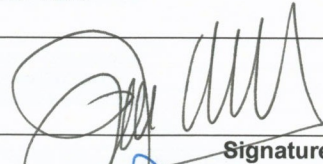




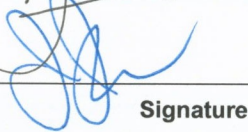
LCLS Room Data Sheet #	1.9-1016	Front End Enclosure (FEE)	Revision 2
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Javier A. Sevilla
Owner / Editor


Signature

8/15/05
Date

Jim Welch
Conventional Facilities System
Physicist


Signature

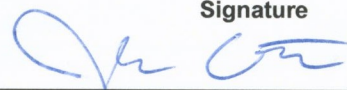
8/16/05
Date

David Saenz
Conventional Facilities System
Manager


Signature

8/15/05
Date

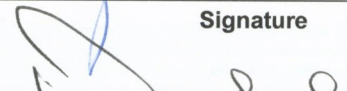
Richard Bionta
FEE WBS Manager


Signature

Date

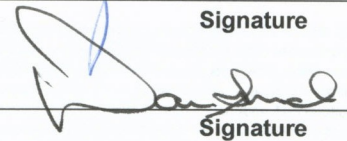
John Arthur for R Bionta 8-17-05

John Arthur
Photon Beam System Manager


Signature

8-17-05
Date

Darren Marsh
Quality Assurance Manager


Signature

8/15/05
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

FACILITY COMPONENT	FRONT END ENCLOSURE (FEE) - ROOM DATA SHEET		
	Name of Building	LCLS-Front End Enclosure	
	Organization or Department	SLAC, Stanford University	
	Net area	157.5	sq. meters 1,694 SF
	Critical dimensions	H:	3.8 12'-6"
		W:	4.5 14'-9"
		L:	35.0 114 ft
	Hours of operation	Facility is locked 24/7/365 (periodic maintenance only)	
	Users/Occupancy	No occupancy throughout the year	
	Building orientation	FEE to be located immediately downstream from the Electron Beam Dump.	
FUNCTIONAL OBJECTIVE	The FEE follows the Electron Beam Dump (EBD) and allows for various diagnostics equipment.		
PLANNING CONSIDERATIONS & CRITICAL FACTORS	Floor level is to remain constant throughout the entire length of the FEE at 1.4m below the beam axis. Y = - 0.895305m in LCLS coordinate system (refer to LCLS-TN-03-8). The FEE would be structurally a simple extension of the Electron Beam Dump, with steel shielding separating the two facilities. Numerous cable trays and other equipment need to be supported from the ceilings and walls along the length of FEE. Refer to LCLS ESD- Generic Accelerator Tunnel Construction Tolerance Specification, ESD 1.9-102 and General Concrete Guideline, ESD 1.9-103.		
FINISHES	Wall	Reinforced concrete, white	
	Ceiling	Reinforced concrete, white	
	Floor	Concrete slab, floor surface resistant to Liquid Nitrogen spills. Refer to LCLS General Concrete Guideline- ESD 1.9-103. Refer to LCLS ESD Generic Accelerator Tunnel Construction Tolerance, ESD-1.9-102	
	Base		
	Doors		
	Fenestrations	None	
	Acoustical	None	
APPLICABLE STANDARDS	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- 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		

