GE HealthCare

MR Project Implementation Guide

Working together to get your innovative technology online so you can begin providing patient care.

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Use of this guide

Installation of your new GE HealthCare system requires that your site be prepared to follow the product's unique site preparation requirements. Our mutual goal is to prepare for delivery and installation of your system on time.

GE HealthCare has experience aiding customers with preparing their sites for the delivery and installation of their systems. This guide provides an overview of many of the typical site preparation steps GE HealthCare has experienced while aiding its customers during the preparation of their sites for the delivery and installation of their systems. This guide has information on the following topics.

- Project Implementation
- Construction
- Site Evaluation
- Site Ready
- Project Team
- System Delivery
- Preliminary Plans
- Installation and Calibration
- Construction Plans
- Applications
- Plan Review
- Project Completion
- Close-Out Meeting

In addition, your site plan and design need to incorporate the site planning information and requirements found in the applicable GE HealthCare pre-installation manual and the site-specific final equipment installation drawings for your system. Please contact your GE HealthCare Project Manager if you have not yet received a copy of the applicable GE HealthCare pre-installation manual. PDF copies of the GE HealthCare's pre-installation manuals, along with PDF copies of typical preliminary project drawings and typical final installation drawings are available for viewing and downloading at the following link.

https://www.geHealthCare.com/support/site-planning

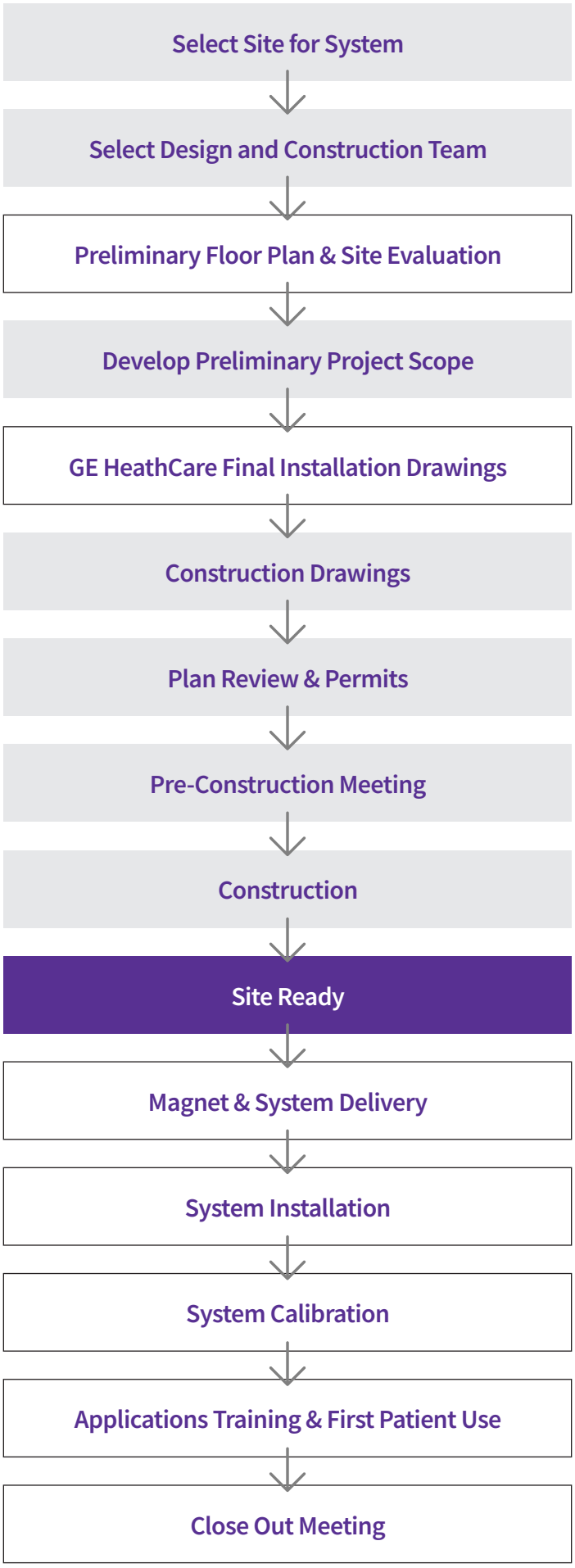
You may find it beneficial to share and use this guide with your facilities team, system users, architects, engineers, contactors, or others involved in the design and construction of your site. Portions of this guide are repeated in more than one section for completeness of information within a given section.

Your GE HealthCare team is available to help with your project. Your GE HealthCare Project Manager is your GE HealthCare focal point during the project implementation process. Please contact your GE HealthCare Project Manager with any questions you may have.

Process Flow

An understanding of the process steps by team members supports the creation of an objective schedule. To do this, all team members should have a good understanding of the steps in this process.

This guide describes the typical project implementation process steps and time needed for each step. Decide if your project has special needs not addressed by this typical process flow and develop a specific schedule for your project.
GE HealthCare will provide you with help during various steps of your site preparation project as shown in this guide.



Customer & GEHC Responsible

Customer Responsible

This part of the Process Flow section outlines additional task descriptions for each process step.

Note: This is not a comprehensive list of tasks or requirements in the project implementation process.
You must collaborate with your team to define all the specific tasks and scope for your site.

Select Site for System — Cycle varies

- Determine project type, such as new construction, addition, renovation, upgrade
- Gather MR system user inputs
- Facility planning involvement is critical
- The applicable GE HealthCare pre-installation manual and typical drawings will be provided to you by your GE HealthCare Project Manager
- Determine if a Certificate of Need or any special permitting is needed

Select Design and Construction Team — Cycle 1–2 weeks

- Select an architect or qualified designer as early as possible
- Decide on Design-Build or Design-Bid-Build site preparation approach
- Conduct an onsite pre-bid meeting if the Design-Build approach is selected
- Consider the MR system construction experience as a main criterion for contractor choice
- Hire a rigger for the magnet delivery, verify experience

Preliminary Floor Plan and Site Evaluation — Cycle 1-2 weeks

- Team collaboration
  - GE HealthCare Project Manager
  - Customer team
- Perform a complete site evaluation specific to your MR system type, such as
  - Gauss field containment
  - Moving metal
  - Electromagnetic interference
  - RF shield
  - Nearby steel
  - Vibration levels
  - Acoustic requirements
- Perform a broadband (high-speed Internet) connectivity assessment
- Define filming, printing, and PACS interface requirements
- Review the magnet and system delivery route and the magnet access point
- Select the desired system location and room configurations
- Your GE HealthCare Project Manager will develop a preliminary floor plan incorporating your input
- Customer's written approval of GE HealthCare's preliminary floor plan
- Identify if permanent structural shoring is required under the magnet

Develop Preliminary Project Scope

Cycle included in preceding

- Select an architect for input
- Define your project scope
  - Unique elements for MR system configuration
  - Construction requirements
  - User inputs are critical
- Finalize the project floor plan
- Develop preliminary written project schedule to establish a planned first use date
- Agreement and commitment are needed from all parties involved

GE HealthCare Final Installation Drawings

Cycle 2-3 weeks

- Customer's written approval of GE HealthCare's preliminary floor plan is needed to try with the site-specific final equipment installation drawings
- Your GE HealthCare Project Manager will coordinate with the GE HealthCare Design Center to complete the site-specific final equipment installation drawings
- AutoCAD and PDF files of the site-specific installation drawings are provided by project manager (prints are available upon request)
- GE HealthCare's final installation drawings are NOT construction drawings, but portions may need to be incorporated into the architect's construction documents/plans

Construction Drawings

Cycle 3-7 weeks

- Conduct an on-site design kick-off meeting
- Utilize the GE HealthCare pre-installation manual and equipment installation drawings
- GE HealthCare Project Manager is available for support
- Facility Planning/Landlord involvement is critical
- Your architect/engineering team manages code and regulatory compliance
- Finalize the magnet and system delivery route and verify elevator load ability rating, if applicable; the Rigger and GE HealthCare Project Manager input is critical at this stage
- Hold periodic team review meetings

Plan Review and Permits

Cycle varies

- Required governmental approvals vary by location
- Obtain construction bids, if using the Design-Bid-Build approach
- Highlight potential customer risks resulting from delays to the schedule
- Arrange permits to close street or sidewalk for delivery or rigging, if applicable

Pre-Construction Meeting

Cycle 1 week

- Team collaboration is essential
- Pre-Construction Review
  - Critical that contractor, all suppliers, and subcontractors are present
  - Find critical path events
  - Identify any items that may have a long lead time
  - Ensure all shop drawings for construction are complete
  - Finalize the project schedule prioritizing meeting critical milestones for pre-installation items, system delivery, system installation, and customer Go-Live.
- Schedule input and commitment from the entire team is critical
- Coordinate the project schedule with the rigging company
- Distribute proper construction drawings to all trade groups

Construction

Cycle varies (site dependent)

- Complexity of the project drives total project cycle time
- Order long lead-time items
- Your GE HealthCare Project Manager is available for support and questions
- Communicate status updates to your GE HealthCare Project Manager
- Critical path items checked and completed, such as:
  - RF shield
  - Magnetic shield, if applicable
  - Chiller
  - Cryogen vent
  - HVAC operational
  - Power available
- Closely check site progress
- Conduct required inspections and measurements
- Maintain planned completion date: focus construction efforts on the exam room, equipment room, and control room
- Confirm magnet and system delivery routes
- Review and coordinate equipment storage location(s)
- Plan for opening and closing of the magnet access point
- Hold periodic project team review meetings

Site Ready!

- Site Readiness Assessment complete: led by your general contractor and is conducted with GE HealthCare's Project Manager
- Maintain planned completion date: focus construction efforts on exam room, equipment room, and control room
- General contractor completes the items on the construction punch list
- Schedule and complete magnet and system delivery dates
- Verify broadband connectivity and IP addresses are obtained

Magnet and System Delivery

Cycle 1-2 weeks

Your GE HealthCare MR system is typically delivered in phases: 1) Pre-installation items, and 2) Magnet and Electronics.

- Final schedule notification sent to rigger and GE HealthCare Project Manager
- Coordinate temporary shoring, if needed
- Pre-installation items typically arrive 2 to 6 weeks prior to magnet arrival. Items may include a chiller, main disconnect panel, and heat exchanger cabinet.
- Delivery of the magnet and electronics, then closing of the magnet delivery opening
  - Cryogen vent and chiller connections to magnet which must occur within 24 hours of the magnet delivery
  - Install any required anchors in the RF floor
  - Final RF room test, send a copy to your GE HealthCare Project Manager
- Delivery of the system components typically occurs on the same day as the magnet. Coordination of equipment storage locations must adhere to equipment storage requirements.

Installation & Calibration

Cycle 2-3 weeks

- Coordinate availability of General Contractor, Electrician, Plumber, HVAC technician, and Facilities personnel to support delivery and installation activities
- Mechanical installation of the MR system
- MR Calibration Engineers or Field Service Engineers complete system calibrations
- Connect to the hospital's network/PACS systems
- Connect to facility data network and GEHC VPN for MR system monitoring

Applications Training & First Patient Use

Cycle < 1 week

- GE HealthCare Applications Specialist scheduled for on-site training
- Review the pre-training materials provided by GE HealthCare
- Identify staff members who will take part in GE HealthCare led training
- Provide supplemental personnel support to allow for the technologists' participation
- Education Center classes scheduled for technologists, if applicable
- Identify the mix of exam types performed by staff members
- Ensure proper patient loads are scheduled

Close Out Meeting

As the project is now completed, it is time to do a final assessment, name key contacts, and reflect on what worked and could be improved on. Your GE HealthCare Project Manager will start a project close-out meeting to review the following:

- Review the project plan to ensure all tasks have been completed
- Review follow-up requirements
- Find project positives/improvement areas
- Complete the hand-off to GE HealthCare Service

Site Evaluation

There are several ways to accommodate your GE HealthCare system at your site.

