

TYPICAL

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REV	DATE	MODIFICATIONS
01 - C1 - Cover Sheet		16 - E2 - Electrical Layout (2)
02 - C2 - Disclaimer - Site Readiness		17 - E3 - Electrical Elevations
03 - A1 - General Notes		18 - E4 - Power Distribution
04 - A2 - Equipment Layout		19 - E5 - Power Requirements
05 - A3 - Section Views		20 - E6 - Interconnections
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		



## OPTIMA IGS 320-330 FINAL STUDY

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: <https://www.gehealthcare.com/support/manuals>

GE HealthCare 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 drawings. GE HealthCare cannot accept responsibility for any damage due to the partial use of GE HealthCare final issue drawings, however caused. All dimensions are in millimeters unless otherwise specified. Do not scale from printed pdf files. GE HealthCare accepts no responsibility or liability for defective work due to scaling from these drawings.

Drawn by	Verified by	Concession	GON/Quote	PIM Manual	Rev
RET	TST	-	-	5537562-1-1EN	3
Format	Scale	File Name		Date	Sheet
A3	1/4"=1'-0"	EN-VAS-TYP-OPTIMA_IGS_3X0-NF.DWG		08/Sep/2025	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>

## CUSTOMER SITE READINESS REQUIREMENTS

### REQUIRED MANUALS FOR SYSTEM PRE-INSTALLATION

Description	Document Number*
Product specific Pre-installation Manual	Refer to cover page
*documents can be accessed in multiple languages at <a href="https://www.gehealthcare.com/support/manuals">https://www.gehealthcare.com/support/manuals</a>	

- A mandatory component of this drawing set is the GE HealthCare Pre-installation manual. Failure to reference the Pre-installation manual will result in incomplete documentation required for site design and preparation.
- The items on the GE HealthCare Site Readiness Checklist **DOC2949062** and Worksheet **DOC2949068** are REQUIRED to facilitate equipment delivery to the site. Equipment will not be delivered if these requirements are not satisfied.
  - Any deviation from these drawings must be communicated in writing to and reviewed by your local GE HealthCare installation project manager prior to making changes.
  - Make arrangements for any rigging, special handling, or facility modifications that must be made to deliver the equipment to the installation site. If desired, your local GE HealthCare installation project manager can supply a reference list of rigging contractors.
  - New construction requires the following;
    1. Secure area for equipment,
    2. Power for drills and other test equipment,
    3. Restrooms.
  - Provide for refuse removal and disposal (e.g. crates, cartons, packing)

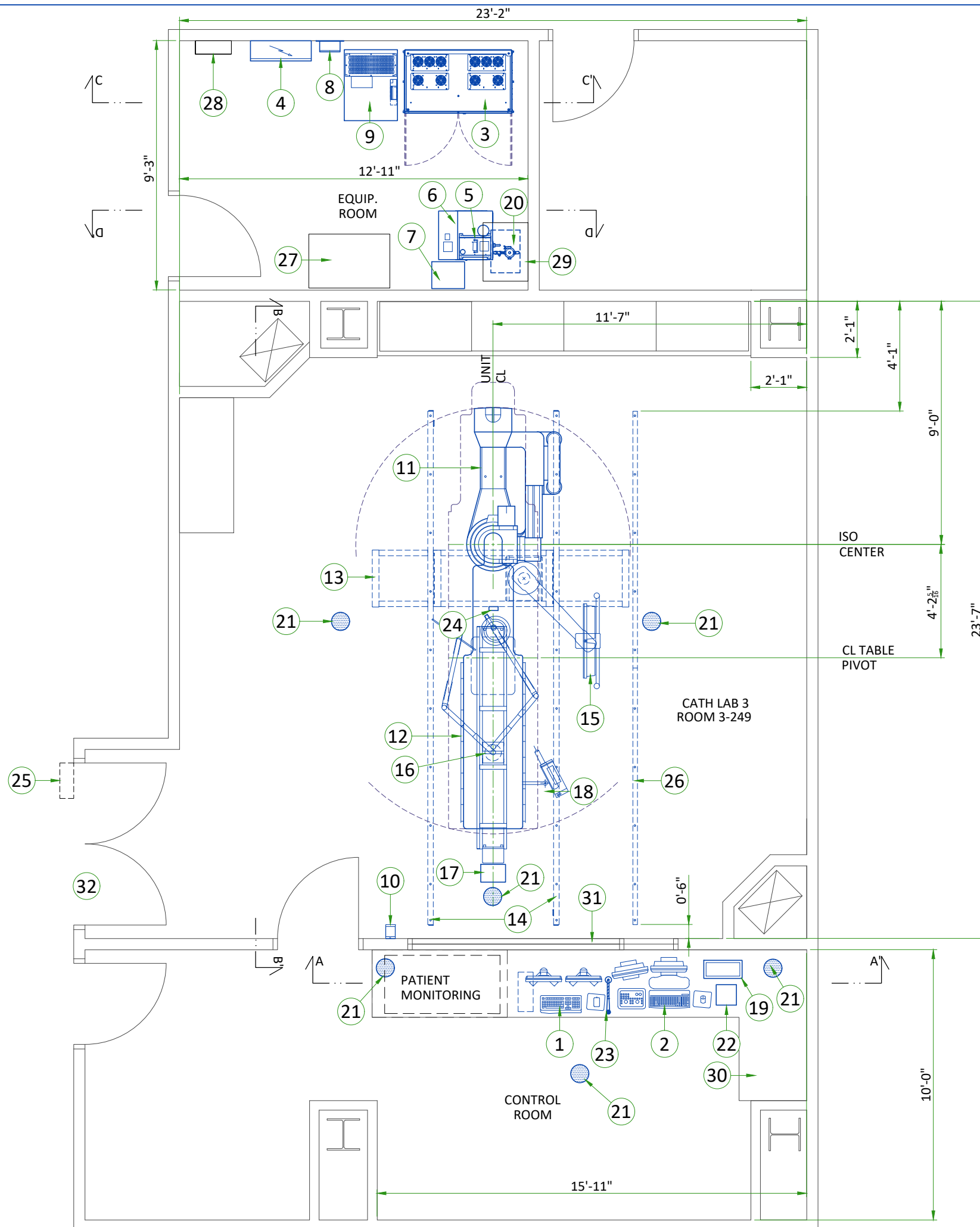
## MAGNETIC INTERFERENCE SPECIFICATIONS

- Image intensifiers must be located in ambient static magnetic fields of less than 1 gauss to guarantee specified imaging performance.
- X-ray tubes must be located in ambient static magnetic fields of less than 10 gauss to guarantee specified performance.
- System electronics must be located in ambient static magnetic fields of less than 10 gauss to guarantee data integrity.
- Operators console equipment must be located in ambient static magnetic fields of less than 10 gauss to obtain specified geometric linearity.

## ELECTROMAGNETIC INTERFERENCE

The system is suitable for use in the specified electromagnetic environment. The purchaser or user of the system should assure that it is used in an electromagnetic environment as described below:

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



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

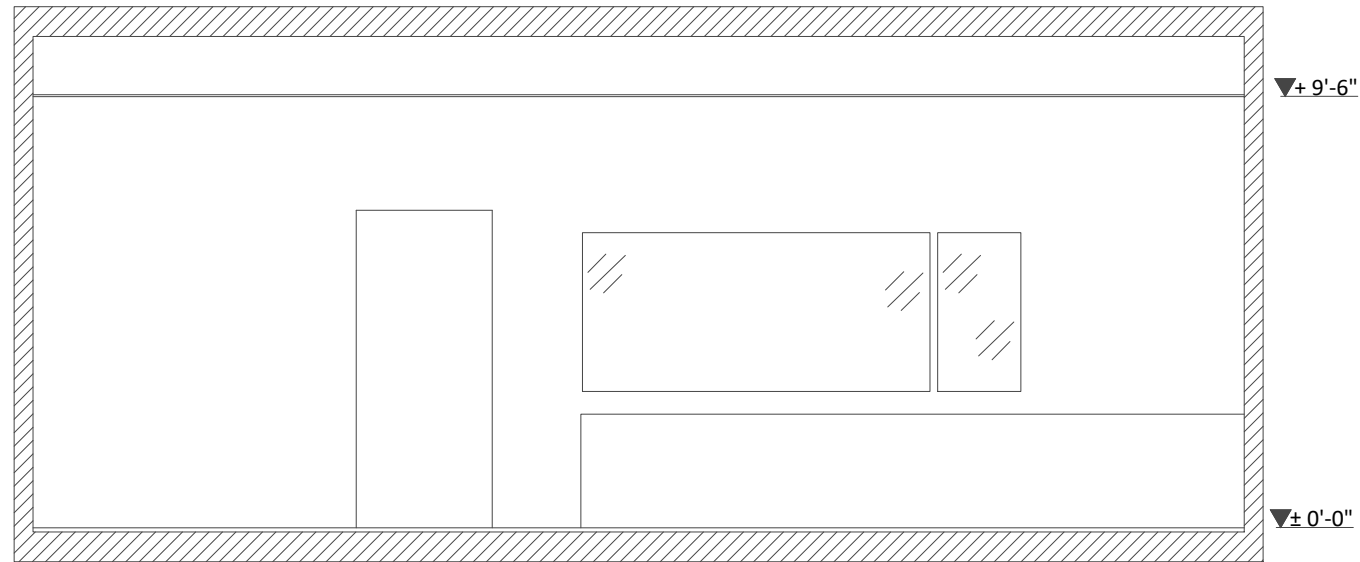
BY	ITEM	DESCRIPTION	MAX HEAT OUTPUT (BTU/h)	WEIGHT (lbs)	MAX HEAT OUTPUT (W)	WEIGHT (kg)
A	1	ADVANTAGE WORKSTATION (AW)	3412	70	1000	31.7
A	2	OPERATOR CONSOLE	341	43	100	19.6
A	3	SYSTEM CONTROL CABINET	7370	1323	2160	600
B	4	POWER DISTRIBUTION BOX (PDB)	1535	326	450	148
A	5	DETECTOR CONDITIONER	717	32	210	14.6
A	6	COOLIX 4100 WATER CHILLER	23645	265	6930	120
A	7	COOLIX 4100 AUTOTRANSFORMER	307	66	90	30
A	8	FLUORO UPS INTERFACE BOX	-	9	-	4
A	9	FLUORO UPS UL	7302	1169	2140	530
A	10	XRAY BUZZER	-	2	-	1
A	11	LC GANTRY	-	1654	-	750
A	12	OMEGA V LONG PATIENT TABLE	-	1301	-	590
A	13	MONITOR SUSPENSION LONG BRIDGE	-	225	-	102
A	14	MONITOR SUSPENSION RAILS (x2)	-	139	-	63
A	15	SUSPENSION WITH 4 MONITORS	-	298	-	135
A	16	MAVIG RAD SHIELD AND LAMP WITH 2.5M CEILING TRACK	-	205	-	93
B	17	LED LAMP TRANSFORMER	-	6	-	2.7
A	18	INJECTOR HEAD	-	-	-	-
A	19	REMOTE CONTROL FOR INJECTOR	-	4	-	2
A	20	INJECTOR ELECTRONICS	-	37	-	17
B	21	VITALINQ SPEAKER (x6)	-	-	-	-
B	22	VITALINQ CONSOLE	-	-	-	-
B	23	VITALINQ MICROPHONE	-	-	-	-
B	24	VITALINQ MICROPHONE (ONE ON MONITOR BRIDGE IN EXAM ROOM)	-	-	-	-
D	25	ELECTRICAL BOX (LIGHT SIGNALING - NOT SUPPLIED BY GE)	-	-	-	-
A	26	CABLE DRAPE RAIL	-	-	-	-
C	27	CUSTOMER SUPPLIED STORAGE CABINET	-	-	-	-
C	28	150-AMP LOCAL SERVICE DISCONNECT FOR LOCK-OUT/ TAG-OUT CAPABILITY. (MAY BE A FUSED DISCONNECT, CIRCUIT BREAKER OR SAFETY SWITCH.)	-	-	-	-
C	29	SHELF	-	-	-	-
C	30	COUNTER TOP FOR EQUIPMENT- PROVIDE GROMMETED OPENINGS AS REQUIRED TO ROUTE CABLES	-	-	-	-
C	31	CONTROL WALL TO CEILING WITH LEAD GLASS VIEWING WINDOW	-	-	-	-
C	32	MINIMUM OPENING FOR EQUIPMENT DELIVERY IS 1118 mm x 2108 mm [44 in x 83 in], CONTINGENT ON A 2438 mm [96 in] CORRIDOR WIDTH	-	-	-	-

EXAM ROOM HEIGHT	
FINISHED FLOOR TO SLAB HEIGHT	TBD
FALSE CEILING HEIGHT	Rec. 9'-6"

