

EXHIBIT II

**DELIVERABLE DOCUMENTATION
LIGO VACUUM EQUIPMENT**

- A. The deliverable documentation of this contract is summarized in the following Contract Data Requirements List (CDRL), which identifies the items to be delivered and when delivery is required, the quantity and type of each item, and frequency of issue. Documentation shall be delivered as early as available but no later than the date specified in the CDRL. The Data Requirement Description (DRD) forms referenced in the CDRL describe the specific requirements for the item(s) to be delivered.
- B. The Contractor shall display on the cover or title page of all deliverable non-design documentation (i.e., all documents except drawings and specifications) the following minimum information:
- Document Title
 - Contractor's Name
 - Contract Number
 - Document Number (Institute and/or Contractor assigned)
 - Program Identification — LIGO
 - Date of Issue
 - CDRL Line Item Number
 - Approval Status
- C. The approval code on the CDRL is defined as follows:
- A= Submitted for LIGO's approval.
X= LIGO approval not required.
- D. The following applies to all data submitted for approval:
1. The Contractor shall submit the approval draft on or before the date indicated.

2. If the draft is approved, the Contractor will be notified in writing by the LIGO Contract Technical Manager. The Contractor shall then prepare and deliver final copies as indicated in the CDRL.
3. If the submitted approval draft requires significant Contractor modifications before approval will be granted, the following steps shall be taken:
 - a. The required modifications will be discussed between the cognizant parties and a letter itemizing said changes will be sent by the LIGO Contract Technical Manager to the Contractor.
 - b. The Contractor shall submit an updated draft, containing the required modifications.
 - c. If the updated draft is approved, the Contractor will be notified in writing by the LIGO Contract Technical Manager. The Contractor shall then prepare and deliver final copies as indicated in the CDRL.

The approval requirements for revisions shall be the same as applied to the original data item submittal unless otherwise specified.

4. All documentation is to be delivered to the Document Control Center (DCC) in care of Ms. Linda Turner, LIGO Project, Mail Stop 102-33, California Institute of Technology, 391 So. Holliston Ave., Pasadena, CA 91125. The Document Control Center will be the point of official receipt and distribution.

CONTRACT DATA REQUIREMENTS LIST

CDRL NO	TITLE OR DESCRIPTION OF DATA	APPROVAL CODE	FREQUENCY OF ISSUE	DATE DUE TO USER	QUANTITY		REMARKS
					ORIG.	COPIES	
01	Phase A Preliminary design	A	Once	10 days prior to PDR ¹	1	3	¹ Preliminary Design Review
02	Phase A Project Management Plan	A	Once	10 days prior to PDR	1	3	
03	Phase A Fixed Price Proposal	X	Once	10 days prior to PDR	1	3	
04	Phase B Updated Preliminary Design						
	Draft	X	Once	10 days prior to updated PDR	1	3	
	Final	A	Once	30 days ARC ²	1	3	² After Receipt of comments

*See remarks column

CONTRACT DATA REQUIREMENTS LIST

CDRL NO	TITLE OR DESCRIPTION OF DATA	APPROVAL CODE	FREQUENCY OF ISSUE	DATE DUE TO USER	QUANTITY		REMARKS
					ORIG.	COPIES	
*05	Project Management Plan						
	Draft	X	Once	10 days prior to PDR	1	3	
	Final	A	Once	30 days ARC	1	3	
06	Final Design						
	Draft	X	Once	10 days prior to FDR	1	3	
	Final	A	Once	30 days ARC	1	3	
07	Preliminary Design Review Data Package	X	Once	10 days prior to PDR	1	3	Presentation material
08	Final Design Review Data Package	X	Once	10 days prior to FDR	1	3	Presentation material
09	Acceptance Test Report	A	Once	TBD	1	3	
10	Acceptance Test Review Data Package	X	Once	10 days prior to ATR	1	3	Presentation material
11	Minutes	X	Once for each Meeting	1 week after Meeting	1	3	
12	Status Report	X	Monthly	15 days after Meeting	1	0	

*All CDRLs on this page are Phase B deliverables

**Data Requirement Description (DRD)
for CDRL No. 01: Preliminary Design**

Purpose: To document the design of the LIGO overall vacuum system and substantiate that the design meets the requirements.

Preparation Instructions: Assemble a package of plans, drawings, specifications procedures, calculations etc. which describe the overall vacuum system design. This data package shall include as a minimum the items described in the contract Statement of Work (Article I, paragraph 1) Additional information which may be required to fully describe and assess the adequacy of the system design shall also be included in this data package.

**Data Requirement Description (DRD)
for CDRL No. 02: Project Management Plan**

Purpose: To provide the basic operating plan for the project which allows for detailed scheduling, work progress reporting, and tracking of termination liability.

Preparation Instructions: Prepare a Project Management Plan describing the planned implementation of the effort in Statement of Work (Article I, paragraph 2). The Plan shall serve as a baseline document for project scheduling, for work progress monitoring and reporting and for tracking the termination liability. The Plan shall include:

- I. A Work Breakdown Structure (WBS) reflecting the negotiated scope of work, in a products oriented fashion.
- II. A WBS Dictionary narratively describing the scope of each WBS element, including the products (hardware, design, specs, etc.) which are produced within the element..
- III. A Project Schedule which includes the schedules for implementation of all WBS elements, showing pertinent milestones.
- IV. A summary Schedule, based on the detail schedule showing the contract deliverables.
- V. Configuration Management Plan including Documentation Control.
- VI. Quality Assurance Plan.
- VII. Safety Plan
- VIII. Summary labor-loading projections, by quarter.
- IX. Spending profile by quarter.
- X. Procurement Plan.

