




B	02/Feb/2021	Initial release based on PIM revision 3
A	01/May/2020	Initial release based on PIM revision 2
REV	DATE	MODIFICATIONS
01 - C1 - Cover Sheet 02 - C2 - Disclaimer - Site Readiness 03 - A1 - General Notes 04 - A2 - Equipment Layout 05 - A3 - Section Views 06 - A4 - Equipment Details (1) 07 - A5 - Equipment Details (2) 08 - A6 - 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 - M1 - HVAC 15 - E1 - Electrical Notes		16 - E2 - Electrical Layout (2) 17 - E3 - Electrical Elevations 18 - E4 - Power Requirements 19 - E5 - Interconnections 20 - E6 - Power requirements (Light Signaling) 21 - E7 - Power requirements (Light Signaling) (2)
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		
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.		

TYPICAL



GE Healthcare

INNOVA IGS 520/530/540/330 WITH AUTORIGHT

FINAL STUDY

Drawn by		Verified by	Concession	S.O. (GON)	PIM Manual	Rev
RET		TST	-	-	5813633-8EN	3
Format	Scale	File Name			Date	Sheet
A3	1/4"=1'-0"	EN-VAS-TYP-IGS-5-AR-WEB.DWG			14/Oct/2021	01/21

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.

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

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.
Vascular baseplates preparation complete per GE requirements.
For IGS 730/740: Floor finish is according to the GE Specifications and protection is installed . Specifications for concrete substrate & Monopur 7 mm flooring have been met. Table baseplate installed and flush to the finished floor.
For IGS 730/740: Room Interventional Reference Point (RIRP) value has been defined with the customer. Either 1120mm, 1278 mm or 1508 mm.
Ensure that all third party suppliers are identified and have been informed about the project dates and how they need to proceed in accordance with their needs for interfacing to our equipment.
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.
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.

CONNECTIVITY REQUIREMENTS

Service Connectivity for new systems will be based on the Insite-RSvP Platform which allows to configure a direct Internet connection to the RSvP Server (routers/VPN tunnel no more mandatory). Communication with the RSvP server will be outbound only and require using Transport Layer Security (TLS) over TCP port 443. This is commonly known as an HTTPS (HTTP-Secure) connection.

There will be several ways to connect the system to the RSvP Enterprise Server. See below the main options that might not be all available or authorized at your site depending on actual network constraints or local regulations.:

- The system allows for DNS configuration or proxy server-based connection to the Internet.
- Connection thru a GE Proxy will be possible in the future.
- In the case the customer does not accept the above connection protocol or regulatory reasons prevent using these types of configurations, the local/regional connectivity teams can provide help to connect through SSL/TLS proxy IP over the site-to-site VPN.

To make the system connectivity operational before the system installation is finished, ensure the connectivity solution is defined as early as possible during the pre-installation process and proper information are exchanged between the customer Network Administrators and GEHC Sales and/or Service representatives.

For more information please refer to the latest version of the Pre Installation Manual.

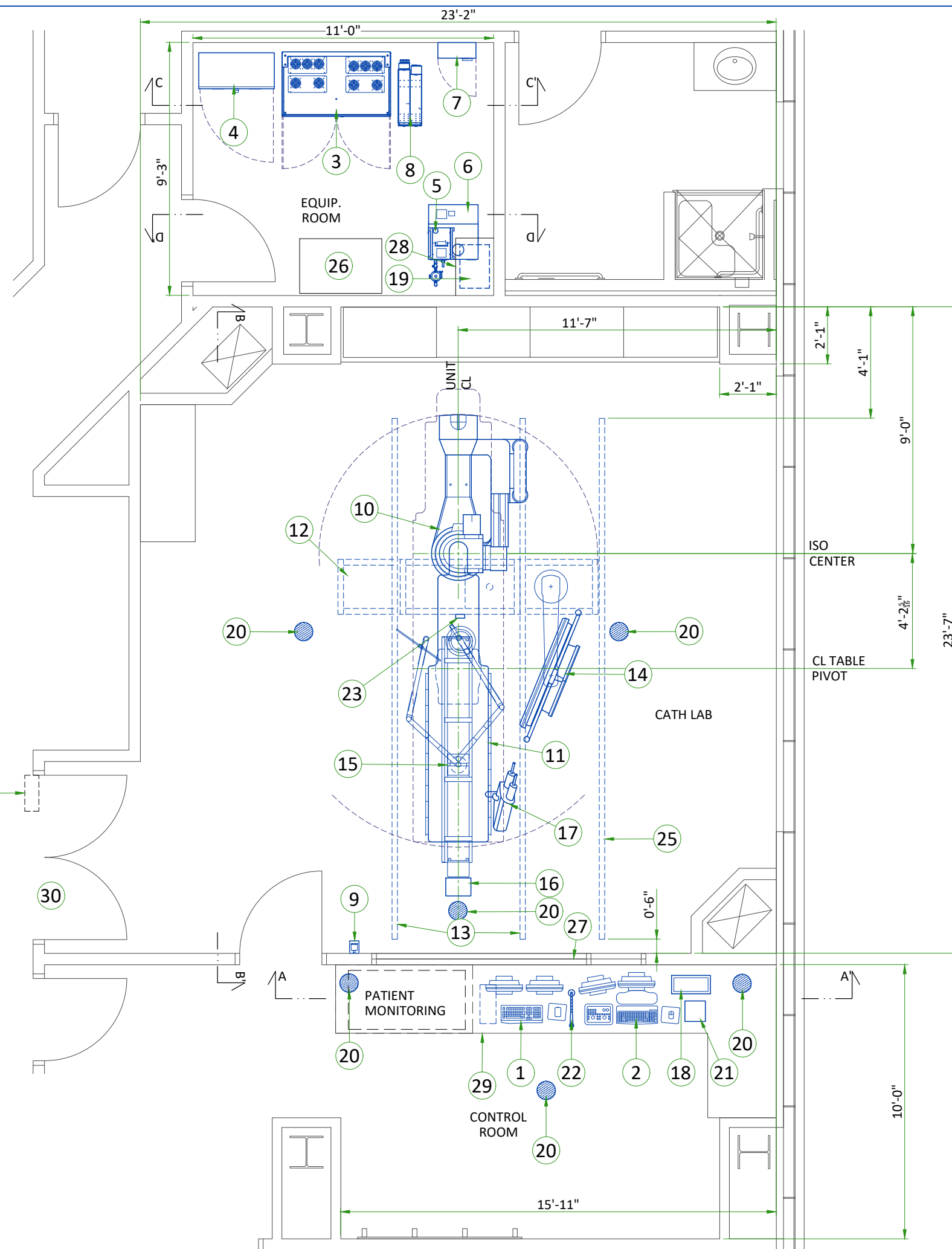
ELECTROMAGNETIC INTERFERENCE

The IGS System is intended for use in the electromagnetic environment specified below.
The Customer or the user of the System should assure that it is used in such an environment.

EMISSIONS	TEST COMPLIANCE	ELECTROMAGNETIC ENVIRONMENT
Radio–Frequency Emissions CISPR11	Group1 Class A limits	The IGS System uses Radio Frequency energy only for its internal function.Therefore, its Radio Frequency emissions are very low and are not likely to cause any interference in nearby electronic equipment.
		The IGS System is suitable for use in all establishments other than domestic and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes.
Harmonic emissions IEC 61000–3–2	Not applicable	The IGS System is suitable for use in all establishments other than domestic and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes.
Voltage fluctuations/ flicker emissions IEC 61000–3–3	Not applicable	The IGS System is suitable for use in all establishments other than domestic and those directly connected to the public low-voltage power supply network that supplies buildings used for domestic purposes.

CUSTOMER SITE READINESS REQUIREMENTS

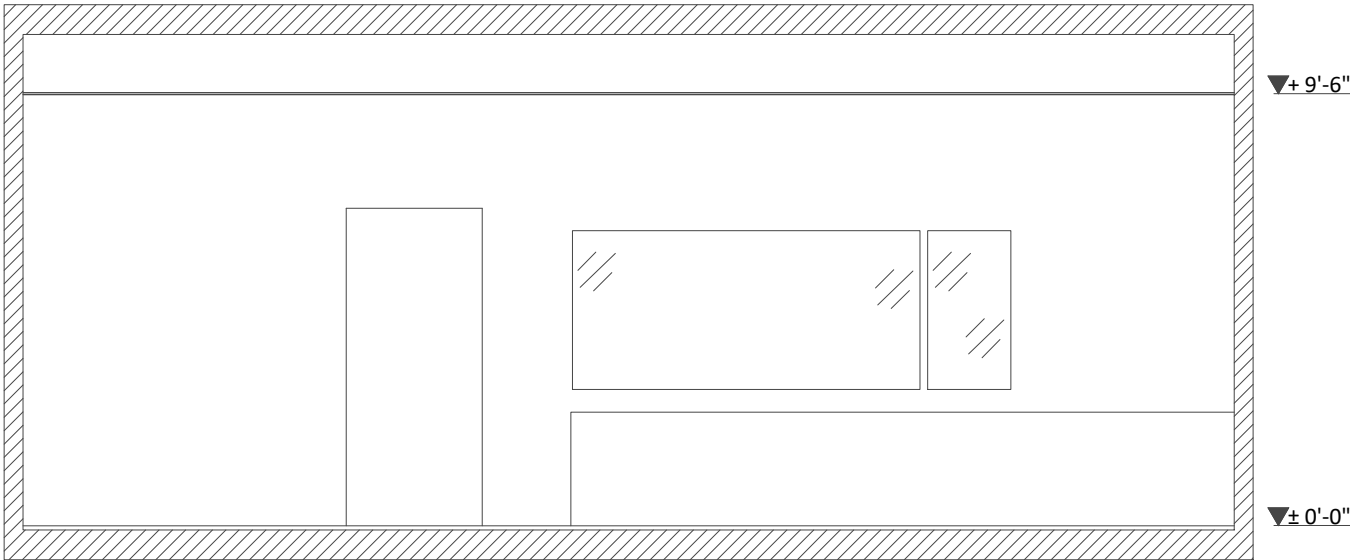
- Any deviation from these drawings must be communicated in writing to and reviewed by your local GE healthcare installation project manager prior to making changes.
- Make arrangements for any rigging, special handling, or facility modifications that must be made to deliver the equipment to the installation 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)
- For CT, MR, PET/CT, and SPECT systems 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 preinstallation manual for vibration specifications.



LEGEND						
A	GE Supplied			D	Available from GE	
B	GE Supplied/contractor installed			E	Equipment existing in room	
C	Customer/contractor supplied and installed			*	Item to be reinstalled from another site	
BY	ITEM	DESCRIPTION	MAX HEAT OUTPUT (btu)	WEIGHT (lbs)	MAX HEAT OUTPUT (W)	WEIGHT (kg)
D	1	Advantage workstation	2019	22	590	10
A	2	Operator console	341	19.6	100	9
A	3	C-FRT Cabinet	7370	1226	2160	556
A	4	System Interface Cabinet (PDU)	1365	628	400	285
A	5	Detector conditioner	717	32	210	14.5
A	6	COOLIX 4100 tube chiller	23646	265	6930	120
D	7	Main disconnect panel (MDP)	205	49	60	22
D	8	8kVA UPS	1760	185	520	84
A	9	Xray buzzer	-	1	-	0.5
A	10	LC gantry	2416	1733	708	786
A	11	OMEGA V long patient table	614	1635	180	741.5
A	12	Monitor suspension long bridge	-	-	-	-
A	13	Longitudinal stationary rail	-	68	-	31
D	14	Large Display Monitor with two backup monitors	341	645	100	293
D	15	Mavig rad shield and LED lamp with 2.5m ceiling track	-	143	-	65
D	16	External Transformer for LED Surgical lamp	-	6	-	3
D	17	Injector head on table rail	-	15	-	7
D	18	Injector control	-	4	-	2
D	19	Injector electronics	320	37	94	17
D	20	Vitalinq speaker	-	-	-	-
D	21	Vitalinq console	-	-	-	-
D	22	Vitalinq microphone	-	-	-	-
D	23	Vitalinq microphone (one on monitor bridge in exam room)	-	-	-	-
D	24	Light signaling control box	-	-	-	-
C	25	Cable drape rail				
C	26	Storage cabinet				
C	27	Control wall to ceiling with lead glass viewing window.				
C	28	Shelf - customer to provide adequate wall support				
C	29	Counter top for equipment- provide grommets openings as required to route cables				
C	30	Minimum door opening for equipment delivery is 46 in. w x 87 in. h [1160mm x 2200mm], contingent on a 96 in. [2438mm] corridor width				
EXAM ROOM HEIGHT						
				Minimum		Recommended
FINISHED FLOOR TO FALSE CEILING				9'-0"	2.74m	10'-0" 3.05m
For Accessory Sales: (866) 281-7545 Options 1, 2, 1, 2 or mail to: gehcaccessoriesales@ge.com						

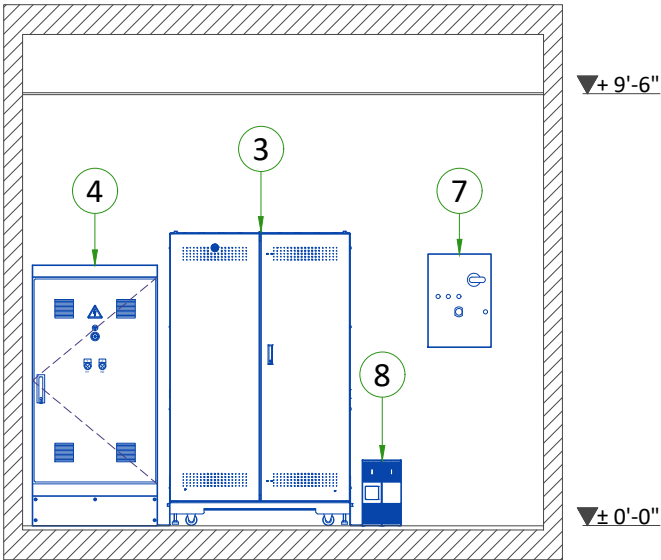
CONTROL ROOM VIEW

SECTION A-A'



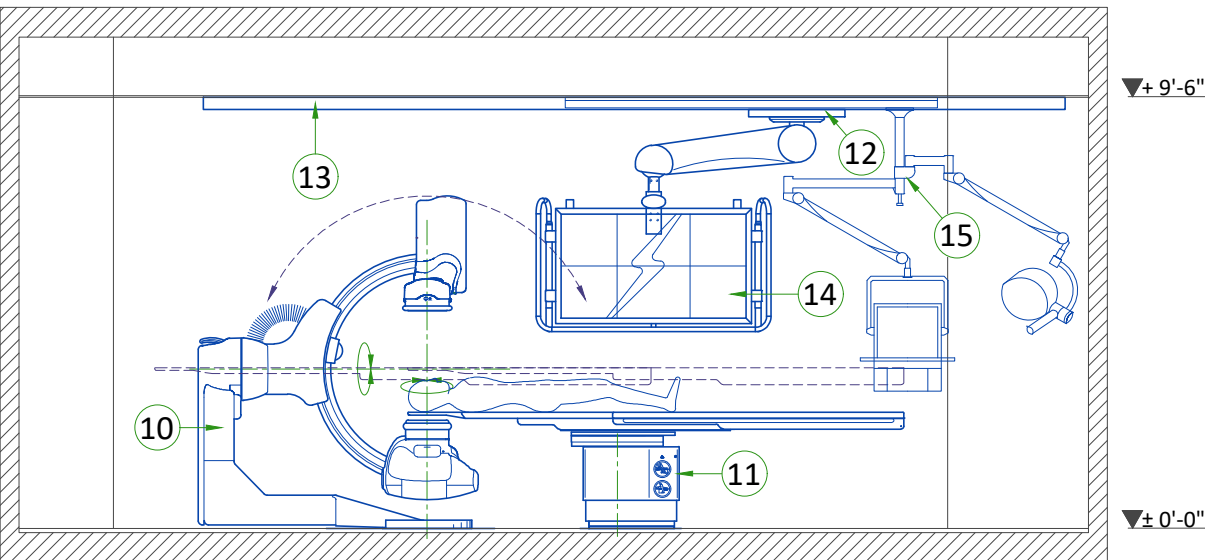
TECHNICAL ROOM VIEW

SECTION C-C'



