



REV	DATE	MODIFICATIONS
C	15/Oct/2020	Initial release per PIM revision 3
B	27/Sep/2019	Initial release per PIM revision 2
A	06/Jun/2019	Initial release per PIM revision 1

- 01 - C1 - Cover Sheet
- 02 - C2 - Disclaimer - Site Readiness
- 03 - A1 - General Notes
- 04 - A2 - Equipment Layout
- 05 - A3 - Radiation Protection
- 06 - A4 - Equipment Dimensions (1)
- 07 - A5 - Equipment Dimensions (2)
- 08 - A5 - Delivery
- 09 - S1 - Structural Notes
- 10 - S2 - Structural Layout
- 11 - S3 - Structural Details (1)
- 12 - S4 - Structural Details (2)
- 13 - S5 - Structural Details (3)
- 14 - S6 - Structural Details (4)
- 15 - M1 - HVAC

- 16 - E1 - Electrical Notes
- 17 - E2 - Electrical Layout
- 18 - E3 - Electrical Elevations
- 19 - E4 - Power Requirements
- 20 - E5 - Details - Interconnections

**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.**  
 Pre Installation documents for GE Healthcare products can be accessed on the web at: [www.gehealthcare.com/siteplanning](http://www.gehealthcare.com/siteplanning)

GE does not take responsibility for any damages resulting from changes on drawings made by others. Errors may occur by not referring to the complete set of final issue drawing. GE cannot accept responsibility for any damage due to the partial use of GE final issue drawings, however caused. All dimensions are in millimeters unless otherwise specified. Do not scale from printed pdf files. GE accepts no responsibility or liability for defective work due to scaling from these drawings.

<b>TYPICAL</b>					
----					
----					



GE Healthcare

----

## DISCOVERY MI-DR PET/CT FINAL STUDY

Drawn by	Verified by	Concession	S.O. (GON)	PIM Manual	Rev
PMM	BAP	-	-	5746684-1EN	3
Format	Scale	File Name		Date	Sheet
A3	1/4"=1'-0"	EN-PET-TYP-DISCOVERY-MI-DR-WEB.DWG		15/Oct/2020	01/20

## DISCLAIMER

### GENERAL SPECIFICATIONS

- GE 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 GE 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 GE, 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. GE 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 GE 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 GE 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 GE. 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 GE 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. GE does not take responsibility for the specification or provision of radio-protection.

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

## GLOBAL SITE READINESS CHECKLIST (DI)

DOC1809666 Rev. 7

Site Ready Checks at Installation
EHS Site Requirements
Overall access route to the scan room free from obstruction / high hazards.
Enough space to store tools, equipment, parts, install waste and the general area free from obstruction and trip hazards.
Enough necessary facilities for the GE employees available.
No 3rd parties working in the area that may affect the safety of the installation activity.
Area free from any chemical, gas, dust, welding fume exposure and has painting been completed and dry.
All emergency routes identified, signed and clear from obstruction.
Accessible single source lockable panel that LOTO can be applied to for GE equipment installation (MDP and/or PDU).
There are no other conditions or hazards that you have observed or have been made aware of by the customer or contractors on site.
Required for Mechanical Install start
Room dimensions, including ceiling height, for all Exam, Equipment/Technical & Control rooms meets GE specifications.
Ceiling support structure, if indicated on the GE drawing, is in the correct location and at the correct height according to the Original Equipment Manufacturer specifications.
Levelness and spacing has been measured, and is ready for the installation of any GE supplied components.
Overhead support Structure (unistrut) has been confirmed with customer/contractor to meet required GE provided criteria.
Finished ceiling is installed. If applicable ceiling tiles installed per PMI discretion.
Floor levelness/flatness is measured and within tolerance, and there are no visible defects per GEHC specifications.
Entry door threshold meets PIM requirement
Floor Strength and thickness have been discussed with customer/contractor and they have confirmed GE requirements are met.
Rooms that will contain equipment, including staging areas if applicable, are construction debris free. Precautions must be taken to prevent debris from entering rooms containing equipment.
Cable ways (floor/wall/ceiling/Access Flooring) are available for installation of GE cables are of correct length and diameter.
Cable ways routes per GE Final drawings and cable access openings areas installed at a time determined by GEHC PM. Surface floor duct can be installed at time of system installation.
Adequate room illumination installed and working.
Customer supplied countertops where GE equipment will be installed are in place.
Nuclear Medicine systems levelness measurement survey must be provided to GE prior the delivery.
Required for Calibration start
HVAC systems Installed, and the site meets minimum environmental operational system requirements.
System power & grounding (PDB/MDP) is available as per GE specifications.
System power & grounding (PDB/MDP) is installed at point of final connection and ready to use. Lock Out Tag Out is available.
PMI to confirm all feeder wires and breaker are size appropriately. EPO installed if needed.
PMI to confirm with electrician all power and signal cables are well terminated ensuring there are no loose connections.
Network outlets installed.
Computer network available and working.
Site has license for using/importing radioactive sources and a Hot Lab is available. Radioactive Sources should be available for system calibration during installation.
Lead doors and windows complete or scheduled to be installed. If applicable, radiation protection (shielding) finished & radioprotection regulatory approval for installation obtained.

Note: The details shown here are only an extract from DOC1809666. For the complete document please contact your PMI.

## ENVIRONMENT

### ALTITUDE

- Operating altitude: from -150 m [-492 ft] (below) to 4000 m [13123 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

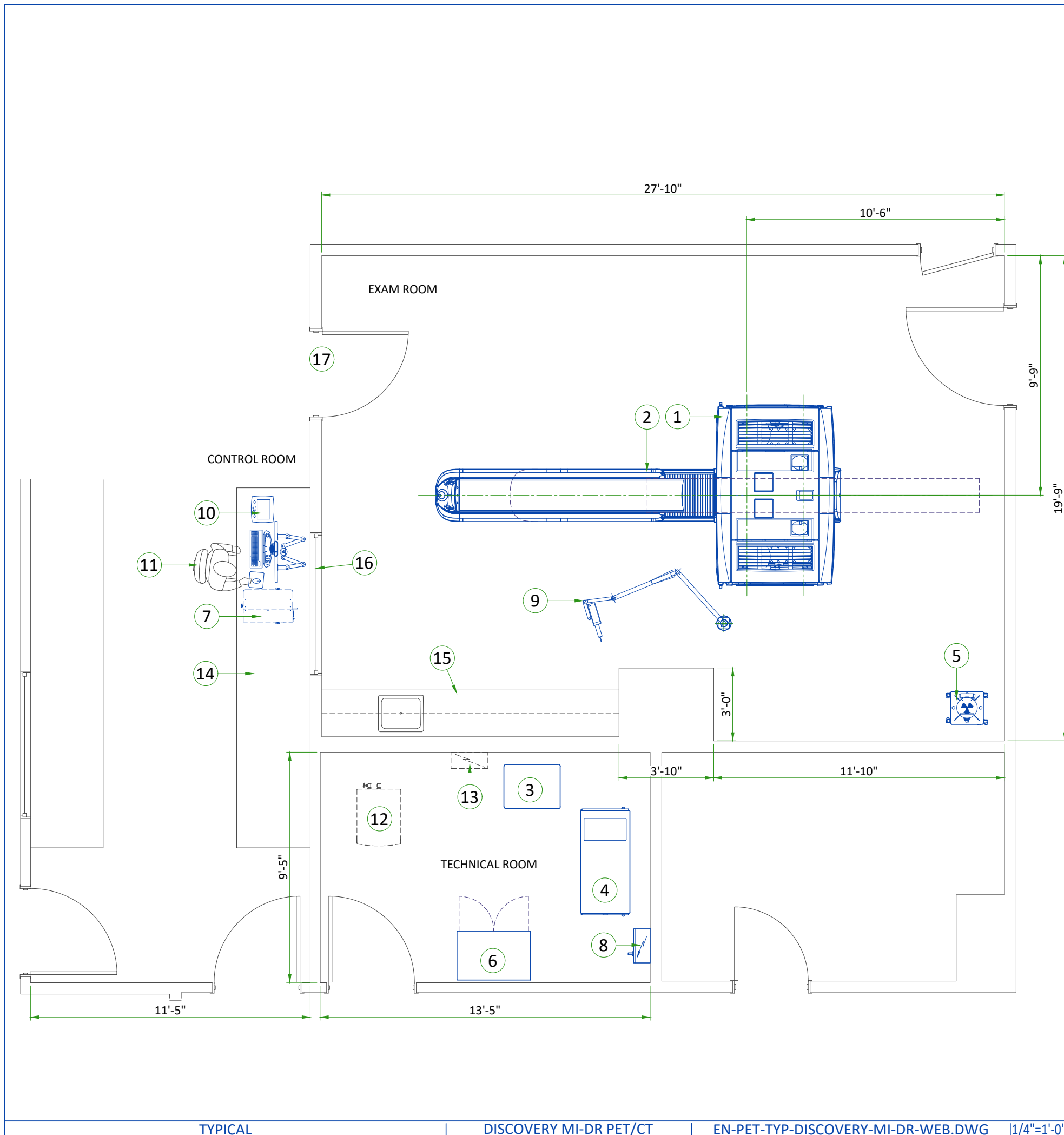
- Shock Restrictions: The system cannot tolerate shock or vibration. System components cannot be tipped, dropped, or hoisted.
- The scanning facility shall be isolated from vibration such as; hospital power plants, pumps, motors, air handling equipment, air conditioning units, nearby rooms with exercise 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/s<sup>2</sup> 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.

## CUSTOMER SITE READINESS REQUIREMENTS

- 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. Capability for image analysis,
  4. Restrooms.
- Provide for refuse removal and disposal (e.g. crates, cartons, packing)
- 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 preinstallation manual for the vibration specification.

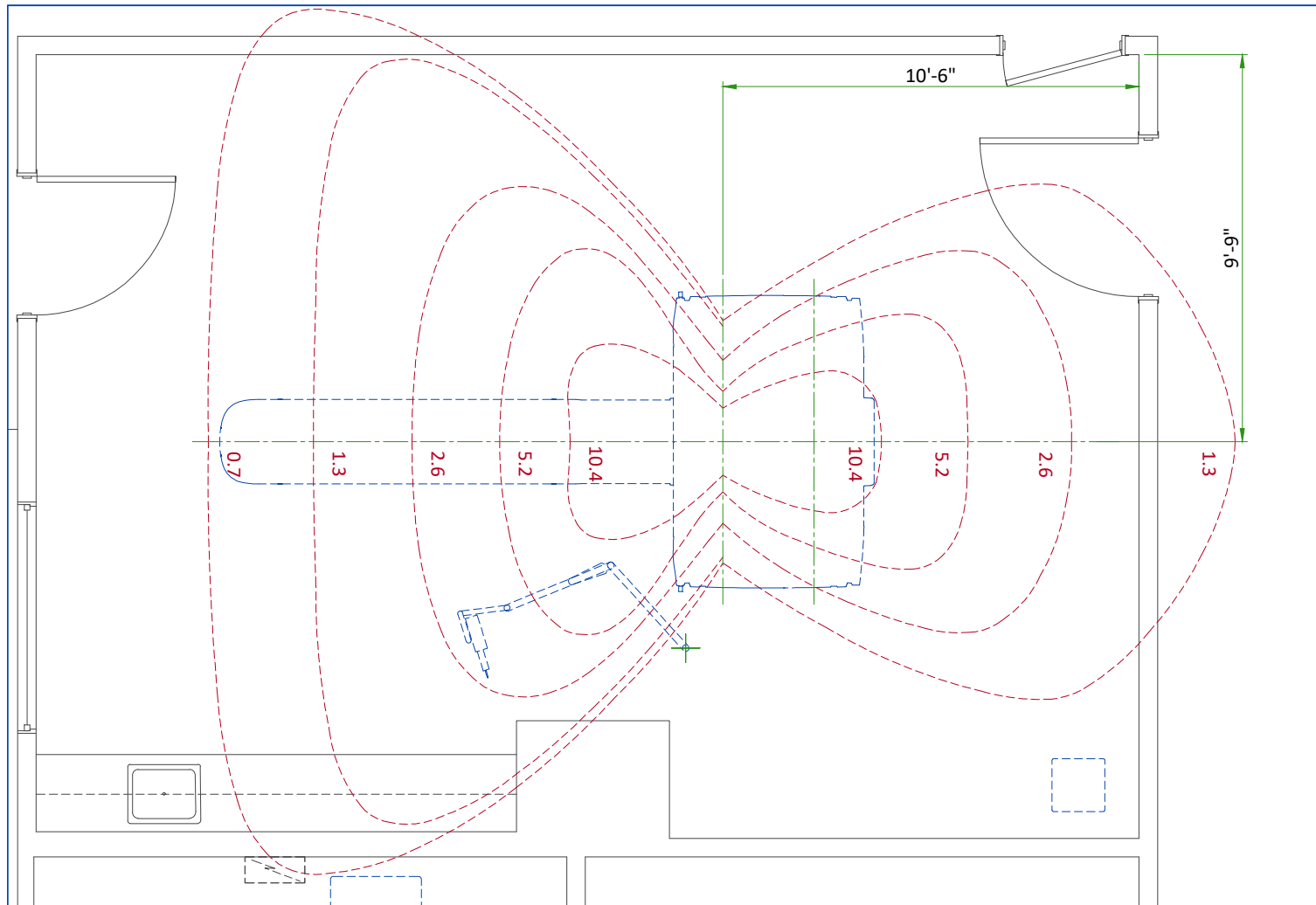


LEGEND						
A	GE Supplied	C	Customer/contractor supplied and installed			
B	GE Supplied/contractor installed	D	Available from GE			
E	Existing/Reinstall					
BY	ITEM	DESCRIPTION	MAX HEAT OUTPUT (btu)	WEIGHT (lbs)	MAX HEAT OUTPUT (W)	WEIGHT (kg)
A	1	Discovery MI -DR Gantry	24737	6702	7200	3040
A	2	Patient Table	1023	1808	300	822
A	3	Power Distribution Unit	3400	813	1000	370
A	4	PARC4	4436	540	1300	246
A	5	Annulus Phantom Safe	-	330	-	149
A	6	Service Cabinet	-	90	-	40
A	7	Operators Console	3625	144	1100	65
D/B	8	Main Disconnect Panel	-	55	-	25
D	9	Injector - ceiling mounted	-	79	-	36
D	10	Injector Control and Electronics	320	22	94	10
D	11	Operators Chair	-	-	-	-
D	12	Chiller (Future Upgrade)	-	-	-	-
D	13	Power Distribution Box (Future Upgrade)	-	-	-	-
C	14	Counter top for equipment				
C	15	Counter top with sink, base and wall cabinets				
C	16	Lead glass window				
C	17	Minimum door opening for equipment delivery is 55 in. w x 80 in. h [1397mm x 2032mm], contingent on a 96 in. [2438mm] corridor width				

Exam Room Height	
Finished Ceiling Height	9'-0"

For Accessory Sales: (866) 281-7545 Options 1, 2, 1, 2 or mail to: [gehaccessorysales@ge.com](mailto: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  $\pm 40\%$ .