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

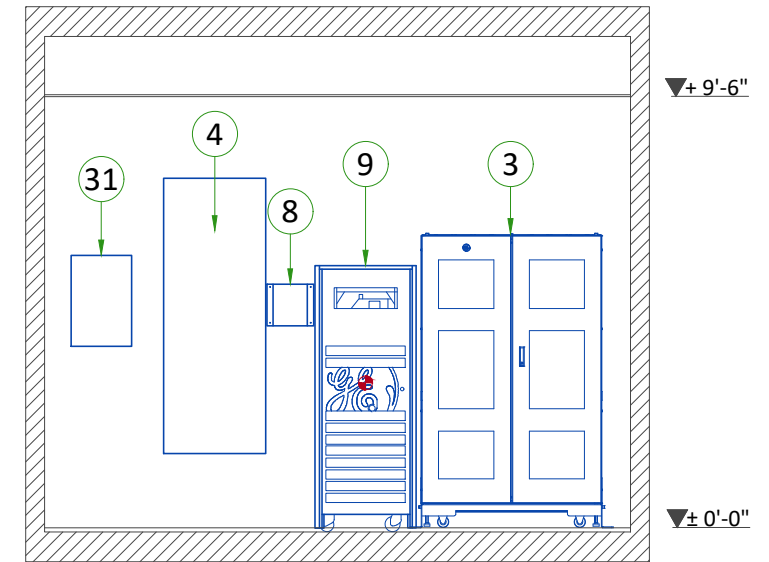
### CONTROL ROOM VIEW

#### SECTION A-A'



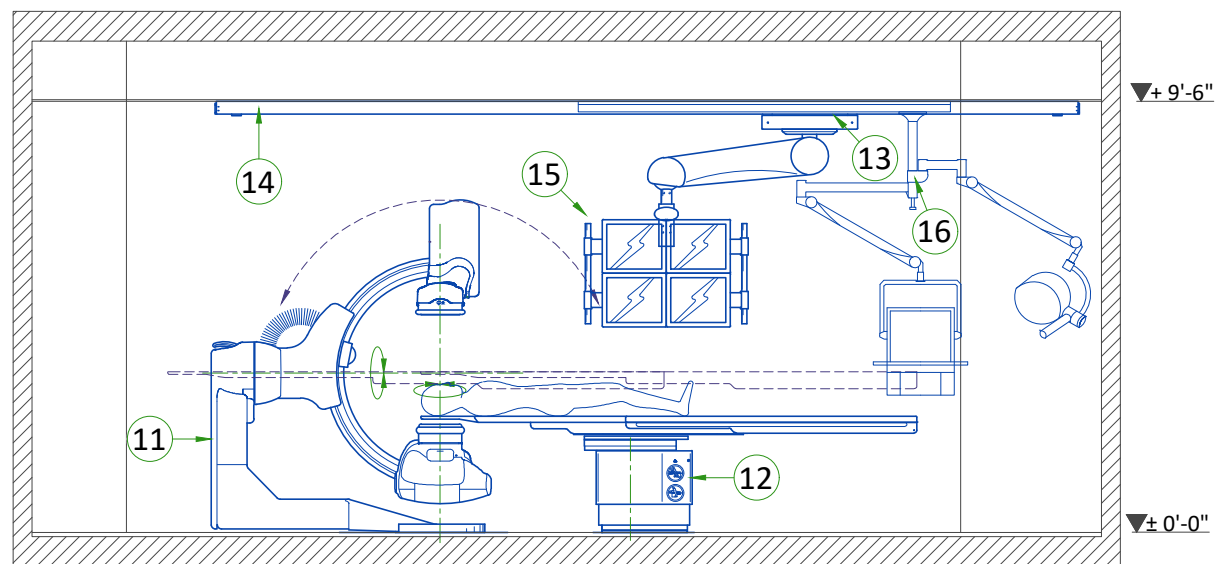
### TECHNICAL ROOM VIEW

#### SECTION C-C'



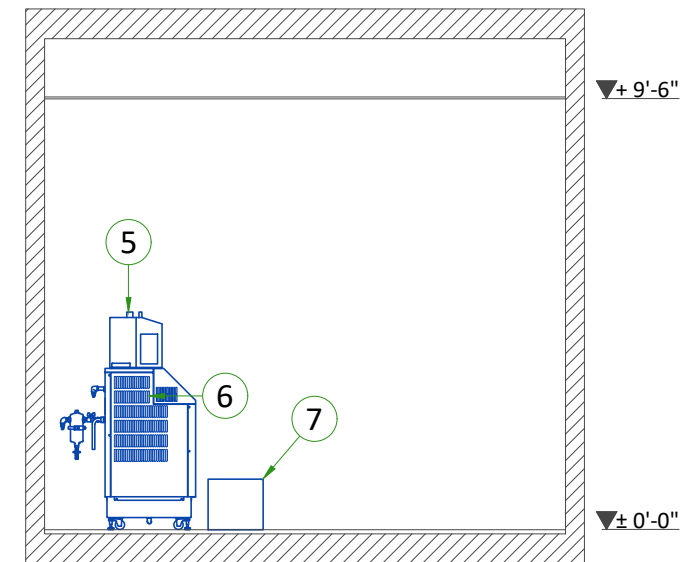
### EXAM ROOM VIEW

#### SECTION B-B'



### TECHNICAL ROOM VIEW

#### SECTION D-D'

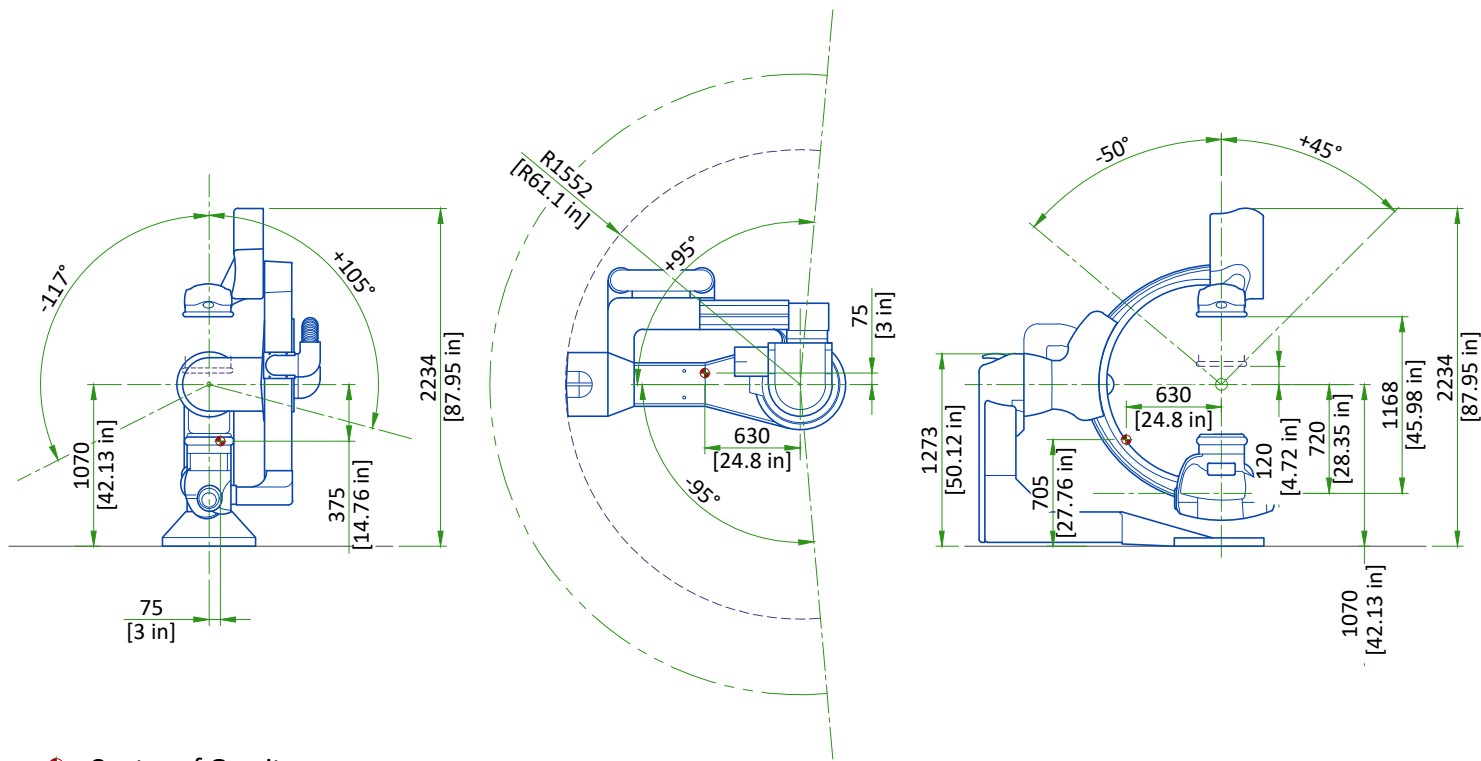


## GANTRY

FRONT VIEW

TOP VIEW

SIDE VIEW

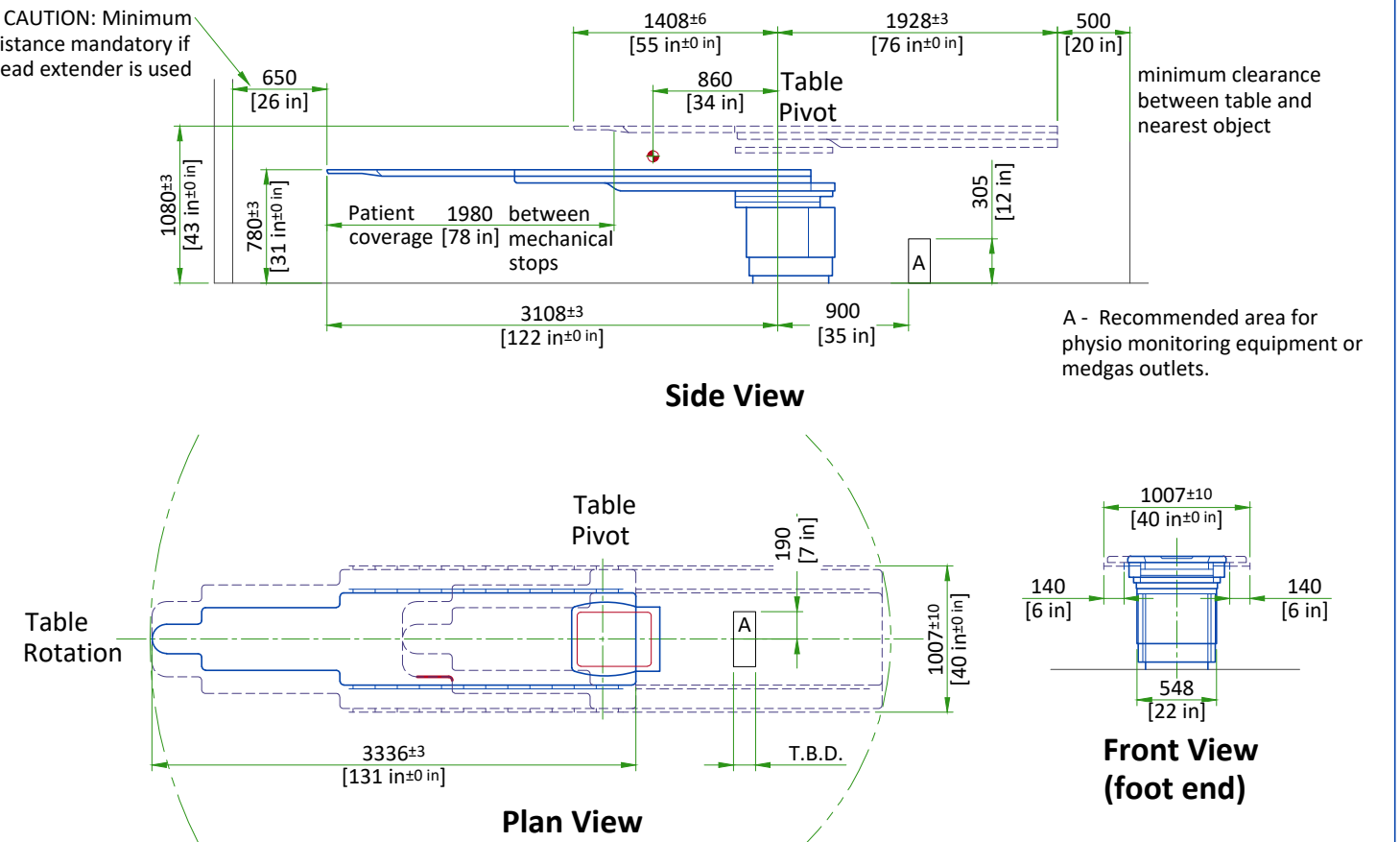


Center of Gravity

SCALE 1:50

## OMEGA V PATIENT TABLE

CAUTION: Minimum distance mandatory if head extender is used



Scale 1:50

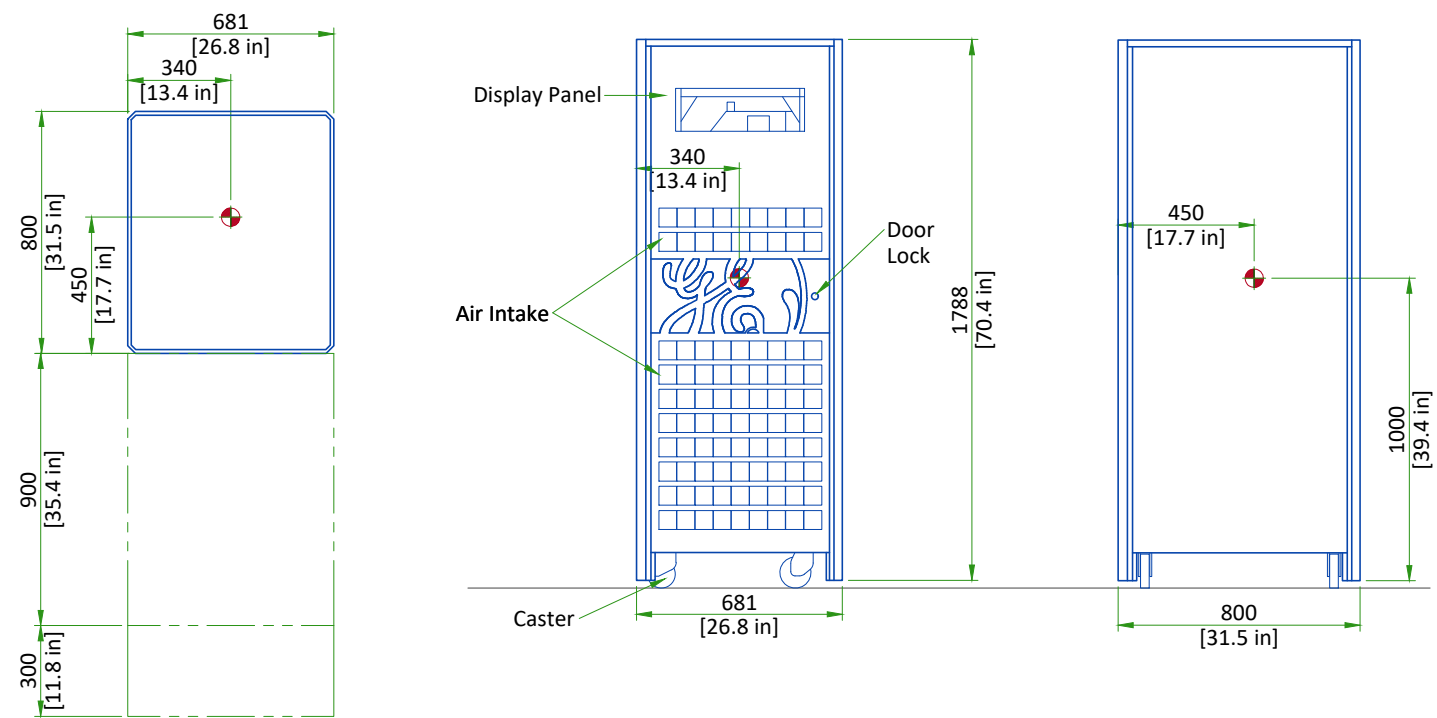
Center of Gravity

## DIGITAL ENERGY SG SERIES 10-20kVA UPS

PLAN VIEW

FRONT VIEW

SIDE VIEW

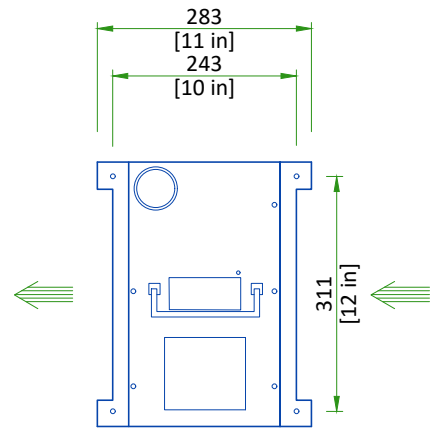


Center of Gravity

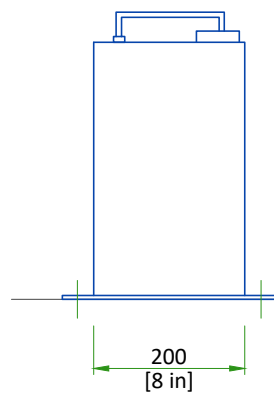
SCALE 1:25

## DETECTOR CONDITIONER

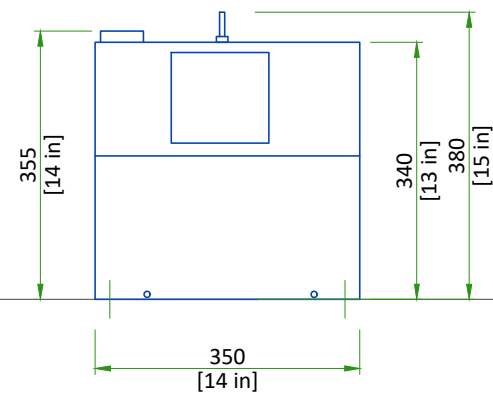
TOP VIEW



FRONT VIEW



SIDE VIEW

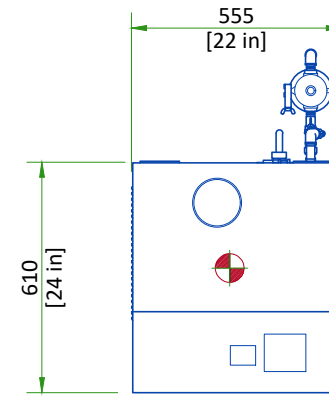


➡ Indicates air flow

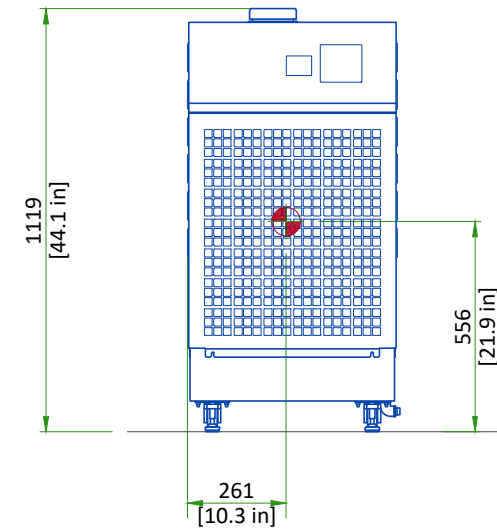
Scale 1:10

## X-RAY TUBE CHILLER

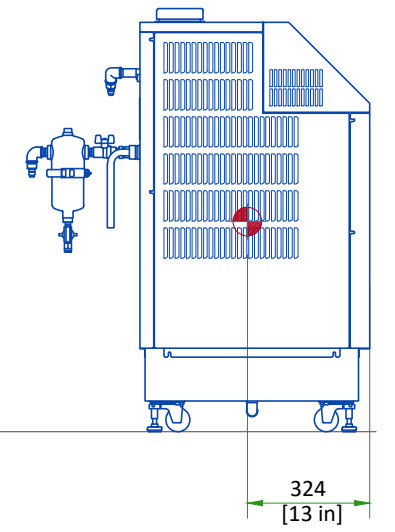
TOP VIEW



FRONT VIEW



SIDE VIEW

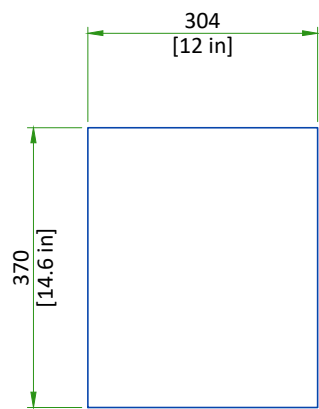


