

DRAFT CRITERIA CONFIGURATION LIST

STRUCTURE	DEEP TUNNEL IL SOLUTION		NEAR SURFACE	Comments /Source (source applicable for deep tunnel scheme)
	LENGTH (ft)	BORED INTERIOR DIAM (ft)	CAST ENCLOSURE (ft) - for near surface scheme	
INJECTORS				
Electron				
Source / Pre-Accelerator (Polarized Source)	164	13.5	TBD	USLCSG Report March 2004
Source / Pre-Accelerator (UnPolarized Source)	164	13.5	TBD	USLCSG Report March 2004
Electron Injection Linac Tunnel	984	13.5	TBD	USLCSG Report March 2004
ServiceArea: (Tunnel for deep tunnel / Serv Bldg for Cut&Cover)	558	13.5	32 x 20 x QTY	USLCSG Report March 2004
Shafts: (TBM and cryomodule access)	One 22 ft x 76.5 ft dia. X depth (Elliptical for Cryomodule access)			USLCSG Report March 2004
Support buildings:	80 ft x 229 ft (head house for end shaft)			US Civil design summary 2004
Positron (undulator @ electron linac tunnel)				
Injection Tunnel	NONE (use the main linac tunnel except the bypass portion)			USLCSG Report March 2004
<i>Bypass Tunnel for Positron: (located at IR,</i>	1,640	10	TBD	USLCSG Report March 2004
ServiceArea: (Tunnel for deep tunnel / Serv Bldg for Cut&Cover)	NONE (use the main linac service tunnel or service vault/bldg)			USLCSG Report March 2004
Shaft:	One 22 ft x 76.5 ft dia. X depth (Elliptical for Cryomodule access)			USLCSG Report March 2004
Support buildings:	80 ft x 229 ft (head house for end shaft)			US Civil design summary 2004
DAMPING RING				
Electron				
Damping Ring Tunnel:	3,051	13.5	TBD	US Civil Design Summary 2004
ServiceArea: (Tunnel for deep tunnel / Serv Bldg for Cut&Cover)	NONE (use the main linac service tunnel or service vault/bldg)			US Civil Design Summary 2004
Shafts:	Four- 30" Dia. X depth (Ventilation shafts)			Tesla, W.Bialowins & US Civil Design Summary04
Support buildings:	None			US Civil design summary 2004
Positron				
Damping Ring Tunnel:	3,051	13.5	TBD	US Civil design summary 2004
ServiceArea: (Tunnel for deep tunnel / Serv Bldg for Cut&Cover)	NONE (use the main linac service tunnel or service vault/bldg)			US Civil design summary 2004
Shafts:	Four- 30" Dia. X depth (Ventilation shafts)			Tesla, W.Bialowins & US Civil Design Summary04
Support buildings:	None			US Civil design summary 2004
MAIN LINAC				
Electron				
Beam Tunnel	71,565	13.5	TBD	US Civil design summary 2004
ServiceArea: (Tunnel for deep tunnel / Serv Bldg for Cut&Cover)	71,565	13.8	32 x 20 x QTY	US Civil design summary 2004
Shaft (Total 4 Shafts)	(3) 30ftx 40ft Dia Elliptical and (1) 22 ft x 76.5 ft Dia Elliptical			US Civil design summary 2004
Support buildings: CRYO CAVERN SPACE at TUNNEL	Four -40 ft x 30 ft x 35 ft H			Cryo Placeholder. Need to be optimized
Support buildings: CRYO Hall at Surface 500GeV	Three - 229ft x 262 ft x 49 ft			Arkadiy & US Civil Design Summary 2004
Support buildings: Future CRYO Hall at Future 1 TeV	One- 229ft x 262 ft x 49 ft			Arkadiy & US Civil Design Summary 2004
Support buildings: LCW Plant at Surface @ 500 GeV	Four- 229 ft x 75 ft x 49 ft			US Civil design summary 2004
Support buildings: (staging area)	Four - 229 ft x 80 ft x 49 ft			US Civil design summary 2004
Positron				
Beam Tunnel	68,015	13.5	TBD	US Civil design summary 2004
ServiceArea: (Tunnel for deep tunnel / Serv Bldg for Cut&Cover)	68,015	13.8	32 x 20 x QTY	US Civil design summary 2004
Shaft (Total 4 Shafts)	(3) 30ftx 40ft Dia Elliptical and (1) 22 ft x 76.5 ft Dia Elliptical			US Civil design summary 2004
Support buildings: CRYO SPACE at TUNNEL	Four -40 ft x 30 ft x 35 ft H			Arkadiy & US Civil Design Summary 2004
Support buildings: CRYO Hall at Surface	Three - 229ft x 262 ft x 49 ft			Arkadiy & US Civil Design Summary 2004
Support buildings: Future CRYO Hall at Future 1 TeV	One- 229ft x 262 ft x 49 ft			Arkadiy & US Civil Design Summary 2004
Support buildings: LCW Plant at Surface	Four- 229 ft x 75 ft x 49 ft			US Civil design summary 2004