Some examples are the following

- **New Facility**
- **Building Addition**
- **Renovation**
- **Replacement of existing MR system or upgrade**
- **Leased Space**
- **PDC Cassette or Mini-Clinic**

The specific site you select influences the complexity, schedule, and cost of the project. Your GE HealthCare Project Manager will help you identify potential locations that could satisfy your patient flow requirements and GE HealthCare's space requirements.

Some questions to consider:

- **What type of GE HealthCare MR system did you purchase?**
- **Are you replacing or upgrading an existing MR system in an existing location? Is the MR system located at your existing facility or in a new independent clinic, medical office building, or leased space?**
- **Is this a PDC Cassette/Mini Clinic?**
- **Do you plan any future expansion into the surrounding area?**
- **Is the location proper for the MR System weight, size, fringe field, vibration sensitivity, moving metal environment, acoustics, and other specific requirements specified in GE HealthCare's applicable pre-installation manual?**
- **What system location and layout provide the most efficient workflow for your staff and patient flow, including proximity to other facility functions and diagnostic imaging systems?**
- **Is space available in your existing building to renovate?**
- **Is space available to build an addition?**

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New Facility

Building Addition

Renovation

Leased Space

Construction

PDC Cassette or PDC Mini-Clinic

Magnetic Shielding

Determine the criteria for gauss field containment; refer to the applicable GE HealthCare pre-installation manual for proximity assessment and other criteria. The field containment criteria are critical to the design of your site and will determine if magnetic shielding or other proximity control methods are required. room has magnetic shielding, forward details of the shield to your GE HealthCare Project Manager for review.

System Upgrades

If you are replacing or upgrading an existing system in an existing RF shield room, the existing RF shield must be evaluated for compliance with your new system's RF shield requirements. Those requirements are provided in GE HealthCare's applicable pre-installation manual. This test should be conducted prior to de installation of the existing MR system. This test must be done with the PEN panel removed and a blank panel inserted. This will show the need for repair or modifications to the existing RF shield or the need for a new RF shield. Repairing, changing, or replacing the RF shield should be factored into your project cost and schedule. You may also have to make other room modifications to meet current siting requirements, such as cable concealment, egress, floor levelness, and floor support.

Please see the RF shield subsection in the Summary of Critical Items section of this Guide. Reusing an existing RF shield may require modifications, including the cryogen vent, penetration panel, and floor.

Site Vibration

The vibration environment at your site can affect the MR system's performance. You need to have your site evaluated for the existing vibration levels to assure your site follows the requirements provided in the applicable GE HealthCare pre-installation manual.

Electromagnetic Interference

The electromagnetic interference and power quality at your site can affect the MR system's performance. You need to evaluate your site to ensure compliance with the requirements provided in the applicable pre-installation manual. If your site does not follow those requirements, corrective actions will be necessary prior to delivery and installation of your system.

Moving Metal

Your site needs to be evaluated to decide if it follows the magnet moving metal requirements provided in the applicable GE HealthCare pre-installation manual. If your site does not meet those requirements, proper corrective actions will be necessary prior to delivery and installation of your system.

System Delivery

Both the system delivery route and magnet access point need to be reviewed to decide if floor support is needed along the delivery path during the delivery of system components. Decide if the delivery path to the designated rooms has adequate clearance to accommodate for the size and turning radius of the system components being delivered.

System delivery considerations include: the width and height of corridors and doorways, and the elevator size and ability along the path from the point of delivery to the installation location.

Consult your GE HealthCare Project Manager about questions you may have concerned your site.

You will receive a preliminary floor plan from your GE HealthCare Project Manager. That floor plan should be reviewed with your entire team. Your GE HealthCare Project Manager needs your written approval of that preliminary floor plan to authorize starting your site-specific final equipment installation drawings.

Typical Delivery

Project Team

Overview

You may find it helpful for applicable members of your project team to use this guide. Those team members may include:

- **Senior Management**
- **Project Manager**
- **Architectural and Engineering Firms**
- **Construction Team**
- **Information Technology Representative**
- **System Users**
- **Other personnel that have visibility and an impact on the implementation the project**

Your team's involvement is critical to the success of your project's design and construction efforts. It is particularly important to identify your specific team members and start team meetings early in the project to develop an appropriate floor plan and project schedule.

A well developed and executed project plan and schedule helps to minimize the possibility of delays in system delivery and installation, thereby potentially avoiding:

- **Delays in scanning patients**
- **Cost overruns for construction**

The capabilities of your project architect and contractors are critical factors to your project's success. GE HealthCare can provide Design-Build services through its internal MedFACS team. These Design-Build services are provided at an added cost based on a mutually agreed upon scope of work. See the GE HealthCare Support section for more information regarding the services the MedFACS team can provide.

Selecting Your Design and Construction Team

Selecting the right design and construction team is important to the outcome of your project. GE HealthCare's systems have unique and specific site preparation requirements. The design and construction professionals you hire will need to use the applicable pre-installation manual available through your GE HealthCare Project Manager.

When assessing the qualifications of the design professionals and the construction contractors, it is an innovative idea to consider the amount of experience they have with respect the design and site renovation or construction for the installation and operation of systems that are like your new system.

You need to decide if you will use the Design-Build approach or the Design-Bid-Build approach for your project.

Design-Build

For Design-Build you will be looking for a contractor that has design capability or a design team with construction capability. You would contract with a single company for the design and construction services. This method will end the need for a construction bid cycle after construction drawings and specifications are completed.

Design-Bid-Build

For Design-Bid-Build you would be entering into contracts with both a design firm and a general contractor. This approach may require additional project management from your staff to coordinate the activities between the other parties. This differs from the Design-Build approach where you typically have a single point of contact. This method will require obtaining construction bids after the construction drawings and specifications are completed.

Once you review the qualifications of the design firms and construction contractors, you will need to select a design firm to prepare the construction drawings and specifications. When the construction drawings and specifications are completed, you will need to select one or more of more contractors to bid on the construction work; they should be invited to a pre-bid meeting at the project location. The meeting attendees should focus on understanding the scope of the construction work, the existing site conditions, and the planned project schedule.

Your GE HealthCare Project Manager will develop a preliminary floor plan incorporating your input. MR system sites need to be evaluated to decide if magnetic shielding is needed or if mitigation of existing moving metal, vibration, or acoustic conditions is needed. You may need to evaluate more than one location and room configuration to find a location for your new MR system that meets your requirements and is consistent with GE HealthCare's site preparation requirements.

Team Collaboration

Find your project team members. For an effective site design, obtain input from all team members and users about workflow, patient flow, and facility configuration.

It is your responsibility to evaluate potential design professionals and contractors for your project.

GE HealthCare Support

GE HealthCare Project Manager

GE HealthCare provides project implementation support through your GE HealthCare Project Manager. This support for your project implementation process will be provided through the following primary activities:

- **Help in assessing sites for the location of your system**
- **Help in developing a preliminary floor plan for your system**
- **Provide an applicable GE HealthCare pre-installation manual and site-specific final equipment installation drawings that include the site preparation requirements that your architect and engineer should use when designing your site**
- **Provide your architect and engineers with help resolving questions about GE HealthCare's site preparation requirements**
- **Provide GE HealthCare site-specific equipment installation drawings**
- **Provide supporting information to your contractor(s) related to schedule development and construction planning**
- **Help when you conduct periodic site readiness assessments to decide the status of the site preparation requirements that need to be completed for delivery of the system**
- **Help you with the coordination of the system delivery and installation activities**
- **Coordinate the close-out meeting**

GE HealthCare MR Siting and Shielding Team

GE HealthCare's MR Siting and Shielding team provides support services unique to the magnetic resonance product line.

Those support services are made up of preliminary site evaluations, preliminary magnetic shield designs, reviews of vibration and electromagnetic interference test results, floor steel reviews, cryogen vent reviews, final magnetic shield design drawings, and shield shop drawing reviews.

All reviews of customer-provided facility drawings will be checked for compliance with the major requirements in the applicable GE HealthCare pre-installation manual for your MR system. For projects involving the relocation of existing MR systems, there is a fee for the MR Siting and Shielding team services.

Magnetic shield designs are created using GE HealthCare's proprietary finite element analysis computer programs or by selective use of GE HealthCare's pre-designed shields.

You may request MR Siting and Shielding team support services through your GE HealthCare Project Manager.

GE HealthCare's Design-Build Services

GE HealthCare can provide Design-Build services to its customers through its MedFACS (Medical Facilities Construction Services) team. MedFACS provides GE HealthCare's customers with single-source responsibility for both the equipment and the design and construction services needed to prepare your site for the installation and operation of your new system. Through this process GE HealthCare can deliver a predictable project schedule and provide its design and construction services in compliance with GE HealthCare's site preparation requirements for your new system.

The construction is custom tailored to meet your needs while integrating the site preparation requirements for your new system and the conditions at the existing site. Typical MedFACS projects include single room renovations, multi-modality imaging departments, modular buildings, and small building additions/clinics. The MedFACS team uses proprietary detailed standard documentation to create a detailed site-specific scope of work and a site-specific drawing indicating the site floor plan. These drawings are typically either the preliminary project drawings prepared by GE HealthCare's Project Manager or the site-specific final equipment installation drawings. Once the MedFACS quotation is accepted, the MedFACS team will begin the performance of its design and construction services.

Please contact your GE HealthCare Project Manager if you would like to explore this matter further with a representative of the MedFACS team.

Roles and Responsibilities

Action	Reason	Responsibilty
Helium Vent **MR Assessment Form (COC) –** ***Safety***	Proper Helium extraction from the Magnet Room is used in an emergency for safe release of helium gas.	The customer is responsible for any re-routing of the Helium Exhaust Vent and ensuring design and implementation to GEHC Specifications.
Seismic Anchoring – ***Safety***	Only applicable in areas where seismic activity is a concern.	The customer is responsible for seismic anchoring of GE components.
Connectivity – ***Performance***	Network connectivity allows remote monitoring and automatic error reporting of the magnet cooling system to ensure proper function and reduce chance of helium loss.	The customer is responsible for ensuring network connectivity is available and IT is engaged prior to magnet delivery.
Floor leveling – ***Performance***	Magnet, Enclosure, and Patient Table areas must be flat and level within 3 mm (0.125”).	The customer is responsible to ensure levelness within GEHC specifications.
Power supply – ***Performance***	Adequate power supply must be insured so the system can run properly.	The customer is responsible for ensuring reliable and adequate power supply to meet minimum requirements for safe operation of MR system.
Chilled water – ***Performance***	Most MR systems will need a water chiller to support proper cooling of the Magnet - If applicable.	The facility must provide an uninterrupted supply of liquid coolant to the GEHC product specific cooling cabinet - If applicable.
RF Shielding – ***Performance and Regulatory***	Gaps in RF shielding can negatively impact image quality.	Customer/customer contractor needs to hire a RF shielding company to perform necessary RF shield installation, testing, and repairs. Your GEHC Project Manager can help coordinate the timing of shield test and repair.
Electrical/Magnetic Field Interference – ***Performance***	GEHC will perform a White Pixel Test and Coherent Noise Test which will identify electrical interference. This interference can come from the MR system itself or from components of the MR room environment.	If tests fail, electrical interference from the environment would need to be remedied at the customer’s expense.
HVAC – ***Performance***	Proper cooling is needing for performance and reliability of GEHC system.	The customer is responsible for HVAC system design, purchase, and installation.

