

WBS	Name	Cost
1	Run2b Silicon Detector Schedule	\$13,328,319.20
1.1	Run 2b Silicon Project	\$13,328,319

Notes

Table summarises the number of parts needed to the project:

Layer	Type	Φ-seg.	Z-seg.	Length	Width	Pitch	Total
5	A	30	6	96.4	40.5	75/37.5	360
5	A	30	6	96.4	40.5	75/37.5	360
4	A	24	6	96.4	40.5	75/37.5	288
4	2.5°	24	6	96.4	43.1	80/40	288
3	A	18	6	96.4	40.5	75/37.5	216
3	2.5°	18	6	96.4	43.1	80/40	216
2	A	12	6	96.4	40.5	75/37.5	144
2	2.5°	12	6	96.4	43.1	80/40	144
1	A	6	6	96.4	40.5	75/37.5	72
1	A	6	6	96.4	40.5	75/37.5	72
0	A	12	6	96.4	14.8	50/25	144

	Sensors	Modules	Staves	4-chips hybrids	2-chips hybrids	MPC	JPC
Outer Axials	1512	756	180	1080	0	180	40
Outer Stereo	648	324					
L0	144	72	0	0	72	0	16
TOTAL	2304	1152	180	1080	72	180	56

1.1.1	DAQ	\$6,030,702
1.1.2	Sensors	\$2,296,246

Notes

The table below summarises the type and number of sensors needed:

WBS	Name	Cost
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"Sensors" continued

Notes

Silicon Sensors

Layer	Type	Φ-seg.	Z-seg.	Length	Width	Pitch	Total
5	A	30	6	96.4	40.5	75/37.5	360
5	A	30	6	96.4	40.5	75/37.5	360
4	A	24	6	96.4	40.5	75/37.5	288
4	2.5°	24	6	96.4	43.1	80/40	288
3	A	18	6	96.4	40.5	75/37.5	216
3	2.5°	18	6	96.4	43.1	80/40	216
2	A	12	6	96.4	40.5	75/37.5	144
2	2.5°	12	6	96.4	43.1	80/40	144
1	A	6	6	96.4	40.5	75/37.5	72
1	A	6	6	96.4	40.5	75/37.5	72
0	A	12	6	96.4	14.8	50/25	144

	Sensors Quantity	Total (+ 20% spares)
Outer Axials	1512	1814
Outer Stereo	648	778
L0	144	172
TOTAL	2304	2764

1.1.3	Construction (Modules and staves)	\$2,241,206
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Notes

added 50% cont. to cost on each costed item

WBS	Name	Cost
1.1.4	Beampipe	\$237,771
	<u>Notes</u>	
	The beampipe is designed to be compatible with the old pipe (it has the same flanges to connect to the Tevatron beampipe). It is constructed from Beryllium for low mass, with short stainless steel sections on the end. We are considering a drilled technology rather than the traditional rolled technique. The pieces are the same OD and ID as the D0 pipe to minimize the total cost of the CDF + D0 pipe. The pipes are not identical, CDFs is longer and has different flanges on the end.	
1.1.5	Support Mechanics	\$1,579,240
	<u>Notes</u>	
	This section covers infrastructure, the support structures for the staves, barrels, L0, and transportation and installation at B0. 50% cont. is included on all costed items	
1.1.6	Cooling and Monitoring	\$213,238
	<u>Notes</u>	
	This task covers the cooling system, the monitoring of the cooling and power to the detectors and the position monitors (RASNIKS) 50% cont. is included on all costed items	
1.1.7	Final Assembly (Installation and Integration)	\$676,943
	<u>Notes</u>	
	This task covers installation of staves into the barrels, installation of L0 modules on the CF supports and the integration of L0 and beampipe with the outer barrel. Added 50% contingency to all costed items	
1.1.8	Transportation and Installation	\$52,974
1.2	Central Preshower	\$945,050.28
	<u>Notes</u>	
	Summary task for the Central Preradiator detector	
1.2.2	Procure parts	\$667,825.00
	<u>Notes</u>	
	Summary task for the procurement of all the parts needed for the detector	
1.2.3	CPR Detector Assembly	\$102,915.28
	<u>Notes</u>	
	Summary task for the assembly of the CPR modules.	
1.2.4	CCR Detector Assembly	\$19,076.00
	<u>Notes</u>	
	Summary task for the construction of the Central Crack chamber modules.	