⊕ Center of Gravity

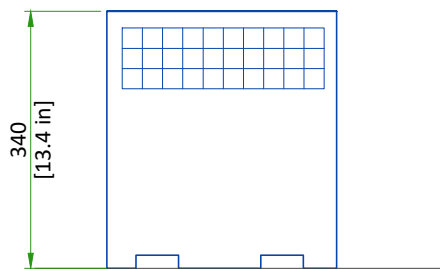
Scale 1:20

## COOLIX AUTOTRANSFORMER

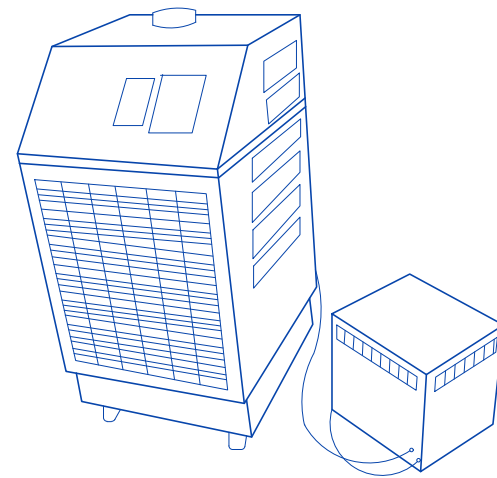
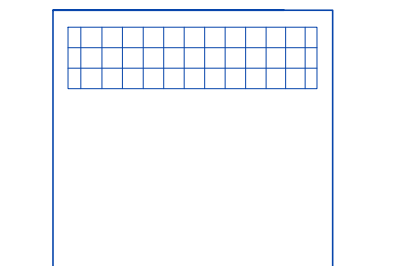
Plan View



Front View



Side View



Scale 1:10

## DELIVERY

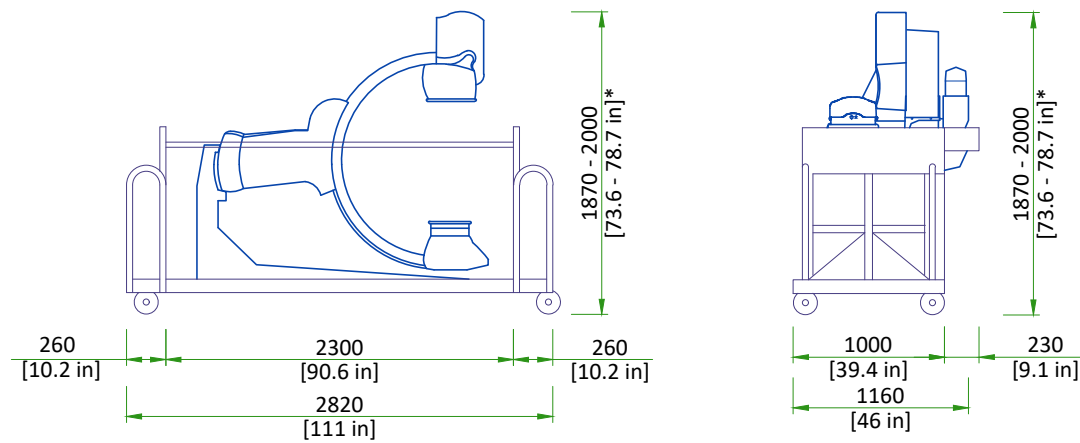
### THE CUSTOMER/CONTRACTOR SHOULD:

- 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

EQUIPMENT	DIMENSIONS		WEIGHT
GANTRY	LENGTH	2820 mm [111 in]	1060 kg [2340 lb]
	WIDTH	1230 mm [48.4 in]	
	HEIGHT	2000 mm [79 in]	

## SHIPPING DOLLY FOR LC GANTRY



SHIPPING WEIGHT: 1060 kg [2337 lb].

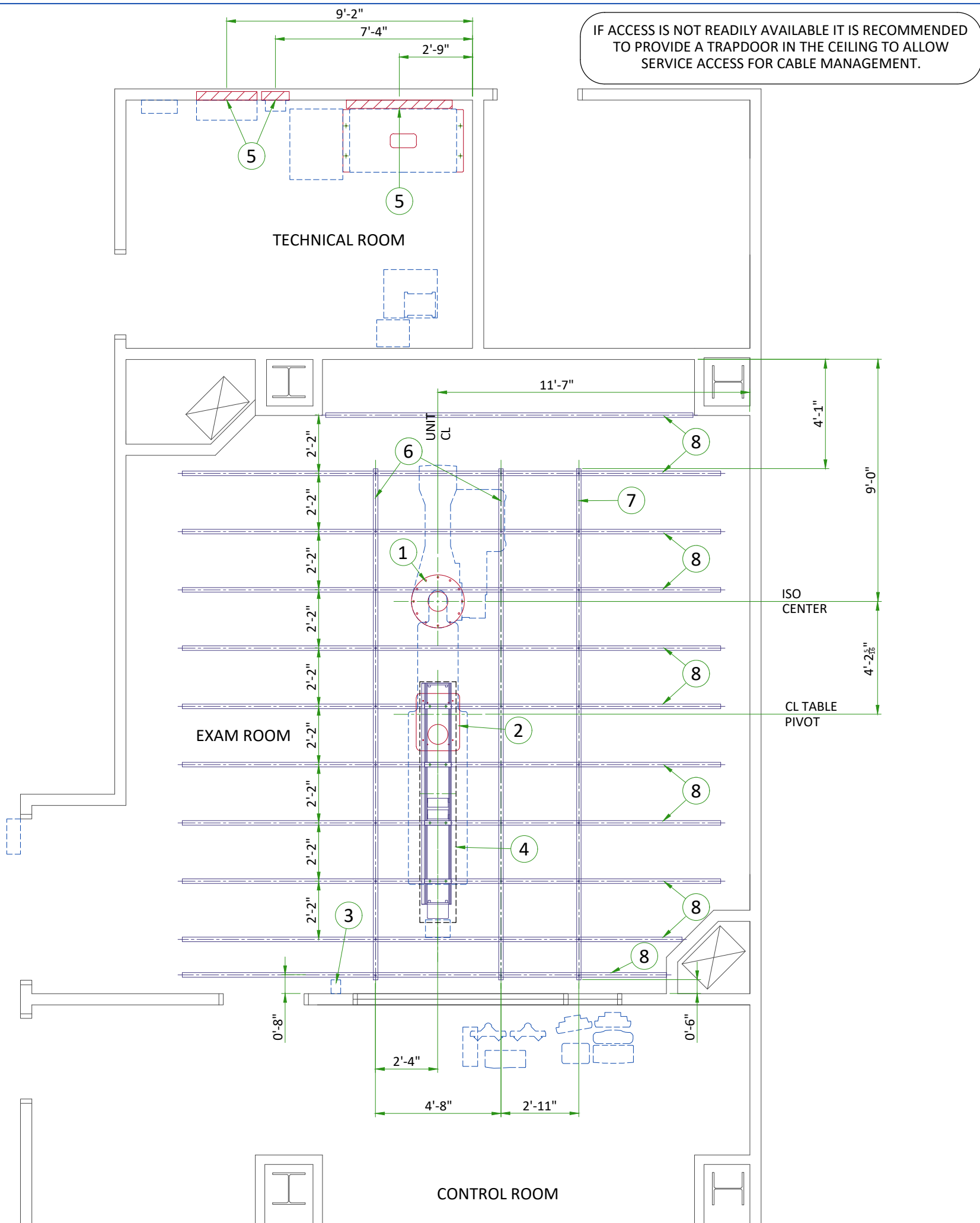
### DIMENSIONS

	HEIGHT	WIDTH	LENGTH
Full configuration	1870-2000 mm [73.6 - 78.7 in]*	1230 mm [48.4 in]	2820 mm [111.0 in]
Left top handle removed and right top handle inside	1870-2000 mm [73.6 - 78.7 in]*	1160 mm [45.7 in]	2820 mm [111.0 in]
Short lifts configuration	2000 mm [78.7 in]	1160 mm [45.7 in]	2300 mm [90.5 in]
NOTE	* Height can be adjusted: ONLY when necessary on delivery path and IF floor rolling surface is flat and leveled (no obstacle), Dolly can be lowered down by 120-130 mm (it means dolly horizontal bars are at 10 mm from floor surface, to prevent any damage on gantry).		