The following people or firms, with your team, will participate in the project's implementation. Some of the participant's key project touch points are listed below:

GE HealthCare Project Manager

- Participate in the preliminary floor plan and site evaluation phase
- Participate in the construction kick-off meeting
- Periodic site visits
- Project progress report 30 days prior to the planned magnet delivery date
- Participate in the site readiness assessment prior to the magnet and system delivery

GE HealthCare Project Manager and Field Service Engineer

- System Delivery

GE HealthCare Field Service Engineer

- Mechanical Installation
- Calibration
- Acceptance

GE HealthCare Applications Team

- Applications training

GE HealthCare Sales, Project Manager, PACS Engineer, Field Service Engineer

- Project completion, Service hand-off, and close-out meeting

Customer

- Maintain good communications among all team members
- Ensure all site-specific construction items are completed prior to system delivery
- Your representative is available at the site to accept and inventory the system components when delivered
- Secure rigging services, if applicable

Architect/Engineer

- Develop an overall floor plan for your site and coordinate with the GE HealthCare Project Manager
- Develop site-specific construction drawings and specifications
- Coordinate the design with the applicable GE HealthCare pre-installation manual and the site-specific final equipment installation drawings, ensuring all those requirements are incorporated
- Follow applicable governing code and regulation requirements
- Coordinate plan review and approval processes necessary for governmental approvals and construction permits
- Communicate with GE HealthCare's Project Manager regarding questions or changes with the following: floor plan, system selection, schedule changes, and other items that impact the project schedule and/or the site preparation

Contractor

- Develop the construction schedule and communicate with the entire project team
- Obtain all required demolition and construction permits
- Keep the project on track with the construction schedule, ensuring all scheduled tasks are achieved by the scheduled dates
- Construct the site, manage sub-contractors, deliver the site consistent with the requirements in construction drawing and specifications, and complete it on time
- Coordinate/communicate all issues with your team, your architects and engineers, and GE HealthCare's Project Manager
- Obtain all required demolition and construction permits and coordinate all required construction inspections
- Ensure that both the site readiness assessment and the site assessment checklist are completed prior to system delivery
- Coordinates the system delivery with GE HealthCare's Project Manager
- Strictly enforce all federal, state, local, and project site safety requirements and ensure the project site and system components are secure

Project Plan

Develop a Preliminary Project Plan

Early project planning helps enable on time project execution. The earlier you develop the plan, the earlier you can identify when your system will be available for patient use, as well as identify potential risks to your project and schedule.

- Get input from your architect, construction contractor, facilities team, technologist, landlord, and other project team members
- Review and consider the requirements for the installation of your new system specified in the applicable GE HealthCare pre-installation manual and typical drawings
- The major project elements and events and their durations and estimated dates should be identified as you develop your preliminary project plan
- Typical standard durations of the major project elements and events can be obtained from various sources, such as architectural/engineering design firms and the construction, mechanical, electrical, and other specialty contractors

Develop a Preliminary Project Schedule

- A written project schedule, even though it is preliminary, will help you establish a planned “first use” date for your new GE HealthCare system
- Incorporate the durations identified when you developed your preliminary project plan
- Identify any needed construction drawing review, approval, and permit processes so the applicable durations can be included in the project schedule
- Identify any required or potential zoning changes that may be needed. The typical durations required for such changes should be included in the project schedule
- Your GE HealthCare Project Manager will help you prepare the initial system installation durations included in the project schedule

Estimate Your Project Costs

- Your costs will vary based on the type of construction, the construction schedule, your location, and the complexity of the project
- Preliminary cost estimates should be obtained from your architect and/or contractor once you have developed a preliminary scope of work and floor plan

Initial Project Definition

- Your preliminary scope of work, project schedule, and preliminary floor plan will become the basis from which your design and construction teams can begin the detailed planning for your project
- The scope of work, preliminary floor plan, and project schedule can be used to review, refine, and obtain the agreement of your team members
- Once you have the agreement of your team members, your GE HealthCare Project Manager can start to plan your system delivery date

Design Kick-Off Meeting

This meeting is to communicate the preliminary project requirements, begin to set expectations, review the project schedule, answer questions, explore concerns, and begin refining all the project elements.

Typical Attendees

Customer team typically consists of:

- Director of Radiology
- Facilities Management
- IT Representative
- Technologist Representatives
- Customer’s Internal or External Design Team

GE HealthCare team typically consists of:

- Sales Representative
- Project Manager
- Field Service Engineer

Meeting Prerequisites

- GE HealthCare’s Project Manager has received AutoCAD drawings of the site from customer’s design team
- GE HealthCare’s Project Manager has provided the applicable GE HealthCare pre-installation manual and typical final equipment installation drawings to the customer’s design team
- Send meeting agenda to attendees prior to meeting
- Communicate estimated length of meeting (usually 1 to 2 hours)
- GE HealthCare’s Project Manager has provided preliminary floor plan drawings to customers

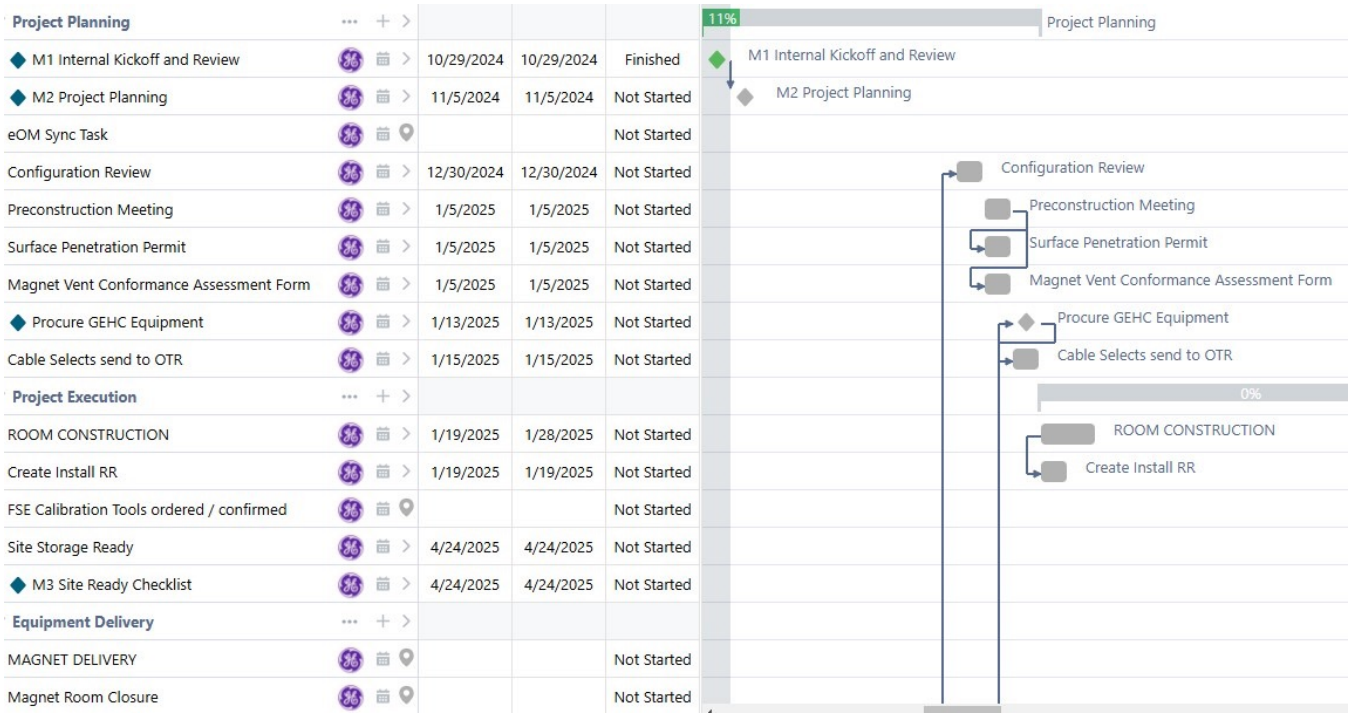
Typical Agenda Topics

- Introductions
- Discuss roles, responsibilities, and information flow
- Review initial preliminary floor plan drawings
- Discuss and identify the GE HealthCare system type on the order, note any changes required
- Project Implementation items to be discussed
  - Project Manager received preliminary site layout from customer's architect
  - Determine when a vibration study will be done
  - Determine when an electromagnetic interference study will be done, if applicable
  - Determine if seismic anchoring is required
  - Discuss rigging requirements
  - Determine if magnetic shielding is needed, and, if so, determine design requirements and magnet location so GE HealthCare's Project Manager can request a magnetic shielding design from GE HealthCare's MR Siting and Shielding team
  - Discuss magnet access and closure alternatives
  - Discuss and determine the cryogen venting route

- Customer's written approval of GE HealthCare's preliminary floor plan drawings
- Identify a preliminary system delivery date, discuss the ramifications of changing the delivery date once it is finalized
- Identify when the construction drawings and specifications will be completed and determine the schedule for governmental drawing reviews/approvals and the obtaining of construction permits
- Meeting Follow-up Activities
  - Distribute a follow-up e-mail detailing expectations to each meeting participants
  - Resolve if magnetic shielding is required and, if so, complete a GE HealthCare magnetic shielding design
  - Resolve if seismic anchoring is required and, if so, obtain the seismic anchoring detain drawings
  - If electromagnetic interference countermeasures are needed, resolve how they will be addressed

A Gantt chart is commonly used for developing and tracking project schedules. Some tasks are dependent and require completion of preceding tasks before they can begin. The Gantt chart provided below is a sample of a typical project schedule.

The duration of each task will depend on the type of project and specific site requirements. Your project team will need to collaborate and determine the tasks needed and duration of each task to create an appropriate schedule for your project.



