



REV	DATE	MODIFICATIONS
A	10/Jul/2018	First issue drawing / Final study based on RAD-

- C1 - 01 - Cover Sheet
- C2 - 02 - Disclaimer - Site Readiness
- A1 - 03 - General Notes
- A2 - 04 - Equipment Layout
- A3 - 05 - Section Views
- A4 - 06 - Equipment Dimensions
- A5 - 07 - Delivery
- S1 - 08 - Structural Notes
- S2 - 09 - Structural Layout
- S3 - 10 - Structural Details
- M1 - 11 - HVAC - Enviroment
- E1 - 12 - Electrical Notes

- E2 - 13 - Electrical Layout
- E3 - 14 - Electrical Elevations
- E4 - 15 - Power Requirements
- E5 - 16 - Interconnections

A mandatory component of this drawing set is the GE Healthcare Pre Installation manual. Failure to reference the Pre Installation manual will result in incomplete documentation required for site design and preparation.
 Pre Installation documents for GE Healthcare products can be accessed on the web at: www.gehealthcare.com/siteplanning

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.

<p>Typical</p> <p>----</p> <p>----</p>

 <p>GE Healthcare</p>	<p>----</p> <p>----</p> <p>----</p>
---	-------------------------------------

PROTEUS XRF FINAL STUDY

Drawn by	Verified by	Concession	S.O. (GON)	PIM Manual	Rev
BAP	PMM	-	----	1913363	7
Format	Scale	File Name		Date	Sheet
A3	1/4"=1'-0"	EN-RAD-TYP-PROTEUS XRF-WEB.DWG		03/Aug/2018	01/16

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. 5

Customer Name:	PMI Name:	
GON/SO Number:	Field Service Name:	
Equipment:	Country/City or City/State:	
Required site assessment milestones	Date of completion (dd/mm/yyyy)	
1) Check site before Equipment Delivery to Storage		
2) Check site before installation start		
Place an "X" in either Y or N column		
Site Ready Checks at Installation		Y N
General Site Planning		
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 has been confirmed with customer/contractor to meet required GE provided criteria.		
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.		
Finished ceiling is installed. If applicable ceiling tiles installed per PMI discretion.		
Adequate delivery route from truck to final place of installation has been reviewed with all stakeholders, all communications/notifications have occurred, arrangements have been made for special handling (rigging, elevator, fork lift, etc.). All floors along delivery route will support weight of the equipment, temporary reinforcements arranged if needed.		
System power & grounding (PDB/MDP) is available as per GE specifications, installed at point of final connection and ready to use. Lock Out Tag Out is available.		
System power and grounded audit has been scheduled to be completed during installation of equipment. (If Required) GEHC PM to confirmed if needed.		
Adequate room illumination installed and working.		
Cable ways (floor/wall/ceiling/Access Flooring) are available for installation of GE cables and 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.		
HVAC systems Installed, and the site meets minimum environmental operational system requirements.		
Network outlets installed and computer network available and working.		
Hospital IT/connectivity contacts have been engaged and information has been added to Project management tool. (If Required)		
Floor levelness/flatness is measured and within tolerance, and there are no visible defects per GEHC specifications. Floor Strength and thickness have been discussed with customer/contractor and they have confirmed GE requirements are met.		
Customer supplied countertops where GE equipment will be installed are in place.		
Specific for CT & X-ray		
Doors and windows complete or scheduled to be installed. If applicable, radiation protection (shielding) finished & radioprotection regulatory approval for installation obtained.		
Status of work		
General comments		
System can be delivered		PMI signature
Site ready for installation		FS signature: optional

CUSTOMER SITE READINESS REQUIREMENTS

- Any deviation from these drawings must be communicated in writing to and reviewed by your local GE healthcare installation project manager prior to making changes.
- Make arrangements for any rigging, special handling, or facility modifications that must be made to deliver the equipment to the installation site. If desired, your local GE healthcare installation project manager can supply a reference list of rigging contractors.
- New construction requires the following;
 1. Secure area for equipment,
 2. Power for drills and other test equipment,
 3. Capability for image analysis,
 4. Restrooms.
- Provide for refuse removal and disposal (e.g. crates, cartons, packing)
- It is the customer's responsibility to contract a vibration consultant/engineer to implement site design modifications to meet the GE vibration specification. Refer to the system preinstallation manual for the vibration specification.

ENVIRONMENTAL SPECIFICATIONS

MAGNETIC INTERFERENCE

To guarantee specified imaging performance:

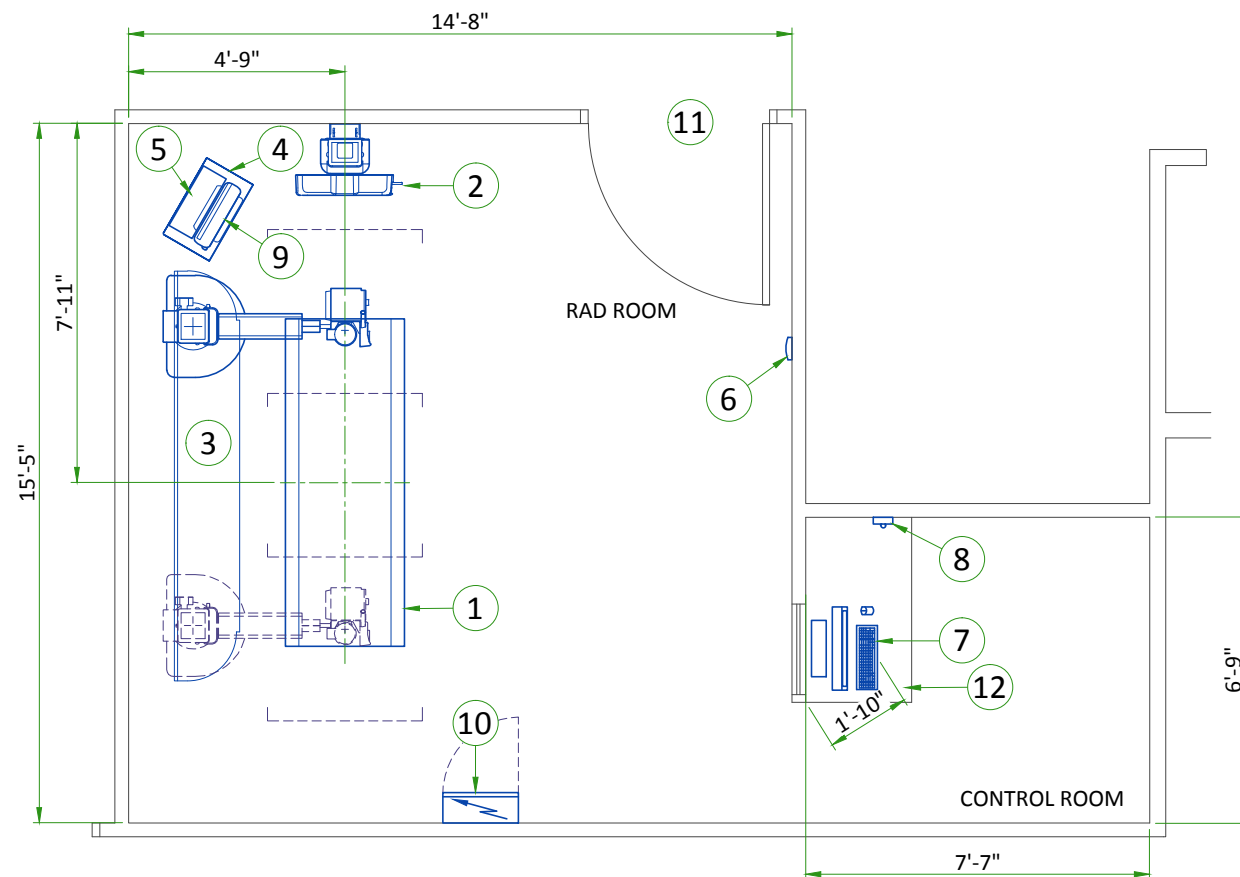
X-ray tubes and control console equipment must be located in ambient static field of less than 10 gauss.
Digital flat panel must be located in ambient static magnetic fields of less than 1 gauss.

To guarantee data integrity:

System electronics must be located in ambient static magnetic fields of less than 10 gauss.

To obtain specified geometric linearity:

Operators console equipment must be located in ambient static magnetic fields of less than 10 gauss.