## RADIOACTIVE ISOTOPES

### RADIOACTIVE ISOTOPES AND RADIOPROTECTION

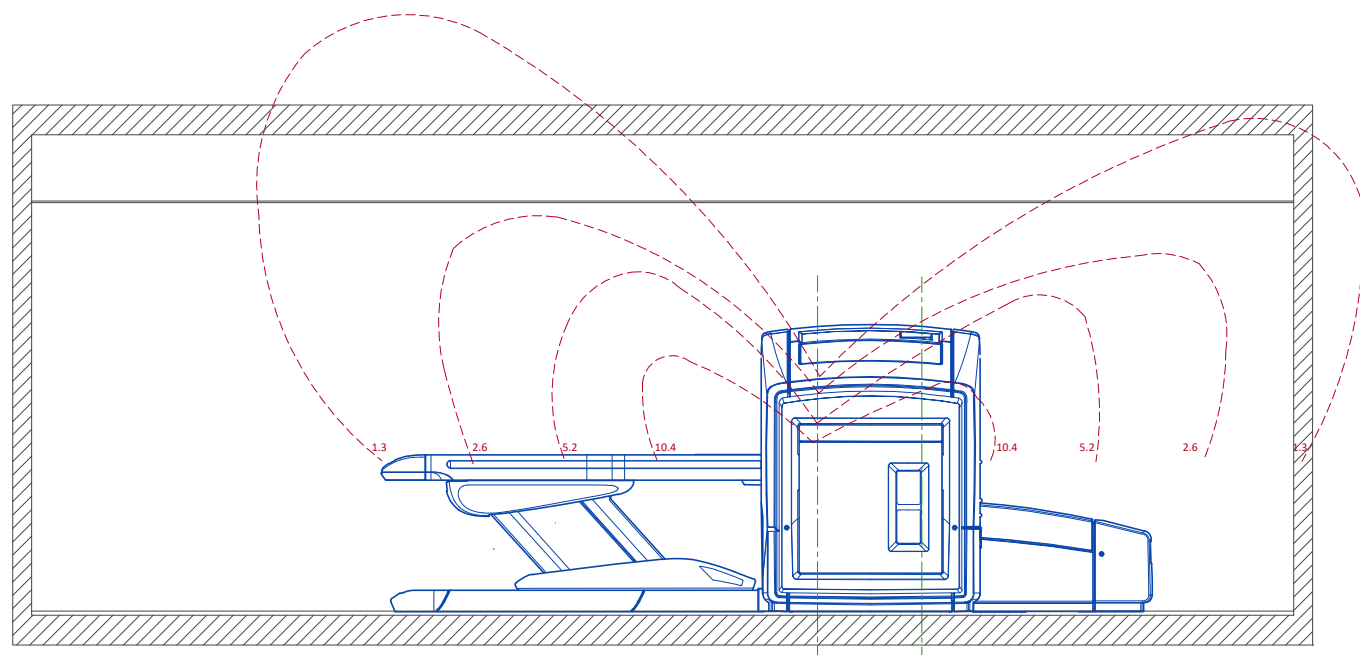
Since the system produces X-ray radiation and involves the use of radioactive isotopes, compliance with Nuclear Regulatory Commission regulations (or country similar regulatory requirements), must be adhered to and all permissions obtained well in advance.

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.

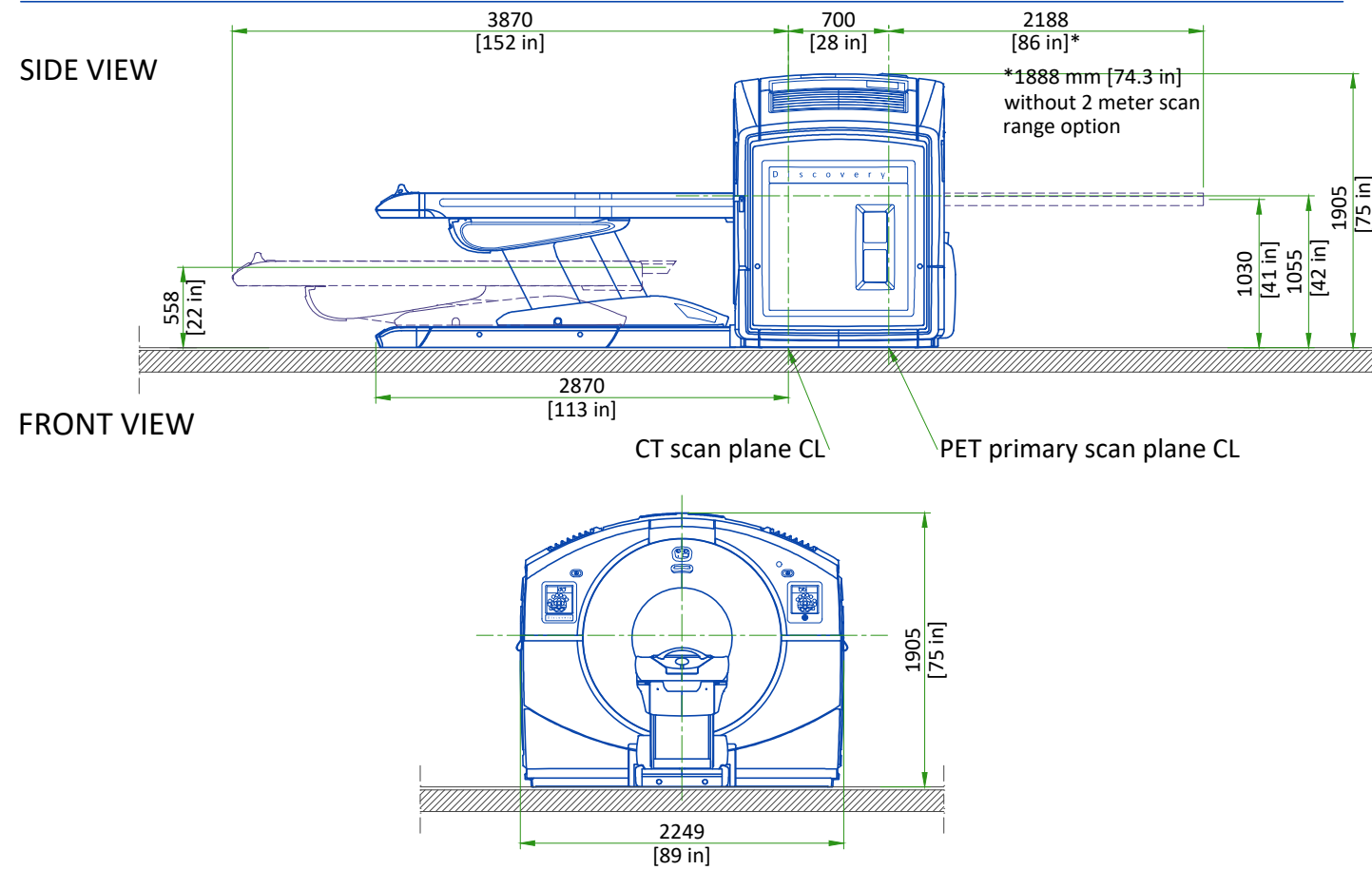
It is essential that regulatory compliance and preparations are completed early so that required source materials can be obtained prior to installation, including calibration sources and isotopes. These sources and isotopes may have fairly long delivery lead times and a short half-life, so that it may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

### RADIOACTIVE SOURCE - ISOTOPE

The PET/CT system uses one radioactive source during calibration and the Daily QA Check.	
Isotope	Ge-68
Activity level	55 MBq $\pm$ 20%
Typical Positron Emitting Isotopes include	Fluorine 18
	Carbon 11
	Nitrogen 13
	Oxygen 15
It is customer's responsibility provide isotopes for system calibration and prepare the required doses.	



