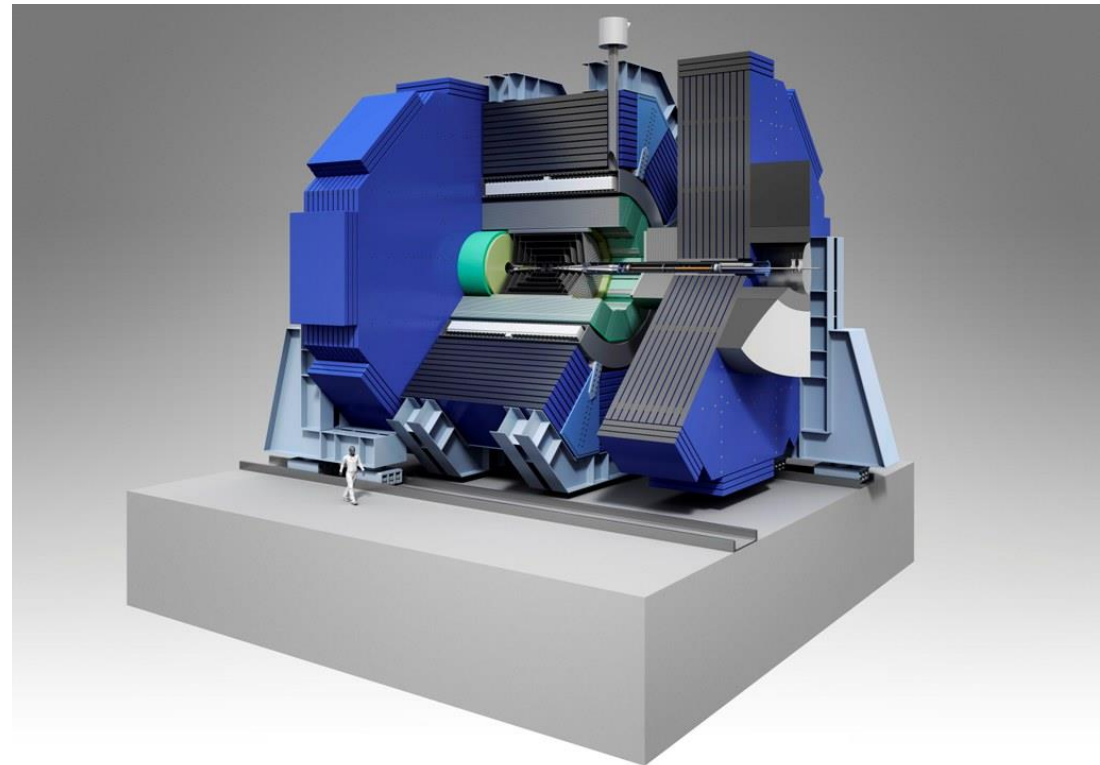
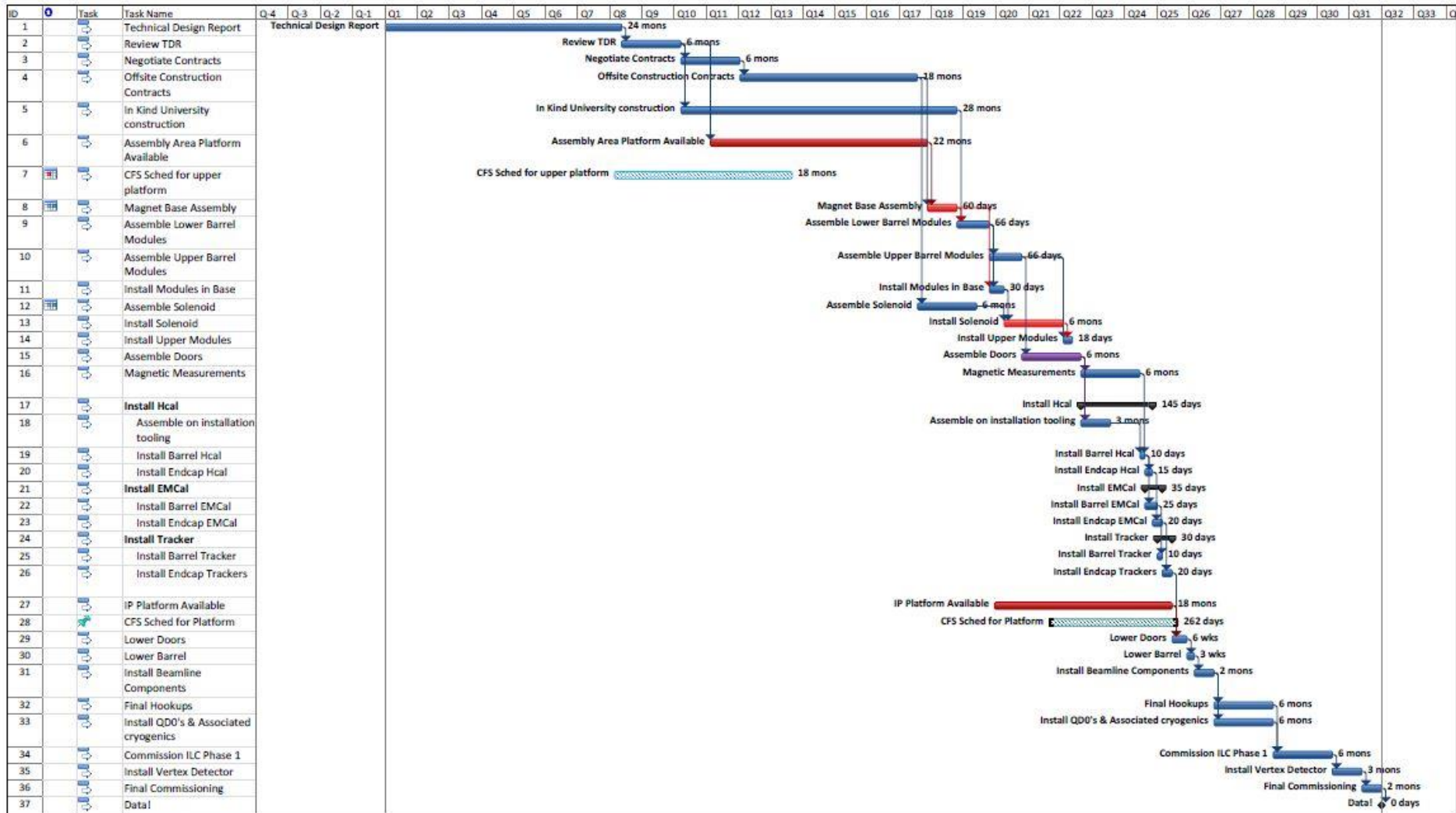


