

Stanford Linear Accelerator Center Stanford Synchrotron Radiation Laboratory

LCLS Room Data Sheet # 1.9-1016 Front End Enclosure (FEE) **Revision 2** B Javier A. Sevilla Owner / Editor Signature Date Jim Welch **Conventional Facilities System** Signature Date Physicist 8/15/05 David Saenz M **Conventional Facilities System** Signature Date Manager h Ct for RBanka 8-17.05 **Richard Bionta** FEE WBS Manager Signature Date 8-17-05 John Arthur Photon Beam System Manager Signature Date Darren Marsh 20 8 Quality Assurance Manager Signature Date

REVISION INFORMATION

Rev 2. Added layout figures, added plan view figure, delete table with SLAC furnished equipment

Added diversity factor. Clarified exhaust requirements- "GREEN LINE". Clarified temperature stability to +/- 1F

Added LCLS ESD 1.9-102, 1.9-103, 1.9-104 and 1.9-105.

Updated table with electrical requirements for SLAC furnished equipment

ROOM DATA SHEETS

WBS and System Managers: Richard Bionta/ John Arthur

FUNCTIONAL OBJECTIVE Hours PLANNING CONSIDERATIONS & CRITICAL Floor FACTORS Floor FINISHES Wall Ceiling Floor Base Doors	e of Building nization or Department rea ad dimensions sof operation s/Occupancy ing orientation EE follows the Electron Bea level is to remain constant t to LCLS-TN-03-8). The FEE ies. Numerous cable trays a ric Accelerator Tunnel Cons	am Dump (EBD) and allows for vario throughout the entire length of the F E would be structurally a simple exte and other equipment need to be sup struction Tolerance Specification, ES Reinforced concrete	LCLS-Front Er SLAC, Stanfor 157.5 H: W: L: Facility is lock No occupancy FEE to be loca Dump. Dus diagnostics equipment.	nd Enclosure rd University [sq. meters 3.8 4.5 35.0 ed 24/7/365 (periodic mainte t throughout the year ated immediately downstrear ated immediately downstrear n axis. Y = - 0.895305m in L0 n Dump, with steel shielding s I walls along the length of FE ncrete Guideline, ESD 1.9-10	1,694 SF 12'6" 14'.9" 114 ft anance only) m from the Electron Beau CLS coordinate system separating the two E. Refer to LCLS ESD-03.		
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FINISHES Wall Ceiling Floor Base Doors	g	Reinforced concrete	e white				
Ceiling Floor Base Doors	g	Deinforced	Wall Reinforced concrete, white				
Floor Base Doors		Reinforced concrete	e, white				
Base		Concrete slab, floor s Guideline- ESD 1.9-1 1.9-102	surface resistant to Liquid Ni 03. Refer to LCLS ESD Ge	itrogen spills. Refer to LCLS eneric Accelerator Tunnel Co	General Concrete Instruction Tolerance, E		
Doors							
	3						
Fenes	strations	None					
Acous	stical	None					
		H					
29 CF of Lab APPLICABLE STANDARDS SLAC Energ Stand	FR Part 1910 Occupational S por, Uniform Building Code (ling appendixes, Uniform Pli gulations Title 8 Industrial S y and Health Act (OSHA), G Environmental Safety & He gy Code, DOE standard 10 lard and SLAC LOTO	Safety and Health Standards Dept o (UBC) 1997 including appendixes, N lumbing Code (UPC) 2003 including safety, Title 19 Public Safety, NFPA Seneral Services Administration 41 C ealth Manual, General Industrial Acti CFR Part 435, ASHRAE/IES Stands	of Labor, 29 CFR Part 1926 National Electric Code (NEC appendixes, Uniform Fire C 70 National Fire Codes, Nat CFR part 101-19, Environme ivities Storm Water Permit (ards 90.1, NFPA Standard 1	Safety and Health Regulatio 2002, Uniform Mechanical Code (UFC) 2003 including a tional electrical Safety Code ental Protection Agency 40 C SLAC Permit), NFPA 101 life 13 and SLAC Fire Marshal re	ns for Constructions De Code (UMC) 2003 ppendixes, California C ANSI C2, Occupationa FR Parts 264 and 265 s Safety Code, Title 24- equirements, LCLS Cat		