**Data Requirement Description (DRD)
for CDRL No. 03: Fixed Price Proposal**

Purpose: To provide a fixed price cost proposal for the design and construction of the Vacuum Equipment at the two LIGO sites.

Preparation Instructions: The Fixed Price Proposal shall be provided as in the contract Statement of Work (Article 1. paragraph 3). The Fixed Price Proposal shall be detailed to the lowest levels of the WBS as defined in the Project Management Plan (CDRL No. 02).

**Data Requirement Description (DRD)
for CDRL No. 04: Updated Preliminary Design**

Purpose: To document the design of the LIGO overall vacuum system and substantiate that the design meets the requirements.

Preparation Instructions: Assemble a package of plans, drawings, specifications procedures, calculations etc. which describe the overall vacuum system design. This data package shall include as a minimum the items described in the Exhibit V, Phase B Scope of Work, Delivery or Performance Schedule, and Price and Payment. Additional information which may be required to fully describe and assess, the adequacy of the system design shall also be included in this data package.

**Data Requirement Description (DRD)
for CDRL No. 05: Project Management Plan**

Purpose: To provide the basic operating plan for the project which allows for detailed scheduling, work progress reporting, and tracking of termination liability.

Preparation Instructions: Update and revise the Project Management Plan generated for CDRL no. 02 of Phase A as described in Exhibit V, Phase B Scope of Work, Delivery or Performance Schedule, and Price and Payment.

**Data Requirement Description (DRD)
for CDRL No. 06: Final Design**

Purpose: To define and document the vacuum equipment design.

Preparation Instructions: Prepare a stand alone document, consisting of drawings, specifications, plans, procedures, etc., as described in Exhibit V, Phase B Scope of Work, Delivery or Performance Schedule, and Price and Payment.

**Data Requirement Description (DRD)
for CDRL No. 07: Preliminary Design Review Data Package**

Purpose: To present and substantiate the preliminary design for the vacuum equipment.

Preparation Instructions: The Data Package to be provided in support of the Preliminary Design Review shall contain all presentation material as well as backup data and information on all topics to be discussed at the review.

**Data Requirement Description (DRD)
for CDRL No. 08: Final Design Review Data Package**

Purpose: To present and substantiate the final design for the vacuum equipment.

Preparation Instructions: The Data Package to be provided in support of the Final Design Review shall contain all data and information on all topics to be discussed and presented at the Review.

**Data Requirement Description (DRD)
for CDRL No. 09: Acceptance Test Report**

Purpose: To document the acceptance test process and results.

Preparation Instructions: Substantiate that the vacuum equipment complies with the Design documented in CDRL No. 06 and the requirements in Exhibit V, Phase B Scope of Work, Delivery or Performance Schedule, and Price and Payment.

**Data Requirement Description (DRD)
for CDRL No. 10: Acceptance Test Review Data Package**

Purpose: To present all aspects of as built design and associated fabrication, installation and acceptance testing of the vacuum equipment, and to provide a permanent record of presented material and subsequent closeout of resultant action items.

Preparation Instructions: The Data Package to be provided in support of the Acceptance Test Review shall contain all data and information on all topics to be discussed and presented at the Review and shall include, but not be limited to, the following for each LIGO site:

- I. Test report excerpts documenting the results of the acceptance tests, in accordance with CDRL No. 09, Acceptance Test Report.
- II. Performance verification.
- III. As-built drawings.
- IV. Disposition of property procured under the contract or made available as Government furnished property.
- V. Remaining issues and open action items.

**Data Requirement Description (DRD)
for CDRL No. 11: Minutes**

Purpose: To document proceedings of all formal Institute/Contractor LIGO project meetings.

Preparation Instructions: The Minutes shall document proceedings of all formal Institute/Contractor project meetings. The Minutes shall include:

- I. A summary of all business transactions between the Contractor and the Institute, including any alterations and/or clarifications to the Review Data Package generated during the Review.
- II. Contractor action items and planned completion dates.
- III. Institute action items and planned completion dates.

**Data Requirement Description (DRD)
for CDRL No. 12: Status Report**

Purpose: To assess project progress and status.

Preparation Instructions: The Data Packages to be provided in support of the monthly progress meeting shall contain all data and information on all topics to be discussed and presented at a review, and shall include, but not be limited to, the following:

- I. All current technical contract activities.
- II. Updated schedules including milestones and other events accomplished or missed, reasons for delay and corrective measures taken.
- III. Problem areas, including those concerns requiring action(s), decision(s) or assistance on the part of the Institute.
- IV. Action items closed during the review period, progress of open action items, and identification of new action items.
- V. Response to technical direction received.
- VI. Cost status showing expenditures and obligations made at the WBS report item level, including in-house costs, vendor costs, open commitments, actuals verses budget, percent complete at the WBS element level and calculated termination liability.