

Title

**Room Preparation
For LS Laser System
Installation in CT Environments**

Scope

Centralite LS Laser Systems

Target Group

**Laser Installation Engineers, CT Room Designers
and Contractors**

Room Preparation for LS System Installation

This document has been prepared to give guidelines on the preparation of CT rooms before a Diacor LS laser system can be properly installed.

Step 1: Determine which Laser System will be installed.

This document covers three different stationary laser systems offered by Diacor:

- LS-1 – 3 red diode cross lasers (model DLL-2)
 - 1 red diode sagittal laser (model DLL-4)
- LS-2 – 2 red diode cross lasers (model DLL-2)
 - 1 red diode sagittal laser (model DLL-4)
- LS-3 – 3 red diode cross lasers (model DLL-2)
- LS-3MO – 2 red diode cross lasers (model DLL-2)
 - 1 motorized red diode cross lasers (model DLL-2M)
- LS-4 – 3 green diode cross lasers (model DLG-1)
 - 1 green diode sagittal laser (model DLG-1S)
- LS-5 – 2 green diode cross lasers (model DLG-1)
 - 1 green diode sagittal laser (model DLG-1S)
- LS-6 – 3 green diode cross lasers (model DLG-1)

Step 2: Find basic information on the CT scanner that will be installed.

CT scanners vary somewhat from model to model, and from manufacturer to manufacturer. Two dimensions are critical to correct installation of the laser system:

The height of the centerline of the scanner above the floor (“H”)

The distance from the scan plane to the front edge of the Gantry (“D”)

“H” must be known in order to place mount plates at the correct height on the walls. “D” is used to determine the offset distance (“OD”) from the scan plane to the laser plane. In determining “D”, any accessories, such as the table position display panel, should be included. “OD” should be a round number, typically 50, 55, or 60 cm. It should be the minimum value that is at least x cm larger than “D”.

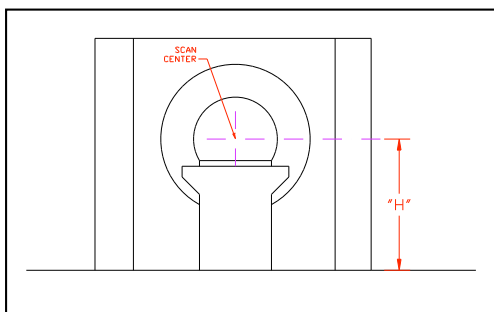


Figure 1 - "H" - Height of scan centerline

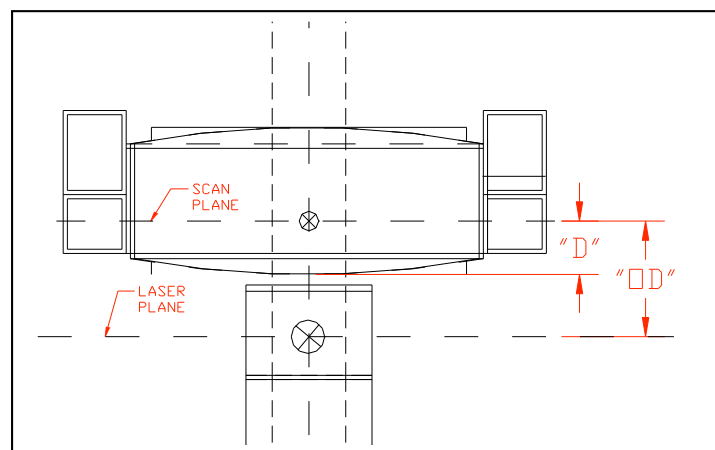


Figure 2 - Offset from scan plane to laser plane

Step 3: Determine mounting configuration

The next step is to determine how the lasers will be mounted in the CT room. This is a function of room layout, wall and ceiling construction, and availability of wall and ceiling space. The simplest mounting configuration is mounting the lasers on mount plates on the walls and on the ceiling, with the CT scanner parallel to the side walls, as shown in figure 3. In this case, rigid mount plates of the appropriate size must be mounted to the structure of the walls and ceiling.