Figure No. 1

SCHEMATIC PLAN VIEW- NOT TO SCALE



Figure No. 2



Figure No. 3



MECHANICAL REQUIREMENTS	HVAC	X	Heating system	Temp:		Mechanical humidification	
		×	Air conditioning	Temp: 72 F	N	Direct exhaust system	
			Direct supply		H	Positive pressure system	
			Smoke control system		H	Standard registers	
		N			X	Otandard registers	
		4	Temperature sensors connected	d to SLAC's DDC	-	Requirement for gases	
			system				
		List of Gases -			Comments:		
		a) Dry Air; High p	urity Nitrogen and Argon		a) H	VAC system - Space temperatu	re shall be
		b) Nitrogen boll of right outside stoir	IT Station to be located outside r	lear service dock,	desi	gned for 72 F +/- 1 degree F. Re	elative
		c) Provide clean (dry oil-free compressed air 20 S	CEM/each 100 psig	hun	dd linns for: Dry Air Brocoss G	2020
		Provide outlets a	t two locations (on concrete wa	II) with shut off valve	Nitro	agen/Argon Purge: and "Green I	ine" (see
		and pressure gau	ige. Equally space along the ler	igth of the FEE.	sche	ematic above) Exhaust requirem	ents - 350
			3. 1. , 1	5	CFN	apacity-Total CFM for both ou	utlets in FEE
					(Me	chanical Pump exhaust line, Pur	ge gases and
					HEF	PA filters)	
					c) G	as line size: 0.5"; gas pressure	variable from
					5 to	100psi)	
					d) N	litrogen purge line (10 liter/min, :	> 30 psi or use
					gen	eral line spec (5 to 100 psi)	
	Communications	X	Telephone- a phone at one			PA speakers	
	Communications	8	location		ш	PA speakers	
		\boxtimes	Data port- 2 outlets-two			PA station	
			locations				
			Payphone			CCTV camera	
		×	Fire alarm station			CCTV monitor	
			Intercom				
		Comments:	- line le tien) d dete				
		a) Telephone (two	o lines per location) and data po	orts (two outlets per ea		ocation) are required.	
		b) One 18" wide cable tray and one 12" wide cable tray. Also, provide 12" wide cable tray between racks.					
		racks. Install cable travs on wall at 7.5 feet AFF					
		c) Cable trays shall be made of galvanized steel, provide each cable tray with 1 # 4/0 bare copper wire for grounding.					
		d) Racks will be f	urnished and installed by SLAC				, ouriaing.
		.,					
	Plumbing/Fire Protection		Hot water system			Electric water cooler	
	Plumbing/Fire Protection		Hot water system Cold water system			Electric water cooler Drinking fountain	
	Plumbing/Fire Protection		Hot water system Cold water system Tempered water			Electric water cooler Drinking fountain Smoke detection system	
	Plumbing/Fire Protection		Hot water system Cold water system Tempered water Waste drain			Electric water cooler Drinking fountain Smoke detection system Wet Sprinkler System	
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	Plumbing/Fire Protection		Hot water system Cold water system Tempered water Waste drain Floor drain Trench drain			Electric water cooler Drinking fountain Smoke detection system Wet Sprinkler System Eye wash	
	Plumbing/Fire Protection	Comments: Comments:	Hot water system Cold water system Tempered water Waste drain Floor drain Trench drain			Electric water cooler Drinking fountain Smoke detection system Wet Sprinkler System Eye wash	
	Plumbing/Fire Protection		Hot water system Cold water system Tempered water Waste drain Floor drain Trench drain t water for HVAC only. (CW) lines for turbo and/or lon	numps or equivalent		Electric water cooler Drinking fountain Smoke detection system Wet Sprinkler System Eye wash	header
	Plumbing/Fire Protection	Comments: a) Chilled and hot b) Cooling water b) cooling at upstree	Hot water system Cold water system Tempered water Waste drain Floor drain Trench drain t water for HVAC only. (LCW) lines for turbo and/or lon am end.	pumps or equivalent	I N N N N N N N	Electric water cooler Drinking fountain Smoke detection system Wet Sprinkler System Eye wash	header
	Plumbing/Fire Protection	Comments: a) Chilled and hot b) Cooling water (located at upstreat	Hot water system Cold water system Tempered water Waste drain Floor drain Trench drain t water for HVAC only. (LCW) lines for turbo and/or lon am end. 208 V 3 phase outlets	pumps or equivalent		Electric water cooler Drinking fountain Smoke detection system Wet Sprinkler System Eye wash ired with a capacity of 3 gal/min,	header
ELECTRICAL REQUIREMENTS	Plumbing/Fire Protection	Comments: a) Chilled and hol b) Cooling water located at upstrea	Hot water system Cold water system Tempered water Waste drain Floor drain Trench drain t water for HVAC only. (LCW) lines for turbo and/or lon am end. 208 V, 3 phase outlets 110V outlets	pumps or equivalent		Electric water cooler Drinking fountain Smoke detection system Wet Sprinkler System Eye wash ired with a capacity of 3 gal/min, Uninterrupted power supply Special electric welding	header
ELECTRICAL REQUIREMENTS	Plumbing/Fire Protection	Comments: a) Chilled and hor b) Cooling water located at upstreat	Hot water system Cold water system Tempered water Waste drain Floor drain Trench drain t water for HVAC only. (LCW) lines for turbo and/or lon am end. 208 V, 3 phase outlets 110V outlets 208/230V, single phase	pumps or equivalent		Electric water cooler Drinking fountain Smoke detection system Wet Sprinkler System Eye wash ired with a capacity of 3 gal/min, Uninterrupted power supply Special electric welding 208V 3 phase	header Type: 480V
ELECTRICAL REQUIREMENTS	Plumbing/Fire Protection	Comments: Comments: a) Chilled and hot b) Cooling water located at upstread S Comments:	Hot water system Cold water system Tempered water Waste drain Floor drain Trench drain t water for HVAC only. (LCW) lines for turbo and/or lon am end. 208 V, 3 phase outlets 110V outlets 208/230V, single phase	pumps or equivalent		Electric water cooler Drinking fountain Smoke detection system Wet Sprinkler System Eye wash ired with a capacity of 3 gal/min, Uninterrupted power supply Special electric welding 208V 3 phase	header Type: 480V
ELECTRICAL REQUIREMENTS	Plumbing/Fire Protection	Comments: a) Chilled and hot b) Cooling water located at upstreat Comments: a) FEE has exten	Hot water system Cold water system Tempered water Waste drain Floor drain Trench drain t water for HVAC only. (LCW) lines for turbo and/or lon am end. 208 V, 3 phase outlets 110V outlets 208/230V, single phase sive list of equipment. Emerger	pumps or equivalent	requiper cequiper ceq	Electric water cooler Drinking fountain Smoke detection system Wet Sprinkler System Eye wash ired with a capacity of 3 gal/min, Uninterrupted power supply Special electric welding 208V 3 phase oment operation is not required.	header Type: 480V
