

Project Considerations

Back to Earth

Siting Concept



Steve Dixon (Fermilab FESS) will discuss tomorrow

Preliminary Cost Estimate

Ø Major Components

- Ø Beamline, Target Station & Horn
- Ø Transport line
- Ø Decay ring
- Ø Detectors (Far & Near)
- Ø Project Office
- Ø Total

\$30M
9
54
18
15
\$126M

Ø Basis of Estimation (BOE)

- Ø Took existing facilities (MiniBooNE beam line and target station, MINOS detector, vetted magnet costing models, m2e civil construction costs, EuroNu detector costing, have added all cost loading factors and have escalated to 2012 \$ when necessary.

Costing Details



Beamline & Target Station

Ø Based on MiniBooNE

Ø Horn & PS, misc electrical equipment	\$6.0M
Ø Instrumentation	.5
Ø Civil (~ 2XMiniBooNE)	6.3
Ø Beam line	1.5
Ø Total	\$14.3

Ø Escalating factors

- Ø 1.5 – to include fully loaded SWF
- Ø 1.35 – in 2012 \$

Ø Total: \$30M

Ø Magnets (Used Strauss & Green Costing Model) – V. Kashikhin

nuStorm Superconducting Magnets cost estimation June 14, 2012									
		Pole field	Length	Aperture	Quantit	Gradient	Magnet Cost*	Total cost	
Name	Type	Bp, T	Lm, m	Da, m	Qty	G, T/m	C, M\$	Total C, M\$	Cr, M\$
D1	Dipole	3.9	0.85	0.3	24	0	0.4787	11.488	1.56
Q1	Quadrupole	3.8	0.5	0.3	30	6.33	0.2070	6.210	1.95
Q2	Quadrupole	1.6	0.6	0.3	33	2.67	0.1295	4.273	2.145
Q3	Quadrupole	0.4	0.6	0.3	63	0.67	0.0526	3.313	4.095
					150			25.3 M\$	9.8
* - magnet cost calculated using the magnetic field energy volume where Lm is the magnet length									



Decay Ring – Estimate I I

Ø From Alex Bogacz (ring designer)

19 June 2012 – KBB													
May 15 13:20 Ring_new.opt													
qty		name	Lcm	aperture	Bkgcm[i]	Bkgcm[i]		width[cm]	height[cm]	radius[cm]	storedenergy[MJ]	cost/ea	cost/type
24		dAin	85	15	38.9138	0		15	15		0.1184	\$30,804	\$739,303
4		qD1	50	15	0	-2.68838				15	0.1143	\$290,562	\$1,162,249
4		qD2	50	15	0	-2.56058				15	0.1037	\$263,594	\$1,054,374
4		qD3	50	15	0	-2.43127				15	0.0935	\$237,643	\$950,571
2		qD4	50	15	0	-2.45204				15	0.0951	\$241,720	\$483,441
12		qDD	60	30	0	-0.108				30	0.0035	\$9,003	\$108,041
2		qDDa	30	30	0	-0.108				30	0.0018	\$4,502	\$9,003
28		qDS	60	15	0	-1.086				15	0.0224	\$56,898	\$1,593,151
4		qF1	50	15	0	2.38574				15	0.0900	\$228,825	\$915,302
4		qF2	50	15	0	2.48112				15	0.0974	\$247,488	\$989,951
4		qF3	50	15	0	2.57227				15	0.1047	\$266,006	\$1,064,023
4		qF4	50	15	0	2.53313				15	0.1015	\$257,972	\$1,031,889
12		qFD	60	30	0	0.108				30	0.0035	\$9,003	\$108,041
36		qFS	60	15	0	1.086				15	0.0224	\$56,898	\$2,048,337
2		qFSa	30	15	0	1.086				15	0.0112	\$28,449	\$56,898
2		qMD1	50	15	0	-0.804088				15	0.0102	\$25,994	\$51,987
2		qMD2	50	15	0	1.10154				15	0.0192	\$48,782	\$97,564
2		qMD3	50	15	0	-0.76149				15	0.0092	\$23,312	\$46,625
2		qMD4	50	15	0	0.354415				15	0.0020	\$5,050	\$10,100
2		qMS1	50	15	0	-2.05816				15	0.0670	\$170,301	\$340,601
2		qMS2	50	15	0	1.87905				15	0.0559	\$141,950	\$283,900
2		qMS3	50	15	0	-1.61757				15	0.0414	\$105,192	\$210,385
2		qMS4	50	15	0	1.41665				15	0.0317	\$80,683	\$161,366
													\$13,517,101.53

Decay Ring

- Ø Used bigger number for magnets
- Ø PS & Instrumentation - \$1M
- Ø Vacuum - \$2M
- Ø Civil - \$15.7M
 - Ø Based on m2e tunnel costs (&depth) (\$9.5k/foot) times 1.5 to fully load, EDI A...
- Ø Total: 53.8M
- Ø Note: Transport line costed at 17% (by length) of DR - \$9M

Estimate effort to produce full proposal

Table X. Estimated effort to produce full proposal

Task	Σ FTE
Target Station	0.75
Capture & transport	1.25
Injection	0.25
Decay ring	2
Far Detector (Engineering)	1
Far Detector (Sim & Analysis)	2
Near Detector (Engineering)	1
Near Detector (Sim & Analysis) ^a	3.5
Costing	1
Total	12.75