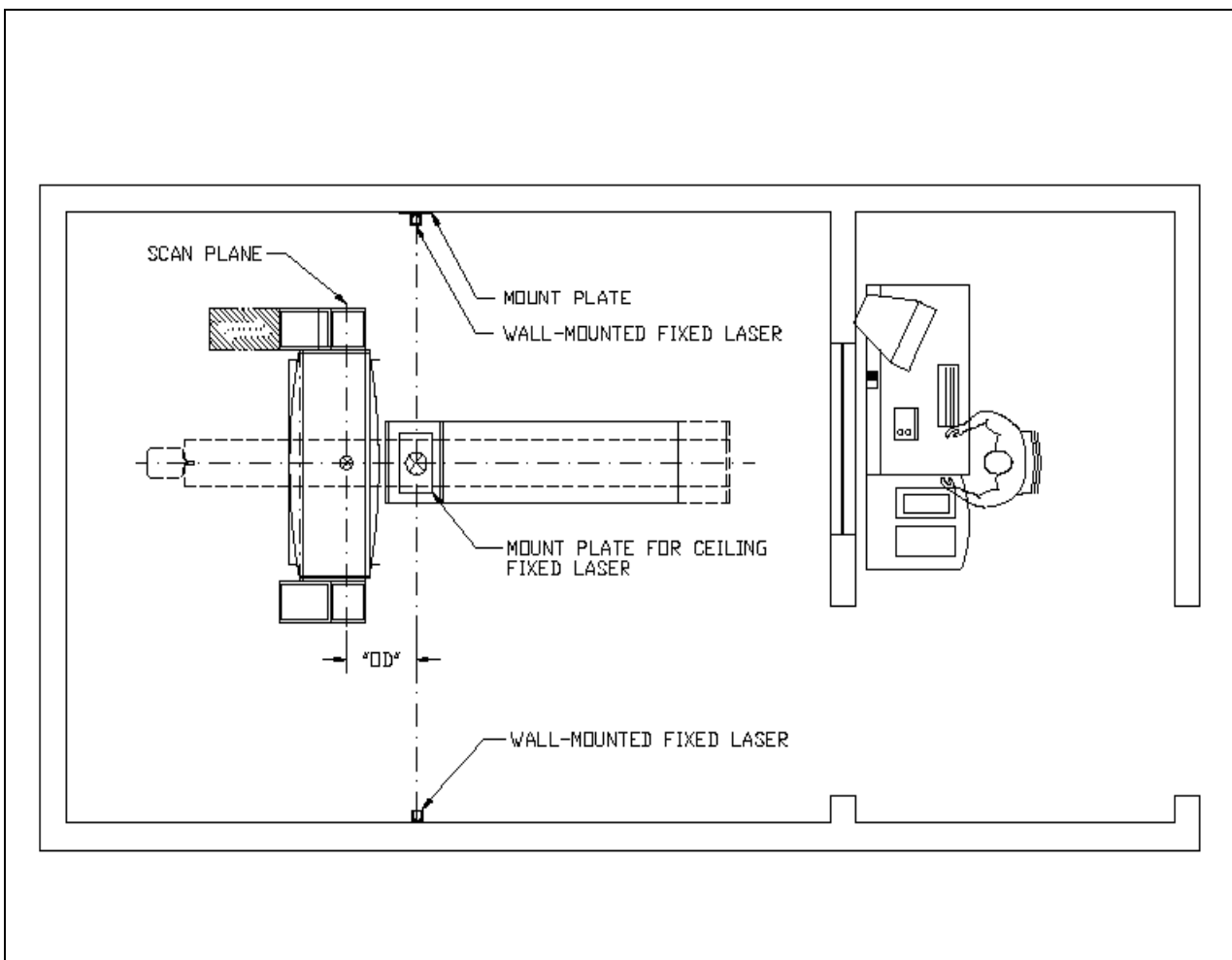


Figure 3 Wall and ceiling-mounted lasers on parallel walls

Alternately, the lasers can be recessed into the wall structure. This provides a more aesthetically pleasing installation, and protects the lasers from being knocked out of alignment due to collision from medical equipment in the room. This also allows the lasers to be mounted to a rigid structure separate from the room structure, to assure consistent laser alignment.

If the room walls are not parallel to the CT scanner, there are two options for mounting the side lasers, as shown in figure 4. One option is to mount the laser to the wall, but to mount it using an angle bracket kit, which allows the laser to be rotated into the correct laser plane. A second option is to use a pedestal to mount the laser. The pedestal is a circular floor-mounted column to which a laser can be mounted. A pedestal mount may be selected in rooms where the walls are parallel to the CT scanner, but the wall space is used for other purposes, or the walls are too far away from the CT scanner. In the case where a pedestal mount is used, provision must be made to run the necessary actuator cable or power cord to the base of the pedestal.