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Sample for Reference Only

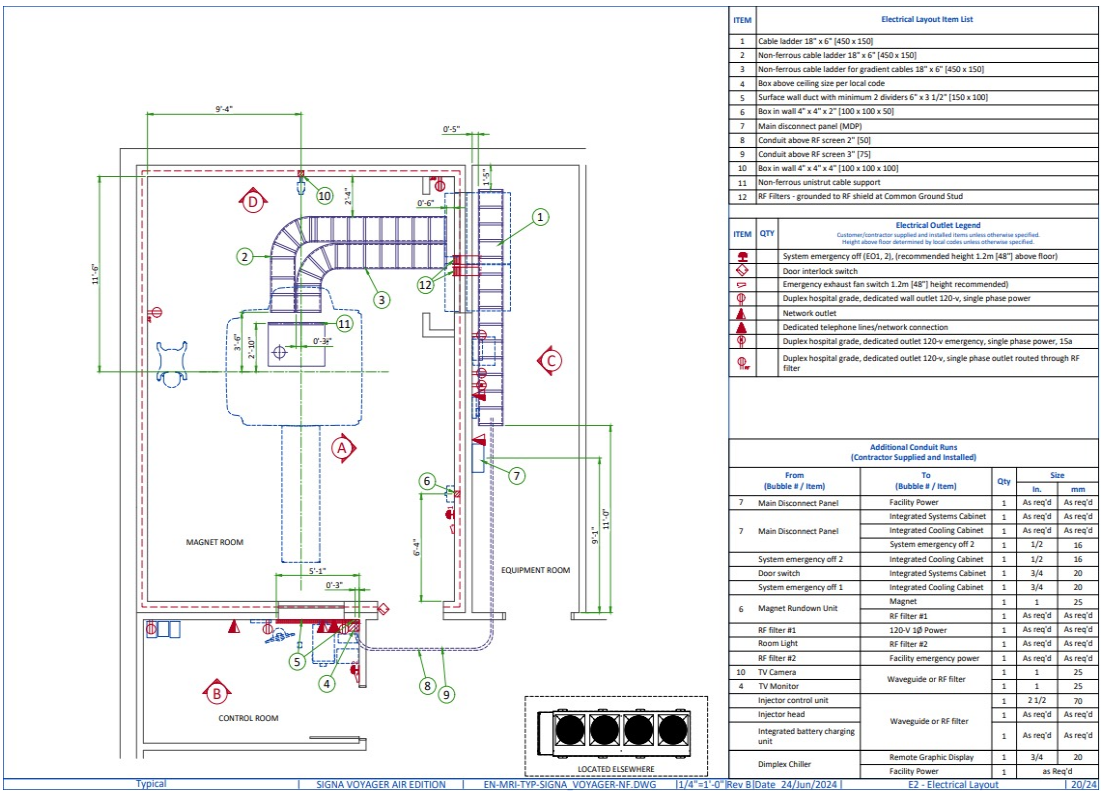
GE HealthCare Site-Specific Final Equipment Drawings

The GE HealthCare site-specific final equipment installation drawings and the applicable GE HealthCare pre-installation manual include the requirements your design team will need to incorporate into the project construction drawings and specifications.

Installation Drawings Features

- The site-specific final equipment installation drawings are provided in both AutoCAD and PDF file formats for utilization by your design team
- Hardcopy drawings are also available upon request
- The GE HealthCare site-specific final equipment installation drawings are not construction drawings.
- Your architect and engineers must create the project construction drawings and specifications for your project that meet local, state, and federal requirements
- The GE HealthCare site-specific final equipment installation drawings indicate the configuration and interconnection of your system's components
- Your architectural and engineering team will need to determine patient flow and other functional needs, such as dressing and waiting rooms, toilets, viewing rooms, lighting, electrical outlets, power feeders, HVAC, and other requirements that are specific to your project site
- The requirements in the applicable GE HealthCare pre-installation manual must be carefully reviewed, understood, and incorporated into the project construction drawings and specifications by your architectural and engineering team
- Any changes in the project design by you or your architectural and engineering team, contactor, or plan review agency require coordination with your GE HealthCare Project Manager. If that occurs and revised installation drawings are needed, they can be prepared and provided
- Your GE HealthCare Project Manager is available to answer questions regarding GE HealthCare's site-specific final equipment installation drawings
- The GE HealthCare site-specific final equipment installation drawings may need to be revised to incorporate any mutually agreed upon project design and construction changes

It is important to work with a competent architectural and engineering team and construction contractor who both have experience in medical facility design and construction for diagnostic imaging systems.



ITEM	Electrical Layout Item List
1	Cable ladder 18" x 6" [450 x 150]
2	Non-ferrous cable ladder 18" x 6" [450 x 150]
3	Non-ferrous cable ladder for gradient cables 18" x 6" [450 x 150]
4	Box above ceiling size per local code
5	Surface wall duct with minimum 2 dividers 6" x 3 1/2" [150 x 100]
6	Box in wall 4" x 4" x 2" [100 x 100 x 50]
7	Main disconnect panel (MDP)
8	Conduit above RF screen 2" [50]
9	Conduit above RF screen 3" [75]
10	Box in wall 4" x 4" x 4" [100 x 100 x 100]
11	Non-ferrous unistrut cable support
12	RF Filters - grounded to RF shield at Common Ground Stud

ITEM	QTY	Electrical Outlet Legend Customer/contractor supplied and installed items unless otherwise specified. Height above floor determined by local codes unless otherwise specified.
		System emergency off (EO1, 2), (recommended height 1.2m [48"] above floor)
		Door interlock switch
		Emergency exhaust fan switch 1.2m [48"] height recommended)
		Duplex hospital grade, dedicated wall outlet 120-v, single phase power
		Network outlet
		Dedicated telephone lines/network connection
		Duplex hospital grade, dedicated outlet 120-v emergency, single phase power, 15a
		Duplex hospital grade, dedicated outlet 120-v, single phase outlet routed through RF filter

Additional Conduit Runs (Contractor Supplied and Installed)				
From (Bubble # / Item)	To (Bubble # / Item)	Qty	Size	
			In.	mm
7 Main Disconnect Panel	Facility Power	1	As req'd	As req'd
7 Main Disconnect Panel	Integrated Systems Cabinet	1	As req'd	As req'd
	Integrated Cooling Cabinet	1	As req'd	As req'd
	System emergency off 2	1	1/2	16
System emergency off 2	Integrated Cooling Cabinet	1	1/2	16
Door switch	Integrated Systems Cabinet	1	3/4	20
System emergency off 1	Integrated Cooling Cabinet	1	3/4	20
6 Magnet Rundown Unit	Magnet	1	1	25
	RF filter #1	1	As req'd	As req'd
RF filter #1	120-V 1ϕ Power	1	As req'd	As req'd
Room Light	RF filter #2	1	As req'd	As req'd
RF filter #2	Facility emergency power	1	As req'd	As req'd
10 TV Camera	Waveguide or RF filter	1	1	25
4 TV Monitor		1	1	25
Injector control unit	Waveguide or RF filter	1	2 1/2	70
Injector head		1	As req'd	As req'd
Integrated battery charging unit		1	As req'd	As req'd
Dimplex Chiller	Remote Graphic Display	1	3/4	20
	Facility Power	1	as Req'd	

Typical Electrical Installation Drawing E2 Sheet

Type text here

GE HealthCare installation drawings are not construction drawing

Construction Drawings

The construction documents (drawings and specifications) describe and detail what is needed to prepare your site for the installation of your GE HealthCare system. Proper and accurate planning by your design team prior to this stage will reduce issues during the project's construction or renovation phase.

It is helpful for you to conduct a design kick-off meeting to get everyone's agreement on the overall project scope and schedule. This meeting should be held at the project site to help facilitate any discussion around the existing conditions. The project architect, engineers, and contractor should all be invited to this meeting along with your facilities team and your GE HealthCare Project Manager.

Hospital or clinic staff, facility planning department, and/or landlord involvement is critical during the design phase to ensure any of their specific requirements are incorporated and any needed internal reviews and approvals are obtained.

The construction documents typically consist of design drawings and written specifications. You will need to check with the state and local authorities having legal control over any plan review and permitting processes to determine if the drawings need to be sealed by licensed design professionals. Those authorities may include reviews/approvals by the local planning and building department, the state planning and building department, the state fire marshal's office, and/or the state department of health.

Building Codes and Regulatory Compliance Requirements

Your design team is responsible for complying with the applicable building codes and regulatory requirements, including the Americans with Disabilities Act. This includes the applicable building codes and state health department requirements, as well as any other regional design and construction laws, codes, or regulations.

Critical Design Elements

The following is a list of critical design elements that often generate questions. While this list is not all-inclusive, it does contain items that will require the design team's attention.

- Cryogen vent design
- Design of the exhaust fan required for the exam room
- Foundation design (e.g., seismic, vibration)
- Review relationship of ferrous materials (e.g., beams, columns, and rebar) to magnet isocenter
- Lighting in the exam and control rooms
- DC lighting controller for the exam room
- RF shield room and magnetic shield, if applicable, incorporation into the design and construction documents
- Moving metal and electromagnetic interference countermeasures, e.g., restrict parking, move driveways, re-direct traffic
- HVAC system designed to meet the system requirements specified in the applicable GE HealthCare pre-installation manual
- Chiller and chilled water distribution and equipment, verify how it will be sourced
- GE HealthCare supplied heat exchanger cabinet or system cooling cabinet, if applicable
- A back-up water source, if required, must comply with the water quality and flow requirements specified in the applicable pre-installation manual
- Recommended room sizes and ceiling heights
- Clearances for magnet and system component delivery and servicing, including cryogen Dewar delivery
- Magnet and system delivery route, magnet delivery/removal access to the exam room, service clearances and egress clearances
- Floor loading during the magnet delivery process, and staging areas for unloading the equipment
- Floor levelness and preparation
- Conduits, overhead cable trays, recessed cable ducts for system cables and interconnects
- Verify GE HealthCare system cable length
- Junction box, electrical conduits, raceway size
- Power feeder requirements that comply with GE HealthCare's applicable power regulation and grounding requirements
- Main disconnect panel, verify how it will be sourced
- An uninterruptible power supply system if one is required
- Personnel telephone equipment and services
- Network (high-speed Internet) connectivity

Requirements for many of these items can be found in the applicable GE HealthCare pre-installation manual or on GE HealthCare's site-specific final equipment installation drawings.

Delivery Considerations for Design Team

Finalize the system delivery route during the construction drawing phase of the process. Note any doors to remove and if temporary floor supports are required along the delivery path during the magnet and system components. This needs to be incorporated into the project during the design phase.

Plan Review and Approvals

Once the construction documents are completed, they may need to be submitted for review to the applicable state and local planning departments having authority for your location and those issuing construction permits.

Your design team is responsible for meeting all code and regulatory requirements and the applicable site preparation requirements for the system. The design team is responsible for coordinating any plan reviews and necessary follow-up activities with the applicable local state and local planning departments.

Note: Some authorities may require periodic reviews during the construction drawing phase of the design process.

Plan Review and Permits

This part of the process has the potential for adversely impacting the project schedule. By hiring an architectural/engineering design team with experience in the medical field and site preparation for diagnostic imaging systems you may have the opportunity to avoid some of the pitfalls that otherwise might occur with an inexperienced design team.

The project schedule includes many tasks that have the potential to create delays and the construction documents planning department review cycle is one of them.

If you are using the Design-Bid-Build approach for your project, the plan review period would be a suitable time to obtain bids for the construction work. The bidding process can take several weeks depending on the complexity of the project.

The duration of the state and local planning review process varies widely, ranging from days to months, depending on your location, the type of facility, and the type of construction. State and local planning reviews for projects in hospitals can take longer than projects in a commercial setting. These review processes may require multiple reviews at various stages during the drawings and specifications. During the planning review process, it may be determined that follow-up submissions and reviews may be required. In that event it may be difficult to avoid delays that will adversely affect the project schedule. Once the construction documents have been reviewed and approved by the applicable agencies, your contractor can apply for and obtain the appropriate construction permits.

There are some situations and authorities where demolition permits are available. These permits allow starting the on- site demolition work prior to commencing the construction work, improving the project schedule.

Your contractor will need to schedule inspections throughout the construction process. The inspecting authority having legal control may also require a final inspection. When the inspection is satisfactorily completed, a certificate of occupancy can be applied for and obtained. In some situations, the certificate of occupancy may be required before you can scan patients.

In addition to obtaining construction permits, you may need to obtain a permit to close portions of the street or sidewalk to accommodate system delivery and rigging vehicles.

Pre-Construction Review Meeting

Purpose

Reinforce expectations, review specifications, and answer questions. Establish timeline and solidify the system delivery date.