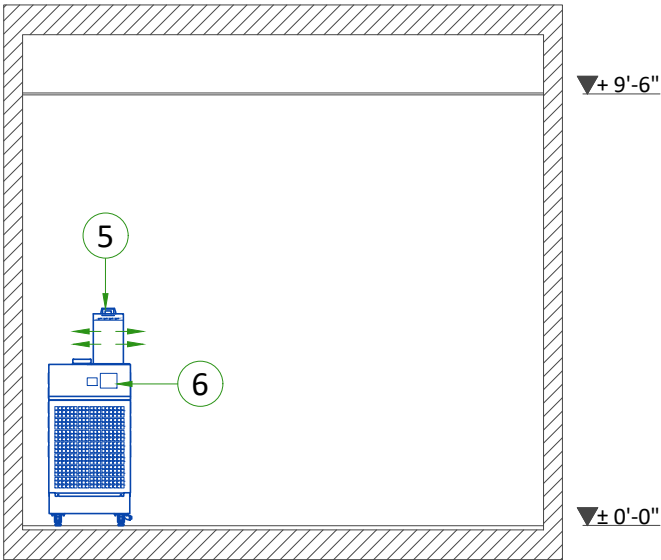
EXAM ROOM VIEW

SECTION B-B'



TECHNICAL ROOM VIEW

SECTION D-D'