DRAFT CRITERIA CONFIGURATION LIST

Support buildings: (staging area)	Four - 229 ft x 80 ft x 49 ft	US Civil design summary 2004	
BEAM DELIVERY SECTION			
Electron to IR1 (HIGH ENERGY)			
Beam Tunnel	6,443	13.5 TBD	US Civil design summary 2004
ServiceArea: (Tunnel for deep tunnel / Serv Bldg for Cut&Cover)	6,443	13.5 32 x 20 x QTY	US Civil design summary 2004
Shafts:	None		US Civil design summary 2004
Support buildings:	None		US Civil design summary 2004
Positron to IR 1 (HIGH ENERGY)			
Beam Tunnel	6,443	13.5 TBD	US Civil design summary 2004
ServiceArea: (Tunnel for deep tunnel / Serv Bldg for Cut&Cover)	6,443	13.5 32 x 20 x QTY	US Civil design summary 2004
Shafts:	None		US Civil design summary 2004
Support buildings:	None		US Civil design summary 2004
Electron to IR2 (LOW ENERGY)			
Beam Tunnel	6,935	13.5 TBD	US Civil design summary 2004
ServiceArea: (Tunnel for deep tunnel / Serv Bldg for Cut&Cover)	6,935	13.5 TBD	US Civil design summary 2004
Shafts:	None		US Civil design summary 2004
Support buildings:	None		US Civil design summary 2004
Positron to IR 2 (LOW ENERGY)			
Beam Tunnel	6,935	13.5 TBD	US Civil design summary 2004
ServiceArea: (Tunnel for deep tunnel / Serv Bldg for Cut&Cover)	6,935	13.5 TBD	US Civil design summary 2004
Shafts:	None		US Civil design summary 2004
Support buildings:	None		US Civil design summary 2004
INTERACTION REGION			
Detector Hall 1 below	109 ft x 249 ft x 98 ft	US Civil Design Summary 2004	
Detector Hall 2 below	108 ft x 249 ft x 98 ft	US Civil Design Summary 2004	
Shafts IR1	One 30 ft x 40 ft x Depth (diameter elliptical)	US Civil Design Summary 2004	
Shafts IR2	One 30 ft x 40 ft x Depth (diameter elliptical)	US Civil Design Summary 2004	
Support Building IR1	One- 200ft x 100ft	US Civil Design Summary 2004	
Support Building IR2	One- 200ft x 100ft	US Civil Design Summary 2004	
Electron Beam Dump Housing	Two- 98 ft x 82 ft x 49 ft	Tesla TDR & US Civil Design Summary 2004	
Positron Beam Dump Housing	Two- 98 ft x 82 ft x 49 ft	Tesla TDR & US Civil Design Summary 2004	
ACCELERATOR TEST MODULE FACILITY	279 ft x 443 ft x 40ft High	Tesla TDR & US Civil Design Summary 2004	
COOLING WATER INFRASTRUCTURE			
ELETRICAL DISTRIBUTION/INFRASTRUCTURE			

<u>LCW</u>	500 GEV	1 TEV	Comments (source)
OPERATION	9 months Non-Summer Machine Operation		
CONFIGURATION for DEEP TUNNEL SCHEME	Cooling towers for primary heat rejection at each hall, Distribution piping in service tunnel (high pressure rating)		
CONFIGURATION for NEAR SURFACE	Cooling towers for primary heat rejection at each hall, Distribution piping buried HDPE (normal pressure rating)		
LCW temperatures (F) & Conductivity	80F supply and 154F return @ 1uS/cm (Tesla TDR)		
LCW supply temp range	30 to 40C [86F to 104F]for body and 25 to 63C [77F to 145F]for collector (W.Bialowins)		
LCW Temperature Stability	None (W.Bialowins)		
LCW supply Pressure at Klystron	3.5Bar[51psi] for Collector and 5 Ba[73psi] for body and window; 10 bar[150] for test pressure (S.Choroba 4/2003)		
LCW Pressure Drop at Klystron	0.1Bar to 0.5 Bar for Collector, and 1Bar delta for body and window (S. Choroba, 4/2003)		
INJECTORS (KW-Total)	8,721	8,721	
<i>INJECTORS (Electron - 2 sources)</i>			