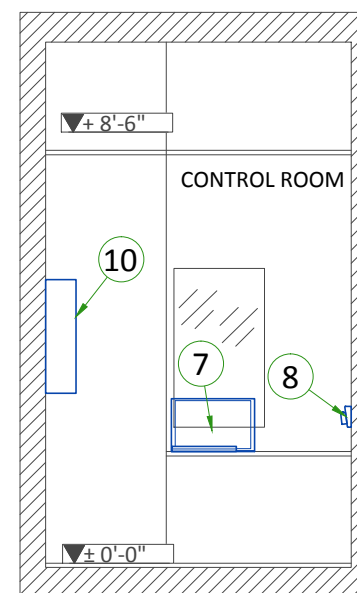
LEGEND

BY	ITEM	DESCRIPTION	MAX HEAT OUTPUT (btu)	WEIGHT (lbs)	MAX HEAT OUTPUT (W)	WEIGHT (kg)
A	GE Supplied					
C	Customer/contractor supplied and installed					
B	GE Supplied/contractor installed					
D	Available from GE					
A	1	Elevating Table	423	617	123	279
A	2	Wall Stand	-	320	-	145
A	3	Tube Stand	450	760	132	344
A	4	Generator	542	209	160	94
A	5	Aero DR Interface Unit	112	25	33	11
A	6	Access Point	112	2.2	33	0.9
A	7	CS7 Control Console	1774	37	520	16
A	8	PC Interface Box	-	1	-	0.45
A	9	Battery Charger/Docking Station	98	13	29	5
A	10	Main Disconnect Panel (MDP)	-	80	-	36
C	11	Minimum opening for equipment delivery is 35.4 in. w x 80 in. h, contingent on a 96 in. corridor width				
C	12	Counter top for equipment- provide grommets openings as required to route cables				

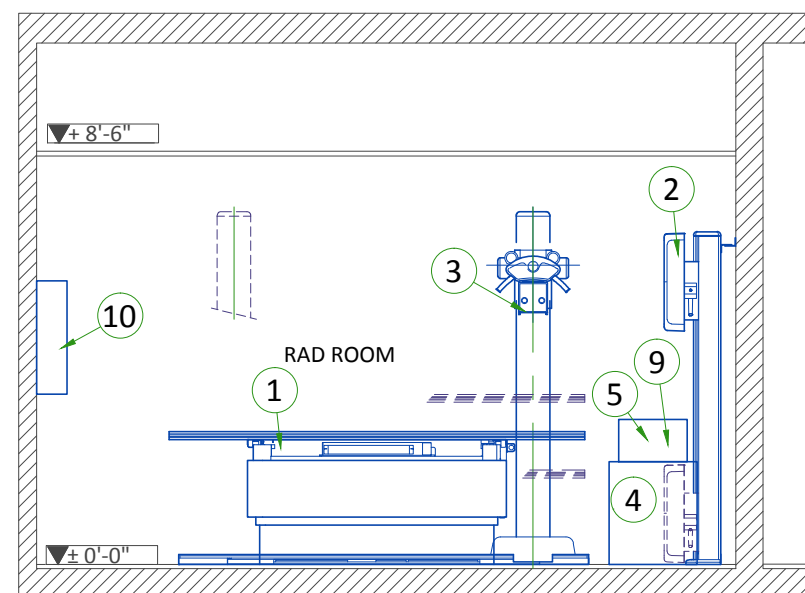
Exam room height

Finished floor to slab height	TBD
Recommended finished ceiling height	8'-6"

