

DISCLAIMER

GENERAL SPECIFICATIONS

- GEHC is not responsible for the installation of developers and associated equipment, lighting, cassette trays and protective screens or derivatives not mentioned in the order.
- The final study contains recommendations for the location of GEHC equipment and associated devices, electrical wiring and room arrangements. When preparing the study, every effort has been made to consider every aspect of the actual equipment expected to be installed.
- The layout of the equipment offered by GEHC, the dimensions given for the premises, the details provided for the pre-installation work and electrical power supply are given according to the information noted during on-site study and the wishes expressed by the customer.
- The room dimensions used to create the equipment layout may originate from a previous layout and may not be accurate as they may not have been verified on site. GEHC cannot take any responsibility for errors due to lack of information.
- Dimensions apply to finished surfaces of the room.
- Actual configuration may differ from options presented in some typical views or tables.
- If this set of final drawings has been approved by the customer, any subsequent modification of the site must be subject to further investigation by GEHC about the feasibility of installing the equipment. Any reservations must be noted.
- The equipment layout indicates the placement and interconnection of the indicated equipment components. There may be local requirements that could impact the placement of these components. It remains the customer's responsibility to ensure that the site and final equipment placement complies with all applicable local requirements.
- All work required to install GEHC equipment must be carried out in compliance with the building regulations and the safety standards of legal force in the country concerned.
- These drawings are not to be used for actual construction purposes. The company cannot take responsibility for any damage resulting therefrom.

CUSTOMER RESPONSIBILITIES

- It is the responsibility of the customer to prepare the site in accordance with the specifications stated in the final study. A detailed site readiness checklist is provided by GEHC. It is the responsibility of the customer to ensure all requirements are fulfilled and that the site conforms to all specifications defined in the checklist and final study. The GEHC Project Manager of Installation (PMI) will work in cooperation with the customer to follow up and ensure that actions in the checklist are complete, and if necessary, will aid in the rescheduling of the delivery and installation date.
- Prior to installation, a structural engineer of record must ensure that the floor and ceiling is designed in such a way that the loads of the installed system can be securely borne and transferred. The layout of additional structural elements, dimensioning and the selection of appropriate installation methods are the sole responsibility of the structural engineer. Execution of load bearing structures supporting equipment on the ceiling, floor or walls are the customer's responsibility.

RADIO-PROTECTION

- Suitable radiological protection must be determined by a qualified radiological physicist in conformation with local regulations. GEHC does not take responsibility for the specification or provision of radio-protection.

THE UNDERSIGNED, HEREBY CERTIFIES THAT I HAVE READ AND APPROVED THE PLANS IN THIS DOCUMENT.		
DATE	NAME	SIGNATURE

CUSTOMER SITE READINESS REQUIREMENTS

REQUIRED MANUALS FOR SYSTEM PRE-INSTALLATION	
Description	Document Number*
Product specific Pre-installation Manual	Refer to cover page
*documents can be accessed in multiple languages at https://www.gehealthcare.com/support/manuals	

- A mandatory component of this drawing set is the GE HealthCare Pre-installation manual. Failure to reference the Pre-installation manual will result in incomplete documentation required for site design and preparation.
- The items on the GE HealthCare Site Readiness Checklist **DOC2949061** and Worksheet **DOC2949068** are **REQUIRED** to facilitate equipment delivery to the site. Equipment will not be delivered if these requirements are not satisfied.
 - Any deviation from these drawings must be communicated in writing to and reviewed by your local GE HealthCare installation project manager prior to making changes.
 - Make arrangements for any rigging, special handling, or facility modifications that must be made to deliver the equipment to the installation site. If desired, your local GE HealthCare installation project manager can supply a reference list of rigging contractors.
 - New construction requires the following;
 1. Secure area for equipment,
 2. Power for drills and other test equipment,
 3. Restrooms.
 - Provide for refuse removal and disposal (e.g. crates, cartons, packing)
 - It is required to minimize vibrations within the scan room. It is the customer's responsibility to contract a vibration consultant/engineer to implement site design modifications to meet the GE vibration specification. Refer to the system Pre-installation manual for vibration specifications.

ENVIRONMENT

ALTITUDE

- Operating altitude: from -150 m [-492 ft] (below) to 2400 m [7875 ft] (above) sea level.

MAGNETIC FIELD SPECIFICATIONS

- Limit the magnetic interference to guarantee specified imaging performance.

GANTRY

- Ambient static magnetic fields less than 1 Gauss.
- Ambient AC magnetic fields less than 0.01 Gauss.

OPERATOR CONSOLE

- Ambient static magnetic fields less than 10 Gauss.

MAXIMUM GANTRY AUDIBLE NOISE LEVEL

- The maximum ambient noise level is produced by the gantry during a CT scan acquisition.
- It is less than 70 dBA when measured at a distance of one meter from the nearest gantry surface, in any direction.

BACKGROUND RADIATION

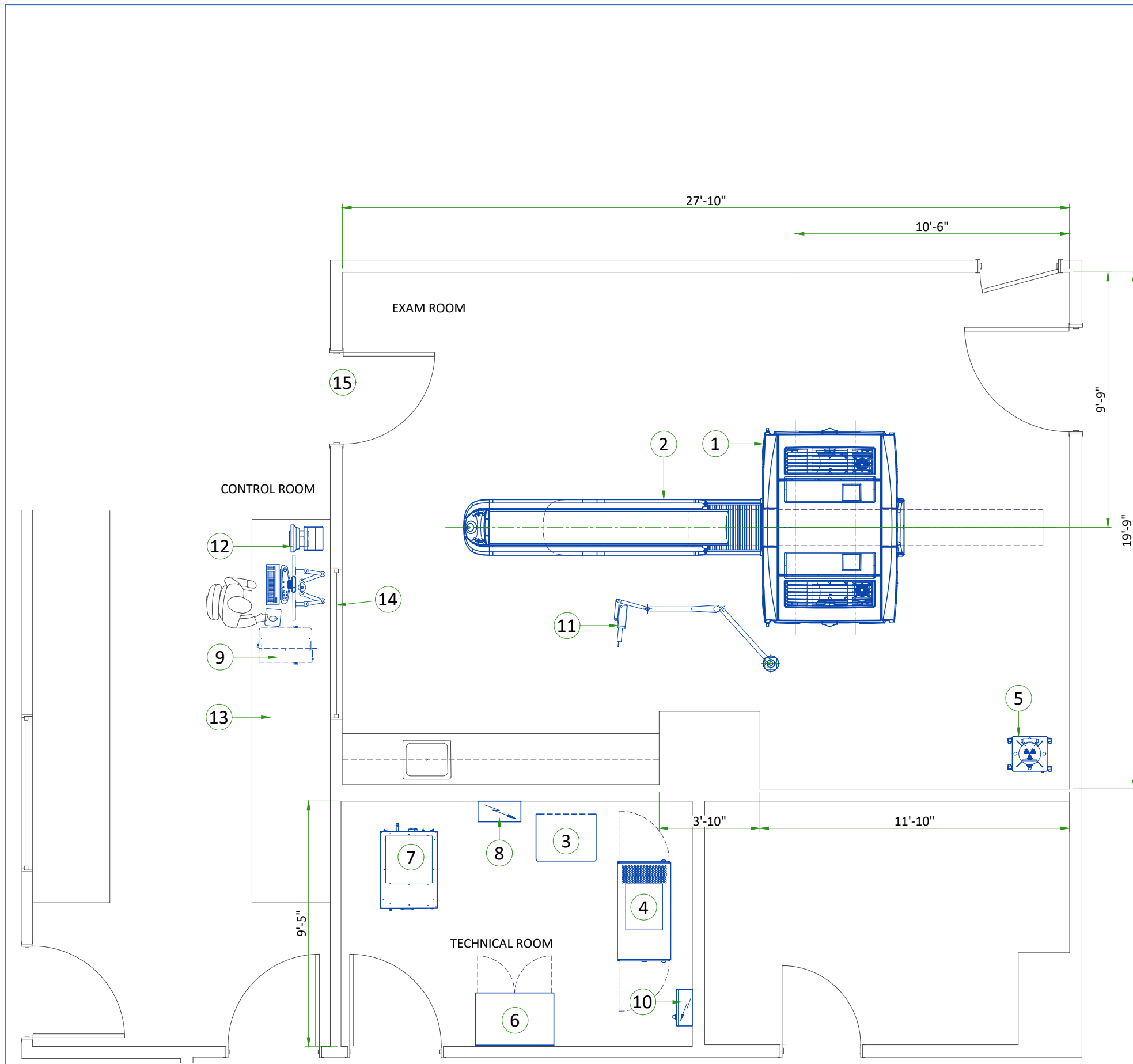
- It is important that background radiation be kept to a minimum. The coincidence detection used in a PET system allows a moderate amount of external singles events. The PET/CT system has been found to have less than 1% deadtime if the external field is below 1 mR/hr from a single source.
- Because area background can be more general than a single source, a lower limit is appropriate. If the area dose rate is maintained to less than 0.2 mR/hr (due to 511 or lower energy gamma rays) at the covers, detector deadtime should not exceed 1%.
- Radioactive sources must be stored in approved shielded containers. It is recommended that any radioactive source not specifically designed to be housed in the gantry's lead storage container be stored in a separate room (hot lab) adjacent to, and accessible from, the Scan Room. Doses should be prepared in the same area.

VIBRATION SPECIFICATIONS

- Shock Restrictions: The system cannot tolerate shock or vibration. System components cannot be tipped, dropped, or hoisted.
- The scanning facility shall be isolated from vibration such as; hospital power plants, pumps, motors, air handling equipment, air conditioning units, nearby rooms with exercise equipment or where exercise occurs, hallway foot traffic, elevators, parking lots, roads, subways, trains, and heliports; otherwise, vibration will affect the image quality of the scanner.
- CT systems are sensitive to vibration and may display limited performance if exceeding the vibration limits listed below. The band of frequencies in which systems exhibit the most sensitivity appears at or near the resonant frequencies of the gantry and the patient table, the latter of which varies depending on patient mass and location. These frequencies fall within the following ranges:
 - Patient Table: 2 – 10 Hz
 - Gantry: 8 – 14 Hz
- It is the customer's responsibility to contract a vibration consultant or qualified engineer to verify that these specifications are met and implement an appropriate solution.
- The maximum steady state vibration transmitted through the floor should not exceed 2.5 mm/s² RMS maximum single frequency above ambient baseline from 0.5 to 80 Hz (measured in any 1 hour during a normal operating period).

IMPORTANT CUSTOMER READINESS ALERT

- This equipment involves the use of radioactive isotopes, including those sources necessary for equipment calibration. Appropriate regulatory compliance and licensing must be arranged by the customer early in the planning process and then demonstrated/available for equipment installation.
- Note: delivery path down corridors for gantry's and table must be evaluated prior to construction, as 90 degree turns require specific corridor width.



LEGEND

BY	ITEM	DESCRIPTION	MAX HEAT OUTPUT (BTU/h)	WEIGHT (lbs)	MAX HEAT OUTPUT (W)	WEIGHT (kg)
A	1	GANTRY	28320	6383	8300	2895
A	2	PATIENT TABLE	1024	1813	300	822
A	3	POWER DISTRIBUTION UNIT (PDU)	3412	816	1000	370
A	4	RECONSTRUCTION MINI CABINET (PARC4.X)	4436	402	1300	182.2
A	5	ANNULUS PHANTOM SHIELD CONTAINER	-	329	-	149
A	6	STORAGE CABINET	-	90	-	41
A	7	AIRSYS CHILLER	9724	485	2850	220
A	8	CHILLER PDB	-	66	-	30
A	9	OPEN CONSOLE	3207	144	940	65.1
B	10	MAIN DISCONNECT PANEL (MDP)	-	46	-	21
A	11	INJECTOR ON CEILING	-	79	-	36
A	12	INJECTOR CONTROL	-	-	-	-
C	13	COUNTER TOP FOR EQUIPMENT- PROVIDE GROMMETED OPENINGS AS REQUIRED TO ROUTE CABLES				
C	14	LEAD GLASS WINDOW				
C	15	MINIMUM OPENING FOR EQUIPMENT DELIVERY IS 1397 mm x 2032 mm [55 in x 80 in], CONTINGENT ON A 2438 mm [96 in] CORRIDOR WIDTH				

EXAM ROOM HEIGHT	
FINISHED FLOOR TO SLAB HEIGHT	TBD
FALSE CEILING HEIGHT	9'-0"

For Accessory Sales: (866) 281-7545 Options 1, 2, 1, 2 or mail to: gehaccessorysales@ge.com

RADIATION PROTECTION LAYOUT

SHIELDING REQUIREMENTS SCALING

CHANGED PARAMETER	MULTIPLICATION FACTOR
mAs	new mAs/100
80 kV	0.24
100 kV	0.45
120 kV	0.71
140 kV	1.00
1 mm aperture	0.20
3 mm aperture	0.22
5 mm aperture	0.27
10 mm aperture	0.38
15 mm aperture	0.48
20 mm aperture	0.59
30 mm aperture	0.79
40 mm aperture	1.00

SHIELDING REQUIREMENTS:

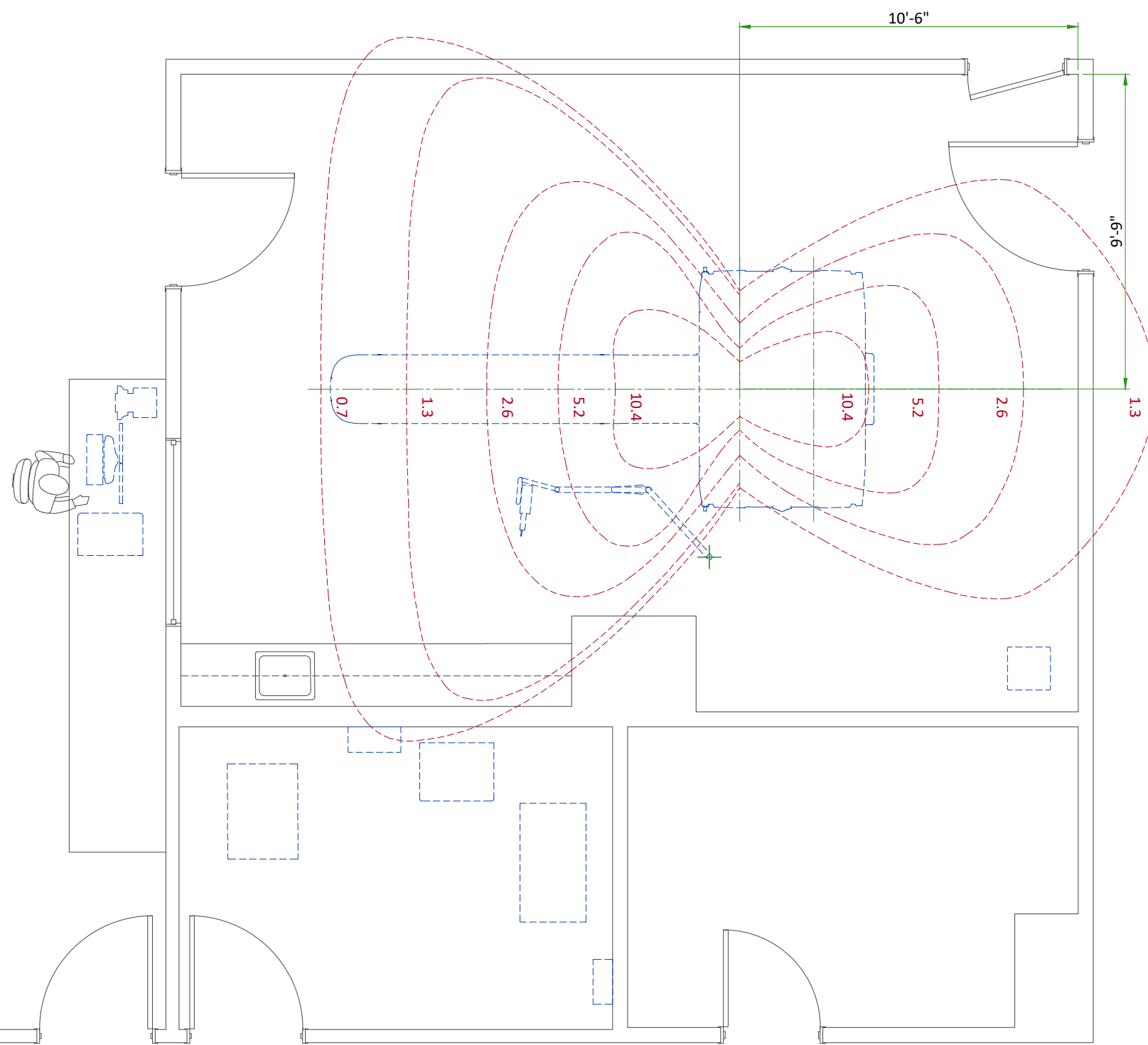
Engage a qualified radiological health physicist to review your scan room shielding requirements, taking into consideration:

- Scatter radiation levels within the scanning room.
- Equipment placement.
- Weekly projected work-loads (number of patients/day technique (kvp*mA)).
- Materials used for construction of walls, floors, ceiling, doors, and windows.
- Activities in surrounding scan room areas.
- Equipment in surrounding scan room areas (e.g., film developer, film storage).
- For small and medium filter survey, the 20 cm water phantom should be placed on the phantom headholder inserted into the end of the patient table.

The four scatter surveys depict measured radiation levels within the scanning room at the indicated distanced, while scanning a 16 cm CTDI phantom for the Head Scan mode and 32 cm CTDI phantom for the Body Scan Mode. Use the mAs, kV and aperture scaling factors in the table shown here to adjust exposure levels to the scan technique used at the site.

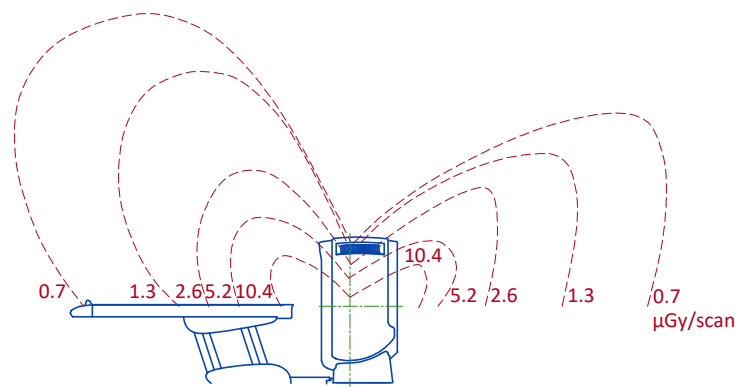
For example: The exposure level for a 120 kV, 800 mA, 1 sec scan at 50" (127 cm) away from the scan plane is: $10.4 \mu\text{Gy} \times 0.71 \times 800/100 = 59.1 \mu\text{Gy}$

NOTE: Actual measurements can vary. Expected deviations equals $\pm 15\%$, expect for the 5 mA and 1.25mm techniques, where variations may be greater (up to a factor of 2), due to the inherent deviation in small values. The maximum deviation anticipated for tube output equals $\pm 40\%$.

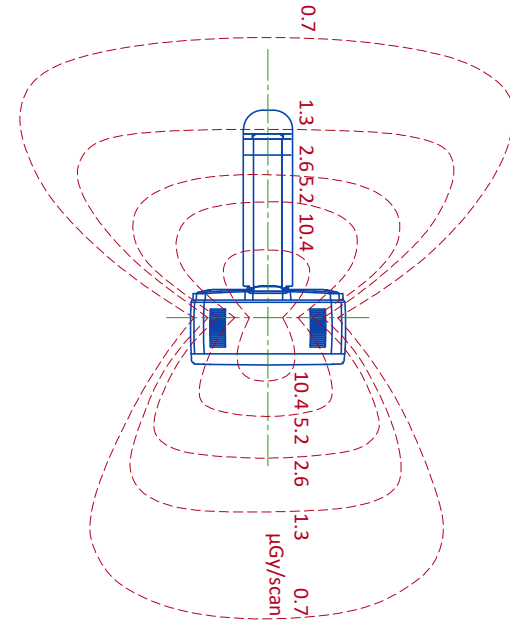


RADIATION SCATTER - HEAD PHANTOM

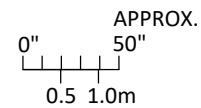
NOTE: 140 kV
100 mAs/scan
1 sec
40mm aperture



Elevation



Plan View



RADIOACTIVE ISOTOPES

RADIOACTIVE ISOTOPES AND RADIOPROTECTION

Since the system produces X-ray radiation and involves the use of radioactive isotopes, compliance with Nuclear Regulatory Commission regulations (or country similar regulatory requirements), must be adhered to and all permissions obtained well in advance.

It is Customer's responsibility consult a qualified radiological health physicist for radiation protection requirements for the walls, floor, ceiling, doors, window glass, etc.(lead content and thickness) and warning lights and signs, in accordance with local requirements.

It is essential that regulatory compliance and preparations are completed early so that required source materials can be obtained prior to installation, including calibration sources and isotopes. These sources and isotopes may have fairly long delivery lead times and a short half-life, so that it may not be advisable to store them over long periods of time.

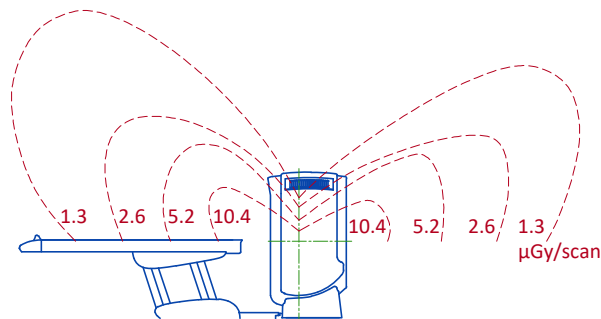
RADIOACTIVE SOURCE - ISOTOPE

The PET/CT system uses the following radioactive sources during calibration and the Daily QA Check.

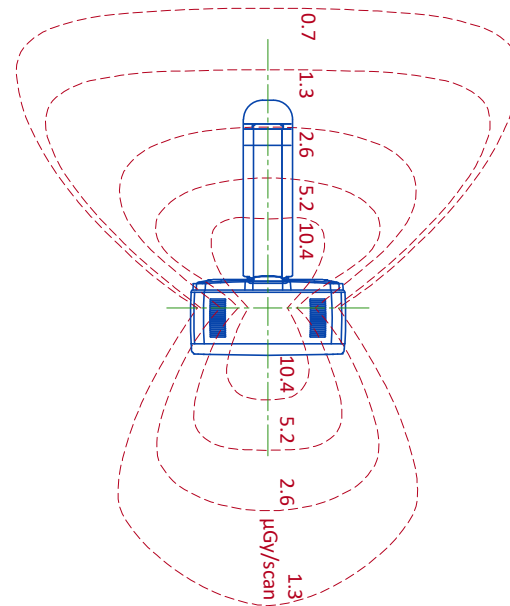
Daily QA Check (Annulus phantom)	Isotope	Germanium-68
	Activity level	55 MBq ± 20%
Quarterly QA calibration (normalization and Well Counter calibration)	Isotopes	Germanium-68 and Fluorine 18
	Activity level	55 MBq ± 20% and 37 MBq (1 mCi)
Check Image Alignment procedure (VQC phantom)	Isotope	Germanium-68
	Activity level	3.5 MBq ± 20%
Typical Positron Emitting Isotopes include	Fluorine 18	
	Carbon 11	
	Nitrogen 13	
	Oxygen 15	
It is the customer's responsibility provide isotopes for system calibration and prepare the required doses.		

RADIATION SCATTER - BODY PHANTOM

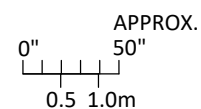
NOTE: 140 kV
100 mAs/scan
1 sec
40mm aperture



