

## Statement of Work

### HAM Straight Crossbeam Weldment and HAM Crossbeam Connector Weldment for Advanced LIGO SI-151

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

#### 2.0 Quality Control:

<u>DCC #</u>	<u>Description</u>		
<a href="#">Q0900001-v3</a>	Advanced LIGO Supplier Quality Requirements, dated 4/15/09, describes following contractor/supplier QA/QC actions for this procurement:		
<input checked="" type="checkbox"/>	1.1 Design Verification	<input type="checkbox"/>	1.8 Storage
<input checked="" type="checkbox"/>	1.2 Raw Material Procurement	<input checked="" type="checkbox"/>	1.9 Transport
<input checked="" type="checkbox"/>	1.3 Traceability of Materials	<input type="checkbox"/>	1.10 Customs
<input type="checkbox"/>	1.4 Calibration Program	<input type="checkbox"/>	2.1 Pre-Award Inspection
<input checked="" type="checkbox"/>	1.5 Critical Interfaces	<input checked="" type="checkbox"/>	2.2 Supplier In Process Quality Control
<input checked="" type="checkbox"/>	1.6 Cleanliness	<input checked="" type="checkbox"/>	2.3 In Process Inspection
<input checked="" type="checkbox"/>	1.7 Packaging	<input checked="" type="checkbox"/>	2.4 Pre-Ship Inspection
		<input type="checkbox"/>	2.5 Receiving Inspection
		<input type="checkbox"/>	2.6 Discrepant Material
		<input type="checkbox"/>	2.7 Material Review Action
		<input type="checkbox"/>	2.8 Material Review Actions at Contractor
		<input type="checkbox"/>	2.9 Discrepant Material Storage
		<input checked="" type="checkbox"/>	2.10 Quality Records
		<input type="checkbox"/>	<b>As defined</b>

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.

#### 3.0 Included Documents:

<u>DCC #</u>	<u>Description</u>
<a href="#">D080456-v2</a>	HAM Straight Crossbeam Weldment (This weldment is made up of three parts: D080455-v2, D080454-v2, D080453-v2)
<a href="#">D080455-v2</a>	HAM Crossbeam Mounting Flange
<a href="#">D080454-v2</a>	HAM Crossbeam Clamp Plate
<a href="#">D080453-v2</a>	HAM Straight Crossbeam Tube
<a href="#">D080462-v2</a>	HAM Crossbeam Connector Weldment (This weldment is made up of four distinct parts: D080461-v2, D080460-v2, D080458-v2, D080459-v2)
<a href="#">D080461-v2</a>	HAM Crossbeam Connector Gusset
<a href="#">D080460-v2</a>	HAM Crossbeam Connector Mount Plate
<a href="#">D080458-v2</a>	HAM Crossbeam Connector Tube
<a href="#">D080459-v2</a>	HAM Crossbeam Connector HEPI Plate

## 4.0 Specification:

This SOW covers is for the manufacture of 2 distinct weldments, D080456-v2 and D080462-v2.

D080456-v2 is made up of three distinct parts in the listed quantities:

D080455-v2, qty: 2 per weldment,

D080454-v2, qty: 2 per weldment,

D080453-v2, qty: 1 per weldment.

D080462-v2 is made of four distinct parts in the listed quantities:

D080461-v2, qty: 7 per weldment,

D080460-v2, qty: 1 per weldment,

D080458-v2, qty: 1 per weldment,

D080459-v2, qty: 1 per weldment.

### 4.1. Manufacturing

#### 4.1.1. 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.

#### 4.1.2. Cleaning requirements for machining

1. All machining fluids must be water soluble (not simply water miscible) and free of sulfur, chlorine, and silicone, such as Cincinnati Milacron Cimtech 410.
2. Thoroughly clean part to remove all oil, grease, dirt, and chips.

#### 4.1.3. Material

This part is made from ASTM A36 steel and A500 Grade B steel.

#### 4.1.4. Machining

These parts shall be machined and welded to make the final two distinct weldment parts. Parts must satisfy tolerance requirements after welding. If necessary, surfaces on plates may be machined after welding.

#### 4.1.5. Finishing, painting, anti-rust

Plug all screw holes, both tapped and screws before finish work.

Paint surfaces except those indicated on drawings.

Prime: Sherwin Williams Industrial Wash Primer P60G2.

Paint: Medium Blue Sherwin Williams (Polane (R) T-PLUS Polyurethane Enamel).

Apply "Oxisolv Rust Inhibitor" to all unpainted surfaces, per manufacturer instructions.

Remove plugs from all holes.

#### 4.1.6. Marking

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:

D080456-v2

S/N – 001

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

#### 4.2. Quantity Required

A total quantity of 36 of the part D080456-v2 are required.

A total quantity of 72 of the part D080462-v2 are required.

#### 4.3. Delivery Requirements

The parts are to be delivered to our two observatories:

LIGO Livingston Observatory (LLO)

Attn: Joe Hanson and Tom Gentry

19100 LIGO Lane

Livingston, LA 70754

and

LIGO Hanford Observatory (LHO)

Attn: Hugh Radkins and Jodi Fauver

127124 North Route 10

Richland, WA 99354

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.

The contractor is responsible for providing shipping containers and transportation which protects these parts from damage from the transportation environment (weather, handling, accidents, etc.). In particular care must be taken to ensure that handling does not result in scratched or dented/nicked parts; point or line loads on the corners and edges can cause upsets in the part surfaces.

#### **4.4. Delivery Schedule**

Desired delivery schedule is as follows. If the bidding vendor can not meet this delivery requirement an alternate plan by the bidding vendor will be considered as part of the bid evaluation.

24 of part D080456-v2 to LHO by February 22, 2010  
48 of part D080462-v2 to LHO BY February 22, 2010

12 of part D080456-v2 to LLO by February 22, 2010  
24 of part D080462-v2 to LLO by February 22, 2010

#### **4.5. End Item Data Package**

At the time of delivery of the parts, the contractor shall 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
- Certificate or statement of compliance with all contract and drawing process restrictions