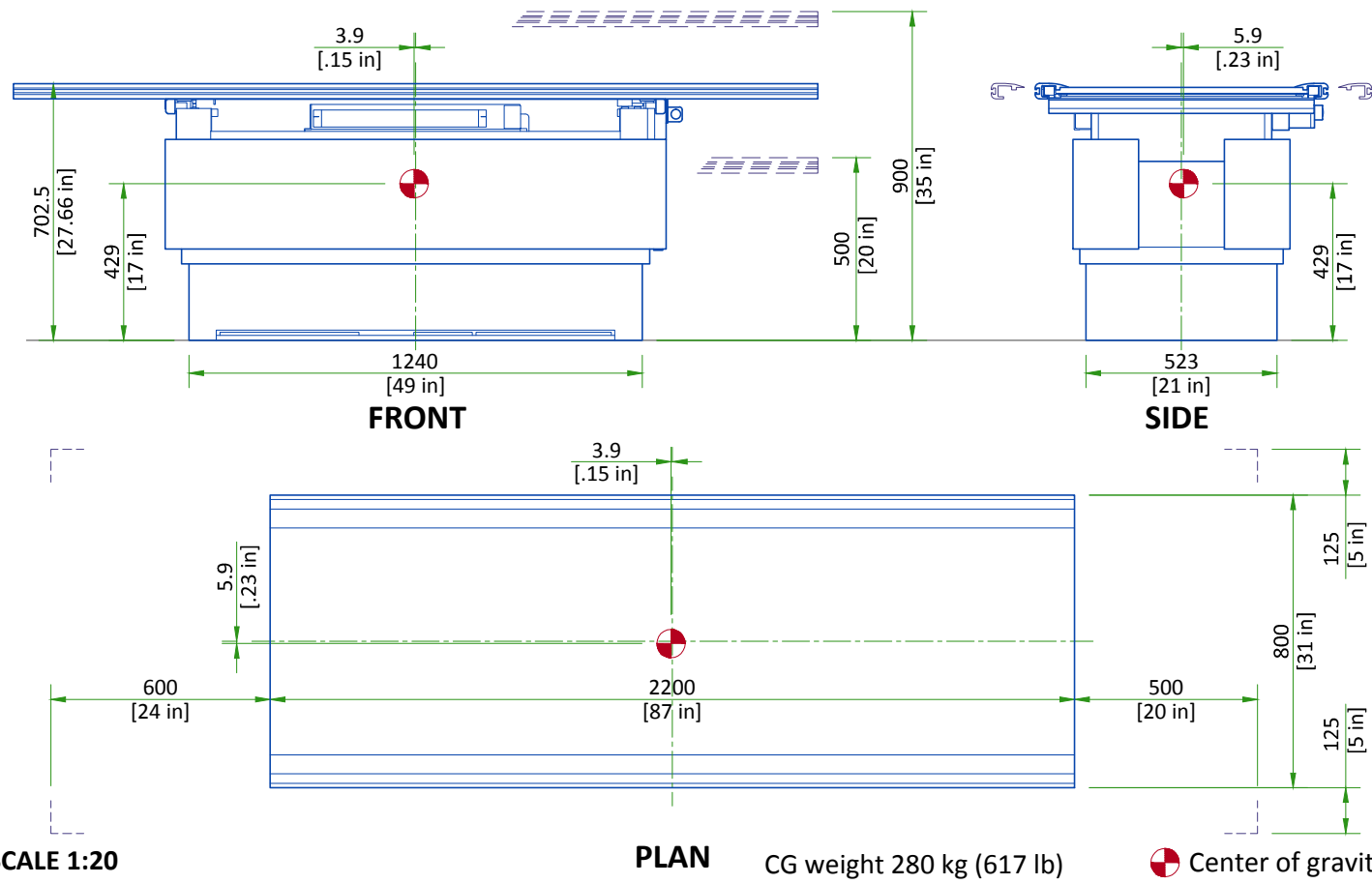
SECTION VIEW



FRONT VIEW

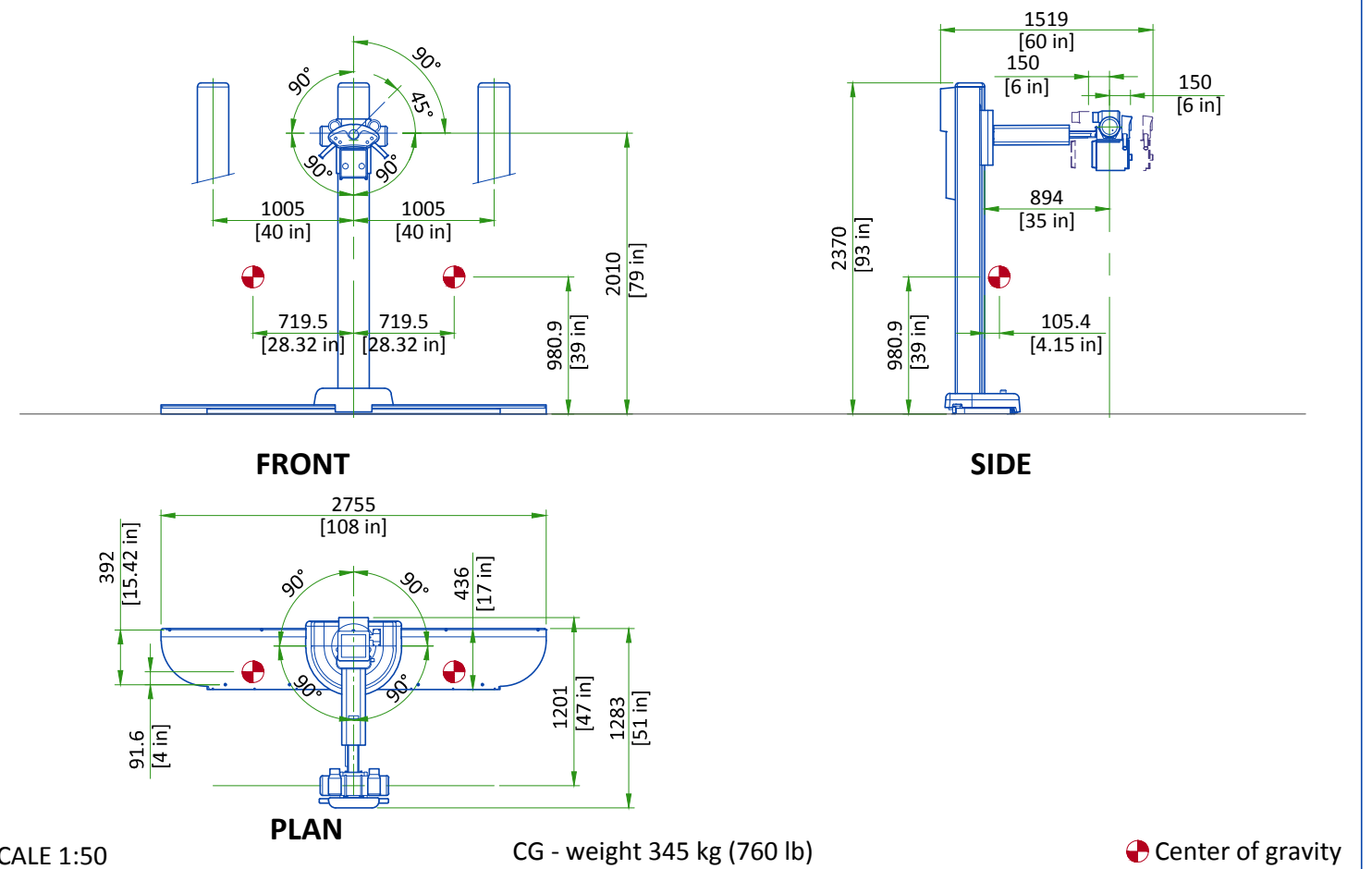


ELEVATING TABLE



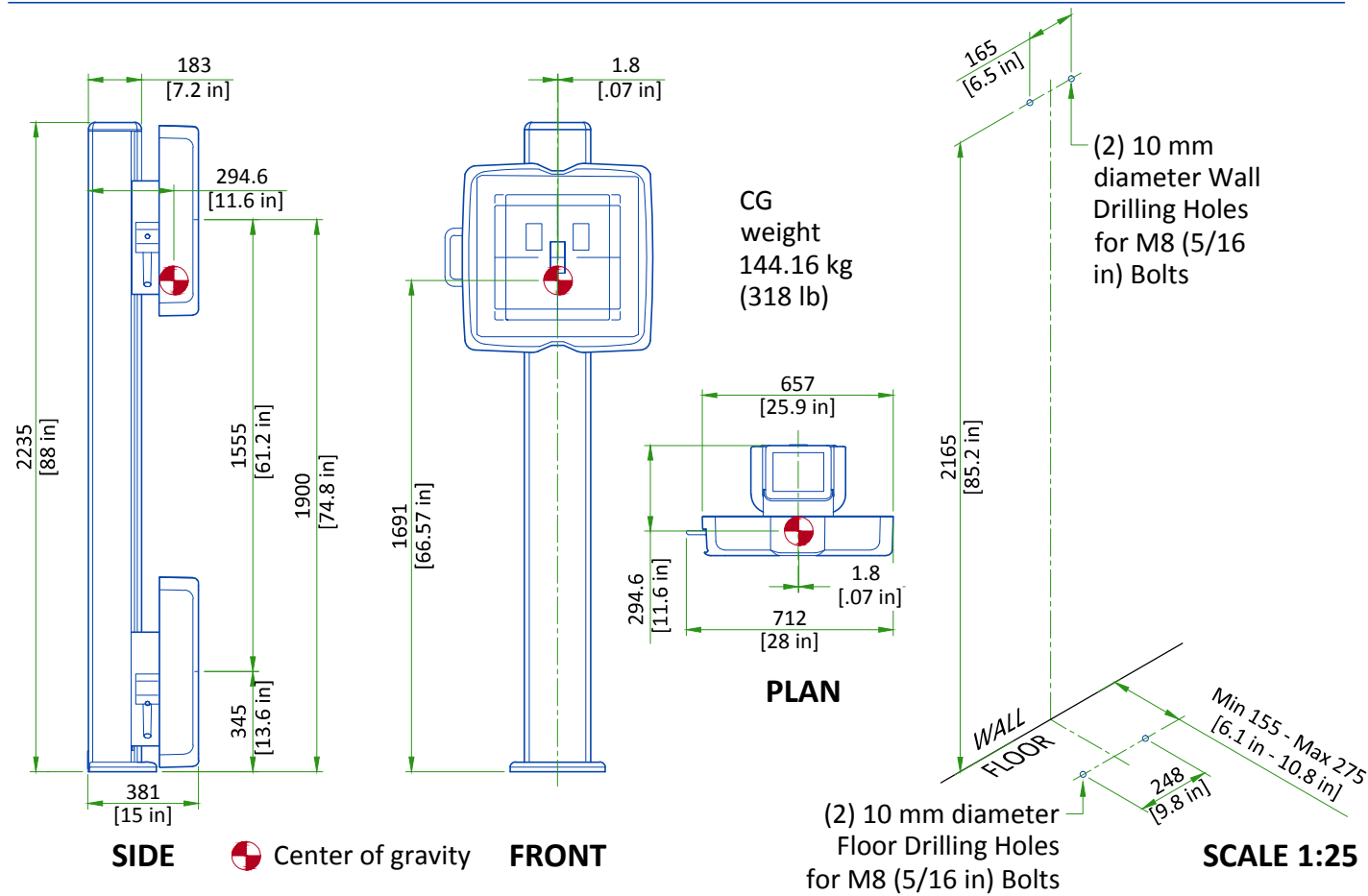
SCALE 1:20

AT/ET TUBE STAND



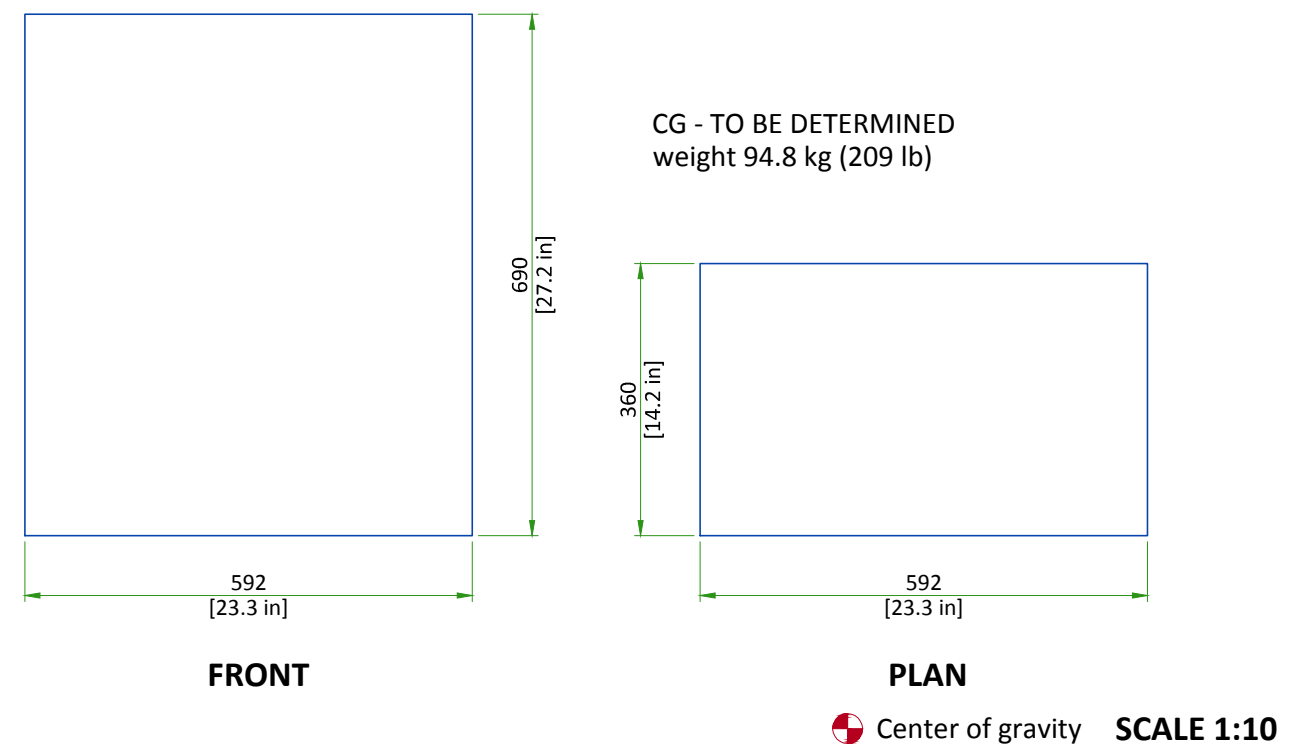
SCALE 1:50

WALL STAND



SCALE 1:25

GENERATOR



SCALE 1:10

DELIVERY

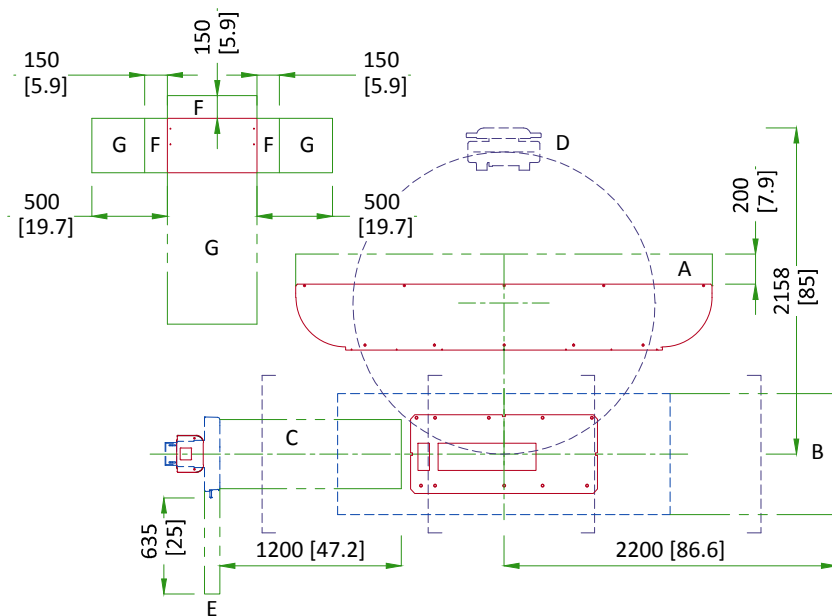
THE CUSTOMER/CONTRACTOR SHOULD:

- 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.

AT/ET SHIPPING DIMENSIONS AND WEIGHTS

	TUBE STAND COLUMN WITH COLLIMATOR, X-RAY TUBE, HV CABLES AND TABLE TOP	TUBE STAND BASE	ELEVATING TABLE	STANDARD WALL STAND	GENERATOR WITH PC INTERFACE BOX AND CABLES
LENGTH cm (in.)	2420 mm (95.3 in)	2820 mm (111 in)	1540 mm (60.6 in)	2290 mm (90.2 in)	1070 mm (42.1 in)
WIDTH cm (in.)	870 mm (34.3 in)	670 mm (26.4 in)	840 mm (33.1 in)	760 mm (30 in)	620 mm (24.4 in)