ELECTRICAL REQUIREMENTS	Plumbing/Fire Protection	Comments: Context at upstread Context at upstread Comments: a) Chilled and hot b) Cooling water (located at upstread Comments: a) FEE has exten b) Provide two (2)	Hot water system Cold water system Tempered water Waste drain Floor drain Trench drain t water for HVAC only. (LCW) lines for turbo and/or lon am end. 208 V, 3 phase outlets 110V outlets 208/230V, single phase sive list of equipment. Emerger) panels, 120-208 volts, 3 ph o	pumps or equivalent	requipes for	Electric water cooler Drinking fountain Smoke detection system Wet Sprinkler System Eye wash ired with a capacity of 3 gal/min, Uninterrupted power supply Special electric welding 208V 3 phase ment operation is not required. "dirty" power, 42 circuits/each. E	header Type: 480V
ELECTRICAL REQUIREMENTS	Plumbing/Fire Protection		Hot water system Cold water system Tempered water Waste drain Floor drain Trench drain t water for HVAC only. (LCW) lines for turbo and/or lon am end. 208 V, 3 phase outlets 110V outlets 208/230V, single phase sive list of equipment. Emerger) panels, 120-208 volts, 3 ph o breaker with a minimum capace	pumps or equivalent ncy or UPS power for e ne for "clean" and one tity of 125 amps. Diver	requipe for sity	Electric water cooler Drinking fountain Smoke detection system Wet Sprinkler System Eye wash ired with a capacity of 3 gal/min, Uninterrupted power supply Special electric welding 208V 3 phase ment operation is not required. "dirty" power, 42 circuits/each. E factor: 60 %.	header Type: 480V
ELECTRICAL REQUIREMENTS	Plumbing/Fire Protection	Comments: a) Chilled and hol b) Cooling water of located at upstree Comments: a) FEE has exten b) Provide two (2) shall have a main c) Power for three bit for three bit for the former than the former	Hot water system Cold water system Tempered water Waste drain Floor drain Trench drain Trench drain t water for HVAC only. (LCW) lines for turbo and/or lon am end. 208 V, 3 phase outlets 110V outlets 208/230V, single phase sive list of equipment. Emerger) panels, 120-208 volts, 3 ph o breaker with a minimum capaca (3) each Multi-Outlet Box:208	pumps or equivalent acy or UPS power for e one for "clean" and one ity of 125 amps. Diver Y/120 volt 100 Amps to	requipe for sity	Electric water cooler Drinking fountain Smoke detection system Wet Sprinkler System Eye wash ired with a capacity of 3 gal/min, Uninterrupted power supply Special electric welding 208V 3 phase poment operation is not required. "dirty" power, 42 circuits/each. E factor: 60 %. installed (by SLAC) on wall. Lay	header Type: 480V
ELECTRICAL REQUIREMENTS	Plumbing/Fire Protection	Comments: a) Chilled and hoi b) Cooling water located at upstree Comments: a) FEE has exten b) Provide two (2) shall have a main c) Power for three distributed in from	Hot water system Cold water system Tempered water Waste drain Floor drain Trench drain t water for HVAC only. (LCW) lines for turbo and/or lon am end. 208 V, 3 phase outlets 110V outlets 208/230V, single phase sive list of equipment. Emerger) panels, 120-208 volts, 3 ph oo breaker with a minimum capac e (3) each Multi-Outlet Box:208 ³ t of primary hardware. Provide	pumps or equivalent ncy or UPS power for e ne for "clean" and one ity of 125 amps. Diver f/120 volt 100 Amps to power from Utility pan	requipe for sity to be hel	Electric water cooler Drinking fountain Smoke detection system Wet Sprinkler System Eye wash ired with a capacity of 3 gal/min, Uninterrupted power supply Special electric welding 208V 3 phase orment operation is not required. "dirty" power, 42 circuits/each. E factor: 60 %. installed (by SLAC) on wall. Lay	header Type: 480V
ELECTRICAL REQUIREMENTS	Plumbing/Fire Protection	Comments: a) Chilled and hot b) Cooling water located at upstree Comments: a) FEE has exten b) Provide two (2) shall have a main c) Power for three distributed in from	Hot water system Cold water system Tempered water Waste drain Floor drain Trench drain t water for HVAC only. (LCW) lines for turbo and/or lon am end. 208 V, 3 phase outlets 110V outlets 208/230V, single phase sive list of equipment. Emerger) panels, 120-208 volts, 3 ph oo breaker with a minimum capac a (3) each Multi-Outlet Box:208% t of primary hardware. Provide	pumps or equivalent acy or UPS power for e ne for "clean" and one ity of 125 amps. Diver f/120 volt 100 Amps to power from Utility pan	requipe for rsity po be el	Electric water cooler Drinking fountain Smoke detection system Wet Sprinkler System Eye wash ired with a capacity of 3 gal/min, Uninterrupted power supply Special electric welding 208V 3 phase orment operation is not required. "dirty" power, 42 circuits/each. E factor: 60 %. installed (by SLAC) on wall. Lay	header Type: 480V
ELECTRICAL REQUIREMENTS	Plumbing/Fire Protection Power supply Lighting	Comments: a) Chilled and hot b) Cooling water located at upstree Comments: a) FEE has exten b) Provide two (2) shall have a main c) Power for three distributed in fron	Hot water system Cold water system Tempered water Waste drain Floor drain Trench drain t water for HVAC only. (LCW) lines for turbo and/or lon am end. 208 V, 3 phase outlets 110V outlets 208/230V, single phase sive list of equipment. Emerger) panels, 120-208 volts, 3 ph oo breaker with a minimum capace (3) each Multi-Outlet Box:208 ³ t of primary hardware. Provide Light fixtures	pumps or equivalent acy or UPS power for e ne for "clean" and one ity of 125 amps. Diver f/120 volt 100 Amps to power from Utility pan	requipes for sity ele	Electric water cooler Drinking fountain Smoke detection system Wet Sprinkler System Eye wash ired with a capacity of 3 gal/min, Uninterrupted power supply Special electric welding 208V 3 phase Drment operation is not required. "dirty" power, 42 circuits/each. E factor: 60 %. installed (by SLAC) on wall. Lay Remote lighting control	header Type: 480V
ELECTRICAL REQUIREMENTS	Plumbing/Fire Protection Power supply Lighting		Hot water system Cold water system Tempered water Waste drain Floor drain Trench drain t water for HVAC only. (LCW) lines for turbo and/or lon am end. 208 V, 3 phase outlets 110V outlets 208/230V, single phase sive list of equipment. Emerger) panels, 120-208 volts, 3 ph o breaker with a minimum capad (a) each Multi-Outlet Box:208' t of primary hardware. Provide Light fixtures Fixture type I: Down light	pumps or equivalent acy or UPS power for e one for "clean" and one ity of 125 amps. Diver (7/120 volt 100 Amps t power from Utility pan		Electric water cooler Drinking fountain Smoke detection system Wet Sprinkler System Eye wash ired with a capacity of 3 gal/min, Uninterrupted power supply Special electric welding 208V 3 phase orment operation is not required. "dirty" power, 42 circuits/each. E factor: 60 %. installed (by SLAC) on wall. Lay Remote lighting control Light switches	header Type: 480V