DRAFT CRITERIA CONFIGURATION LIST

RF GUN UNPOLARIZED SYSTEM (e- SOURCE) (4.5MWKlystron)	126	126	Tesla TDR
RF (LOW LEVEL FOR 20MeV) 200KW (Klystron)	126	126	Tesla TDR
KLYSTRON FOR 500MeV (ONE 10MW)	126	126	Tesla TDR
PREBUNCHER & BUNCHER 12MeV (ONE 10 MW KLYSTRON)	126	126	Tesla TDR
ACCELERATING SECTION (one Klystron)	126	126	Tesla TDR
MATCHING & ANALYSIS SECTION 76 MeV (one Klystron)	126	126	Tesla TDR
KLYSTRON FOR 500MeV (ONE 10MW)	126	126	Tesla TDR
DUMP (15 KW)	15	15	Tesla TDR
KLYSTRON FOR 5GeV (SIX 10MW KLYSTRON) (6 x 126)	756	756	Tesla TDR
ACCEL MODULE TEST FACILITY (2.7MW)	2,700	2,700	Tesla TDR
INJECTORS (positron)			
TARGET (AVE HEAT LOAD 5KW)	5	5	Tesla TDR
ADD 6GEV ML ENERGY LOSS	1,543	1,543	taken from Warm NLC
UNDULATOR	925	925	taken from Warm NLC
KLYSTRON FOR PPA (NINE 10MW KLYSTRON) (9x126)	1,134	1,134	Tesla TDR
DUMP (5 KW)	5	5	Tesla TDR
RF SYSTEM FOR 5 GeV LINAC (6klyst @10MW ea peak)	756	756	Tesla TDR
DAMPING RING (KW Total)	14,800	14,800	
<i>Electron</i>			
DAMPING RING MAGNETS & Power Supply, 2MW cool load	2,000	2,000	Tesla TDR
SYNCHROTRON RADIATION 2.1MW cooling load	2,100	2,100	Tesla TDR
RF SYSTEM for damping ring(Klystron) 2.2MW cooling load	2,200	2,200	Tesla TDR
<i>Positron</i>			
DAMPING RING MAGNETS & Power Supply, 2MW cool load	2,000	2,000	Tesla TDR
SYNCHROTRON RADIATION 3.2MW cooling load	3,200	3,200	Tesla TDR
RF SYSTEM for damping ring(Klystron) 3.3MW cooling load	3,300	3,300	Tesla TDR
MAIN LINAC (KW Total)	86,063	166,513	
<i>Electron</i>			
MODULATOR 500 Gev(11.5 KW PER Modulators X 305 Modulator)	3,508	3,450	Tesla TDR
MODULATOR 1 Tev(11.5 KW PER Modulators X ??? Modulator)	-	3,554	Tesla TDR
RF SYSTEMS for 500 GeV (KLYSTRONS) (305 x 126KW)	38,430	37,800	Tesla TDR
Main Linac from 250GeV to start of BDS (PLACEHOLDER)	1,575	38,934	Tesla TDR
<i>Positron</i>			
MODULATOR 500 Gev(11.5 KW PER Modulators X 298 Modulator)	3,427	3,427	Tesla TDR
MODULATOR 1 Tev(11.5 KW PER Modulators X ??? Modulator)	-	3,496	Tesla TDR
RF SYSTEMS for 500 GeV (KLYSTRONS) (298 x 126KW)	37,548	37,548	Tesla TDR
Main Linac from 250GeV to start of BDS (PLACEHOLDER)	1,575	38,304	Tesla TDR
BEAM DELIVERY SECTION (KW Total)	7,816	7,816	
<i>Electron</i>			
COLLIMATION	2,782	2,782	taken from Warm NLC
BIG BEND & FF	1,126	1,126	taken from Warm NLC
<i>Positron</i>			
COLLIMATION	1,656	1,656	taken from Warm NLC
BIG BEND & FF	2,252	2,252	taken from Warm NLC
INTERACTION REGION (use 1 IR) KW Total	28,200	28,200	
<i>Electron</i>			
IR-HALL 1	2,200	2,200	taken from Warm NLC