HEIGHT cm (in.)	1050 mm (41.3 in)	350 mm (13.8 in)	960 mm (37.8 in)	580 mm (22.8 in)	740 mm (29.1 in)
WEIGHT kg (lbs)	414 kg (912 lb)	104 kg (229 lb)	376 kg (828 lb)	208 kg (458 lb)	140 kg (308 lb)

EXAM ROOM CLEARANCE AREAS



- A: INSTALL AREA:
Minimum space required to utilize the tube stand dollies
- B: SERVICE AREA:
Minimum area to allow you to draw the table top out to open a service area for detector housing
- C: AREA to ensure the SID 1m below table top
- D: OPERATION AREA:
Used when tube column rotates 180° .
Does not include tech work space.
- E: OPERATION AREA:
Used when opening the wall bucky.
- F: OPERATION AREA:
Ventilation required 150 mm [5.9"].
- G: SERVICE AREA:
Service area required when generator is anchored in seismic zones.

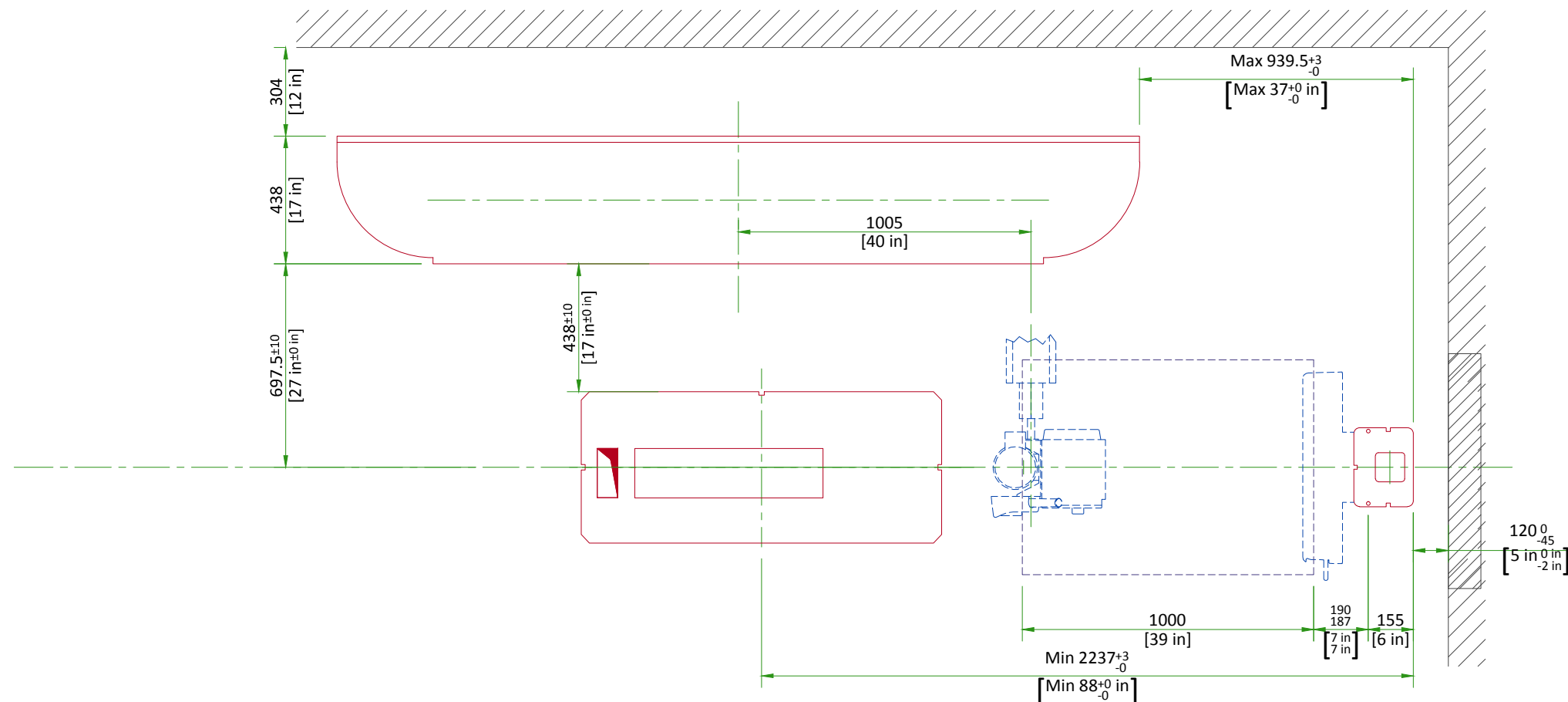
Note: if the WS is on the right side, area B will be on the left side