SCALE 1:50

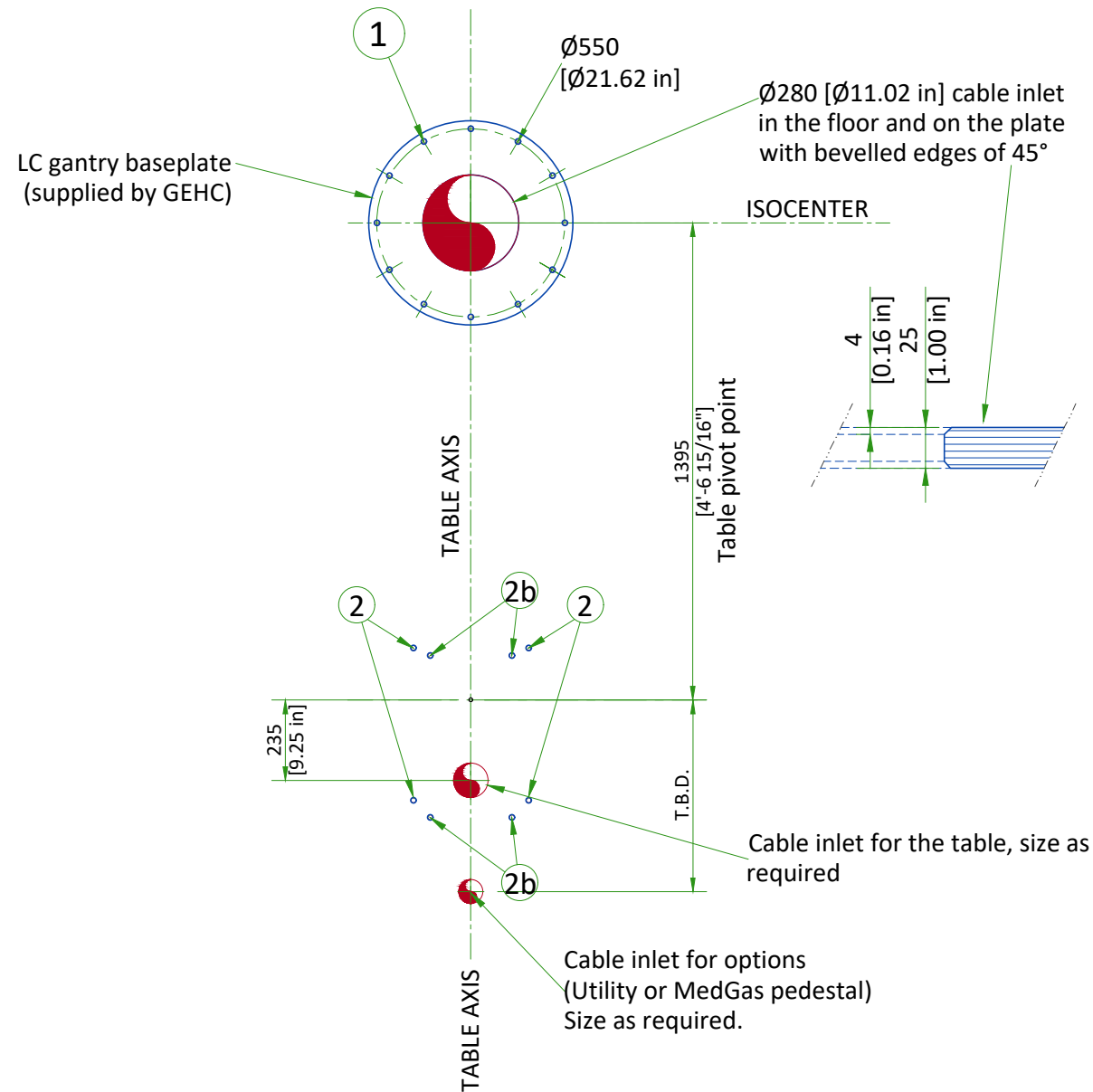
## STRUCTURAL NOTES

- 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 structural support should run continuous with no fittings extending below face of structural support 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. **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 auxiliary 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")
- 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"



STRUCTURAL LAYOUT ITEM LIST	
(GE SUPPLIED / CONTRACTOR INSTALLED)	
1	Area occupied by GE supplied positioner baseplate
2	Area occupied by GE supplied table baseplate
3	Mount X-Ray buzzer bracket on wall above ceiling
(CUSTOMER SUPPLIED / CONTRACTOR INSTALLED)	
4	Area of radiation shield mounted to unistrut grid in ceiling
5	Support backing, locate as shown.
6	Stationary rails attached to gridded support in ceiling.
7	Cable drape rail attached to gridded support in ceiling.
8	Structural support in ceiling for fastening ceiling supported equipment. Supports to run continuous with no fittings extending below face of channel, run wall to wall, be parallel, square, and in the same horizontal plane, flush with the finished ceiling. Rails are mounted to these supports every 2'-2" and require 350 lbs. (597 lbs. In seismic regions) per bolt load. Methods of support that permit attachment to structural steel or through bolts in concrete should be favored. Do not use screw anchors in direct tension.

# LC GANTRY AND TABLE ANCHORING WITH NO BASEPLATE



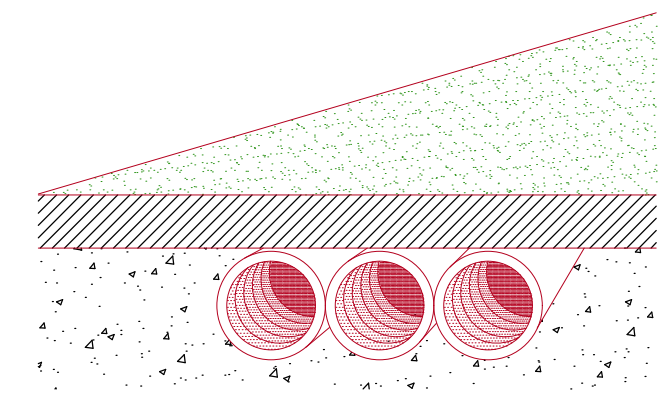
- 1 LC baseplate mounting location : 12 bolts  
Pullout strength on each bolt 736 daN  
- M12 Through-Bolts with large washer (supplied by GEHC)  
Alternates:  
- Chemical anchors (not supplied by GEHC):  
HILTIHVU adhesive capsule + HAS Anchor rod
- 2 Table mounting location : 4 bolts required  
Pullout strength on each bolt 4432 daN  
- M12 Through-Bolts with large washer (supplied by GEHC)  
Alternates:  
- Chemical anchors (not supplied by GEHC):  
HILTIHVU adhesive capsule + HAS Anchor rod
- 2b Alternate bolt holes for seismic zones 1 and 2

# FLOOR REQUIREMENTS AND CABLE MANAGEMENT

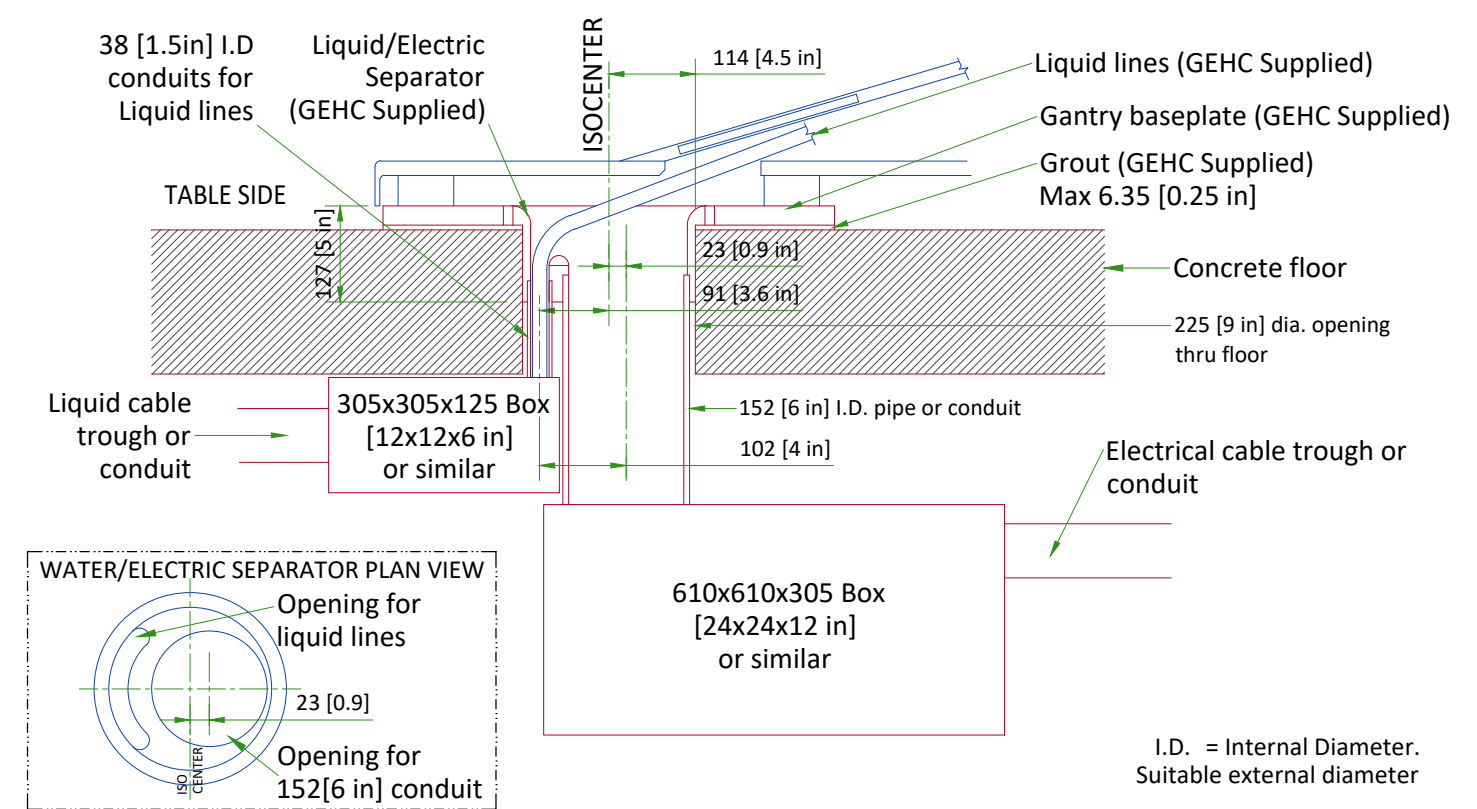
## FLOOR REQUIREMENTS

- The maximum pullout force per GEHC 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).
- If applicable: grout below LC gantry baseplate shall be at least 3 mm [1/8 in] thick and be level within 0.8 mm [1/32 in].
- Anchoring to the floor is intended to the structural elements and not to common screed.