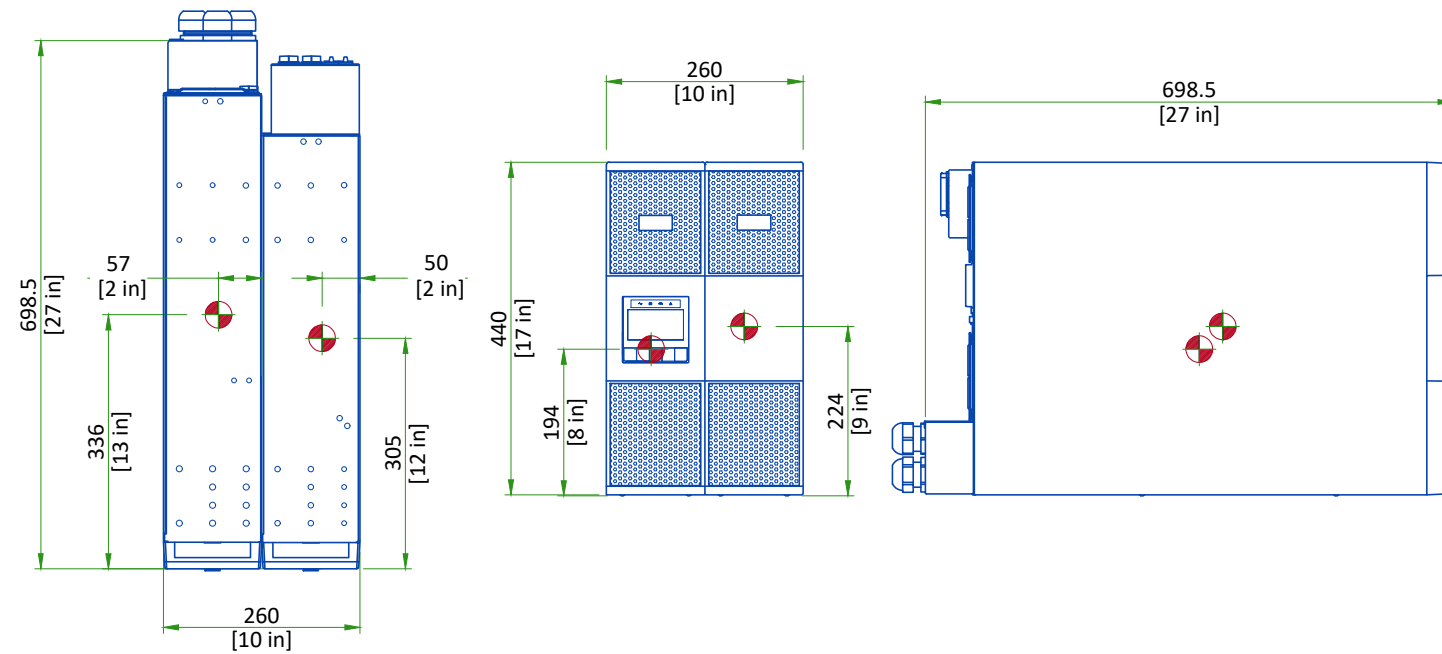


8kVA UPS

TOP VIEW

FRONT VIEW

SIDE VIEW



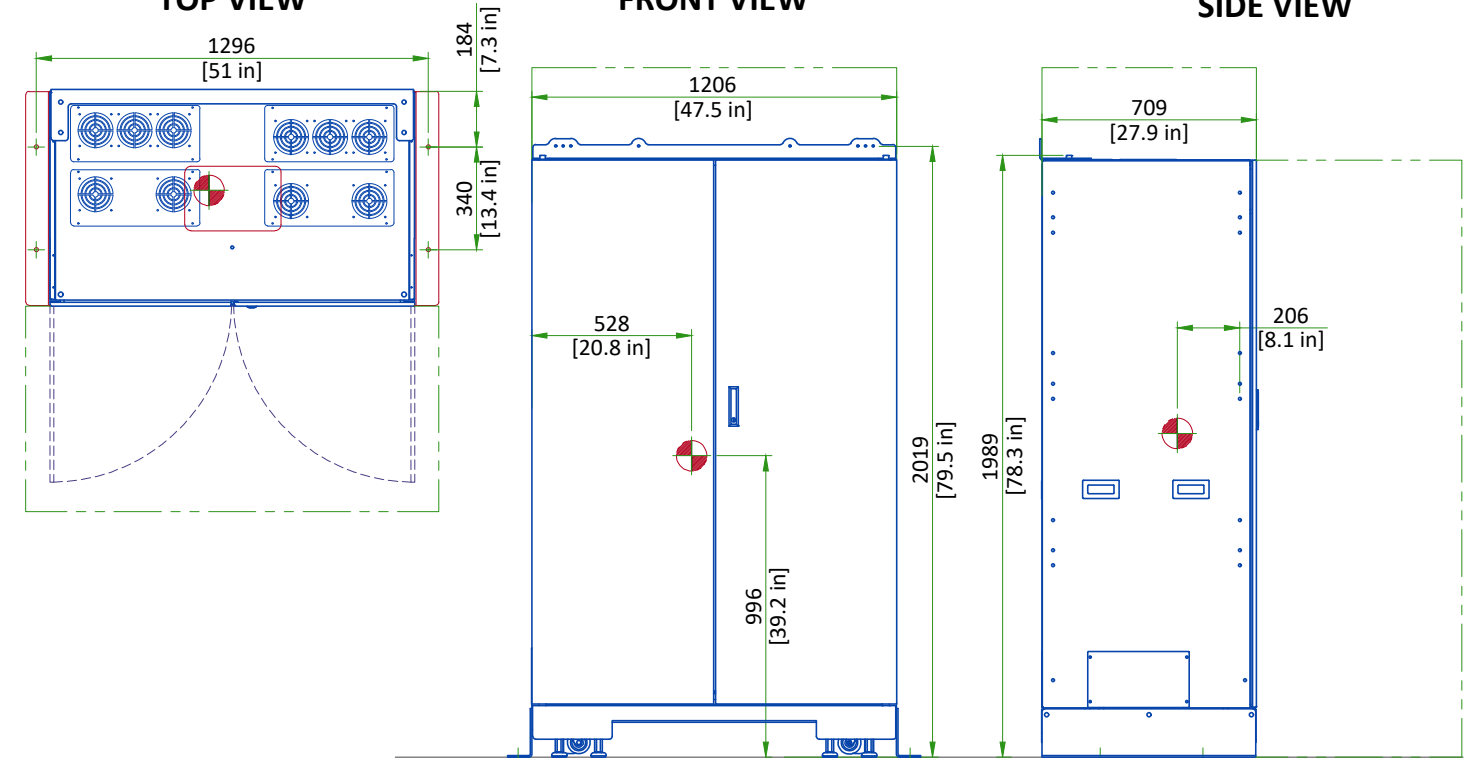
Center of Gravity
Scale 1:10

C-FRT CABINET

TOP VIEW

FRONT VIEW

SIDE VIEW



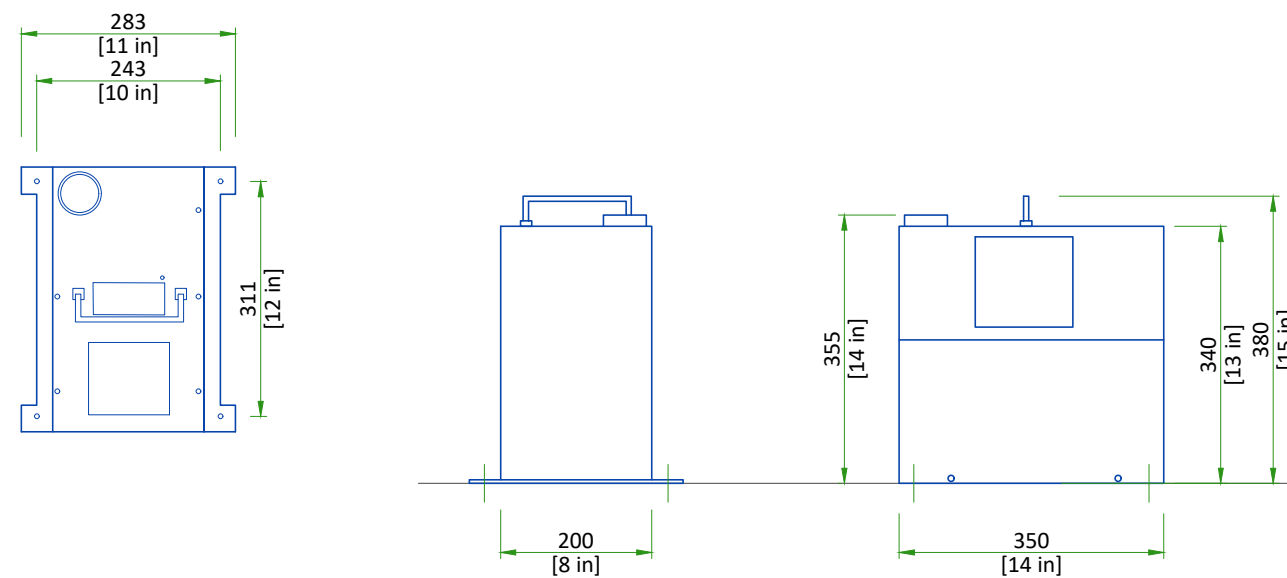
Center of Gravity
SCALE 1:25

DETECTOR CONDITIONER

TOP VIEW

FRONT VIEW

SIDE VIEW



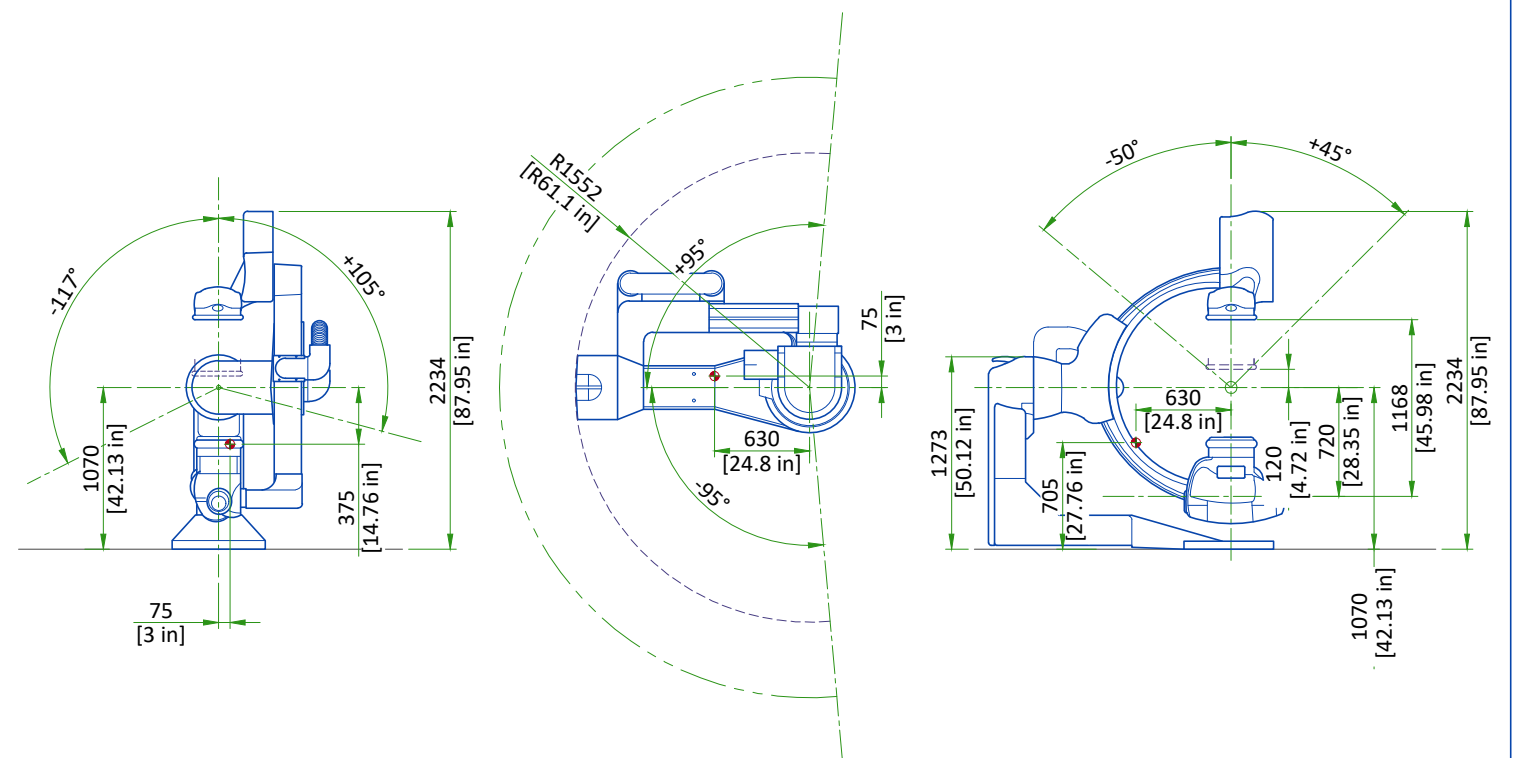
Scale 1:10

GANTRY

FRONT VIEW

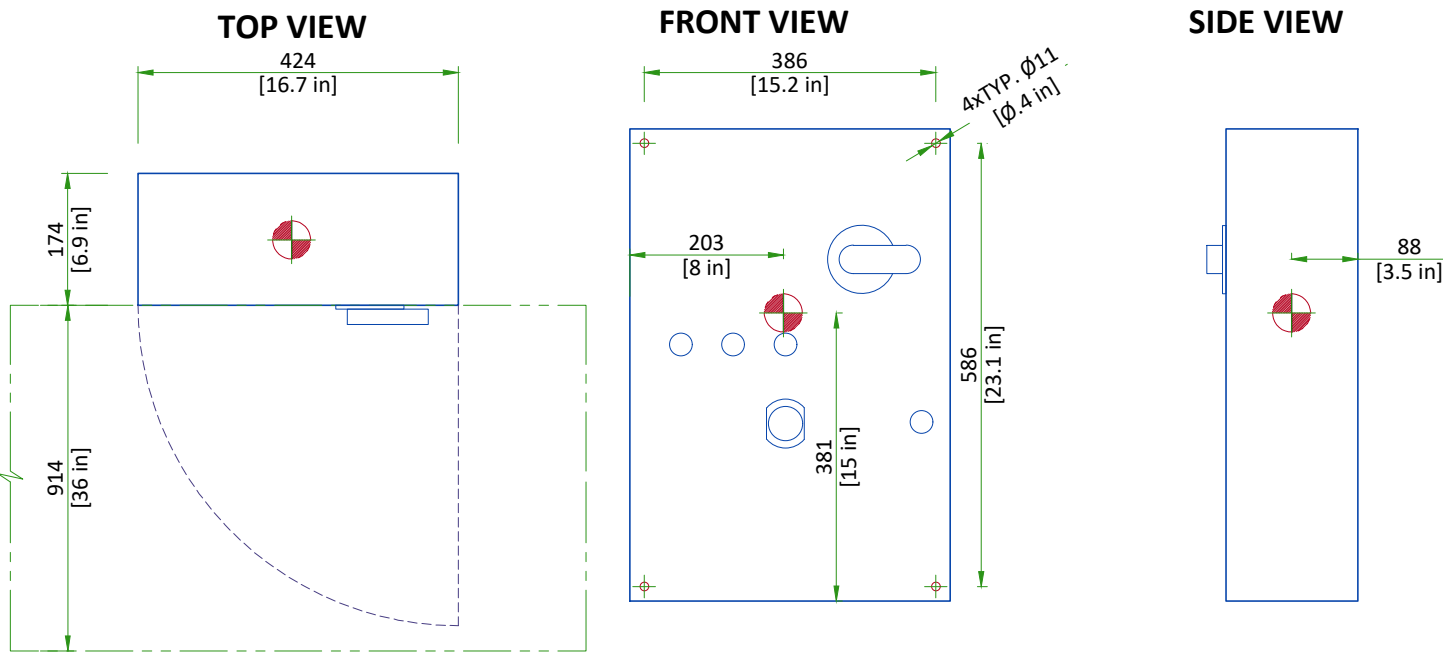
TOP VIEW

SIDE VIEW



Center of Gravity
SCALE 1:50

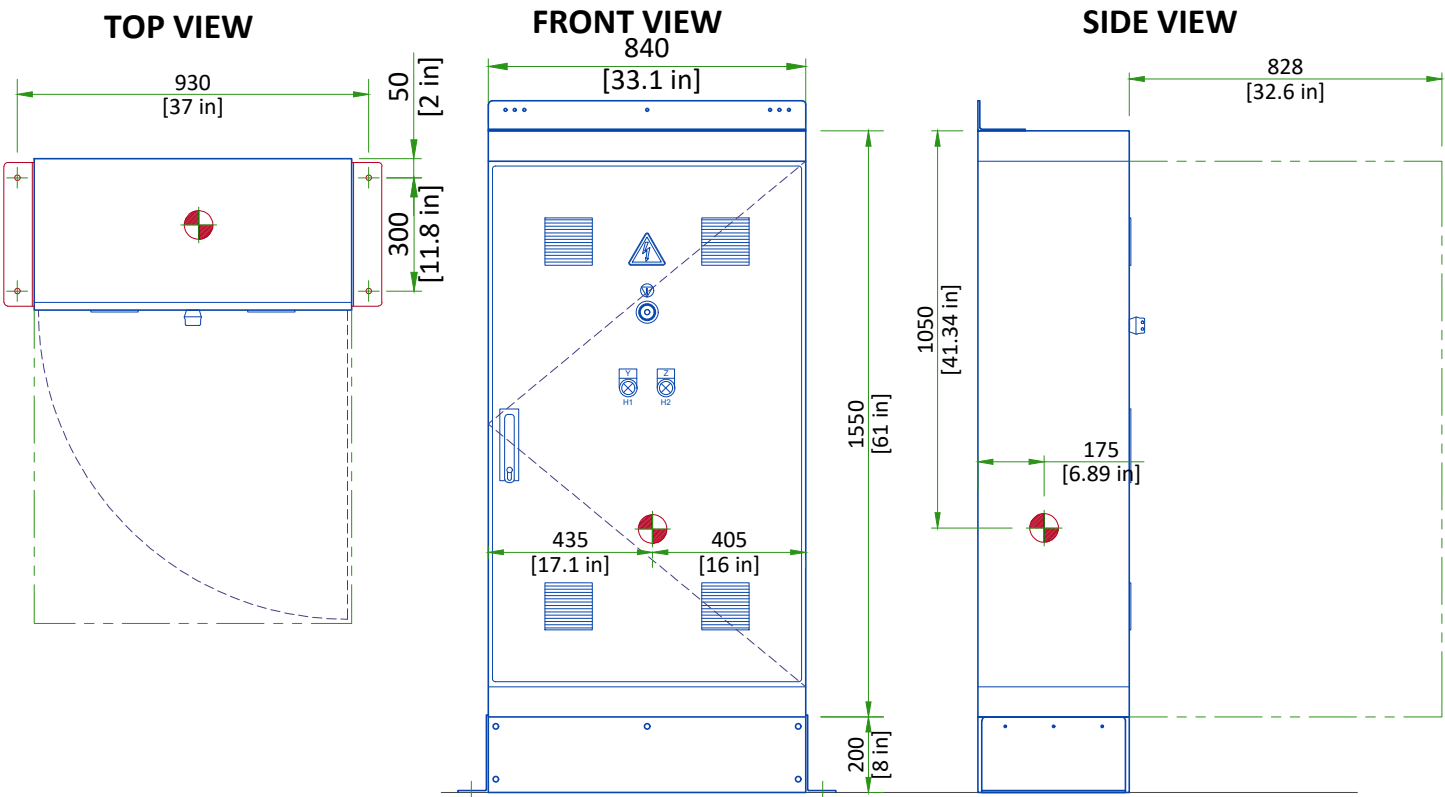
MAIN DISCONNECT PANEL



Center of Gravity

Scale 1:10

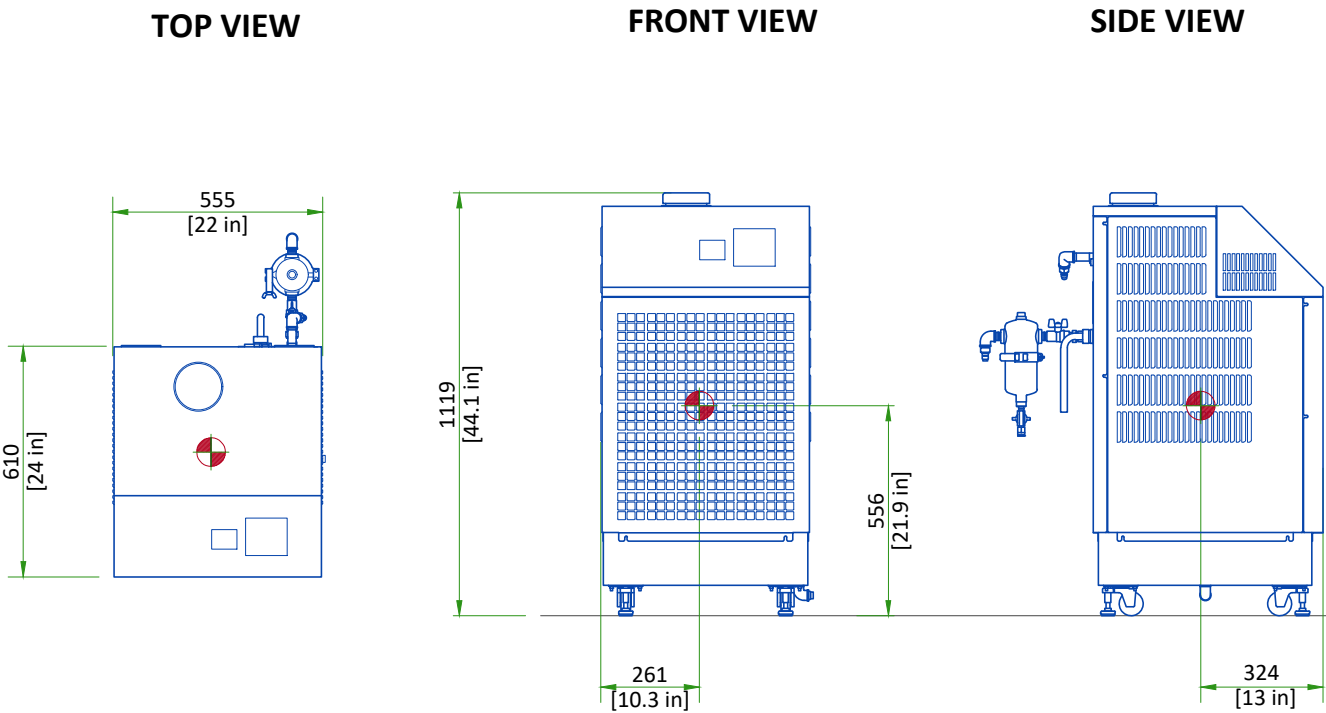
NPA PDU



Center of Gravity

Scale 1:20

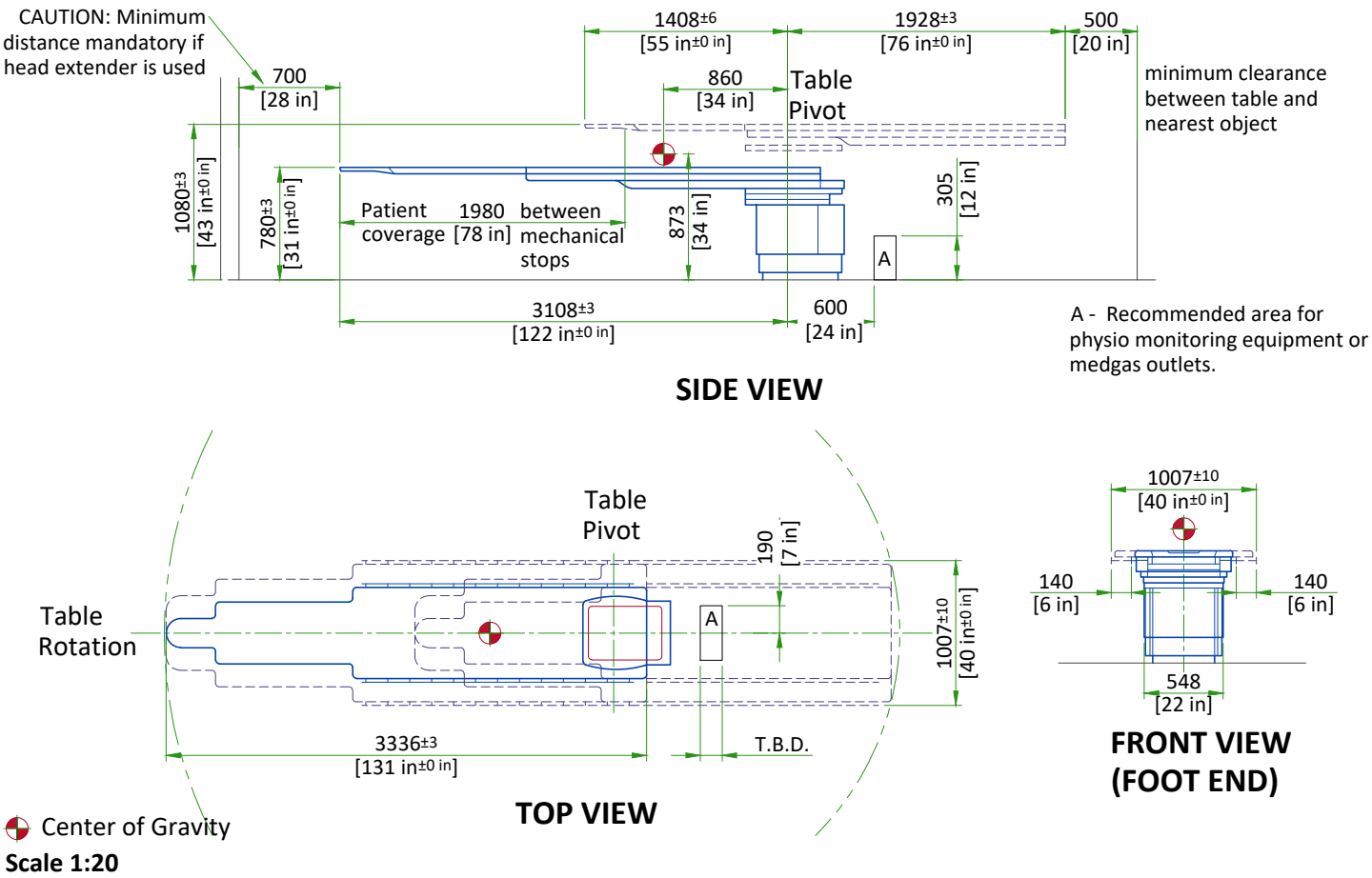
X-RAY TUBE CHILLER



Center of Gravity

Scale 1:20

OMEGA V PATIENT TABLE



Center of Gravity

Scale 1:20

DELIVERY

THE CUSTOMER/CONTRACTOR SHOULD:

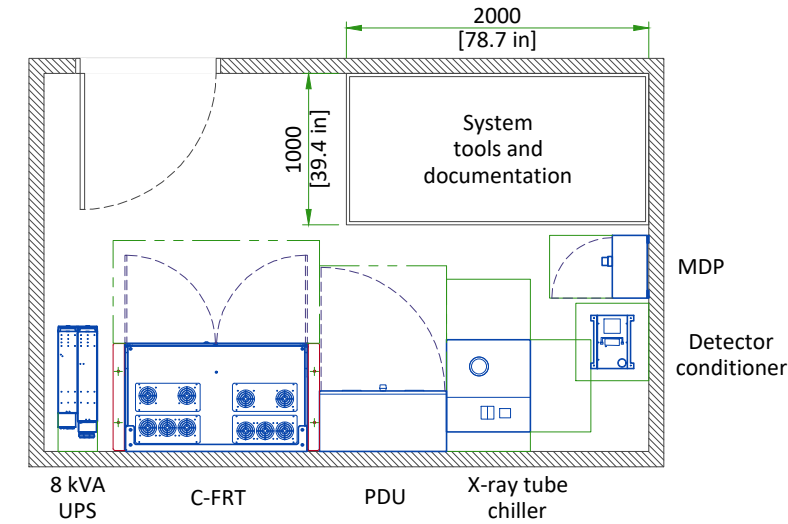
- Provide an area adjacent to the installation site for delivery and unloading of the GE equipment.
- Ensure that the dimensions of all doors, corridors, ceiling heights are sufficient to accommodate the movement of GE equipment from the delivery area into the definitive installation room.
- Ensure that 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					
EQUIPMENT	DIMENSIONS			WEIGHT	
GANTRY (SHIPPING DOLLY)	LENGTH	2820 mm	111 in	1060 kg	2340 lb
	WIDTH	1230 mm	48.4 in		
	HEIGHT	2000 mm	79 in		
OMEGA TABLE BASE ASSEMBLY (ON PALLET)	LENGTH	2060 mm	81 in	585 kg	1290 lb
	WIDTH	840 mm	33 in		
	HEIGHT	1032 mm	41 in		
C-FRT CABINET (ON PALLET)	LENGTH	850 mm	34 in	630 kg	1388 lb
	WIDTH	1500 mm	59 in		
	HEIGHT	2200 mm	87 in		

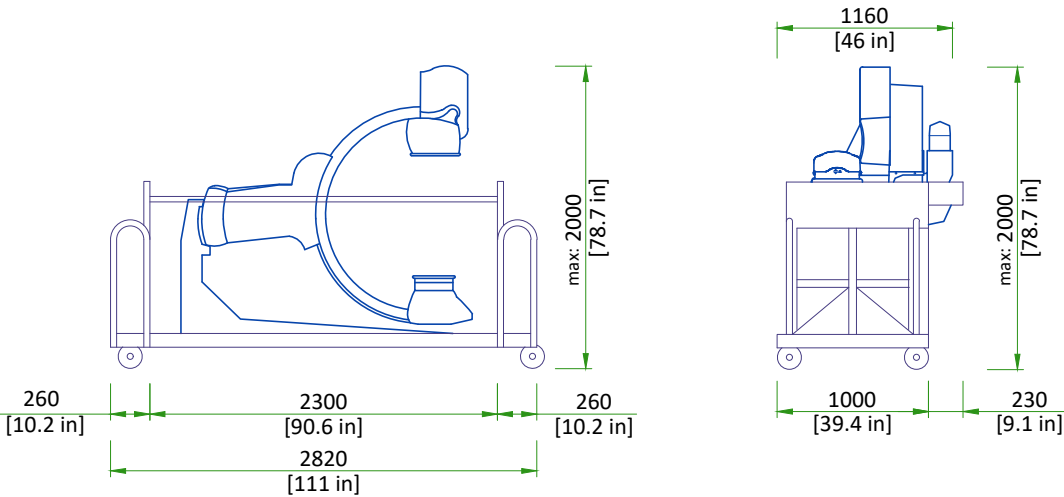
RECOMMENDED AREA IN THE TECHNICAL ROOM

THE TECHNICAL ROOM NEED EXTRA SPACE FOR TOOLS AND DOCUMENTATION

- GE recommend an extra area of 2.0 x 1.0 m (78.7 x 39.4 in) for storage of tools and documentation for the system
- This area doesn't need to be inside the technical room, but in a closer space from the system



SHIPPING DOLLY FOR LC GANTRY



SHIPPING WEIGHT: 1060 kg [2337 lb].