SCALE 1:50

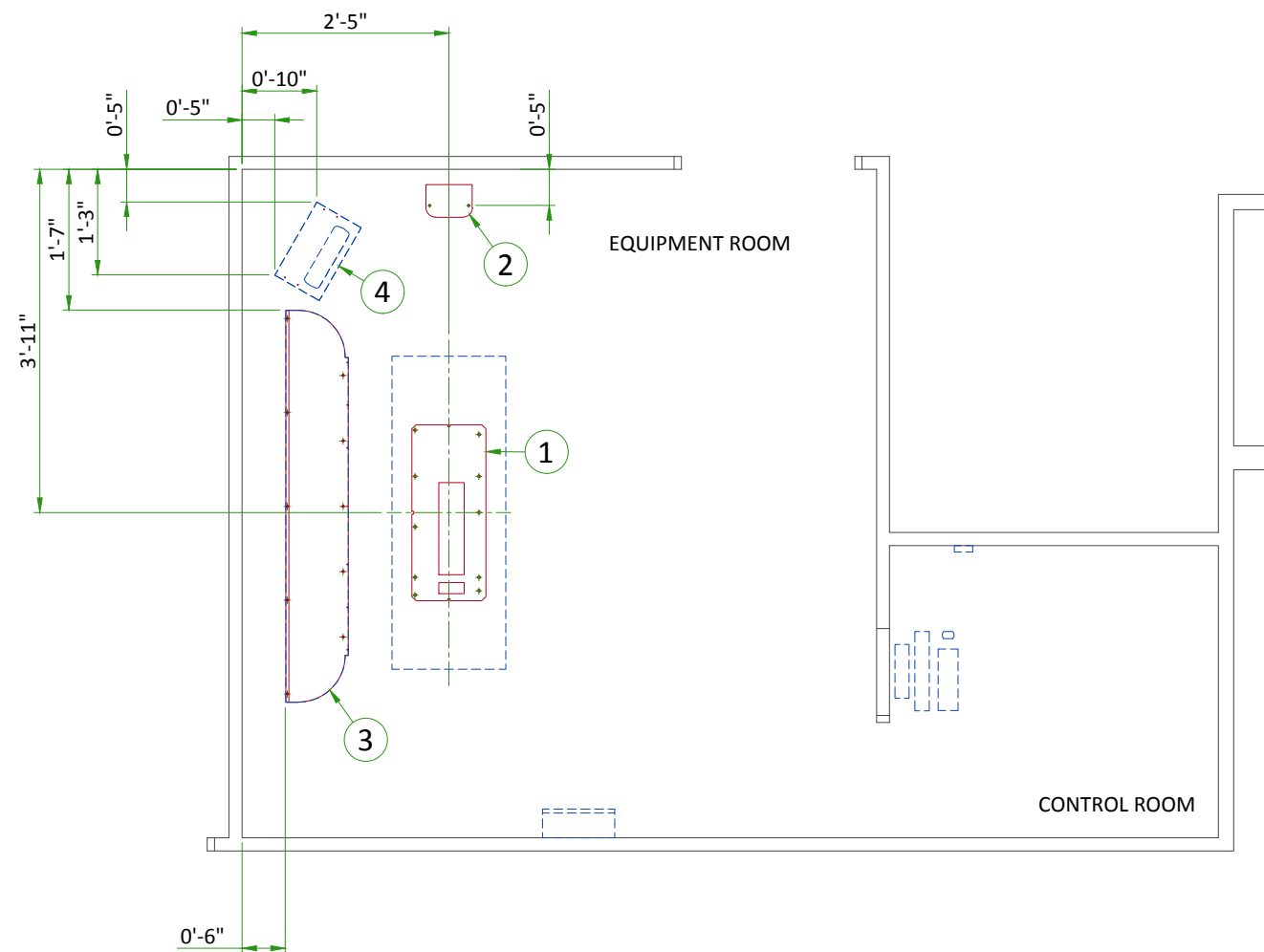
STRUCTURAL NOTES

- Methods of support for the steelwork that will permit attachment to structural steel or through bolts in concrete construction should be favored. Do not use concrete or masonry anchors in direct tension.
- All units that are wall mounted or wall supported are to be provided with supports where necessary. Wall supports are to be supplied and installed by the customer or his contractors. See plan for suggested locations.
- Control walls shall be constructed to minimum 2130mm (7'-0") high.
- 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".
- Different anchor types are used to install the components of the system. Refer to Structural Requirements Section(s) of the Pre-Installation Manual for each anchor requirement.
- Refer to the Structural Requirements Section for the required minimum embedment.
- The ground surface must be flat and leveled, maximum tolerance for leveling is ± 1.5 mm per 1 m (0.2 in per 10 feet). A grout pad provided by the contractor is required to meet this specification. The maximum pad thickness is 6.3 mm (0.25 in).

WALL STAND LOCATION DIMENSIONS

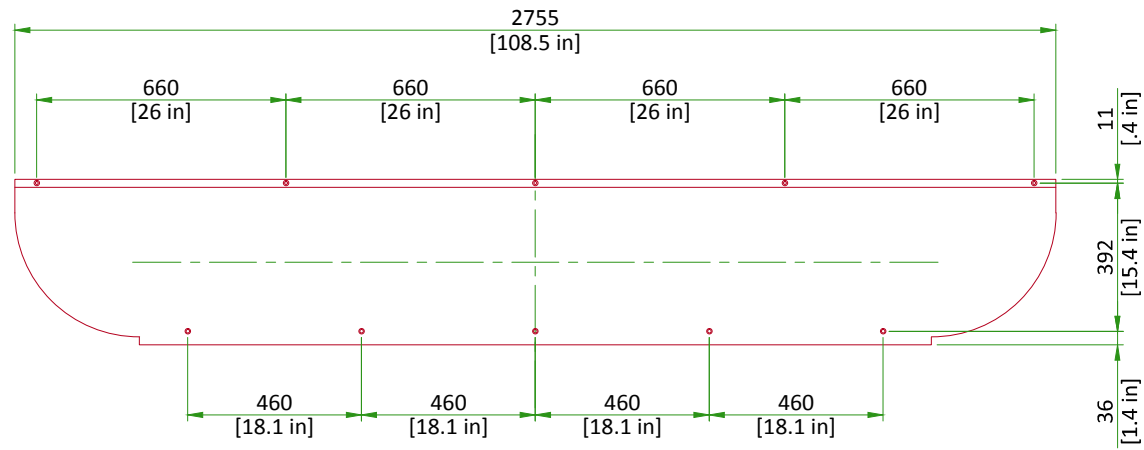


The typical equipment positions shown ensure the 1000 mm [40 in] SID below the table top. The tube stand install dolly clearances and surface horizontal wall duct on the back wall are taken into account. Site the system according to the dimensions on the Equipment Layout.



