



Statement of Work Fabrication of pylons for Advanced LIGO Optical lever

The following documents are incorporated into and made a part this purchase order. Click on the following LIGO Document Control Center (DCC) links to access these documents or go on line to the LIGO Public DCC at <https://dcc.ligo.org/> to access the DCC#.

1.0 Terms:

<u>DCC #</u>	<u>Description</u>
C080185-v1	Laser Interferometer Gravitational Wave Observatory (LIGO) Commercial Items or Services Contract General Provisions California Institute of Technology "Institute", LIGO Rev 11/12/08
F0810001-v4	Technical Direction Memorandum.

2.0 Quality Control:

<u>DCC #</u>	<u>Description</u>		
Q0900001-v4	Advanced LIGO Supplier Quality Requirements, dated 2/10/10, describes following contractor/supplier QA/QC actions for this procurement:		
<input checked="" type="checkbox"/>	3.1 Pre-Award Inspection	<input checked="" type="checkbox"/>	3.9 Discrepant Material Storage
<input checked="" type="checkbox"/>	3.2 Supplier In Process Quality Control	<input checked="" type="checkbox"/>	3.10 Quality Records
<input checked="" type="checkbox"/>	3.3 In Process Inspection	<input type="checkbox"/>	3.11 Drawing and Specification Change Control
<input checked="" type="checkbox"/>	3.4 Pre-Ship Inspection	<input checked="" type="checkbox"/>	3.12 Welding Certification
<input checked="" type="checkbox"/>	3.5 Receiving Inspection	<input checked="" type="checkbox"/>	3.13 End Item Data Package (including Certifications of Compliance)
<input checked="" type="checkbox"/>	3.6 Discrepant Material	<input type="checkbox"/>	4.1 Design Verification
<input type="checkbox"/>	3.7 Material Review Action	<input checked="" type="checkbox"/>	4.2 Raw Material Procurement
<input checked="" type="checkbox"/>	3.8 Material Review Actions at Contractor	<input checked="" type="checkbox"/>	4.3 Traceability of Materials
		<input checked="" type="checkbox"/>	4.4 Calibration Program
		<input type="checkbox"/>	4.5 Critical Interface
		<input checked="" type="checkbox"/>	4.6 Cleanliness
		<input checked="" type="checkbox"/>	4.7 Packaging
		<input checked="" type="checkbox"/>	4.8 Storage
		<input checked="" type="checkbox"/>	4.9 Transport
		<input type="checkbox"/>	4.10 Customs

For the above list the Supplier shall: 1) Identify the corresponding sections/paragraphs in their existing QA/QC system 2) meet or exceed the design requirements contained in the attached engineering documents for each area called out.

LIGO prefers to utilize the vendors existing QA/QC programs to the fullest extent possible consistent with the LIGO QA and QC requirements. All bidders are requested to submit a written description/plan of their existing QA/QC system with their quotes. The bidder must also submit QA/QC plans for managing subcontractor work and materials.

In the event that a prospective contractor lacks an existing quality system, the contractor/vendor shall develop and implement a quality assurance program in compliance with requirements negotiated at contract/PO award.

3.0 End Item Data Package:

At the time of delivery of the parts, the Supplier shall also provide the following data, as a minimum:

- Any as-built modifications (with approval of the LIGO Contracting Officer) as mark-ups to the drawings
- Material certifications
- Dimensional & QC inspection reports—this shall include a report showing that parts have been inspected and fall within specified tolerances. Inspection is required on 1st, last plus 10% of each run.
- Certificate or statement of compliance with all contract and drawing process restrictions.

4.0 Included Documents:

A set of drawings is included with this document. The lists of Assemblies and Drawings (by part number, revision and name) are included in table 1 and 2 of this document. The solid models (SolidWorks Professional 2010) used to create the drawings and assemblies are available for most of the models on request.

5.0 Scope:

This RFQ is for the fabrication of rigid welded stainless steel pylons and machined parts detailed in the drawings included in this package. These pylons will be bolted and grouted by ALIGO to the floor of the ALIGO experimental halls to support the Optical lever launch and receiver optics. Machined parts are components of assemblies which are to be install on the pylons. These weldments and parts will have to be clean and free of grease.

6.0 Quantity Required:

The total quantity required for each part, by drawing number is indicated in table 1 and 2.

7.0 Delivery Requirements:

The deliveries are FOB at these destinations, i.e. the contractor has responsibility for shipping title and control of goods until they are delivered and the transportation has been completed. The contractor selects the carrier and is responsible for the risk of transportation and for filing claims for loss or damage.

Shipping Locations:

These items will be shipped to:

LIGO Livingston Observatory (LLO)
Attn: Joe Hanson and Tom Gentry
19100 LIGO Lane
Livingston, LA 70754

LIGO Hanford Observatory (LHO)
Attn: Hugh Radkins and Jodi Fauver
127124 North Route 10
Richland, WA 99354

California Institute of Technology
391 S. Holliston Ave.
Pasadena, CA 91106
Extension: 4893
Mail Code: 1-85

Shipping Containers:

The contractor is responsible for providing shipping containers and transportation which protects these parts from damage from the transportation environment (weather, handling, accidents, etc.).

