

LCLS Physics			
Requirements Document #	1.2-002	Injector	Revision 0
<p><u>Cooling Water, Electrical Isolation and Fire Extinguisher</u> <u>Requirements for the Sector 20 Alcove</u></p>			
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Brief Summary: This design document describes the water and electrical shielding and fire extinguisher requirements for the drive laser bay at Sector 20 Alcove.

Keywords: Drive Laser, Sector 20, S20, Injector Laser, injector housing, water, electrical grounding, fire extinguisher

Key WBS#'s: 1.2.2

Electrical Isolation Requirements:

The laser bay and the Sector 20 alcove do not require high frequency (rf) shielding of the walls, ceiling or floor. However a good grounding system, meeting SLAC standards and good electrical practices should be installed. This grounding system should connect all electronics ranks, laser tables, laser power supplies and cable trays to a single point ground. In addition, the HVAC system should be electrically isolated from the S20 alcove power. Power transients in the HVAC should not be allowed to propagate via the power lines into the S20 Alcove. I.e., the lights shouldn't flicker when the AC cycles on or off.

Drive Laser Bay Water and Air:

The drive laser system requires water for the heat exchangers on the close loop chillers and cryogenic helium compressor. The requirement is estimated to be 20 GPM at 40-60 PSI and at 70 degrees F or lower. This flow rate and pressure establish the pipe size. This water does not have to be low conductivity since it is being used in the external loop of the heat exchanger (the internal loop is closed and circulates low conductivity water). The heat exchangers are contained inside the chillers which are part of the laser system. This water should be clean to minimize the maintenance of the chiller pumping system, and SLAC requires this to be a close loop system. The manifold for this system should be located in the laser utility area as shown in Figure 1 below. This area is also where the manifold for the dry, clean nitrogen gas is located. This gas is used to continuously purge the laser enclosures. Gas lines will be installed by SLAC, and run from this area to the laser tables in the overhead cable trays.

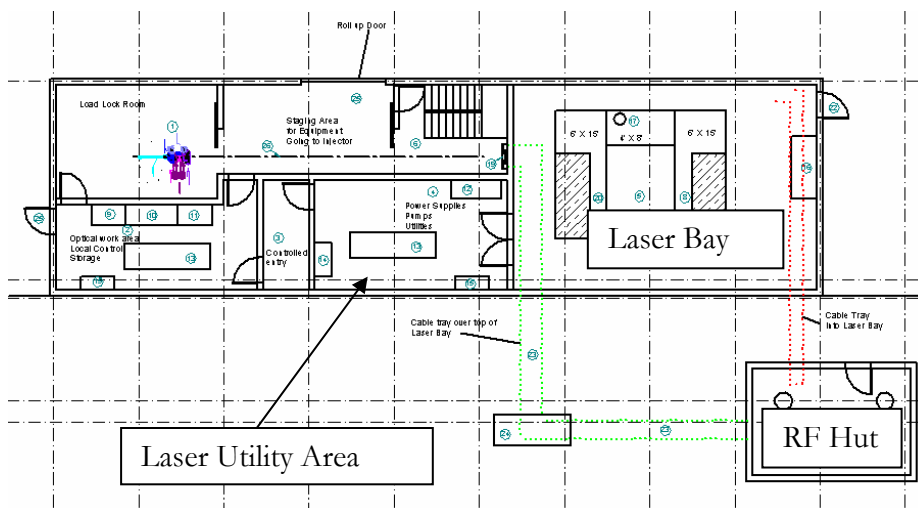


Figure 1: Conceptual layout of the Sector 20 alcove showing the laser utility area where the water and dry nitrogen manifolds should be located.

Fire Extinguisher System:

The S20 alcove rooms, the RF Hut and the injector housing will be protected from fire using the VESDA alarm/smoke detection and sprinkler systems. The VESDA will be used to turn off equipment with the early detection of any fire. The sprinkler is the standard, wet pipe system activated by heat and is not a pre-action system.