ELECTRICAL REQUIREMENTS	Plumbing/Fire Protection Power supply Lighting		Hot water system Cold water system Tempered water Waste drain Floor drain Trench drain t water for HVAC only. (LCW) lines for turbo and/or lon am end. 208 V, 3 phase outlets 110V outlets 208/230V, single phase sive list of equipment. Emerger) panels, 120-208 volts, 3 ph o breaker with a minimum capac (a) each Multi-Outlet Box:208' t of primary hardware. Provide Light fixtures Fixture type II: Down light Fixture type II: Down light Fixture ype II: Down light	pumps or equivalent acy or UPS power for ene for "clean" and one ity of 125 amps. Diver f/120 volt 100 Amps to power from Utility pan	require for sity pole	Electric water cooler Drinking fountain Smoke detection system Wet Sprinkler System Eye wash ired with a capacity of 3 gal/min, Uninterrupted power supply Special electric welding 208V 3 phase ment operation is not required. "dirty" power, 42 circuits/each. E factor: 60 %. installed (by SLAC) on wall. Lay Remote lighting control Light switches Lighting level	header Type: 480V ach panel out evenly
ELECTRICAL REQUIREMENTS	Plumbing/Fire Protection Power supply Lighting	Comments: a) Chilled and hot b) Cooling water r located at upstread Comments: a) FEE has exten b) Provide two (2) shall have a main c) Power for threed distributed in from Comments:	Hot water system Cold water system Tempered water Waste drain Floor drain Trench drain Trench drain t water for HVAC only. (LCW) lines for turbo and/or lon am end. 208 V, 3 phase outlets 110V outlets 208/230V, single phase sive list of equipment. Emerger) panels, 120-208 volts, 3 ph o breaker with a minimum capace (3) each Multi-Outlet Box:208° t of primary hardware. Provide Light fixtures Fixture type I: Down light Fixture type I: Bollard (exteri Emergency lighting	pumps or equivalent acy or UPS power for a one for "clean" and one ity of 125 amps. Diver (/120 volt 100 Amps to power from Utility pan or)	requipe for sity po be lee	Electric water cooler Drinking fountain Smoke detection system Wet Sprinkler System Eye wash ired with a capacity of 3 gal/min, Uninterrupted power supply Special electric welding 208V 3 phase ment operation is not required. "dirty" power, 42 circuits/each. Effactor: 60 %. installed (by SLAC) on wall. Lay Remote lighting control Light switches Lighting level	header Type: 480V ach panel rout evenly
ELECTRICAL REQUIREMENTS	Plumbing/Fire Protection Power supply		Hot water system Cold water system Tempered water Waste drain Floor drain Trench drain Trench drain t water for HVAC only. (LCW) lines for turbo and/or lon am end. 208 V, 3 phase outlets 110V outlets 208/230V, single phase sive list of equipment. Emerger) panels, 120-208 volts, 3 ph o breaker with a minimum capace (3) each Multi-Outlet Box:208° t of primary hardware. Provide Light fixtures Fixture type I: Down light Fixture type II: Bollard (exteri Emergency lighting Surface mounted fluorescent in	pumps or equivalent incy or UPS power for e one for "clean" and one ity of 125 amps. Diver //120 volt 100 Amps to power from Utility pan or)	requipe for sity of be cel	Electric water cooler Drinking fountain Smoke detection system Wet Sprinkler System Eye wash ired with a capacity of 3 gal/min, Uninterrupted power supply Special electric welding 208V 3 phase ment operation is not required. "dirty" power, 42 circuits/each. Effactor: 60 %. installed (by SLAC) on wall. Lay Remote lighting control Light switches Lighting level match existing EETB building	header Type: 480V
ELECTRICAL REQUIREMENTS	Plumbing/Fire Protection Power supply Lighting	Comments: a) Chilled and hot b) Cooling water located at upstree Comments: a) FEE has exten b) Provide two (2) shall have a main c) Power for three distributed in fron Comments: a) Fixtures to be s b) Refer to LC1S Comments: b) Refer to LC1S	Hot water system Cold water system Tempered water Waste drain Floor drain Trench drain Trench drain t water for HVAC only. (LCW) lines for turbo and/or lon am end. 208 V, 3 phase outlets 110V outlets 208/230V, single phase sive list of equipment. Emerger b panels, 120-208 volts, 3 ph of b breaker with a minimum capac a (3) each Multi-Outlet Box:208° t of primary hardware. Provide Light fixtures Fixture type I: Down light Fixture type I: Down light Emergency lighting surface mounted fluorescent, lo	pumps or equivalent icy or UPS power for e ine for "clean" and one ity of 125 amps. Diver //120 volt 100 Amps to power from Utility pan or) w profile. Light intensi ification. ESD-1 9-104	requiped for sity of the set of t	Electric water cooler Drinking fountain Smoke detection system Wet Sprinkler System Eye wash ired with a capacity of 3 gal/min, Uninterrupted power supply Special electric welding 208V 3 phase ment operation is not required. "dirty" power, 42 circuits/each. Effactor: 60 %. installed (by SLAC) on wall. Lay Remote lighting control Light switches Lighting level match existing FFTB building.	header Type: 480V
ELECTRICAL REQUIREMENTS	Plumbing/Fire Protection Power supply Lighting Comments:		Hot water system Cold water system Tempered water Waste drain Floor drain Trench drain t water for HVAC only. (LCW) lines for turbo and/or lon am end. 208 V, 3 phase outlets 110V outlets 208/230V, single phase sive list of equipment. Emerger) panels, 120-208 volts, 3 ph o breaker with a minimum capad (3) each Multi-Outlet Box:208' t of primary hardware. Provide Light fixtures Fixture type I: Down light Fixture type I: Bollard (exteri Emergency lighting surface mounted fluorescent, lo ESD Emergency Lighting Species	I pumps or equivalent Incy or UPS power for e Incy or UPS power for e Ince for "clean" and one ity of 125 amps. Diver //120 volt 100 Amps to power from Utility part or) w profile. Light intensi ification. ESD-1.9-104	requiped for sity of the left state of the left	Electric water cooler Drinking fountain Smoke detection system Wet Sprinkler System Eye wash ired with a capacity of 3 gal/min, Uninterrupted power supply Special electric welding 208V 3 phase proment operation is not required. "dirty" power, 42 circuits/each. Effactor: 60 %. installed (by SLAC) on wall. Lay Remote lighting control Light switches Lighting level match existing FFTB building.	header Type: 480V
