

Review of "Requirements on the Building Structures that will House the Vacuum Chambers of the Laser Interferometric Gravitational Wave Detectors"

In his memo of 3 Oct 88 Yekta Gursel has written a list of requirements for the LIGO chamber station buildings. As the author notes in his closing paragraph, the list is not exhaustive. Nevertheless, the reviewer finds the paper to be quite comprehensive and a useful basis for planning of the LIGO station buildings. This reviewer has just a few comments which appear below.

The memo was written as if there are no constraints of a pecuniary nature, and that is certainly the correct initial approach toward a building requirements document. Neither can this review contain a fine analysis of such considerations, because the detailed information required is not available to the reviewer. Nevertheless, this review will point out a few of the listed requirements that seem excessive in view of their likely cost. It should be kept in mind that many cost-benefit trade-offs will have to be made as plans become more detailed.

The reviewer assumes that the safe-entry warning light referred to in §I is a "lasers-on" light. If other conditions are envisioned which would make entry into the chamber area unsafe then they should be discussed more fully.

In §II the author requires overalls and slippers. These precautions are undoubtedly required for work in and around open chambers, but the reviewer wonders whether this degree of cleanliness is necessary or even attainable during routine, closed-chamber operation. Rai Weiss is working on a document on dust contamination on mirrors and other optical components. The memo should be available in mid-December. With that input, a decision on the degree of cleanliness which is necessary should be achievable.

The loading dock described in §III is unnecessarily elaborate. This reviewer cannot imagine that any room into which trucks are driven can be kept clean, and the requirement of an enclosed rather than an open loading dock seems an unnecessary expense. A system in which forklifts and hand trucks carry packages from the truck to a shipping room should be adequate.

This reviewer disagrees with the §X requirement for machine shop facilities at each LIGO station. The offices, shops, and service areas ought to be integrated into the LIGO central station. It will not be so difficult to transport small parts back and forth between central, mid, and end stations, and one cannot imagine that a machine shop comprehensive enough to handle large parts can be duplicated five or more times at each site.

One consideration which has been left out of Yekta's memo is storage space, and there should be some discussion of how much storage space will be required. This reviewer anticipates that clean storage area will be needed for optical components, as well as a fair amount of standard closet and storage space.

Michael Burka
30 November 88