SCHEMATIC PLAN VIEW- NOT TO SCALE

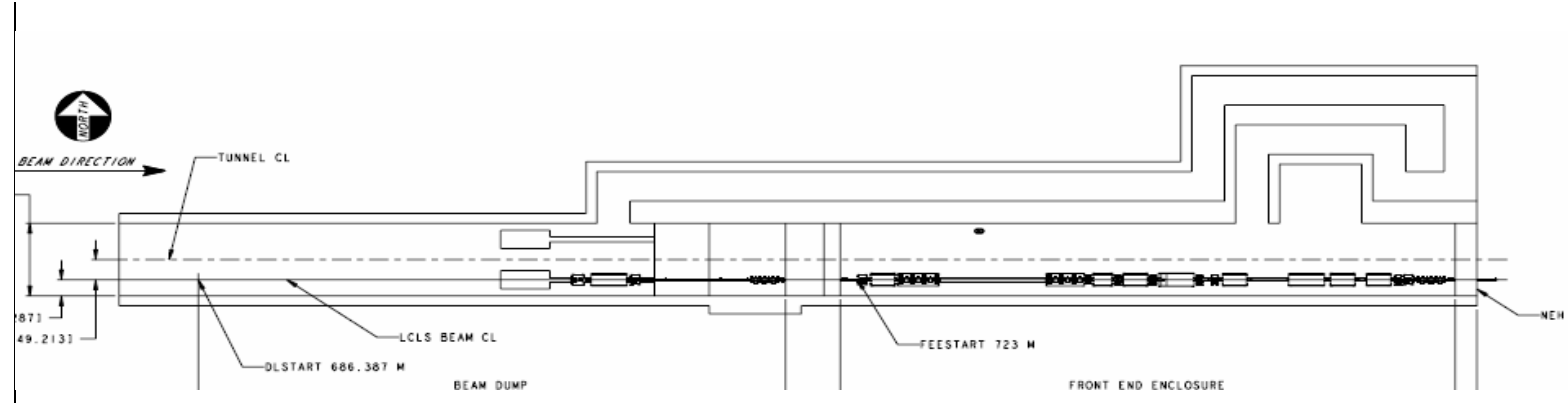


Figure No. 2

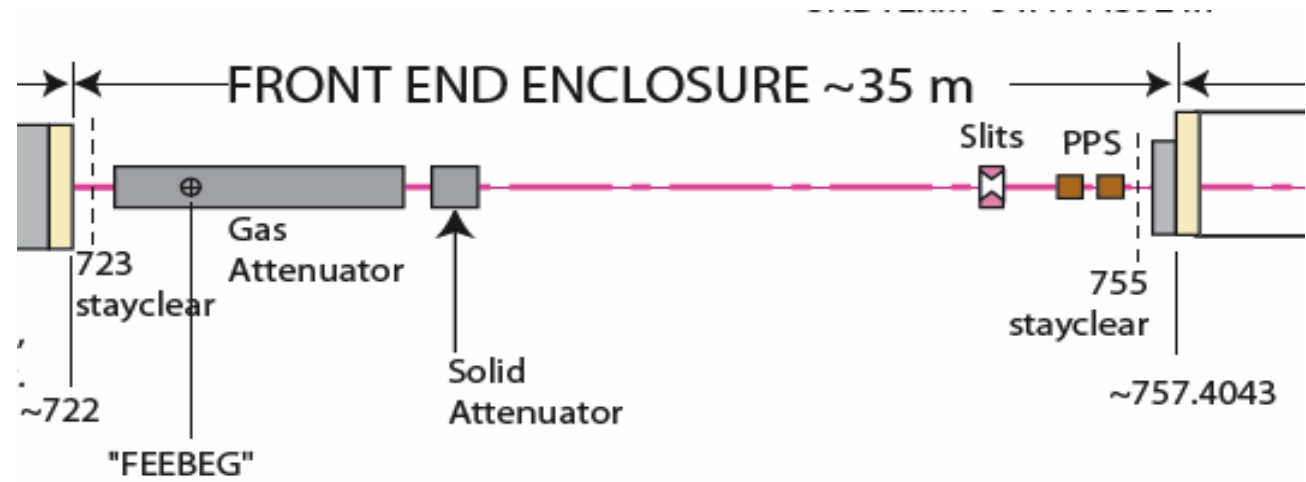
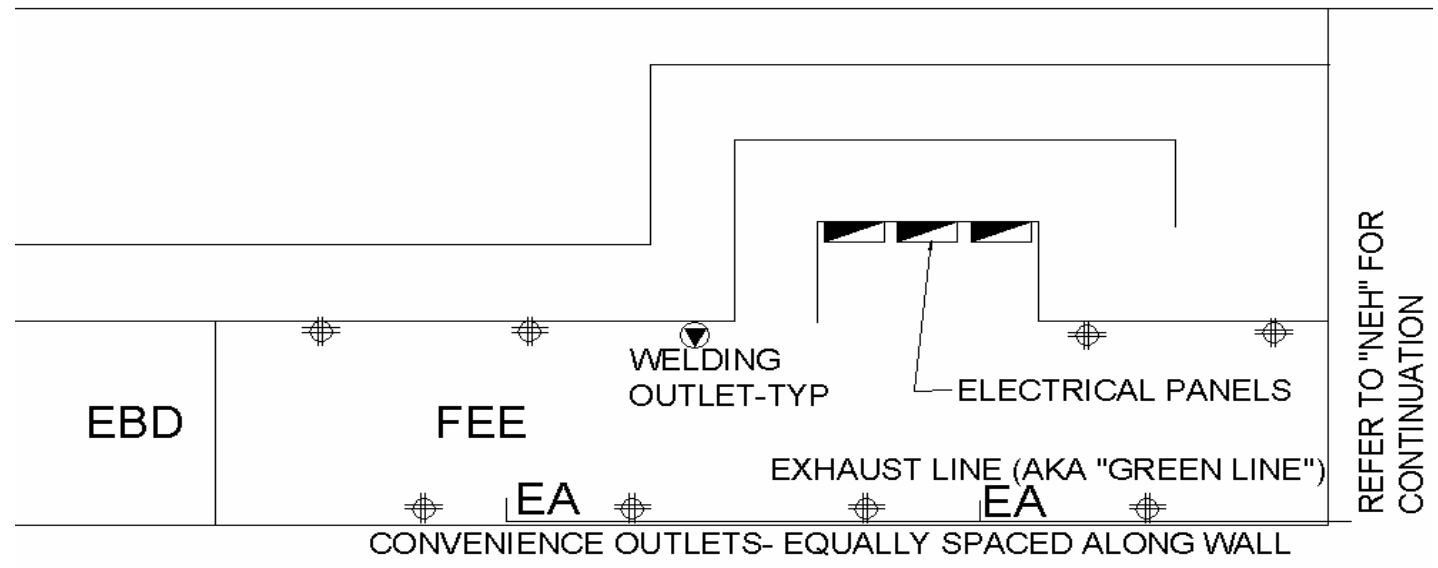