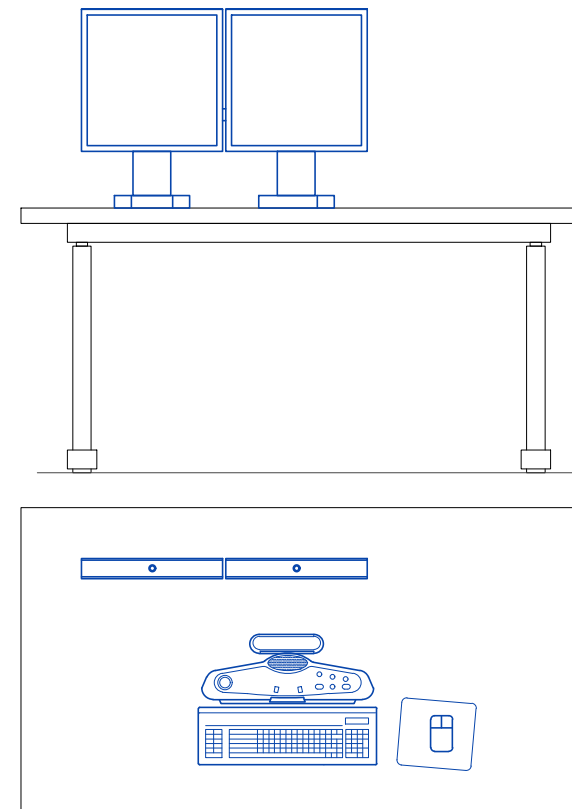
### GANTRY WITH PATIENT TABLE



SCALE 1:50

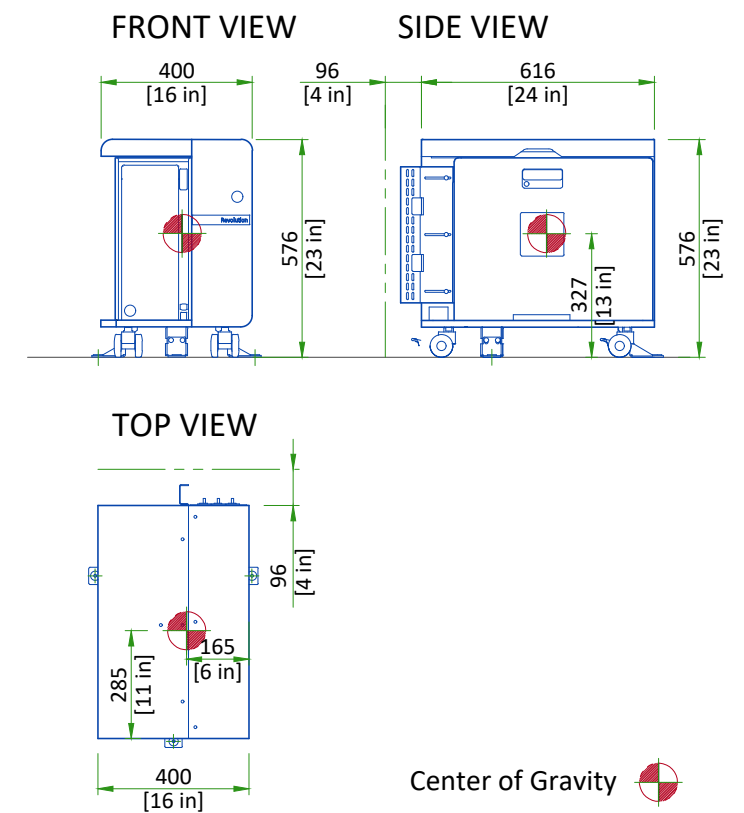
### CT CONSOLE

#### CUSTOMER SUPPLIED TABLE

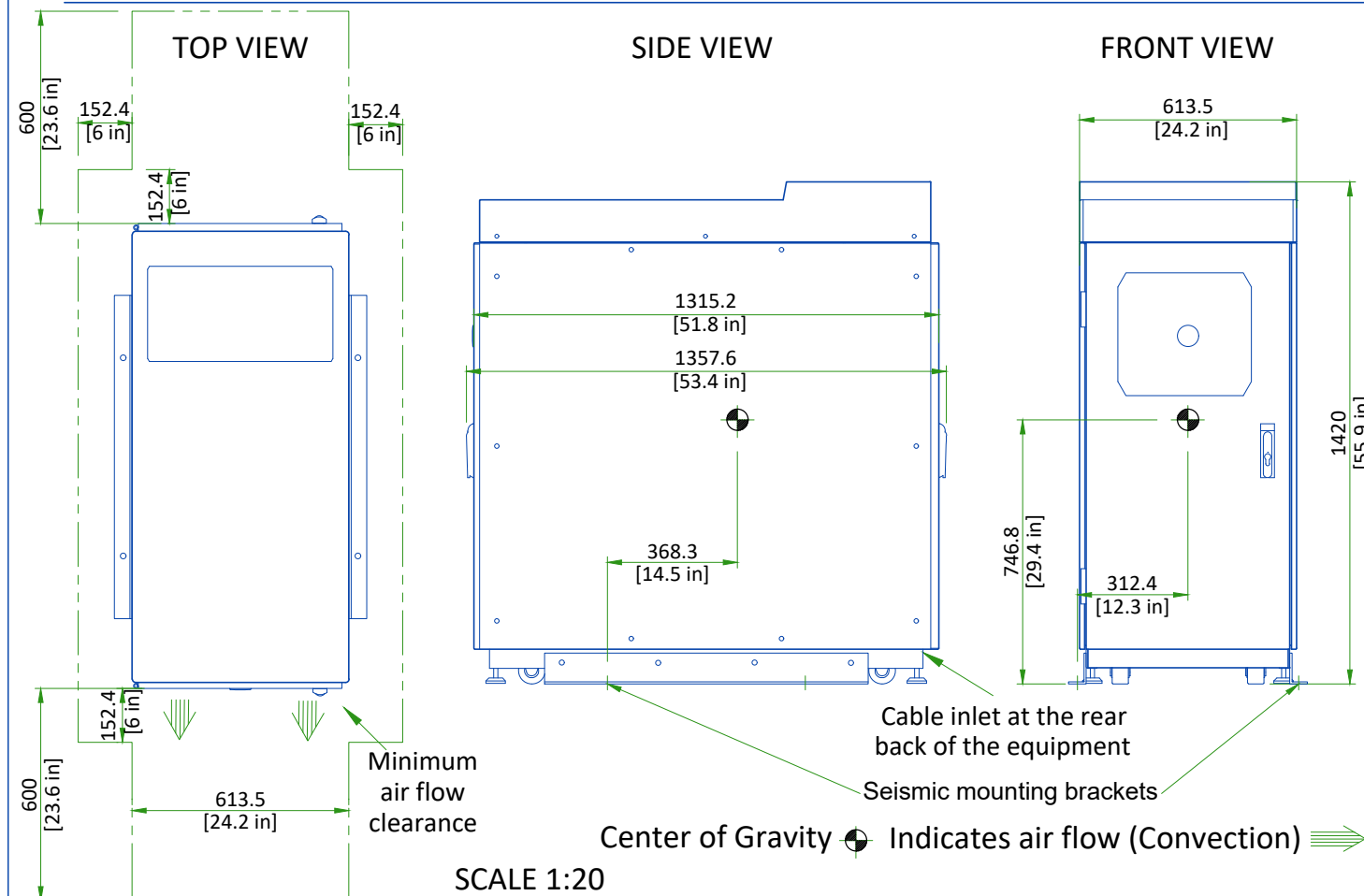


SCALE 1:20

#### CONSOLE DIMENSIONS

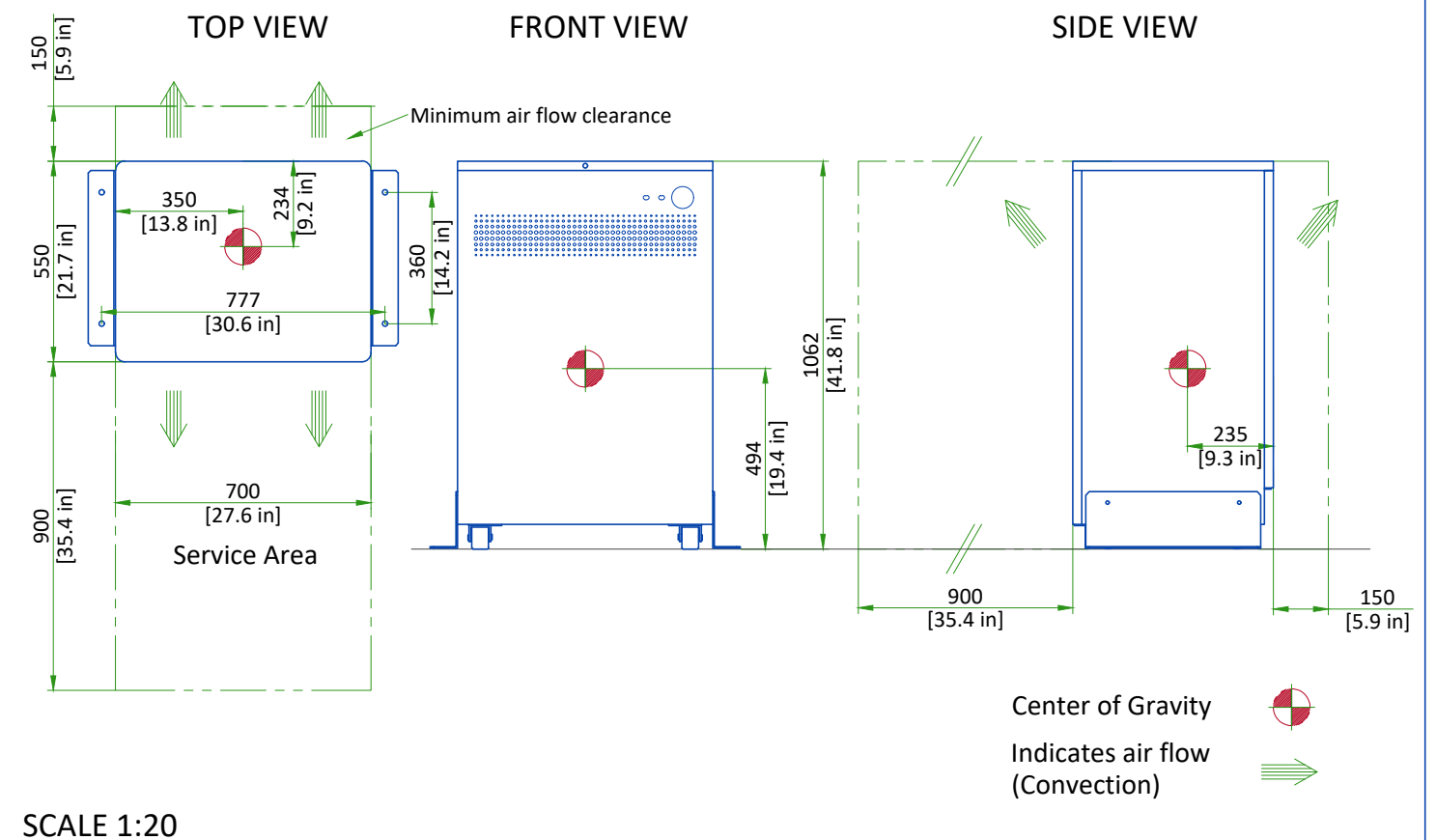


### PARC4 RECONSTRUCTION CABINET



SCALE 1:20

### POWER DISTRIBUTION UNIT (PDU)



SCALE 1:20



## 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

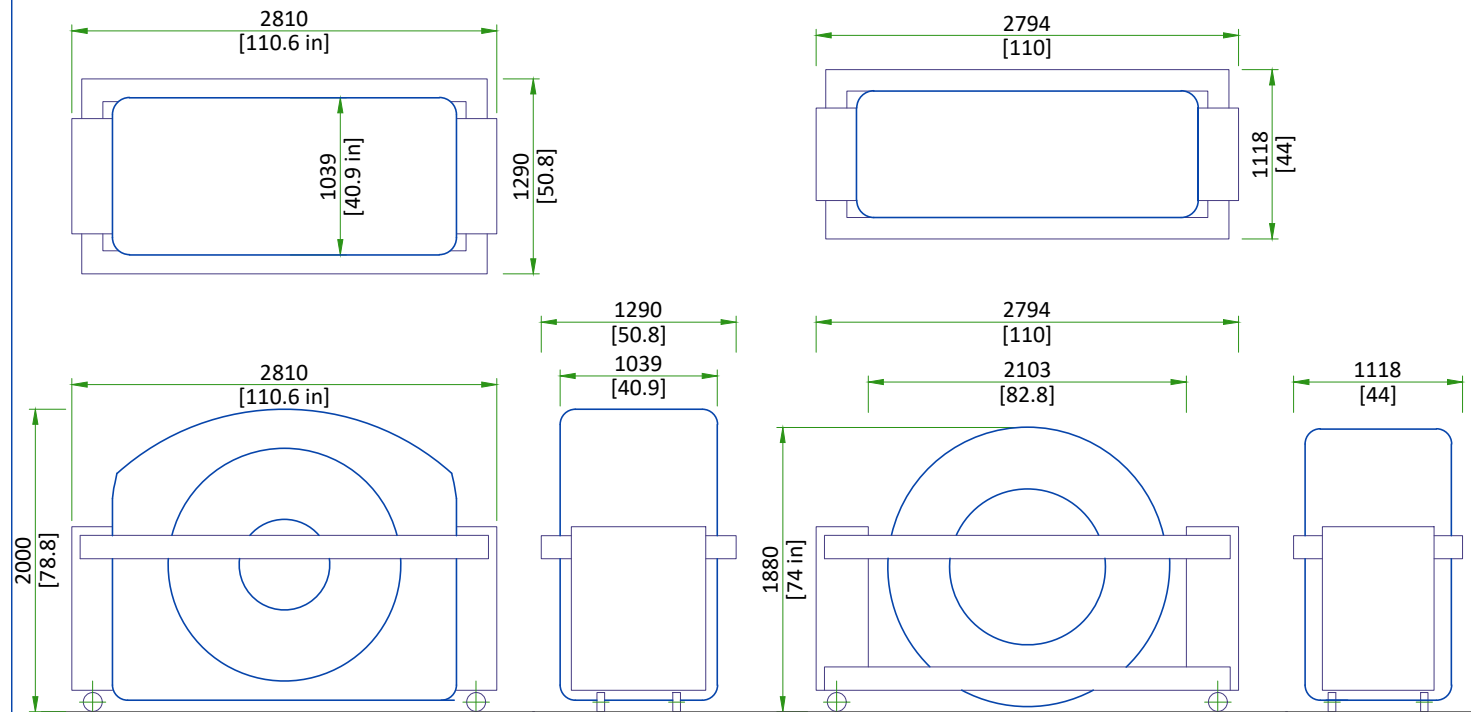
		mm	in	kg	lbs
CT GANTRY	LENGTH	2810	111	2050	4520
	WIDTH	1290	51		
	HEIGHT	2000	79		
PET WELDMENT GANTRY	LENGTH	2794	110	1295	2855
	WIDTH	1118	44		
	HEIGHT	1880	74		
PATIENT TABLE	LENGTH	3836	151	1241	2736
	WIDTH	864	34		
	HEIGHT	1410	55.5		

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.

## SHIPPING DOLLY DIMENSIONS FOR GANTRY

### CT GANTRY

### PET IMAGE RING FOR WELDMENT GANTRY



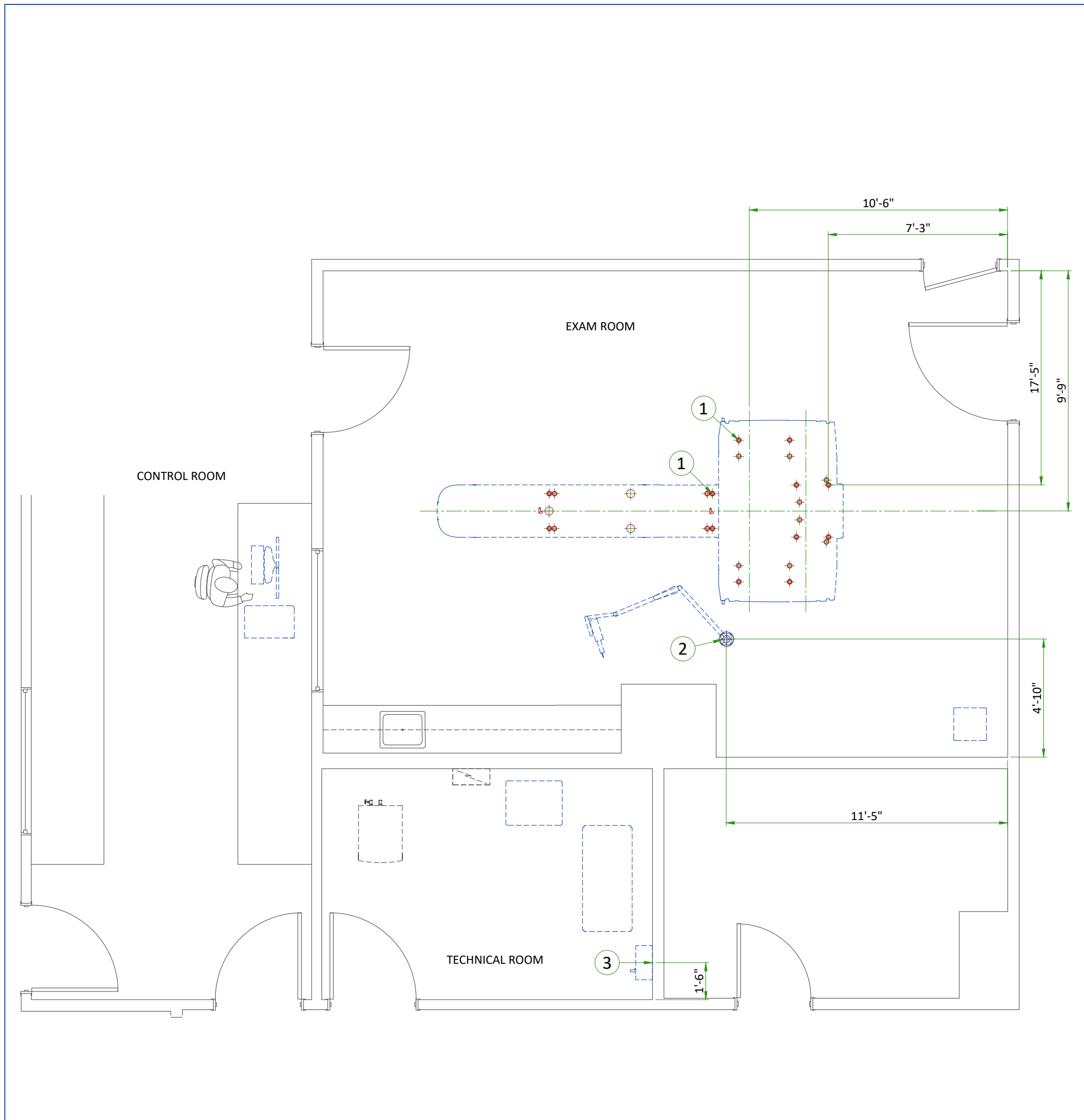
Weight with dollies and side rails = 2050 kg [4520 lbs]