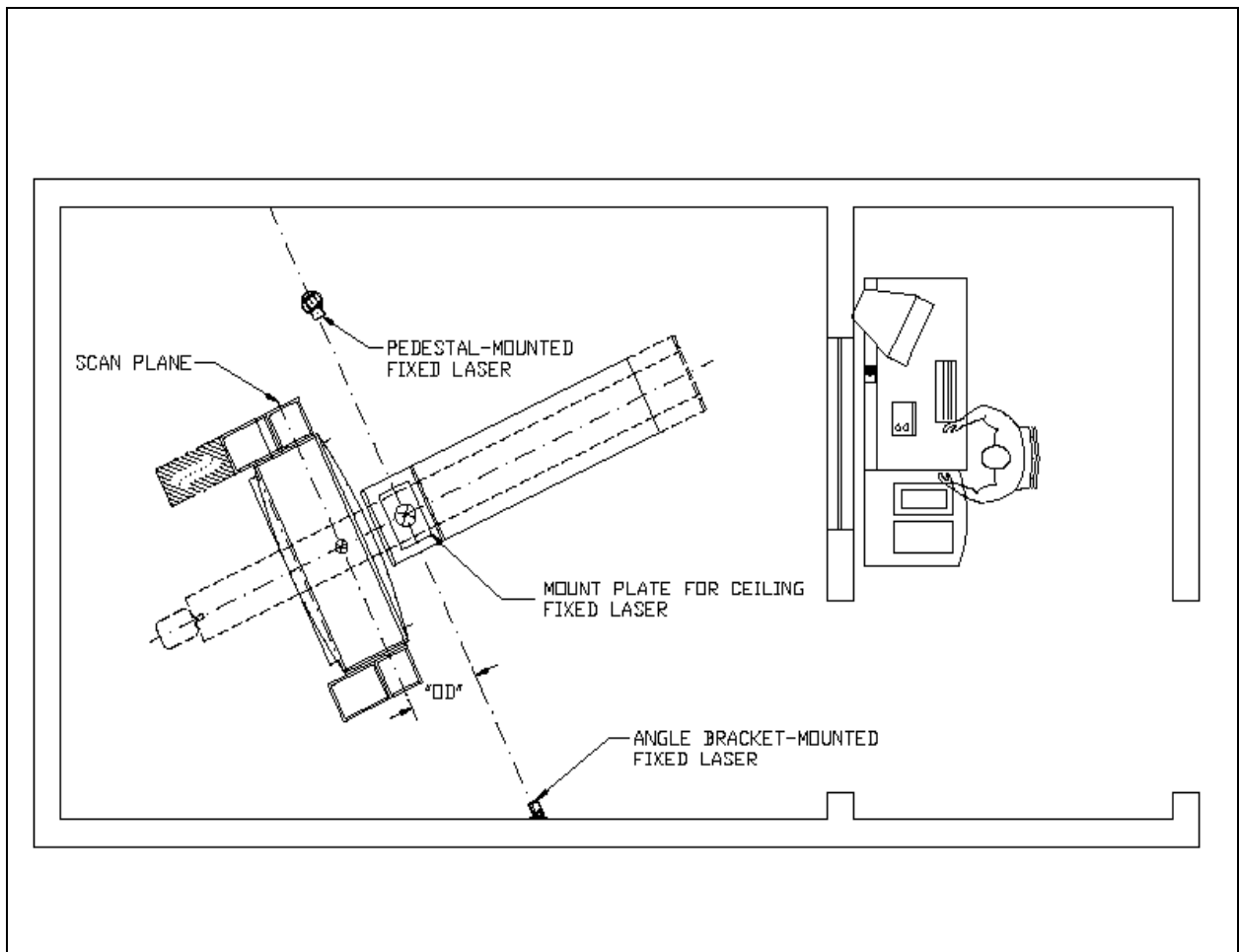


Figure 4 Mounting lasers when wall are not parallel to CT scanner

There may be installations where the ceiling laser cannot be mounted in the same plane as the lasers on the side. Such a case is shown in figure 5. In this case, a sagittal ceiling laser is mounted to a rigid mount plate in the ceiling, but an angle-bracket kit is used to rotate the laser so that the line it projects extends to the head of the table. In this case, the fixed laser in the overhead assembly that would normally form part of the Y laser plane is not supplied as part of the laser assembly. The drawback to this configuration is that the Y plane is formed only by two lasers on the sides of the CT couch, and there may be some areas where this line does not show up on the patient, because the lasers from the sides are blocked by patient body contours (e.g. on the center of the chest between the breasts).