8.0 Manufacturing:

8.1 Precedence

The Statement of Work (SOW) sections below regarding processing or fabrication of the parts are meant to convey the scope and nature of the requested work. If there is a conflict between the SOW and the drawing, the drawing has precedence. The parts are to be produced using the drawings which will be included in the final released SOW package. If there are discrepancies between the drawings and the CAD model, the drawings takes precedence.

8.2 Welding

Welds are to meet MIL-STD-2219, CLASS C.

8.2.1 Weld Supplemental Notes

All lip and fold welding will be 50% stitch welding both on the fold and on the lip sides. The left and right-hand pylons are, apart from the mirror image, identical. Any missing information for the right hand pylon can be extracted from the drawings of the left ended one (they are obtained by simply folding the metal sheets in the opposite direction and welding them in mirror image fashion).

8.3 Finishing

As rolled bright stainless steel finish

8.4 Marking

Marking location is shown on the drawings.

All parts must be marked with a part number, revision code and serial number at the location indicated on the drawing. Marking is to be accomplished by mechanically scribing, stamping or engraving (no dyes or inks).

If not indicated in the drawing, mechanically scribe, stamp or engrave as follows:

<drawing number> - <revision code>, <type number if applicable>

<unique 3 digit serial number starting at 001 for the first part and incrementing thereafter>

As an example:

D0900026-v1

S/N – 001

The serial number must be a sequential 3-digit number, starting with 001, for each part.

Also where indicated, mechanically scribe, stamp, or engrave (no dyes or inks) any LABELS shown on drawing sheets.

9.0 Delivery Schedule:

Please refer to table 1 and 2 for the delivery schedule. Early shipping is acceptable and all shipping should be discussed with LIGO contract technical officer.

Table 1 Weldments & Footings

Total quantities required for each finished unit, destinations and delivery dates

Item Num	Drawing Number	Description	Total Quantity Ordered	WELDMENT "D" NUMBER COMPONENTS BOM	ASSEMBLY DELIVERY QUANTITIES & SCHEDULE		
					CalTech Pasadena CA	LIGO Hanford WA	LIGO Livingston, LA
					2/15/2011	3/30/2011	2/28/2011
1	D1000452-v2	aLIGO AOS OpLev TX Pier Weldment (TM)	12	(E1000332-v1) D1001655 D1000426 D1000425	2	6	4
2	D1001292-v1	aLIGO AOS OpLev & PhotCal RX Pier Weldment LH	6	(E1000333-v1) D1000835 D1000594-1 D1000595-1 D1000596-1	1	3	2
3	D1001297-v1	aLIGO AOS OpLev & PhotCal RX Pier Weldment RH	6	(E1000334-v1) D1000835 D1000594-2 D1000595-2 D1000596-2	1	3	2
4	D1001301-v1	aLIGO AOS OpLev TX Pier Weldment (PR3, SR3)	6	(E1000335-v1) D1001857 D1000426 D1001611-2	1	3	2
5	D1002207-v2	aLIGO AOS OpLev RX Pier Weldment LH (PR3, SR3)	4	N/A	1	1	2
6	D1002208-v1	aLIGO AOS OpLev RX Pier Weldment RH (SR3)	2	N/A	N/A	1	1
7	D1001854-v1	aLIGO AOS OpLev TRX Pier Weldment (HAM)	12	(E1000336-v1) D1001853 D1000426 D1001611-1	1	7	4
8	D1000434-v2	aLIGO AOS Pier Footing 1	33	N/A	5	18	10
9	D1000836-v2	aLIGO AOS Pier Footing 4	13	N/A	3	6	4

Table 2 Mechanical Parts*Total quantities required for each part, destinations and delivery dates*

Item Num	Drawing Number	Description	Total Quantity Ordered	BOM	DELIVERY QUANTITIES & SCHEDULE		
					CalTech Pasadena CA	LIGO Hanford WA	LIGO Livingston LA
					2/15/2011	3/30/2011	2/28/2011
1	D1000502-v3	aLIGO AOS OpLev TX Height Tube	36	N/A	4	20	12
2	D1000509-v1	aLIGO AOS OpLev TX Mounting Plate	12	N/A	2	5	5
3	D1000510-v1	aLIGO AOS OpLev TX Mounting Plate, 7.5 deg. Wedge	3	N/A	2	1	N/A
4	D1001449-v2	aLIGO AOS OpLev Large Telescope Mount	14	N/A	3	6	5
5	D1001452-v1	aLIGO AOS OpLev TX Enclosure Base	14	N/A	3	6	5
6	D1001627-v1	aLIGO AOS OpLev Mounting Plate (HAM)	19	N/A	1	12	6
7	D1001628-v1	aLIGO AOS OpLev Mirror Base	19	N/A	1	12	6
8	D1001646-v1	aLIGO AOS OpLev Telescope Mount Base	19	N/A	2	11	6
9	D1001647-v1	aLIGO AOS OpLev Telescope Clamp	19	N/A	1	12	6
10	D1001670-v1	aLIGO AOS OpLev Auxiliary View Finder Telescope Mount	14	N/A	3	6	5
11	D1001993-v1	aLIGO AOS OpLev TX Mounting Plate (PR3, SR3)	8	N/A	1	4	3
12	D1000428-v1	aLIGO AOS OpLev TX Mounting Base	20	N/A	3	7	10
13	Sheet 10 of 10 from drawing D1002207-v2		1	N/A	1	N/A	N/A