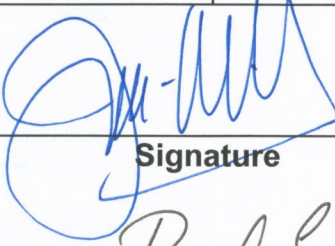
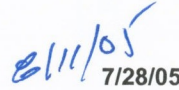
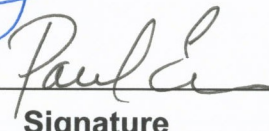
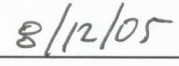

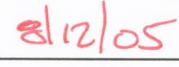
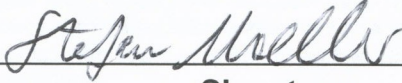
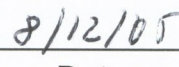

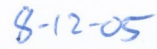
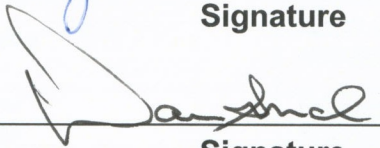
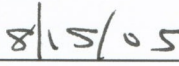


<b>LCLS Room Data Sheet #</b>	<b>1.9-1022</b>	<b>Near Experimental Hall - Laser Bay</b>	<b>Revision 2</b>
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Javier A. Sevilla Owner / Editor		
	<b>Signature</b>	<b>Date</b>
Jim Welch Conventional Facilities System Physicist		
	<b>Signature</b>	<b>Date</b>
David Saenz Conventional Facilities System Manager		
	<b>Signature</b>	<b>Date</b>
Stefan Moeller X-R Endstations WBS Manager		
	<b>Signature</b>	<b>Date</b>
John Arthur Photon Beam System Manager		
	<b>Signature</b>	<b>Date</b>
Darren Marsh Quality Assurance Manager		
	<b>Signature</b>	<b>Date</b>

<b>REVISION INFORMATION</b>
Rev 2. Added figure floor penetrations, data for heat dissipation, voltage for 120 volts outlets Added power demand diversity, cable trays specifications

**ROOM DATA SHEETS**

System Manager: Stefan Moeller/John Arthur

FACILITY COMPONENT	LASER BAY (NEH) - ROOM DATA SHEET		
	<b>Name of Building</b>		
	Laser Bay (NEH)		
	<b>Organization or Department</b>		
	SLAC, Stanford University		
	<b>Net area</b>		
	148.4	sq. meters	1597 SF
	<b>Critical dimensions</b>		
	<b>H:</b>	3.66 m	12'-0"
	<b>W:</b>	9.45 m	31'-0"
	<b>L:</b>	15.7m	51'-6"
	<b>Hours of operation</b>		
	Facility is locked with controlled access		
	<b>Users/Occupancy</b>		
	Laboratory reseachers prepare and run experiments. Occupancy Group "B".		
	<b>Building orientation</b>		
	Laser bay is located on the NEH basement level directly above the 3 experimental hutches (located on the NEH sub-basement level). South side of NEH		
<b>FUNCTIONAL OBJECTIVE</b>	1- Must be able to use laser bay space for at least three separate experimental groups. The implication of this is that lighting, mechanical, electrical and all utilities are to stress flexibility as the layouts of the laser tables and enclosures will always change and adapt to requirements of new experiments.		
<b>PLANNING CONSIDERATIONS &amp; CRITICAL FACTORS</b>	<p>1- Each Laser Lab requires two accesses. One access shall be near the elevator for equipment using one pair of 3'x7' doors with key lock. Another access for personnel. Personnel access shall be by means of a labyrinth, or by a double doors system with vestibule. Provide controlled access (card reader) into the Laser Bay. This vestibule should be sized to accommodate as minimum: a bench which a small group of lab personnel can use to don booties safely, a rack or cabinet to place bootie dispensing and bootie disposal recepticles, smock dispensing / storage / disposal, protective eyewear dispensing / storage, a few personal lockers and the clear space between the inner and outer pair of 3'-0" wide access doors.</p> <p>2- Must be able to physically maneuver horizontally the laser tables from the elevator to the laser lab while on pallet jacks.</p> <p>3 - Provide six 6" diameter holes with metal sleeves in the concrete floor to the hutches (sub-basement)</p>		
<b>FINISHES</b>	Wall	Painted gypsum wall board. No glossy finishes.	
	Ceiling	Mylar wrapped acoustic tile panels within suspended Unistrut framing grid capable of supporting experiment specific diagnostic equipment on suspended shelf below the ceiling above each laser table. Each shelf estimated weight is 500 lbs each.	
	Floor	Resilient sheet flooring-concrete floor	
	Base	Rubber base	
	Doors	Flush hollow metal inner vestibule doors. Doors installed with automatic door bottoms preventing light leak. Outer vestibule doors are locked and openable by key or cardkey.	
	Fenestrations	None allowed.	
	Acoustical	Typical laboratory decibel level required. NC:35	