DRAFT CRITERIA CONFIGURATION LIST

BEAM DUMP 13 MW e+	13,000	13,000	taken from Warm NLC
BEAM DUMP 13 MW e-	13,000	13,000	taken from Warm NLC
<i>Positron</i>			
IR-HALL 2	-	-	No second IR load considered for USLCSG 2004
BEAM DUMP 13 MW e+	-	-	No second IR load considered for USLCSG 2004
BEAM DUMP 13 MW e-	-	-	No second IR load considered for USLCSG 2004
ACCELERATOR TEST MODULE FACILITY (KW Total)	2,700	2,700	Tesla TDR

ELECTRICAL	500 GEV (Mw)	1 TEV (Mw)	Comments
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CONFIGURATION FOR DEEPTUNNEL SCHEME	34.5KV to 480V Modulator XMFR located in <u>Service tunnel</u> 34.5KV to 480V Convetional Power XMFR located in <u>Service tunnel</u>		
CONFIGURATION FOR IDEAL NEAR SURFACE SCHEME	34.5KV to 480V Modulator XMFR located <u>at Surface</u> 34.5KV to 480V Convetional Power XMFR locate <u>at surface</u>		

INJECTOR - TOTAL (MW)	2.7	3.0	Final Elec USLCSG , T.Himmel spreadhseet
e+ e- Injector & Acceleration to 5 GeV- RF (MW)	1.58	1.67	Final Elec USLCSG , T.Himmel spreadhseet
e+ e- Injector & Acceleration to 5 GeV- Cryo (MW)	0.46	0.76	Final Elec USLCSG , T.Himmel spreadhseet
e+ e- Injector & Acceleration to 5 GeV-Cooling (MW)	0.2	0.2	Final Elec USLCSG , T.Himmel spreadhseet
e+ e- Injector & Acceleration to 5 GeV-Racks&power(MW)	0.42	0.33	Final Elec USLCSG , T.Himmel spreadhseet
DAMPING RING- TOTAL (MW)	21	21	Final Elec USLCSG , T.Himmel spreadhseet
e+ e-Damping Rings RF - (MW)	7.5	7.5	Final Elec USLCSG , T.Himmel spreadhseet
e+ e-Damping Rings Cryo- (MW)	0	0	Final Elec USLCSG , T.Himmel spreadhseet
e+ e-Damping Rings Cooling - (MW)	6	6	Final Elec USLCSG , T.Himmel spreadhseet
e+ e-Damping Rings Racks & Power - (MW)	7.5	7.5	Final Elec USLCSG , T.Himmel spreadhseet
MAIN LINAC- TOTAL (MW)	132.7	295.9	Final Elec USLCSG , T.Himmel spreadhseet
modulator input power- RF - (MW)	78.8	167.2	Final Elec USLCSG , T.Himmel spreadhseet
cryo plants - Cryo power(MW)	23.2	75.7	Final Elec USLCSG , T.Himmel spreadhseet
klystron auxiliary power _Racks& Power (MW)	8.4	17	Final Elec USLCSG , T.Himmel spreadhseet
magnet power supplies - Rack&Power (MW)	0.2	0.4	Final Elec USLCSG , T.Himmel spreadhseet
other rack power- Racks&Power (MW)	3.6	7.3	Final Elec USLCSG , T.Himmel spreadhseet
cryo cooling towers pumps fans aux - Cooling Power(MW)	4.1	11	Final Elec USLCSG , T.Himmel spreadhseet
klystron cooling water pumps-Cooling Power (MW)	0.6	1.2	Final Elec USLCSG , T.Himmel spreadhseet
cooling towers with pumps and fans - Cooling (MW)	5.1	7.4	Final Elec USLCSG , T.Himmel spreadhseet
ventilation supply, exhaust, chill - Power (MW)	4.6	4.6	Final Elec USLCSG , T.Himmel spreadhseet
lighting, drains, fire protection... Power (MW)	4.1	4.1	Final Elec USLCSG , T.Himmel spreadhseet
BEAM DELIVERY SECTION - TOTAL (MW)	4.6	4.6	Final Elec USLCSG , T.Himmel spreadhseet
IR Transport (HE/LE) - RF (MW)	0	0	Final Elec USLCSG , T.Himmel spreadhseet
IR Transport (HE/LE) - Cryo Power (MW)	0	0	Final Elec USLCSG , T.Himmel spreadhseet
IR Transport (HE/LE) - Cooling Power (MW)	3.56	3.56	Final Elec USLCSG , T.Himmel spreadhseet
IR Transport (HE/LE) - Racks&Power (MW)	1	1	Final Elec USLCSG , T.Himmel spreadhseet
INTERACTION REGION (excl detectors)- (MW)	2.6	2.6	Final Elec USLCSG , T.Himmel spreadhseet
HE / LE IR Halls (2) - RF (MW)	0	0	Final Elec USLCSG , T.Himmel spreadhseet
HE / LE IR Halls (2) - Cryo Power(MW)	0	0	Final Elec USLCSG , T.Himmel spreadhseet
HE / LE IR Halls (2) - Cooling Power (MW)	2.3	2.3	Final Elec USLCSG , T.Himmel spreadhseet
HE / LE IR Halls (2) - Rack&Power (MW)	0.3	0.3	Final Elec USLCSG , T.Himmel spreadhseet
Electrical Losses in Distribution & efficiencies (MW)	15.9	28.7	Final Elec USLCSG , T.Himmel spreadhseet
ACCELERATOR TEST MODULE FACILITY	4.5	4.5	Tesla TDR