## Assembly Planning for SiD

Steps towards a project completing in the 2020's

Marcel Stanitski, Martin Breidenbach





Project: Simplified Assembly Schedules Date: Fri 10/17/14	Task	Summary	External Milestone	Inactive Summary	Manual Summary Rollup	Finish-only	Deadline
Split	Project Summary	Inactive Task	Manual Task	Manual Summary	Deadline	Progress	
Milestone	External Tasks	Inactive Milestone	Duration-only	Start-only	Progress		

People Power Estimates

Units are FTE's

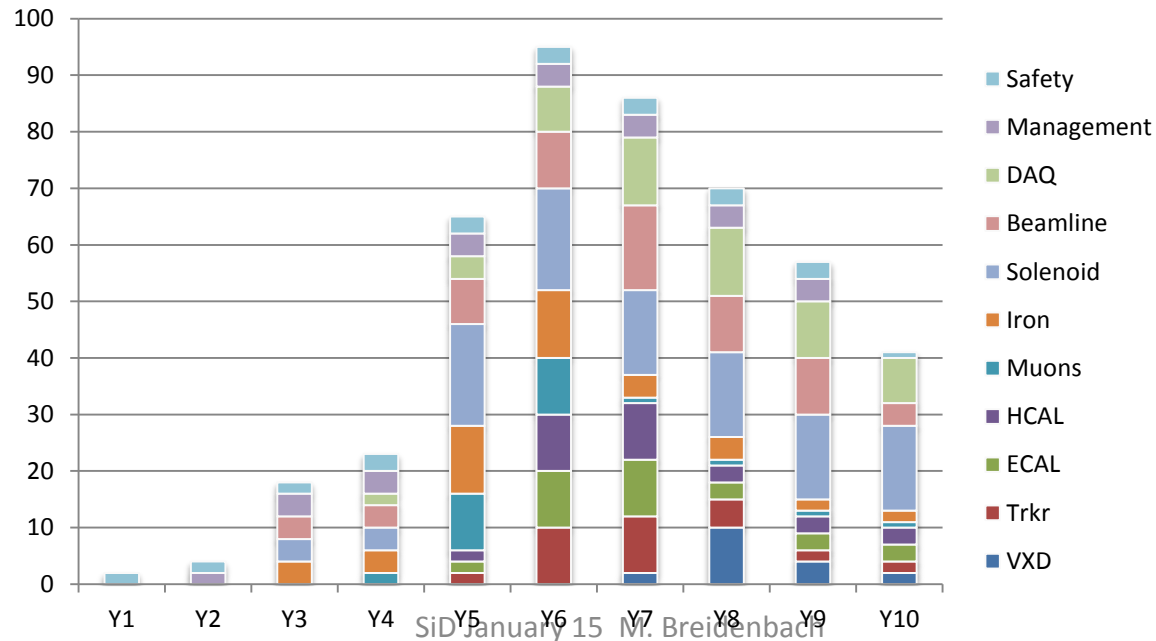
The indicated years correspond to the Simplified Assembly Schedule

		Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	
VXD	Site								2	10	4	2
	Lab							2	8	6	5	5
Trkr	Site						2	10	10	5	2	2
	Lab					2	2	2	5	5	5	5
ECAL	Site						2	10	10	3	3	3
	Lab					2	2	3	4	5	5	5
HCAL	Site						2	10	10	3	3	3
	Lab					2	2	3	4	5	5	5
Muons	Site					2	10	10	1	1	1	1
	Lab				2	2	3	3	2	2	2	2
Iron	Site				4	4	12	12	4	4	2	2
	Lab											
Solenoid	Site				4	4	18	18	15	15	15	15
	Lab											
Beamline	Site				4	4	8	10	15	10	10	4
	Lab					2	4	4	5	4	2	2
DAQ	Site					2	4	8	12	12	10	8
	Lab					2	2	2	2	2	2	2
Management	Site			2	4	4	4	4	4	4	4	0
	Lab		2	2	2	2	2	2	2	2	2	2
Safety	Site		2	2	2	3	3	3	3	3	3	1
	Lab		2	2	2	2	2	2	2	2	2	2
Totals	Site		2	4	18	23	65	95	86	70	57	41
	Lab		4	4	6	16	19	23	34	33	30	30
	All		6	8	24	39	84	118	120	103	87	71

Site is the assembly area; Lab is the greater ILC lab excluding the assembly area.