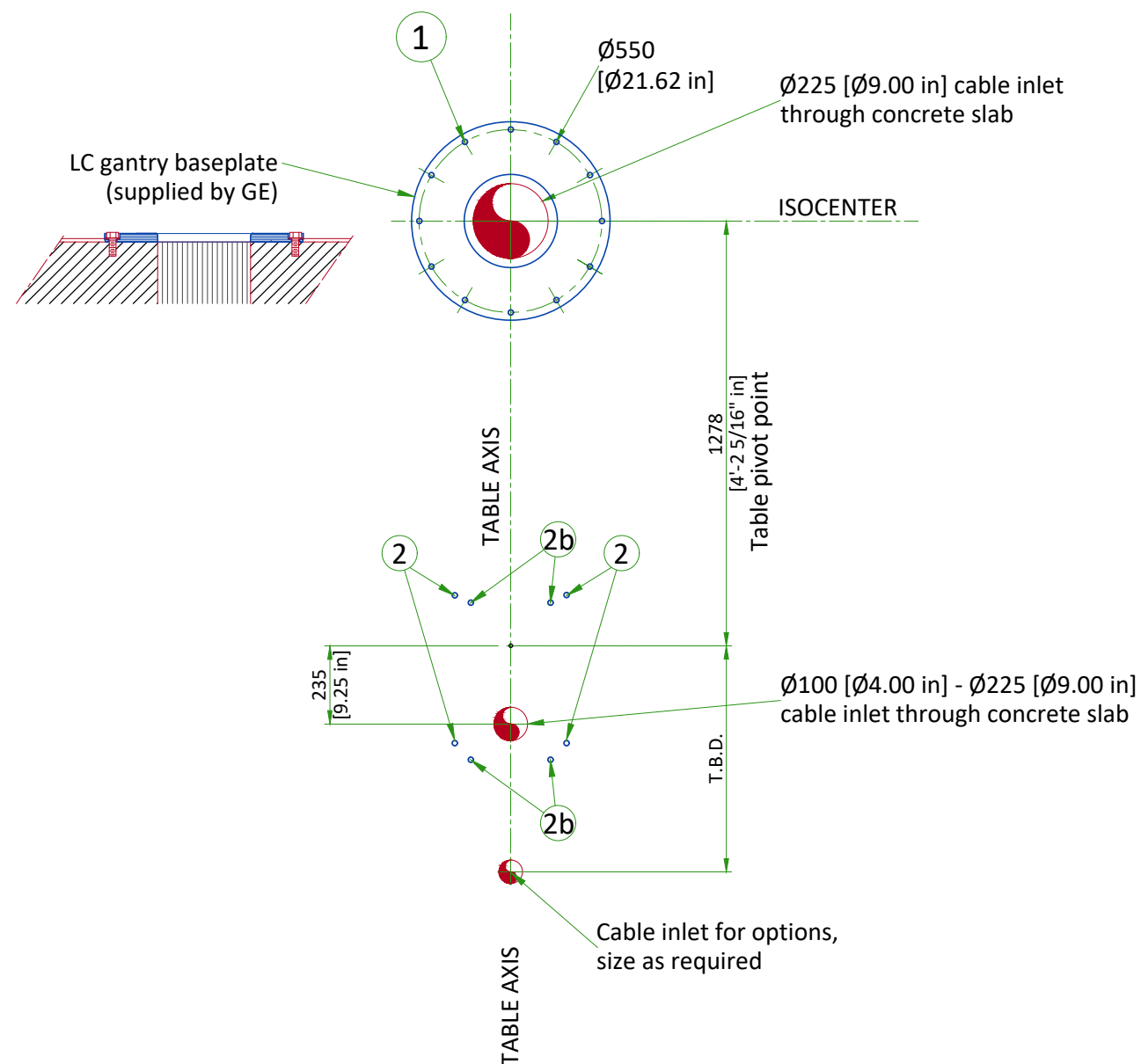
Both ends of the dolly can be removed which will shorten the LC gantry dolly to 2300 mm [90 in], also the right and left top handles can be removed which will make the width 1160 mm [46 in].

SCALE 1:50

STRUCTURAL NOTES

- All steel work and parts necessary to support ceiling mounted tube hanger or other equipment are to be supplied by the customer or his contractors. The unistrut or equivalent structure should run continuous with no fittings extending below face of unistrut channel, run wall to wall, be parallel, square and in the same horizontal plane flush with finished ceiling. The system is to be cross braced vertically, horizontally and diagonally to allow no movement and a maximum of 1,58mm(1/16") deflection. (10) 12,7mm (1/2") dia. X 38,1mm (1 1/2") long bolts with unistrut 12,7mm (1/2") nuts with springs are to be provided by customer or his contractors for each stationary and auxillary support rail. Closure strips shall be provided for areas of unistrut exposed and without mounting units.
- 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.
- Control walls with tube hanger passage above shall be constructed to 2130mm (7'-0") high.
- Floor slabs on which equipment is to be installed must be level to 3,17mm (1/8") in 3050mm (10'-0")
- Minimum floor thickness of 203mm (8").
- 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"

LC GANTRY AND TABLE ANCHORING WITH NO BASEPLATE



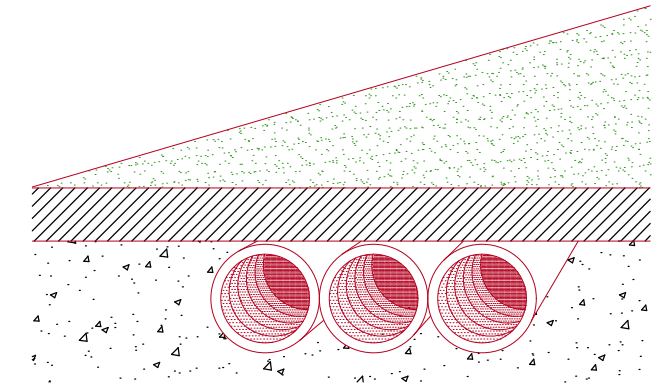
- 1 LC baseplate mounting location : 12 bolts
Pullout strength on each bolt 736 daN
- M20 Through-Bolts recommended (supplied by GE)
Alternates:
- M16 Mechanical anchors (supplied by GE)
- Chemical anchors (not supplied by GE):
HILTIHVU adhesive capsule + HAS Anchor rod
- 2 Table mounting location : 4 bolts required
Pullout strength on each bolt 4432 daN
- M20 Through-Bolts recommended (supplied by GE)
Alternates:
- M16 Mechanical anchors (supplied by GE)
- Chemical anchors (not supplied by GE):
HILTIHVU adhesive capsule + HAS Anchor rod
- 2b Alternate bolt holes for seismic zones 1 and 2

FLOOR REQUIREMENTS AND CABLE MANAGEMENT

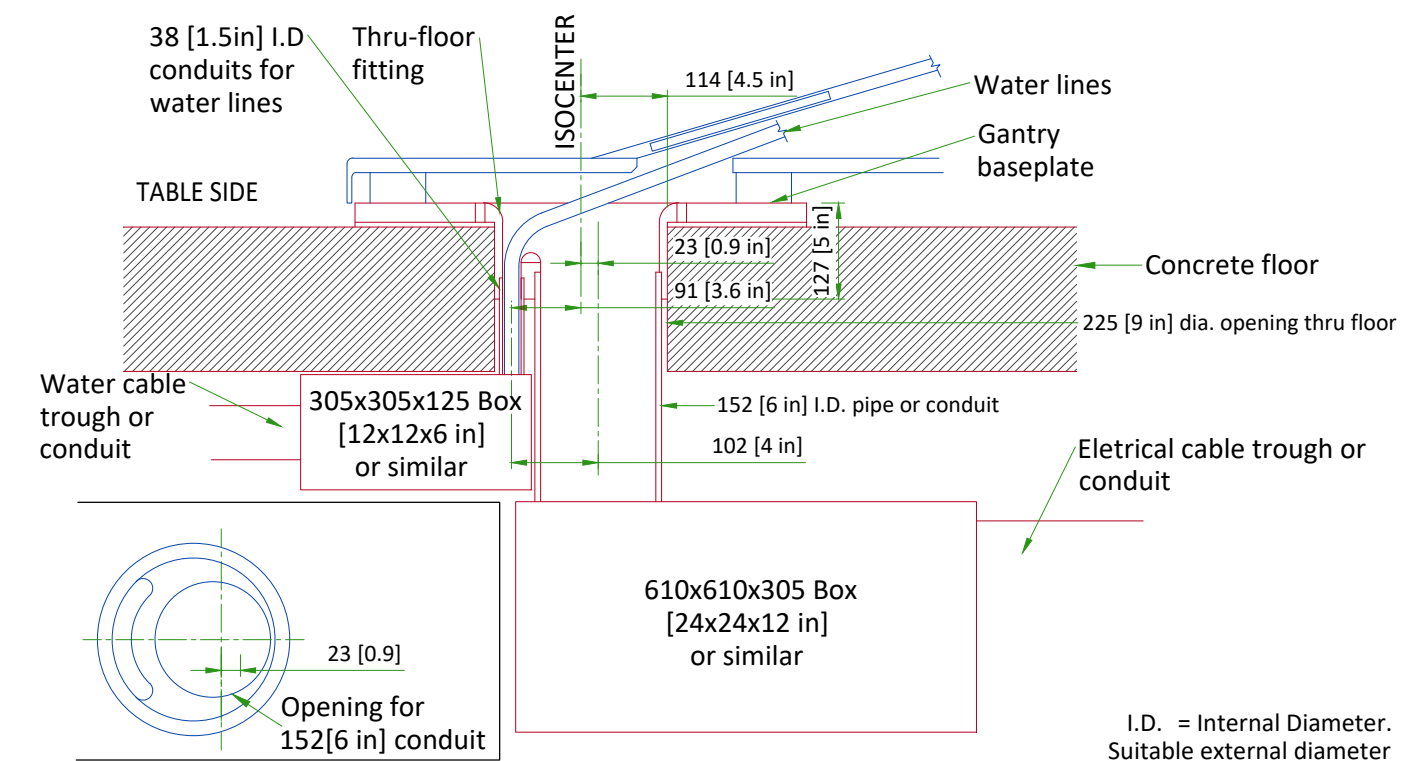
FLOOR REQUIREMENTS

- The maximum pullout force per GE supplied anchor was calculated assuming :
 - A concrete compression strength of **17.24 MPa** at 28 days (which is the minimum required compression strength).
 - Anchors installed to the required hole depth of **165.1 mm [6.5 in] minimum**.
 - Center of anchor hole to concrete edge distance **79.4 mm [3.1 in]**.
 - Make sure to obtain data on compression strength of the concrete before using floor anchors.
- The floor slab on which the equipment is to be installed must be flat and level (1 mm [0.04 in]/1 m [40 in] where equipment is installed and 5 mm [0.2 in]/2 m [79 in] general levelness).
- Anchoring to the floor is intended to the structural elements and not to common screed.
- Do not glue the floor covering in the gantry zone.