ELECTRICAL REQUIREMENTS	Plumbing/Fire Protection Power supply Lighting Comments: a) Refer to LCLS ESD-1.9		Hot water system Cold water system Tempered water Waste drain Floor drain Trench drain t water for HVAC only. (LCW) lines for turbo and/or lon am end. 208 V, 3 phase outlets 110V outlets 208/230V, single phase sive list of equipment. Emerger) panels, 120-208 volts, 3 ph o breaker with a minimum capad (a) each Multi-Outlet Box:208' t of primary hardware. Provide Light fixtures Fixture type I: Down light Fixture type I: Bollard (exteri Emergency lighting surface mounted fluorescent, lo ESD Emergency Lighting Socc fication A, which is applicable for	pumps or equivalent ncy or UPS power for e ne for "clean" and one ity of 125 amps. Diver //120 volt 100 Amps to power from Utility pan or) w profile. Light intensi ification. ESD-1.9-104 or FEL Mirror System a	required for resity to be rel	Electric water cooler Drinking fountain Smoke detection system Wet Sprinkler System Eye wash ired with a capacity of 3 gal/min, Uninterrupted power supply Special electric welding 208V 3 phase orment operation is not required. "dirty" power, 42 circuits/each. E factor: 60 %. installed (by SLAC) on wall. Lay Remote lighting control Light switches Lighting level match existing FFTB building.	header Type: 480V ach panel out evenly fc: 30 s applicable for
ELECTRICAL REQUIREMENTS RADIATION/SEISMIC/VIBRATIONS ISSUES SPECIAL REQUIREMENTS FOR EQUIPMENT	Plumbing/Fire Protection Power supply Lighting Comments: a) Refer to LCLS ESD-1.9 the rest of the FEE. Comments:		Hot water system Cold water system Tempered water Waste drain Floor drain Trench drain t water for HVAC only. (LCW) lines for turbo and/or lon am end. 208 V, 3 phase outlets 110V outlets 208/230V, single phase sive list of equipment. Emerger) panels, 120-208 volts, 3 ph o breaker with a minimum capac (a) each Multi-Outlet Box:208' t of primary hardware. Provide Light fixtures Fixture type I: Down light Fixture type I: Bollard (exteri Emergency lighting surface mounted fluorescent, lo ESD Emergency Lighting Specification A, which is applicable for	a pumps or equivalent acy or UPS power for e ne for "clean" and one ity of 125 amps. Diver //120 volt 100 Amps to power from Utility pan or) w profile. Light intensi ification. ESD-1.9-104 or FEL Mirror System a	required for sity so be left	Electric water cooler Drinking fountain Smoke detection system Wet Sprinkler System Eye wash ired with a capacity of 3 gal/min, Uninterrupted power supply Special electric welding 208V 3 phase ment operation is not required. "dirty" power, 42 circuits/each. Effactor: 60 %. installed (by SLAC) on wall. Lay Remote lighting control Light switches Lighting level match existing FFTB building.	header Type: 480V ach panel out evenly fc: 30 s applicable for
ELECTRICAL REQUIREMENTS RADIATION/SEISMIC/VIBRATIONS ISSUES SPECIAL REQUIREMENTS FOR EQUIPMENT	Plumbing/Fire Protection Power supply Lighting Comments: a) Refer to LCLS ESD-1.9 the rest of the FEE. Comments:		Hot water system Cold water system Tempered water Waste drain Floor drain Trench drain Trench drain t water for HVAC only. (LCW) lines for turbo and/or lon am end. 208 V, 3 phase outlets 110V outlets 208/230V, single phase sive list of equipment. Emerger) panels, 120-208 volts, 3 ph o breaker with a minimum capace 6 (3) each Multi-Outlet Box:208 ³ t of primary hardware. Provide Light fixtures Fixture type I: Down light Fixture type I: Down light Sivface mounted fluorescent, lo ESD Emergency Lighting Surface mounted fluorescent, lo ESD Emergency Lighting Specification A, which is applicable for	pumps or equivalent acy or UPS power for e ine for "clean" and one ity of 125 amps. Diver //120 volt 100 Amps to power from Utility pan or) w profile. Light intensi ification. ESD-1.9-104 or FEL Mirror System a	requipe for situ y to hand l	Electric water cooler Drinking fountain Smoke detection system Wet Sprinkler System Eye wash ired with a capacity of 3 gal/min, Uninterrupted power supply Special electric welding 208V 3 phase ment operation is not required. "dirty" power, 42 circuits/each. E factor: 60 %. installed (by SLAC) on wall. Lay Remote lighting control Light switches Lighting level match existing FFTB building.	header Type: 480V ach panel out evenly [fc: 30] s applicable for
ELECTRICAL REQUIREMENTS RADIATION/SEISMIC/VIBRATIONS ISSUES SPECIAL REQUIREMENTS FOR EQUIPMENT	Plumbing/Fire Protection Power supply Lighting Comments: a) Refer to LCLS ESD-1.9 the rest of the FEE. Comments:	Comments: a) Chilled and hot b) Cooling water r located at upstread Comments: a) FEE has exten b) Provide two (2) shall have a main c) Power for threed distributed in from Comments: a) Fixtures to be s b) Refer to LCLS 105 Vibration specified	Hot water system Cold water system Tempered water Waste drain Floor drain Trench drain Trench drain t water for HVAC only. (LCW) lines for turbo and/or lon am end. 208 V, 3 phase outlets 110V outlets 208/230V, single phase sive list of equipment. Emerger) panels, 120-208 volts, 3 ph o breaker with a minimum capace (3) each Multi-Outlet Box:208° t of primary hardware. Provide Light fixtures Fixture type I: Down light Fixture type I: Down light Fixture type I: Bollard (exteri Emergency lighting surface mounted fluorescent, lo ESD Emergency Lighting Specification A, which is applicable for	pumps or equivalent incy or UPS power for a inc for "clean" and one ity of 125 amps. Diver (/120 volt 100 Amps to power from Utility pan or) w profile. Light intensi ification. ESD-1.9-104 or FEL Mirror System a	requiped for the second	Electric water cooler Drinking fountain Smoke detection system Wet Sprinkler System Eye wash ired with a capacity of 3 gal/min, Uninterrupted power supply Special electric welding 208V 3 phase ment operation is not required. "dirty" power, 42 circuits/each. E factor: 60 %. installed (by SLAC) on wall. Lay Remote lighting control Light switches Lighting level match existing FFTB building.	header Type: 480V ach panel out evenly fc: 30