Recommended Attendees

- Customer Team
  - Director of Radiology
  - Facilities Management
  - Networking/ IT Representative
  - Technologist
  - Customer Design Team

- Contractor
  - Project Manager
  - Superintendent
  - Mechanical and Electrical Subcontractors

- GE HealthCare
  - Sales Representative
  - Project Manager
  - MR Calibration Engineer/Field Service Engineer

Prerequisites

- Contractor's construction schedule and construction drawings
- GE HealthCare site-specific final equipment installation drawings
- Send meeting agenda to attendees prior to meeting and communicate estimated duration, an hour

Agenda Topics

- Discuss roles, responsibilities, and information flow.
  - Verify everyone has current version of the GE HealthCare's site-specific final equipment installation drawings
  - Review GE HealthCare site-specific final equipment installation drawings page by page
  - Discuss any changes in the system order that may affect the project design and construction work
  - Delivery Route should also include storage locations for delivered items
  - Review the rigging requirements

- Review the GEHC Customer Success Action Plan

Customer Success Action Plan	
Construction Funding Approved	Owner
Approved Permitting Required to Bid Project	Owner
Construction Bidding Process Started	Owner
General Contractor Hired	Owner
Submit for Construction Permits	Contractor
HVAC - Ordered	Contractor
Switchgear Ordered	Contractor
Rigging partner identified & Quote(s) Received	Owner
Configuration confirmed	GEHC Project Manager
Chiller & Pre-Install Delivery Dates Aligned (Chiller LT ~7 weeks)	GEHC Project Manager
Project Plan Finalized	
GEHC Inventory Allocation	GEHC
Cable Selects (LT ~10 weeks)	GEHC Project Manager
Trades Availability/RF Shield Scheduled	Contractor
Power Schedule Confirmed	Contractor
MEP Inspections Scheduled	Contractor
MDP / HEC Cabinet Installs Scheduled	Contractor
Drywall Installation Scheduled	Contractor
Alignment on Delivery Dates	
GEHC Manufacturing Slot	GEHC
Chiller & Pre-Install Items Delivered	GEHC Project Manager
Rigging PO Issued	GEHC Project Manager
HVAC Installed	Contractor
Critical Items for Magnet Delivery in Place	Contractor
Site Readiness Checklist for Magnet	GEHC Project Manager
Magnet Delivery Date	GEHC Project Manager
Site Readiness Checklist for Install Start	GEHC Project Manager
Equipment Delivery Date	

Review Contractor's Project Schedule

- Identify and discuss how to manage any long lead material items related to the system installation
- Establish final delivery date agreeable to all parties
- Discuss disposal of system packing material and return of dollies
- Discuss safety training and policy requirements and the security of the delivered system components

Follow-Up

- Plan site visits for milestone reviews
- Follow-up e-mail detailing expectations sent to each attendee with an attached checklist
- Communicate delivery date

Other Pre-Construction Items

Once you obtain construction permits, you are ready to begin the construction phase. Early planning, agreement, and commitment by all your project participants will help focus on the on-time delivery of your system.

The pre-construction review meeting at the project location is a critical step to getting the entire team focused. This meeting is team collaboration and should include your representative, facilities or landlord representative, design team, the contractor's project manager, and superintendent, and the GE HealthCare Project Manager.

Your contractor is responsible for the construction schedule and adherence to all construction-related drawings and specifications. Use this meeting to make sure all project participants commit to the current project schedule. If the parties cannot reach agreement on the current project schedule during this meeting, schedule a timely follow-up meeting to resolve any schedule issues and obtain consensus from all.

Publish the final written project schedule and distribute it to all members of the project team, including the GE HealthCare Project Manager. The project schedule determines the start of the manufacturing process at GE HealthCare for your new system.

Topics to review	Facilities/ Landlord Representa-tive	Architect	Contractor	GE Project Manager
Review the Site Readiness Assessment Checklist for items that need to be completed prior to delivery of the system				
Finalize construction schedule to meet system delivery dates.				
Set delivery dates for the magnet and system, including any pre-delivery items.				
Review scope of project and impact on cycle times.				
Highlight critical path events/long lead time items, such as RF shield, HVAC equipment, cryogen vent material, per-manent power for the system, chilled water source, re-quired exhaust vent, DC lighting controller, power feeder, main disconnect panel, cable trays, electrical ductwork, and other identified long lead items.				
Identify roles and responsibilities for drawings, submittals, and review process to avoid schedule delays.				
Review the GE HealthCare site-specific final equipment installation drawings and the construction drawings in detail with all subcontractors, including the delivery re-quirements/route.				
Review and identify the delivery route and method for the magnet and system. Will a crane be utilized? Where will it be staged? Verify if a local street access permit is required and how it will be obtained by the delivery dates				

This is an example of topics to review and discuss.
This is not an all-inclusive list.

Construction

The design and construction teams manage the construction at your site. If you are using the Design-Build method, you will have a project manager and superintendent managing all aspects of the project.

If you are using the Design-Bid-Build approach, you will have separate contacts for both the design and construction portions of the project and will need someone to coordinate the interaction between them.

Key Items to Remember

- Review the site readiness assessment checklist to monitor progress of the project
- GE HealthCare Project Manager is available for system-related questions
- Project complexity influences schedule times and risks
- Inform your GE HealthCare Project Manager about any design changes relative to the system and associated equipment
- Confirm system delivery route
- Coordinate installation of broadband (high-speed Internet) connectivity
- Testing and/or inspections of anchoring and cable routing methods
- Floor levelness is critical and may affect image quality
- Provide critical status updates to GE HealthCare Project Manager
- Governmental inspections related to construction permits and to satisfy the department of health and other agency requirements may be required
- Continue to manage the completion date and focus on completing the construction of exam, equipment, and control rooms
- Contact your GE HealthCare Project Manager when issues or changes in the design, floor plan, or project schedule occur.

Site Readiness Assessment

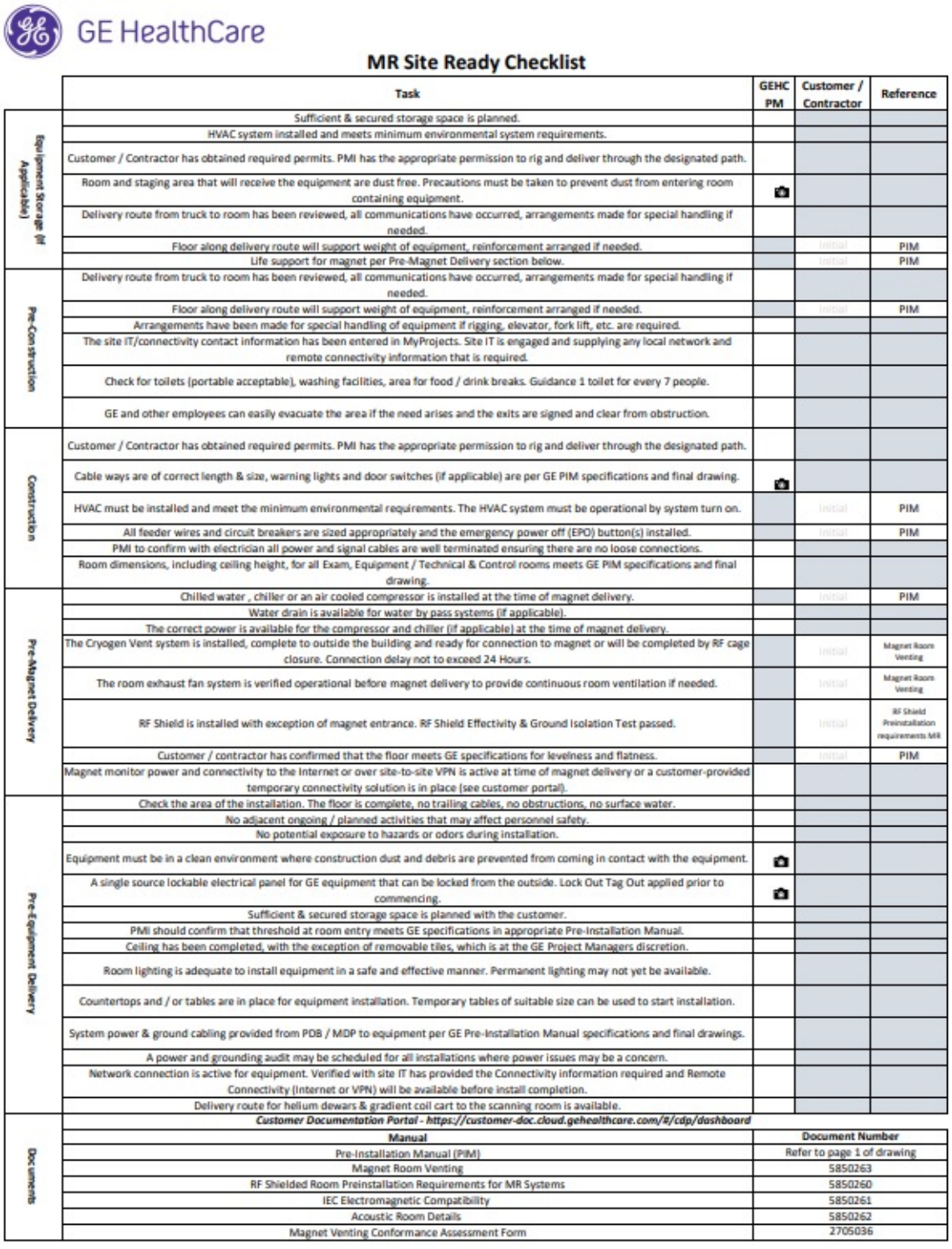
Critical items completed before delivery.

	Check When Complete	Notes/Issues/Action Plan
☐	Cryogen vent is installed and ready to connect to magnet (within 24 hours)	
☐	Main disconnect panel is installed, power is con-nected, and it is available 24x7	
☐	Chilled water supply is available 24x7	
☐	Exam room exhaust fan system is installed and operational	
☐	RF shield room/magnetic shield are completed to the extent they can accept the magnet	
☐	HVAC equipment is installed and operational	
☐	The site meets the applicable GE HealthCare pre-installation manual requirements	
☐	The conduits, cable trays, raceways, and plumbing are installed	
☐	The broadband (high-speed Internet) connection is operational	
☐	Personnel phone lines and phones are installed and operational	
☐	Required governmental inspections are completed	

For a detailed description of the site requirements for each item, refer to GE HealthCare's pre-installation manual for your system

GE HealthCare Site Readiness Checklist

In addition to the assessment items to be completed, a Site Readiness Checklist will be completed by the project manager prior to system delivery. They will identify any corrections/actions that the contractor/customer must complete before system delivery. Your GE HealthCare Project Manager can provide a copy of the current Site Readiness Checklist on request.



