

**Budgetary cost estimate for a 16.5m cooling section (6 modules 2.75m long)
Super FOFO FRONT END LATTICE (Lattice 1)**

DESCRIPTION	UNITS	Qnt	\$/UNIT (2.75m)	SUBTOTAL PER SECTION	Qnt	16.5 m Section EXTENDED \$	Uncertainty	COMMENTS
								Ref. DWG SFOFOSTART201MHZrev1
RF/CENTER COIL ASSEMBLY								
Vacuum Vessel w/support structure	Ass'y	1	\$74,932	\$74,932	6	\$449,593	40%	from FNAL & NC Products, Inc
RF Cavity								
Modulator & Tube	Ass'y	1	\$1,608,000	\$1,608,000	6	\$9,648,000	15%	
Cavity & Ancillary	Ass'y	1	\$884,000	\$884,000	6	\$5,304,000	15%	FNAL Alfred Moretti BD-BS PROTON SRC
System Integration			\$50,000	\$50,000	6	\$300,000		
Center low field large bore Coil	Ass'y	1	\$219,600	\$382,609	6	\$2,295,652	30%	John Miller, Magnet Science & Technology
Cryostat/shielding & vac. chamber	Ass'y	1	\$180,000	\$180,000	6	\$1,080,000		National High Magnetic Field Laboratory
Integration Assembly labor	MH	160	\$65	\$10,400	6	\$62,400		
				\$3,115,009		\$18,690,052	25%	
Lh2 ABSORBER/COILS								
Vacuum Vessel	Ass'y	1	\$16,078	\$16,078	6	\$96,469		
LH2 Absorber Chamber	Ass'y	1	\$52,000	\$52,000	6	\$312,000	20%	Gerhard Designing& manufacturing Inc
Manifold safety & Cooling	Ass'y	1	\$15,200	\$15,200	6	\$91,200		For Convection & Forced flow
Lh2 Circulating Pump	Unit	1	\$30,350	\$30,350	6	\$182,100	10%	Barber-Nichols Inc.(Ref.: SMP-547) attached.
System Controls/Instrumentation	System	1	\$39,000	\$39,000	6	\$234,000		
Higher-field Bucked Solenoids	Ass'y	2	\$388,400	\$678,261	6	\$4,069,565	30%	John Miller, Magnet Science & Tech. NHMFL
Cryostat (for 2 bucked solenoids)	Ass'y	1	\$220,000	\$220,000	6	\$1,320,000		
Integration Assembly labor	MH	240	\$65	\$15,600	6	\$93,600		
				\$1,066,489		\$6,398,934	30%	
Refrigeration								
Liquid Helium	Liters	60	\$200	\$12,000	6	\$72,000	30%	Calculated based Hrs. of He flow through
Liquid Hydrogen	Liters	20	\$100	\$2,000	6	\$12,000		a heat exchanger
Refrigeration system		1	\$350,000	\$350,000	6	\$2,100,000		
				\$364,000		\$2,184,000		
Ancillaries								
Internal Supports		Lot	\$10,667	\$10,667	6	\$64,000		
Nuts bolts and seals		Lot	\$2,000	\$2,000	6	\$12,000		
Plumbing		Lot	\$2,333	\$2,333	6	\$14,000		
Vacuum System			\$9,333	\$9,333	6	\$56,000		
				\$24,333		\$146,000	10%	from E.Black IIT/FNAL
Labor for final systems Integration	MH	320	\$65	\$20,800	6	\$124,800		75% M/Hrs, millwrights, mechanical, electric 25% M/hrs, Design engineering
TOTAL				\$4,665,563		\$27,993,379		
TOTAL LATTICE 1 (3 sections)				~	3	\$84,000,000		