



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

Statement of Work

LIGO-C1302049-v3

1.0 Scope

LIGO Hanford Observatory requires fiberglass insulation removal from approximately 8km(5 miles) of 48inch diameter beam tube. The work will take place inside a concrete enclosure. Contractors will need to supply power, lighting and personal protective gear. The insulation is 6 inches thick, foil backed, and 15 years old and has been damaged by rodents.

The site layout is shown here:

<https://dcc.ligo.org/public/0018/D960707/000/D960707-02.pdf>

Note that on this construction drawing from 1996 the arms are labeled Arm 1 and Arm 2. The new designations are the Y Arm and the X Arm respectively.

The concrete enclosure and beam tube is shown here:

<https://dcc.ligo.org/public/0017/D960189/000/D960189-01.pdf>

This drawing has a cross section of the enclosure showing a worker next to the beam tube.

A demonstration section of 150 feet of beam tube has been uncovered and the concrete enclosure has been cleaned. Contractors shall use this section as the standard of performance.

Attendance at the job walk is required.

2.0 Document Access

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

4.0 Requirements:

Working from the corner station and progressing towards the north the contractor shall remove insulation from the X1 module(X Arm) and clean the enclosure as he progresses. The X1 module is the 2km of enclosure between the corner and the mid station. X2 is the module between the mid and the end station. Similarly, Y1 and Y2 modules are located on the Y Arm. All insulation shall be removed and loaded into contractor supplied bins or trailers for removal from the site.

The floor of the enclosure shall be vacuum cleaned after the insulation has been removed. The cleaning shall be done progressively – as insulation is removed at a work location the cleaning shall begin on that section of enclosure. Cleanup shall lag the removal by no more than 500 meters. Where insulation is

stuck to the beam tube, stainless steel or plastic scraping tools may be used. No fluids shall be used on the beam tube. No wire brushing is allowed.

All enclosure doors of the 2km module may be utilized to promote ventilation. The contractor is responsible for propping the doors open without damage.

The contractor shall identify his work locations with yellow or orange traffic cones located in the road. The contractor shall train all staff so they are aware of any sensitive equipment located on the beam tube. LIGO will identify this equipment during the site job walk.

LIGO would prefer the contractor maintain one work front only. For example all contractor activities in the enclosure shall take place within a 250m distance. Work external to the enclosure is not affected by this request. This will allow us to locate problems should we see a pressure event in the beam tube. LIGO can negotiate this issue.

5.0 Safety and access to the enclosure:

The beam tube enclosure is not air conditioned and during the removal of insulation there will be dust and fibers released and stirred up. The enclosure is a habitat for spiders and mice. On hot days the temperatures inside the enclosure can reach 90F. In addition there is no permanent lighting. Exit doors are placed approximately every 400 feet. The contractor's proposal shall specify the procedures and equipment which will be used to protect the workers from this environment.