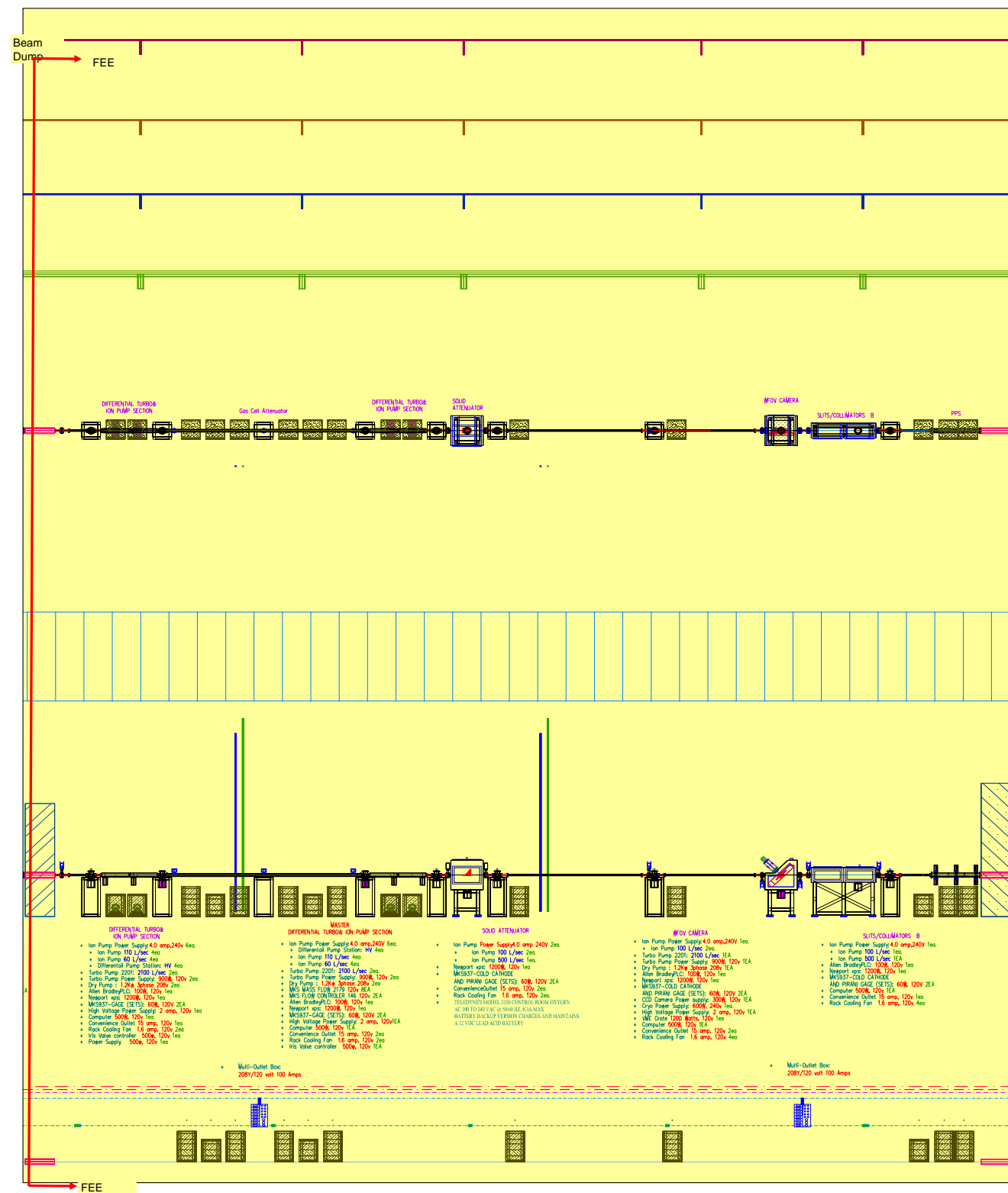
Figure No. 3



SCHEMATIC PLAN LAYOUT-
NOT TO SCALE

MECHANICAL REQUIREMENTS	HVAC	<input checked="" type="checkbox"/>	Heating system	Temp:	<input type="checkbox"/>	Mechanical humidification
		<input checked="" type="checkbox"/>	Air conditioning	Temp: 72 F	<input checked="" type="checkbox"/>	Direct exhaust system
		<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 SLAC's DDC system		<input checked="" type="checkbox"/>	Requirement for gases
		List of Gases - a) Dry Air; High purity Nitrogen and Argon b) Nitrogen boil off station to be located outside near service dock, right outside staircase on first parking lot. c) Provide clean dry oil-free compressed air 20 SCFM/each, 100 psig. Provide outlets at two locations (on concrete wall) with shut off valve and pressure gauge. Equally space along the length of the FEE.			Comments: a) HVAC system - Space temperature shall be designed for 72 F +/- 1 degree F. Relative humidity, RH: 45%, +/- 10%. b) Add lines for: Dry Air, Process Gases, Nitrogen/Argon Purge; and "Green Line". (see schematic above) Exhaust requirements - 350 CFM capacity-Total CFM for both outlets in FEE (Mechanical Pump exhaust line, Purge gases and HEPA filters) c) Gas line size: 0.5"; gas pressure (variable from 5 to 100psi) d) Nitrogen purge line (10 liter/min, > 30 psi or use general line spec (5 to 100 psi)	
	Communications	<input checked="" type="checkbox"/>	Telephone- a phone at one location		<input type="checkbox"/>	PA speakers
		<input checked="" type="checkbox"/>	Data port- 2 outlets-two locations		<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) Telephone (two lines per location) and data ports (two outlets per each location) are required. b) One 18" wide cable tray and one 12" wide cable tray. Also, provide 12" wide cable tray between racks. 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. 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 furnished and installed by SLAC				
	Plumbing/Fire Protection	<input type="checkbox"/>	Hot water system		<input type="checkbox"/>	Electric water cooler
		<input type="checkbox"/>	Cold water system		<input type="checkbox"/>	Drinking fountain
		<input checked="" type="checkbox"/>	Tempered water		<input checked="" type="checkbox"/>	Smoke detection system