ELECTRICAL REQUIREMENTS RADIATION/SEISMIC/VIBRATIONS ISSUES SPECIAL REQUIREMENTS FOR EQUIPMENT	Plumbing/Fire Protection Power supply Lighting Comments: a) Refer to LCLS ESD-1.9 the rest of the FEE. Comments:	Comments: a) Chilled and hot b) Cooling water r located at upstread Comments: a) FEE has exten b) Provide two (2) shall have a main c) Power for threed distributed in from Comments: a) Fixtures to be s b) Refer to LCLS 105 Vibration special	Hot water system Cold water system Tempered water Waste drain Floor drain Trench drain Trench drain t water for HVAC only. (LCW) lines for turbo and/or lon am end. 208 V, 3 phase outlets 110V outlets 208/230V, single phase sive list of equipment. Emerger) panels, 120-208 volts, 3 ph o breaker with a minimum capace (3) each Multi-Outlet Box:208 ³ t of primary hardware. Provide Light fixtures Fixture type I: Down light Fixture type I: Down light Exture type I: Bollard (exteri- Emergency lighting surface mounted fluorescent, lo ESD Emergency Lighting Specification A, which is applicable for	pumps or equivalent incy or UPS power for e one for "clean" and one ity of 125 amps. Diver (/120 volt 100 Amps to power from Utility pan or) w profile. Light intensi ification. ESD-1.9-104 or FEL Mirror System a	required for sisty so be cel	Electric water cooler Drinking fountain Smoke detection system Wet Sprinkler System Eye wash ired with a capacity of 3 gal/min, Uninterrupted power supply Special electric welding 208V 3 phase ment operation is not required. "dirty" power, 42 circuits/each. E factor: 60 %. installed (by SLAC) on wall. Lay Remote lighting control Light switches Lighting level match existing FFTB building.	header Type: 480V ach panel rout evenly fc: 30 s applicable for
ELECTRICAL REQUIREMENTS RADIATION/SEISMIC/VIBRATIONS ISSUES SPECIAL REQUIREMENTS FOR EQUIPMENT ENVIRONMENTAL NEEDS	Plumbing/Fire Protection Power supply Lighting Comments: a) Refer to LCLS ESD-1.9 the rest of the FEE. Comments:	Comments: a) Chilled and hot b) Cooling water r located at upstread Comments: a) FEE has exten b) Provide two (2) shall have a main c) Power for threed distributed in from Comments: a) Fixtures to be s b) Refer to LCLS 105 Vibration special	Hot water system Cold water system Tempered water Waste drain Floor drain Trench drain Trench drain t water for HVAC only. (LCW) lines for turbo and/or lon am end. 208 V, 3 phase outlets 110V outlets 208/230V, single phase sive list of equipment. Emerger) panels, 120-208 volts, 3 ph o breaker with a minimum capace (3) each Multi-Outlet Box:208° t of primary hardware. Provide Light fixtures Fixture type I: Down light Fixture type I: Down light Fixture type II: Bollard (exteri Emergency lighting surface mounted fluorescent, lo ESD Emergency Lighting Specification A, which is applicable for	pumps or equivalent incy or UPS power for e ine for "clean" and one ity of 125 amps. Diver (/120 volt 100 Amps to power from Utility pan or) w profile. Light intensi ification. ESD-1.9-104 or FEL Mirror System a	require for rsity stop be hel	Electric water cooler Drinking fountain Smoke detection system Wet Sprinkler System Eye wash ired with a capacity of 3 gal/min, Uninterrupted power supply Special electric welding 208V 3 phase ment operation is not required. "dirty" power, 42 circuits/each. E factor: 60 %. installed (by SLAC) on wall. Lay Remote lighting control Light switches Lighting level match existing FFTB building.	header Type: 480V ach panel out evenly [fc: 30] s applicable for
ELECTRICAL REQUIREMENTS RADIATION/SEISMIC/VIBRATIONS ISSUES SPECIAL REQUIREMENTS FOR EQUIPMENT ENVIRONMENTAL NEEDS	Plumbing/Fire Protection Power supply Lighting Comments: a) Refer to LCLS ESD-1.9 the rest of the FEE. Comments:	Comments: a) Chilled and hot b) Cooling water r located at upstread Comments: a) FEE has exten b) Provide two (2) shall have a main c) Power for threed distributed in from Comments: a) Fixtures to be s b) Refer to LCLS 105 Vibration special	Hot water system Cold water system Tempered water Waste drain Floor drain Trench drain Trench drain t water for HVAC only. (LCW) lines for turbo and/or lon am end. 208 V, 3 phase outlets 110V outlets 208/230V, single phase sive list of equipment. Emerger) panels, 120-208 volts, 3 ph o breaker with a minimum capace (3) each Multi-Outlet Box:208° t of primary hardware. Provide Light fixtures Fixture type I: Down light Fixture type I: Down light Fixture type II: Bollard (exteri Emergency lighting surface mounted fluorescent, lo ESD Emergency Lighting Specification A, which is applicable for	pumps or equivalent incy or UPS power for e one for "clean" and one ity of 125 amps. Diver (/120 volt 100 Amps to power from Utility pan or) w profile. Light intensi ification. ESD-1.9-104 or FEL Mirror System a	require for situ y to and I	Electric water cooler Drinking fountain Smoke detection system Wet Sprinkler System Eye wash ired with a capacity of 3 gal/min, Uninterrupted power supply Special electric welding 208V 3 phase ment operation is not required. "dirty" power, 42 circuits/each. Effactor: 60 %. installed (by SLAC) on wall. Lay Remote lighting control Light switches Lighting level match existing FFTB building. .CLS Vibration specification B, is	header Type: 480V ach panel rout evenly fc: 30 s applicable for
ELECTRICAL REQUIREMENTS RADIATION/SEISMIC/VIBRATIONS ISSUES SPECIAL REQUIREMENTS FOR EQUIPMENT ENVIRONMENTAL NEEDS	Plumbing/Fire Protection Power supply Lighting Comments: a) Refer to LCLS ESD-1.9 the rest of the FEE. Comments:	Comments: a) Chilled and hot b) Cooling water r located at upstread Comments: a) FEE has exten b) Provide two (2) shall have a main c) Power for threed distributed in from Comments: a) Fixtures to be s b) Refer to LCLS 105 Vibration special	Hot water system Cold water system Tempered water Waste drain Floor drain Trench drain Trench drain t water for HVAC only. (LCW) lines for turbo and/or lon am end. 208 V, 3 phase outlets 110V outlets 208/230V, single phase sive list of equipment. Emerger) panels, 120-208 volts, 3 ph o breaker with a minimum capace (3) each Multi-Outlet Box:208 ³ t of primary hardware. Provide Light fixtures Fixture type I: Down light Fixture type I: Down light Exture type I: Bollard (exteri- Emergency lighting surface mounted fluorescent, lo ESD Emergency Lighting Specification A, which is applicable for	pumps or equivalent incy or UPS power for e one for "clean" and one ity of 125 amps. Diver (/120 volt 100 Amps to power from Utility pan or) w profile. Light intensi ification. ESD-1.9-104 or FEL Mirror System a	require for the sequence of th	Electric water cooler Drinking fountain Smoke detection system Wet Sprinkler System Eye wash ired with a capacity of 3 gal/min, Uninterrupted power supply Special electric welding 208V 3 phase ment operation is not required. "dirty" power, 42 circuits/each. Effactor: 60 %. installed (by SLAC) on wall. Lay Remote lighting control Light switches Lighting level match existing FFTB building. .CLS Vibration specification B, is	header Type: 480V ach panel out evenly fc: 30 s applicable for