ITEM	DESCRIPTION
(GE SUPPLIED / CONTRACTOR INSTALLED)	
1	Table Anchoring
2	Wall Stand Anchoring
3	Tube Stand Anchoring
4	Generator Anchoring

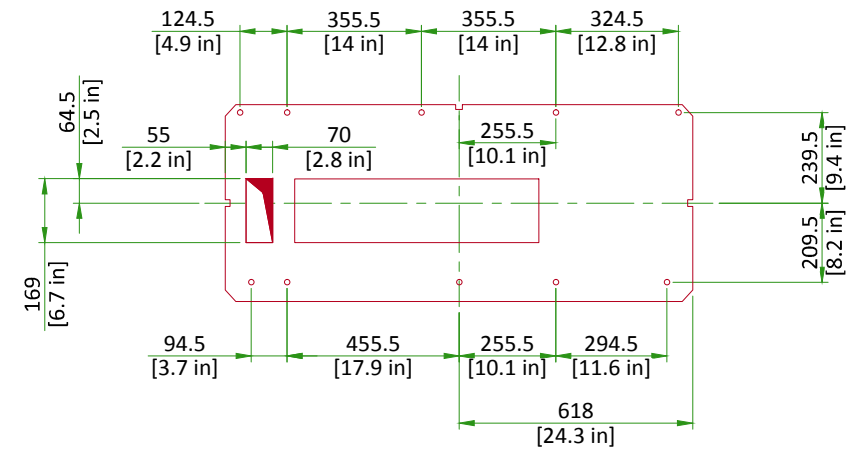
AT/ET TUBE STAND BASEPLATE



Scale 1:20

All anchor holes (total 10) are $\varnothing 10$ mm [$\varnothing 3/8$ in]

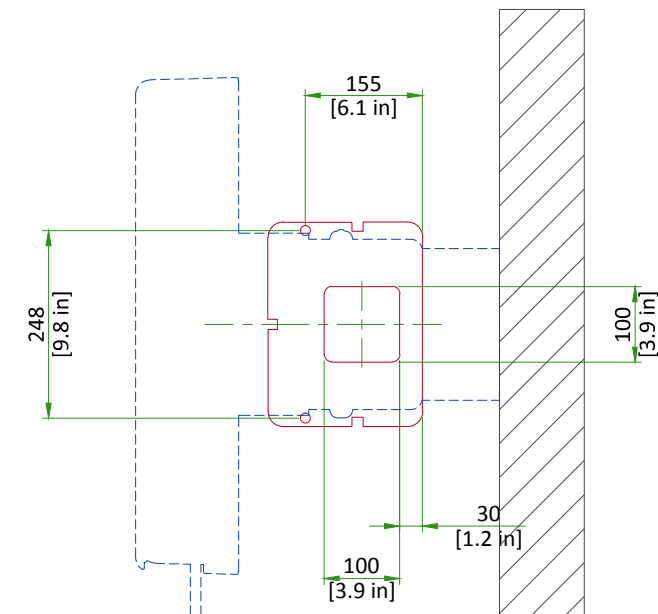
AT/ET TABLE BASEPLATE



Scale 1:20

All anchor holes (total 10) are $\varnothing 10$ mm [$\varnothing 3/8$ in]

WALL STAND BASEPLATE



Scale 1:10

All anchor holes (total 10) are $\varnothing 10$ mm [$\varnothing 3/8$ in]

TEMPERATURE AND HUMIDITY SPECIFICATIONS

IN-USE CONDITIONS

	EXAM ROOM		CONTROL ROOM	
	Min	Max	Min	Max
Temperature	10°C (50°F)	40°C (104°F)	T.B.D.	T.B.D.
Relative humidity (1)	30% to 75%		T.B.D.	
Heat output	W	BTU/h	W (In Use)	BTU/h (In Use)
	523.6	1784.8	97.3	332.5

Exam room heat output assumes a working cycle of one [1] patient every two [2] minutes during one [1] hour.

The optional docking station can be sited in the exam room or the control room. It adds 70.3 W (240 BTU/h) to the heat load.

STORAGE CONDITIONS

Temperature	5°C to 60°C (41°F to 140°F)
Relative humidity (1)	20% to 90%

Material should not be stored for more than 90 days.

(1) non-condensing

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.

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

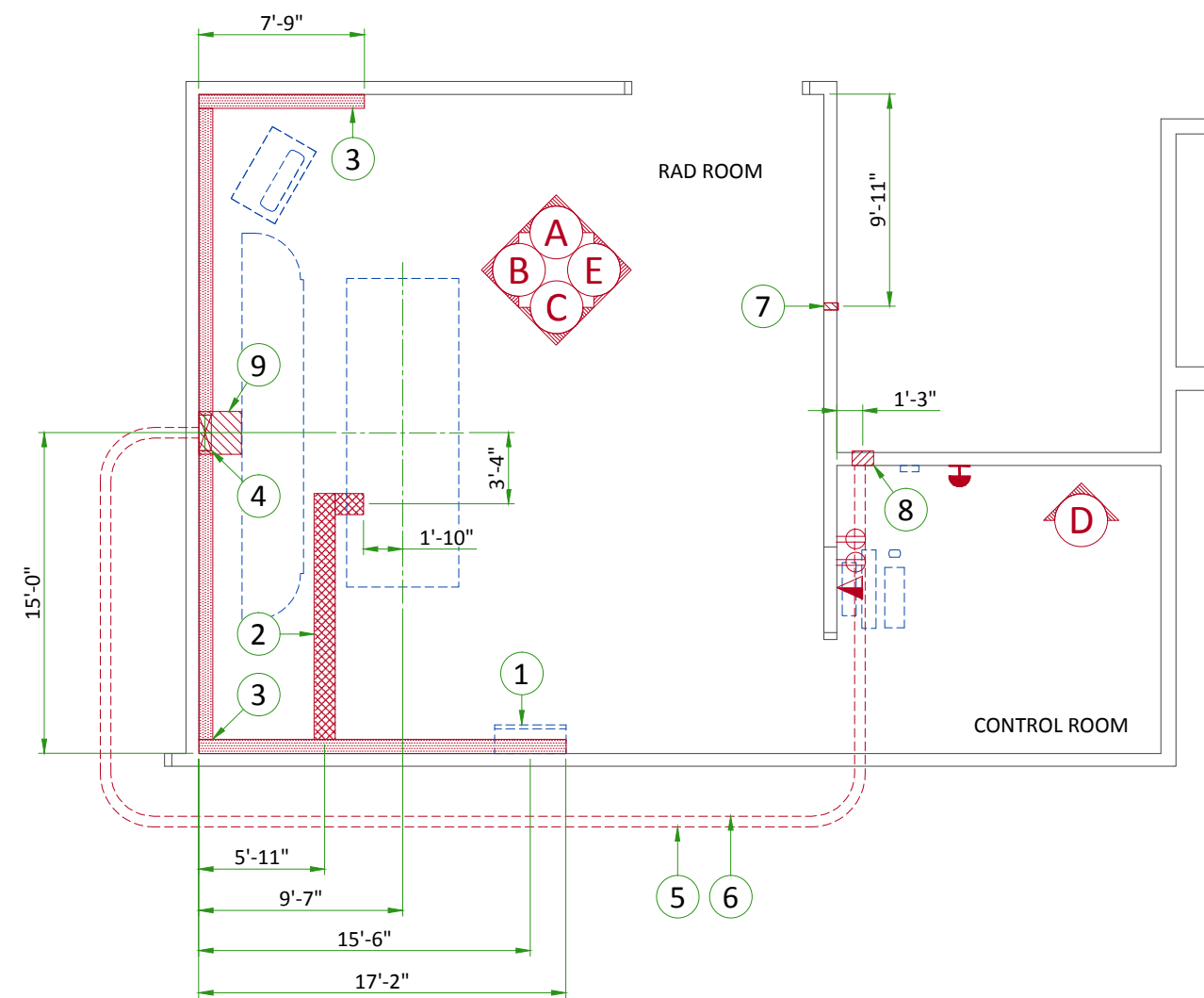
The requirements for these connectivity solutions are explained in the broadband solutions catalogue (separate document).

For all installations, make sure you have at least one (1) RJ45 dedicated to connect the new equipment on the LAN.

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 access flooring are to be cut out and finished off with grommet material by the customers contractor.
- General contractor to insert pull cords for all cable run conduits between the equipment room and the operators control room.
- 10 foot pigtailed at all junction points.
- Grounding is critical to equipment function and patient safety. Site must conform to wiring specifications shown on this plan.