Weight with dollies and side rails = 1295 kg [2855 lbs]



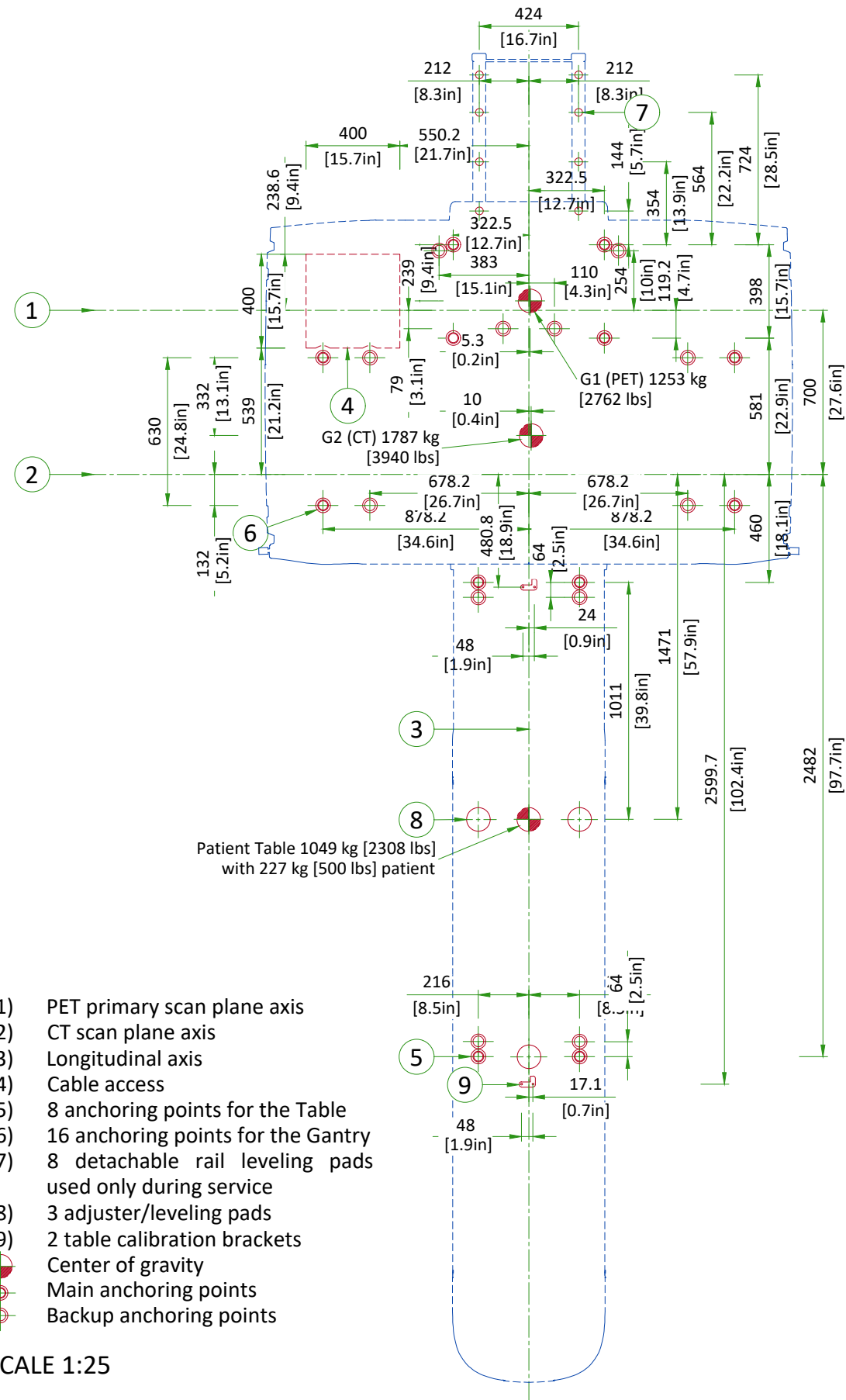
## STRUCTURAL NOTES

- 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 detail on Structural Detail sheets for more information.
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

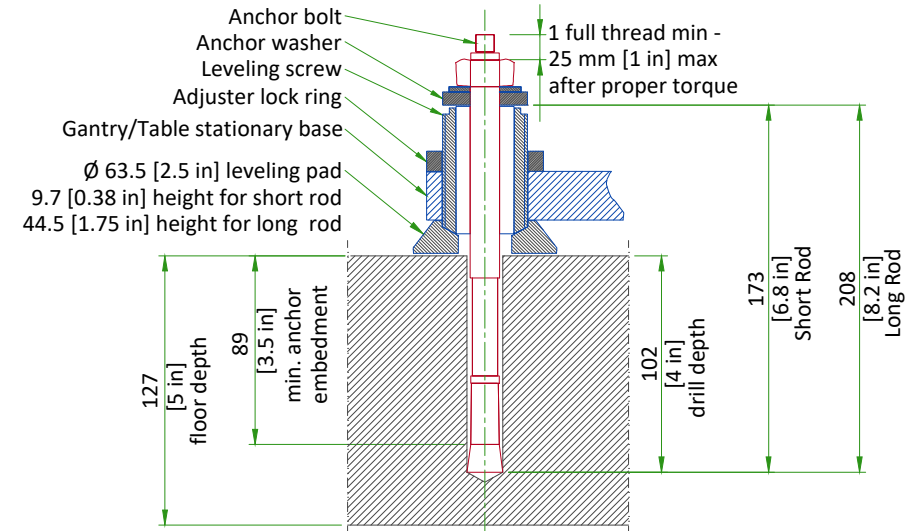
# ANCHORING/LOADING DISTRIBUTION TO THE FLOOR



SCALE 1:25

# ANCHORING AND FLOOR REQUIREMENTS

## GE SUPPLIED GANTRY ANCHORS (2106573)



## FINISHED FLOOR REQUIREMENTS

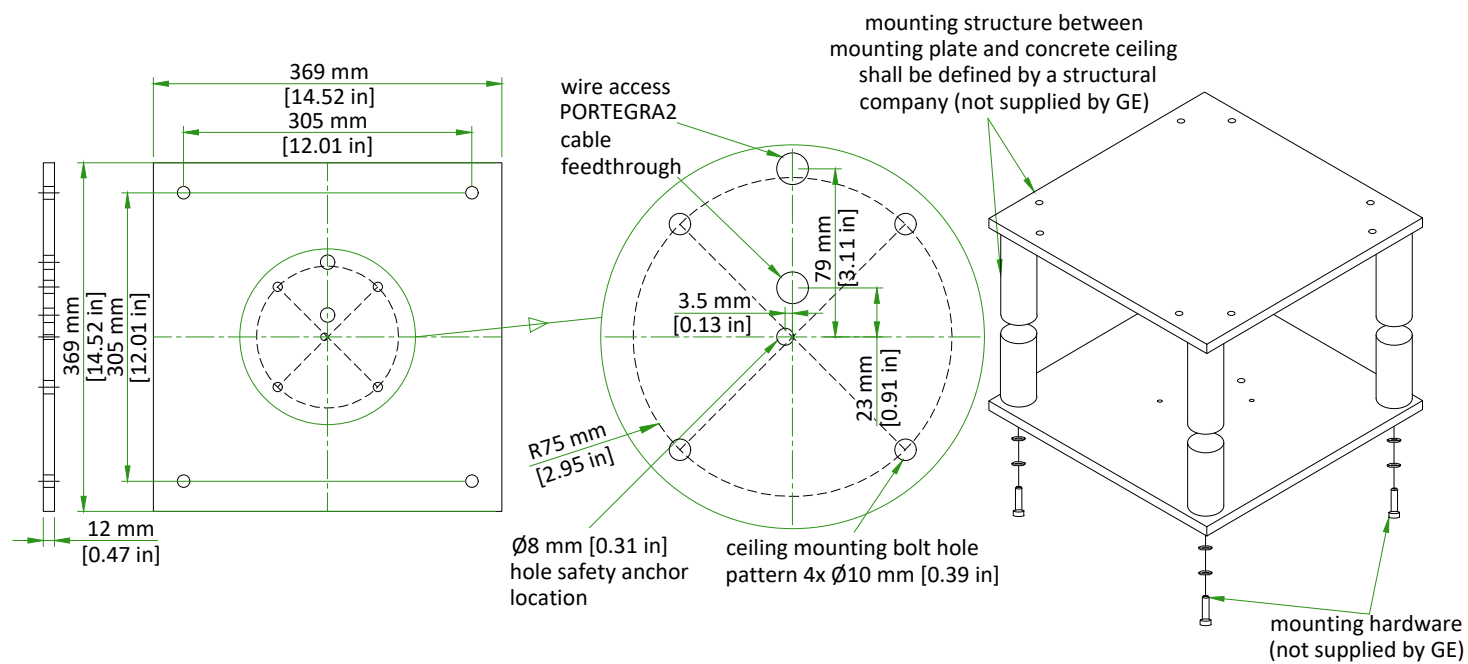
- Installation requires a finish floor in the scan and control rooms.
- The floor surface in the scan room directly under the gantry and table must be level.
- The floor shall be no greater than 6 mm [0.25 in] out of level over a 3048 mm [10 ft] range, with level defined as the horizontal surface between 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.
- These requirements apply to all installation types.

NOT TO SCALE

## NOTES:

If the concrete floor has a floor covering installed over it (such as floor tile), 15 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.)

## CUSTOMER/CONTRACTOR SUPPLIED MOUNTING PLATE



The exact location of all five drill holes for MAVIG column has to be kept, otherwise installation can't be accomplished. Column flange and safety chain fixings to concrete or to structure other than MAVIG anchoring plate or MAVIG bridge shall be defined by a structural company. 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

## 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.

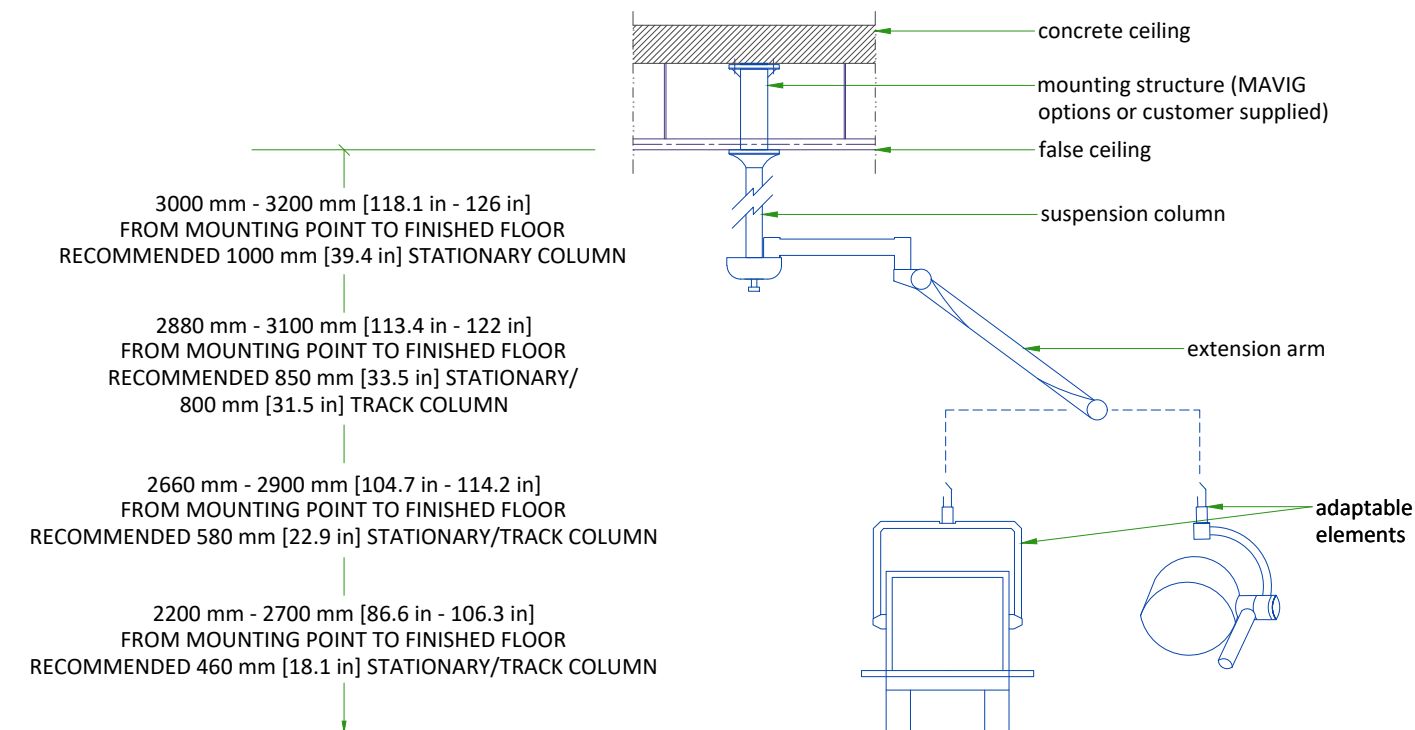
Under GE responsibility or under Customer responsibility, for all pre-installations, whatever is the supporting structure (bridge, chair, Unistrut channel, other channels, direct anchorage in concrete, transversal beam, etc. ...) a certificate must be obtained from a structural engineer.