GE HealthCare

MR Site Ready Checklist

	Task	GEHC PM	Customer / Contractor	Reference
Equipment Storage (if Applicable)	Sufficient & secured storage space is planned.			
	HVAC system installed and meets minimum environmental system requirements.			
	Customer / Contractor has obtained required permits. PMI has the appropriate permission to rig and deliver through the designated path.			
	Room and staging area that will receive the equipment are dust free. Precautions must be taken to prevent dust from entering room containing equipment.	📷		
	Delivery route from truck to room has been reviewed, all communications have occurred, arrangements made for special handling if needed.			
	Floor along delivery route will support weight of equipment, reinforcement arranged if needed.		Initial	PIM
	Life support for magnet per Pre-Magnet Delivery section below.		Initial	PIM
Pre-Construction	Delivery route from truck to room has been reviewed, all communications have occurred, arrangements made for special handling if needed.			
	Floor along delivery route will support weight of equipment, reinforcement arranged if needed.		Initial	PIM
	Arrangements have been made for special handling of equipment if rigging, elevator, fork lift, etc. are required.			
	The site IT/connectivity contact information has been entered in MyProjects. Site IT is engaged and supplying any local network and remote connectivity information that is required.			
	Check for toilets (portable acceptable), washing facilities, area for food / drink breaks. Guidance 1 toilet for every 7 people.			
	GE and other employees can easily evacuate the area if the need arises and the exits are signed and clear from obstruction.			
Construction	Customer / Contractor has obtained required permits. PMI has the appropriate permission to rig and deliver through the designated path.			
	Cable ways are of correct length & size, warning lights and door switches (if applicable) are per GE PIM specifications and final drawing.	📷		
	HVAC must be installed and meet the minimum environmental requirements. The HVAC system must be operational by system turn on.		Initial	PIM
	All feeder wires and circuit breakers are sized appropriately and the emergency power off (EPO) button(s) installed.		Initial	PIM
	PMI to confirm with electrician all power and signal cables are well terminated ensuring there are no loose connections.			
	Room dimensions, including ceiling height, for all Exam, Equipment / Technical & Control rooms meets GE PIM specifications and final drawing.			
Pre-Magnet Delivery	Chilled water , chiller or an air cooled compressor is installed at the time of magnet delivery.		Initial	PIM
	Water drain is available for water by pass systems (if applicable).			
	The correct power is available for the compressor and chiller (if applicable) at the time of magnet delivery.			
	The Cryogen Vent system is installed, complete to outside the building and ready for connection to magnet or will be completed by RF cage closure. Connection delay not to exceed 24 Hours.		Initial	Magnet Room Venting
	The room exhaust fan system is verified operational before magnet delivery to provide continuous room ventilation if needed.		Initial	Magnet Room Venting
	RF Shield is installed with exception of magnet entrance. RF Shield Effectivity & Ground Isolation Test passed.		Initial	RF Shield Preinstallation requirements MR
	Customer / contractor has confirmed that the floor meets GE specifications for levelness and flatness.		Initial	PIM
	Magnet monitor power and connectivity to the Internet or over site-to-site VPN is active at time of magnet delivery or a customer-provided temporary connectivity solution is in place (see customer portal).			
Pre-Equipment Delivery	Check the area of the installation. The floor is complete, no trailing cables, no obstructions, no surface water.			
	No adjacent ongoing / planned activities that may affect personnel safety.			
	No potential exposure to hazards or odors during installation.			
	Equipment must be in a clean environment where construction dust and debris are prevented from coming in contact with the equipment.	📷		
	A single source lockable electrical panel for GE equipment that can be locked from the outside. Lock Out Tag Out applied prior to commencing.	📷		
	Sufficient & secured storage space is planned with the customer.			
	PMI should confirm that threshold at room entry meets GE specifications in appropriate Pre-Installation Manual.			
	Ceiling has been completed, with the exception of removable tiles, which is at the GE Project Managers discretion.			
	Room lighting is adequate to install equipment in a safe and effective manner. Permanent lighting may not yet be available.			
	Countertops and / or tables are in place for equipment installation. Temporary tables of suitable size can be used to start installation.			
	System power & ground cabling provided from PDB / MDP to equipment per GE Pre-Installation Manual specifications and final drawings.			
	A power and grounding audit may be scheduled for all installations where power issues may be a concern.			
	Network connection is active for equipment. Verified with site IT has provided the Connectivity information required and Remote Connectivity (Internet or VPN) will be available before install completion.			
	Delivery route for helium dewars & gradient coil cart to the scanning room is available.			

Documents	*Customer Documentation Portal - https://customer-doc.cloud.gehealthcare.com/#/cdp/dashboard*	
	Manual	**Document Number**
	Pre-Installation Manual (PIM)	Refer to page 1 of drawing
	Magnet Room Venting	5850263
	RF Shielded Room Preinstallation Requirements for MR Systems	5850260
	IEC Electromagnetic Compatibility	5850261
	Acoustic Room Details	5850262
	Magnet Venting Conformance Assessment Form	2705036

DOC2949060-1EN
Revision 1

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MR Magnet Venting Conformance Assessment Form

Site Identification:	
Customer/Hospital/Clinic Name:	
Site name:	
Country:	
Report By:	
Date of Report:	
Completed By (Name and Signature):	
Completed by (Title):	
Completed by (Company):	

Requirement	**Check Correct Response**	
Section 2.2: HVAC Vent Requirements		
Does the incoming air contain at least 5% air from outside the Magnet Room?	☐ Yes	☐ No
Section 2.3: Emergency Exhaust Vent Requirements		
Is the emergency exhaust vent installed at the highest point of the finished/drop ceiling or at the top of the side wall on the coldhead side?	☐ Highest point	☐ Side wall
Has the emergency exhaust vent been tested and is it operational?	☐ Yes	☐ No
Do the emergency exhaust fan and the exhaust intake vent each have a capacity of at least 34 m^3/minute (1200 CFM) with a minimum of 12 room air exchanges per hour?	☐ Yes	☐ No
Is there a manual exhaust fan switch near the Operator Workspace (OW) and in the Magnet Room near the door?	☐ Yes	☐ No
Is the exhaust fan activated by an oxygen monitor?	☐ Yes	☐ No
Is the Magnet Room exhaust fan installed per Figure 2-1 or Figure 2-2 of 5850263-xxx? List applicable ***Figure number***.	☐ Yes	☐ No
Section 3.1: Cryogen Venting Requirements		
Does the vent pipe diameter meet the specifications per Table 3-1 of 5850263-xxx where the pipe interfaces with the magnet adaptor?	☐ Yes	☐ No
Is the vent size designed per the vent pressure drop table listed in section 4 *Reference* of 5850263-xxx? List applicable ***Table number***.	☐ Yes	☐ No
Section 3.2: Venting Requirements		
Is the cryogenic vent supported in such a way that it will not transfer any load to the magnet vent adaptor?	☐ Yes	☐ No
Are the vent options and dimensions selected from Table 3-2 of 5850263-xxx? List the ***Magnet*** used from Table 3-2 of 5850263-xxx here.	☐ Yes	☐ No

Samples for Reference Only

Delivery Photos

Below are typical pictures of an exam room and magnet delivery.

Exam room ready for delivery.

Exam room wall delivery access panel opened.

Exam room with magnet delivery through the wall.

Exam room with magnet delivery through the roof.

Typical flow of events for delivery.

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System Turnover

Installation and Calibration

Once the system arrives at your site, a team of GE HealthCare installers or the GE HealthCare Field Service Engineers arrive to install and connect the system components. A GE HealthCare Field Service Engineer is also assigned to calibrate and evaluate your system to verify it is operating in accordance with GE HealthCare's published performance specifications for that system.

Your broadband (high-speed Internet) service needs to be operational before the calibration activity begins. This enables GE HealthCare's diagnostic, and applications support functions for your system to be activated and operational.

Schedule any applicable acceptance testing by your team to immediately follow completion of the system testing and calibration. If you require in-house testing of the system, make sure you wait to schedule applications training until you complete your in-house testing. Coordinate your acceptance testing schedule with your GE HealthCare Project Manager and GE HealthCare Field Service Engineer to prevent delays and last-minute cancellations.

Application Training and First Patient

GE HealthCare's clinical applications training offerings enable you to utilize the full capability of your new GE HealthCare system. The Applications Team will contact you to set up your training.

Many training choices are available through the training programs. They can be reviewed with and ordered through your GE HealthCare Sales representative. The "Partnership" is your level of engagement in the training process along with GE HealthCare commitment to training.

Customers who plan and allow for the recommended time to train their technologists and radiologists are then positioned to use the full capability your new System. Your team's level of engagement and dedication to the training process plays a significant role in how effectively your new system is used.

GE HealthCare's training offerings provide continuing education credits to your staff if they follow the recommended training curriculum. These offerings will allow your technologists and radiologists to perfect their procedures for image quality and improved productivity. For more information on training programs please visit the link below.

https://www.gehealthcare.com/education

You are now ready to scan patients!

Project Close-Out Meeting

Purpose

To verify that all project tasks have been completed and that any incomplete items are identified and promptly completed.

Usual Attendees

- Customer team typically consists of
  - Medical Director
  - Director of Radiology
  - Modality Supervisor
  - IT Representative

- GE HealthCare team typically consists of
  - Sales Representative
  - Project Manager
  - Director of Service

Prerequisites

- System installation is complete
- Applications training is complete
- Serial number of systems recorded
- Unused applications days identified

Agenda topics

- Status of project tasks
- Contact information reviewed
- GE HealthCare escalation process reviewed
- Future service level/programs reviewed
- Review warranty details

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Summary of Critical Items

Purpose

This section summarizes critical items that must be addressed to optimize installation of your new system. These items are provided to give a high-level summary of system specific items you, your design team, and construction team need to address.

Your site-specific plan and design also require the use of all applicable planning information and requirements specified in GE HealthCare's applicable pre-installation manual and its site-specific final equipment installation drawings for your system.

Please contact your GE HealthCare Project Manager if you have not yet received a copy of the applicable pre-installation manual for your system. Alternatively, you can view and download a PDF copy of the applicable pre-installation manual electronically at the following link:

https://www.geHealthCare.com/support/site-planning

This section has information on the following critical items:

- Broadband and Network Connectivity
- Cryogen Vent
- Magnetic Shield
- RF Shield Room
- Additional RF Shield Room Pictures
- Magnetic Room Pressure Equalization
- Mechanical/Electrical Infrastructure
- Power and Grounding
- Floor Preparation
- Floor Levelness Survey
- MR Leveling and Flattening the Floor Area Overview

Broadband and Network Connectivity

Broadband Highlights

- High productivity decreased costly downtime
- Proactively addresses security
  - Customer controlled and auditable
  - Secure encrypted transaction
- Improved speed and reliability vs. modem
- Single point access reduces telecom costs
- All IP-based products are compatible
- Virtual applications help and training
- Remote diagnosis

Your GE HealthCare Project Manager can assist you on the path to broadband connectivity. You must provide your facility information technology contact person's name to your GE HealthCare Project Manager. This will allow your GE HealthCare Project Manager to initiate GE HealthCare's process that will help you prepare for broadband connectivity at the time of your system's delivery.

Cryogen Vent

MR systems with cryogenic MR magnets (0.7T, 1.5T, 3.0T) require this item for safely venting cryogenic helium vapor from the exam room to outside the facility.

The cryogen vent design requirements are provided in GE HealthCare's applicable pre-installation manual. You need to select an engineer and fabricator to design and build a cryogen vent that follows the requirements for your GE HealthCare MR system. It is important to have your mechanical design engineer confirm the design and installation of your cryogen vent following the applicable GE HealthCare pre-installation manual requirements.

The design and fabrication lead time for a cryogen vent is typically 4 to 6 weeks. It is important to confirm the actual cryogen vent design and fabrication schedule cycle with the supplier(s) you select as those cycle times can vary. The waveguide through the RF room wall or ceiling should be provided by your RF shield supplier.

Please refer to GE HealthCare's applicable pre-installation manual for requirements related to the design criteria, connection details, and materials for the cryogen vent.

Exam Room Interior

Roof exterior vent exit

Typical side wall exterior vent exit

Cryogen vent at RF Shield

Magnetic Shield

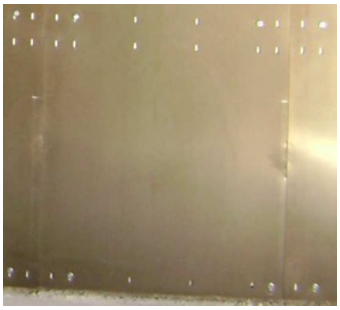
Some sites require magnetic shielding to meet the site magnetic field containment requirements. It is important to select an experienced and specialized RF shield room/magnetic shield supplier shortly after selecting your design team.