## CONDUIT IN/UNDER THE FLOOR



# JUNCTION BOX BELOW FLOOR

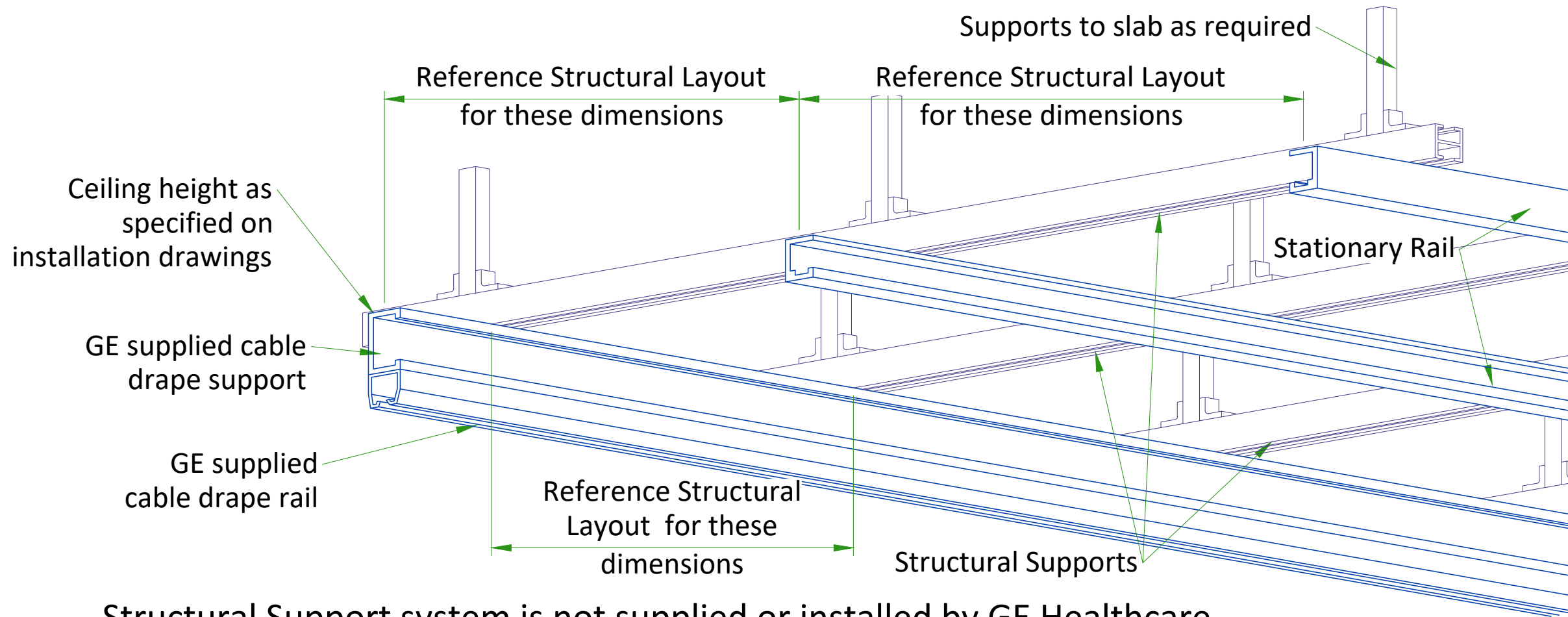


NOTE: PIPE, JUNCTION BOX, AND DUCT OR CONDUIT ARE TO BE SUPPLIED AND INSTALLED BY CUSTOMER OR CUSTOMER'S CONTRACTOR

I.D. = Internal Diameter. Suitable external diameter

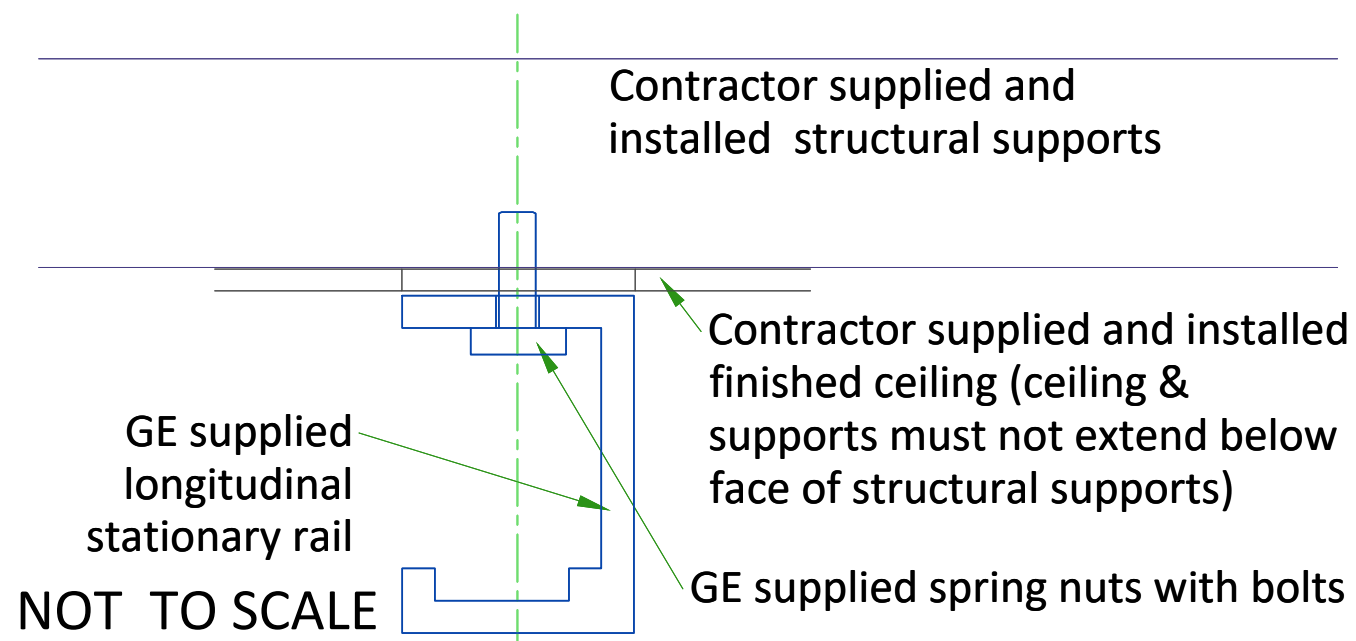
NOT TO SCALE

# XT RADIOGRAPHIC SUSPENSION, INBOARD MOUNTING

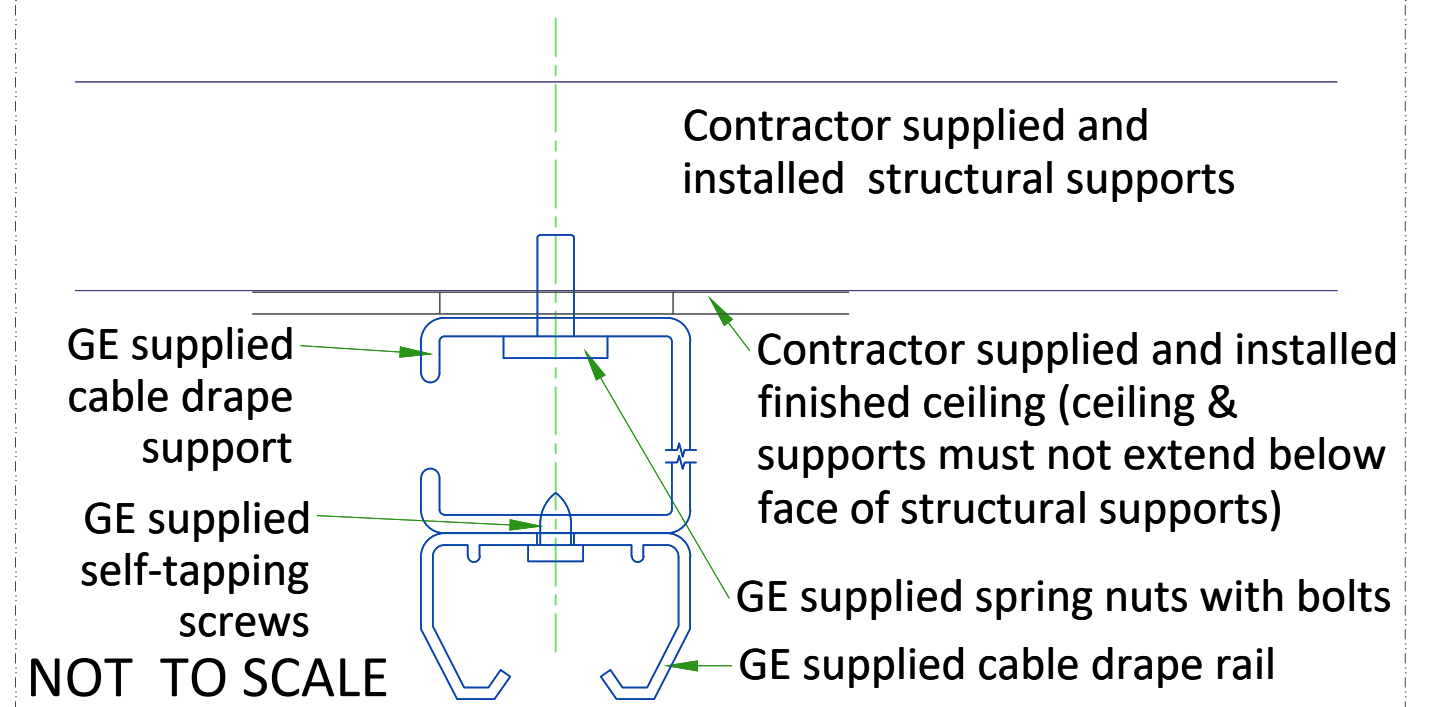


Structural Support system is not supplied or installed by GE Healthcare

## DETAIL 1

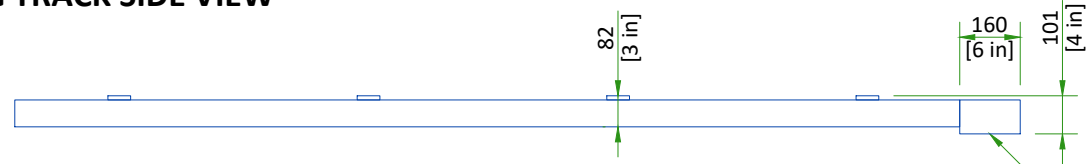


## DETAIL 2

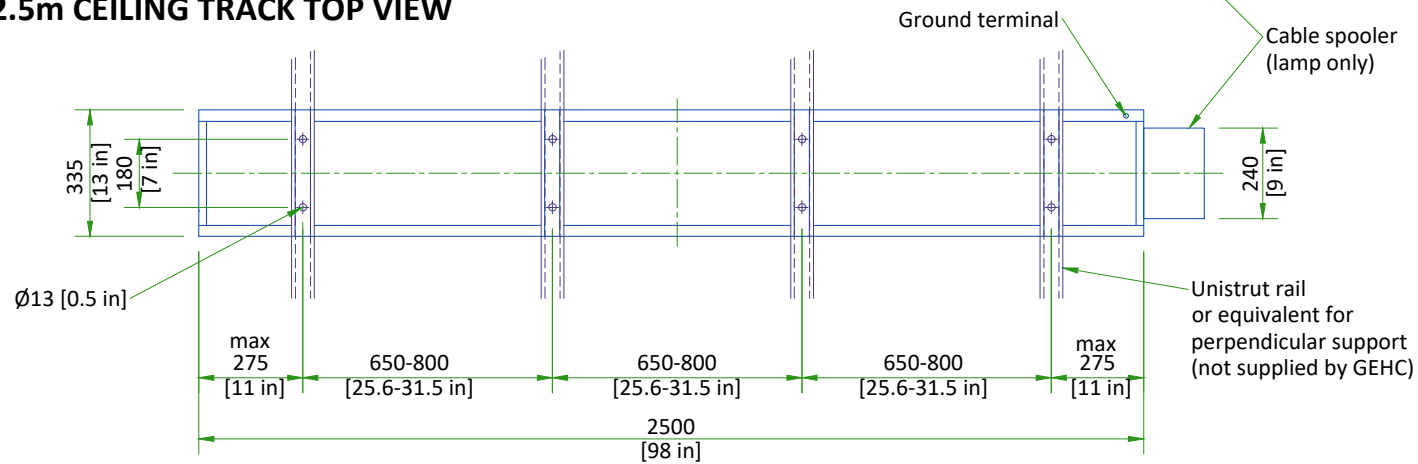


## MAVIG SUSPENSION MOUNTING METHOD

### 2.5m CEILING TRACK SIDE VIEW



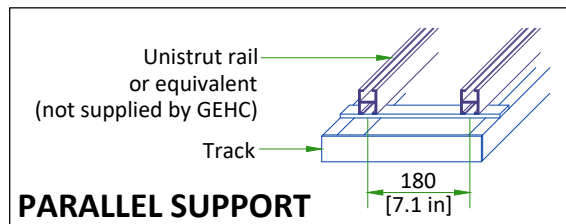
### 2.5m CEILING TRACK TOP VIEW



- 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: POR03O11 TO DESIGN AND MOUNT THE CEILING SUPPORT.