DRAFT CRITERIA CONFIGURATION LIST

CRYOGENIC SYSTEM

Cryogenic System is not a part of the conventional Civil group. Civil related Cryo structure are shown under first page of this spreadsheet

MISC CIVIL RELATED CRITERIA

OPERATION	9 months Non-Summer Machine Operation	
INJECTOR		
ENVIRONMENTAL CONDITION (HVAC)	TBD	
ENVIRONMENTAL CONDITION (HVAC) -undulator	72F	Tesla TDR
VENTILATION	(site specific) Conditioned Air, 88fpm air velocity in tunnel	Placeholder, basis used by USLCSG
RADIATION SHIELDING	TBD	
LIFE SAFETY:EGRESS TO THE SURFACE	2 (Two) Elevators per shaft, GBA recommendation & NFPA 101	Gage Babcock Report 3/29/2001
LIFE SAFETY:EGRESS/ACCESS CONTROL	2000 ft max exist distance, NFPA 520	Gage Babcock Report 3/29/2001
LIFE SAFETY: CROSS CONNECT BET TUNNEL	Min 2 hr Fire resistive Construction	Gage Babcock Report 3/29/2001
LIFE SAFETY: CROSS CONNECT OPENING	1-1/2HR fire door assy; 2 hr firestopped for waveguide penetrator	Gage Babcock Report 3/29/2001
LIFE SAFETY: SIGNS / EMERGENCY LIGHTING	Every 200 ft, Emergency lighting 4 hrs,	Gage Babcock Report 3/29/2001
LIFE SAFETY: SMOKE CONTROL	Separate system for Service tunnel & beam tunnel, + Duct smoke	Gage Babcock Report 3/29/2001
LIFE SAFETY: FIRE PROTECTION SYSTEM	Sprinklers, heat detection, smoke detectors w pull stations	Gage Babcock Report 3/29/2001
DRAINAGE	Gravity drainage to sump at access shafts	Placeholder, basis used by USLCSG
OCCUPANCY	Zero during operation, 6 person per mile during maintenance	Placeholder, basis used by USLCSG
MATERIAL HANDLING	None	Placeholder, basis used by USLCSG
DAMPING RING		
ENVIRONMENTAL CONDITION (HVAC)	TBD	
VENTILATION	(site specific) Conditioned Air, 88fpm air velocity in tunnel	Placeholder, basis used by USLCSG
SHIELDING	24ft concrete or rock without interlock detectors	Placeholder, basis used by USLCSG
LIFE SAFETY:EGRESS TO THE SURFACE	2 (Two) Elevators per shaft, GBA recommendation & NFPA 101	Gage Babcock Report 3/29/2001
LIFE SAFETY:EGRESS/ACCESS CONTROL	2000 ft max exist distance, NFPA 520	Gage Babcock Report 3/29/2001
LIFE SAFETY: CROSS CONNECT BET TUNNEL	Min 2 hr Fire resistive Construction	Gage Babcock Report 3/29/2001
LIFE SAFETY: CROSS CONNECT OPENING	1-1/2HR fire door assy; 2 hr firestopped for waveguide penetrator	Gage Babcock Report 3/29/2001
LIFE SAFETY: SIGNS / EMERGENCY LIGHTING	Every 200 ft, Emergency lighting 4 hrs,	Gage Babcock Report 3/29/2001
LIFE SAFETY: SMOKE CONTROL	Separate system for Service tunnel & beam tunnel, + Duct smoke	Gage Babcock Report 3/29/2001
LIFE SAFETY: FIRE PROTECTION SYSTEM	Sprinklers, heat detection, smoke detectors w pull stations	Gage Babcock Report 3/29/2001
DRAINAGE	Gravity drainage to sump at access shafts	Placeholder, basis used by USLCSG
OCCUPANCY	Zero during operation, 6 person per mile during maintenance	Placeholder, basis used by USLCSG
MATERIAL HANDLING	None	Placeholder, basis used by USLCSG
MAIN LINAC		
ENVIRONMENTAL CONDITION (HVAC)	Dripless damp wall & floors, 60 to 80F, 60%RH	Placeholder, basis used by USLCSG
VENTILATION	(site specific) Conditioned Air, 88fpm air velocity in tunnel	Placeholder, basis used by USLCSG
SHIELDING	24ft concrete or rock without interlock detectors	Placeholder, basis used by USLCSG
LIFE SAFETY:EGRESS TO THE SURFACE	2 (Two) Elevators per shaft, GBA recommendation & NFPA 101	Gage Babcock Report 3/29/2001
LIFE SAFETY:EGRESS/ACCESS CONTROL	2000 ft max exist distance, NFPA 520	Gage Babcock Report 3/29/2001
LIFE SAFETY: CROSS CONNECT BET TUNNEL	Min 2 hr Fire resistive Construction	Gage Babcock Report 3/29/2001
LIFE SAFETY: CROSS CONNECT OPENING	1-1/2HR fire door assy; 2 hr firestopped for waveguide penetrator	Gage Babcock Report 3/29/2001
LIFE SAFETY: SIGNS / EMERGENCY LIGHTING	Every 200 ft, Emergency lighting 4 hrs,	Gage Babcock Report 3/29/2001
LIFE SAFETY: SMOKE CONTROL	Separate system for Service tunnel & beam tunnel, + Duct smoke	Gage Babcock Report 3/29/2001
LIFE SAFETY: FIRE PROTECTION SYSTEM	Sprinklers, heat detection, smoke detectors w pull stations	Gage Babcock Report 3/29/2001