This provides the opportunity for your design team's questions related to the RF shield room and magnetic shielding to be addressed during the planning phase. This also offers an opportunity to help predict your project schedule and ensure you are getting the type of RF and magnetic shielding you want.

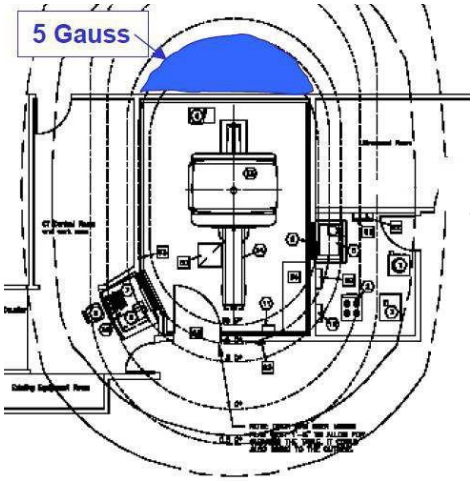
The magnetic shielding requirements are provided in the applicable GE HealthCare pre-installation manual and the site-specific final equipment installation drawings. Once you decide your magnetic field containment requirements and other related site parameters, GE HealthCare has an engineering team that will provide the magnetic shielding design for your site.

The magnetic shielding design, fabrication, and installation lead time averages between 8 and 12 weeks. It is important to confirm the actual magnetic shielding design, fabrication, and installation lead time with your magnetic shielding supplier as those cycle times can vary.

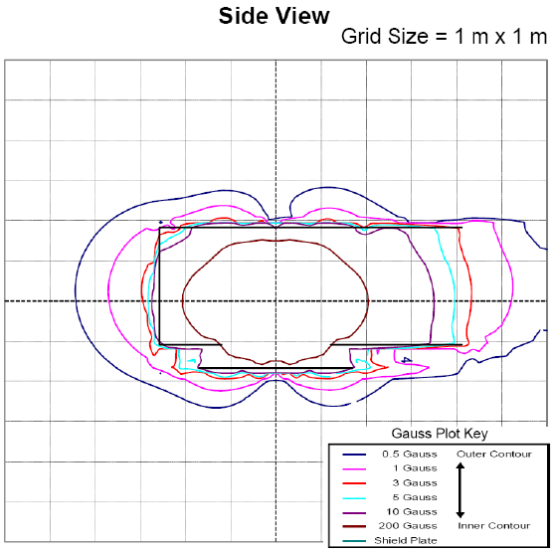
Magnetic Shield



Non-Oriented Silicon Steel or Armco



Typical Shielding: 5 Gauss Line Containment Back Wall



RF Shield Room

It is important to select an experienced and specialized RF shield supplier shortly after selecting your design team. This provides the opportunity for your design team's questions related to the RF shield to be addressed during the planning phase. This also offers an opportunity to help predict your project schedule and ensure you are getting the RF and magnetic shielding you want.

Your new or refurbished RF shield must follow the requirements for your MR system found in the applicable GE HealthCare pre-installation manual. If you are replacing an existing magnet, you need to evaluate the existing RF shield for compliance with GE HealthCare's current RF shield requirements prior to removing the existing magnet from the exam room. This helps to determine the scope of rework the existing RF shield may need to accommodate the installation and operation of your new GE HealthCare MR system.

The RF shield requirements are provided in the applicable GE HealthCare pre-installation manual. Critical requirements include the pressure equalization vent, floor levelness, shield isolation, filters, waveguides, cryogen vent, and other items unique to differing MR systems. All penetrations through the RF shield need detailed coordination in your project design and construction phases. Shield dimensions, materials, and details vary between RF shield suppliers. Flush floor trenches in the exam room can adversely impact imaging quality and may require special materials and assembly techniques. This should be coordinated with your RF shield supplier.

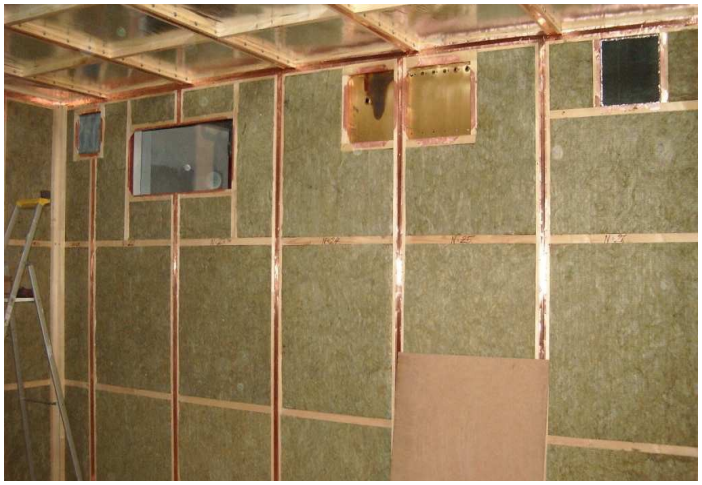
Design, fabrication, and installation lead-time for RF shields averages between 8 and 12 weeks. It is important to confirm the actual RF shield design, fabrication, and installation lead time with your RF shield supplier as those cycle times can vary.

The final RF shield installation must be evaluated for compliance with GE HealthCare's requirements published in its applicable pre-installation manual. A copy of the written test RF shield report(s) should be provided to GE HealthCare's Project Manager.

Copper RF Shield

Galvanized RF Shield

Aluminum RF Shield



Acoustic Isolation

Electrical Filters/Med Gas/Sprinkler line

Two-piece removable anchor base

Penetration Panel/Frame Equipment Room Side

Mechanical/Electrical Infrastructure

YYour GE HealthCare system has specific power, cooling, and HVAC requirements. Those requirements are provided in the applicable GE HealthCare pre-installation manual. These services must be available and operational at the time of system delivery.

Procurement and installation lead time for these items can average between 8 and 10 weeks; check their availability with your supplier. Your GE HealthCare Project Manager can help you if you have questions about the environmental requirements and can provide contacts for equipment sources.

Dimplex Chiller

KKT Chiller

Dynamic Sag Corrector Power Conditioner

Chiller Water Bypass System

Power and Grounding

System site preparation projects can involve extensive electrical work. The system requires that electrical raceways, conduits, and cable trays be installed for the cables that interconnect to the system's sub-systems.

The GE HealthCare final equipment installation drawings for your site will show a diagram of these interconnects. The interconnect diagram describes the cable lengths provided with the system. The applicable GE HealthCare pre-installation manual gives details of cable diameters for each cable. It is important that this information be considered during the design and layout of the raceway, conduits, and junction boxes. If alternate solutions are needed, they should be discussed with your GE HealthCare Project Manager.

Diagnostic imaging equipment has become increasingly sensitive to power quality and proper electrical grounding. This sensitivity is influenced by the increased speed and complexity of the data acquisition computers. To obtain the best system performance and avoid issues related to image quality and reliability, it is extremely important to follow the specific power requirements for your diagnostic imaging equipment.

The wire size of the power feeder conductors must be carefully determined and specified by your electrical engineer, so the wire size follows GE HealthCare's wire size requirements. Failure to meet those requirements could prevent your system from operating in accordance with GE HealthCare's published performance specifications for that system. GE HealthCare's equipment installation drawings include a feeder table chart listing the recommended wire size for each of the conductors. The wire sizes listed in GE HealthCare's feeder table chart listing may exceed the wire size requirements specified by the National Electrical Code. In all cases the wire sizes specified in GE HealthCare's feeder table chart listing must be used to ensure an unacceptable level of impedance is avoided.

There are often other questions about the following list of critical design elements during the project's design and construction phases. Although this is not a comprehensive list of all potential critical design elements, your electrical engineer and electrical contractor will need to consider on the following:

- Design to meet the current version of the National Electric Code for your location and facility
- Proper grounding materials along the ground path
- Proper ground and neutral bonding
- Size of ground wire
- Ground and circuit conductors run in the same conduit
- Single ground in the facility
- Ensure that wire termination connections are tight
- Ensure wires are terminated properly

Main Disconnect Panels

DC Lighting Controller

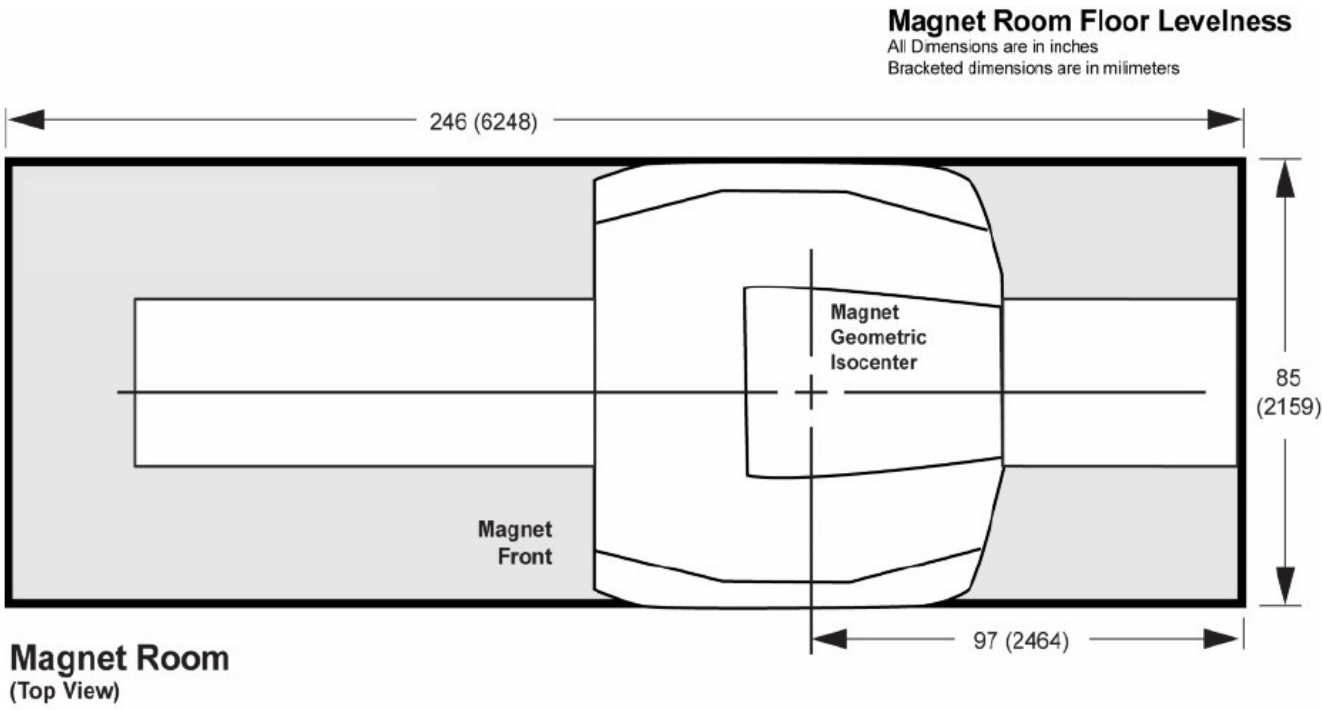
Floor Preparation

To ensure a quality installation of your system, the room floor must be level, and its surface must be smooth. It is imperative that the system installation area, which includes the magnet and table area, be level and flat and follow the requirements listed in GE HealthCare's applicable pre-installation manual.