		<input type="checkbox"/>	Waste drain		<input checked="" type="checkbox"/>	Wet Sprinkler System
		<input type="checkbox"/>	Floor drain		<input type="checkbox"/>	Eye wash
		<input checked="" type="checkbox"/>	Trench drain			
		Comments: a) Chilled and hot water for HVAC only. b) Cooling water (LCW) lines for turbo and/or Ion pumps or equivalent required with a capacity of 3 gal/min, header located at upstream end.				
ELECTRICAL REQUIREMENTS	Power supply	<input checked="" type="checkbox"/>	208 V, 3 phase outlets		<input type="checkbox"/>	Uninterrupted power supply
		<input checked="" type="checkbox"/>	110V outlets		<input checked="" type="checkbox"/>	Special electric welding Type: 480V
		<input checked="" type="checkbox"/>	208/230V, single phase		<input type="checkbox"/>	208V 3 phase
		Comments: a) FEE has extensive list of equipment. Emergency or UPS power for equipment operation is not required. b) Provide two (2) panels, 120-208 volts, 3 ph one for "clean" and one for "dirty" power, 42 circuits/each. Each panel shall have a main breaker with a minimum capacity of 125 amps. Diversity factor: 60 %. c) Power for three (3) each Multi-Outlet Box:208Y/120 volt 100 Amps to be installed (by SLAC) on wall. Layout evenly distributed in front of primary hardware. Provide power from Utility panel				
	Lighting	<input checked="" type="checkbox"/>	Light fixtures		<input type="checkbox"/>	Remote lighting control
		<input type="checkbox"/>	Fixture type I: Down light		<input checked="" type="checkbox"/>	Light switches
		<input type="checkbox"/>	Fixture type II: Bollard (exterior)		<input checked="" type="checkbox"/>	Lighting level fc: 30
		<input checked="" type="checkbox"/>	Emergency lighting			
		Comments: a) Fixtures to be surface mounted fluorescent, low profile. Light intensity to match existing FFTB building. b) Refer to LCLS ESD Emergency Lighting Specification, ESD-1.9-104				
RADIATION/SEISMIC/VIBRATIONS ISSUES	Comments: a) Refer to LCLS ESD-1.9-105 Vibration specification A, which is applicable for FEL Mirror System and LCLS Vibration specification B, is applicable for the rest of the FEE.					
SPECIAL REQUIREMENTS FOR EQUIPMENT	Comments:					
ENVIRONMENTAL NEEDS						