FIGURE NO. 4, PROVIDED FOR REFERENCE ONLY



Item		Amps @ 120V	Amps @ 208V 3 Phase	Amps @ 230V 1
FFF		1068	255	phase
Gas Attenuator: DIFFERENTIAL TURBO& ION		1000	233	<u> </u>
PUMP SECTION				
Ion Pump Power Supply:120V @ 6 Amps 6ea.	6	36		
Differential Pump Station: HV 4ea	4			
Ion Pump 110 L/sec 4ea	4			
Turbe Rump 2201: 2100 L/sec 2ea	4			
Turbo Pump 2201: 2100 L/sec 2ea.	2	10.0		
Scrfoll Pump : 1Kw 3phase 208v 2ea	3	10.0	72	
Allen Bradley PLC: 100W, 120y 1ea	1	1.2	112	
Newport xps: 1200W, 120v 1ea	1	10		
MKS937-GAGE (SETS): 60W, 120V 2EA	2	0.5		
· · ·				
High Voltage Power Supply: 2 amp, 120v 1ea	1	2		
Computer 500W, 120v 1ea	1	4.2		
Convenience Outlet 15 amp, 120v 1ea	1	15		
Rack Cooling Fan 1.6 amp, 120v 2ea	2	1.6		
Iris Valve controller 500w, 120v 1ea	1	4.2		
Cas Attenuator: MASTER DIFFERENTIAL	I	4.2		
TURBO& ION PUMP SECTION				
Ion Pump Power Supply:120V @ 6 Amps 6ea.	6	36		
Differential Pump Station: HV 4ea	4			
Ion Pump 110 L/sec 4ea	4			
Ion Pump 60 L/sec 4ea	4			
Turbo Pump 2201: 2100 L/sec 2ea.	2			
Turbo Pump Power Supply: 750W, 120v 3ea	3	18.8		
Scroll Pump : 1Kw 3phase 208v 2ea	3		7.2	
MKS MASS FLOW 2179 8EA	8			
MKS FLOW CONTROLLER 146 120v 2EA	2	1.6		
Allen Bradley PLC: 100W, 120v 1ea	1	1.2		
Newport xps: 1200W, 120V 1ea	1	10		
WK3937-GAGE (3E13): 60W, 120V 2EA	2	0.5		
High Voltage Power Supply: 2 amp. 120v1ea	1	2		
Computer 500W. 120v 1ea	1	4.2		
Convenience Outlet 15 amp. 120v 2ea	2	30		
Rack Cooling Fan 1.6 amp, 120v 2ea	2	3.2		
Iris Valve controller 500w, 120v 1ea	1	4.2		
SOLID ATTENUATOR				
Ion Pump Power Supply:120V @ 6 Amps 2ea.	2	12		
Ion Pump 100 L/sec 2ea.	2			
Ion Pump 500 L/sec 1ea.	1	- 10		
Newport xps: 1200W, 120V 1ea	1	10		
MKS937-COLD CATHODE AND PIRANI GAGE	2	4		
(SETS): 60W, 120V ZEA Convenience Outlet 15 amn, 120v 2ea	2	30		
Rack Cooling Fan, 1.6 amp, 120v 2ea.	2	3.2		
Teledyne's Model 3350 Control Room Oxvaen	-			
AC 100 to 240 Vac @ 50/60 Hz, 0.3A				
MaxBattery backup version charges and				
maintains 12 Vdc lead acid battery	1	0.3		
DIAGNOSTIC TANK: WFOV CAMERA				
Ion Pump Power Supply:120V @ 6 Amps 1ea.	1	6		
Ion Pump 100 L/sec 2ea.	2			
Turbo Pump 2201: 2100 L/sec 1ea	1			
Turbe Rump Rever Supply: 000W/ 120v 1ee	4	7 5		
Dry Pump - 1 2Kw 3nbase 208y 1ea	1	1.5	5 9	
Allen Bradley PLC: 100W 120y 1ea	1	1	5.8	
Newport xps: 1200W, 120v 1ea	1	10		
MKS937-COLD CATHODE AND PIRANI GAGE	1			
(SETS): 60W, 120V 2EA	2	1		
	-			
CCD Camera Power supply: 300W, 120v 1ea	1	2.5		
Chiller: 12 Amps @ 120V 1ea.	1	12		
High Voltage Power Supply: 2 amp, 120v 1ea	1	2		
VME Crate 1200 Watts, 120v 1ea	1	10		

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

Computer 500W, 120v 1ea	1	4.2	
Convenience Outlet 15 amp, 120v 2ea	2	30	
Rack Cooling Fan 1.6 amp, 120v 4ea	4	6.4	
DIAGNOSTIC TANK: Indirect Imager			
Ion Pump Power Supply:120V @ 6 Amps 2ea.	2	12	
Ion Pump 100 L/sec 3ea.	3		
Ion Pump 500 L/sec 1ea	1		