DRAFT CRITERIA CONFIGURATION LIST

DRAINAGE	Gravity drainage to sump at access shafts	Placeholder, basis used by USLCSG
OCCUPANCY	Zero during operation, 6 person per mile during maintenance	Placeholder, basis used by USLCSG
MATERIAL HANDLING	None	Placeholder, basis used by USLCSG
BEAM DELIVERY SECTION		
ENVIRONMENTAL CONDITION (HVAC)	Dripless damp wall & floors, 60 to 80F, 60%RH	Placeholder, basis used by USLCSG
VENTILATION	(site specific) Conditioned Air, 88fpm air velocity in tunnel	Placeholder, basis used by USLCSG
SHIELDING	24ft concrete or rock without interlock detectors	Placeholder, basis used by USLCSG
LIFE SAFETY:EGRESS TO THE SURFACE	2 (Two) Elevators per shaft, GBA recommendation & NFPA 101	Gage Babcock Report 3/29/2001
LIFE SAFETY:EGRESS/ACCESS CONTROL	2000 ft max exist distance, NFPA 520	Gage Babcock Report 3/29/2001
LIFE SAFETY: CROSS CONNECT BET TUNNEL	Min 2 hr Fire resistive Construction	Gage Babcock Report 3/29/2001
LIFE SAFETY: CROSS CONNECT OPENING	1-1/2HR fire door assy; 2 hr firestopped for waveguide penetrator	Gage Babcock Report 3/29/2001
LIFE SAFETY: SIGNS / EMERGENCY LIGHTING	Every 200 ft, Emergency lighting 4 hrs,	Gage Babcock Report 3/29/2001
LIFE SAFETY: SMOKE CONTROL	Separate system for Service tunnel & beam tunnel, + Duct smoke	Gage Babcock Report 3/29/2001
LIFE SAFETY: FIRE PROTECTION SYSTEM	Sprinklers, heat detection, smoke detectors w pull stations	Gage Babcock Report 3/29/2001
DRAINAGE	Gravity drainage to sump at access shafts	Placeholder, basis used by USLCSG
OCCUPANCY	Zero during operation, 6 person per mile during maintenance	Placeholder, basis used by USLCSG
MATERIAL HANDLING	None	Placeholder, basis used by USLCSG
INTERACTION REGION		
ENVIRONMENTAL CONDITION (HVAC)	Dripless damp wall & floors, 60 to 80F, 60%RH	Placeholder, basis used by USLCSG
SHIELDING	TBD	
EGRESS/ACCESS CONTROL	TBD	
FIRE PROTECTION SYSTEM	TBD	
DRAINAGE	TBD	
OCCUPANCY	TBD	
MATERIAL HANDLING	TBD	
ACCELERATOR TEST MODULE FACILITY		
ENVIRONMENTAL	0.7MW heat dissipation to air, (assume 78F/50%RH)	Tesla TDR (placeholder)
SHIELDING	0.8m thick concrete shielding per each module test bench	Tesla TDR
EGRESS/ACCESS CONTROL	Normal surface bldg egress/access	
