LCLS Room Data Sheet # 1.9-1015	Electron Beam Dump (EBD)	Revision 2

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REVISION INFORMATION

Rev 2. Added figures No. 1 and 2. Updated Code and Standards. Updated Figure No. 3 and table with info from LLNL (7-25-05)
Added cable trays specifications. Deleted "green line" and requirements for gases.
Added requirement for dedicated sump pump in EBD. Clarified electrical and lighting requirements
Added LCLS ESD 1.9-102, 1.9-103, and 1.9-104.

FACILITY COMPONENT	ELECTRON BEAM DUMP - ROOM DATA SHEET		
	Name of Building	Electron Beam Dump	
	Organization or Department	SLAC, Stanford University	
	Net area	180.0 sq. meters	1932SF
	Critical dimensions	**H:** 3.8m	12'-6"
		W: 4.5m	14'-9"
		L: 40m	131'-0"
	Hours of operation	Facility is locked 24/7/365 (periodic maintenance only)	
	Users/Occupancy	No occupancy throughout the year	
	Building orientation	Beam Dump commences downstream of the Undulator Hall thermal barrier wall, and ends at the steel shielding that separates the EBD area from the FEE.	
FUNCTIONAL OBJECTIVE	The electron beam separated from the x-ray bends downward and terminates into the Electron Beam Dump facility. The x-ray beam continues east, at 1.4m above the floor while the electron beam main dump is located below floor level in a shielded dump well. The dump is located directly below the finis floor and can be occasionally accessed for maintenance.		
PLANNING CONSIDERATIONS & CRITICAL FACTORS	Floor level is to remain constant throughout the entire length of the E-Dump at 1.4m below the beam axis. Y = - 0.895305m in LCLS coordinate system (refer to LCLS-TN-03-8). There are four wells and two slots in the dump vault floor. The first pair wells (from West to East) are parallel to each other separated by a section of floor between the two wells, the first two wells are open, protected by steel handrails. A pair of slots in the floor connect the first two wells to the third well. The slots and the third well are covered with steel plate. Cast-in-place iron pipe connects the third well to the fourth well. The fourth well houses the main dump. An additional pipe at the full depth of the wells connects well four to well three for drainage. A sump will be located in well three at the lowest point. Additional piping must penetrate the wall for water supply and return to the main dump. Well four, the dump well is highly shielded to protect from radiation. Radiation shielding thickness requirements are defined in notes from the SLAC Radiation Physics department. The shielding consists of thick steel lining of the floor and walls of the dump well. Over the dump well is a layer of steel and a layer of concrete blocks. A crane or cranes are required for placing and removing the shielding blocks covering the dump well. The thickness of the steel and concrete blocks is described by Radiation Physics. Jacobs is to design the blocks and size the crane(s) such that the blocks can be removed from the dump well for repair of the dump or water system. The existing PEP Ring road which is above the dump, shall be raised by approx. 5'-0". This will reduce vibration caused by the road.		
FINISHES	Wall	Reinforced concrete, white. Refer to LCLS ESD- Generic Accelerator Tunnel Construction Tolerance Specification, ESD 1.9-102 and General Concrete Guideline, ESD 1.9-103.	
	Ceiling	Reinforced concrete, white	
	Floor	a) Floor level is to remain constant throughout the entire length of the EBD at 1.4m below the beam axis. Y = - 0.895305m in LCLS coordinate system (refer to LCLS-TN-03-8). b) Refer to LCLS ESD- Generic Accelerator Tunnel Construction Tolerance Specification, ESD 1.9-102 and General Concrete Guideline, ESD 1.9-103. c) Metal covering over grooved areas on floor. First dump: well dump area is open and protected with stee railings. Second dump well is covered with steel plating and third dump well is covered with radiation shielding.	
	Base	N/A	
	Doors	N/A	
	Fenestrations		
	Acoustical	N/A	
APPLICABLE STANDARDS	29 CFR Part 1910 Occupational Safety and Health Standards Dept of Labor, 29 CFR Part 1926 Safety and Health Regulations for Constructions 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-Energy Code, DOE standard 10 CFR Part 435, ASHRAE/IES Standards 90.1, NFPA Standard 13 and SLAC Fire Marshal requirements, LCLS Cabling Standard and SLAC LOTO		

VIEWS & SCHEMATICS (N. T. S.)