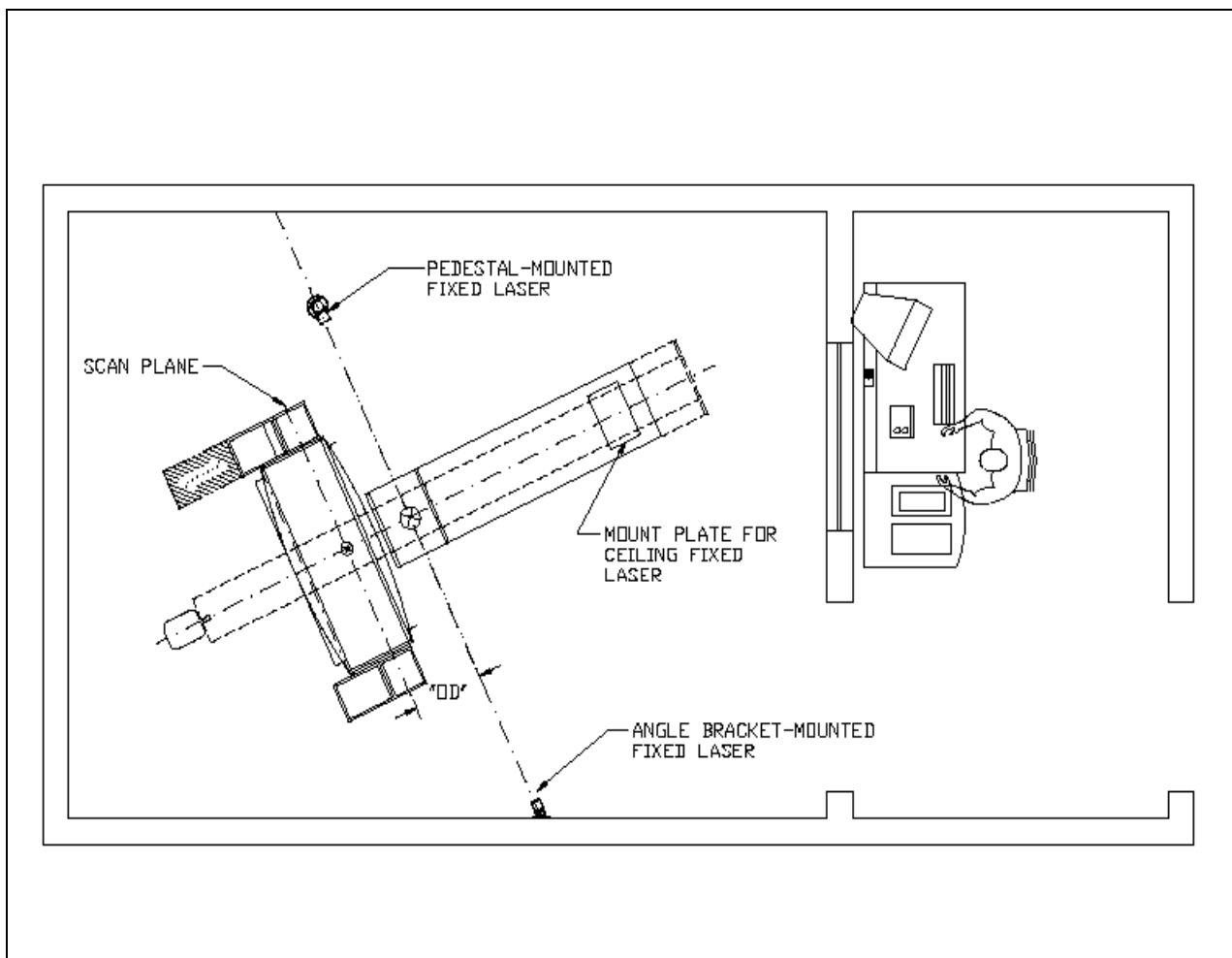


Figure 5 Overhead laser moved towards foot of CT couch.

