LIGO LABORATORY
California Institute of Technology
1200 E. California Blvd.
Pasadena, CA 91125

Statement of Work
Fabrication of D060492, Upper Structure Weldment
for Advanced LIGO AOS
C1105628

1.0 Scope:

This SOW is for seven (7) Upper Structure Weldments detailed in assembly drawing D060492 using parts fabricated from the drawings in the related documents list linked in the DCC file for D060492 plus fourteen (14) cross members, D060499-v4-type3, which will be bolted to the Upper Structure Weldments . These Weldments and parts are for use in an ultra high vacuum (UHV) system for the Transmission Monitor System (TMS) in Advanced LIGO and must strictly adhere to material specifications and cleanliness standards.

2.0 Document Access

Many supplemental documents and specifications are incorporated into and made a part this Statement of Work. Click on the document links to access these documents from the LIGO Document Control Center (DCC) or go on line to the LIGO Public DCC at https://dcc.ligo.org/ to access the DCC#.

3.0 Commercial Terms and Applicable LIGO Specifications:

Note: The documents listed below are invoked for this Statement of Work and comprise additional requirements which are integral to this Statement of Work.

- LIGO-C080185-v1 LIGO Commercial Items or Services Contract General Provisions
- LIGO-Q0900001-v5 Advanced LIGO Supplier Quality Requirements
- LIGO-Q1100003-v1 Acceptable Quality Level (AQL) for Inspection of LIGO Components
- LIGO-E0900364-v8 Metal Components for use in the Advanced LIGO Vacuum System
- LIGO-E0900048-v9 Welding Specification for Weldments used within the Advanced LIGO Vacuum System

4.0 Quality System:

Referring to the above referenced LIGO Specification Q0900001, Suppliers should include a copy of their current ISO 9001, AS9100, or TS16949 certification in their bid package. Suppliers lacking current certification should send a copy of their Quality Manual with their bid package.

Refer to LIGO-Q1100003-v1 for the AQL (Acceptable Quality Level) table. An AQL level of 1.0 is required for this structure meaning 100% of these Weldments should be inspected for quality.

5.0 Assembly to be Manufactured

D060492-v3	Drawing of final assembly of Upper Structure Weldment	quantity: 7
D060499-v4, type 3	Cross Member (equivalent to D060499-v3)	quantity: 14

6.0 Manufacturing:

6.1 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.

6.2 Restrictions

- Machine all surfaces of machined parts to remove oxides and mill finish. Abrasive removal techniques are not acceptable. No sanding or "Scotchbrite" abrasive methods shall be used on any surface on the interior of the storage containers.
- All machining fluids must be fully synthetic, water soluble (not simply water miscible) and free of sulfur, chlorine, and silicone.
- Thoroughly clean part to remove all oil, grease, dirt, and chips with soap and water. Follow with solvent (acetone) wipe. Pay close attention to holes.
- No epoxy or other non-approved material may be used.
- No repairs to parts except where LIGO approved; no unauthorized welding to fix machining errors

6.3 Materials

Materials are noted on the drawings.

6.4 Machining

All parts are to be machined. No grinding or lapping with abrasive wheels, cloth or stones is permitted. No sanding of any type. No parts shall be cast or molded. Water soluble (not just water miscible) cutting fluid (lubrication) is to be used for all machining operations. The use of cutting fluids or lubricants, which contain sulfur, chlorine or silicone compounds is prohibited.

6.5 Welding

Welding must adhere to LIGO welding specifications found in document E0900048 (see section 3.0 above).

6.6 Finishing

Any required surface finish is defined in the drawings.
Localized scratches, digs and blemishes should be minimized.

6.7 Marking

All completed Upper Structure Weldments should be marked with a final part number (D060492-vX) and a serial number. Marking is to be accomplished by mechanically scribing, stamping or engraving (no dyes or inks). *Please NOTE: Serial numbers shall start with 020 for this part rather than 001.*
If not indicated in the drawing, mechanically scribe, stamp or engrave as follows:

<drawing number> - <revision code>

<unique 3 digit serial number starting at 020 for the first part and incrementing thereafter>
As an example:
D060492-v3 020

7.0 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
- Certification of the material used
- Dimensional & QC inspection reports—this shall include a report showing that parts have been inspected and fall within specified tolerances.

8.0 Delivery Requirements:

8.1 Delivery Quantities and Destinations

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 –

LIGO Livingston Observatory (LLO) **quantity to LLO: 2**
Attn: Chris Guido
19100 LIGO Lane
Livingston, LA 70754

and

LIGO Hanford Observatory (LHO) **quantity to LHO: 5**
Attn: Gerardo Moreno
127124 North Route 10
Richland, WA 99354

8.2 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.). Mating edges of parts should be especially protected from damage during shipping.

8.3 Delivery Dates:

- First Article delivered 8 weeks ARO.
- Two pieces delivered every two (2) weeks after approval of first article.
- Specific delivery destination for each delivery will be provided prior to each shipment.
- Early Delivery is acceptable with the above conditions.