Turbo Pump 2201: 2100 L/sec 1ea	1			
Turbo Fullip 2201. 2100 E/Sec Tea				
Turbo Pump Power Supply: 900W, 120y 1ea	1	7.5		
Day Dawn of Older Capping: Coort, 1201 roa		1.0	5.0	
Dry Pump : 1.2KW 3phase 208V 1ea	1		5.8	
Allen Bradley PLC: 100W, 120v 1ea	1	1		
Newport xps: 1200W_120y 1ea	1	10		
	-	10		
MKS937-COLD CATHODE AND PIRANI GAGE				
(SETS): 60W. 120V 2EA	2	1		
(•		
CCD Camera Power supply: 300W, 120v 1ea	1	2.5		
Chiller 12 Amns @ 120V 1ea	1	12		
onnici: 12 Anips @ 1204 ica.	-	12		
High Voltage Power Supply: 2 amp. 120v 1ea	1	2		
Computer 500W 120v 1ee	1	4.2		
Computer 500w, 120v Tea		4.2		
Convenience Outlet 15 amp, 120v 2ea	2	30		
Rack Cooling Fan, 1.6 amp, 120v 4ea	4	64		
		0.4		
DIAGNOSTIC TANK: Spectrometer				
Ion Pump Power Supply:120V @ 6 Amps 2ea	2	12		
ion rump rower Suppry.120V @ 0 Amps zea.	2	12		
Ion Pump 100 L/sec 3ea.	3			
Ion Pump 500 L/sec 1ea	1			
Turke Duran 2201-2400 Lage dee				
Turbo Pump 2201: 2100 L/sec fea				
Turbo Pump Power Supply: 000W 120y 1cc	1	75		
Turbo Fump Fower Suppry: 900W, 120V Tea	1	1.5		
Dry Pump : 1.2Kw 3phase 208v 1ea	1		5.8	
Allen Bradley PLC: 100W, 120v 1ea	1	1		
Nowport ypo: 1200W/ 400: 4	4	40	l	
Newport xps: 1200W, 120V 16a	1	10		
MKS937-COLD CATHODE AND PIRANI GAGE				
(SETS): 60W 120V 2EA	2	1		
(0210). 00W, 120V ZEA	۷	1		
CCD Camera Power supply: 300W 120v 1ea	1	25		
		2.5		
Chiller: 12 Amps @ 120V 1ea.	1	12		
High Voltage Bower Supply 2 emp 120y 1ee	4	2		
righ voltage Power Supply: 2 amp, 120v tea	I	2		
Computer 500W, 120v 1ea	1	4.2		
Convenience Outlet 15 amn 120v 2ea	2	30		
		50		
Rack Cooling Fan 1.6 amp, 120v 4ea	4	6.4		
DIAGNOSTIC TANK: Total Energy Monitor				
	-			
Ion Pump Power Supply:120V @ 6 Amps 2ea.	2	12		
Ion Pump 100 L/sec 3ea.	3			
Ion Dump FOOL/goo dog				
Ion Pump 500 L/sec 1ea	1			
Turbo Pump 2201: 2100 L/sec 1ea	1			
Turbo Pump Power Supply: 900W, 120v 1ea	1	7.5		
Dry Pump : 1.2Kw 3phase 208y 1ea	1		58	
Allen Dredley DLC: 400W/ 400y 4cc	4	4	0.0	
Allen Bradley PLC: 100W, 120V lea		1		
Newport xps: 1200W, 120v 1ea	1	10		
MKS937-COLD CATHODE AND PIRANI GAGE				
	•			
(SETS): 60W, 120V 2EA	2	1		
CCD Comoro Bower supply: 200W 120v 1eo	1	25		
COD Camera Fower Supply: SUUW, 120V Tea	1	2.0	ļ	
Chiller: 12 Amps @ 120V 1ea.	1	12		
-		İ	1	
High Voltage Dewar Sumplus 2 ame 400 4	4	<u>^</u>		
righ voltage Power Supply: 2 amp, 120v 1ea	1	2		
Computer 500W, 120v 1ea	1	4.2		
Convenience Outlet 15 amp. 120v 2ea	2	30		
Deals Cooling For 4.0 mm 400 f				
Kack Cooling Fan 1.6 amp, 120v 4ea	4	6.4		
FEL MIRROR SYSTEM				
Ion Pump Power Supply:120V @ 6 Amps 1ea.	3	18		
Ion Pumn 100 L/sec 1ea	3	İ	1	
ION Pump 500 L/sec 1ea	3			
Allen Bradley PLC: 100W, 120v 1ea	1	1		
Newport xps: 1200W 120v 100	-		1	
140 mport Ap3. 1200 v, 120 v 18a	2	201		
MKS937-COLD CATHODE AND PIRANI GAGE	3	30		
(SETS): 60W 120V 2EA	3	30		
	6	30		
Computer E00W 400: 4ac	6	30		
Computer 500W, 120v 1ea	3 6 1	30 3 4.2		
Computer 500W, 120V 1ea Convenience Outlet 15 amp, 120V 1ea	6 1 2	30 3 4.2 30		
Computer 500W, 120v 1ea Convenience Outlet 15 amp, 120v 1ea	6 1 2 6	30 3 4.2 30		
Computer 500W, 120v 1ea Convenience Outlet 15 amp, 120v 1ea Rack Cooling Fan 1.6 amp, 120v 4ea	3 6 1 2 6	30 3 4.2 30 19.2		
Computer 500W, 120v 1ea Convenience Outlet 15 amp, 120v 1ea Rack Cooling Fan 1.6 amp, 120v 4ea ION CHAMBERS (3 TOTAL)	3 6 1 2 6	30 3 4.2 30 19.2		
Computer 500W, 120v 1ea Convenience Outlet 15 amp, 120v 1ea Rack Cooling Fan 1.6 amp, 120v 4ea ION CHAMBERS (3 TOTAL)	3 6 1 2 6	30 3 4.2 30 19.2		
Computer 500W, 120v 1ea Convenience Outlet 15 amp, 120v 1ea Rack Cooling Fan 1.6 amp, 120v 4ea ION CHAMBERS (3 TOTAL)	3 6 1 2 6	30 3 4.2 30 19.2		
Computer 500W, 120v 1ea Convenience Outlet 15 amp, 120v 1ea Rack Cooling Fan 1.6 amp, 120v 4ea ION CHAMBERS (3 TOTAL) Ion Pump Power Supply:120V @ 6 Amps 1ea.	3 6 1 2 6 3	30 3 4.2 30 19.2 18		
Computer 500W, 120v 1ea Convenience Outlet 15 amp, 120v 1ea Rack Cooling Fan 1.6 amp, 120v 4ea ION CHAMBERS (3 TOTAL) Ion Pump Power Supply:120V @ 6 Amps 1ea. Ion Pump 100 L/sec 2ea.	3 6 1 2 6 	30 3 4.2 30 19.2 18		
Computer 500W, 120v 1ea Convenience Outlet 15 amp, 120v 1ea Rack Cooling Fan 1.6 amp, 120v 4ea ION CHAMBERS (3 TOTAL) Ion Pump Power Supply:120V @ 6 Amps 1ea. Ion Pump 100 L/sec 2ea.	3 6 1 2 6 	30 3 4.2 30 19.2 18		
Computer 500W, 120v 1ea Convenience Outlet 15 amp, 120v 1ea Rack Cooling Fan 1.6 amp, 120v 4ea ION CHAMBERS (3 TOTAL) Ion Pump Power Supply:120V @ 6 Amps 1ea. Ion Pump 100 L/sec 2ea. Turbo Pump 2201: 2100 L/sec 1ea	3 6 1 2 6 3 6 3	30 3 4.2 30 19.2 18		
Computer 500W, 120v 1ea Convenience Outlet 15 amp, 120v 1ea Rack Cooling Fan 1.6 amp, 120v 4ea ION CHAMBERS (3 TOTAL) Ion Pump Power Supply:120V @ 6 Amps 1ea. Ion Pump 100 L/sec 2ea. Turbo Pump 2201: 2100 L/sec 1ea	3 6 1 2 6 3 6 3	30 3 4.2 30 19.2 18		
Computer 500W, 120v 1ea Convenience Outlet 15 amp, 120v 1ea Rack Cooling Fan 1.6 amp, 120v 4ea ION CHAMBERS (3 TOTAL) Ion Pump Power Supply:120V @ 6 Amps 1ea. Ion Pump 100 L/sec 2ea. Turbo Pump 2201: 2100 L/sec 1ea Turbo Pump Power Supply: 900W 120v 1ea	3 6 1 2 6 3 6 3 3	30 3 4.2 30 19.2 18 22 5		
Computer 500W, 120v 1ea Convenience Outlet 15 amp, 120v 1ea Rack Cooling Fan 1.6 amp, 120v 4ea ION CHAMBERS (3 TOTAL) Ion Pump Power Supply:120V @ 6 Amps 1ea. Ion Pump 100 L/sec 2ea. Turbo Pump 2201: 2100 L/sec 1ea Turbo Pump Power Supply: 900W, 120v 1ea	3 6 1 2 6 3 6 3 3	30 3 4.2 30 19.2 18 22.5		
Computer 500W, 120v 1ea Convenience Outlet 15 amp, 120v 1ea Rack Cooling Fan 1.6 amp, 120v 4ea ION CHAMBERS (3 TOTAL) Ion Pump Power Supply:120V @ 6 Amps 1ea. Ion Pump 100 L/sec 2ea. Turbo Pump 2201: 2100 L/sec 1ea Turbo Pump Power Supply: 900W, 120v 1ea Dry Pump : 1.2Kw 3phase 208v 1ea	3 6 1 2 6 3 6 3 3 3 3	30 3 4.2 30 19.2 18 22.5	17.4	

Newport xps: 1200W, 120v 1ea	3	30		
MKS937-COLD CATHODE AND PIRANI GAGE				
(SETS): 60W, 120V 2EA	6	3		
CCD Camera Power supply: 300W, 120v 1ea	3	7.5		
Chiller: 12 Amps @ 120V 1ea.	3	36		
High Voltage Power Supply: 2 amp, 120v 1ea	3	6		
VME Crate 1200 Watts, 120v 1ea	3	30		
Computer 500W, 120v 1ea	3	12.6		
Convenience Outlet 15 amp, 120v 2ea	6	90		
Rack Cooling Fan 1.6 amp, 120v 4ea	12	19.2		
Multi-Outlet Box:				
Multi-Outlet Box: 208Y/120 volt 100 Amps 2X	2		200	
Weld plug (Use Linac spec) 480V				
120V AC WALL 4 PLEX OUTLET- 2 Walls, standard separation, 3 circuits (20Amps ea.)		60		