

**CALIFORNIA INSTITUTE OF TECHNOLOGY**  
Laser Interferometer Gravitational Wave Observatory (LIGO) Project

To/Mail Code: Distribution/18-34  
From/Mail Code: Phil Lindquist/18-34  
Phone/FAX: 395-3193/304-9834  
Refer to: LIGO-T010065-00-P  
Date: June 6, 2001

**Subject:** LIGO Technical Review Board (TRB) Meeting Minutes - May 18, 2001

**Keywords:** Change Control, Technical Review Board, Civil Construction, Hanford, Office and Support Building (OSB)

**Attendees**

B. Barish	M. Coles (tel.)	D. Coyne (tel.)	T. Frey
P. Lindquist	O. Matherny (tel.)	F. Raab (tel.)	G. Sanders (tel.)
D. Shoemaker (tel.)	G. Stapfer (tel.)	R. Weiss (tel.)	

**Overview**

A LIGO Technical Review Board (CCB) was held on Friday, May 18, 2001 to discuss a proposed Office and Laboratory Building at Hanford.

As a result of favorable construction costs we are in a position to consider returning scope to the Construction Project that was removed during Civil Construction to preserve and manage Contingency. The office space in the existing Office and Support Building (OSB) is inadequate. In the original design, the OSB was larger, but it was scaled down to assure adequate contingency. In addition, laboratory space is insufficient, and there is no auditorium.

In the initial plan for the new structure Hanford proposed to locate the building adjacent to the existing OSB. However, the Detector Group recognized that the new building presents an opportunity remove sources of vibration away from the technical slab in the Laser and Vacuum Equipment Area (LVEA). Some simple experiments were performed, and Hanford determined that at about 700 feet, the impact of human activity begins to drop off. The current location proposed for the new building is 775 feet from the Technical Slab. There is a trade-off in ease of access to the LVEA by the Hanford staff.

The new building is designed to provide office space, additional laboratory space, and an auditorium. Hanford had planned to renovate the Staging Building to provide some additional space. With the new building as proposed, the staging building renovation will be scaled back, and activities will be moved directly to the Office and Laboratory Building. There will be two good-sized laboratories, 11 offices, and shipping/receiving bays. The laboratories include space that will be used for Advanced LIGO.

A preliminary schematic package was provided and distributed for discussion. It included:

- “LIGO Preliminary Schematic Design”, NTD#: 2001-0109, NTD Architects, May 15, 2001
- “Schematic Design NTD Architects,” A CD dated May 17, 2001 prepared for Caltech LIGO, Hanford WA proposed Office/Lab
- Proposed Office/Laboratory Building Floor Plan, NTD Architects, dated May 17, 2001
- Proposed Office Laboratory Site Plan, NTD Architects, dated May 17, 2001
- LIGO Office & Laboratory Building, Hanford, Washington, Trial Cost and Budget Analysis, NTD Architects, dated 15-May-00 (sic).

These documents showed the locations, footprints, and elevations of the buildings as well as views from the building.

## **Discussion**

The control of traffic to and from the old OSB was discussed. The objective is to allow transport as needed but not to promote it on a general basis. There will be walkways place to encourage use. Bicycles were suggested.

The old optics lab will continue to be used for final optics assembly. The bake area for optics also will stay in the OSB. The new building will be the site for three bake ovens (in the large laboratory). There is motivation to move this activity since it has proved to be one of the noisiest due to vacuum pumps, water de-ionizers, bell jar handling, etc.

The clean water skid will be placed high in the new shipping and receiving area. The current skid is thought to be the second largest source of vibration in the LVEA (air handler #4 is biggest source.)

All Control and Data System (CDS) equipment will go into the old Mass Storage Room.

Laboratory A in the new building is planned to be 1189 square feet, Laboratory B 540 square feet. The height of the building is 20 feet providing a room height of approximately 16 feet. Possible lowering of the building height over the offices and LDAS area was suggested as a possible cost saver.

The auditorium will be big enough to provide seating for at least 160. The final layout will consider the design features of the auditorium at Livingston and satisfaction with seating space and aisles there.

Albert Lazzarini was given an action to identify the requirements for temperature control (as well as any other requirements) for the LDAS area.

The conference room in the new building is approximately 400 square feet.

Barry Barish questioned whether the reception area is big enough (currently a bit smaller than 210 square feet).

Fixtures for the laboratories are not part of the proposed contracts.

Cleanliness issues in the clean rooms were discussed. Our clean rooms use standard construction techniques, and this is an opportunity, perhaps, to do better. Some high particle counts have been observed, although they may not be attributable to the materials used in the clean rooms. A large amount of activity in the portable clean rooms accompanied by insufficient air flow was suggested as a possible source of the problem. Air flow is important and the new laboratories will have much better laminar flow.

### **Cost Estimate**

The estimated cost per square foot is \$155, which compares favorably with recent historical costs for similar buildings nationwide and is the same cost per square foot used to establish a planning budget for the building when the location adjoined the OSB. However, the total estimate of \$2.5 to 2.6 million exceeds the planning budget set aside. Cost drivers include relocating the building remotely from the current OSB and the attendant increased cost of utilities, the relocation of some of the infrastructure from the OSB, and the additional landscaping (sidewalks) to encourage foot traffic. These costs will be offset somewhat by reduced costs for Staging Building renovations.

### **Schedule**

Noisy digging will be completed by the end of March, and the building will be completed by August 2002. The plan is to do the rough grading as a separate contract to be initiated as soon as possible and in parallel with other work. It is anticipated that this can start in September of this year.

### **Recommendation**

Prepare a Change Request and schedule a LIGO Change Control Board (CCB).

PEL:pel

attachments:

- "LIGO Preliminary Schematic Design", NTD#: 2001-0109, NTD Architects, May 15, 2001 (not distributed, contact LIGO Document Control Center for copy)
- "Schematic Design NTD Architects," A CD dated May 17, 2001 prepared for Caltech LIGO, Hanford WA proposed Office/Lab (not distributed, contact LIGO Document Control Center for copy)
- Proposed Office/Laboratory Building Floor Plan, NTD Architects, dated May 17, 2001 (not distributed, contact LIGO Document Control Center for copy)
- Proposed Office Laboratory Site Plan, NTD Architects, dated May 17, 2001 (not distributed, contact LIGO Document Control Center for copy)
- LIGO Office & Laboratory Building, Hanford, Washington, Trial Cost and Budget Analysis, NTD Architects, dated 15-May-00 (sic).

Distribution:

R. Bork	J. Camp	M. Coles	D. Coyne
K. Duncan	E. Jasnow	F. Kaufman	A. Lazzarini
O. Matherny	I. Petrac	F. Raab	D. Shoemaker
G. Stapfer	R. Weiss	S. Whitcomb	J. Worden
M. Zucker			

cc:

B. Barish	G. Sanders
Chronological File	Document Control Center