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



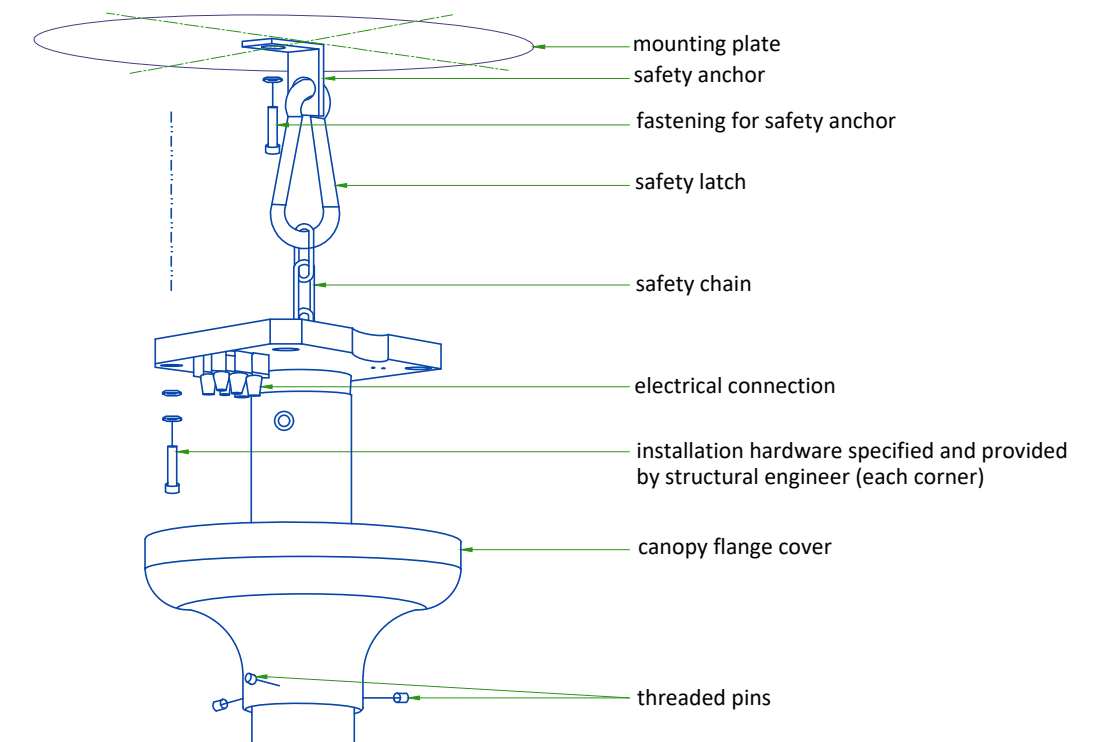
For rooms with higher mounting point than 3200 mm [126 in], a ceiling construction between structural ceiling and vertical column is suggested which needs to be designed by a structural engineer.

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.

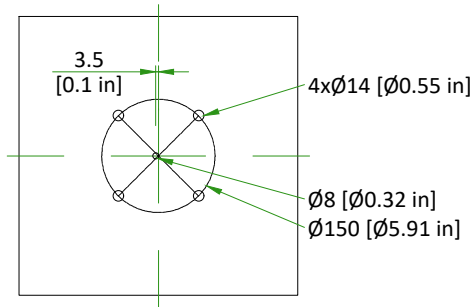
All design and pre-installation activity must be done in accordance of the MAVIG Installation manual.

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

NOT TO SCALE

## LCD MONITOR MOUNTING PLATES

CUSTOMER SUPPLIED BOOM PEDESTAL MOUNTING PLATE



CUSTOMER SUPPLIED JUNCTION BOX MOUNTING PLATE

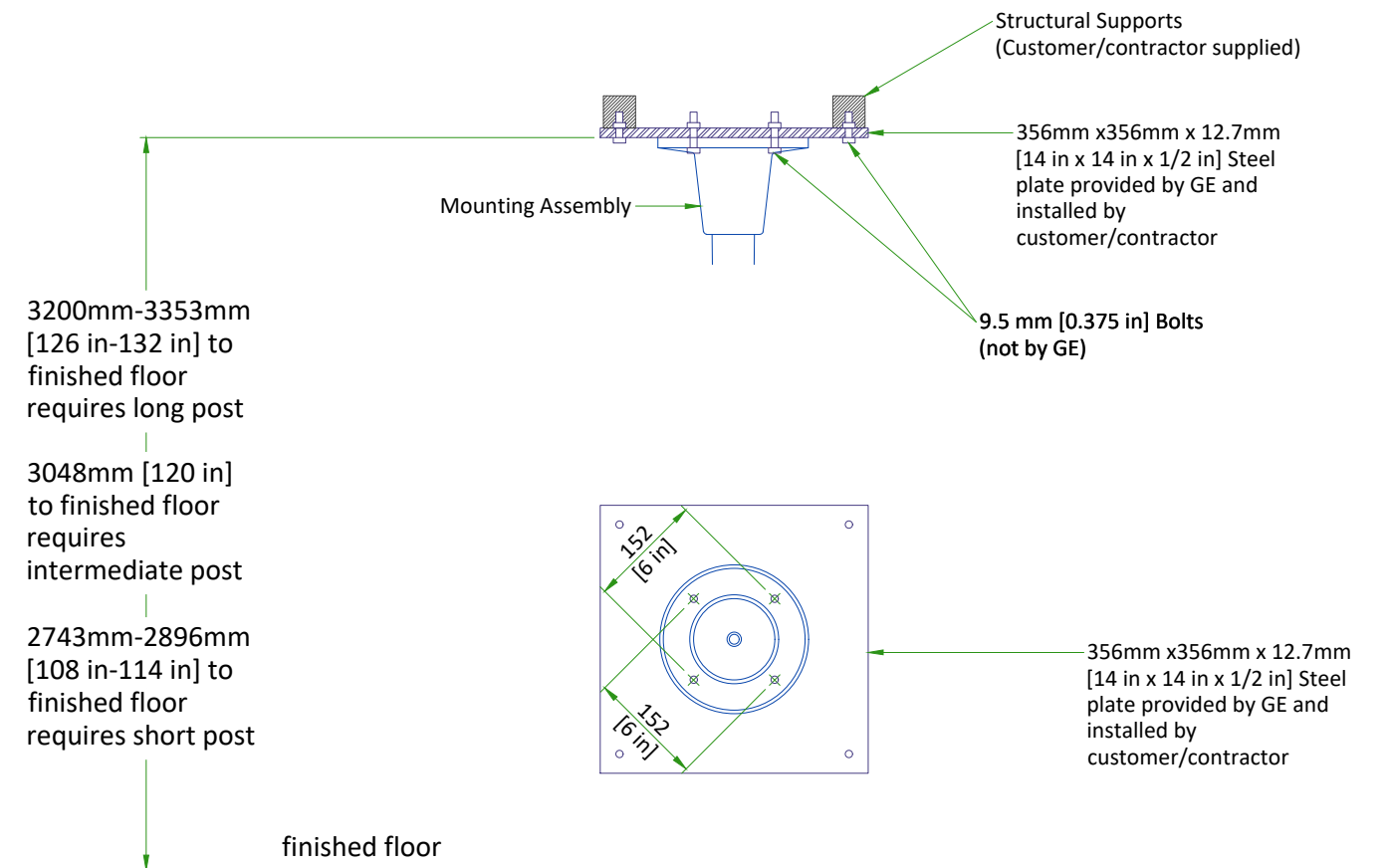
A 152 mm x 152 mm x 102 mm [6 in x 6 in x 4 in] or equivalent ceiling box is required to be flush mounted next to the ceiling plate. There should be two (2) conduits exiting into the box and the box grounded to the mounted plate. The electrical box cover plate must be flush mounted to the finished ceiling and with provision to add a 102 mm x 102 mm [4 in x 4 in] centered GE-supplied electrical cover ceiling plate.

- The support structure for a ceiling-mounted option using a Mavig pedestal, requires a flush ceiling mounting plate.
- Detailed instruction for hole size and a template is available from Mavig or in their Portegra Installation Manual.
- GE supplied boom weight: 30.9 kg [68 lbs]

NOTE: The customer's architect is responsible for designing and installing the Junction Plates. The system manufacturer will NOT inspect and test that the Junction Plates meet the loading capacity specified (recommend a 6x safety factor).