CONDUIT IN THE FLOOR



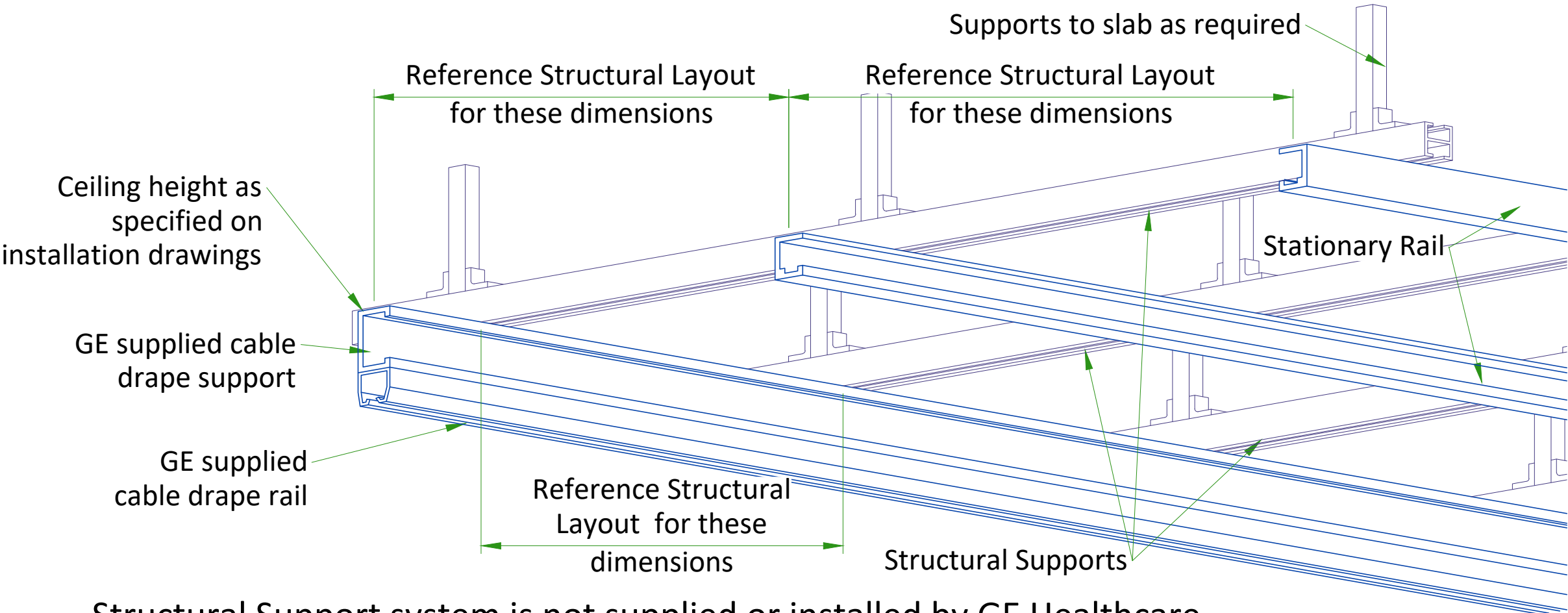
GANTRY UNDER FLOOR CABLING DETAILS



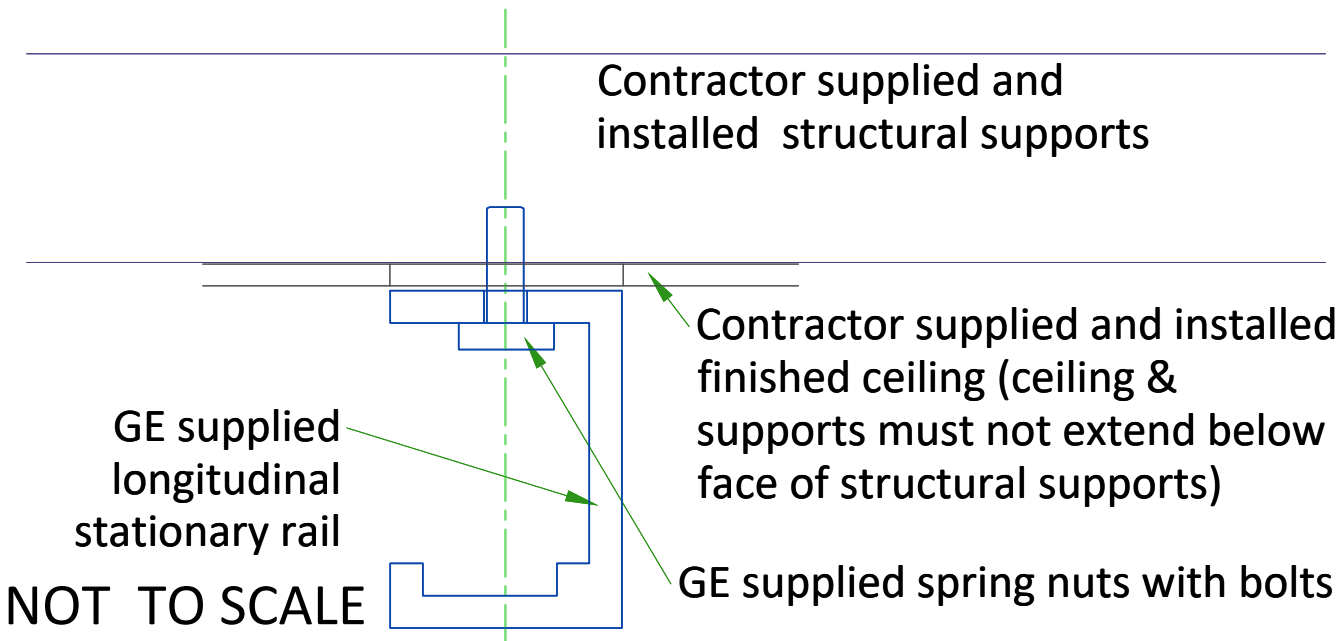
NOTE: PIPE, JUNCTION BOX AND DUCT OR CONDUIT ARE TO BE SUPPLIED AND IS TO BE INSTALLED BY CUSTOMER OR CUSTOMER'S CONTRACTOR

NOT IN SCALE

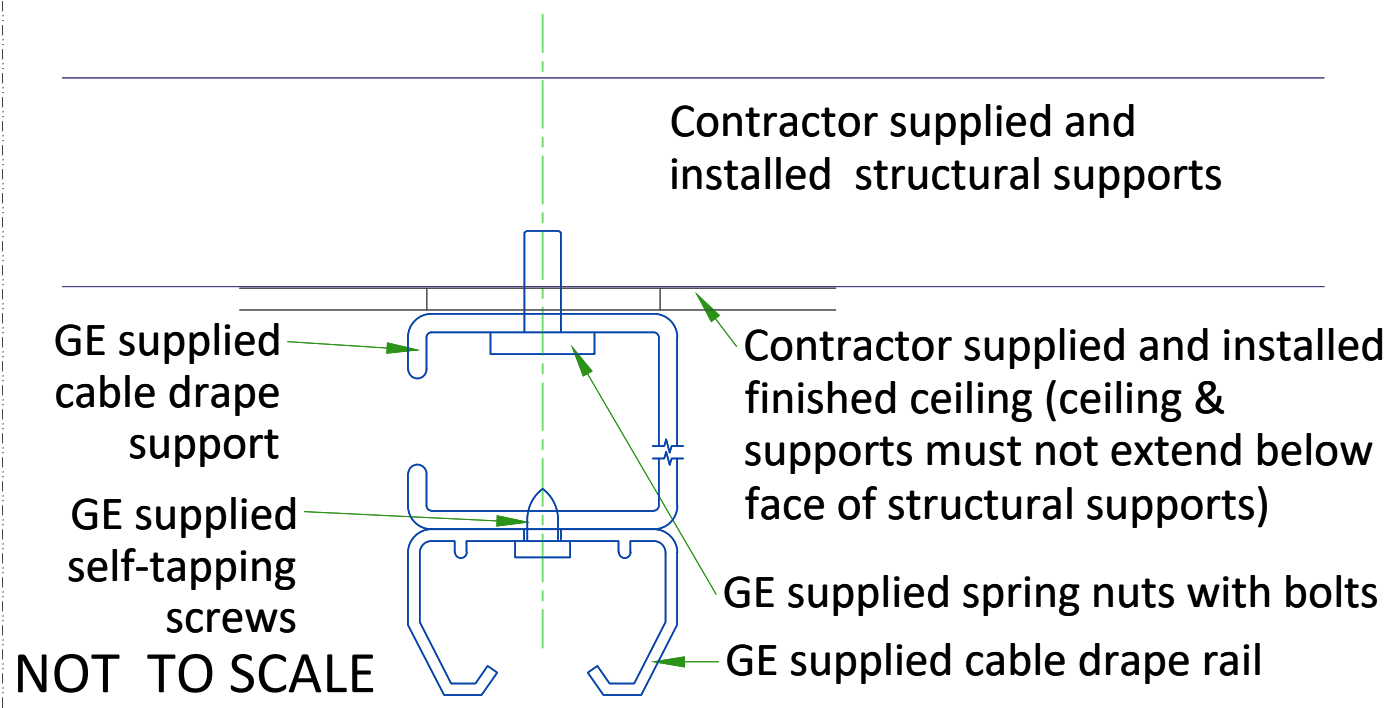
XT RADIOGRAPHIC SUSPENSION, INBOARD MOUNTING



DETAIL 1

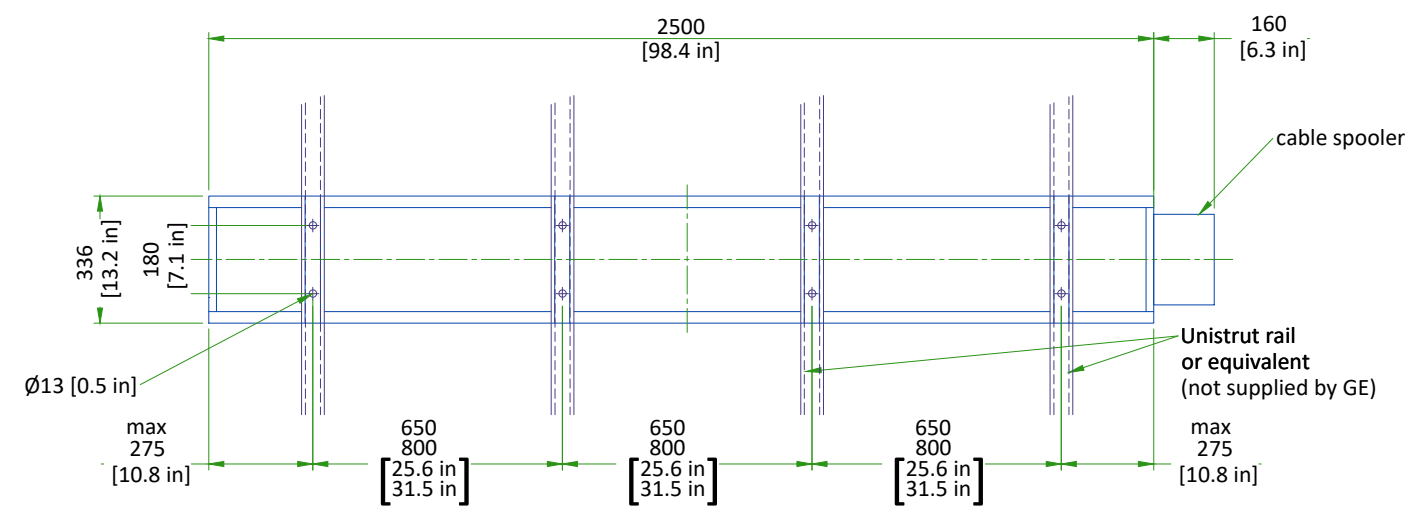


DETAIL 2



MAVIG SUSPENSION MOUNTING METHOD

2.5m CEILING TRACK

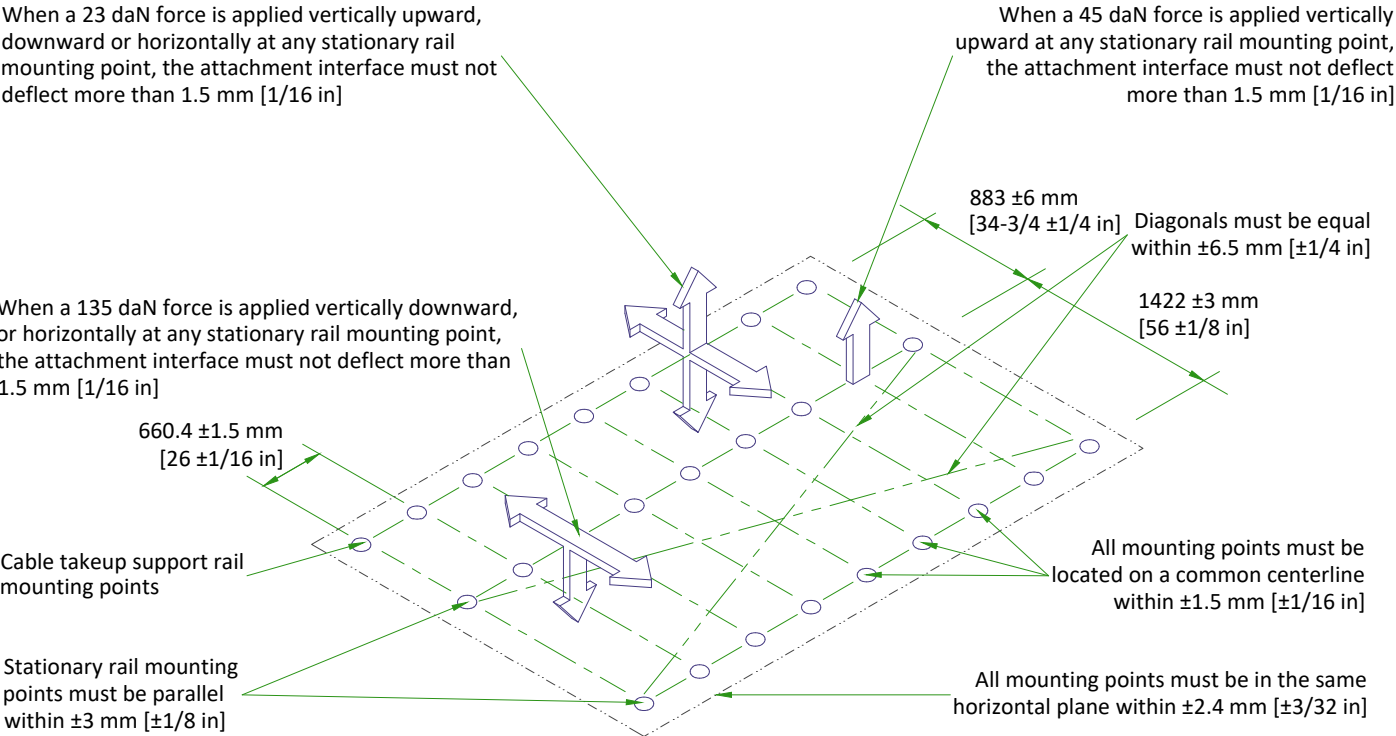


- Weight up to: 94 kg [207 lb] (75 kg [165 lb] system + 19 kg [42 lb] track)
- The required factor of safety is "4" for attaching to Unistrut or equivalent rails and "6" for attaching to the concrete ceiling.

CONSULT MAVIG INSTALLATION MANUAL REV: POR03001 TO DESIGN AND MOUNT THE CEILING SUPPORT.

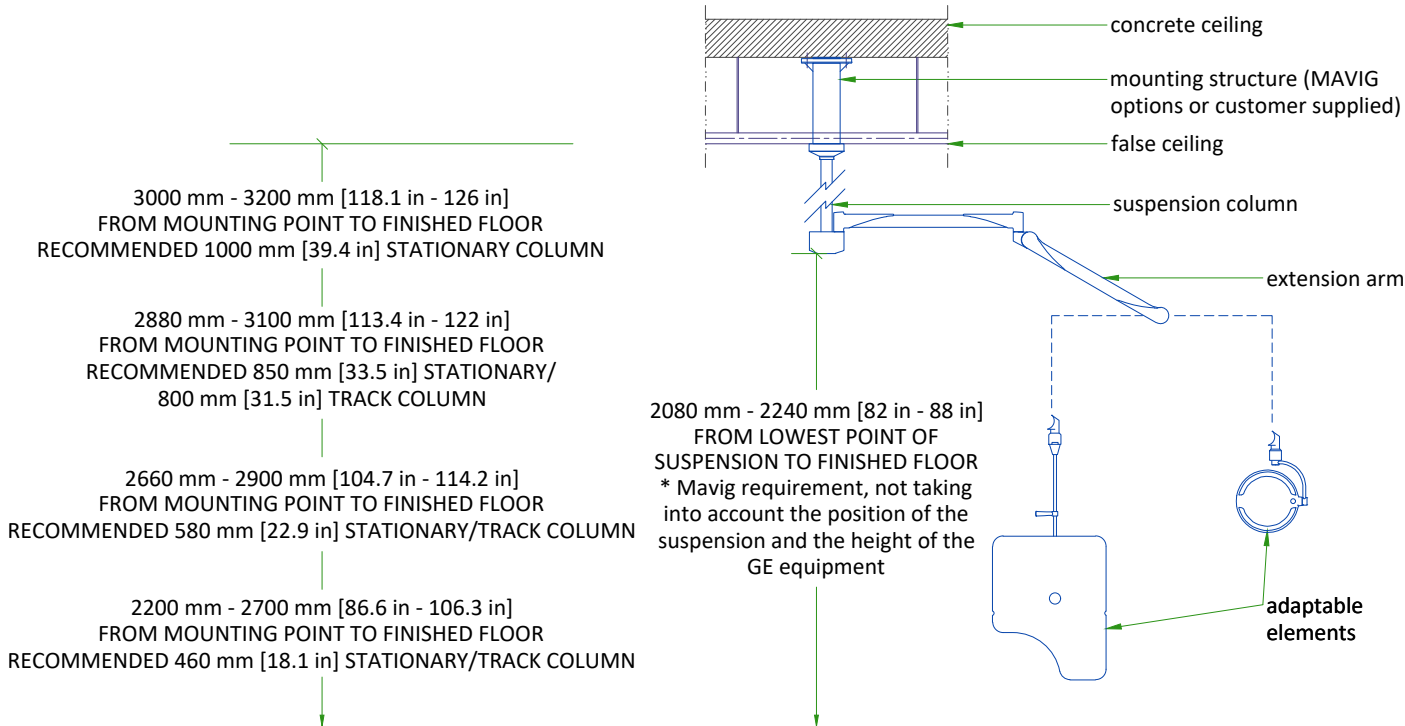
SCALE 1:20

MONITOR SUSPENSION RAIL MOUNTING SPECIFICATIONS



Each stationary rail must be mounted by bolts supplied or by 12 mm [1/2 in] as metric bolts. The maximum load per bolt must not exceed 1557 N [350 lbs] and each mounting bolt must not "PULL OUT" or otherwise fail under a vertically downward dead load of 6228 N [1400 lbs].