SCALE 1:20

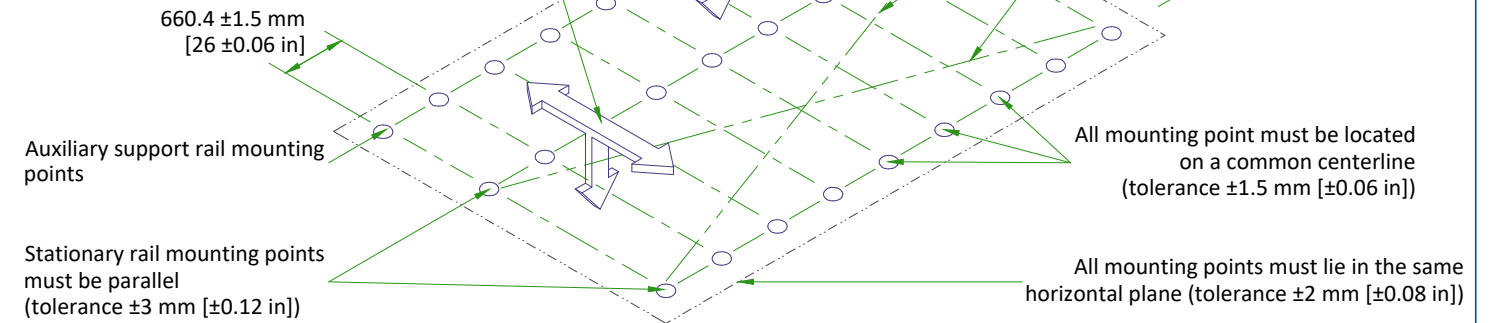


## MONITOR SUSPENSION RAIL MOUNTING SPECIFICATIONS

When a 23 daN force is applied vertically upward, downward or horizontally at any stationary rail mounting point, the attachment interface must not deflect more than 1.5 mm [0.06 in]

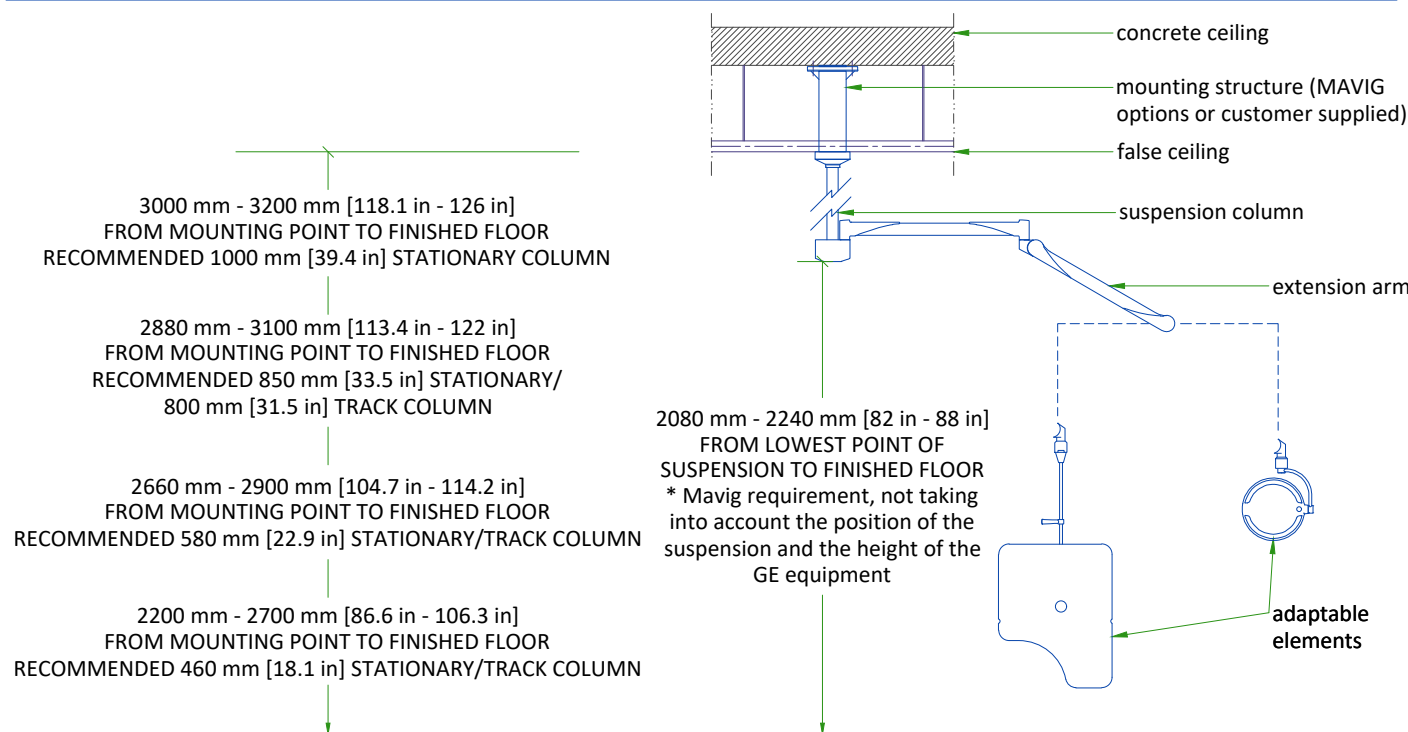
When a 45 daN force is applied vertically upward at any stationary rail mounting point, the attachment interface must not deflect more than 1.5 mm [0.06 in]

When a 135 daN force is applied vertically downward, or horizontally at any stationary rail mounting point, the attachment interface must not deflect more than 1.5 mm [0.06 in]



Each stationary rail must be mounted by bolts supplied or by 12 mm [0.47 in] as metric bolts. Maximum load per bolt is 160 daN, however each mounting bolt must not "PULL OUT" or otherwise fail under a vertically downward dead load of 635daN.

## 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]	22 °C [72 °F]	32 °C [90 °F]	15 °C [59 °F]	22 °C [72 °F]	35 °C [95 °F]	20 °C [68 °F]	22 °C [72 °F]	25 °C [77 °F]
Temperature gradient	≤ 10 °C/h [50 °F/h]			≤ 10°C/h [50 °F/h]			≤ 10 °C/h [50 °F/h]		
RH (1) non condensing	30% to 70%			30% to 75%			30% 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 70%
Material should not be stored for more than 90 days.	

(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.

### 20 kVA FLUORO UPS

Air renewal	According to Standard IEC 62040-1-2
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Systems with 20 kVA UPS shall be stored for less than 6 weeks if the storage temperature is above +30 °C, and less than 12 weeks if storage temperature is above +25 °C .

## HEAT DISSIPATION

ROOM	DESCRIPTION	HEAT DISSIPATION					
		STAND BY		AVERAGE*		MAX	
		kW	BTU/hr	kW	BTU/hr	kW	BTU/hr
Examination room	LC Gantry						
	Patient table	0.41	1394	0.89	1858	1.62	5517
	4 monitor	0.34	1146	0.34	1146	0.34	1146
	Typical injector	0.09	320	0.09	320	0.09	320
	<b>TOTAL</b>	<b>0.84</b>	<b>2860</b>	<b>1.32</b>	<b>3324</b>	<b>2.05</b>	<b>6983</b>
Control room	Operator Console	0.25	853	0.25	853	0.25	853
	Advantage Workstation (AW)	-	-	-	-	1.00	3412
	<b>TOTAL</b>	<b>0.25</b>	<b>853.00</b>	<b>0.25</b>	<b>853</b>	<b>1.25</b>	<b>4265</b>
Technical room	System Cabinet	0.70	2387	1.53	5217	2.16	7378
	Tube chiller	2.53	8619	5.50	18725	6.93	23625
	Detector conditioner	0.21	709	0.21	709	0.21	709
	Power Distribution Box	0.40	1364	0.45	1534	0.45	1534
	Fluoro UPS UL	1.98	6751	1.98	6751	1.98	6751
	<b>TOTAL</b>	<b>5.82</b>	<b>19830.00</b>	<b>9.67</b>	<b>32936</b>	<b>11.73</b>	<b>39997</b>

#### WARNING

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





\* This average corresponds to 11 cases in 10 hours.

## ELECTRICAL NOTES

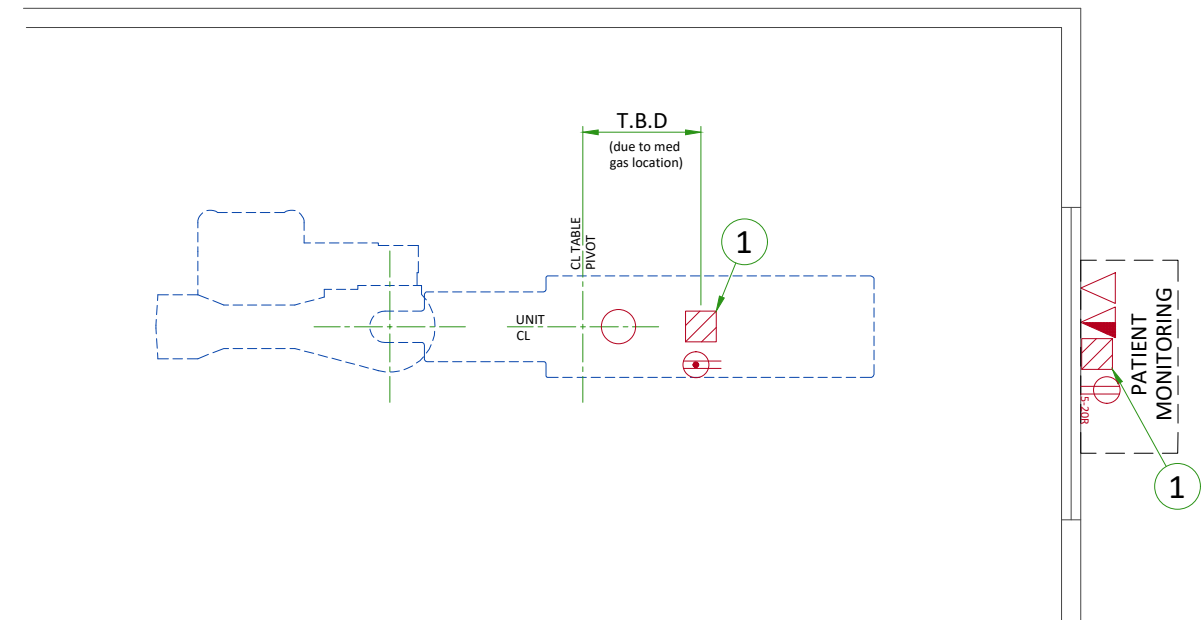
1. Aluminum or solid wires are not allowed.
2. Wire sizes given are for use of equipment. Larger sizes may be required by local codes.
3. It is recommended that all wires be color coded, as required in accordance with national and local electrical codes.
4. Conduit sizes shall be verified by the architect,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

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

ITEM	Outlet Legend for Physio Equipment
	Duplex hospital grade, dedicated outlet 120-v emergency, single phase power, 15a
	5-15R NEMA Receptacle, dedicated outlet 120-v, single phase power
	Dedicated telephone line(s)
	Network outlet

ELECTRICAL LAYOUT ITEM LIST	
1	J-Box or area of conduit stubs for patient monitoring - Size per local code



## CONNECTIVITY REQUIREMENTS

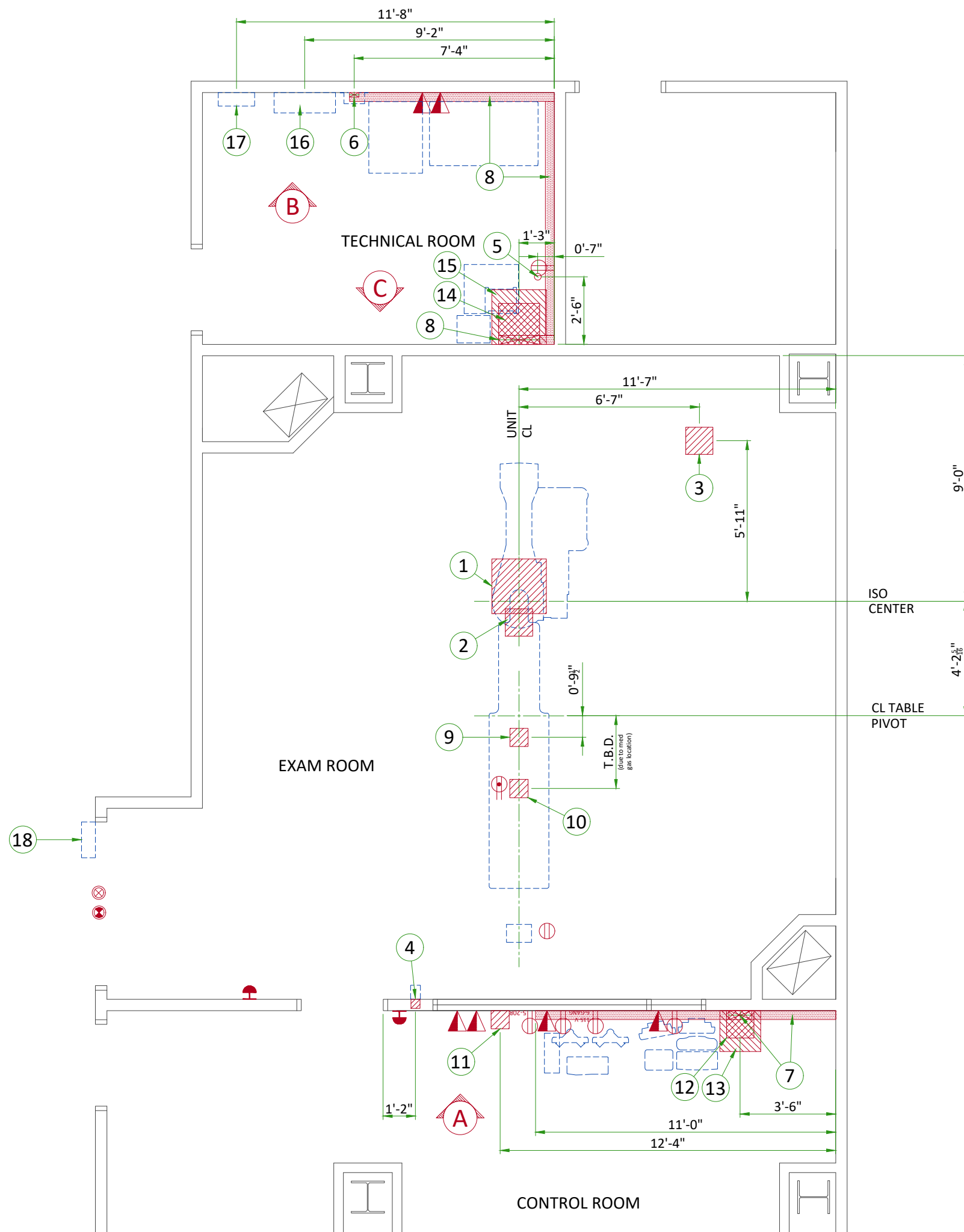
Service Connectivity for new systems will be based on the Insite-RSvP Platform which allows to configure a direct Internet connection to the RSvP Server (routers/VPN tunnel no more mandatory). Communication with the RSvP server will be outbound only and require using Transport Layer Security (TLS) over 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.