Step 4: Power Requirements

A separate power outlet must be provided for each fixed laser (one mounted on each wall, the other mounted overhead). In the case of pedestal-mounted fixed lasers, provisions must be made to route the power cord to the base of the pedestal. The standard length of the power cord is 6 ft. If the power plug is located at a distance greater than this length, some provision must be made for an extended power cord length.

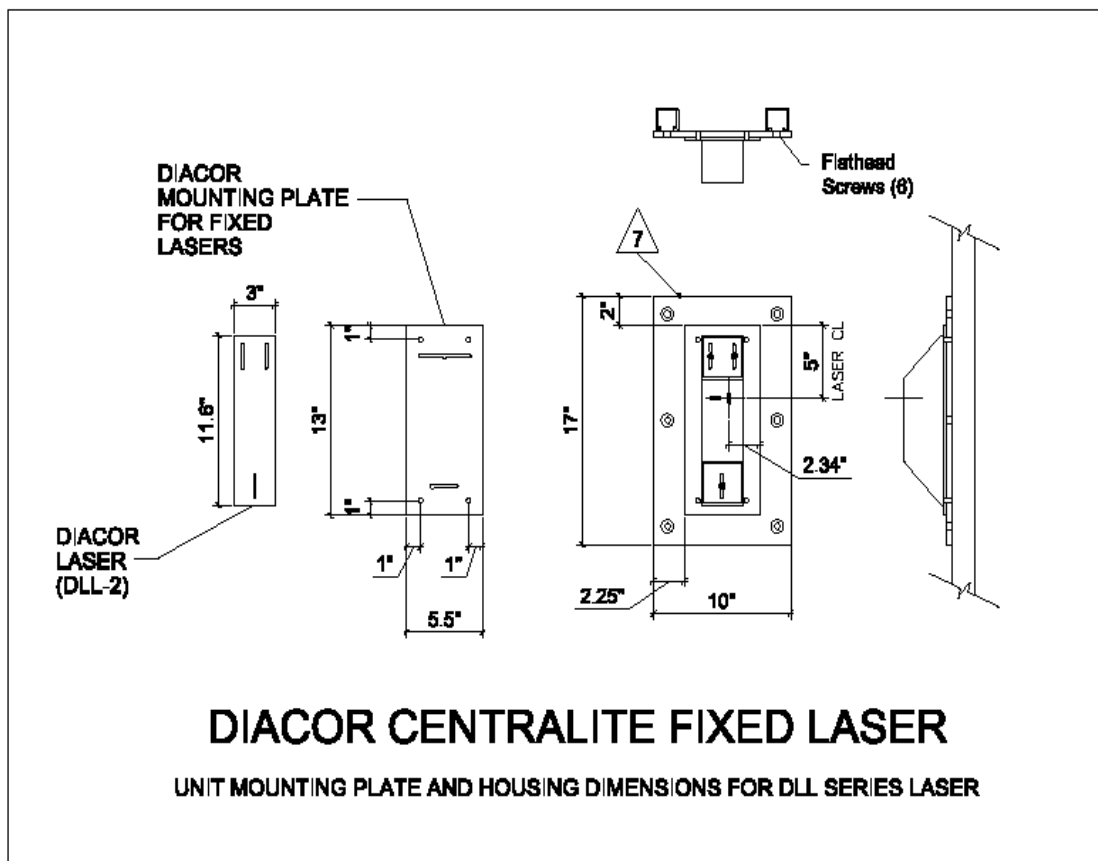
In general it is desirable for all of the power outlets in the room associated with the LS system to be on a common switched circuit, so that the entire laser system can be turned on or off from a single switch.

Step 5: Mount Plates

In order to achieve the maximum stability of the lasers lines in a LS system, all of the lasers must be mounted to a rigid mount plate, securely mounted to the building structure. These mount plates are not provided by Diacor, and should be installed by the building contractor before the system can be installed.

Recommended Size for Mounting Plate

DLL-2:	10 in. x 17 in. x 1/4 in.	Lateral Laser
DLG-1:	10 in. x 22 in. x 1/4 in.	Lateral Laser
DLL/DLG	24 in. x 24 in. x 1/4 in.	Ceiling Laser



The 10" width for the lasers are correct if the plates are to be mounted to Unistrut that runs from floor to ceiling. If the plates are to be mounted to the wall they should be large enough to span at least two wall studs.