Figure No. 1

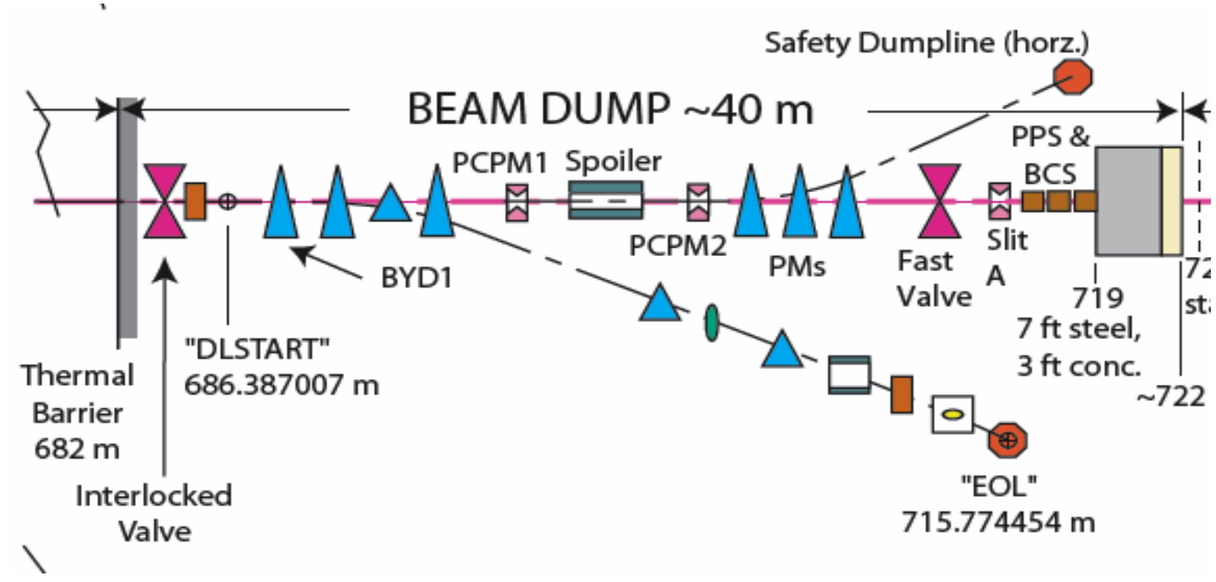


Figure No. 2