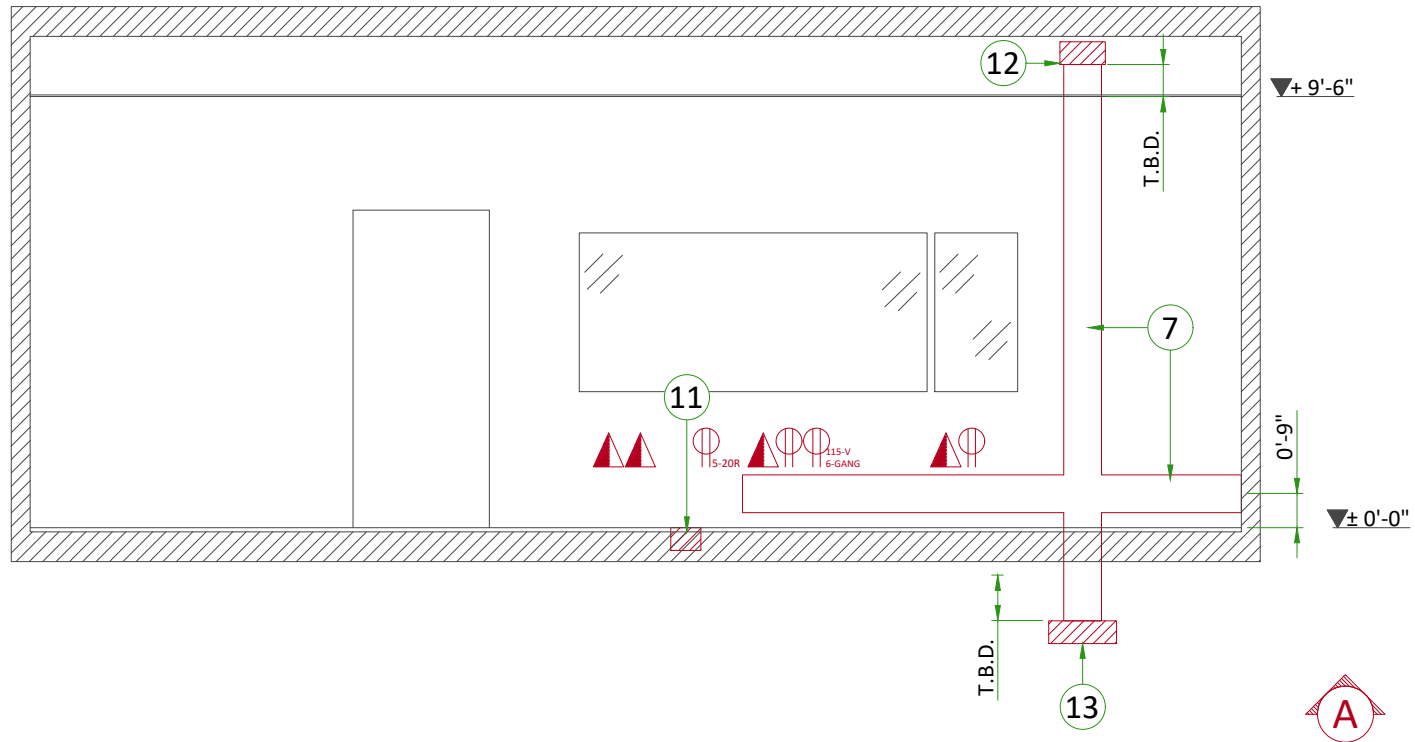
For more information please refer to the latest version of the Pre Installation Manual.



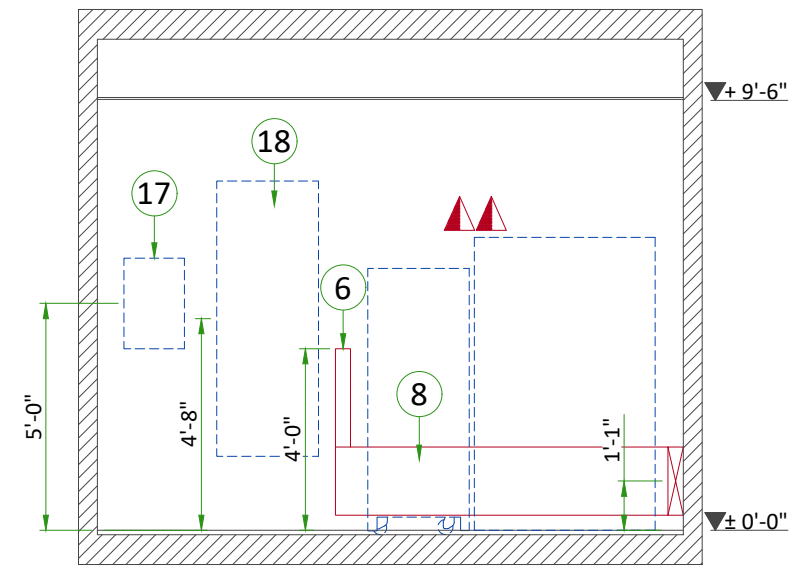
Item	Electrical Layout Item List
1	24" x 24" x 12" [600 x 600 x 300] Box below floor, (1) 6" [150] dia. suitable length threaded pipe, (2) 6" [150] dia. locknuts and (4) 1" [25] dia. locknuts. (LC Gantry)
2	(1) GE supplied fitting. (1) 12" x 12" x 6" [300 x 300 x 150] Box, (1) 6" [150] dia. bushing, (4) 1" [25] dia. bushing for water lines
3	12"x12"x6" [300 x 300 x 150] flush ceiling box with split coverplate (monitors)
4	4"x4"x4" [100 x 100 x 100] flush box 12" [300] below finished ceiling (X-ray buzzer)
5	Empty 3" [75] conduit below floor for waterlines
6	4" x 2" [100 x 50] surface wall duct with minimum 2 dividers (UPS interface box)
7	10" x 3 1/2" [250 x 89] surface wall duct with minimum 2 dividers
8	18" x 3 1/2" [450 x 89] surface wall duct with minimum 2 dividers
9	8" x 8" x 6" [200 x 200 x 150] box below floor (table)
10	8" x 8" x 6" [200 x 200 x 150] box below floor under table (PDM/TRAM)
11	8" x 8" x 6" [200 x 200 x 150] box below floor (patient monitoring equipment)
12	12"x12"x6" [300 x 300 x 150] box above ceiling in control room
13	18" x 18" x 6" [450 x 450 x 150] box below floor in control room
14	18"x18"x6" [450 x 450 x 150] box above ceiling in equipment room
15	24"x24"x12" [600 x 600 x 300] box below floor in equipment room
16	Power Distribution Box (PDB)
17	Local service disconnect (LOTO)
18	Light signaling control box

ITEM	QTY	Electrical Outlet Legend
		Customer/contractor supplied and installed items unless otherwise specified. Height above floor determined by local codes unless otherwise specified.
		System emergency off (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

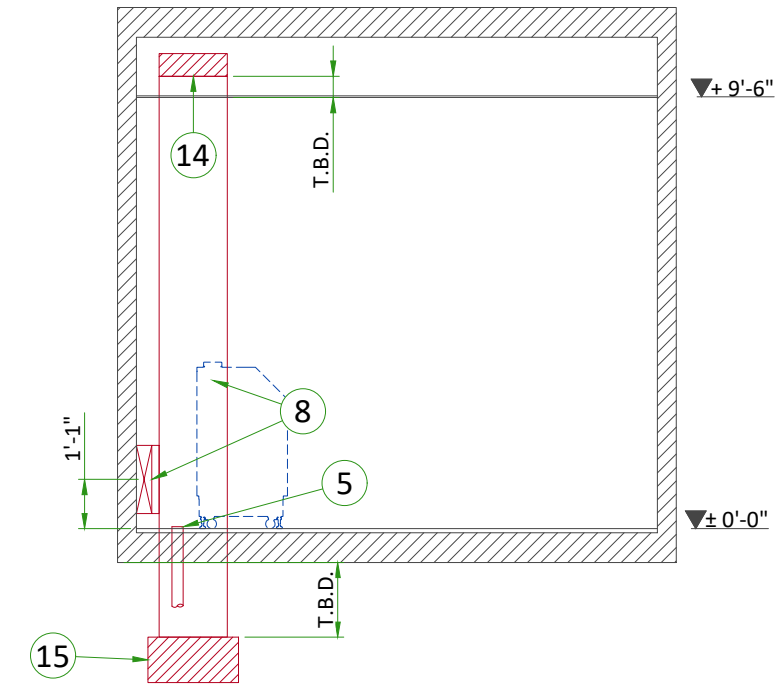
Additional Conduit Runs (Contractor Supplied and Installed)					
From (Bubble # / Item)	To (Bubble # / Item)	Qty	Usable length	Size (in)	
1 Gantry	15 System Control Cabinet	4	51 ft.	4	
1 Gantry	9 Table	1	13 ft.	4&2	
13 Control Room	15 System Control Cabinet	1&2	58 ft.	3 1/2 & 2 1/2	
5 Water Line	2 Gantry	1	59 ft.	3	
18 Light Signaling Control Box	Warning light	1	-	1/2	
18 Light Signaling Control Box	14 System Control Cabinet	1	-	1/2	
18 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	14 System Control Cabinet	1	90 ft.	1 1/2	
4 X-Ray Buzzer	12 Control Room	1	90 ft.	1 1/2	
3 3-4 Monitor Suspension	14 System Control Cabinet	2	83 ft.	2 1/2	
3 Monitor Bridge / Boom	12 Control Room	1	83 ft.	2 1/2	
16 Power Distribution Box	20 kVA UPS	2	70 ft.	As Req'd	
16 Power Distribution Box	Emergency off	1	-	1/2	
16 Power Distribution Box	Emergency off	1	-	1/2	
16 Power Distribution Box	14 System Control Cabinet	1	70 ft.	1	
17 LOTO Disconnect	480-V 3 phase power	1	-	As Req'd	
17 LOTO Disconnect	16 Power Distribution Box	1	-	As Req'd	
15 Injector Electronics	9 Injector Head	1	-	3	
15 Injector Electronics	13 Injector Control	1	-	3	
12 Patient Monitoring Console	3 Monitor Bridge / Boom	1	-	3	
11 Patient Monitoring Console	10 TRAM/PDM	2	-	3	



A



B



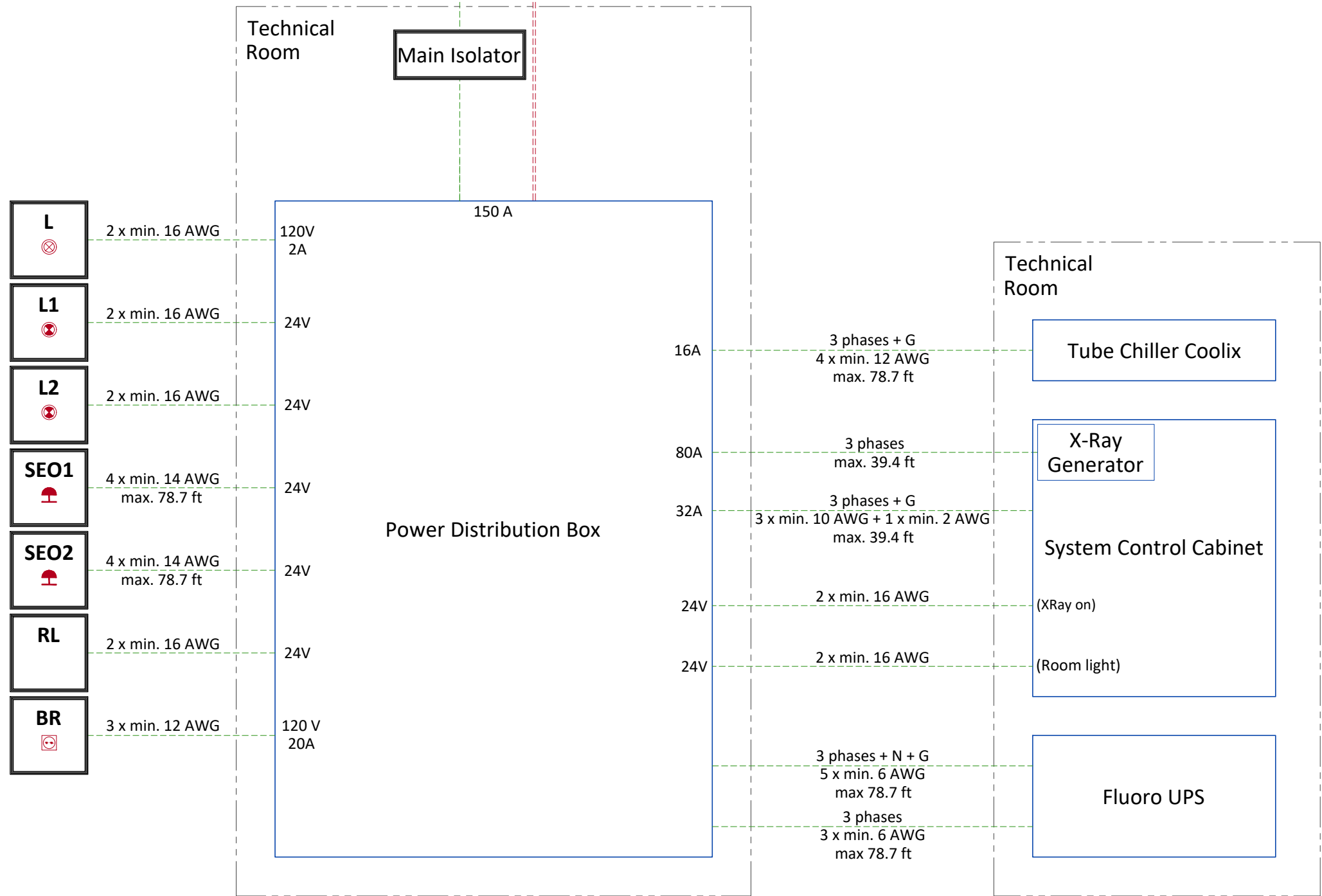
C

# POWER DISTRIBUTION

## POWER SUPPLY FOR MAIN SYSTEM

Main supply (480 V)  
3 phases+N

Ground  
(min. 2 AWG or same size as  
feeder wire, whichever is larger)