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

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.

TEMPERATURE AND HUMIDITY SPECIFICATIONS

IN-USE CONDITIONS

	EXAM ROOM			CONTROL ROOM			TECHNICAL ROOM		
	Min	Recommended	Max	Min	Recommended	Max	Min	Recommended	Max
Temperature	15 °C [59 °F]	20 °C [68 °F]	32 °C [90 °F]	15 °C [59 °F]	20 °C [68 °F]	35 °C [95 °F]	15 °C [59 °F]	20 °C [68 °F]	25 °C [77 °F]
Temperature gradient	≤ 10 °C/h			≤ 10 °C/h			≤ 10 °C/h		
RH (1) non condensing	20% to 70%			20% to 75%			20% to 75%		
Humidity gradient	≤ 10%/h			≤ 10%/h			≤ 10%/h		

STORAGE CONDITIONS

Temperature	+10 °C [50 °F] to +40 °C [104 °F]
RH (1) non condensing	10% to 80%
Pressure	700 hPa to 1030 hPa
Overall storage time shall be less than 6 months.	

(1) Relative humidity

AIR RENEWAL

According to local standards.

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.

8 kVA UPS

Systems with 8 kVA UPS shall be stored for less than 14 weeks if the storage temperature is above +30°C, and less than 25 weeks if storage temperature is above +25 °C.

HEAT DISSIPATION

ROOM	DESCRIPTION	HEAT OUTPUT (kW)				HEAT OUTPUT (BTU/hr)			
		STAND BY	MODERATE ¹	TYPICAL ²	MAX ³	STAND BY	MODERATE ¹	TYPICAL ²	MAX ³
Exam room	Gantry and table	0.41	0.55	0.89	1.62	1399	1877	3037	5528
	Large Display Monitor (LDM) with 2 backups	0.10	0.10	0.10	0.10	341	341	341	341
	Typical injector	0.09	0.09	0.09	0.09	307	307	307	307
	TOTAL	0.60	0.74	1.08	1.81	2047	6176	3685	6176
Control room	DL console and live monitor	0.10	0.10	0.10	0.10	341	341	341	341
	AW Workstation	0.59	0.59	0.59	0.59	2013	2013	2013	2013
	TOTAL	0.69	0.69	0.69	0.69	2354	2354	2354	2354
Technical room	C-FRT Cabinet	0.70	1.02	1.53	2.16	2388	3480	5221	7370
	PDU	0.50	0.50	0.50	0.50	1706	1706	1706	1706
	Tube Chiller	2.53	4.49	5.49	6.93	8633	15321	18733	23646
	Detector Conditioner	0.21	0.21	0.21	0.21	717	717	717	717
	UPS 8 kVA	0.52	0.52	0.52	0.52	1760	1760	1760	1760
	TOTAL	4.46	6.74	8.25	10.32	15204	35199	28137	35199

WARNING
The list contains only the principal components of the system and doesn't contain any non-GE supplied equipment.

¹ Moderate Use corresponds to 8 cases in 10 hours.

² Typical Use corresponds to 11 cases in 10 hours.

³ Maximum Use is during the case.

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:

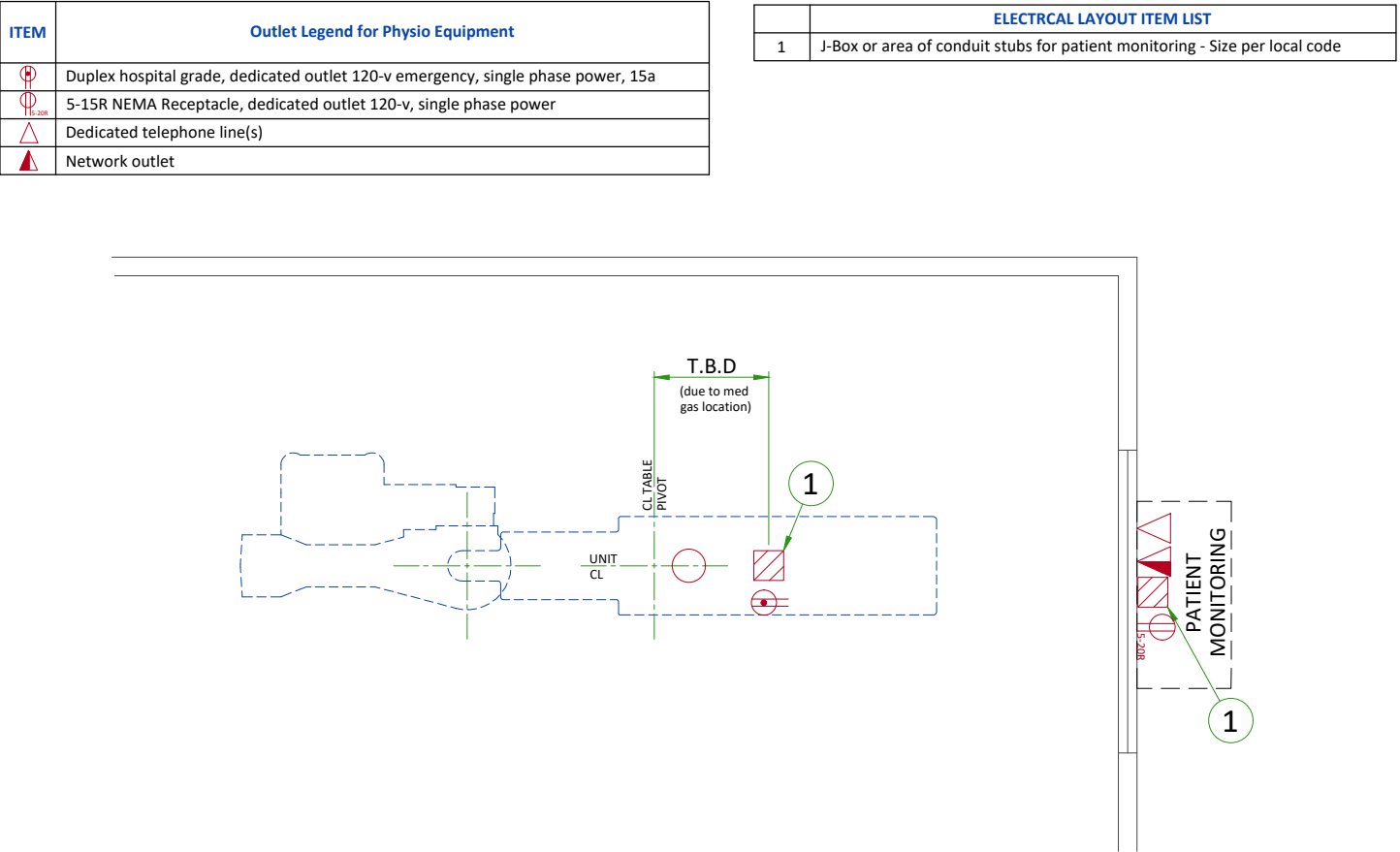
1.Ductwork shall be metal with dividers and have removable, accessible covers.

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 pigtails at all junction points.
- Grounding is critical to equipment function and patient safety. Site must conform to wiring specifications shown on this plan.

TYPICAL PHYSIO MONITORING

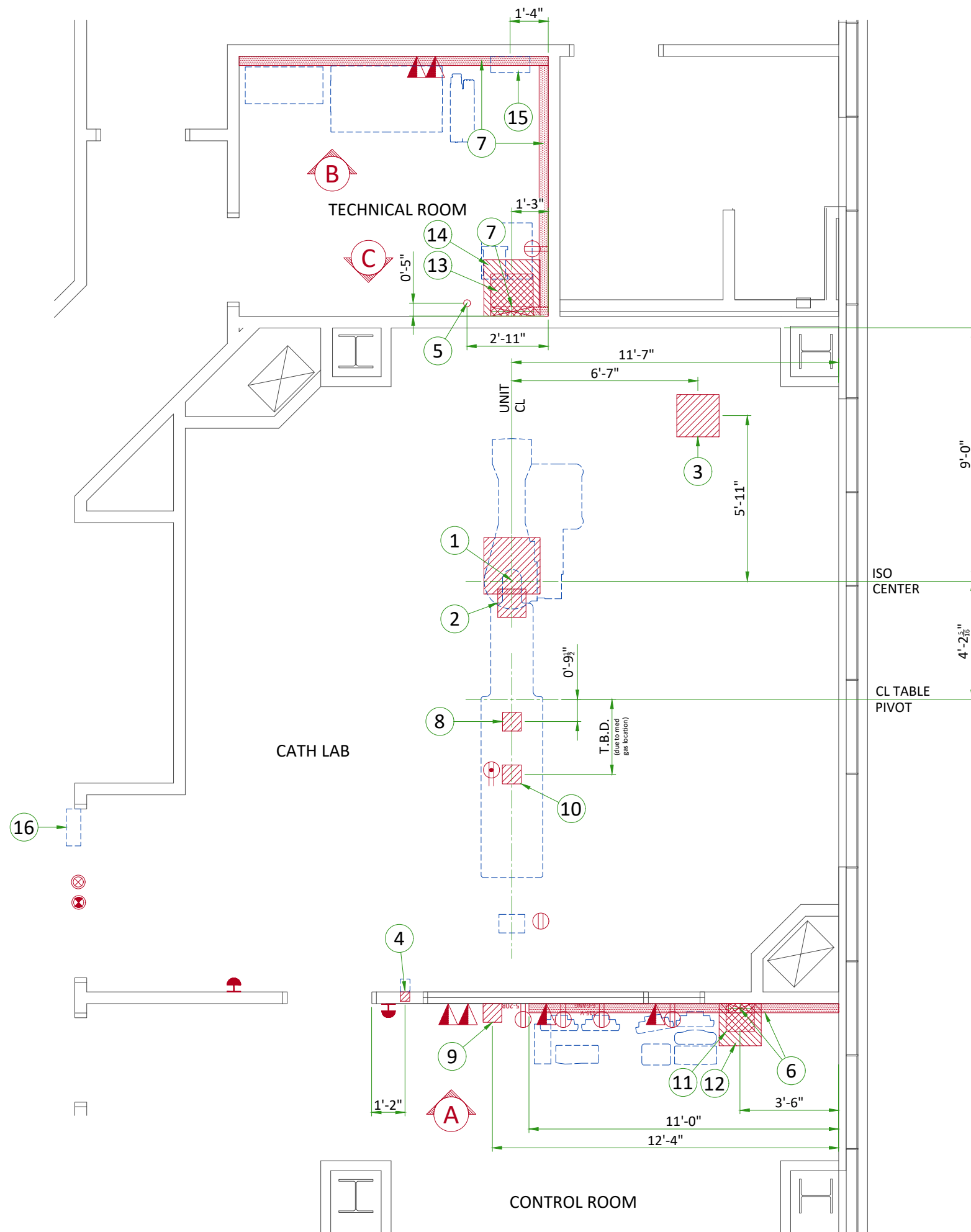


CONNECTIVITY REQUIREMENTS

Broadband Connections are necessary during the installation process and going forward to ensure full support from the Engineering Teams for the customers system. Maximum performance and availability for the customers system is maintained and closely monitored during the lifetime of the system. Proactive and reactive maintenance is available utilising the wide range of digital tools using 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

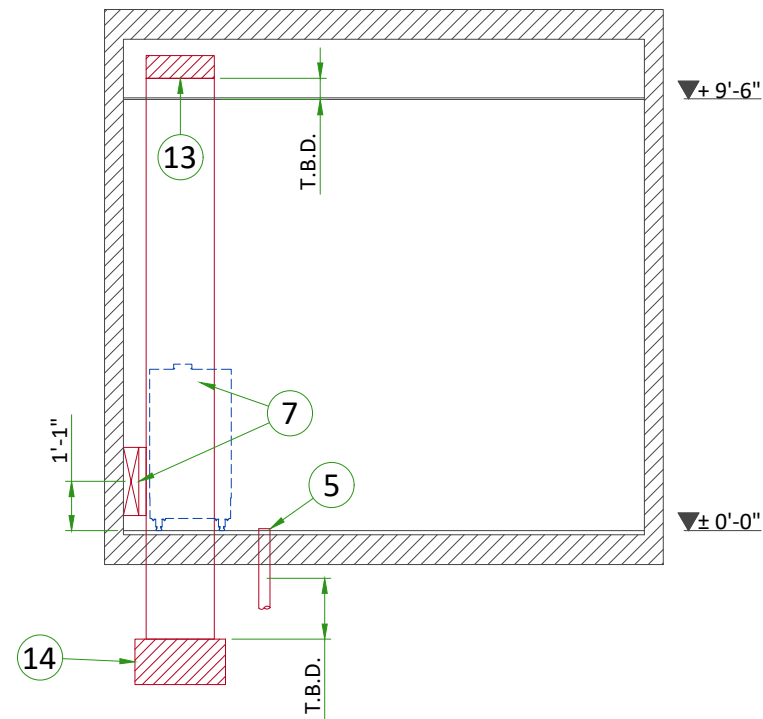
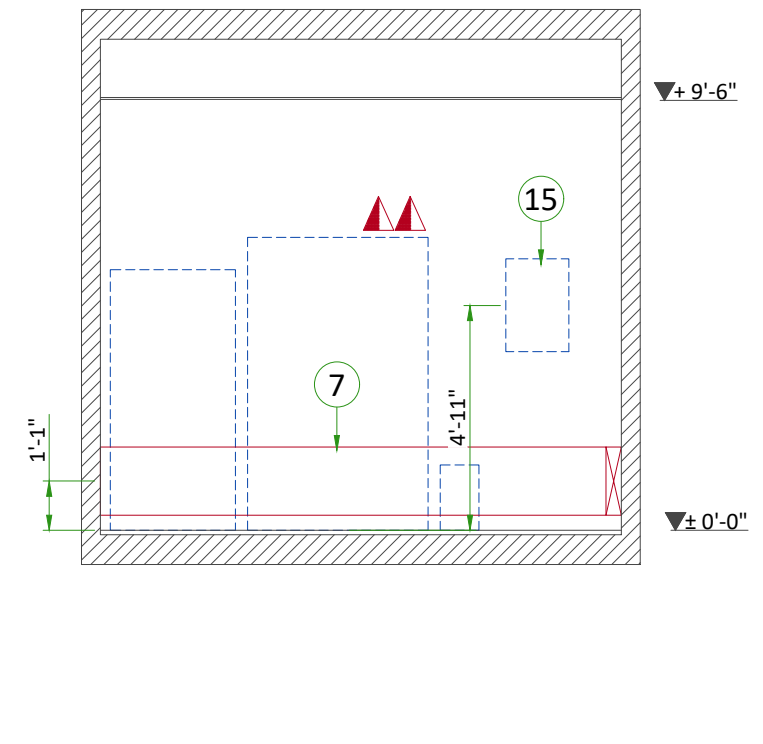
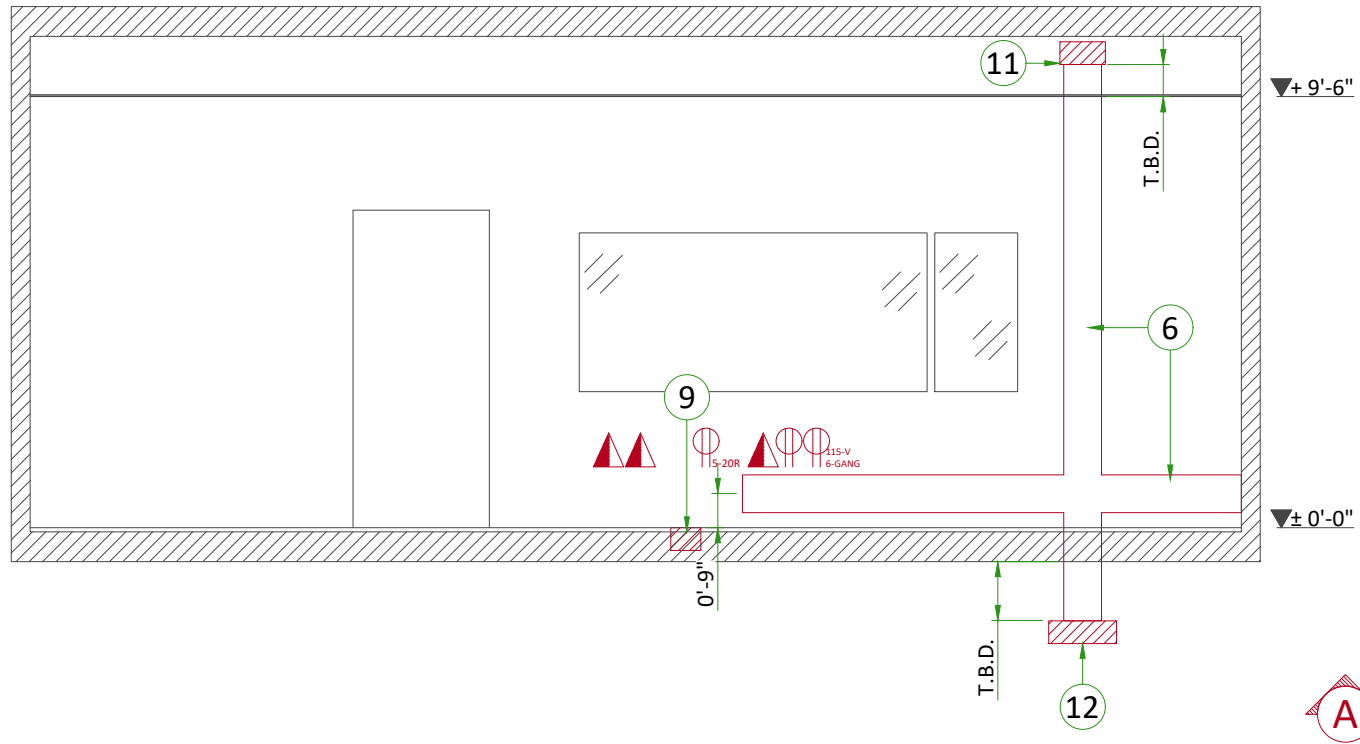
The requirements for these connectivity solutions are explained in the broadband solutions catalogue (separate document).