FIGURE NO. 4, PROVIDED FOR REFERENCE ONLY



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

Item	Amps @ 120V	Amps @ 208V 3 Phase	Amps @ 230V 1 phase
FEE	1068	255	0
Gas Attenuator: DIFFERENTIAL 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
Allen Bradley PLC: 100W, 120v 1ea	1	1.2	
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	
Power Supply 500w, 120v 1ea	1	4.2	
Gas Attenuator: MASTER DIFFERENTIAL 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	
MKS937-GAGE (SETS): 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		
Newport xps: 1200W, 120v 1ea	1	10	
MKS937-COLD CATHODE AND PIRANI GAGE (SETS): 60W, 120V 2EA	2	1	
Convenience Outlet 15 amp, 120v 2ea.	2	30	
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	
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		
Turbo Pump Power Supply: 900W, 120v 1ea	1	7.5	
Dry Pump : 1.2Kw 3phase 208v 1ea	1		5.8
Allen Bradley PLC: 100W, 120v 1ea	1	1	
Newport xps: 1200W, 120v 1ea	1	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 Amps @ 120V 1ea.	1	12	
High Voltage Power Supply: 2 amp, 120v 1ea	1	2	
VME Crate 1200 Watts, 120v 1ea	1	10	

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 Pump Power Supply: 900W, 120v 1ea	1	7.5		
Dry Pump : 1.2Kw 3phase 208v 1ea	1		5.8	
Allen Bradley PLC: 100W, 120v 1ea	1	1		
Newport xps: 1200W, 120v 1ea	1	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 Amps @ 120V 1ea.	1	12		
High Voltage Power Supply: 2 amp, 120v 1ea	1	2		
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: Spectrometer				
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 Pump Power Supply: 900W, 120v 1ea	1	7.5		
Dry Pump : 1.2Kw 3phase 208v 1ea	1		5.8	
Allen Bradley PLC: 100W, 120v 1ea	1	1		
Newport xps: 1200W, 120v 1ea	1	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 Amps @ 120V 1ea.	1	12		
High Voltage Power Supply: 2 amp, 120v 1ea	1	2		
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: Total Energy Monitor				
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 Pump Power Supply: 900W, 120v 1ea	1	7.5		
Dry Pump : 1.2Kw 3phase 208v 1ea	1		5.8	
Allen Bradley PLC: 100W, 120v 1ea	1	1		
Newport xps: 1200W, 120v 1ea	1	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 Amps @ 120V 1ea.	1	12		
High Voltage Power Supply: 2 amp, 120v 1ea	1	2		
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		
FEL MIRROR SYSTEM				
Ion Pump Power Supply:120V @ 6 Amps 1ea.	3	18		
Ion Pump 100 L/sec 1ea.	3			
Ion Pump 500 L/sec 1ea	3			
Allen Bradley PLC: 100W, 120v 1ea	1	1		
Newport xps: 1200W, 120v 1ea	3	30		
MKS937-COLD CATHODE AND PIRANI GAGE (SETS): 60W, 120V 2EA	6	3		
Computer 500W, 120v 1ea	1	4.2		
Convenience Outlet 15 amp, 120v 1ea	2	30		
Rack Cooling Fan 1.6 amp, 120v 4ea	6	19.2		
ION CHAMBERS (3 TOTAL)				
Ion Pump Power Supply:120V @ 6 Amps 1ea.	3	18		
Ion Pump 100 L/sec 2ea.	6			
Turbo Pump 2201: 2100 L/sec 1ea	3			
Turbo Pump Power Supply: 900W, 120v 1ea	3	22.5		
Dry Pump : 1.2Kw 3phase 208v 1ea	3		17.4	
Allen Bradley PLC: 100W, 120v 1ea	3	3		

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 Weld plug (Use Linac spec) 480V	2		200	
120V AC WALL 4 PLEX OUTLET- 2 Walls, standard separation, 3 circuits (20Amps ea.)		60		