<b>APPLICABLE STANDARDS</b>	29 CFR Part 1910 Occupational Safety and Health Standards Dept of Labor, 29 CFR Part 1926 Safety and Health Regulations for Construction Dept of Labor, Uniform Building Code (UBC) 1997 including appendixes, National Electric Code (NEC) 2002, Uniform Mechanical Code (UMC) 2003 including appendixes, Uniform Plumbing Code (UPC) 2003 including appendixes, Uniform Fire Code (UFC) 2003 including appendixes, California Code of Regulations Title 8 Industrial Safety, Title 19 Public Safety, NFPA 70 National Fire Codes, National electrical Safety Code ANSI C2, Occupational Safety and Health Act (OSHA), General Services Administration 41 CFR part 101-19, Environmental Protection Agency 40 CFR Parts 264 and 265, SLAC Environmental Safety & Health Manual, General Industrial Activities Storm Water Permit (SLAC Permit), NFPA 101 life Safety Code, Title 24, DOE standard 10 CFR Part 435, ASHRAE/IES Standards 90.1, NFPA Standard 13 and SLAC Fire Marshal requirements, LCLS Cabling Standard, SLAC LOTO			
<b>BUILT-IN CABINETS</b>	Upper and Lower cabinets			
<b>VIEWS &amp; SCHEMATICS (N. T. S.)</b>	<b>See Figure No. 1</b>			
<b>MECHANICAL REQUIREMENTS</b>	<b>HVAC</b>	<input checked="" type="checkbox"/>	Heating system Temp:	<input checked="" type="checkbox"/> Mechanical humidification
	<b>Provide filtered clean air using pre-filters, high efficiency filters and HEPA filters in the air handling unit. 6 FPM average room velocity or less, Not an official "certified" Clean Room but equivalent to a Class 100,000.</b>	<input checked="" type="checkbox"/>	Air conditioning Temp: 72 degrees F± 1 degree F	<input checked="" type="checkbox"/> Direct exhaust system - for laser table experiment enclosures only.
		<input type="checkbox"/>	Direct supply	<input type="checkbox"/> Positive pressure system
		<input type="checkbox"/>	Indirect supply	<input type="checkbox"/> Negative pressure system
		<input type="checkbox"/>	Smoke control system	<input type="checkbox"/> Standard registers
		<input checked="" type="checkbox"/>	Temperature sensors connected to DDC system	<input checked="" type="checkbox"/> Requirement for gases
		<b>List of Gases -</b> 1. Provide piping to Laser Bay for N2 gas to be piped from a nitrogen boil off station (centralized system), which is located outside outside of NEH in parking lot area near the service dock. 2. <u>Centralized Mechanical Utilities:</u> Clean dry oil-free compressed air 20 SCFM, 100 psig. Provide three locations (along concrete wall) with shut off valve and pressure gauge		1- Low velocity less than 6 FPM. 2- Relative Humidity shall be 45% +/- 10% 3. 200 CFM exhaust ducts (6") for process exhaust at 1.5"W.C. static pressure for Laser Bay 4.- Direct Digital Control for operations and interface w/ SLAC Energy Management System (EMS).
	<b>Communications</b>	<input checked="" type="checkbox"/>	Telephone- 2 phone lines/location	<input type="checkbox"/> PA speakers
		<input checked="" type="checkbox"/>	Dataport- 2 jacks/location	<input type="checkbox"/> PA station
		<input type="checkbox"/>	Payphone	<input type="checkbox"/> CCTV camera
		<input checked="" type="checkbox"/>	Fire alarm station	<input type="checkbox"/> CCTV monitor
		<input type="checkbox"/>	Intercom	
	Comments: a) Provide cable trays- Refer to figure No. 1. Cable trays shall be made of galvanized steel, provide with 1# 4/0 bare copper wire as grounding for each cable tray.			

