	X			InBore Monitor	
RF Wall interface frame	X			X			InBore Monitor	RF Vendor to install interface frame
RF Window	X	X		X			InBore Monitor	RF Window to be installed by Philips unless RF Vendor installs it to test their shielding
Glass Bezel	X	X					InBore Monitor	

Installation Item	Supplied by Philips	Installed by Philips	Supplied by Shield Vendor	Installed by Shield Vendor	Supplied by Contractor	Installed by Contractor	Category	Notes
Passive magnetic shielding requirements with PIB monitor			X	X	X	X	InBore Monitor	Needs evaluated by site planning for correct setup for PIB
Local mains power supplied behind the RF Wall					X	X	InBore Monitor	Behind RF Wall
Conduit runs from AECC for video and network to behind InBore monitor location					X	X	InBore Monitor	Behind RF Wall
Power cable for InBore Monitor	X	X					InBore Monitor	
Required space between monitor and outside structural wall					X	X	InBore Monitor	Approx 4.2" needed from RF Wall to Structural Wall
Heating/Cooling for InBore monitor space if required					X	X	InBore Monitor	Monitor temp range 32F - 104F
Network and DVI video cable for InBore Monitor	X	X					InBore Monitor	
Power switch for InBore Monitor in technical room					X	X	InBore Monitor	Need to control power to monitor behind RF Window
Patient head coil mirror	X						InBore Monitor	
External HDMI video cable	X	X					InBore Monitor	22.7m HDMI cable to be run from the AECC to control room
Conduit run for HDMI cable					X	X	InBore Monitor	Cable can be ran in conduit with external audio until we start to supply a face plate.
Exam Room Display	X	X					Exam Room Inbore	MR Compatible monitor
Exam Room Display power supply	X	X					Exam Room Inbore	Mounted above ceiling near monitor and power outlet
Opening in finished examination room wall centered on iso-center on rear wall						X	Exam Room Inbore	Dimensions on Philips site plans
Distance between exam room wall and RF wall > 6"						X	Exam Room Inbore	This distance is for the monitor, frame, and air flow
Monitor mounting frame					X	X	Exam Room Inbore	Needs built to specs in site plans.
Studs to mount monitor mouting frame					X	X	Exam Room Inbore	Studs required to provide correct distance for the monitor mount frame
Bezel mounting hardware	X					X	Exam Room Inbore	Eccentric leveling and locking bars
Glass Bezel	X	X					Exam Room Inbore	
Local filtered mains power outlet near power supply in ceiling					X	X	Exam Room Inbore	Above ceiling. Can use the same filter power for projector
Conduit runs from AE Cabinet for video and network fibers to waveguide					X	X	Exam Room Inbore	Fiber cables. Can use a larger conduit to for the projector fiber cables and monitor cables
Power cable for InBore Monitor	X	X					Exam Room Inbore	5m cable that runs from the power supply in ceiling to the monitor
Heating/Cooling for Exam room monitor space if required					X	X	Exam Room Inbore	
Waveguide for video and network fibers			X	X			Exam Room Inbore	Can run through the same waveguide for projector fibers
Video and network fiber convertors and power supplies	X	X					Exam Room Inbore	Installed in cabinet. On monitor side built into monitor
Network and DVI video fiber cable for exam room monitor	X	X					Exam Room Inbore	Runs through waveguide
Power switch for exam room onitor in technical room					X	X	Exam Room Inbore	Need to control power to monitor
Patient head coil mirror	X						Exam Room Inbore	
External HDMI video cable	X	X					Exam Room Inbore	22.7m HDMI cable to be run from the AECC to control room
Conduit run for HDMI cable					X	X	Exam Room Inbore	Cable can be ran in conduit with external audio until we start to supply a face plate.

PHILIPS

Project
Ingenia Ambition 1.5T X
Good Samaritan Hospital of Suffern
Community Medical Care
Suffern, NY
Room: MRI 1.5T (TMP 92)

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