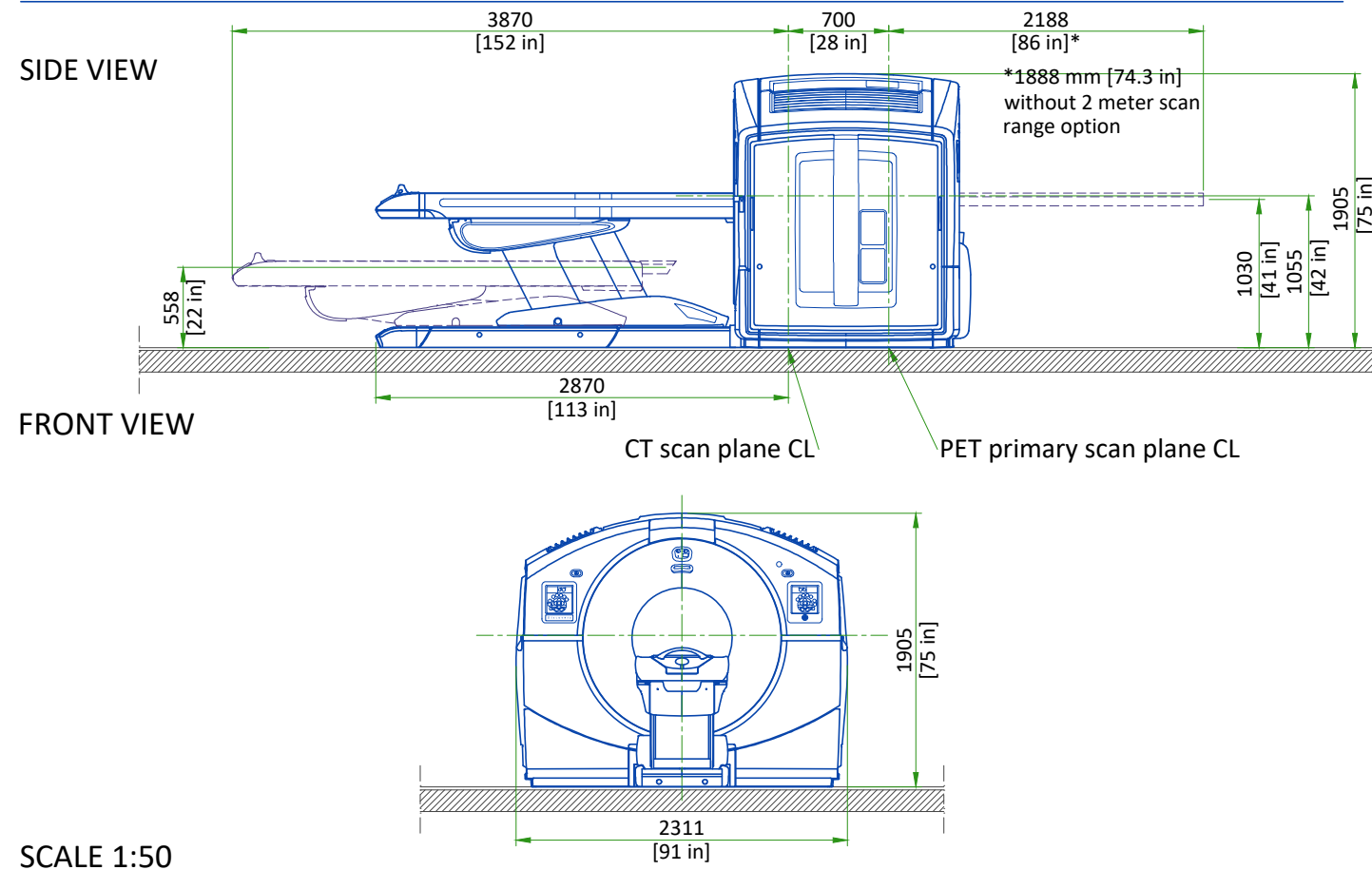
Elevation



Plan View

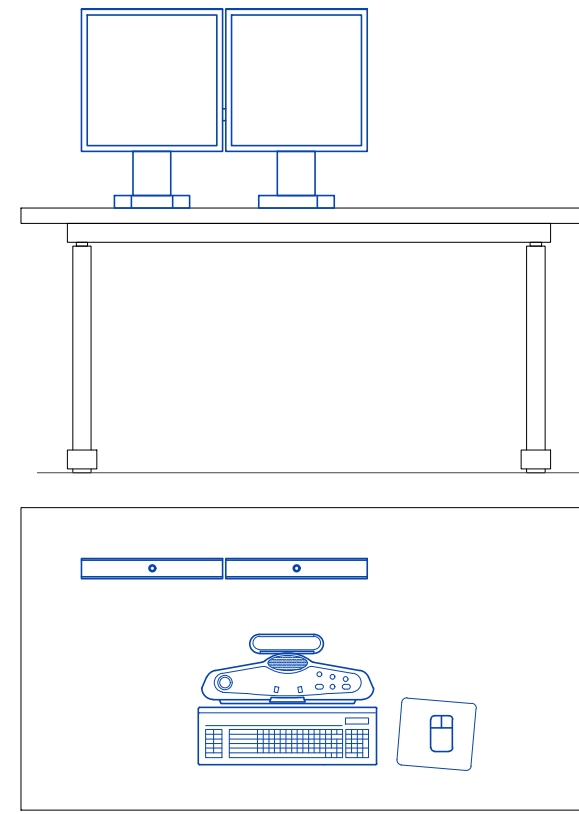


GANTRY WITH PATIENT TABLE

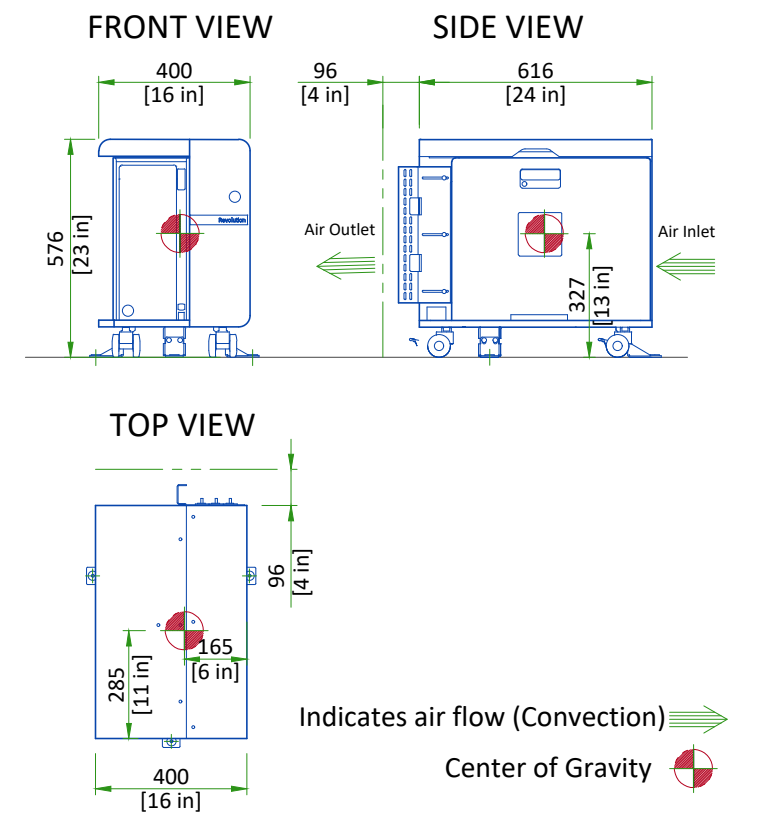


CT CONSOLE

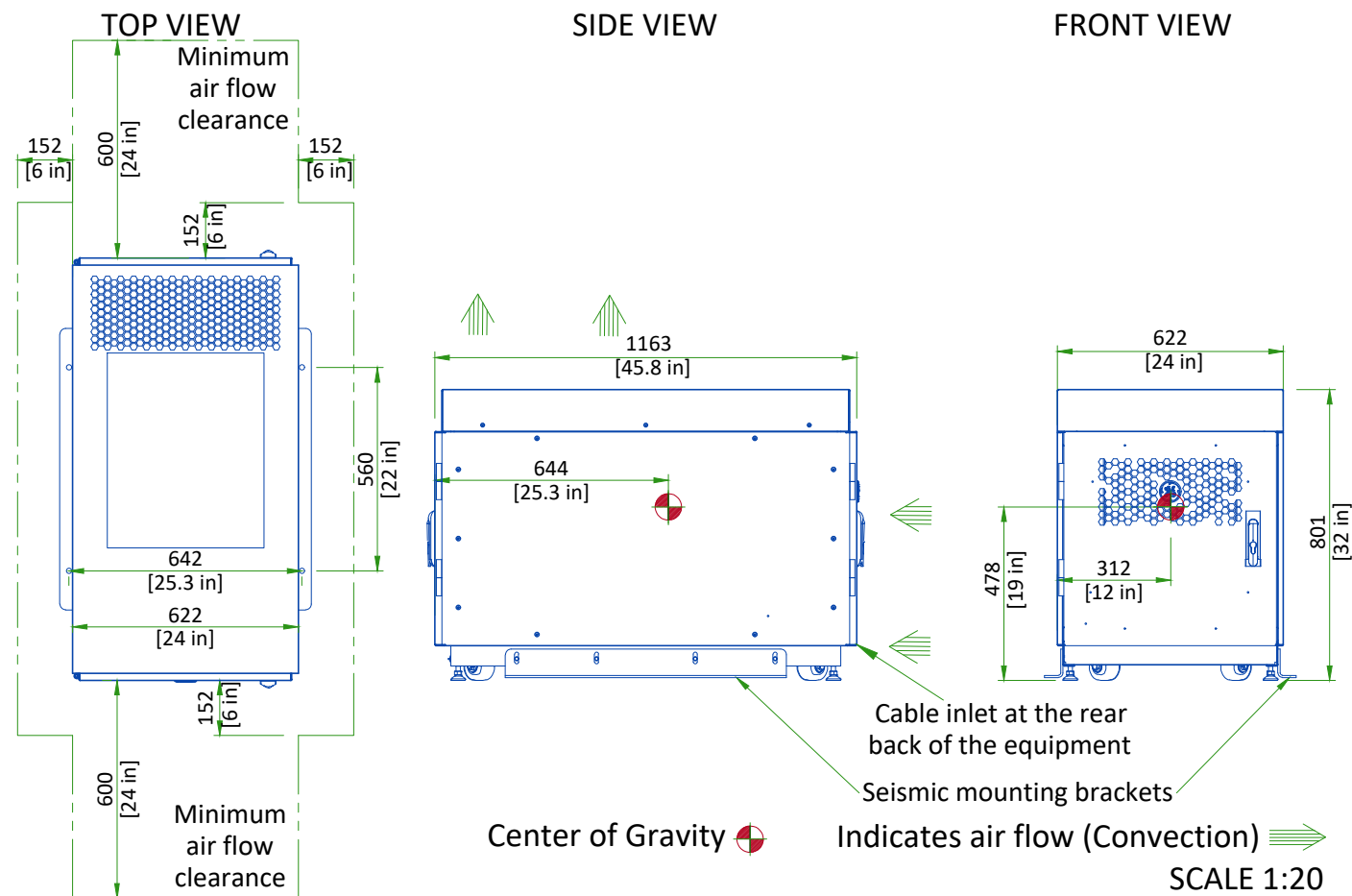
CUSTOMER SUPPLIED TABLE



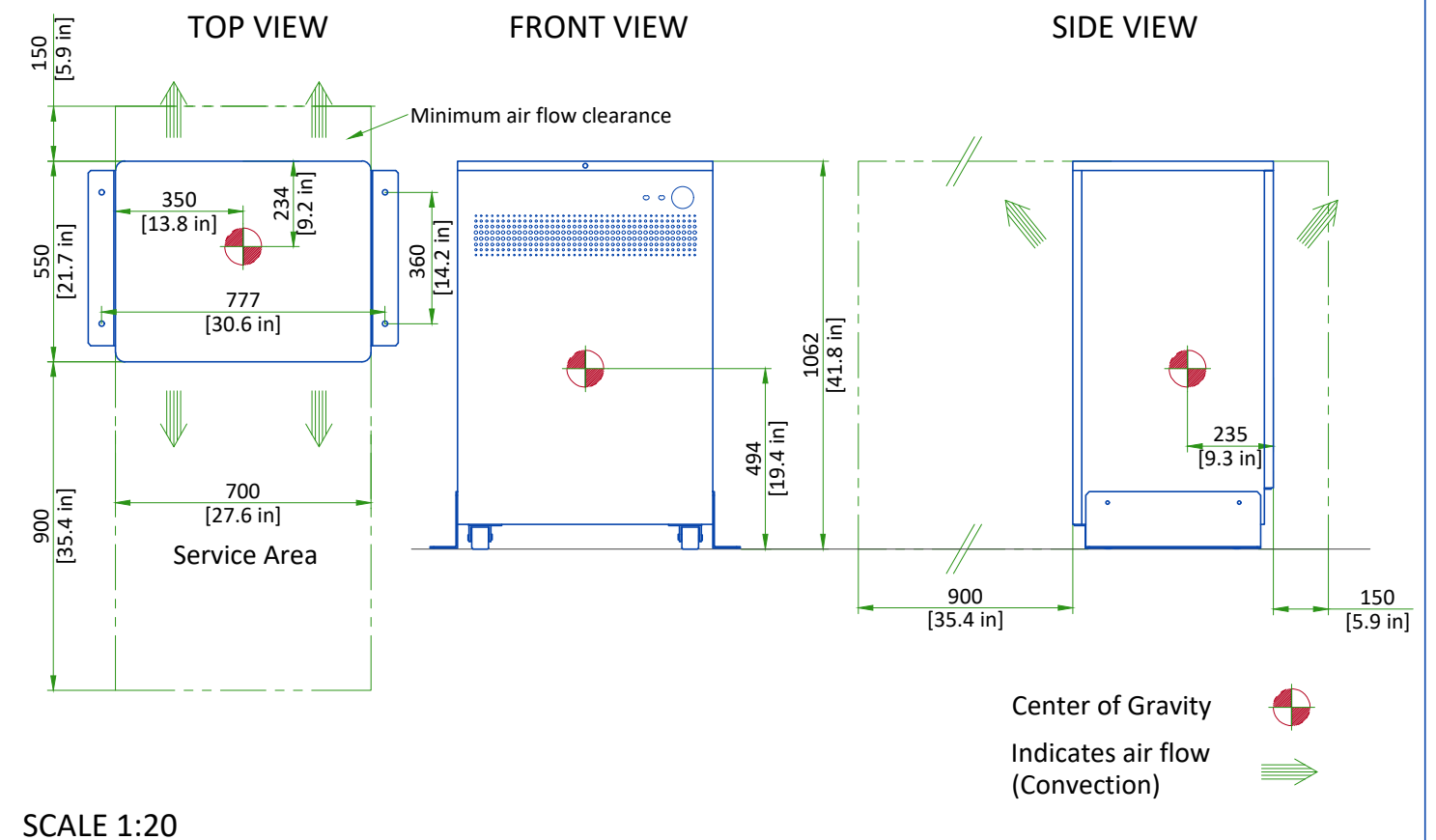
CONSOLE DIMENSIONS



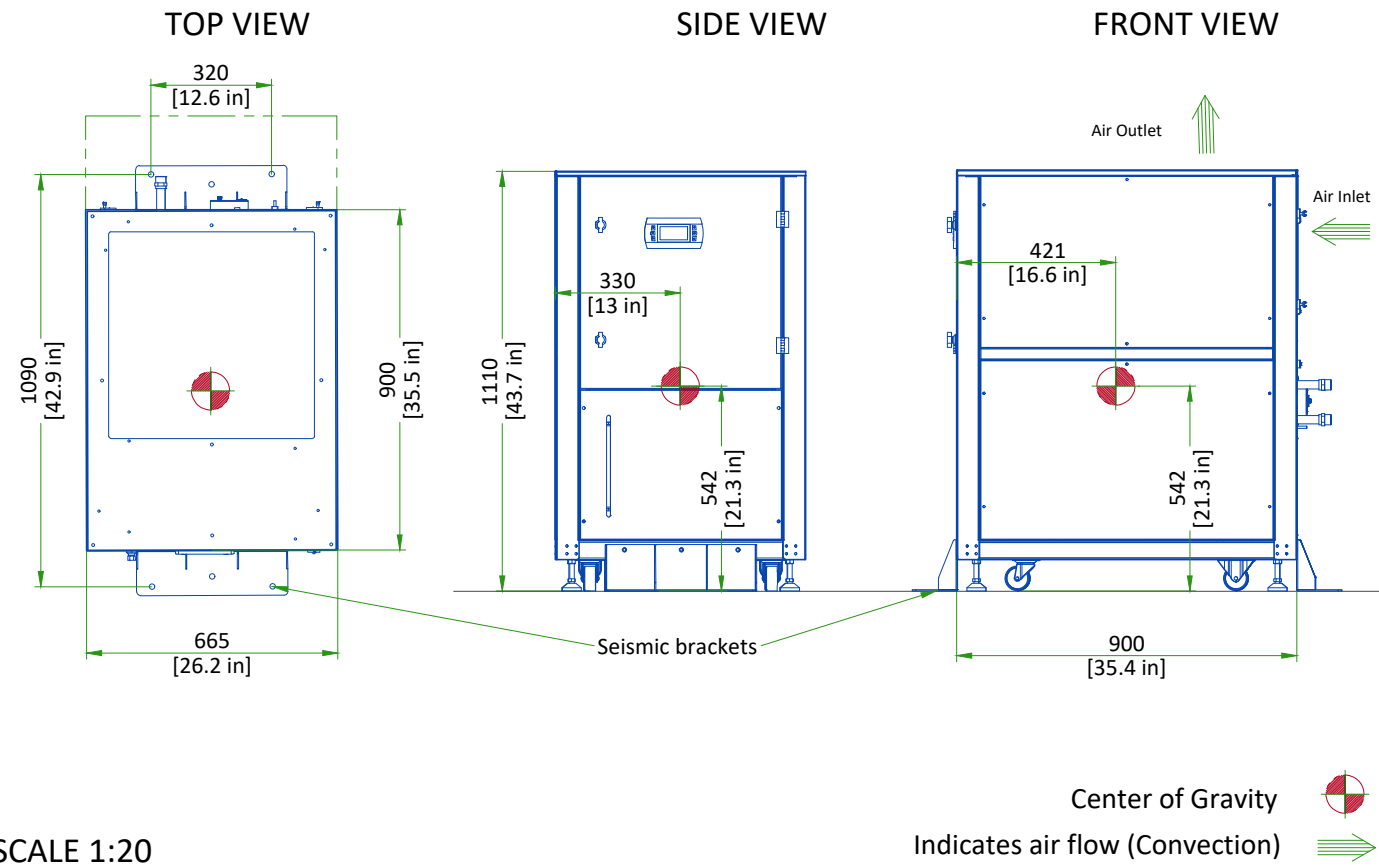
PARC4 RECONSTRUCTION CABINET



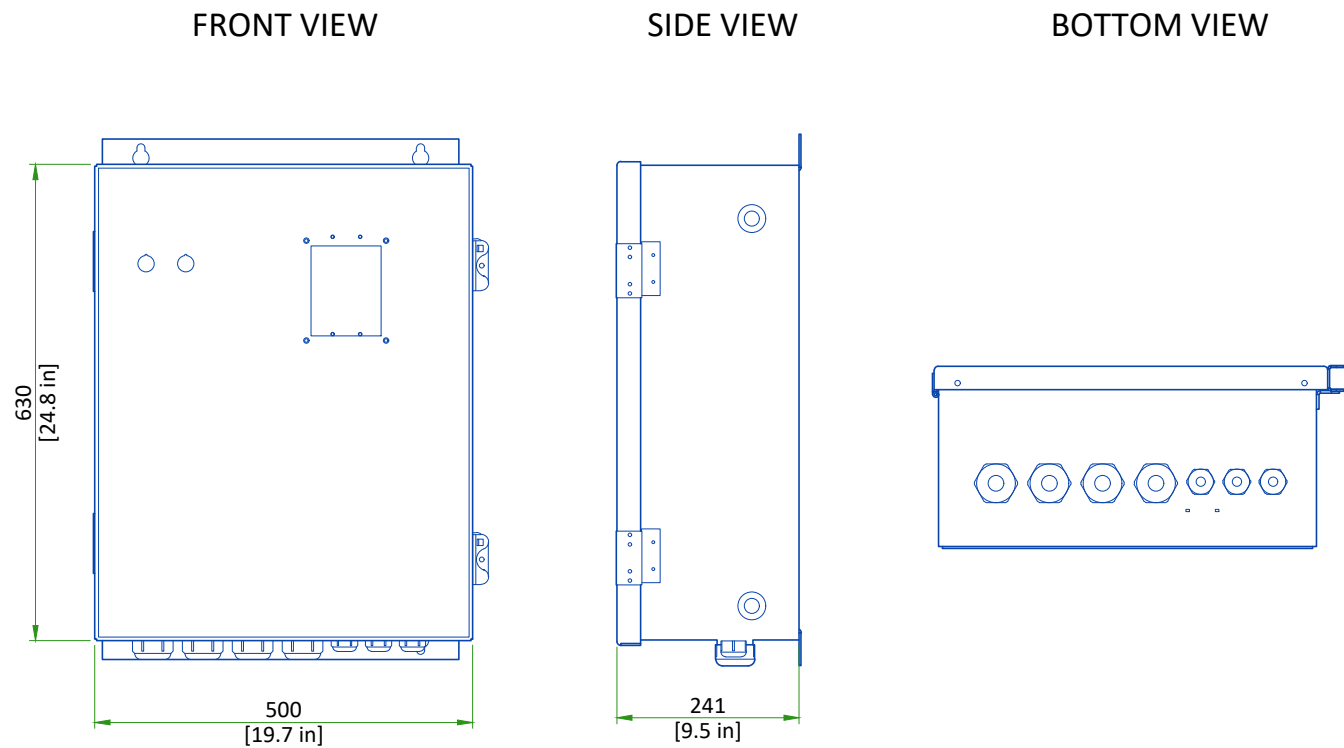
POWER DISTRIBUTION UNIT (PDU)



CHILLER (AIRSYS MODEL)

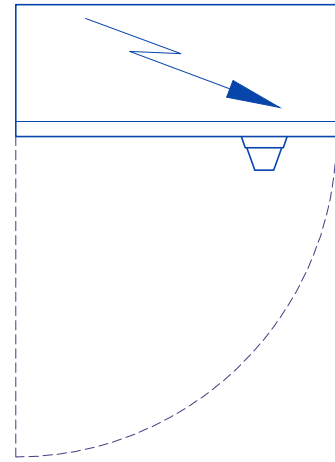


CHILLER PDB

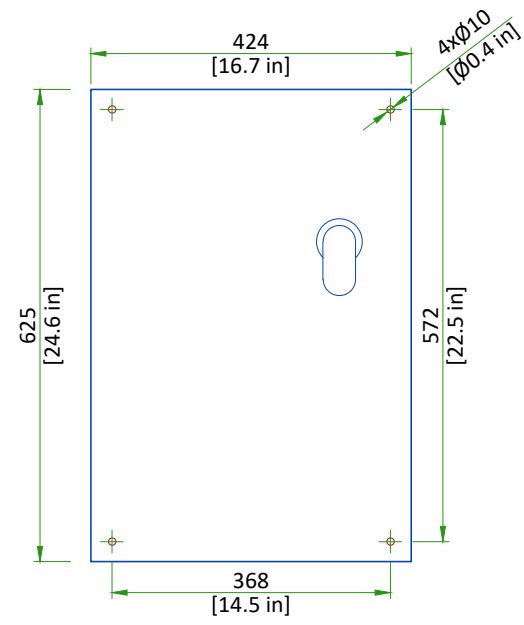


MAIN DISCONNECT PANEL

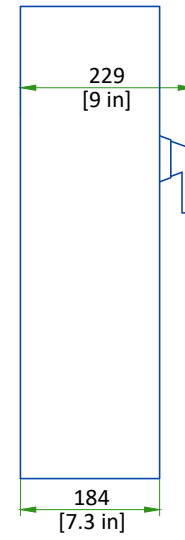
TOP VIEW



FRONT VIEW



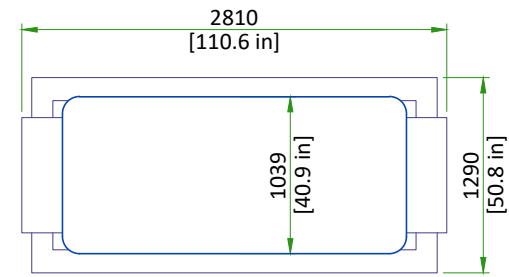
SIDE VIEW



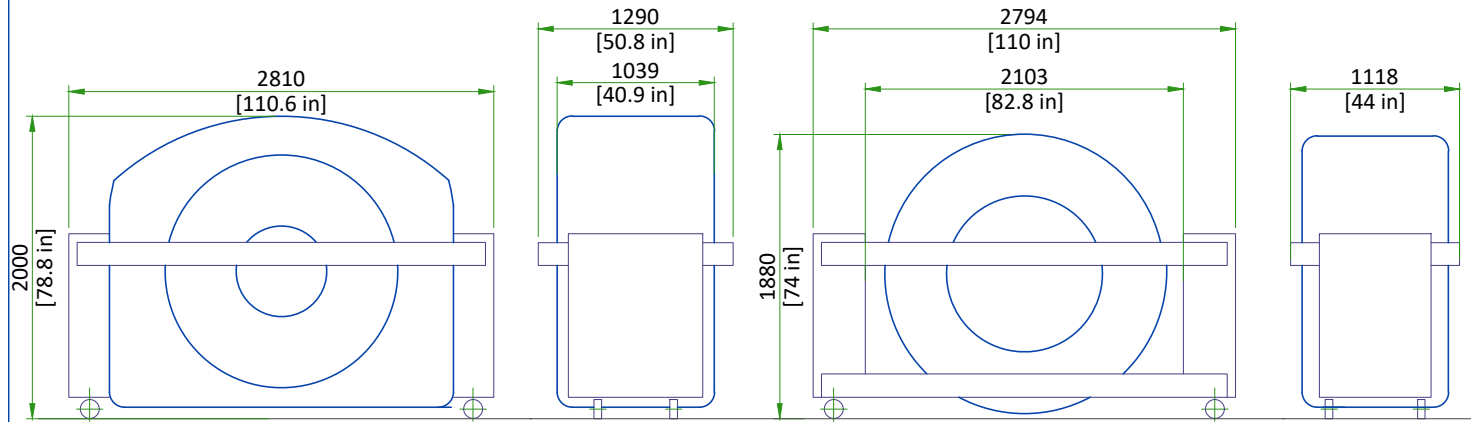
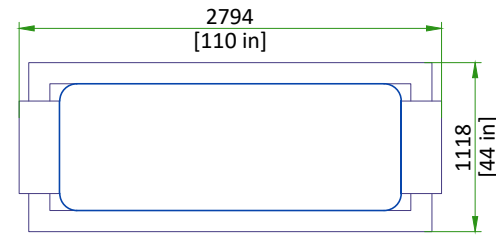
SCALE 1:10

SHIPPING DOLLY DIMENSIONS FOR GANTRY

CT GANTRY



PET IMAGE RING FOR WELDMENT GANTRY



Weight with dollies and side rails = 2050 kg [4520 lbs]

Weight with dollies and side rails = 1204 kg [2654.3 lbs]

DELIVERY

THE CUSTOMER/CONTRACTOR SHOULD:

- Provide an area adjacent to the installation site for delivery and unloading of the GE equipment.
- Ensure that the dimensions of all doors, corridors, ceiling heights are sufficient to accommodate the movement of GE equipment from the delivery area into the definitive installation room.
- Ensure that access routes for equipment will accommodate the weights of the equipment and any transportation, lifting and rigging equipment.
- Ensure that all necessary arrangements for stopping and unloading on public or private property not belonging to the customer have been made.

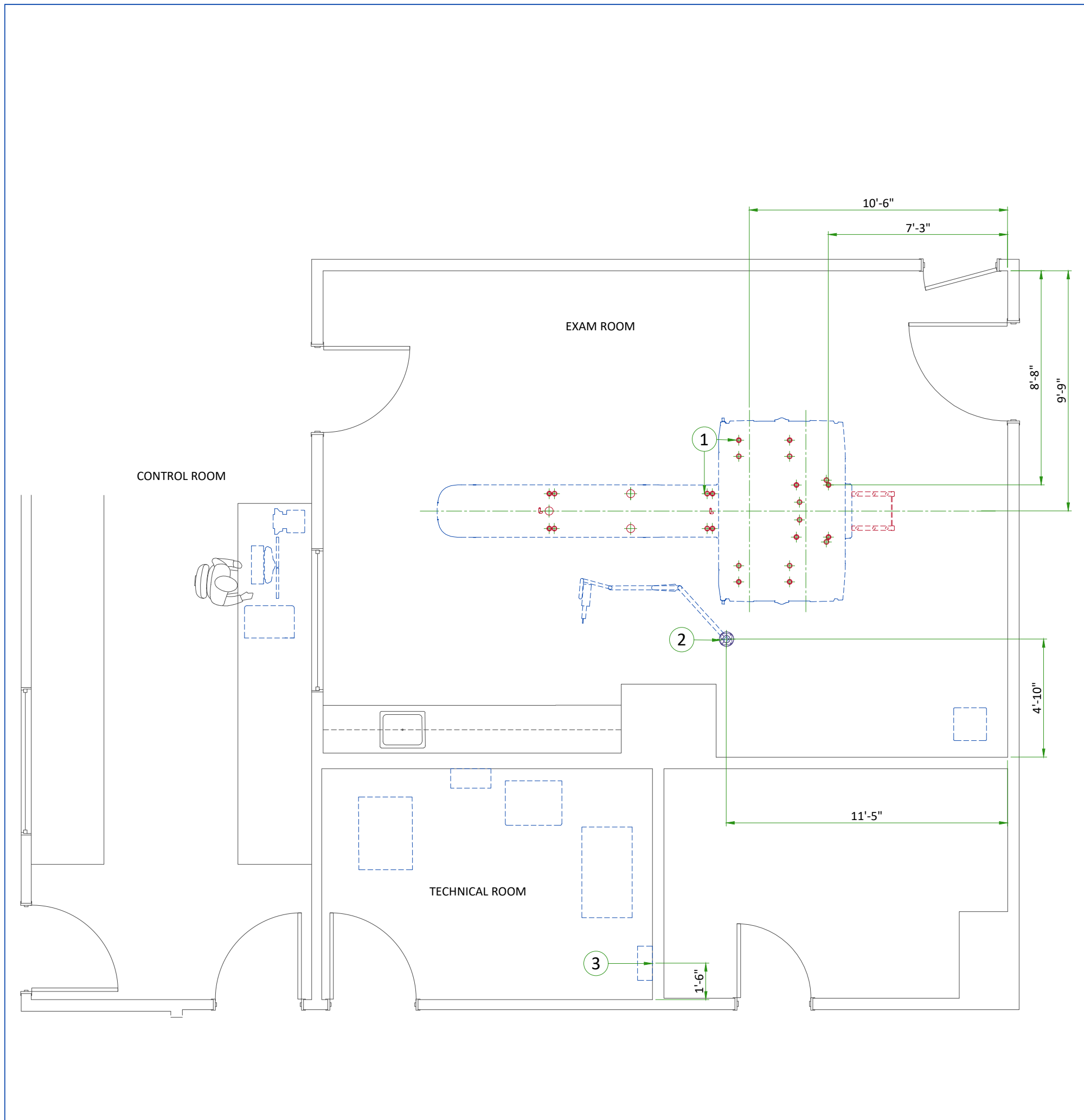
DIMENSIONS OF DELIVERY WITH DOLLY TRANSPORT EQUIPMENT

		mm	in	kg	lbs
CT GANTRY	LENGTH	2810	111	2050	4520
	WIDTH	1290	51		
	HEIGHT	2000	79		
PET WELDMENT GANTRY	LENGTH	2794	110	1204	2654.3
	WIDTH	1118	44		
	HEIGHT	1880	74		
PATIENT TABLE	LENGTH	3836	151	1241	2736
	WIDTH	864	34		
	HEIGHT	1410	55.5		

Above dimensions shown with side rails on. The minimum unobstructed hallway width is 1803 mm, the minimum clear doorway openings is 1067 mm to accommodate delivery of the system.

