

LIGO PROJECT

CALIFORNIA INSTITUTE OF TECHNOLOGY
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FACSIMILE COVER SHEET

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TO Marty Tellalian
CBITSC

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FROM Larry K. Jones
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Our comments to your letter on alternate cleaning evaluation. I'll mail the original.

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1/24/94

Chicago Bridge & Iron Technical Services Company
1501 North Division Street
Plainfield, IL 60544-8929
Attn.: M. L. Tellalian

Reference: Contract C146 for LIGO Beam Tube Modules

Subject: Your letter of January 10, 1994, "Additional Cleaning
Procedure Development and Coupon Preparation, CBI WBS
Change #720"

Please consider the following modifications to the proposed contract change letter:

1. For clarity, adopt a standard format at the start of the letter as an "executive summary" for all change requests. The following is a suggested format for change requests, using the Alternative Beam Tube Section Cleaning as an example:

CHANGE ORDER REQUEST

- **Title:** Alternative Beam Tube Section Cleaning
- **Description:** (See attached technical discussion for details)
 - Investigate alternative cleaning materials for beam tube sections.
 - Develop alternative coupon cleaning procedures and prepare cleaned coupons for evaluation by Caltech.
- **Reason:** This additional work is outside the scope of the existing contract, which specifies Oakite 33 for cleaning beam tube sections. Data to date show Oakite 33 to be not acceptable due to:
 - Oakite 33 may be expensive to handle and dispose of.
 - Specified procedure is not effective in removing hydrocarbons (weld coupons showed hydrocarbons under black light inspection after cleaning).

- **Estimated Price:**

- Stage 1: \$XXXX
- Subsequent Stages: \$XXXX

2. The following modifications are desired in the technical discussion of the letter (to be modified and attached to the Change Order Request):

- a. all coupons should be hydrocarbon contaminated before cleaning in a controlled, representative way. This will reveal differences in cleaning effectiveness.
- b. an initial screening should be performed by black light to simplify the evaluation process. Any process that leaves hydrocarbon residuals detectable by black light should be eliminated from further testing (except for the Oakite 33 process currently specified, which will serve as the baseline).
- c. considering the limitation of the LIGO outgassing equipment to making three measurements in parallel, the preparation of coupons should be performed in stages to allow concentration on the most desirable alternative processes from both a cost and disposal standpoint. Please give your price estimate on a "per stage" basis.

Stage 1: process coupons cleaned with Oakite 33 and two alternative processes; send to the LIGO team for surface analyses and H2 outgassing tests. The alternative processes would be chosen in priority order in terms of desirability to CBI and their capability to pass the black light screening test. Caltech will review the test data and give approval for CBI to proceed with the next stage, if needed.

Stage 2: process coupons cleaned with three additional processes, again chosen in priority order.

Sincerely,



Larry K. Jones
Beam Tube Technical Manager

cc: W. Althouse
F. Asiri
M. Humphrey
I. Petrac
G. Stapfer
R. Weiss