ITEM	ELECTRICAL LAYOUT ITEM LIST
1	24" x 24" x 12" [600 x 600 x 300] Box below floor, (1) 6" [150] dia. suitable length threaded pipe, (2) 6" [150] dia. locknuts and (4) 1" [25] dia. locknuts.
2	(1) GE supplied fitting. (1) 12" x 12" x 6" [300 x 300 x 150] Box, (1) 6" [150] dia. bushing, (4) 1" [25] dia. bushing for water lines
3	18"x18"x6" [450 x 450 x 150] box above ceiling (monitors)
4	4"x4"x4" [100 x 100 x 100] flush wall junction box 12" [300] below finished ceiling (x-ray buzzer)
5	Empty 3" [75] conduit below floor for waterlines
6	10" x 3 1/2" [250 x 89] surface wall duct with minimum 2 dividers
7	18" x 3 1/2" [450 x 89] surface wall duct with minimum 2 dividers
8	8" x 8" x 6" [200 x 200 x 150] box below floor (table)
9	8" x 8" x 6" [200 x 200 x 150] box below floor (patient monitoring equipment)
10	8" x 8" x 6" [200 x 200 x 150] box under table (PDM/TRAM)
11	12"x12"x6" [300 x 300 x 150] box above ceiling in control room
12	18" x 18" x 6" [450 x 450 x 150] box below floor in control room
13	18"x18"x6" [450 x 450 x 150] box above ceiling in equipment room
14	24"x24"x12" [600 x 600 x 300] box below floor in equipment room
15	Main disconnect panel
16	Light signaling control box

ITEM	QTY	Outlet Legend for GE Equipment
		System emergency off (SEO), (recommended height 1.2m [48"] above floor)
		X-Ray ON lamp (L1) - 24 V
		System ON lamp (L) - 24 V (only if needed per local codes)
		Duplex hospital grade, dedicated wall outlet 120-v, single phase power
		Duplex hospital grade, dedicated ceiling outlet 120-v, single phase power
		Network outlet
		Duplex hospital grade, dedicated outlet 120-v emergency, single phase power, 15a
		6-Gang hospital grade, dedicated wall outlet 115-V, single phase power
		5-20R NEMA Receptacle, dedicated outlet 120-v, single phase power

Additional Conduit Runs (Contractor Supplied and Installed)					
From (Bubble # / Item)	To (Bubble # / Item)	Qty	Usable length	Size (in)	
1 Gantry	14 CFRT Cabinet	4	52 ft.	4	
1 Gantry	8 Table	1	13 ft.	4&2	
12 Control Room	14 CFRT Cabinet	1 & 2	59 ft.	3 1/2 & 2 1/2	
5 Water Line	2# Gantry	1	59 ft.	3	
16 Light Signaling Control Box	Warning light	1	-	1/2	
16 Light Signaling Control Box	13 System Interface Cab. (PDU)	1	-	1/2	
16 Light Signaling Control Box	120-V 1 phase power	1	-	As Req'd	
LED Transformer	Spooler	1	-	As Req'd	
LED Transformer	120-V 1 phase power	1	-	As Req'd	
LED Lamp	Spooler	1	-	Cables come with spooler	
4 X-Ray Buzzer	13 CFRT Cabinet	1	90 ft.	1 1/2	
4 X-Ray Buzzer	11 Control Room	1	90 ft.	1 1/2	
3 Monitor Bridge / Boom	11 Control Room	1	88 ft.	2 1/2	
3 Large Display Monitor	11 CFRT Cabinet (LDM server)	1	88 ft.	3 & 3/4	
14 CFRT Cabinet (LDM server)	12 Control Room	1	59 ft.	3	
14 CFRT Cabinet (LDM server)	10 TRAM/PDM	2	-	3	
14 System Interface Cab. (PDU)	Emergency off	1	-	1/2	
13 System Interface Cab. (PDU)	Emergency off	1	-	1/2	
13 Main Disconnet Panel	7 System Interface Cab. (PDU)	1	14-44 ft.	1	
14 Injector Electronics	8 Injector Head	1	-	3	
14 Injector Electronics	12 Injector Control	1	-	3	
8 Table	10 TRAM/PDM	1	-	3	
9 Patient Monitoring Console	3 Monitor Bridge / Boom	1	-	3	
9 Patient Monitoring Console	10 TRAM/PDM	2	-	3	



POWER REQUIREMENTS

POWER SUPPLY	3 PHASES+G 380/400/415/480 V ±10%
FREQUENCIES for 380/400/415V	50/60 Hz ± 3 Hz
FREQUENCY for 480V	60 Hz ± 3Hz
PEAK POWER CONSUMPTION	150 kVA
MOMENTARY POWER CONSUMPTION	100 kVA
LONG TIME POWER CONSUMPTION	18 kVA
MINIMUM PROTECTION	100 A (D curve or equivalent)
MAXIMUM LINE IMPEDANCE PHASE TO PHASE	380 V : 0.09 Ω / 400 V : 0.096 Ω / 415 V : 0.102 Ω / 480 V : 0.12 Ω

- Power supply should come into a Mains Disconnect Panel (MDP) containing the protective units and controls.
- The section of the supply cable should be calculated in accordance with its length and the maximum line impedance phase to phase and rating of protection.

SUPPLY CHARACTERISTICS

- Power input must be separated from any others which may generate transients (elevators, air conditioning, radiology rooms equipped with high speed film changers ...)
- All equipment installed with IGS system components must be powered separately (e.g. lighting, power outlets)
- Transients must be less than 2,000 V peak in common mode and 1,000 V in differential mode, with a duration limited to a few microseconds.

GROUND SYSTEM

- At least 35 mm² copper from main ground point to the MDP.
- 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 IGS cableways and to additional equipotential connections linking up all the conducting units in the rooms where IGS units are located.

CABLES

- Power and cable installation must comply with the distribution diagram.
- MDP to PDU cable shall be copper cable and cable insulation temperature shall be 90°C.
- All cables must be isolated and flexible, cable color codes must comply with standards for electrical installation.
- The cables from signalling and remote control (SEO, L...) will go to PDU with a pigtail length of 2.0 m, 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 :

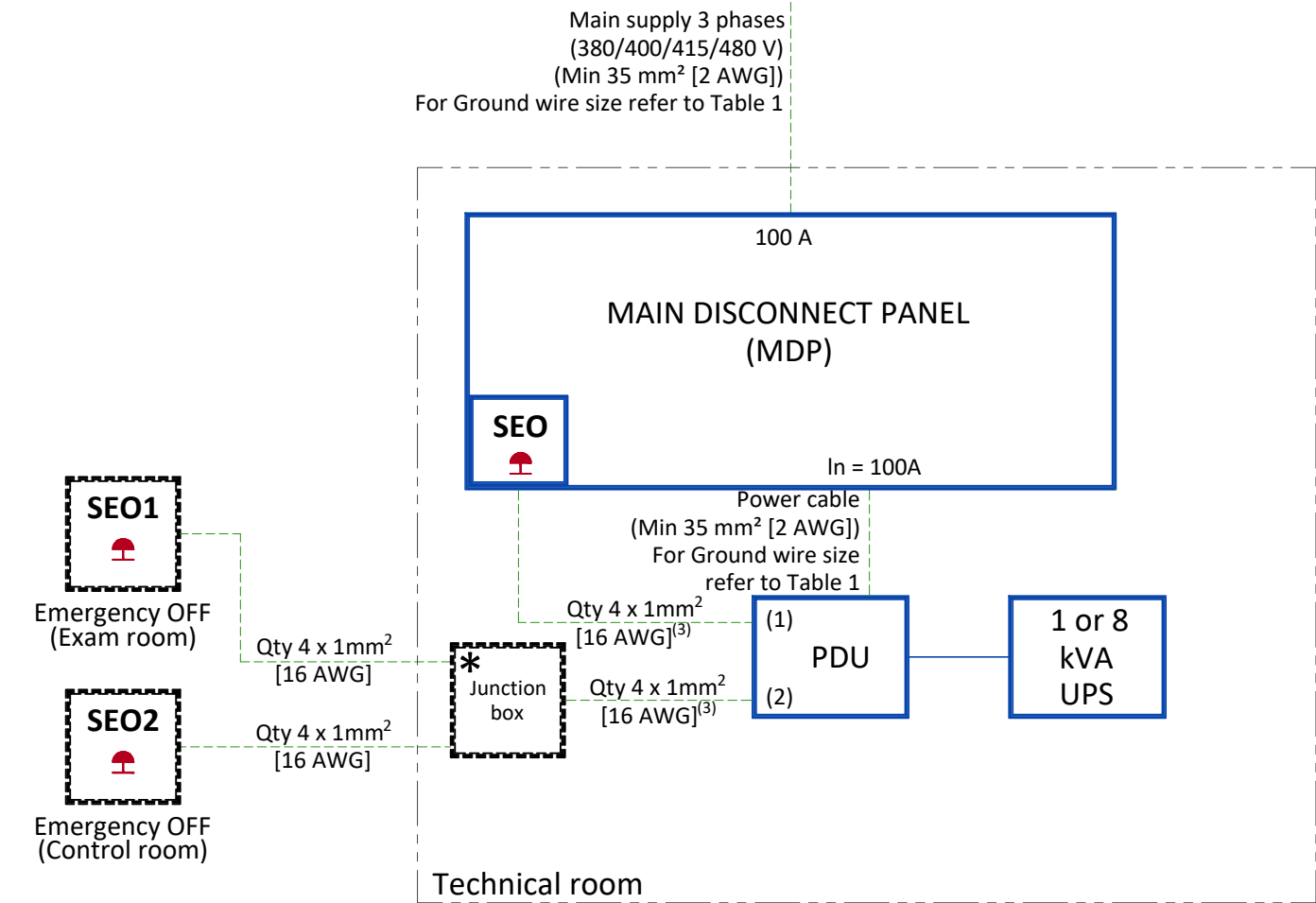
- Protecting cables against water (Cableways should be waterproof),
- Protecting cables against abnormal temperatures (Proximity to heating pipes or ducts),
- Protecting cables against temperature shocks,
- Replacing cables (Cableways should be large enough for cables to be replaced) ,
- Only GE cables are running inside cableways.
- Metal cableways should be grounded.

MANDATORY LOTO REQUIREMENTS

- The MDP shall provide means of disconnecting the mains power from the system, with LOTO capability to ensure safe service operation. It can be done by the input breaker if it has disconnecting capability, or by a separate disconnection device.
- An operator should be able to apply LOTO without opening the MDP box. When a LOTO device is installed on the MDP input breaker or on the disconnecting device, there shall be no voltage at the output of the MDP.