FLOOR AND ELECTRICAL LAYOUT

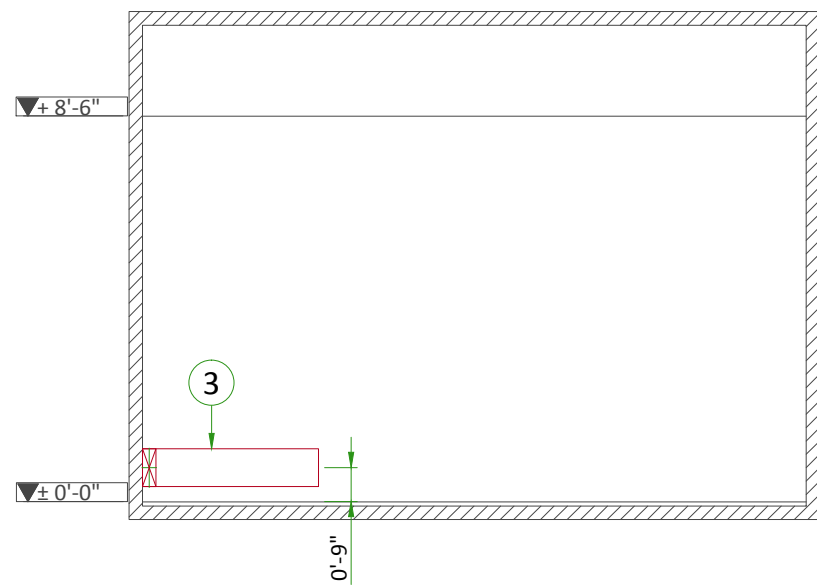
ITEM	DESCRIPTION
1	Main disconnect panel (recommended 1 1/2m [60 in] floor to middle of panel)
2	6" x 3 1/2" surface floor duct with minimum 1 divider
3	10" x 3 1/2" horizontal surface wall duct with minimum 2 dividers
4	10" x 3 1/2" vertical surface wall duct with minimum 2 dividers
5	1" conduit above ceiling
6	2 1/2" conduit above ceiling
7	Flush single gang box @ 1'-0" on center below finished ceiling (TYP) [Access Point]
8	6" x 6" x 4" box [18"] above finished floor (TYP) [Console]
9	12" x 12" x 6" box above ceiling

ITEM	QTY	Outlet Legend for GE Equipment
△	1	Dedicated telephone line(s)
▲	1	Network outlet
⊥	1	System emergency off (SEO), (recommended height 1.2m [48"] above floor)
⊗	2	X-Ray room warning light control panel
⊙	1	X-Ray ON lamp (L1) - 24V
◇	2	Door interlock switch (needed only if required by state/local codes)

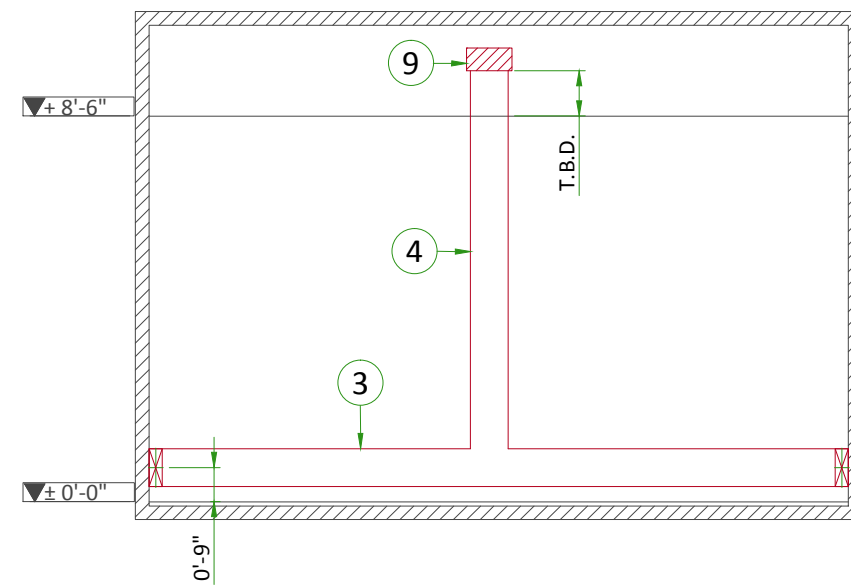
	SURFACE WALL DUCT
	SURFACE FLOOR DUCT

**Additional Conduit Runs
(Contractor Supplied and Installed)**

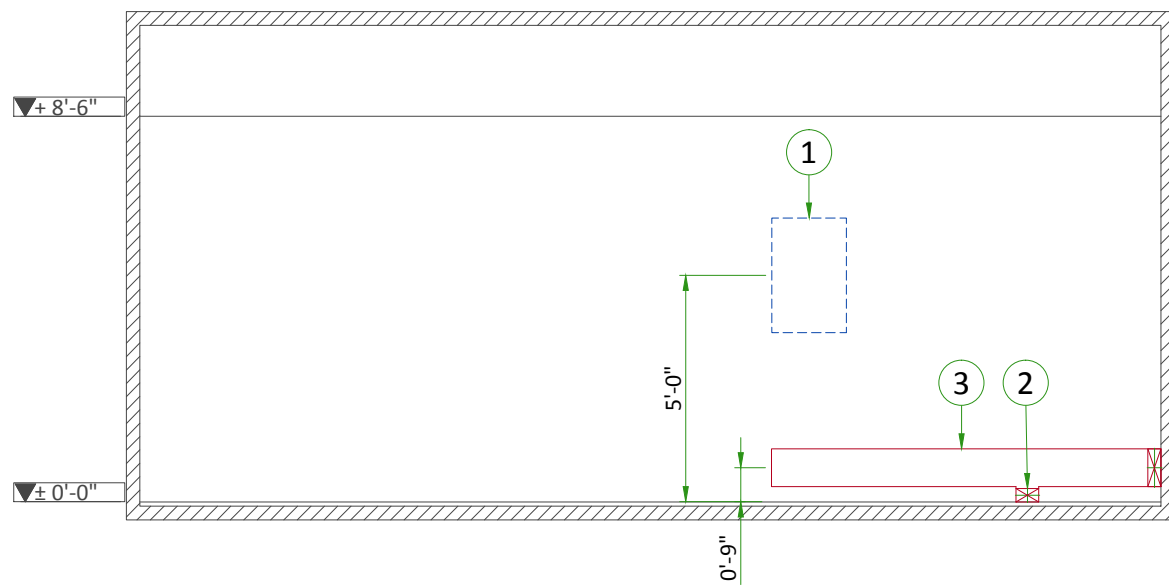
From	To	Qty	Size (in)	Size (mm)
Main Disconnect Panel	Feeder	1	as Req'd	
Main Disconnect Panel	Generator	1	as Req'd	
	Table	1	1/2	16
	System Emergency Off	1	1/2	16
Warning Light Control	Warning Light	1	1/2	16
	Generator	1	1/2	16
	120-V 1Ø Power	1	as Req'd	
Door Interlock Switch	Generator	1	1/2	16
Interface Box	Access Point	1	1	25



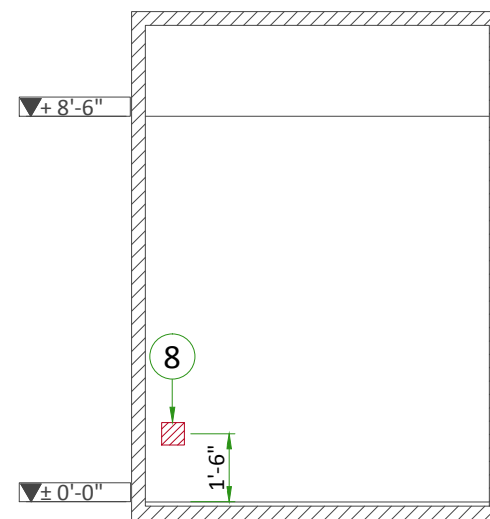
A



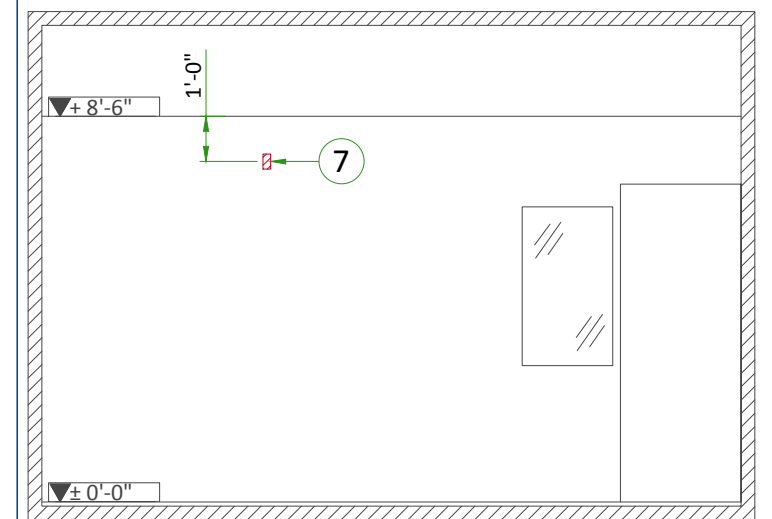
B



C



D



E

POWER REQUIREMENTS

Power Supply	1 Phase+G 230/240 ±10% / 3 Phase+G 400/415/440/480V ±10%
Frequencies	50 / 60 Hz
Minimum kVA Required	1 Phase and 3 Phase 50kW: 62.5kVA / 3 Phase 65kW: 80kVA / 3 Phase 80kW: 100kVA
Stand-by Consumption	500 W
Power Line	Maximum line regulation 5%

- Neutral must be terminated inside the main disconnect panel (MDP) and not at any GE cabinet.
- The section of the supply cable should be calculated in accordance with its length and the maximum permissible voltage drops. Refer to Feeder Table.