FIRE PROTECTION SYSTEM	TBD	
DRAINAGE	N/A	
OCCUPANCY	TBD	
MATERIAL HANDLING	TBD	
INSTRUMENT AIR	500 cu.m./hr (500 CFH)	Tesla TDR
Land acquisition	TBD	
Off-Site Support		
Alignment Network:	30exterior	WAG
Construction Support/Spoil Disposal:	TBD	
Site Preparation		
Clearing/Grading: TBD acres	Clearing/Grading:	
Drainage: TBD LF	Drainage: TBD LF	
Fencing: TBD LF	Fencing: TBD LF	
Irrigation: TBD acres	Irrigation: TBD	
Waste and Water Systems:	Waste and Water	
On-site water treatment plant for peak population of TBD	On-site water	

DRAFT CRITERIA CONFIGURATION LIST

TBD LF water distribution system On-site sewage treatment plant for peak population of TBD TBD LF sanitary sewer lines Electrical System:	TBD LF water On-site sewage TBD LF sanitary TBD	
Communications Systems: PBX for No. TBD lines TBD LF telephone cable TBD LF SCADA cable	Communications PBX for No. TBD TBD LF telephone TBD LF SCADA	
Roads/Paving: TBD SY	Roads/Paving: TBD SY	
New Office Space	30,000 SF	Used for USLCSG Rev 4 Proj Estimate
New Computing Space	20,000 SF	Used for USLCSG Rev 4 Proj Estimate
New Light Lab Space	5,000 SF	Used for USLCSG Rev 4 Proj Estimate
New Cafeteria	5,000 SF	Used for USLCSG Rev 4 Proj Estimate
New Large Heavy Assembly Buildings	40,000 SF	Used for USLCSG Rev 4 Proj Estimate
New Small Heavy Assembly Buildings	40,000 SF	Used for USLCSG Rev 4 Proj Estimate
New Light Shop Space	27,000 SF	Used for USLCSG Rev 4 Proj Estimate
New Warehousing	40,000 SF	Used for USLCSG Rev 4 Proj Estimate
New Gas & Cryo Storage	6,000 SF	Used for USLCSG Rev 4 Proj Estimate
New Security Buildings	1,600 SF	Used for USLCSG Rev 4 Proj Estimate
New Emergency Response	5,000 SF	Used for USLCSG Rev 4 Proj Estimate
New Medical & ES&H	4,000 SF	Used for USLCSG Rev 4 Proj Estimate
New Heavy & Light Equipment Maintenance	13,000 SF	Used for USLCSG Rev 4 Proj Estimate
New Campus Utility Plant Building	40,000 SF	Used for USLCSG Rev 4 Proj Estimate
New Operations Control Room	15,000 SF	Used for USLCSG Rev 4 Proj Estimate
New Operations Annex Wing	10,000 SF	Used for USLCSG Rev 4 Proj Estimate
New Communications Center	5,000 SF	Used for USLCSG Rev 4 Proj Estimate

3/5/2005

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