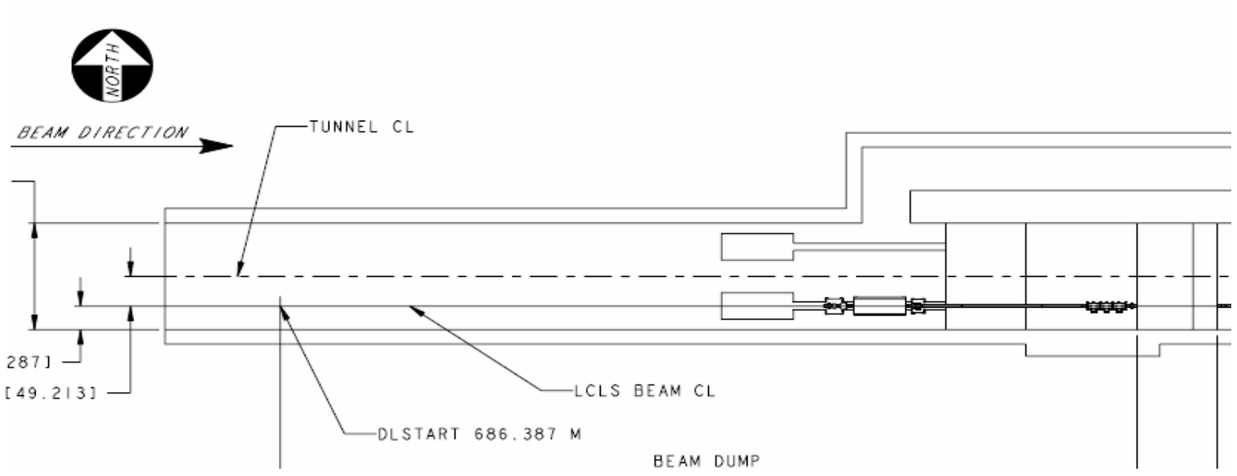
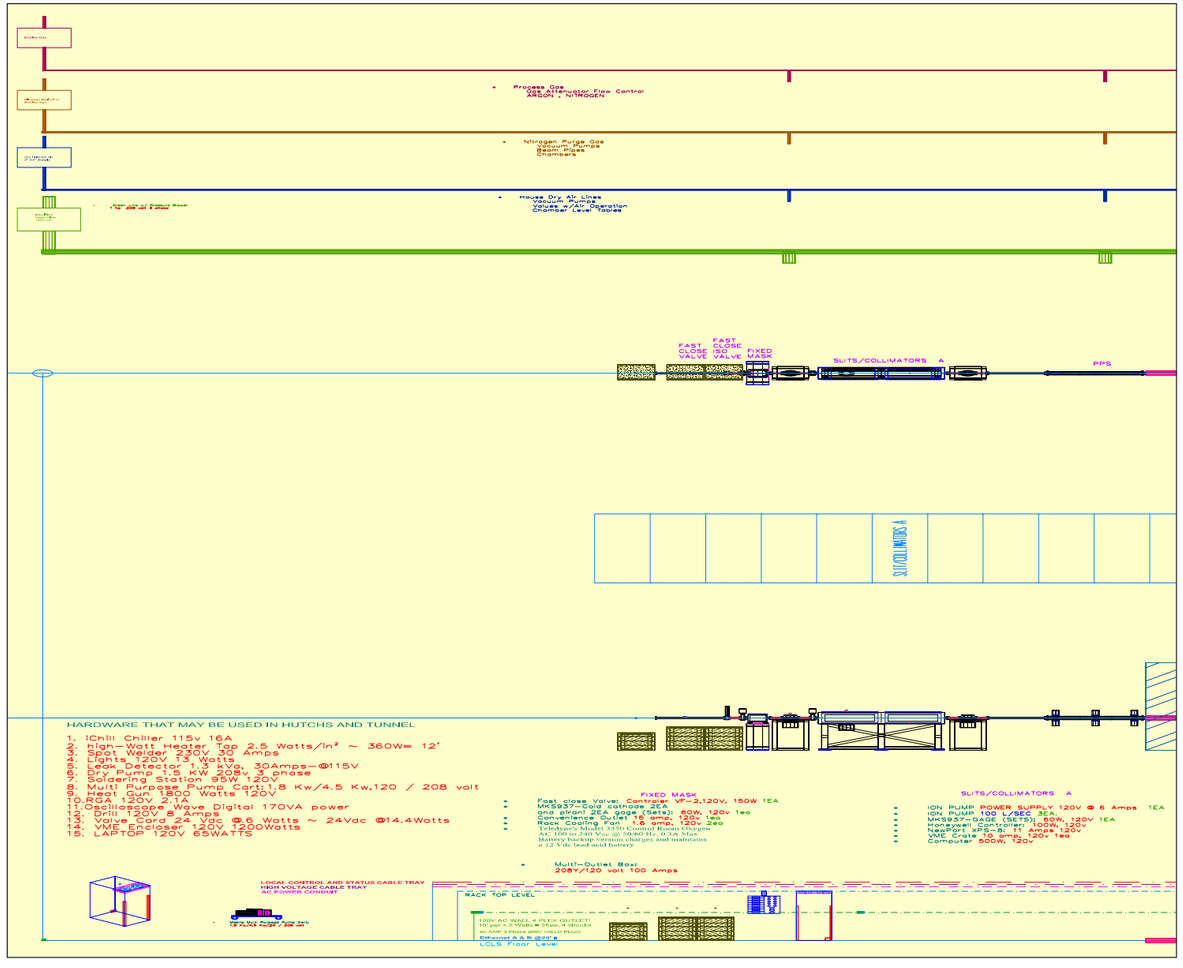


