

Detector Costing Guidelines
M. Breidenbach 21 July 2006
Updated 18 September 2006

This is a proposed set of costing guidelines that possibly are a rational compromise between ILC machine estimating desires and plausibility:

1. Estimate labor in units of MY and type – e.g. years of Mechanical Engineer. The estimate should be “most likely” need.
2. Estimate uncertainty in each labor type as a fraction. The uncertainty should extend to “high confidence” of adequacy.
3. Estimate M&S in any local currency, using 2005 or 2006 numbers. Same approach for central value and uncertainty.
4. Keep any escalation as an easily separated contribution.
5. Keep any indirect costs (institutional overhead) as an easily separated contribution.
6. Do not cost R&D through the TDR.

Treaty Points with ILC Machine

1. Assume that Final Focus quadrupoles, BPM's, etc are provided by ILC, but the inboard beamline is a detector responsibility.
2. Assume that detectors will not cost energy spectrometers or polarimeters.
3. Assume that R&D and TDR stages will produce “serious” prototypes of tooling and detectors. However, full scale tooling should be costed in the estimate.
4. Do not cost IR bridge cranes, but cost all portable Hoisting and Rigging equipment including fork lifts and man lifts (including rented crane for lowering detector parts down shaft).
5. Cost all local equipment, such as welding machines, small machine shop, etc.
6. Assume required AC power and LCW are available at the IR wall. Assume only “nominal” HVAC and lighting.
7. Include detector integration and assembly.
8. Include all staff for safety and QA.
9. Include online computing and data storage and networking.
10. Include offline computing (not including physicist desktop systems).

Attempt to agree on important unit costs. Otherwise make as clear as possible what is being assumed in a separate unit cost table. Suggested candidates are:

Tungsten	(Kilogram)	May need separate costs by thickness
Si Detector	(cm ²)	May need separate costs by type
Solenoid	(megajoule)	Is this a reasonable way to parameterize?
Multilayer PCB	(m ²)	PCB for detector planes, not electronics
Machined Iron	(Kg)	Iron for the magnet, fabricated & assembled

For SiD:

Use the WBS program. Describe the item in the WBS Dictionary note. Describe the basis of estimate in the BOE note. Use hyperlinks as appropriate. If you don't have it, get wbs from www-sldnt.slac.stanford.edu/wbs. We will "agree" on labor rates in the labor table later.

Each subsystem will include its electronics up to the treaty point- which is the fiber optic coupler leading to the second stage concentration. However, all of the development costs of the electronics will be in the electronics section.

Escalation and Indirects will be calculated separately.