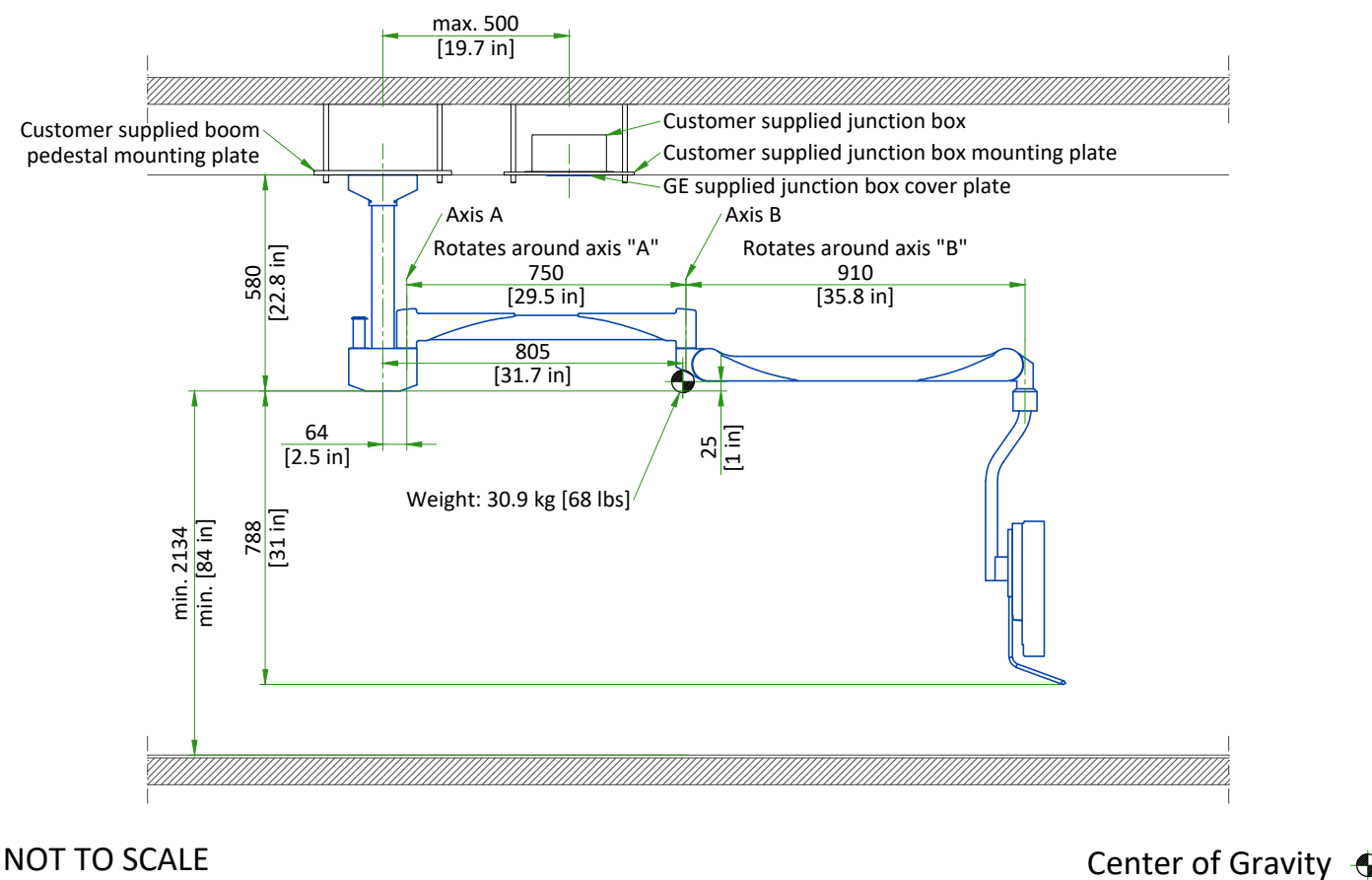
NOT TO SCALE

## MEDRAD MOUNTING DETAILS FOR CEILING INJECTOR



Scale 1:10

## LCD MONITOR SUSPENSION



NOT TO SCALE

Center of Gravity

## MEDRAD MOUNTING DETAILS FOR CEILING INJECTOR

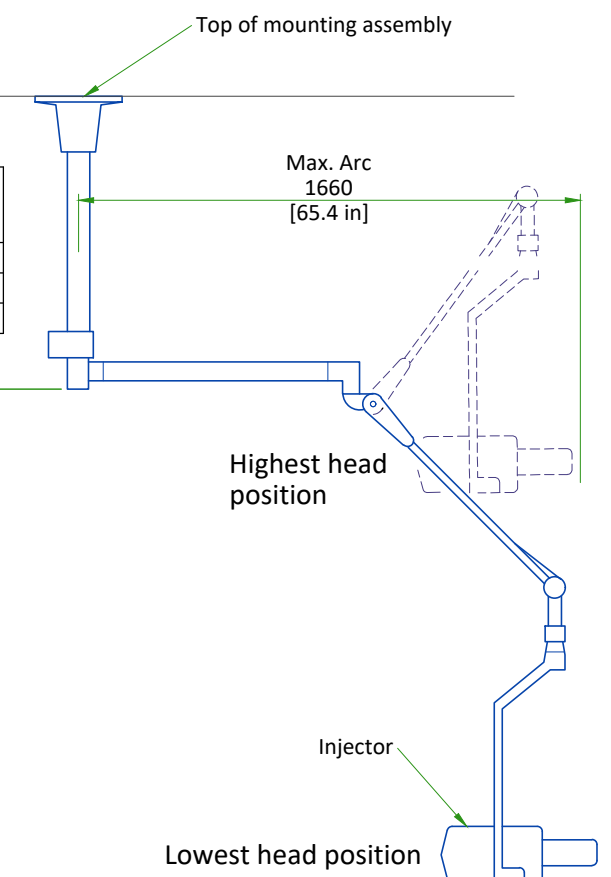
Verify mounting assembly dimensions with injector manufacturer.

Post	Lengths		GE ECat No.
	in	mm	
Short	22.8	580	E8007NB, ND, NG, NY, PB & PE
Intermediate	33.5	850	E8007PP, PN, PK, PR & PY
Long	39.4	1000	E8007NE, NF, NJ, NN, PD & E8018AA

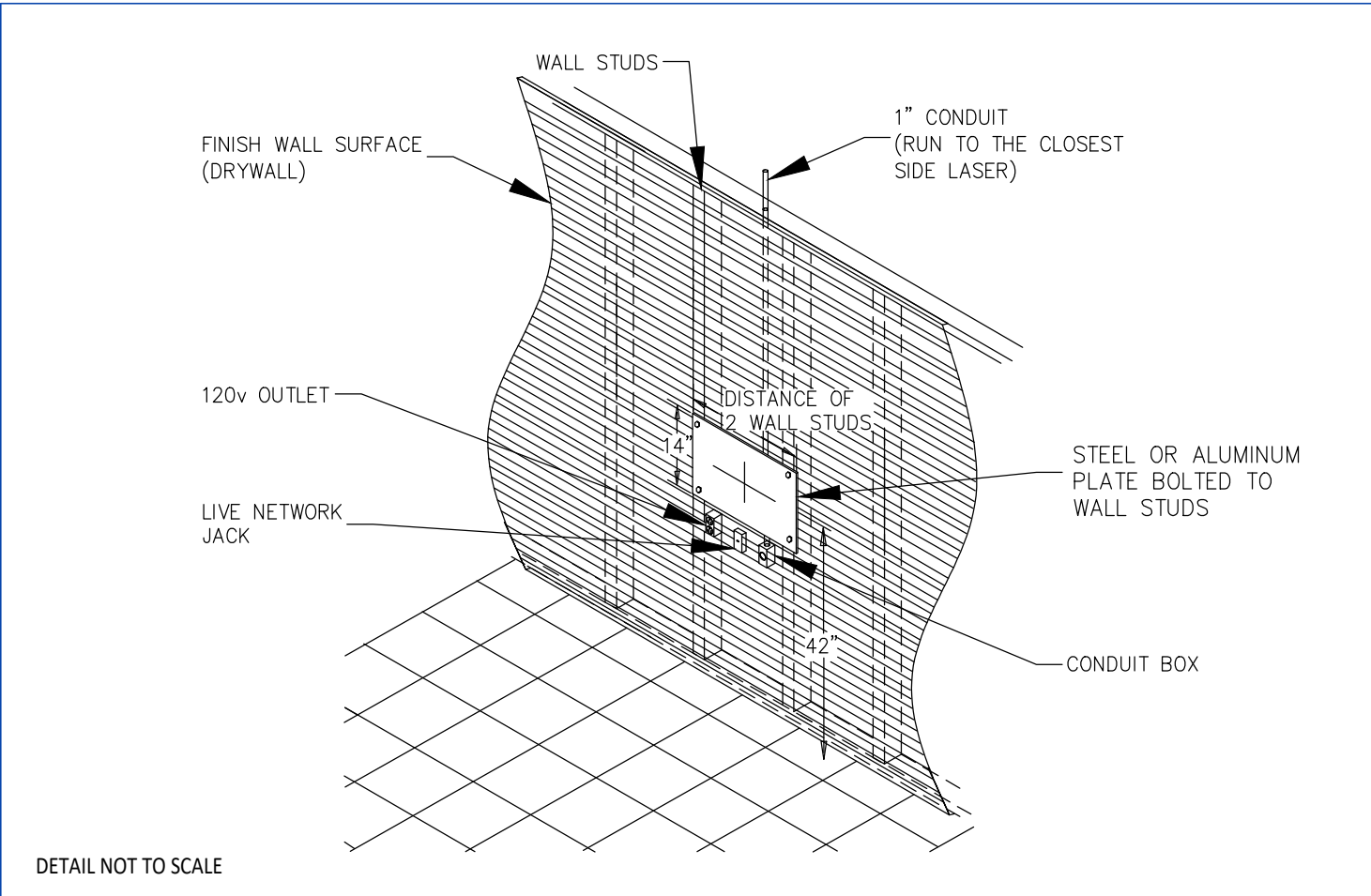
Recommended height to floor  
2083mm - 2235mm [82 in - 88 in]

Post	Min. Plate Height		Max. Plate Height	
	in	mm	in	mm
Short	108	2743	114	2896
Intermediate	120	3048		
Long	126	3200	132	3353

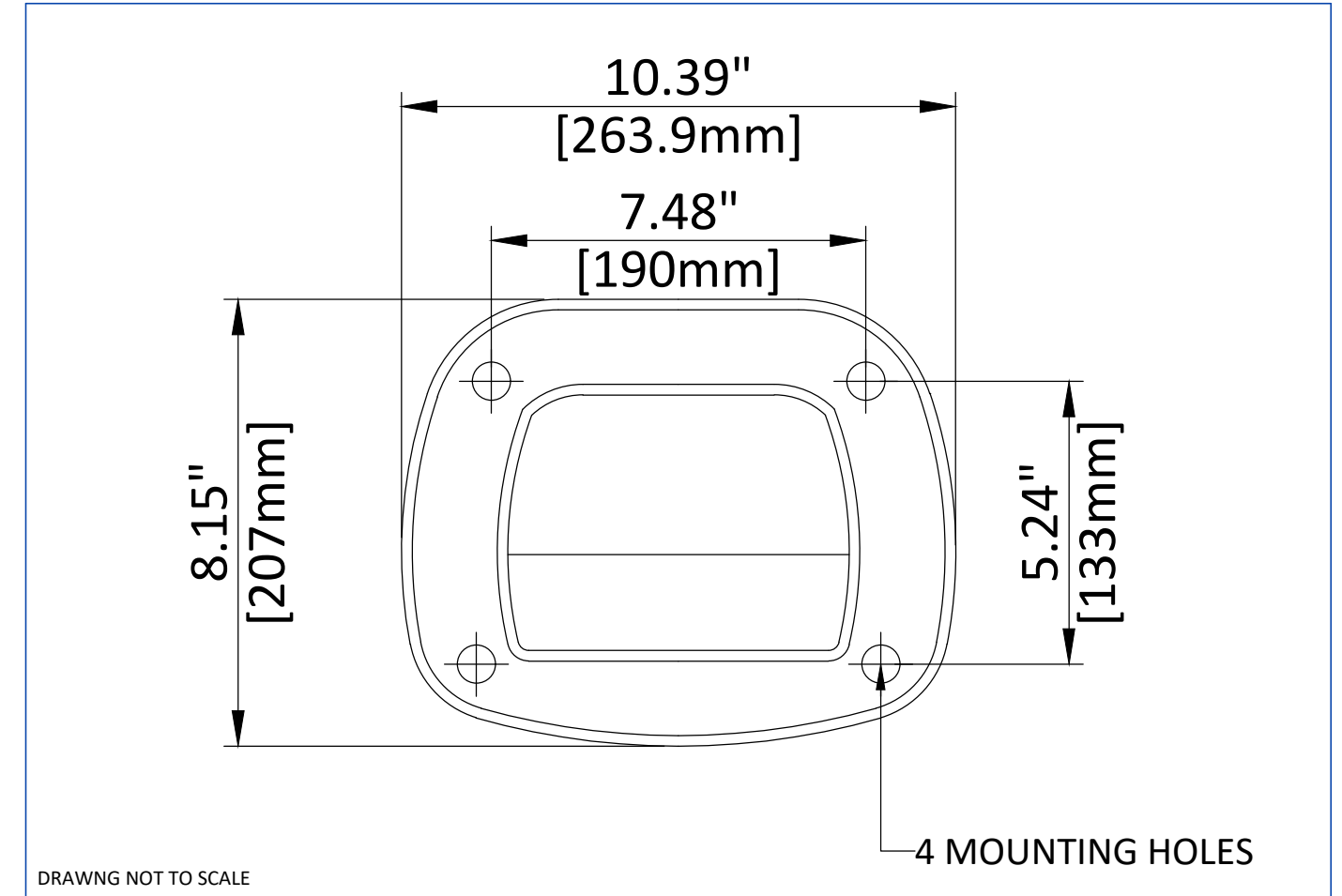
Not to Scale



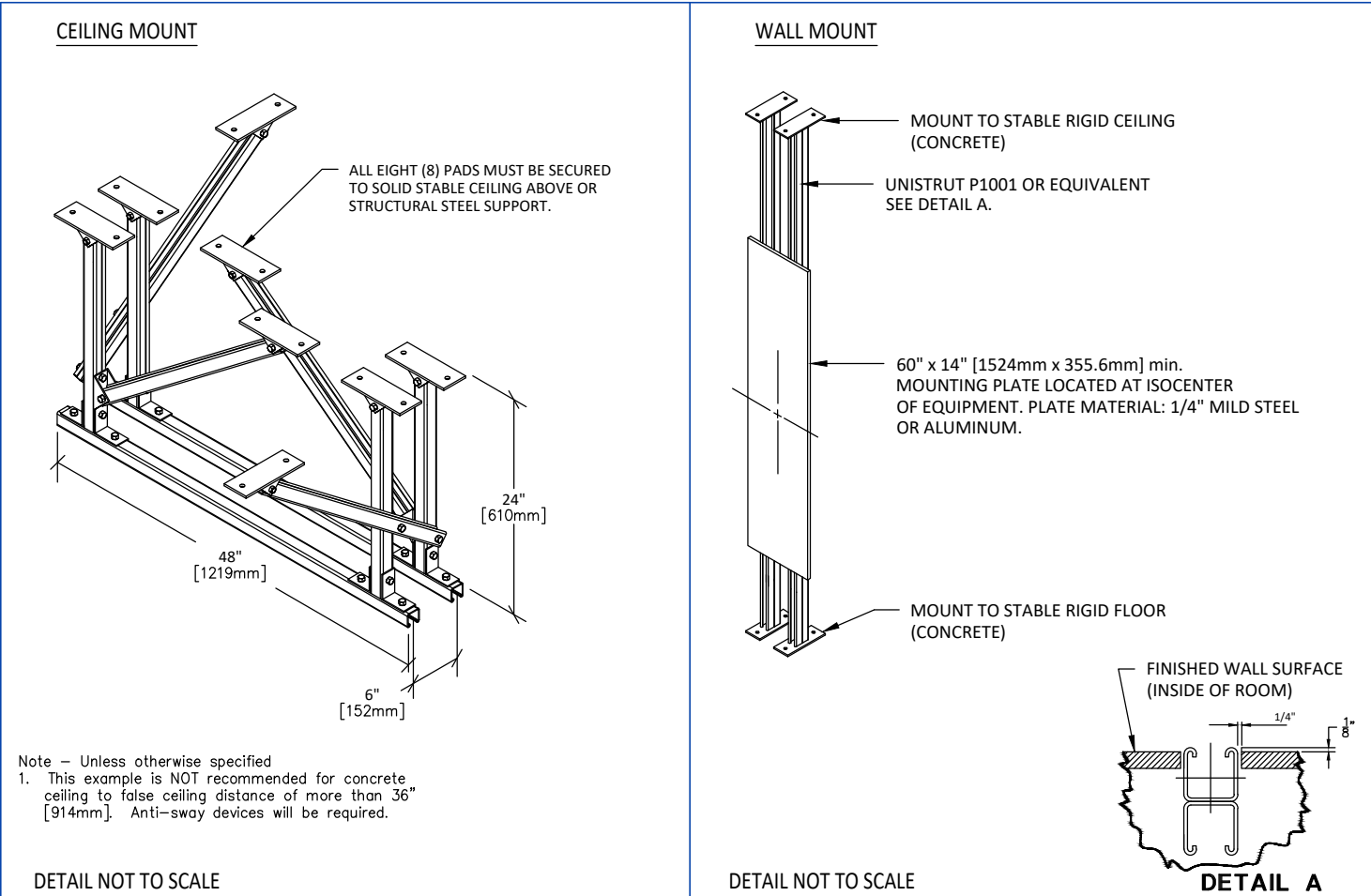
## MOUNTING DETAILS FOR LASER CONTROL MONITOR