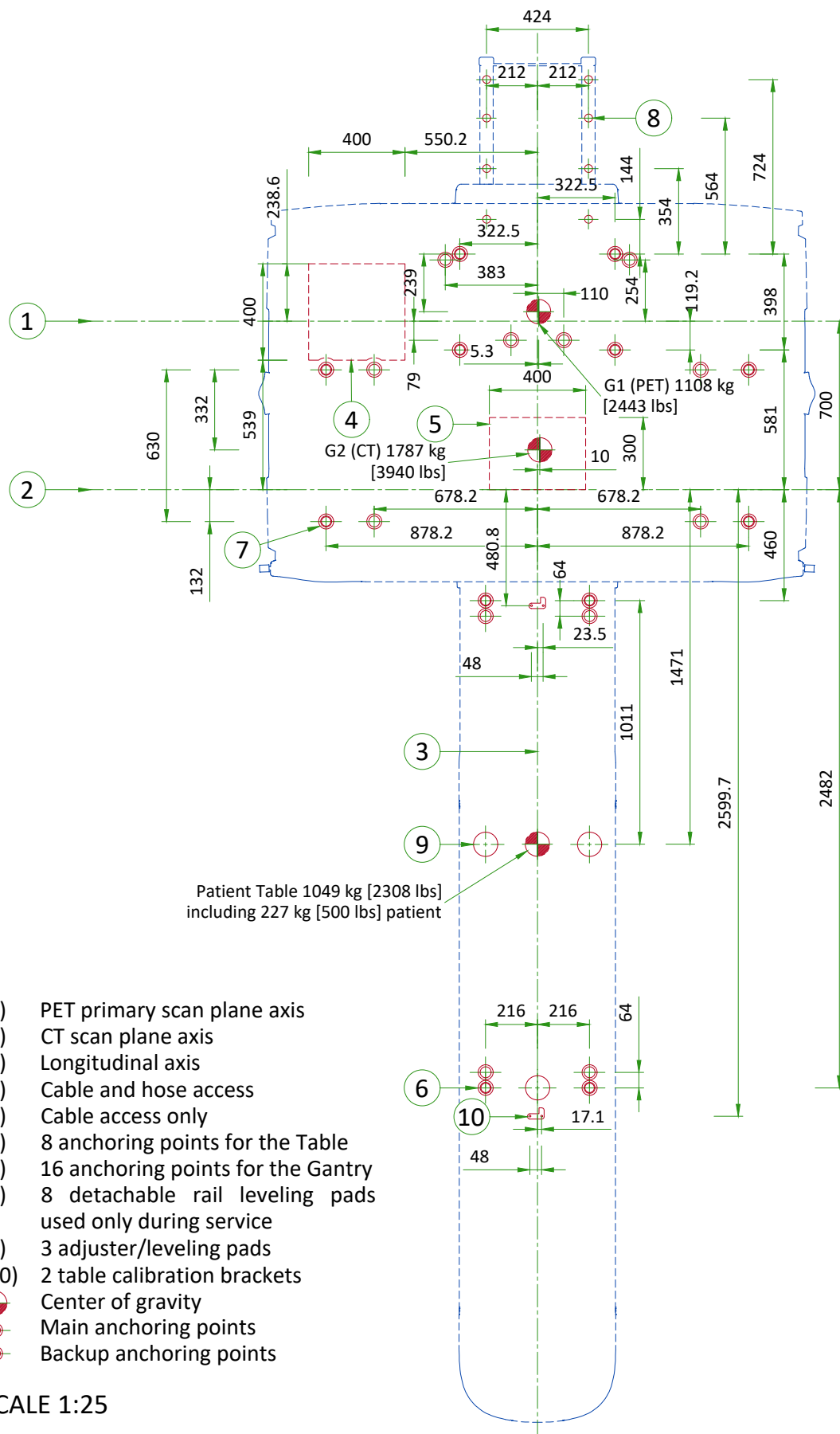
STRUCTURAL NOTES

- Methods of support for the steelwork that will permit attachment to structural steel or through bolts in concrete construction should be favored. Do not use concrete or masonry anchors in direct tension.
- All units that are wall mounted or wall supported are to be provided with supports where necessary. Wall supports are to be supplied and installed by the customer or his contractors. See plan and detail sheets for suggested locations and mounting hole locations.
- All ceiling mounted fixtures, air vents, sprinklers, etc. To be flush mounted, or shall not extend more than 6,35mm (1/4") below the finished ceiling.
- Floor slabs on which equipment is to be installed must be level to 6.00mm (1/4") in 3050mm (10'-0")
- Dimensions are to finished surfaces of room.
- Customers contractor must provide all penetrations in post tension floors.
- Customers contractor must provide and install any non-standard anchoring. Documents for standard anchoring methods are included with GE equipment drawings for geographic areas that require such documentation.
- Customers contractor must provide and install hardware for "through the floor" anchoring and/or any bracing under access floors. This contractor must also provide floor drilling that cannot be completed because of an obstruction encountered while drilling by the GE installer such as rebar etc.
- It is the customer's responsibility to perform any floor or wall penetrations that may be required. The customer is also responsible for ensuring that no subsurface utilities (e.g., electrical or any other form of wiring, conduits, piping, duct work or structural supports (i.e. post tension cables or rebar)) will interfere or come in contact with subsurface penetration operations (e.g. drilling and installation of anchors/screws) performed during the installation process. To ensure worker safety, GE installers will perform surface penetration operations only after the customer's validation and completion of the "GE surface penetration permit"



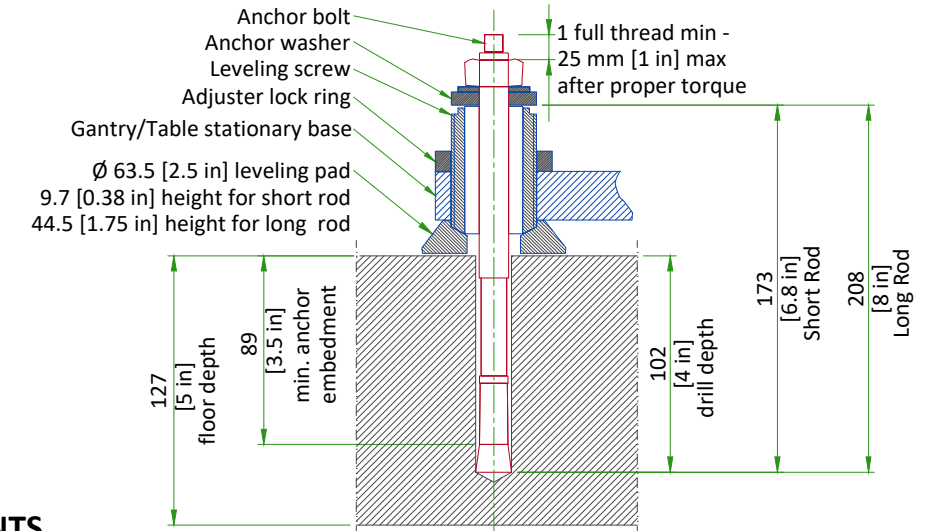
ITEM	DESCRIPTION
(CONTRACTOR SUPPLIED & INSTALLED)	
1	Floor contact area for discovery gantry and patient table. See Structural Details.
2	Structural supports for fastening the overhead counterpoised suspension. Support should run continuous with no fittings extending below face of channel, be parallel, square, and in the same horizontal plane, above finished ceiling. Ensure mounting surface is installed level or plumb within +/- 1 degree, and is structurally sufficient to maintain a level or plumb condition under 110 lb (50kg) system load and maximum system moment of 4400 in-lb (500n-m). Methods of support that will permit attachment to structural steel or through bolts in concrete construction should be favored. Do not use screw anchors in direct tension. 14" x 14" x 1/2" thick steel plate provided by manufacturer. See detail on structural detail sheets.
3	Support Backing, locate as shown

ANCHORING/LOADING DISTRIBUTION TO THE FLOOR



ANCHORING AND FLOOR REQUIREMENTS

GE SUPPLIED GANTRY ANCHORS (5867778)



NOTES:

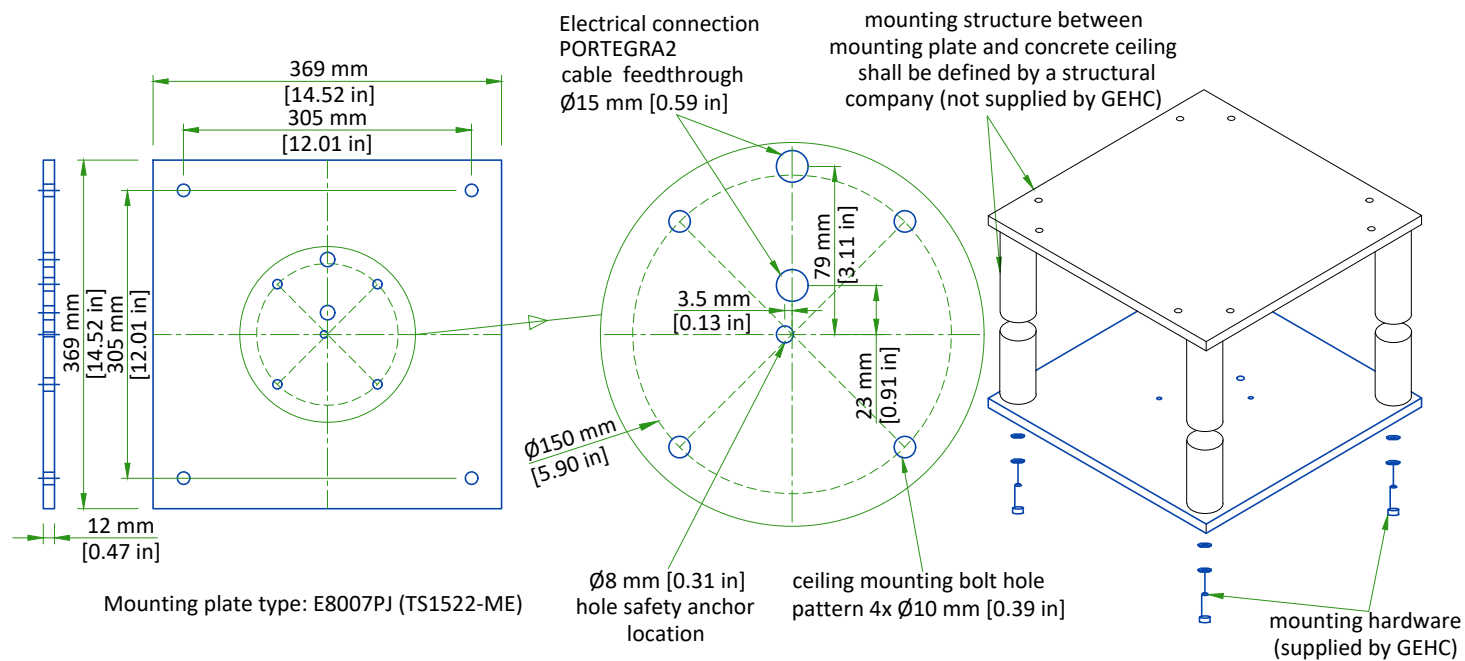
If the concrete floor has a floor covering installed over it (such as floor tile), 17 or more openings 101.6 mm [4 in] in diameter will be cut into the floor covering to ensure the table and gantry rest on the concrete. (Openings are cut during installation.) Shims shall not be used to level the gantry or patient table.

FINISHED FLOOR REQUIREMENTS

- Installation requires a finish floor in the scan and control rooms.
- The floor surface in the scan room directly under the gantry and table must be level.
- The floor shall be no greater than 6 mm [0.25 in] out of level over a 3048 mm [10 ft] range, with level defined as the horizontal surface between the highest and lowest points.
- The floor shall have a minimum concrete thickness of 127 mm [5 in].
- Shims should not be used to compensate for a floor that does not meet this requirement.
- Concrete floors must have a minimum strength of $f'c = 1.7 \times 10^7$ Pa [2500 PSI] at 28 days (curing time) for mounting floor anchors. It is the responsibility of each customer to have appropriate tests performed to determine and measure concrete strength.
- These requirements apply to all installation types.

NOT TO SCALE

MAVIG SUSPENSION MOUNTING METHOD



Column flange and safety chain fixation to concrete or to structure other than MAVIG anchoring plate or MAVIG bridge shall be defined by a structural engineer.

All design and pre-installation activity must be done in accordance of the MAVIG Installation manual.

Contact your GEHC Project Manager for OEM documentation. Installation of mounting plate performed by GEHC or GEHC sub-contractor.

NOT TO SCALE

CEILING SUSPENSION DISCLAIMER

Safety and precautionary comments:

Only qualified, licensed technicians can perform electrical connections, installation, removal and repair. It is strongly recommended that at least two persons perform the installation.

Installing the system: Prior to installation, a structural engineer must confirm that the mounting structure is strong enough to provide proper support for the entire system and any attached end devices. Installation must be completed according to local building codes.

Determination of required installation hardware and torque values for installation of the ceiling column and ceiling track is the sole responsibility of the structural engineer.

Ceiling mounted systems must be installed properly. Failure to follow the instructions provided may lead to a potentially dangerous and unstable condition of the system.

GE and/or MAVIG is not responsible for unauthorized modifications made to the system or use of the system for unintended purposes. GE and/or MAVIG cannot be held liable for improper operation and modifications. Since improper modifications may impair proper operation, safety or reliability of the system, product modifications require written authorization from MAVIG.

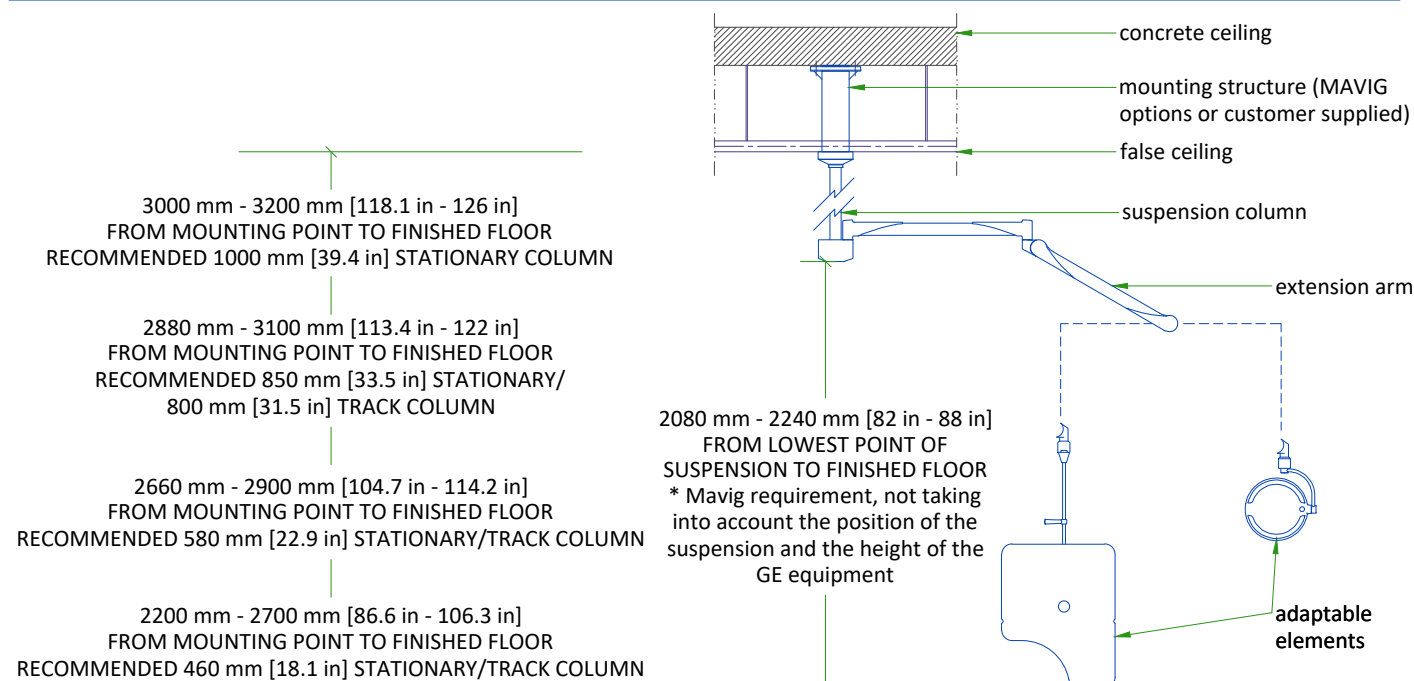
Under GE responsibility or under Customer responsibility, for all pre-installations, whatever is the supporting structure (bridge, chair, Unistrut channel, other channels, direct anchorage in concrete, transversal beam, etc. ...) a certificate must be obtained from a structural engineer.