Where possible, the entire floor of the exam room should be level and flat rather than just the system installation area. It is important to verify that the floor is both flat and level before system installation begins. Measurements should be taken left-to-right or right-to-left, front-to-back, or back-to-front, and diagonally in either direction. Please refer to the applicable GE HealthCare pre-installation manual for the specific requirements.

The floor must be prepared so that it will support floor loading as described in the applicable GE HealthCare pre-installation manual.

Important: Floor loading capacity must be confirmed by your structural engineer.



Floor Levelness Survey

Floor levelness and floor flatness surveys must be completed prior to your MR system arriving on site to ensure the floor follows GE HealthCare's floor levelness and floor flatness requirements. Complete the survey following the detailed specifications and instructions provided in the applicable GE HealthCare pre-installation manual.

MR Leveling and Flattening the Floor Area Overview

No filling material should be used to compensate for holes or depressions in the floor surface. If necessary, level and flatten the entire floor area. Please refer to the applicable pre-installation manual for details.

The exam room floor must be leveled, and its surface must be smooth. Any deviations in levels will have a detrimental effect on the system performance and operation.

It is desirable for the floor in the entire room will be leveled and flattened, following the requirements provided in the applicable GE HealthCare pre-installation manual. If this is not possible, it is imperative that the system installation area is leveled and flattened.

When the exam room floor is read for installation, verify the surface flatness (of the applicable area) follows the floor levelness and flatness requirements of the applicable pre-installation manual using a straight edge of 150 cm (5') in length (or longer).

See the below example of the typical floor levelness and flatness requirements. Refer to the applicable pre-installation manual for the actual requirements for your system.

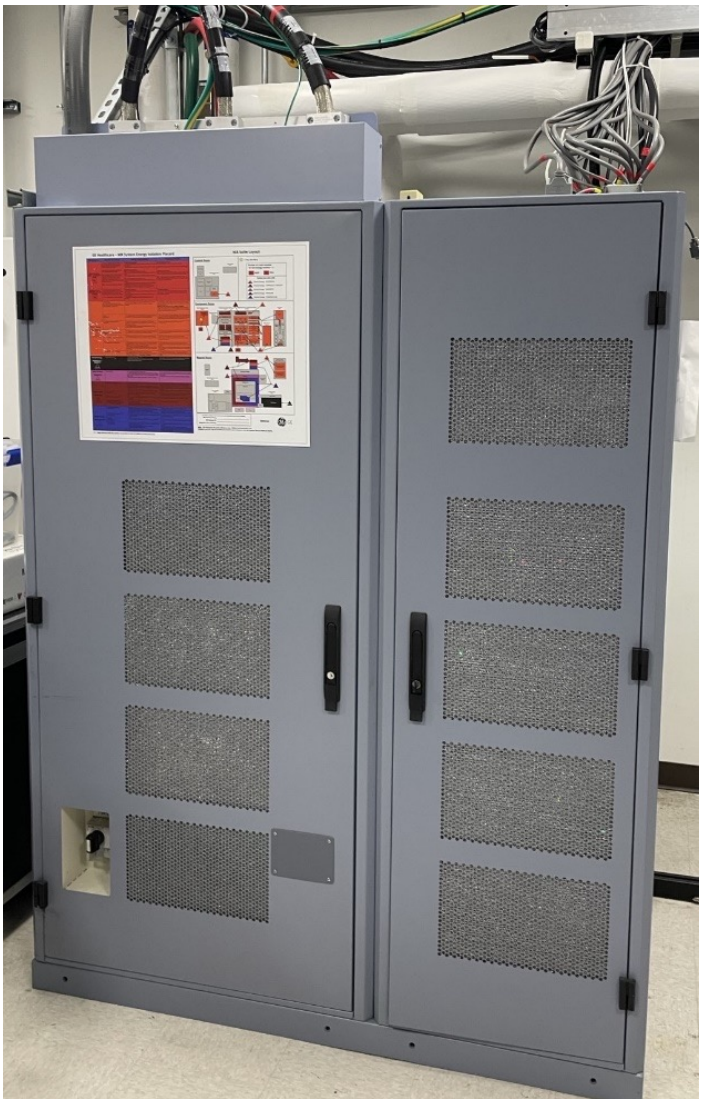
Item	Requirement
Floor Leveling Area	7'1"' X 20'6" (216 cm X 625cm) minimum
Flatness	Surface should be smooth and have no more than 0.125" (3 mm) deviation throughout the in the above-specified floor leveling area.
Levelness	Floor Levelness must be 0.125 in. (3 mm) between high and low spots in the above-specified floor leveling area.

Example: Floor Levelness and Flatness Requirements

System Specific Component Information by Room

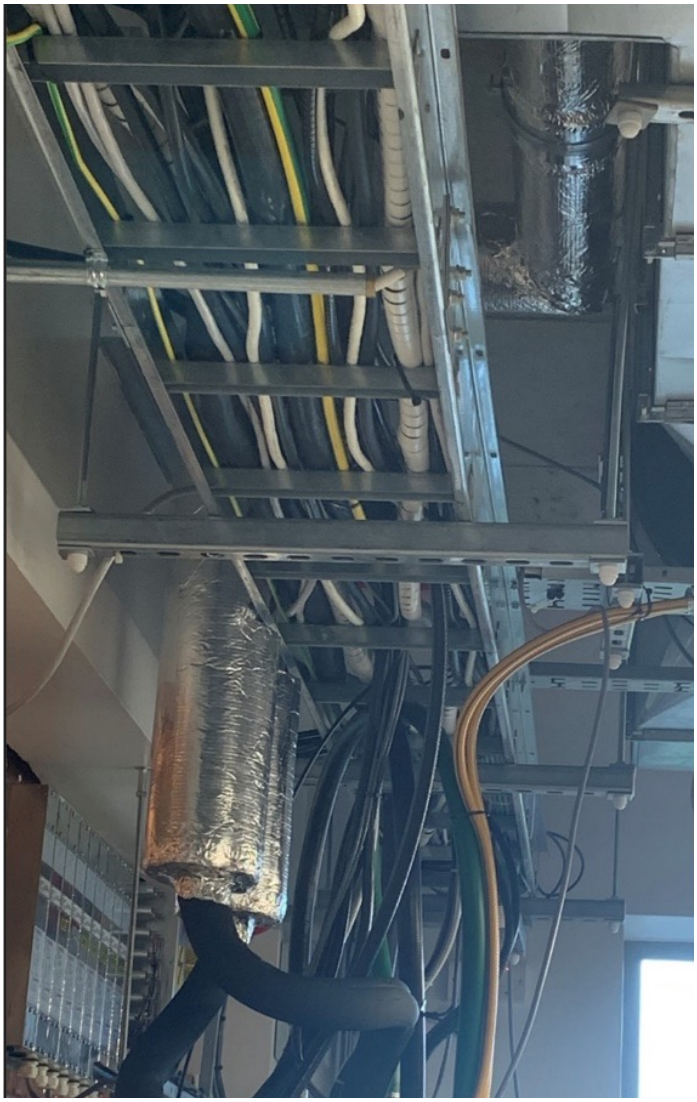
Typical Equipment Room Components

ICC



PGR

Penetration Panel



Cable Management System

Penetration Panel Filters and Wave Guides

Magnet Motor

Shield Cooler Cabinet

Chiller Lines and Filter

Typical Exam Room Components

Magnet and Patient Table (Signa Hero System Shown)

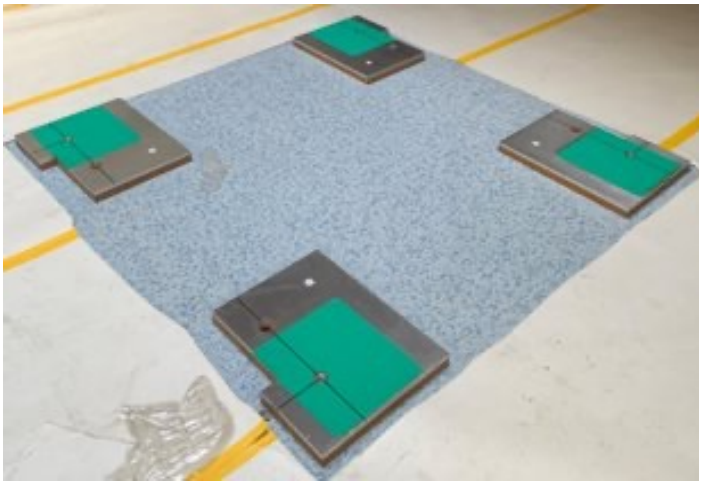
Magnet Rundown Unit

Optional Coil Cart

Cryogen Vent

Cables and Hoses

Cable Concealment above Magnet



Vibroacoustic Dampening Kit (installed under magnet feet)

Head Neck Unit (HNU)

32 Ch Peripheral Vascular Array (PV)

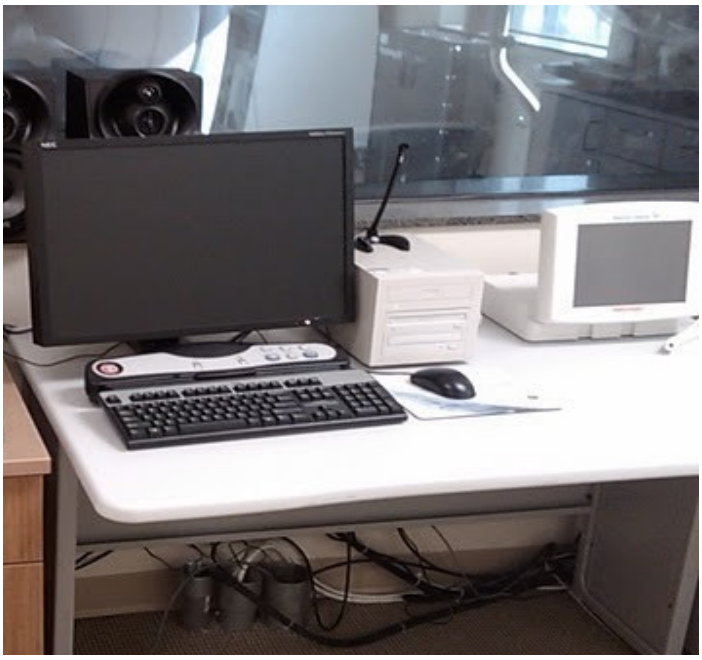
16 Ch Anterior Array

Integrated Flat Posterior Array (PA) Built into Table

Coil Assortment (Optional Injector)

Coil Storage Idea

Typical Control Room Components



Optional Operators Workspace Table

Scan Control Interface Module and Keyboard

Patient Alert

Optional Intercom/Music System

Optional MR Patient Experience

About GE HealthCare

GE HealthCare provides transformational medical technologies and services that are shaping a new age of patient care. Our broad expertise in medical imaging and information technologies, medical diagnostics, patient monitoring systems, drug discovery, biopharmaceutical manufacturing technologies, performance improvement and performance solutions services help our customers to deliver better care to more people around the world at a lower cost. In addition, we partner with HealthCare leaders, striving to leverage the global policy change necessary to implement a successful shift to sustainable HealthCare systems.

Our “healthymagination” vision for the future invites the world to join us on our journey as we continuously develop innovations focused on reducing costs, increasing access, and improving quality around the world. Headquartered in the United Kingdom, GE HealthCare is a unit of General Electric Company (NYSE: GE). Worldwide, GE HealthCare employees are committed to serving HealthCare professionals and their patients in more than one hundred countries. For more information about GE HealthCare, visit our website at www.geHealthCare.com.

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