## FLOOR MOUNTED LASER DETAIL



## MOUNTING DETAILS FOR CEILING/WALL LASERS



## 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	22°C	26°C	18°C	22°C	26°C	18°C	22°C	26°C
	64°F	72°F	79°F	64°F	72°F	79°F	64°F	72°F	79°F
Temperature gradient	≤ 3°C/h			≤ 3°C/h			≤ 3°C/h		
	≤ 5.4°F/h			≤ 5.4°F/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)
Exam Room	PET Gantry	1.8	5971
	CT Gantry	5.5	18766
	Patient table	0.3	1024
	<b>TOTAL</b>	<b>8</b>	<b>25761</b>
Exam room or Technical room*	Power distribution unit (CT PDU)	1.0	3400
	PARC 4 (Reconstruction Cabinet)	1.3	4436
	<b>TOTAL</b>	<b>2</b>	<b>7836</b>
Control 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
	<b>TOTAL</b>	<b>1</b>	<b>3625</b>
*Technical Room is not mandatory, the placements of these elements are recommended in the Exam Room.			
<b>WARNING</b> This chart contains only the principal components of the PET/CT system and does not include information about non-GE supplied equipment.			

## ELECTRICAL NOTES

1. All wires specified shall be copper stranded, flexible, thermo-plastic, color coded, cut 10 foot long at outlet boxes, duct termination points or stubbed conduit ends. All conductors, power, signal and ground, must be run in a conduit or duct system. Electrical contractor shall ring out and tag all wires at both ends. Wire runs must be continuous copper stranded and free from splices.
  - 1.1. 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. 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.
10. The maximum point to point distances illustrated on this drawing must not be exceeded.
11. Physical connection of primary power to GE equipment is to be made by customers electrical contractor with the supervision of a GE representative. The GE representative would be required to identify the physical connection location, and insure proper handling of GE equipment.
12. 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.

- All junction boxes, conduit, duct, duct dividers, switches, circuit breakers, cable tray, etc., are to be supplied and installed by customers electrical contractor.
- Conduit and duct runs shall have 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.
- General contractor to insert pull cords for all cable run conduits between the equipment room and the operators control room.
- 10 foot pigtailed at all junction points.
- Grounding is critical to equipment function and patient safety. Site must conform to wiring specifications shown on this plan.

## CONNECTIVITY REQUIREMENTS

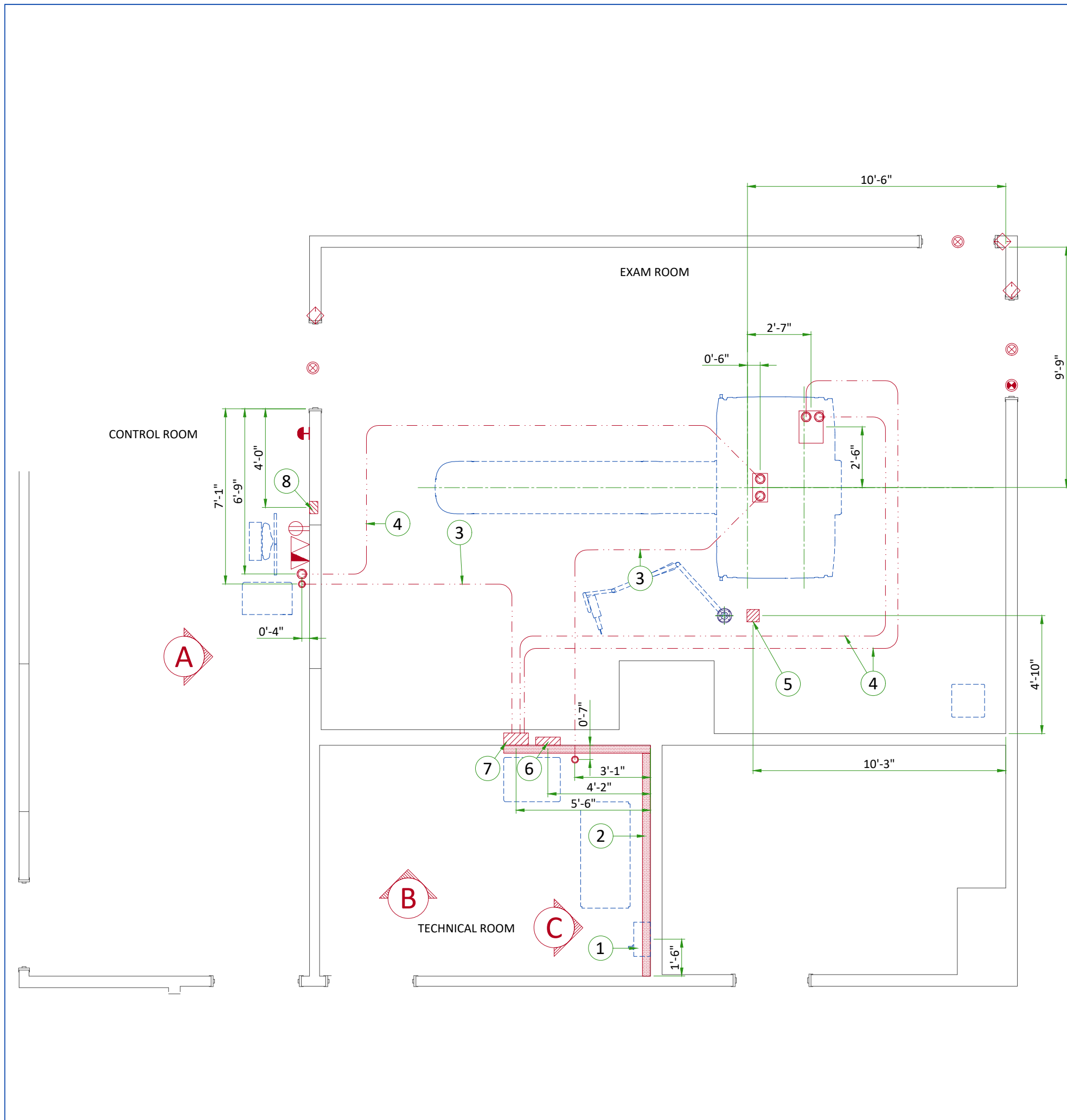
Broadband Connections are necessary between customer's imaging devices and the GE Support Center, starting from the installation process to ensure full support from the Engineering Teams. GE provides remote maintenance and maximum availability for the customer's system, during the equipment's full lifetime. GE guarantees to keep the equipment at a maximum performance level.

Proactive and reactive maintenance are available through utilizing a wide range of digital tools. You may choose from the connectivity solutions listed below:

- Site-to-Site VPN/GE Solution
- Site-to-Site VPN/Customer Solution
- Connection through Dedicated Service Network
- Internet Access - connectivity for InSite 2.0

The requirements for these connectivity solutions are explained in the broadband solutions catalogue (separate document).

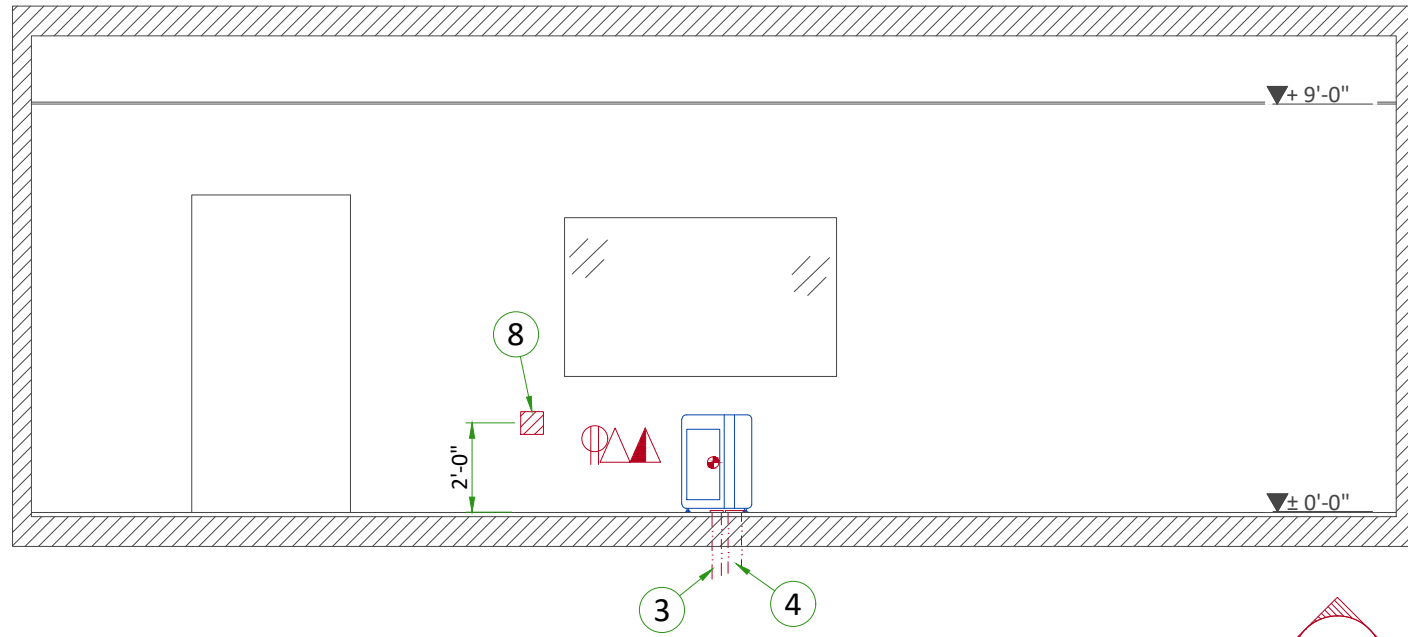




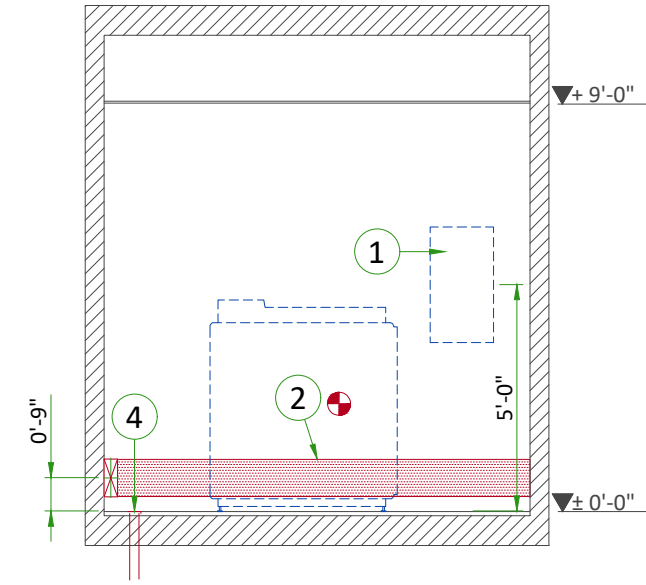
ITEM	DESCRIPTION
<b>FLOOR</b>	
1	Main disconnect panel (recommended 1 1/2m [60 in] floor to middle of panel)
2	250 x 100 [10" x 3 1/2"] surface wall duct with minimum 2 dividers
3	64 [2 1/2"] conduit below floor
4	89 [3 1/2"] conduit below floor
5	150 x 150 x 100 [6" x 6" x 4"] box above ceiling
6	300 x 400 x 100 [12" x 16" x 4"] box for power distribution unit
7	300 x 400 x 150 [12" x 16" x 6"] box for power distribution unit
8	150 x 150 x 100 [6" x 6" x 4"] box 450 [18"] above finished floor

ITEM	QTY	Outlet Legend for GE Equipment
△		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)

