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

Statement of Work
PS-132 aLIGO Laser Area Enclosure Cleanrooms

The following documents are incorporated into and made a part this Statement of Work (SOW). 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:

DCC #	*Description*
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:

The supplier shall:

1) Meet or exceed all specifications and requirements
2) Identify the corresponding sections/paragraphs in their existing QA/QC system or proposed QA/QC plan for each of the boxes checked in the table below.

DCC #	*Description*
Q0900001-v4	Advanced LIGO Supplier Quality Requirements, dated 2/10/10, describes the following contractor/supplier QA/QC actions for this procurement:

☐	3.1 Pre-Award Inspection	☐	3.9 Discrepant Material Storage	☐	4.4 Calibration Program
☒	3.2 Supplier In Process Quality Control	☒	3.10 Quality Records	☐	4.5 Critical Interface
☐	3.3 In Process Inspection	☒	3.11 Drawing and Specification Change Control	☒	4.6 Cleanliness
☐	3.4 Pre-Ship Inspection	☐	3.12 Welding Certification	☐	4.7 Packaging
☐	3.5 Receiving Inspection	☒	3.13 End Item Data Package (including Certifications of Compliance)	☐	4.8 Storage
☐	3.6 Discrepant Material	☒	4.1 Design Verification	☒	4.9 Transport
☒	3.7 Material Review Action	☐	4.2 Raw Material Procurement	☐	4.10 Customs
☐	3.8 Material Review Actions at Contractor	☐	4.3 Traceability of Materials		

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:

- Cleanroom performance assessment including air flow rates and particulate levels over the full range of air flows.
- As-built design and fabrication drawings including electrical.

4.0 Included Documents:

Required Drawings:

DCC #	*Description*
C1002229-v1	PSL Laser Area Enclosure Cleanrooms - Specifications, Requirements, and Design Considerations
D1002633-v2	Ante-room Plan, H1 Laser Area Enclosure
D1002634-v1	Ante-room Elevations, H1 Laser Area Enclosure
D1002781-v2	Ante-room Plan, H2 Laser Area Enclosure
D1002786-v2	Ante-room Elevations, H2 Laser Area Enclosure
D1002787-v2	Ante-room Plan, L1 Laser Area Enclosure
D1002789-v2	Ante-room Elevations, L1 Laser Area Enclosure

Acoustic Shell Drawings (*For Reference Only*):

DCC #	*Description*
D1002386-v3	Mechanical Plan, H1 Laser Area Enclosure Acoustic Shell
D1002387-v2	Mechanical Plan and schedules, H1 Laser Area Enclosure Acoustic
D1002388-v3	Mechanical Sections and Details, H1 Laser Area Enclosure Acoustic Shell
D1002389-v2	Room Layout/Framing Plan, H1 Laser Area Enclosure Acoustic Shell
D1002390-v2	Framing Plans and Elevations, H1 Laser Area Enclosure Acoustic Shell
D1002396-v2	Mechanical Plan, H2 Laser Area Enclosure Acoustic Shell
D1002397-v2	Mechanical Plan and schedules, H2 Laser Area Enclosure Acoustic Shell
D1002398-v2	Mechanical Sections and Details, H2 Laser Area Enclosure Acoustic Shell
D1002399-v2	Room Layout/Framing Plan, H2 Laser Area Enclosure Acoustic Shell
D1002411-v2	Framing Plans and Elevations, H2 Laser Area Enclosure Acoustic Shell
D1002391-v3	Mechanical Plan, L1 Laser Area Enclosure Acoustic Shell
D1002392-v2	Mechanical Plan and schedules,L1 Laser Area Enclosure Acoustic Shell
D1002393-v2	Mechanical Sections and Details, L1 Laser Area Enclosure Acoustic Shell
D1002394-v2	Room Layout/Framing Plan, L1 Laser Area Enclosure Acoustic Shell
D1002395-v2	Framing Plans and Elevations, L1 Laser Area Enclosure Acoustic Shell

5.0 Scope:

This SOW is for the design, fabrication, installation and performance testing of three of Class 1000 cleanroom facilities for the aLIGO laser systems. They include the cleanroom to be constructed inside the Laser Area Enclosure Acoustic Shell, the Ante-room cleanroom, the Air Shower, and the double doors that separate the Ante-room from the Acoustic Shell. **The construction of the Laser Area Enclosure Acoustic Shell is not part of the scope of this SOW**.

Constraints:

1) Welded, sheet vinyl flooring will be in place before construction of the Acoustic Shell and must be protected from damage during construction.

2) The 5 ft. x 16 ft. x 40" surface height PSL optical table will be grouted in place prior to construction of the Acoustic Shell and must be protected from damage.

4) Activities that generate particulates, such as sanding, grinding, and painting must be avoided or controlled. Exceptions, along with particulate mitigation plans must be approved by LIGO in advance.

Information to be updated prior to start of construction:
1) Exact dimensions of finished opening for double doors between Ante-room and Laser Room.
2) Exact dimensions of finished opening for exhaust damper in wall between Ante-room and Laser Room.

6.0 Quantity Required:

1 ea.	H2 Interferometer at LIGO Hanford Observatory, Richland, WA
1 ea.	H1 Interferometer at LIGO Hanford Observatory, Richland, WA
1 ea.	L1 Interferometer at LIGO Livingston Observatory, Livingston, LA

Any deliveries must be coordinated in advance and 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 and Contact Personnel:

LIGO Hanford Observatory (LHO)
Attn. Rick Savage and Jodi Fauver
127124 North Route 10
Richland, WA 99354

Contact Info: Rick Savage, 509-372-8130, richard.savage@ligo.org

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

Contact Info: Valery Frolov, 225-686-3167, valery.frolov@ligo.org

On-site Fabrication, Installation and Testing will occur in the following windows:

- One unit (L1) at the LIGO Livingston Observatory: February 9 – March 2, 2011
- First unit (H2) at the LIGO Hanford Observatory: May 20 – June 10, 2011
- Second unit (H1) at the LIGO Hanford Observatory: February 21 – March 13, 2012

For Reference Only:

- L1 Acoustic Shell Installation: January 19 - February 8, 2011
- H2 Acoustic Shell Installation: April 28 - May 19, 2011
- H1 Acoustic Shell Installation: January 31 - Feb 20, 2012