	<b>Plumbing/Fire Protection</b>	<input type="checkbox"/> Hot water system	<input type="checkbox"/> Electric watercooler
		<input type="checkbox"/> Cold water system	<input type="checkbox"/> Drinking fountain
		<input checked="" type="checkbox"/> Process cooling water	<input checked="" type="checkbox"/> Smoke detection system
		<input type="checkbox"/> Waste drain	<input checked="" type="checkbox"/> Standard sprinkler heads
		<input checked="" type="checkbox"/> Floor drain	<input type="checkbox"/> Eye wash
		<input type="checkbox"/> Trench drain	
		<b>Comments:</b> 1- Process Cooling water: 30 GPM, 25 PSI at 68 F in Laser Bay. Refer to LCLS ESD for Water Cooling Specifications. Terminate with shut off valve and pressure gauge. Locate piping on concrete wall	
<b>ELECTRICAL REQUIREMENTS</b>	<b>Power supply</b>	<input type="checkbox"/> 208 V 1ph and 208 volts, 3 phase outlets	<input type="checkbox"/> Uninterrupted power supply
		<input checked="" type="checkbox"/> 110V, 1ph Double duplex outlets, 20 amps locate at 10ft apart on walls.	<input checked="" type="checkbox"/> Special electric Type:
		<input type="checkbox"/> Emergency power	Provide three panels, 208 volts, 3 ph-120 volts, (two "clean" and one "dirty" power). Each panel shall have a main breaker. All panels should have 20% spare capacity and additional breaker space. Capacity of each panel: min. <b>125</b> amps. Diversity: 60%. <b>Panel location:</b> Near to vestibule
		<b>Comments:</b> 1- Number of circuits: 42 circuits for each panel. 2 - Heat dissipation from equipment for entire room: 15kW	
		<input checked="" type="checkbox"/> Light fixtures -	<input type="checkbox"/> Remote lighting control
		<input type="checkbox"/> Fixture type I: Downlight	<input checked="" type="checkbox"/> Light switches
		<input type="checkbox"/> Fixture type II: Bollard (exterior)	Lighting level FC: 100
	<b>Lighting</b>	<input checked="" type="checkbox"/> Emergency lighting	
		<b>Comments:</b> 1- All conduits are surface mounted. Low profile fixtures preferred. 2- No night lighting desired. 3- Each of the three experimental areas within the Laser Bay is to be separately zoned for lighting control flexibility. 4- Must have the ability to completely darken the room when required by the particular experiment. 5- Lighting level should be higher than normal standard office environment due to the dark laser protective goggles worn by the lab personnel. 6- Light fixtures could be located at the lower unistrut level, placing the fixtures as close to the worksurface as possible.	

<b>RADIATION/SEISMIC/VIBRATIONS ISSUES</b>	<b>Comments:</b> 1- All equipment (HVAC, cable trays, panels, etc) and systems are to be seismically braced and restrained per Code. 2- Vibration criteria per LCLS ESD Vibration Specification 3- Vibration generating HVAC equipment, pumps, and any other equipment located adjacent to the Laser Labs are to be mounted on vibration isolating assemblies to mitigate the transmission of vibration into the building structure and affect the experiments.					
<b>SPECIAL REQUIREMENTS FOR EQUIPMENT</b>	<b>Comments:</b> 1- Laser experimental equipment requires cooling either by providing a centralized system of cooling water supply and return piping or a decentralized system of small remote laboratory chillers located within a small closet. Either way is a closed system. Locate a small closet to accommodate these remote chillers. 2- Experiments require the creation of a vacuum within a vessel. A pump room should be included adjacent to the Laser Labs in a sound isolated room which accommodates a SLAC provided "rough" vacuum pump (Roots blower) and a "high" vacuum pump (turbo pump). 3. Provide six floor penetrations (6" diameter) with metal sleeves into x-ray hutches below (see figure 1). Two penetrations for each hutch for laser beam transport. 4. Provide cable trays (see figure 1 below).					
	<b>CHEMICALS</b>			<b>SPECIALTY GASES</b>		
<b>CHEMICALS / GASES</b>		#	Chemical Type	Quantity	#	Gas Type
			Radiation protection is a must for surrounding facilities.			
<b>ENVIRONMENTAL NEEDS</b>	1.0					

**Figure 1**

- 12" double cable tray
- 12" single cable tray

Fig. Laser bay: NEH Basement