WBS	Name	Cost
1.2.5	Fiber Bundles	\$54,000.00
	<u>Notes</u>	
	Physicist estimate.	
1.3	Run Ib Data Acquisition project	\$1,199,907.20
	<u>Notes</u>	
	Data Acquisition project is mostly the upgrade of the level3 and event builder systems plus some minor upgrade in the computing related.	
1.3.1	Event-Builder Upgrade	\$557,411.20
	<u>Notes</u>	
	The Event Builder upgrade is based on the same technology as the first one except for increased bandwidth. This path has been chosen since the increase in throughput and rate a mild and using the same technology minimizes the effort needed for the upgrade.	
	The details of the purchase and all parts are assumed to be equal to the purchase of the present Event Builder hardware. According to somewhat outdated quotes the hardware costs about 500k.	
	Contingency is included in the sense that these are old quotes and the hardware will only become cheaper, although not by much.	
	Further Details on the Hardware from a quote from December 2001	
	Raw cost	
	32 port ASX 4000 (Marconi) \$215k	
	16 OC12 PCI cards (ForeRunnerHE 622) \$30k	
	15 OC-12 PMC cards (Cyclonwe PMC59) \$60k	
	Total \$305k	
	Spares	
	1 Spare switch backbone \$51k	
	1 Spare switch module \$40k	
	3 Spare PCI cards \$6k	
	3 Spare ATM cards \$12k	
	Total \$109k	
	Total including spares \$414k	
	Including 30% contingency \$538k	
1.3.2	Computer for Level3 PC Farm / DAQ	\$642,496.00
	<u>Notes</u>	
	Computer purchase is part of the operations but the cost is listed here for convenient tracking.	
	We work with the assumption that every three years PCs become obsolete and have to be replaced.	
	The assumption is that a computer costs about \$1500. This number is probably going to be smaller since in the last years the computers have only gotten cheaper. Some farms group have bought computers recently for this price.	
	It is not useful to get a more detailed quote at this point since the prices are going to vary.	

WBS	Name	Cost
"Computer for Level3 PC Farm / DAQ" continued		
<u>Notes</u>		
In terms of the human resources this project is rather light weight. The preparation work on the prototype takes 50% of the postdoc/researcher type plus 50% of one student. It takes two students 50% of their time supervised by a postdoc/researcher type to complete the installation and commissioning.		
1.4	Calorimeter upgrades	\$204,480.00
1.4.1	Electromagnetic timing	\$204,480.00
1.8	Installation of Run IIB	\$555,437.00
1.8.1	Roll Out From Run 2A	\$44,205.60
1.8.2	Assembly Hall Tasks	\$395,799.20
1.8.3	Run IIB Roll in	\$64,612.20
1.9	Administration	\$466,480.00
<u>Notes</u>		
This summary task covers all the administrative costs associated with the design and construction of the CDF Run IIB project.		
1.9.1	Fiscal Years	\$0.00
<u>Notes</u>		
This summary task will hold tags for the Fiscal years.		
1.9.2	Design Phase	\$65,500.00
<u>Notes</u>		
This task covers all the administrative costs associated with the design phase of the project. This task will be complete when the project has been baselined, and received CD-3.		
1.9.3	Construction Phase	\$400,980.00
<u>Notes</u>		
This summary task covers the administrative costs incurred during the construction phase of the project. It will be complete when the construction of all other subprojects is complete.		
2	CPR2April10	\$945,050.28
3	tempDAQ	\$1,199,907.20
4	EMTimingOct01	\$204,480.00
5	I & I V3.0	\$555,437.00
6	AdminJan02	\$466,480.00