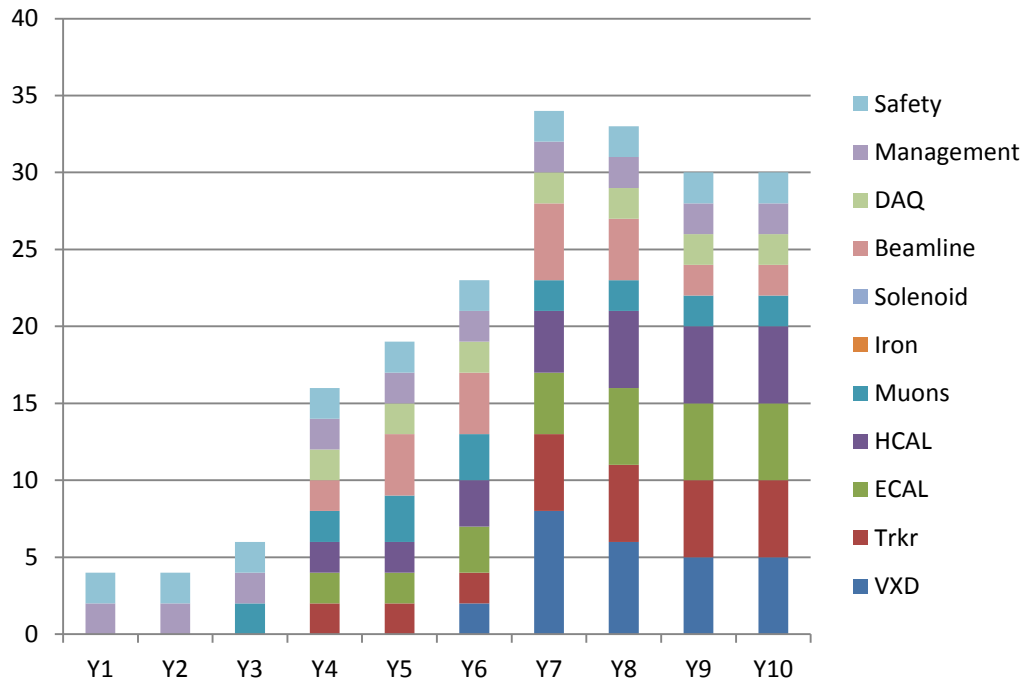
# People on the assembly site

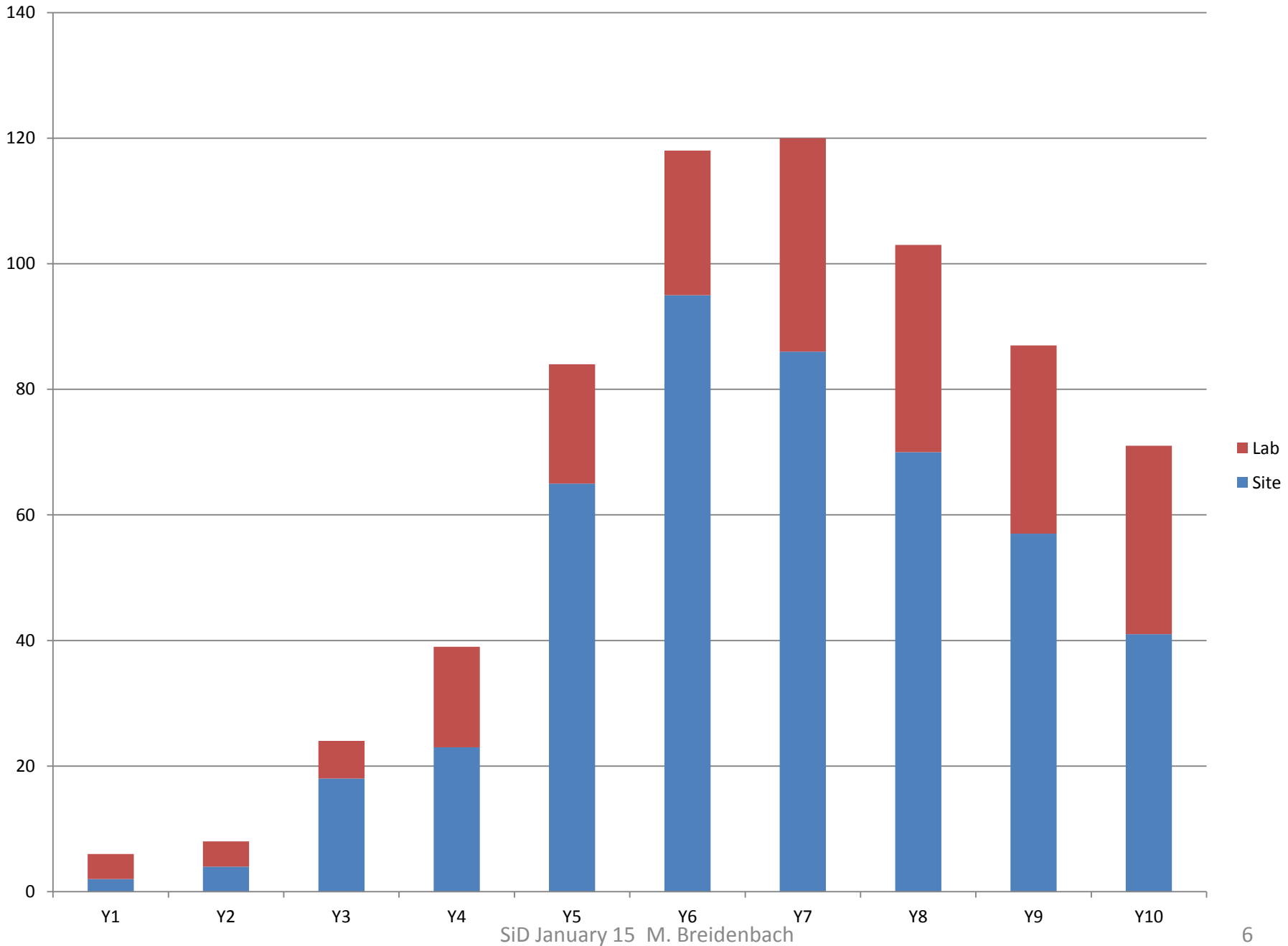
	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10	
VXD	0	0	0	0	0	0	0	2	10	4	2
Trkr	0	0	0	0	0	2	10	10	5	2	2
ECAL	0	0	0	0	0	2	10	10	3	3	3
HCAL	0	0	0	0	0	2	10	10	3	3	3
Muons	0	0	0	0	2	10	10	1	1	1	1
Iron	0	0	4	4	4	12	12	4	4	2	2
Solenoid	0	0	4	4	4	18	18	15	15	15	15
Beamline	0	0	4	4	4	8	10	15	10	10	4
DAQ	0	0	0	0	2	4	8	12	12	10	8
Management	0	2	4	4	4	4	4	4	4	4	0
Safety	2	2	2	2	3	3	3	3	3	3	1