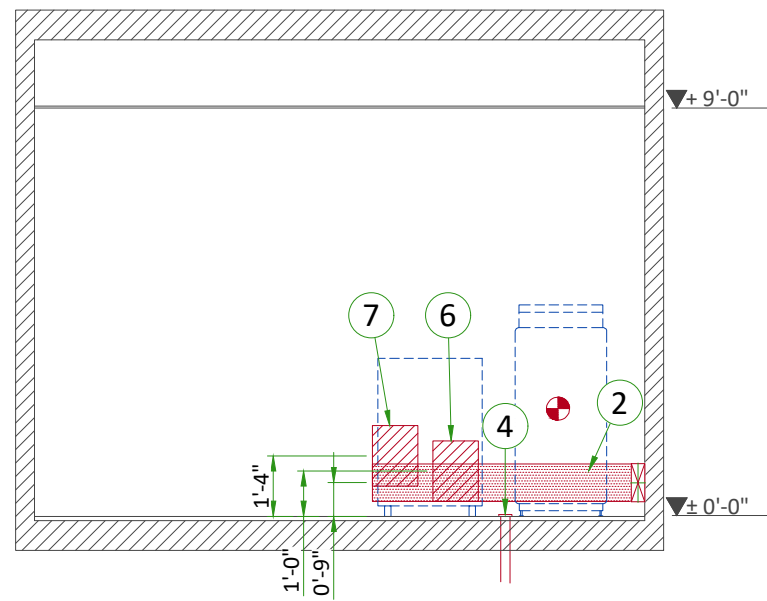
<b>Additional Conduit Runs (Contractor Supplied and Installed)</b>				
From	To	Qty	Size	
			In.	mm
3 phase power	Main disconnect	1	AS REQ'D	AS REQ'D
	Emergency off	1	1/2	13
Main disconnect	Power Distribution Unit	1	AS REQ'D	AS REQ'D
	UPS	1	1 1/4	30
Power Distribution Unit	Door Switch	1	1/2	13
	Warning light control	1	1/2	13
Warning light	Warning light control	1	1/2	13
1 phase power	Warning light control	1	1/2	13
Injector	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	50/60 Hz ± 3 Hz
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

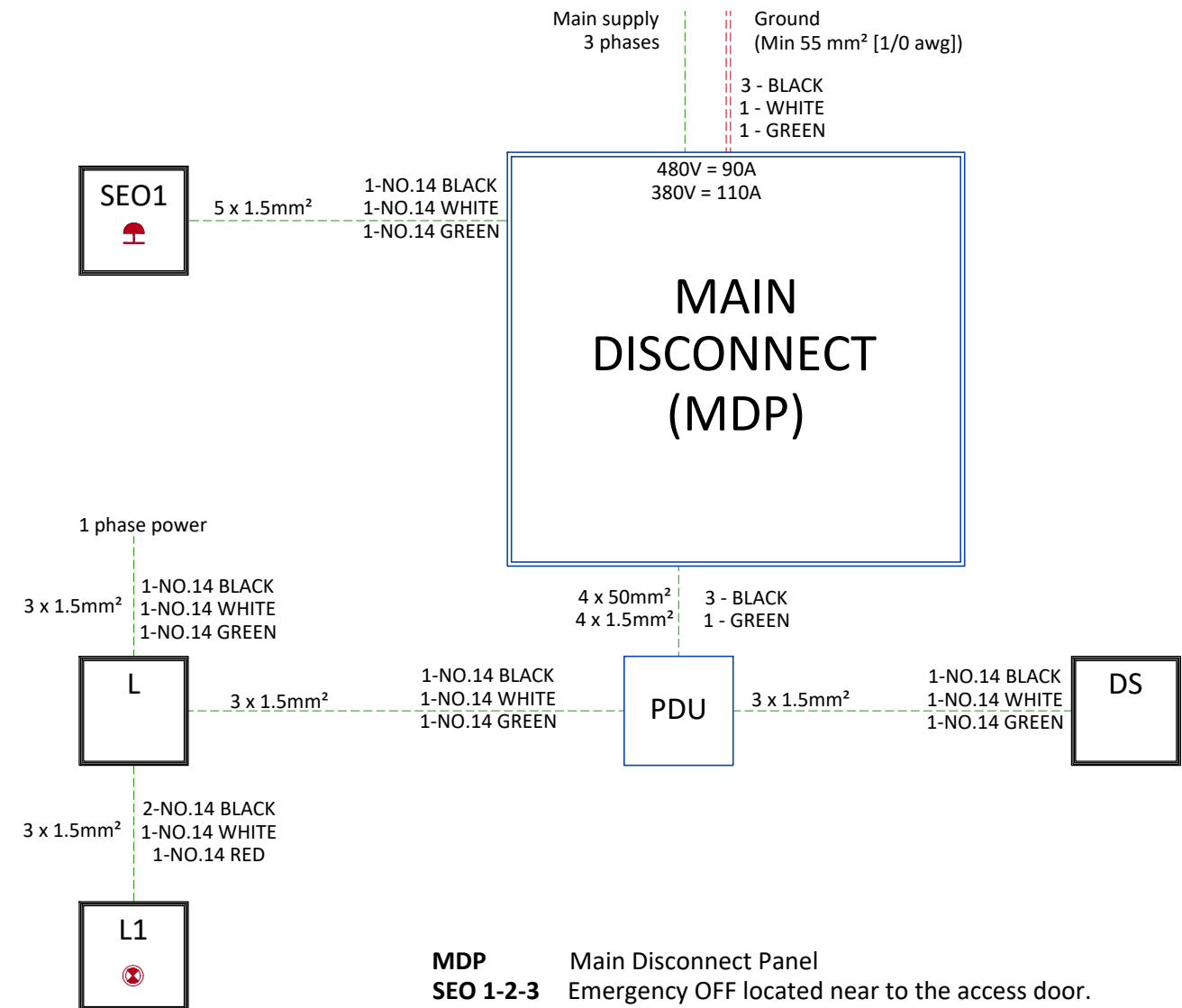
- Power and cable installation must comply with the distribution diagram.
- All cables must be isolated and flexible of HO7RNF type, cable color codes must comply with standards for electrical installation.
- The cables from signaling and remote control (Y,SEO,L...) will go to A1 Main Disconnect with 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



- MDP** Main Disconnect Panel  
**SEO 1-2-3** Emergency OFF located near to the access door.  
**DS** Door Switch  
**PDU** Power Distribution Unit  
**L** Warning Light Control Box  
**L1** X-Ray ON light - 24V Located near access doors

### FEEDER TABLE

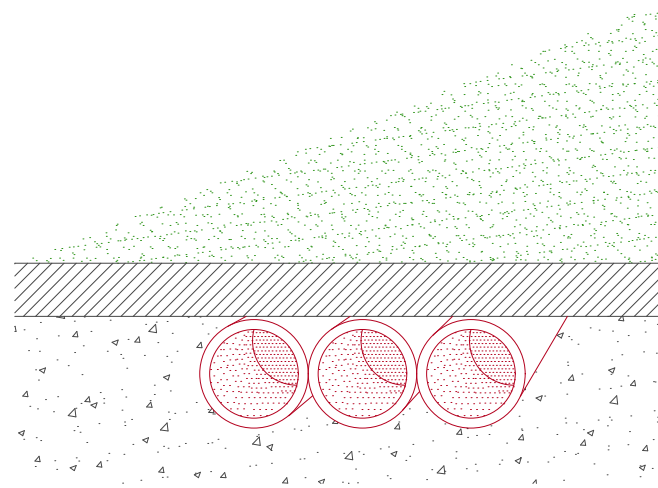
MIN. FEEDER WIRE SIZE, AWG OR MCM (sq. mm)/VAC	MINIMUM FEEDER WIRE LENGTH - ft (m)							
	50 (15)	100 (30)	150 (46)	200 (61)	250 (76)	300 (91)	350 (107)	400 (122)
480 VAC	3 (30)	3 (30)	3 (30)	3 (30)	3 (30)	2 (35)	1 (45)	1 (45)

#### GENERAL NOTES

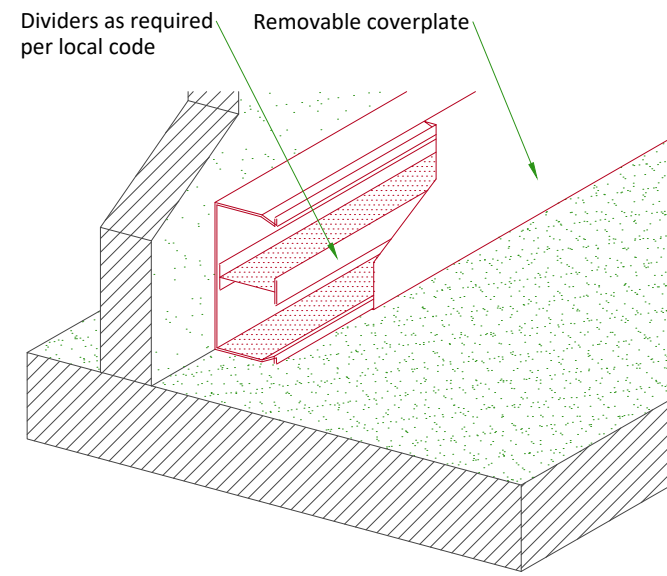
- In all cases qualified personnel must verify that the feeder (at the point of take-off) and the run to the CT-PET system meet all the requirements stated in the PIM
- For a single unit installation, the minimum transformer size is 125KVa, with 2.4% rated regulation at unity power factor. Resultant maximum allowable feeder regulation is 3.4%
- Grounding conductor will be a 1/0 minimum. this ground will run from the equipment back to the power source/main grounding point and always travel in the same conduit with the feeders

## TYPICAL CABLE MANAGEMENT

### CONDUIT IN THE FLOOR

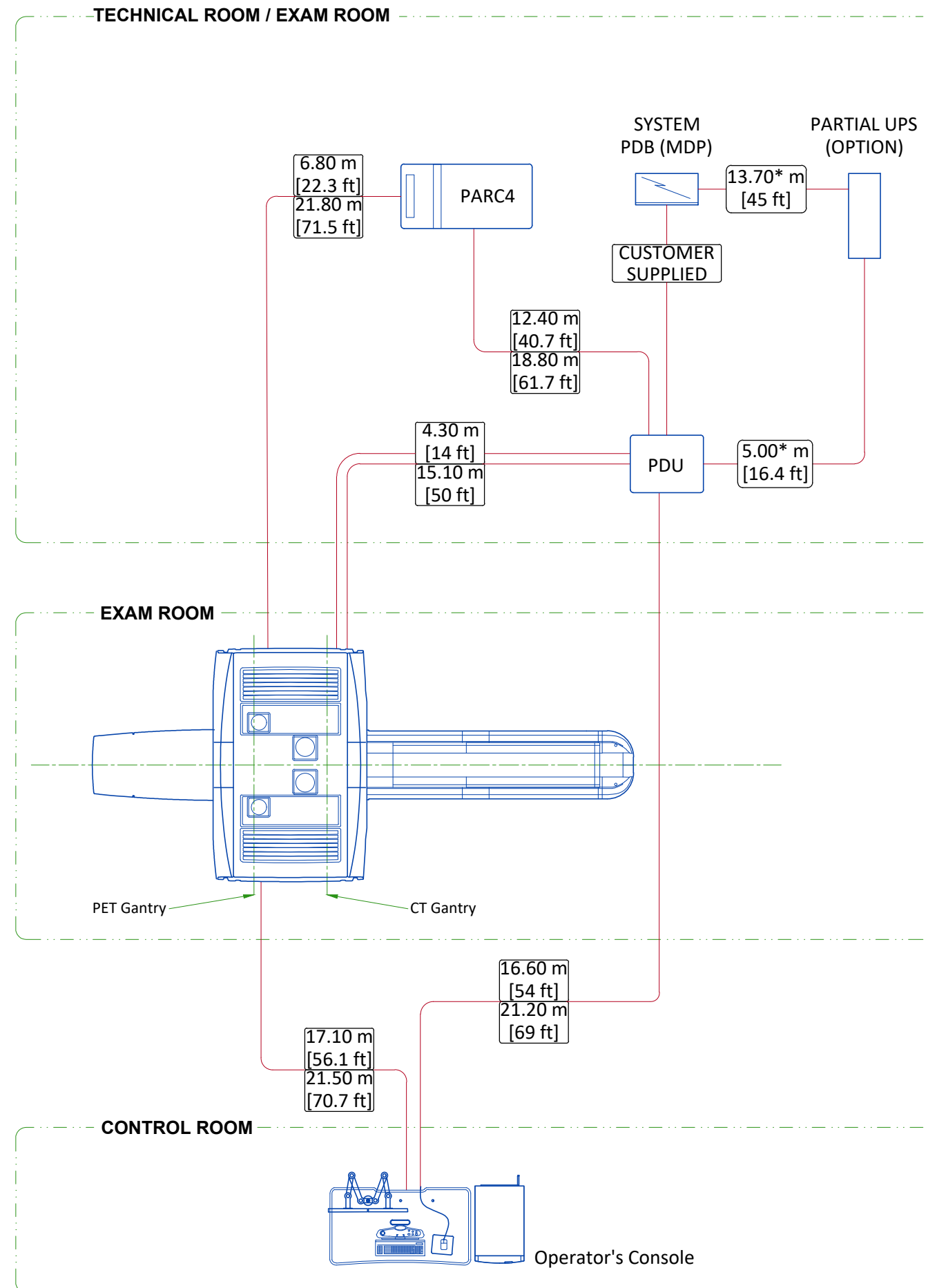


### DUCT ON THE WALL



NOT TO SCALE

## INTERCONNECTIONS



\*18 m [59 ft] cable between PDU and UPS, 18.7 m [61.4 ft] cable between UPS and System PDB (MDP) available as Long Cable Collector Kit spare part