POWER DISTRIBUTION FOR IGS SYSTEM

POWER SUPPLY FOR MAIN SYSTEM



- SEO Emergency OFF button with two normally closed (NC) contacts in the door of MDP
- SEO 1-2 Emergency OFF button with two NC contacts located 1.50 m [5 ft] above floor.
The EPO button shall be protected against accidental activation.
*Series connection of SEO1 and SEO2 NC contacts
- PDU Power Distribution Unit/System Interface Cabinet

NOTES:

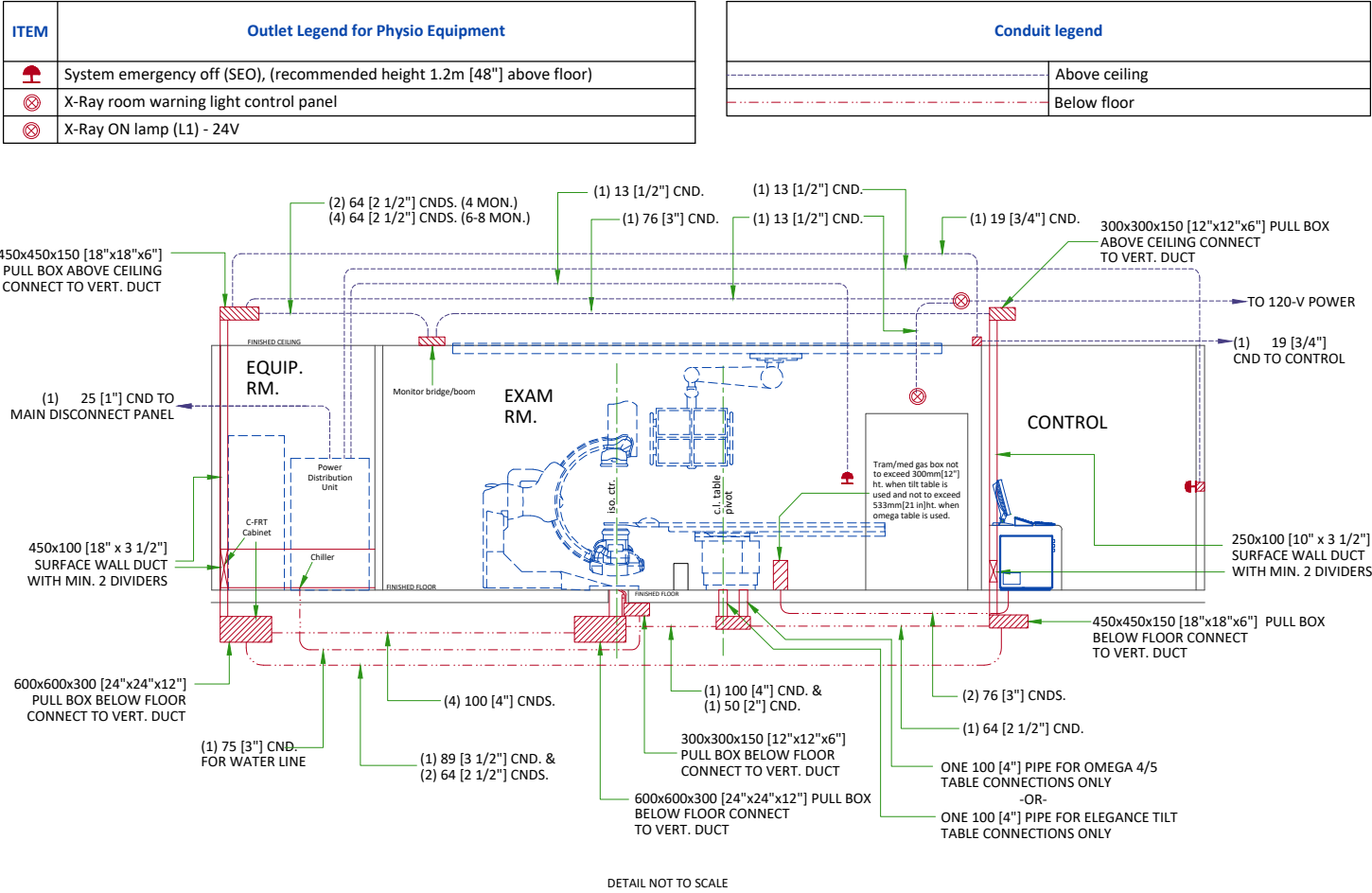
- (1) Emergency power off : MDP EPO
- (2) Emergency power off : Remote EPO
- (3) Cable with 2 m [6.6 ft] extra length on the floor behind the PDU

Table 1

LENGTH	<6 m [20 ft]	<15.1 m [50 ft]
GAUGE	Qty 1x2 AWG	Qty 2x2 AWG
GAUGE	Qty 1x35 mm²	Qty 2x35 mm²

-----	Cable SUPPLIED BY CUSTOMER
-----	Cable SUPPLIED BY GE
-----	Equipment SUPPLIED BY CUSTOMER
-----	Equipment SUPPLIED BY GE

ELECTRICAL SECTION VIEW



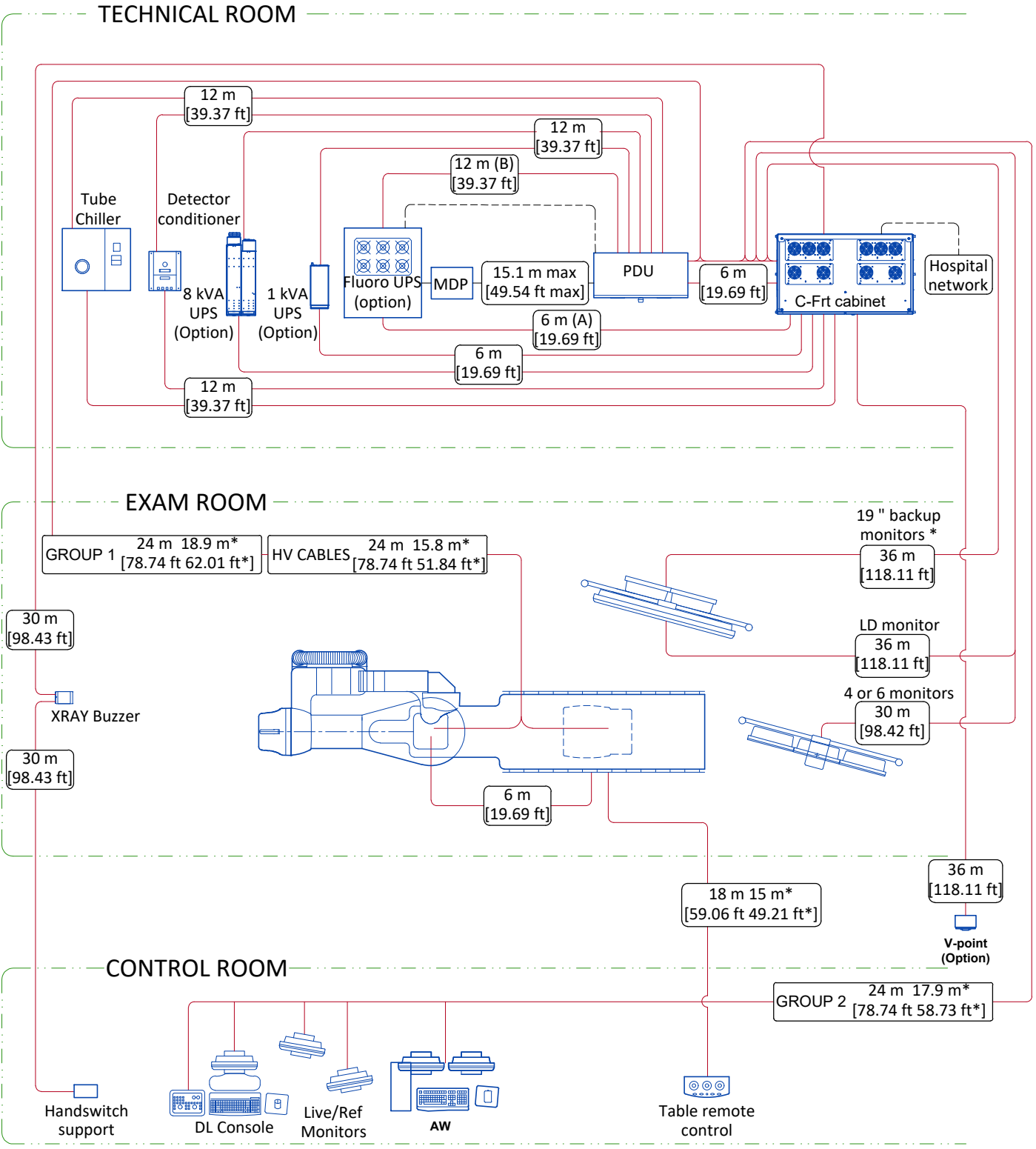
ITEM

Conduit legend

Above ceiling

Below floor

INTERCONNECTIONS



		Cable supplied by the client	
		Cable supplied by GE	
		Room wall	
.....mft	Total length	
.....m*ft*	Usable length	

Notes:

(A): A 6 m Ethernet cable between the C-FRT Cabinet and the Fluoro UPS is provided with the system. If a longer cable is needed, it shall be provided by the hospital; it shall be Cat5 minimum.

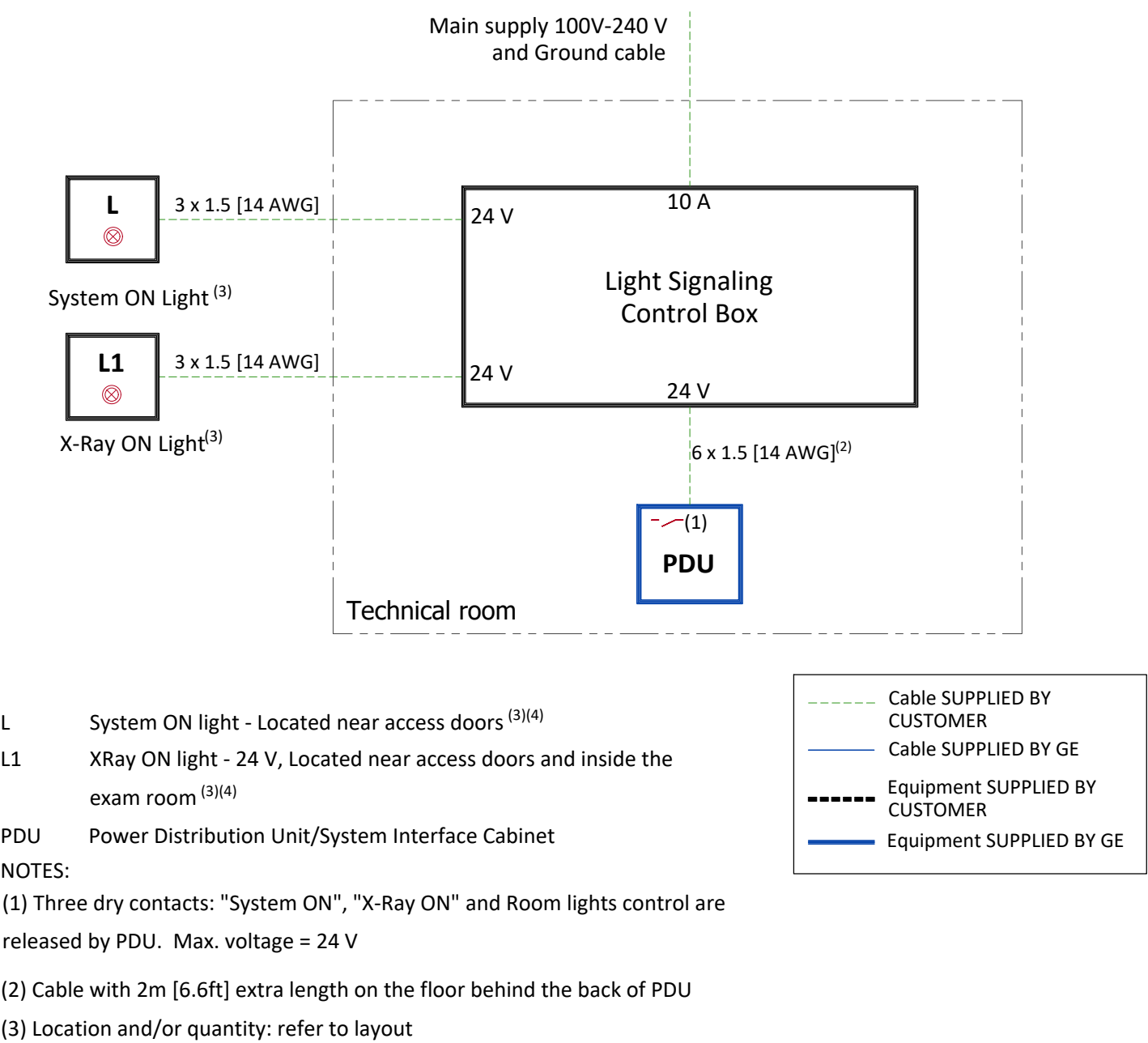
(B): A 12 m EPO cable between the PDU and the Fluoro UPS is provided with the system. If a longer cable is needed, it shall be provided by the hospital, its minimum gauge shall be 1 mm² [17 AWG].

POWER REQUIREMENTS (LIGHT SIGNALING)

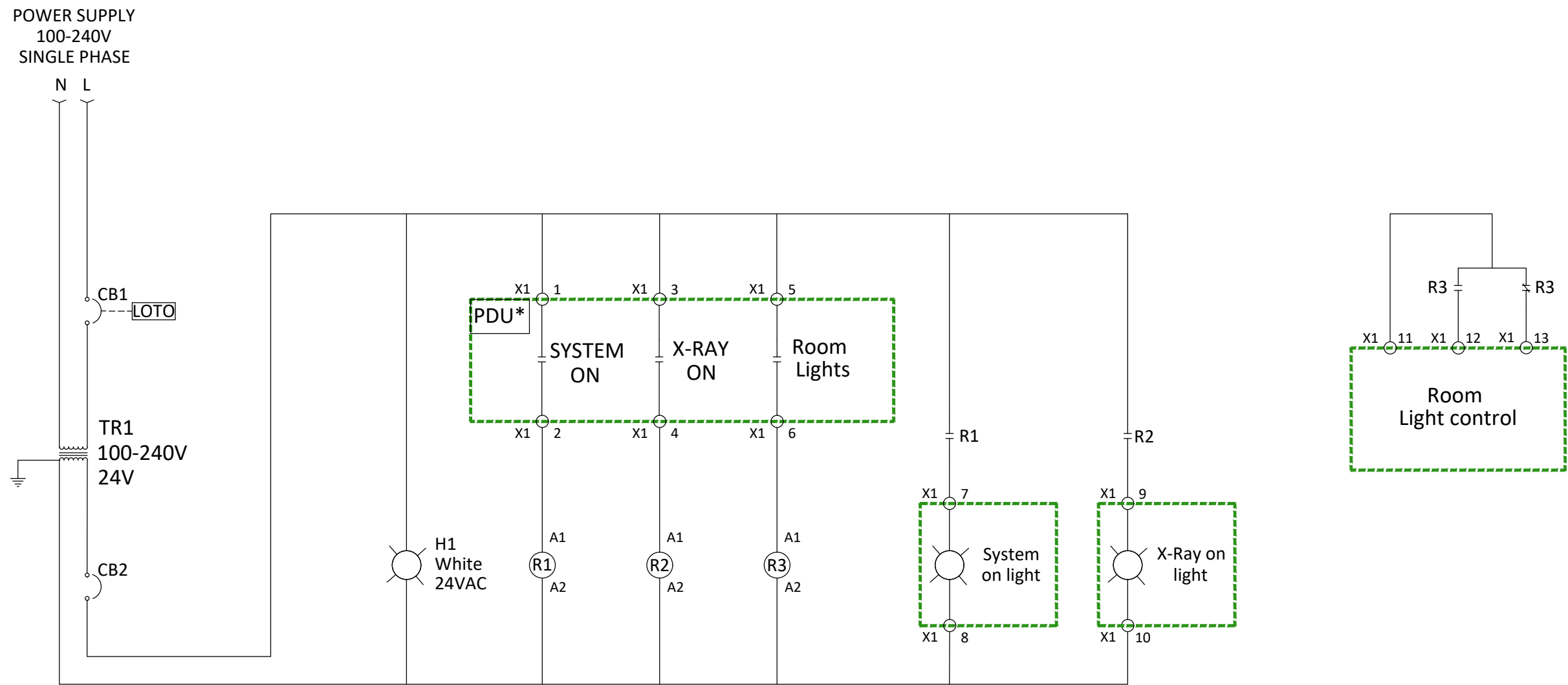
SPECIFICATIONS OF POWER INPUT

FOR ELECTRICAL BOX LIGHT SIGNALING	
POWER DEMAND	10 A
VOLTAGE	Single Phase 100V - 240V ± 10%
FREQUENCY	50/60 Hz ± 3Hz

POWER DISTRIBUTION (LIGHT SIGNALING)



DETAILED SCHEMATICS ELECTRICAL BOX (LIGHT SIGNALING)



SYMBOLS LEGEND

- Circuit breaker
- Relay coil
- Relay contact - normally open (de-energized state)
- Relay contact - normally closed (de-energized state)
- Control power transformer
- Indication light
- Cable/conductor termination
- External lock-out/tag-out capability
- Ground

IG: Lockable interruptor
CB1/CB2: Circuit breaker
R1/R2/R3: 24 VAC 50/60 Hz auxiliary relay
TR1: Transformer

H1: System ON lamp voltage control
L: System ON Lamp
L1: X-Ray ON Lamp

* TERMINAL X1					
	SYSTEM ON		X-RAY ON		ROOM LIGHTS
	1	2	3	4	5 6
PDU ON/OFF BOARD	1	2	1	2	1 2
	J15		J6		J10