- L System ON light - 120V
- L1 XRay ON light - 24V
- L2 XRay ON light - 24V  
Located inside exam room, visible from anywhere in the room (1)
- SEO1-2 Emergency OFF button with two normally closed (NC) contacts (1)
- RL Room light circuit: room lights off during X-Ray generation
- BR Injector wall outlet 10/16A+G
- (1) Location and/or quantity: refer to layout

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

- NOTES :
- All the cables entrances to the PDB are at the bottom of the cabinet.
  - Max size of terminal block for PDB input cables: 4 x 3/0 AWG

## POWER REQUIREMENTS

POWER SUPPLY	<b>3 PHASES+N+G 380/400/415/480 V ±10%</b>
FREQUENCIES for 380/400/415 V	<b>50/60 Hz ± 3 Hz</b>
FREQUENCY for 480 V	<b>60 Hz ± 3Hz</b>
MAXIMUM INPUT POWER (0.1 sec max)	<b>150 kVA</b>
CONTINUOUS (AVERAGE) POWER	<b>60 kVA</b>
MAXIMUM LINE IMPEDANCE PHASE TO PHASE	<b>380 V : 0.09 Ω / 400 V : 0.096 Ω / 415 V : 0.102 Ω / 480 V : 0.12 Ω</b>

- An EMI filter, provided by GE, is required in front of the PDB when Fluoro UPS CE is used.
- Neutral is mandatory for Fluoro UPS (20 kVA) control.
- TNS neutral point connection must be used.
- In case of IT or delta configuration without neutral, an isolation transformer is needed (supplied by customer)
- Three-phase, 5 conductors (3 phase conductors, 1 neutral and 1 protective earth conductor)
- Power supply should come into a power distribution box (PDB) containing the protective units and controls.
- The section of the supply cable should be calculated in accordance with its length and the maximum line resistance per 2 phases.

### 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 35mm<sup>2</sup> copper from main ground point to the PDB.
- 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.
- All cables must be isolated and flexible, cable color codes must comply with standards for electrical installation.
- The cables from signalling and remote control (Y, SEO, L...) will go to PDB with a pigtail length of 1.5 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

- Core system: A wall circuit breaker or equivalent device with LOTO capability must be installed on the mains line to the PBD. This device must be compatible with the power input specifications of the system. The customer is responsible for the procurement, delivery and installation of this breaker.

## 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	*1/0 (55)	*1/0 (55)	*1/0 (55)	1/0 (55)	3/0 (85)	4/0 (107)	4/0 (107)	300M (150)

#### GENERAL NOTES

IN ALL CASES QUALIFIED PERSONNEL MUST VERIFY THAT THE FEEDER (AT THE POINT OF TAKE-OFF) AND THE RUN TO THE GE SYSTEM MEET ALL THE REQUIREMENTS STATED IN THE PIM

FOR A SINGLE UNIT INSTALLATION, THE MINIMUM TRANSFORMER SIZE IS 225KVA, WITH 2.4% RATED REGULATION AT UNITY POWER FACTOR. RESULTANT MAXIMUM ALLOWABLE FEEDER REGULATION IS 3.6%

THE GROUND WIRE TO EARTH SHALL BE A MINIMUM OF AWG 2/0 (UL) OR 35 MM<sup>2</sup> (CE) OR THE SAME SIZE (100%) AS FEEDER WIRES, WHICH EVER IS LARGER.

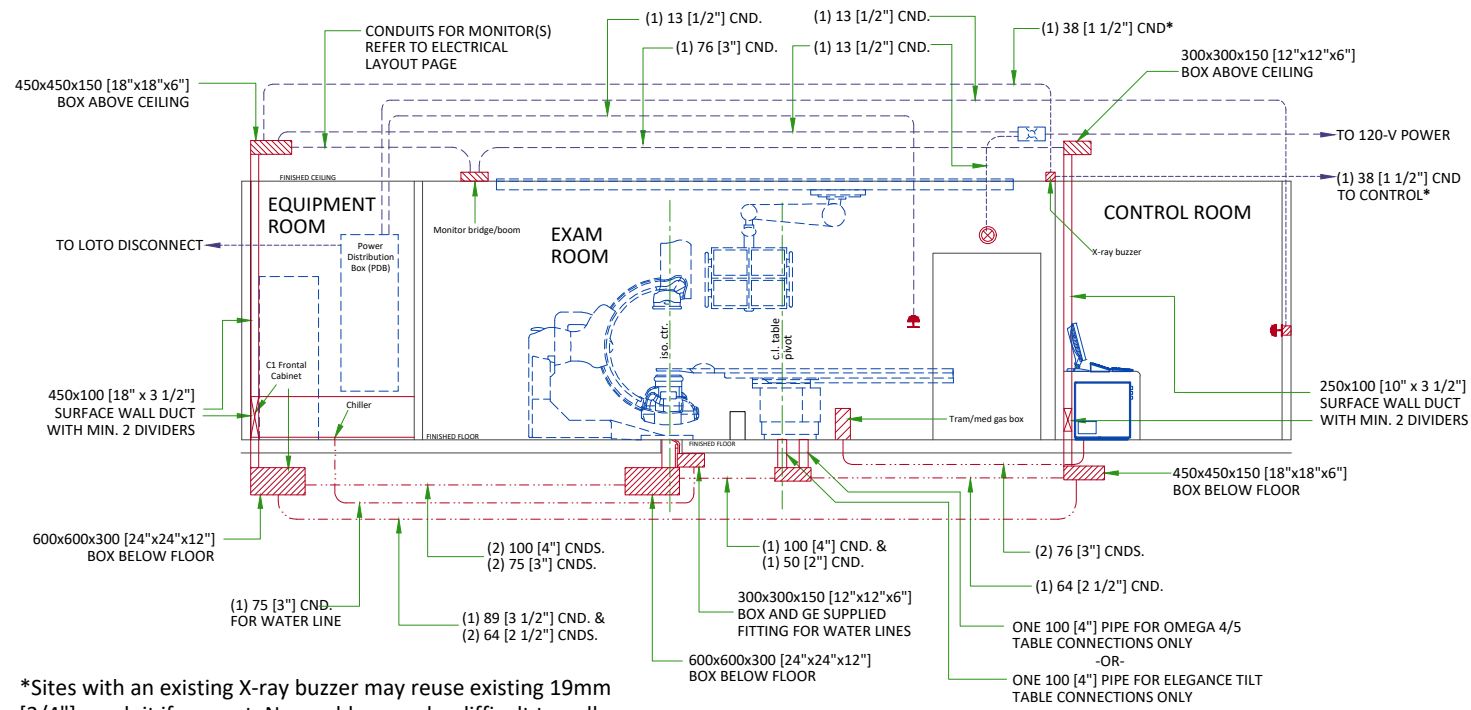
WHEN A FLUORO UPS IS OR WILL BE INSTALLED, A NEUTRAL LINE IS MANDATORY. IF IT SCHEME AS EARTHING SYSTEM IS USED, AN ISOLATION TRANSFORMER IS REQUIRED WITH DELTA-WYE OR DELTA-STAR CONNECTION.

\* MINIMUM WIRE SIZE FOR CIRCUIT BREAKER, BASED ON RECOMMENDED OVERCURRENT PROTECTION.

# TYPICAL ELECTRICAL SECTION VIEW

ITEM	Outlet Legend for Equipment
	System emergency off (SEO), (recommended height 1.2m [48"] above floor)
	Light Signaling Control Box (above ceiling or in equipment room)
	X-Ray ON lamp (L1) - 24V

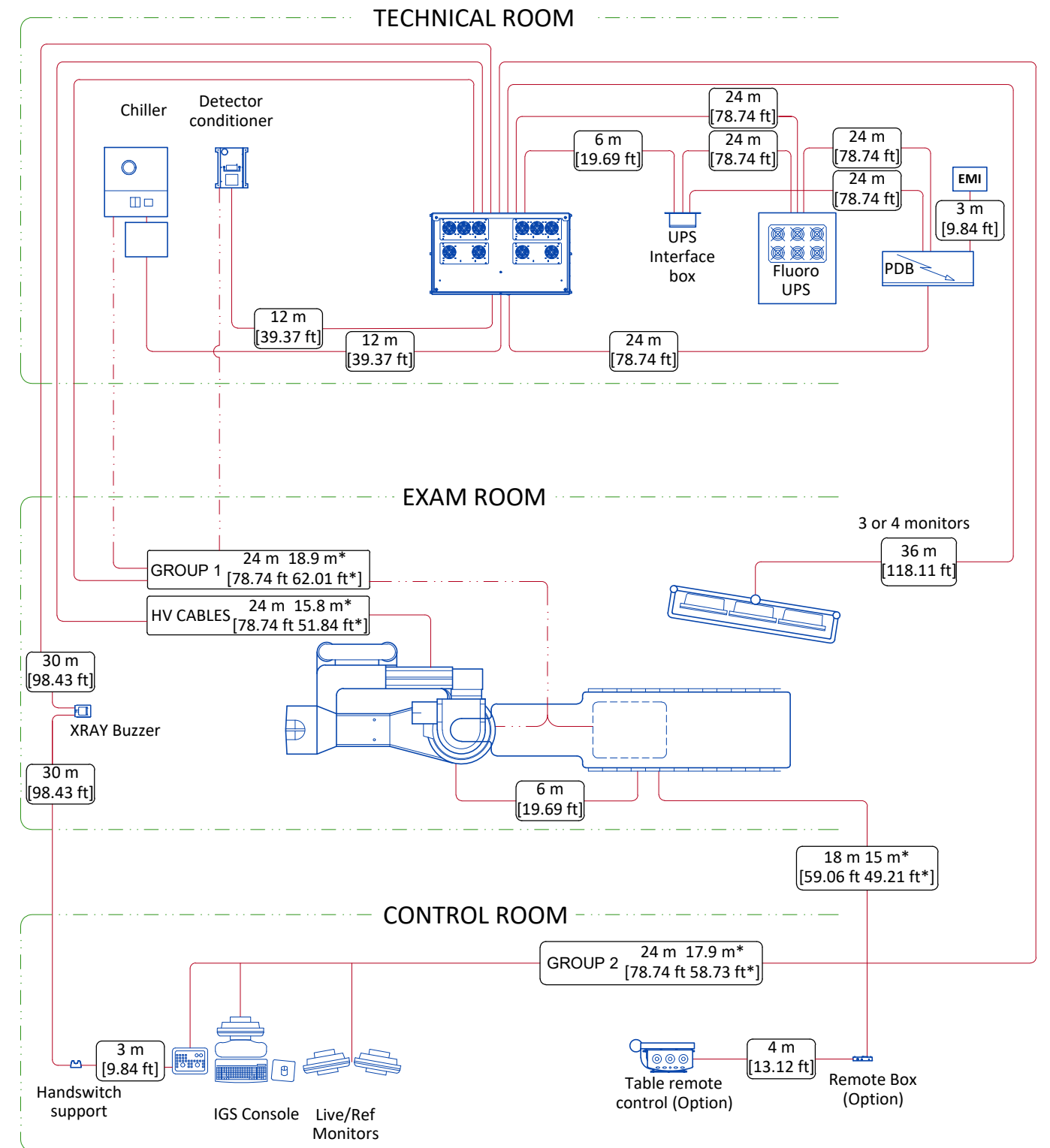
**NOTE:**  
This diagram displays a typical interconnection method for GE equipment and should be used to determine electrical routing per local site conditions and regulatory requirements. Refer to Electrical Layout page for site-specific planning information.



\*Sites with an existing X-ray buzzer may reuse existing 19mm [3/4"] conduit if present. New cables may be difficult to pull.

DETAIL NOT TO SCALE

# INTERCONNECTIONS



	Cable supplied by GE
	Cable supplied by GE (contains water hoses)
	Room wall
	Total length
	Usable length