This certificate shall include the definition of fasteners and of their tightening torque, especially for the non-standard cases described in MAVIG PIM and for which the standard anchoring/screws delivered with product shall not be used but shall be defined (and implemented in most cases) by the structural company.

WARNING:

It is prohibited to alter the length of the ceiling column or remove any securing screws.

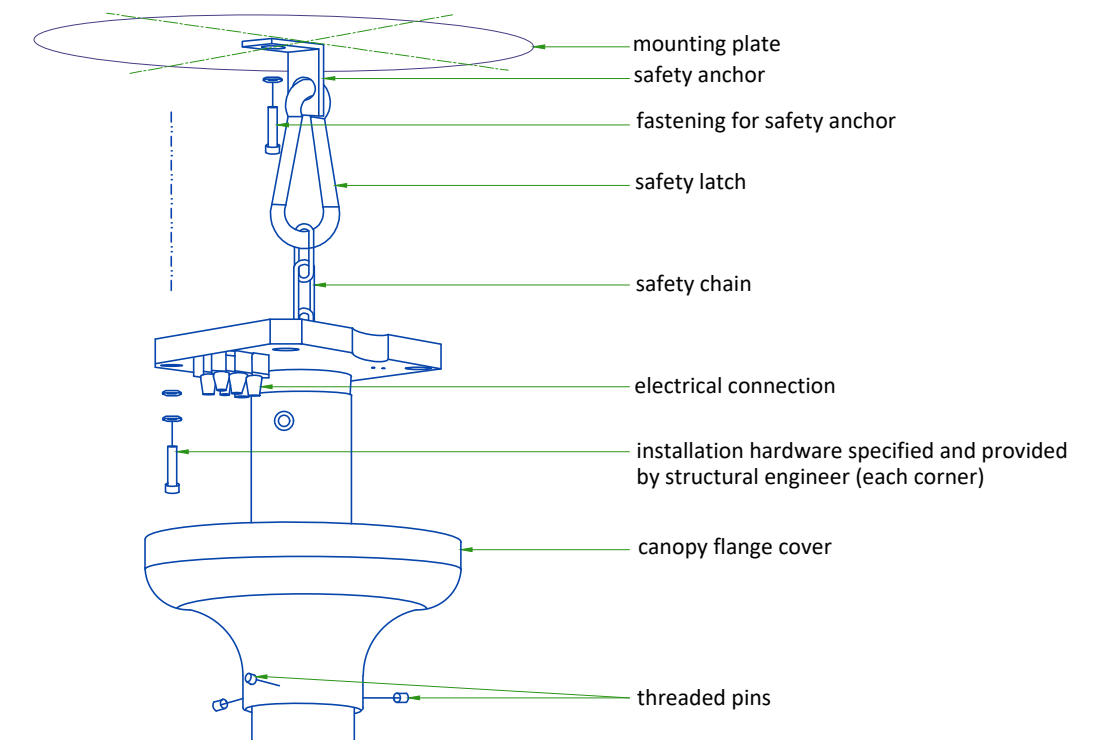
SUSPENSION COLUMN LENGTHS AND INSTALLATION DETAILS



- Available column lengths might differ, please refer to the GE commercial catalog for current selection options
- For rooms with higher mounting point than 3200 mm [126 in], a ceiling construction between structural ceiling and vertical column is suggested which needs to be designed by a structural engineer
- All design and pre-installation activity must be done in accordance of the MAVIG Installation manual
- Contact your GE Project Manager for OEM documentation
- Installation of mounting plate performed by GE or a GE sub-contractor

NOT TO SCALE

PORTEGRA2 COLUMN ASSEMBLY



- Safety chain shall be always attached.
- Do not use shims between column and mounting surface.

All design and pre-installation activity must be done in accordance of the MAVIG Installation manual.

Contact your GE Project Manager for OEM documentation. Installation of mounting plate performed by GE or a GE sub-contractor.

NOT TO SCALE

TEMPERATURE AND HUMIDITY SPECIFICATIONS

IN-USE CONDITIONS

	EXAM ROOM			CONTROL ROOM			TECHNICAL ROOM		
	Min	Recommended	Max	Min	Recommended	Max	Min	Recommended	Max
	Temperature	18°C 64°F	22°C 72°F	26°C 79°F	18°C 64°F	22°C 72°F	26°C 79°F	18°C 64°F	22°C 72°F
Temperature gradient	≤ 3°C/h ≤ 5.4°F/h			≤ 3°C/h ≤ 5.4°F/h			≤ 3°C/h ≤ 5.4°F/h		
Relative humidity (1)	30% to 60%			30% to 60%			30% to 60%		
Humidity gradient	≤ 5%/h			≤ 5%/h			≤ 5%/h		

STORAGE CONDITIONS

Temperature	0°C to +30°C	+32°F to +86°F
Relative humidity (1)	≤ 70% RH	
Temperature gradient	≤ 3°C/h	≤ 5.4°F/h
Humidity gradient	≤ 5%/h	

Material should not be stored for more than 6 month.

(1) Non-condensing

AIR RENEWAL

According to local standards. The HVAC system should be designed to provide 5 air changes per hour to maintain adequate air quality and temperature.

NOTE : In case of using air conditioning systems that have a risk of water leakage it is recommended not to install it above electric equipment or to take measures to protect the equipment from dropping water.

HEAT DISSIPATION

ROOM	DESCRIPTION	Max (kW)	Max (BTU/hr)
Exam Room	PET Gantry	2.8	9554
	CT Gantry	5.5	18766
	Patient table	0.3	1024
Exam room or Technical room*	Power distribution unit (CT PDU)	1.0	3400
	PARC 4 (Reconstruction Cabinet)	2.0	6824
	Chiller (Airsys model)	2.85	9700
Control Room or Reporting Room	Operator console	0.84	2860
	LCD Monitor (2 units, 170 BTU/50 Watts each)	0.1	340
	Peripheral Media Tower (PMT)	0.13	425
*Technical Room is not mandatory, the placements of these elements are recommended in the Exam Room.			
WARNING This chart contains only the principal components of the PET/CT system and does not include information about non-GEHC supplied equipment.			

CONNECTIVITY REQUIREMENTS

Your new GE Healthcare imaging modality will require local and remote connectivity to enable our full range of digital support:

- Local connectivity - This allows your system to connect to local devices such as PACS and modality worklist. We will require network information to configure the system(s), and a live ethernet port(s) prior to the delivery of the system(s).
- Remote connectivity - Your GE Healthcare service warranty includes InSite™ (applicable to InSite capable products), a powerful broadband-based service which enables digital tools that can help guard your hospital against equipment downtime and revenue loss by quickly connecting you to a GE Healthcare expert.

Depending on product family and software version, imaging systems can be connected in one of the following methods:

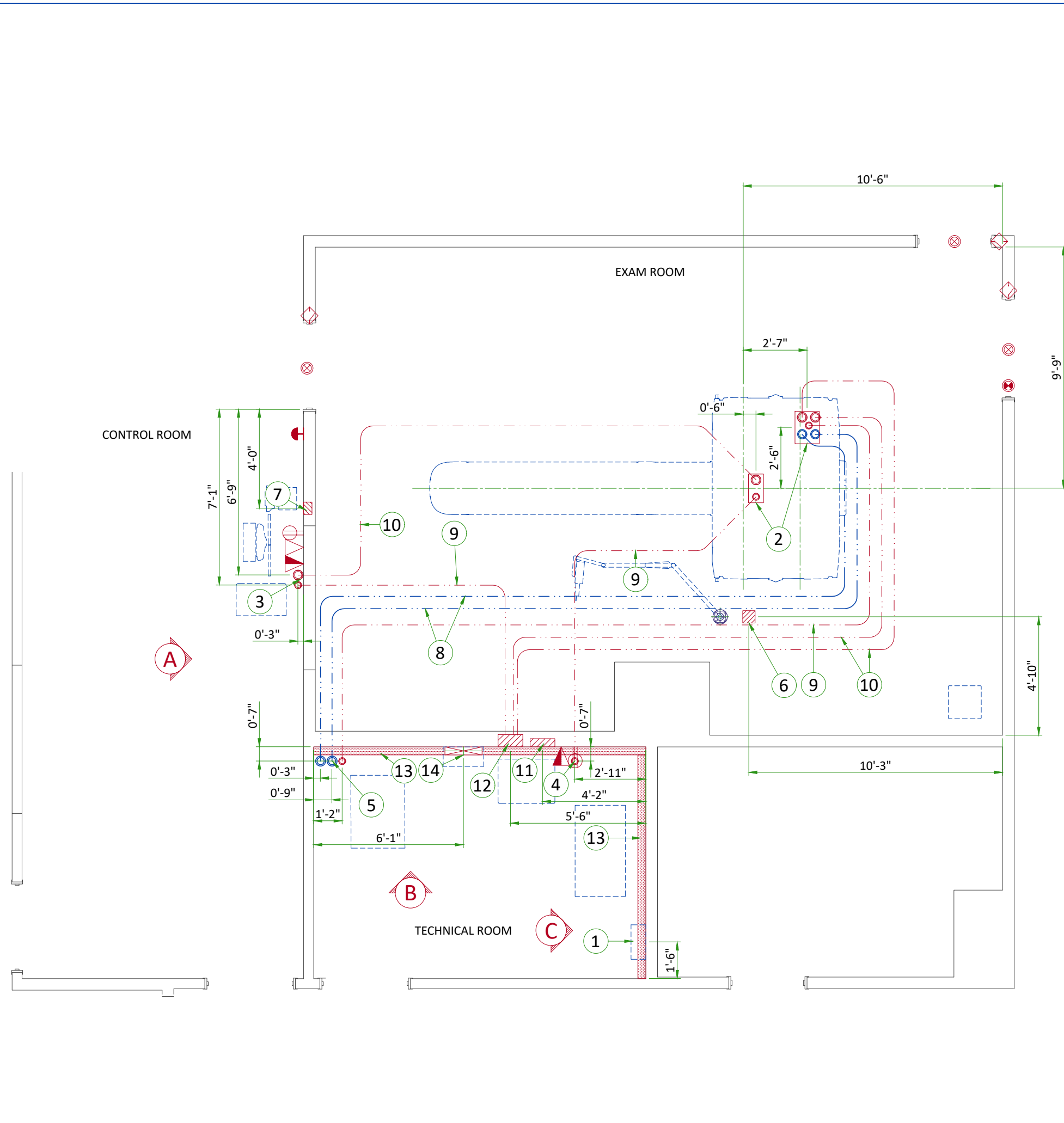
1. TLS over TCP Port 443 (Preferred method for new products) via:
 - a. DNS resolution
 - b. Customer-provided Proxy or
 - c. GE Proxy (Available in some regions)
2. Site-to-Site IPsec VPN tunnel

Please provide the GE project manager with the contact information for the resource that can provide information required to set up these connections. GEHC will send out communication to these contacts, which will include the project's Connectivity requirements, and a Connectivity form. This form will need to be completed and returned to GEHC prior to delivery of the system to ensure the system is tested and connectivity is enabled prior to the completion of the installation.

ELECTRICAL NOTES

1. Aluminum or solid wires are not allowed.
2. Wire sizes given are for use of equipment. Larger sizes may be required by local codes.
3. It is recommended that all wires be color coded, as required in accordance with national and local electrical codes.
4. Conduit sizes shall be verified by the architect, electrical engineer or contractor, in accordance with local or national codes.
5. Convenience outlets are not illustrated. Their number and location are to be specified by others. Locate at least one convenience outlet close to the system control, the power distribution unit and one on each wall of the procedure room. Use hospital approved outlet or equivalent.
6. General room illumination is not illustrated. Caution should be taken to avoid excessive heat from overhead spotlights. Damage can occur to ceiling mounting components and wiring if high wattage bulbs are used. Recommend low wattage bulbs no higher than 75 watts and use dimmer controls (except MR). Do not mount lights directly above areas where ceiling mounted accessories will be parked.
7. Routing of cable ductwork, conduits, etc., must run direct as possible otherwise may result in the need for greater than standard cable lengths (refer to the interconnection diagram for maximum usable lengths point to point).
8. Conduit turns to have large, sweeping bends with minimum radius in accordance with national and local electrical codes.
9. In some cases GEHC will specify ground wires to be sized larger than code. In these situations, the GEHC specification must be followed.
10. A special grounding system is required in all procedure rooms by some national and local codes. It is recommended in areas where patients might be examined or treated under present, future, or emergency conditions. Consult the governing electrical code and confer with appropriate customer administrative personnel to determine the areas requiring this type of grounding system.
11. The maximum point to point distances illustrated on this drawing must not be exceeded.
12. Physical connection of primary power to GEHC equipment is to be made by customers electrical contractor with the supervision of a GEHC representative. The GEHC representative would be required to identify the physical connection location, and insure proper handling of GEHC equipment.
13. GEHC conducts power audits to verify quality of power being delivered to the system. The customer's electrical contractor is required to be available to support this activity.
14. Every installation is unique. The electrical contractor will be required to support the installation of the GEHC equipment by providing knockouts, grommeted openings, bushings, etc. as required. All power connections to be performed by the electrician.