Figure No. 3- CONFIGURATION OF EQUIPMENT FURNISHED BY SLAC- FOR REFERENCE



See List of Special Equipment for details -REFERENCE ONLY

MECHANICAL REQUIREMENTS	**HVAC**	☐	Heating system	Temp:	☐	Mechanical humidification	
		☐	Air conditioning	Temp:	☒	Direct exhaust system	
		☒	Direct supply		☐	Positive pressure system	
		☐	Indirect supply		☐	Negative pressure system	
		☐	Smoke control system		☐	Standard registers	
		☐	Temperature sensors connected to SLAC's DDC system		☒	Requirement for gases	
		List of Gases -			**Comments:** a) Ventilation shall be required in area while occupied. b) Add lines for: Dry Air - Clean dry oil-free compressed air 20 CFM, 100 psig. Provide two locations (south wall) with shut off valve and pressure gauge.		
	Communications	☒	Telephone- Two phone lines at one location		☐	PA speakers	
		☒	Data port- Two outlets-per location		☐	PA station	
		☐	Payphone		☐	CCTV camera	
		☒	Fire alarm station		☐	CCTV monitor	
		☐	Intercom				
		Comments: **a)** Telephone stations are for maintenance & emergency use only. Provide one location for phone and one location for data ports b) Provide (2) two 18" wide cable trays, stacked vertically. c) Cable trays shall be 6" deep for I&C cables and control cables for DC racks, and 4" deep for high voltage cables for DC racks. Install cable trays on wall at 7.5 feet AFF. d) Cable trays shall be made of galvanized steel and provide each cable tray with 1 # 4/0 bare copper wire for grounding.					
	Plumbing/Fire Protection	☐	Hot water system		☐	Electric water cooler	
		☐	Cold water system		☐	Drinking fountain	
		☒	Low Conductivity Water-See comments		☒	Smoke detection system	
		☐	Waste drain		☒	Wet Sprinkler System	
		☐	Floor drain		☐	Eye wash	
		☒	Trench drain				
		Comments: 1) Tunnel trench drainage system shall flow toward the Undulator Hall for further routing to a holding tank located in RSY. 2) Compressed air piping system (85 psi min, 120 psi max) shall provide a 1/2" outlet every 50' on center. 3) Provide a dedicated sump pump for the beam dump.					
ELECTRICAL REQUIREMENTS	**Power supply**	☒	208V 3 Phase		☐	Uninterrupted power supply	
					☒	Special electric	Type: 480v
		☒	120V outlets, 1 ph, 20 amps				
		Comments: **a)** Requirements are limited to convenience receptacles along the walls. Provide at least three (3) double duplex, on both walls. 120 volts, 1 ph, 20 amps. B) Provide one 480V welding receptacles, 3 phase, 100 amps.					
	Lighting	☒	Light fixtures		☒	Remote lighting control	
		☒	Fixture type I: Down light		☒	Light switches-See comments	
		☐	Fixture type II: Bollard (exterior)		☒	Lighting level	FC: 30
		☒	Emergency lighting				
		Comments: a) Fixtures are surface mounted fluorescent, low profile.					
		b) Provide three (3) way control switch					

RADIATION/SEISMIC/VIBRATIONS ISSUES	**Comments:** a) See AE Design Guidelines for Radiation and Seismic requirements. b) Vibration requirements: Refer to LCLS ESD-Vibration specification B.	
SPECIAL REQUIREMENTS FOR EQUIPMENT	**Comments:** a) Requirement for low-conductivity cooling water for the electro-magnets, see EBD utility spreadsheet. b) Cable trays: Provide (2) two 24" wide cable trays stacked vertically on south wall near ceiling, to run full-length of EBD. c) Cable penetrations must be cast into the wall/ceiling to route cables from service bldgs to beam line equipment. d) Penetrations shall comply with radiation requirements as per attached rad document.	
ENVIRONMENTAL NEEDS	1.0	Radiation protection is a must for surrounding facilities

LIST OF EQUIPMENT TO BE FURNISHED BY SLAC-PROVIDED FOR REFERENCE ONLY

Item		Amps @ 120V	Amps @ 208V 3 Phase	Amps @ 230V 1 phase
Total		**132**	**100**	**0**
Beam Dump	**Count**	**132**	**100**	**0**
Fix Mask				
Fast close Valve: Controller VF-2,120V, 150W 1ea	1	1		
MKS937-Cold cathode and pirani 2EA gage (Sets): 60W, 120v 1ea	1	0.5		
Convenience Outlet 15 amp, 120v 1ea	1	15		
Rack Cooling Fan 1.6 amp, 120v 2ea	2	3.2		
Teledyne's Model 3350 Control Room Oxygen AC 100 to 240 Vac @ 50/60 Hz, 0.3A MaxBattery backup version charges and maintains 12 Vdc lead acid battery	1	0.3		
SLITS/COLLIMATORS A				
ION PUMP POWER SUPPLY 120V @ 6 Amps 1ea	1	6		
ION PUMP 100 L/SEC 3EA.	3			
MKS937-GAGE (SETS): 60W, 120V 1ea	1	0.5		
Honeywell Controller: 100W, 120v	1	1		
NewPort XPS-8: 11 Amps 120v	1	11		
VME Crate 10 amp, 120v 1ea	1	10		
Computer 500W, 120v	1	4.2		
Multi-Outlet Box:				
Multi-Outlet Box: 208Y/120 volt 100 Amps	1		100	
Use Linac spec for 480V Weld plug				
120V AC WALL 4 PLEX OUTLET; 2 Walls. Standard separation; 4 circuits (20Amps ea.)		80		