# People at the lab, but not at the detector assembly site

	Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10
VXD	0	0	0	0	0	0	2	8	6	5
Trkr	0	0	0	0	2	2	2	5	5	5
ECAL	0	0	0	0	2	2	3	4	5	5
HCAL	0	0	0	0	2	2	3	4	5	5
Muons	0	0	2	2	2	3	3	2	2	2
Iron	0	0	0	0	0	0	0	0	0	0
Solenoid	0	0	0	0	0	0	0	0	0	0
Beamline	0	0	0	2	4	4	5	4	2	2
DAQ	0	0	0	2	2	2	2	2	2	2
Management	2	2	2	2	2	2	2	2	2	2
Safety	2	2	2	2	2	2	2	2	2	2





SiD January 15 M. Breidenbach

# Comments

- The indicated people are our ~guess at how many people are required at the lab and at the assembly area to assemble and commission SiD.
- We assume that reasonable internet bandwidth is available early on, and that significant subsystem testing is handled remotely.
- We do not count people who may or may not come to the lab to analyze data.

# Costs, with costed labor

		M&S	M&S Contingency	Labor	Labor Contingency	Total
	1.1 SiD	\$314,852,164	\$126,733,665	\$80,366,566	\$17,217,458	\$539,169,853
1.1.1	Beamline Systems	\$3,680,000	\$1,423,000	\$1,525,864	\$367,078	\$6,995,942
1.1.2	Vertex Detector	\$2,797,000	\$2,034,750	\$2,810,540	\$953,667	\$8,595,956
1.1.3	Tracker	\$18,505,740	\$6,962,229	\$8,615,351	\$2,420,633	\$36,503,953
1.1.4	EM Cal	\$104,801,828	\$47,108,354	\$30,823,543	\$4,626,445	\$187,360,170
1.1.5	HCal	\$51,179,488	\$23,551,730	\$4,553,357	\$1,195,690	\$80,480,265
1.1.6	Muon Tracker	\$8,299,900	\$3,038,965	\$2,854,857	\$779,604	\$14,973,326
1.1.7	Electronics	\$4,899,907	\$1,649,917	\$9,688,085	\$1,598,125	\$17,836,035
1.1.8	Magnet	\$115,664,500	\$39,710,950	\$6,364,915	\$1,908,932	\$163,649,298
1.1.9	Installation	\$4,102,800	\$1,082,070	\$4,009,599	\$1,130,925	\$10,325,394
1.1.10	Management	\$921,000	\$171,700	\$9,120,454	\$2,236,359	\$12,449,513
These numbers do not include indirects or escalation						
Labor Cost correspond to paying for labor at US National Laboratory rates, with benefits but no overhead.						



# Labor by subsystem and category, people-years

	Project Mechanical Engineer	Project Electronics Engineer	Electronics Engineer	Electronics Tech	Mechanical Engineer	Mechanical Designer	Mechanical Tech	Alignment Engineer	Cryogenics Engineer	Software Engineer	Electrical Engineer	Machinist	Power Conversion Engineer	Electrician	Iron Worker	Plumber	Rigger	Integration Engineer	QA Engineer	Safety Engineer	Scheduler	Accountant	Administrative Assistant	Procurement Officer
Beamline Systems			2	4	2	2	4																	
Vertex Detector				2	6	4.5	11	1.5	0.5															
Tracker				17	24	13	23																	
EM Cal				174	13	12	102																	
HCal				11	13	12	5																	
Muon Tracker				6	4	4	12	1																
Electronics			21	42						20	3													
Magnet			3.5	5	16	13.5	6.5	0.1	5.5	3		0.5	1											
Installation				3	4		11	0.7	1				0.25	4.5	6.5	3.5	5							
Management	7	7																10	8	10	5	10	15	18

# Conclusions

- There are “technical” and “philosophical” issues that must be resolved before significant forward progress on SiD, but almost all fade next to waiting for a decision from Japan.