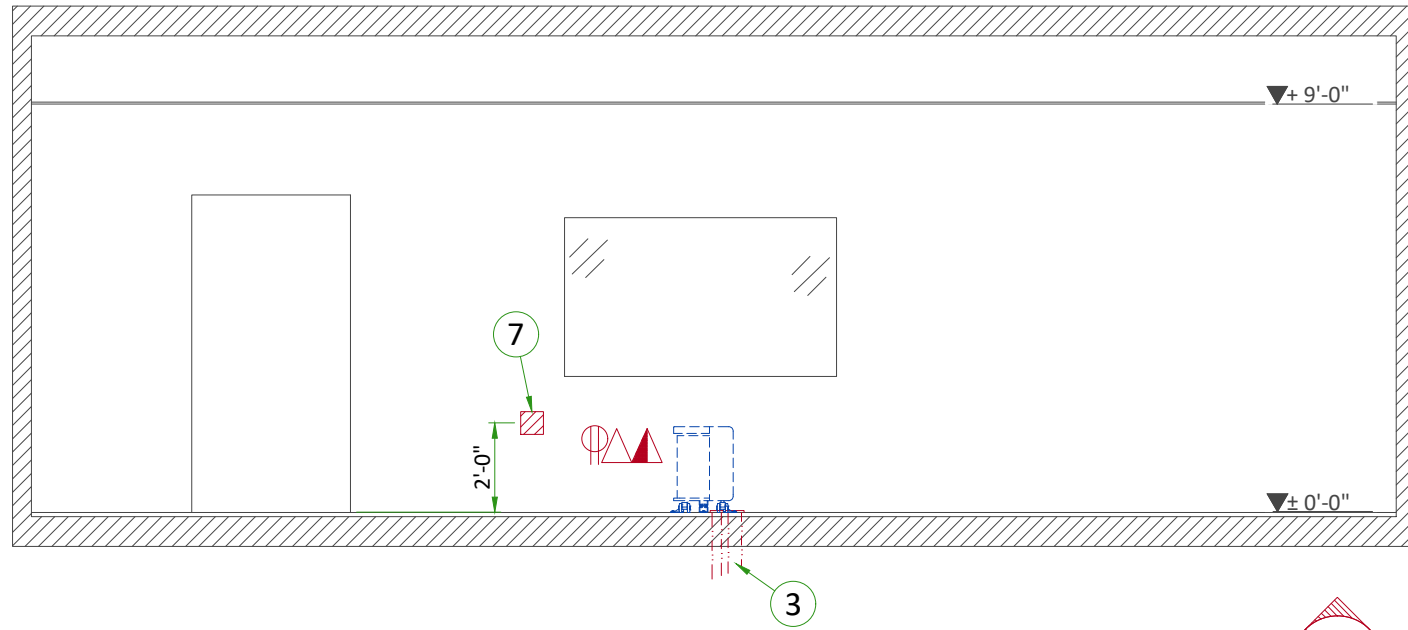
- All junction boxes, conduit, duct, duct dividers, switches, circuit breakers, cable tray, etc., are to be supplied and installed by customers electrical contractor. All junction boxes shall be provided with covers.
- Conduit and duct runs shall have gradual sweep radius bends.
- Conduits and duct above ceiling or below finished floor must be installed as near to ceiling or floor as possible to reduce run length.
- Ceiling mounted junction boxes illustrated on this plan must be installed flush with finished ceiling.
- All ductwork must meet the following requirements:
 1. Ductwork shall be metal with dividers and have removable, accessible covers.
 2. Ductwork shall be certified/rated for electrical power purposes.
 3. Ductwork shall be electrically and mechanically bonded together in an approved manner.
 4. PVC as a substitute must be used in accordance with all local and national codes.
- All openings in raceway and access flooring are to be cut out and finished off with grommet material by the customers contractor.
- Electrical contractor to provide measured pull strings in all conduit and raceway runs.
- Provide 10 foot pigtails at all junction points.
- Grounding is critical to equipment function and patient safety. Site must conform to wiring specifications shown on this plan.



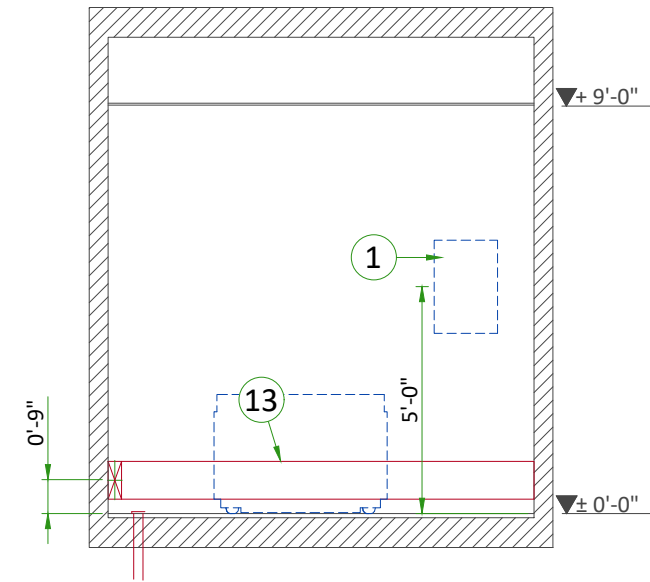
Item	Electrical Layout Item List
1	Main disconnect panel (MDP)
2	Suitable bushings & lock nuts (Gantry)
3	Suitable bushings & lock nuts (Operator's Console)
4	Suitable bushings & lock nuts (PARC)
5	Suitable bushings & lock nuts (Chiller)
6	6" x 6" x 4" [150 x 150 x 100] box above ceiling (injector)
7	6" x 6" x 4" [150 x 150 x 100] box (injector control)
8	3" [75] conduit below floor for water lines
9	2 1/2" [64] conduit below floor
10	3 1/2" [89] conduit below floor
11	12" x 16" x 4" [300 x 400 x 100] box (Power Distribution Unit)
12	12" x 16" x 6" [300 x 400 x 150] box (Power Distribution Unit)
13	10" x 3 1/2" [250 x 100] surface wall duct with minimum 2 dividers
14	18" x 3 1/2" [450 x 100] surface wall duct with minimum 2 dividers

ITEM	QTY	Electrical Outlet Legend
Customer/contractor supplied and installed items unless otherwise specified. Height above floor determined by local codes unless otherwise specified.		
△		Dedicated telephone line(s)
▲		Network outlet
⊕		Duplex hospital grade, dedicated wall outlet 120-v, single phase power
⊔		System emergency off (SEO), (recommended height 1.2m [48"] above floor)
⊗		X-Ray room warning light control panel
⊙		X-Ray ON lamp (L1) - 24V
◇		Door interlock switch (needed only if required by state/local codes)

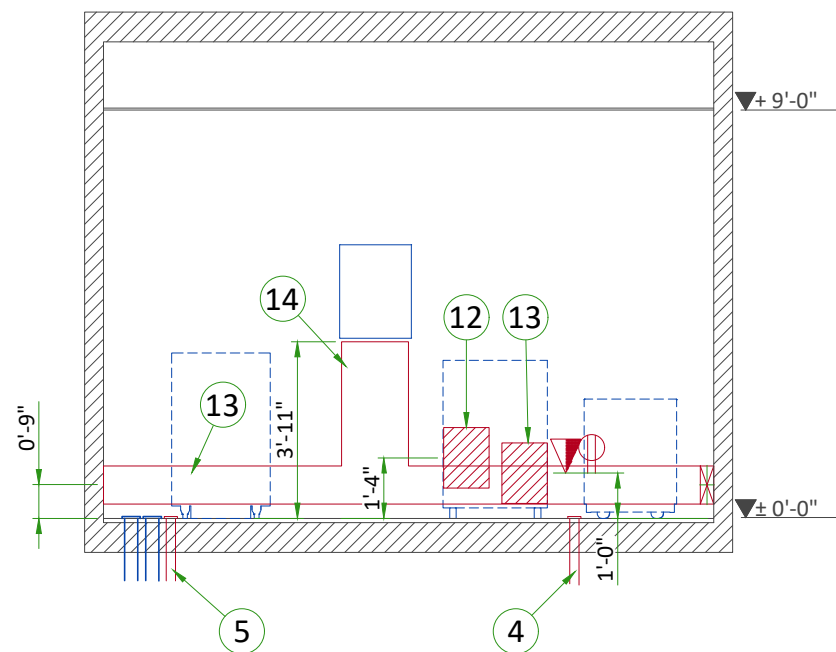
Additional Conduit Runs (Contractor Supplied and Installed)					
From (Bubble # / Item)	To (Bubble # / Item)	Qty	Size		
			In.	mm	
3 Phase Power	1 Main Disconnect	1	As req'd	As req'd	
1 Main Disconnect	Emergency Off	1	1/2	13	
	11 Power Distribution Unit	1	As req'd	As req'd	
11 Power Distribution Unit	Door Switch	1	1/2	13	
	Warning Light Control	1	1/2	13	
Warning Light	Warning Light Control	1	1/2	13	
1 Phase Power		1	1/2	13	
6 Injector	7 Injector Control	1	2 1/2	64	



A



C



B

POWER REQUIREMENTS

POWER SUPPLY	3 PHASES+G 380V/400V/420V/440V/460V/480V ±10%
FREQUENCIES	50/60Hz ± 3Hz
MAXIMUM POWER DEMAND	100 kVA
AVERAGE POWER	30 kVA
POWER FACTOR	0.85

- Power supply should come into a System PDB (MDP) containing the protective units and controls.
- The section of the supply cable should be calculated in accordance with its length and the maximum permissible voltage drops, equal to 3.4% max. of regulation for feeder size.
- There must be discrimination between supply cable protective material at the beginning of the installation (main low-voltage transformer side) and the protective devices in the A1 Main Disconnect.
- TNC neutral point connection must not be used.

SUPPLY CHARACTERISTICS

- Power input must be separate from any others which may generate transients (elevators, air conditioning, radiology rooms equipped with high speed film changers...).
- All equipment (lighting, power outlets, etc...) installed with GE system components must be powered separately.
- Phase imbalance 2% maximum.
- Maximum voltage variation at full load 6% (Including line impedance).
- Transients must be less than 1500V peak. (on a 380V line)
- A record of power input disturbances over a continuous two-weeks period (prior to delivery) enables determination of the frequency and degree of these disturbances and can be used to ascertain the need to provide line conditioning equipment.

GROUND SYSTEM

- System of equipotential grounding.
- Equipotential: The equipotential link will be by means of an equipotential bar. This equipotential bar should be connected to the protective earth conductors in the ducts of the non GE cableways and to additional equipotential connections linking up all the conducting units in the rooms where GE system units are located.
- The impedance of the earth bar should be less than or equal to 2 Ω (ohm).

CABLES

- Power and cable installation must comply with the distribution diagram.
- All cables must be isolated and flexible of HO7RNF type, cable color codes must comply with standards for electrical installation.
- The cables from signaling and remote control (Y,SEO,L...) will go to A1 Main Disconnect with a pigtail length of 1.5m, and will be connected during installation. Each conductor will be identified and isolated (screw connector).

CABLEWAYS

The general rules for laying cableways should meet the conditions laid down in current standards and regulations, with regard to:

- Protecting cables against water (cableways should be waterproof).
- Protecting cables against abnormal temperatures (proximity to heating pipes or ducts).
- Protecting cables against temperature shocks.
- Replacing cables (cableways should be large enough for cables to be replaced).
- Metal cableways should be grounded.

POWER DISTRIBUTION

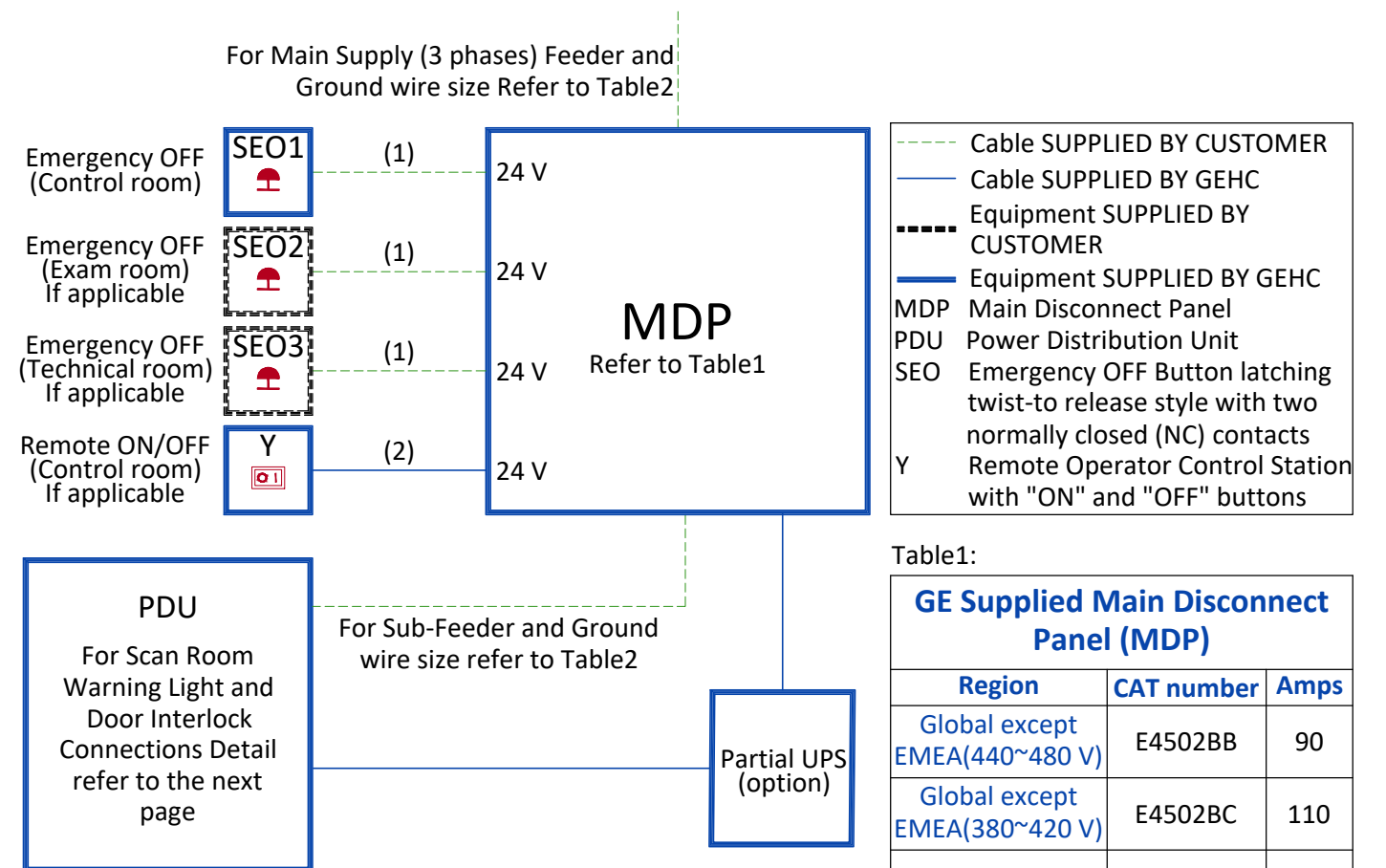


Table1:

GE Supplied Main Disconnect Panel (MDP)		
Region	CAT number	Amps
Global except EMEA(440~480 V)	E4502BB	90
Global except EMEA(380~420 V)	E4502BC	110
EMEA(380~420 V)	E45021BB (3)	125

Table2:

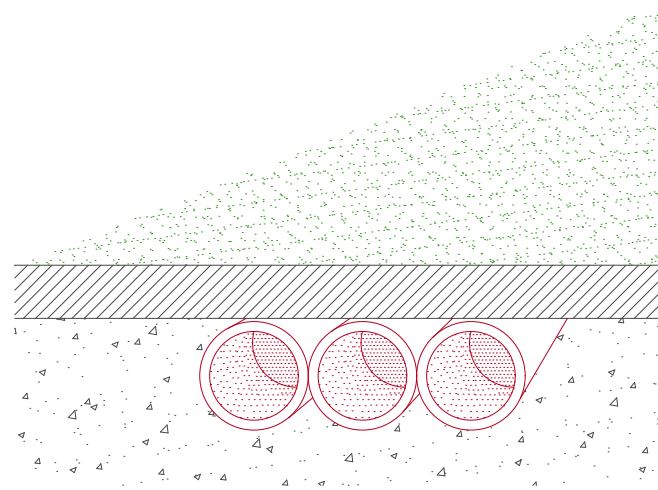
Feeder Table						
The information below assumes the use of copper wire, rated 75 C and run in steel conduit. All ampacity is determined in accordance with the National Electrical Code (NFPA 70), Table 310-16 (2002). The ampacity of the circuit protection device listed above determines the minimum feeder size, except where total source regulation limits require a larger size. If the wire size does not match the lists below, please select the nearest wire size as per to local standards.						
Feeder length from Power Substation to MDP - ft (m)	Minimum Wire Size, AWG or MCM (mm ²)/VAC					
	380 VAC	400 VAC	420 VAC	440 VAC	460 VAC	480 VAC
50 (15)	2 (35)	2 (35)	3 (30)	3 (30)	3 (30)	3 (30)
100 (30)	2 (35)	2 (35)	3 (30)	3 (30)	3 (30)	3 (30)
150 (46)	2 (35)	2 (35)	3 (30)	3 (30)	3 (30)	3 (30)
200 (61)	2 (35)	2 (35)	3 (30)	3 (30)	3 (30)	3 (30)
250 (76)	1 (45)	1 (45)	2 (35)	2 (35)	2 (35)	3 (30)
300 (91)	1/0 (50)	1/0 (50)	1 (45)	1 (45)	2 (35)	2 (35)
350 (107)	2/0 (70)	1/0 (50)	1/0 (50)	1 (45)	1 (45)	1 (45)
400 (122)	2/0 (70)	2/0 (70)	1/0 (50)	1/0 (50)	1/0 (50)	1 (45)
Sub-Feeder length from MDP to PDU - ft (m)						
32 (9.7536)	2 (35)	2 (35)	3 (30)	3 (30)	3 (30)	3 (30)
Grounding						
Run a dedicated 1/0 [50 mm ²] or larger insulated copper ground wire from the power source to the MDP and from MDP to the PDU. Run the ground wire in the same raceway with the three-phase wires.						

Notes :

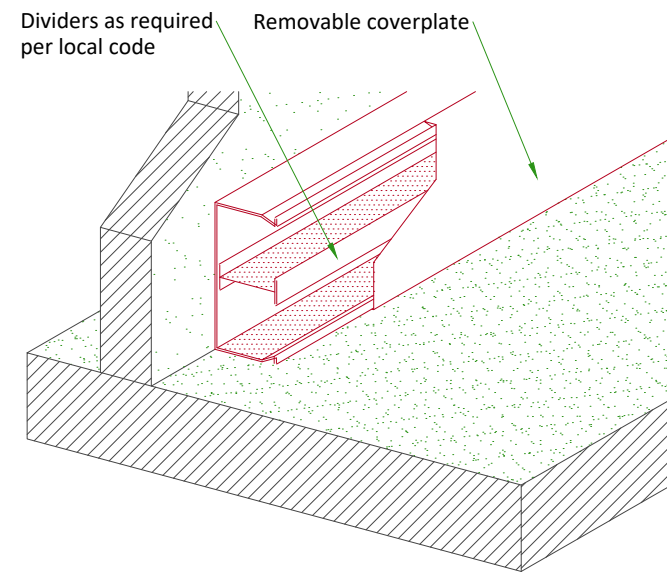
- (1) Wire size: 4x2.5mm² [14AWG] and 1x2.5mm² [14AWG] GND
- (2) Power control cable: 3 m [10 ft], multi-conductor, 24V DC

TYPICAL CABLE MANAGEMENT

CONDUIT IN THE FLOOR



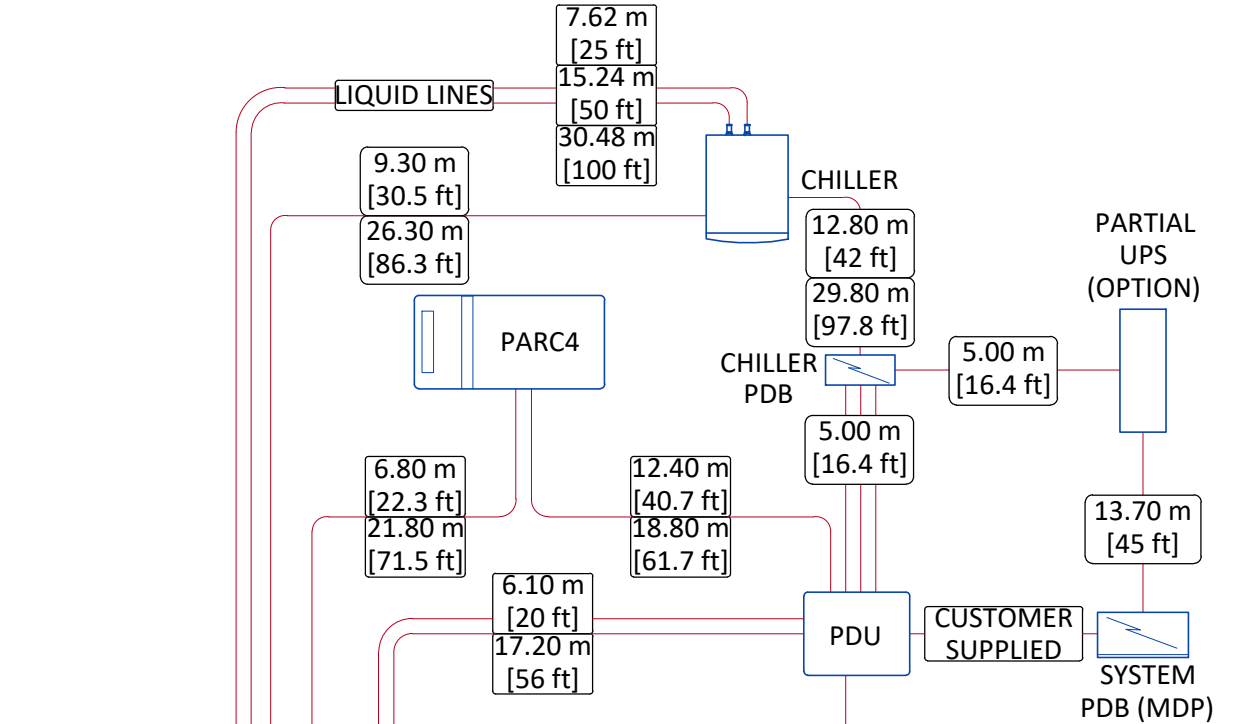
DUCT ON THE WALL



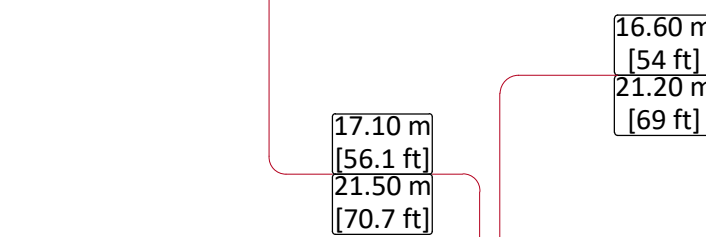
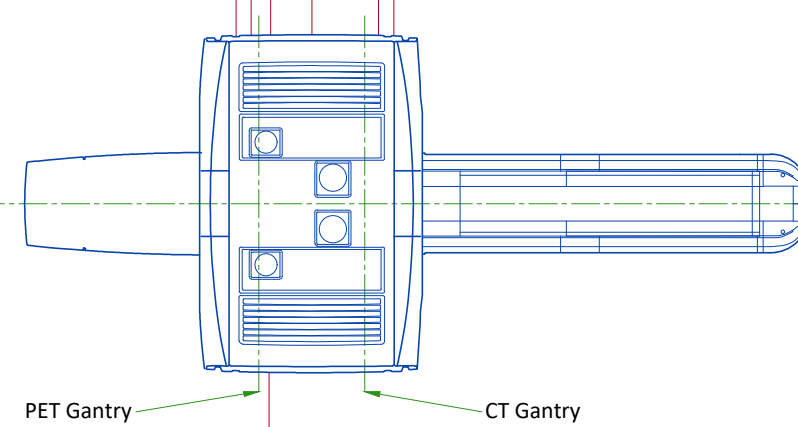
NOT TO SCALE

INTERCONNECTIONS

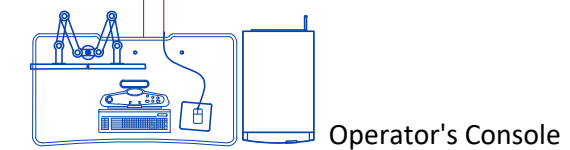
TECHNICAL ROOM / EXAM ROOM



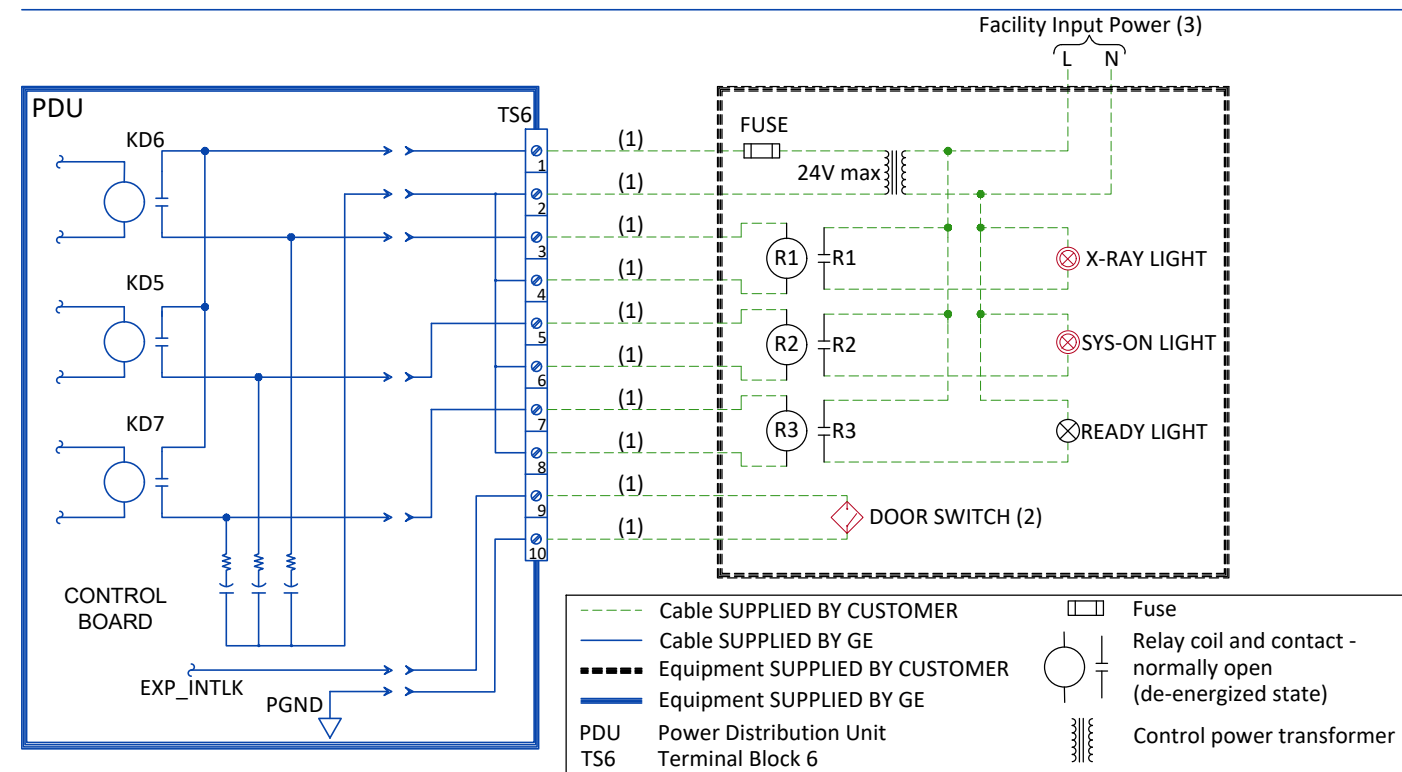
EXAM ROOM



CONTROL ROOM



SCAN ROOM WARNING LIGHT AND DOOR INTERLOCK



Notes :

- (1) Wire size: 2mm² [14 AWG] at 24V
- (2) Door Interlock circuit is jumpered out if a door switch is not provided.
- (3) Grounding not shown on the detail, but must comply with local codes.