Recommended Material

Aluminum is the preferred material for the mount plates. These plates will be drilled and tapped on site to mount the lasers to them. Aluminum makes this task relatively easy.

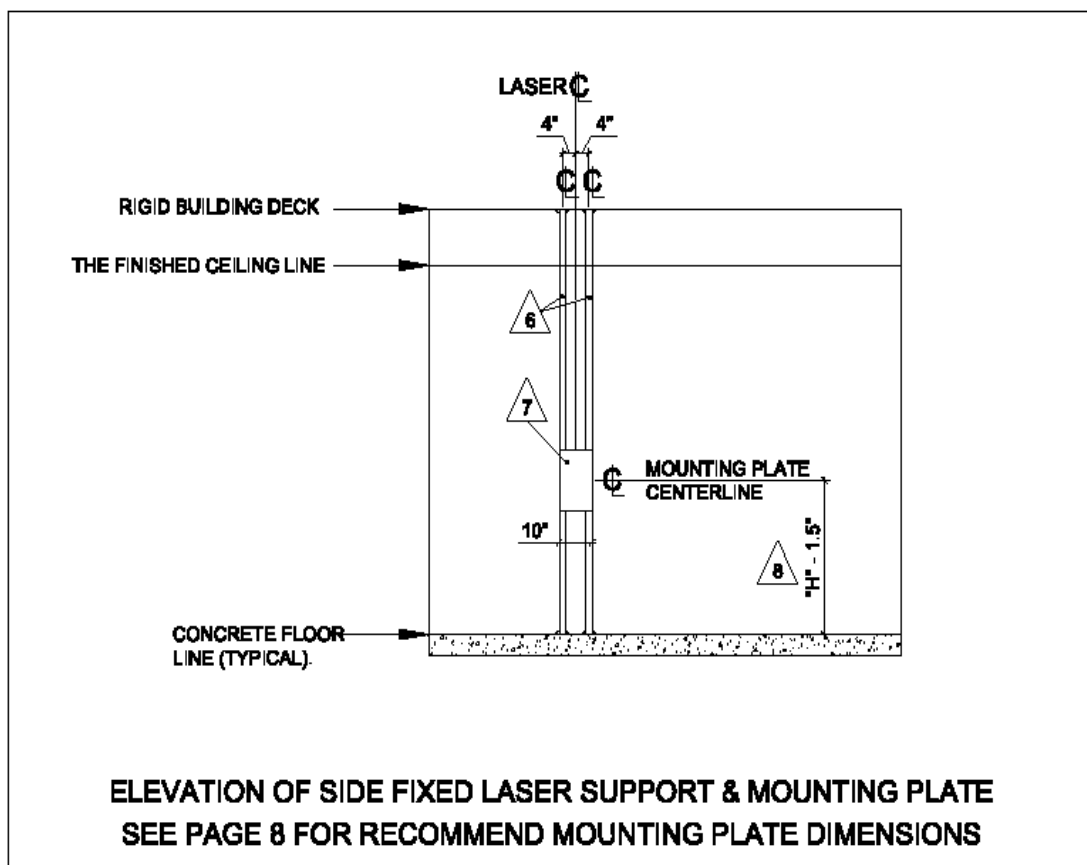
Mount Location

The location of the mount plates depends on the dimensions of the CT scanner determined in step 2 above. The objective is to install the lasers so that the axial plane (Y) is parallel to the scan plane, but offset by a convenient, round number (“OD”) in step 2 above, and so that the horizontal plane zero (Coronal or Z plane) coincides with the center of the CT scan. Note that the location of the laser line relative to the mount plate does **NOT** correspond to the center of the plate, for the fixed lasers.

The attached drawings show the heights of the various mounting plates relative to the “H” dimension determined in step 2 above.

Mount Structure

The attached drawings show several options for structures to secure the mount plates to in the CT room. In general, it is desirable for the mount plates to be mounted to a rigid structure independent of the wall or ceiling itself. Typically unistrut or some kind of structural tube, angle, or channel can be used for this purpose.



For the overhead laser the mount plate can be suspended from the ceiling with threaded rod attached to Unistrut. The mount plate should be 5-6 inches from the top-side of the drop in ceiling panel. There will then need to be a hole cut in the ceiling tile for the laser to project through.

Step 6: Finish Plates

In cases where the laser is to be recessed into the wall, it is generally desirable to provide a finish plate of some kind to finish the opening around the laser.