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 (lighting, power outlets, etc...) installed with GE system components must be powered separately.

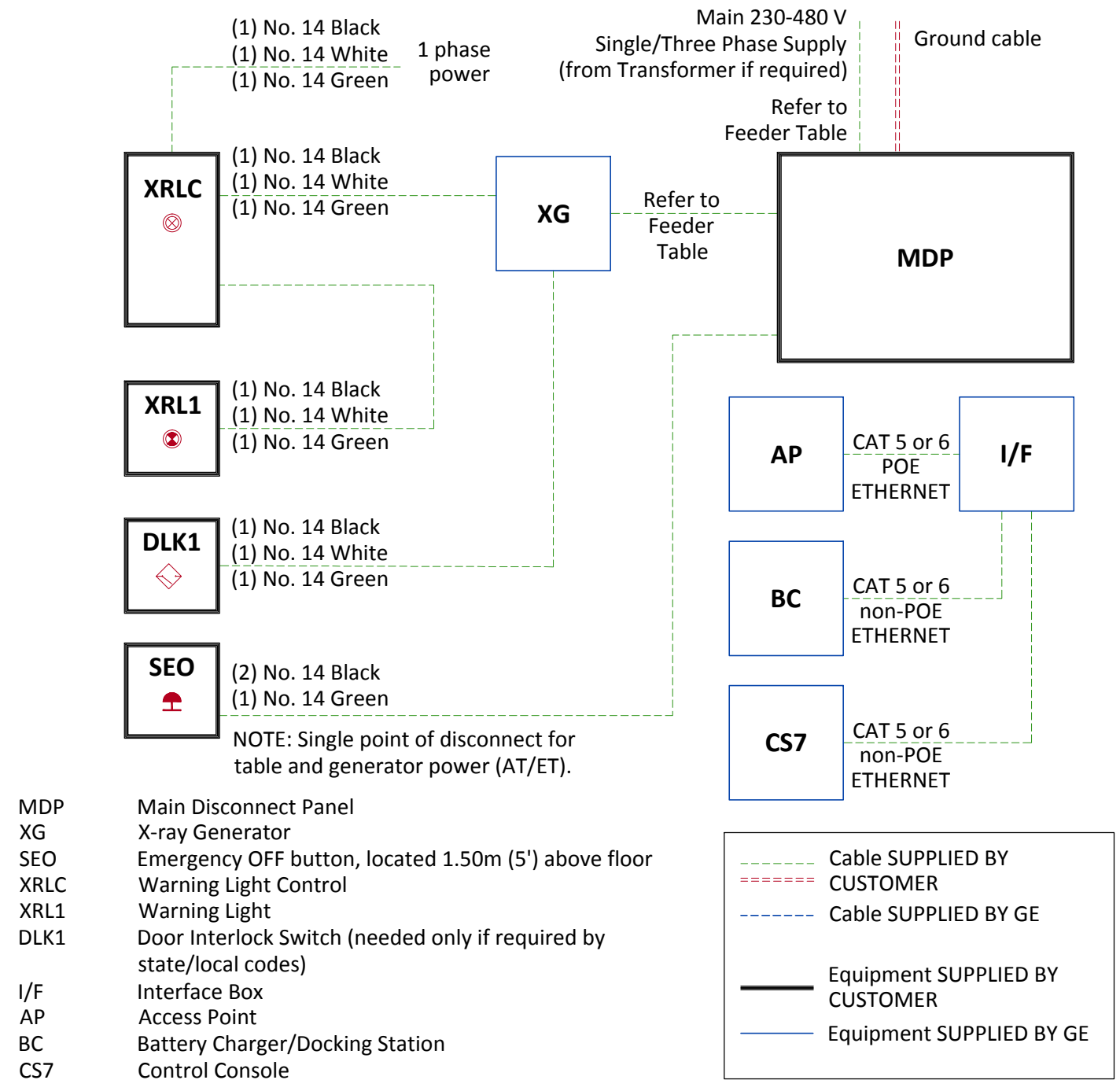
GROUND SYSTEM

- The grounding conductor will be of same size as the feeder. This ground will run from the MDP back to facility power source/main grounding point and always travel in the same conduit with the feeders and neutral.
- Grounding is critical to equipment function and patient safety. Site must conform to wiring specifications shown on this plan.

CABLES

- Power and cable installation must comply with the distribution diagram attached.
- All wiring must be THHN or TFFN stranded copper thermoplastic 600 volt or equivalent insulation. Aluminum or solid wires are not allowed. Cable color codes must comply with standards for electrical installation.
- General contractor to insert pull cords in all GE supplied cable run conduits. 1.5 m (5') pigtails at all junction points.

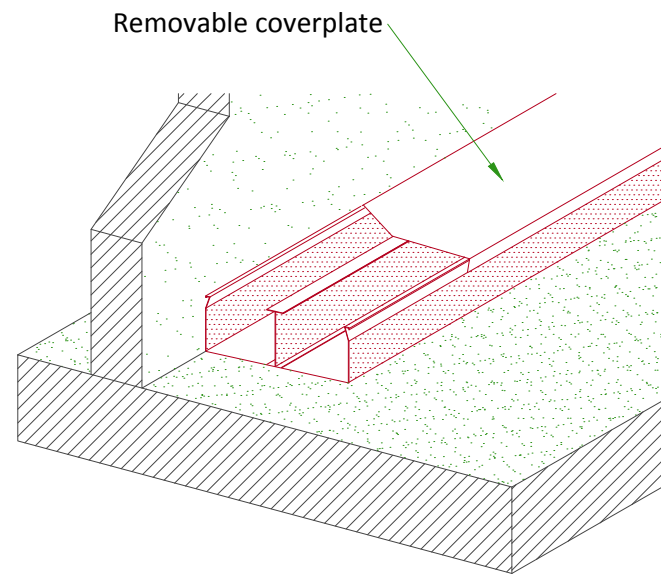
POWER DISTRIBUTION



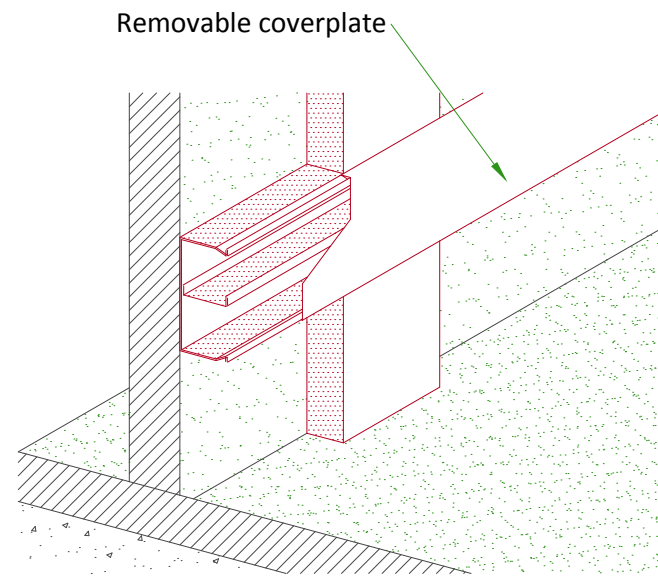
FEEDER TABLE				
MIN. FEEDER WIRE SIZE, AWG OR MCM (sq. M)/VAC	MINIMUM FEEDER WIRE LENGTH - ft (m)			
	50 (15)	100 (30)	150 (45)	200 (60)
480 VAC/GROUND	8 (6)	6 (16)	4 (25)	2 (25)
GENERAL NOTES				
In all cases qualified personnel must verify that the feeder (at the point of take-off) and the run to the X-Ray system meet all the requirements stated in the PIM				
Grounding conductor will run from the equipment back to the power source/main grounding point and always travel in the same conduit with the feeders				

CABLE MANAGEMENT

DUCT ON THE FLOOR



WALL DUCT



NOT TO SCALE

INTERCONNECTIONS

