

	LASER INTERFEROMETER GRAVITATIONAL WAVE OBSERVATORY		E1300847 -v7
	ALIGO INSTALLATION INSTANCE ACCEPTANCE DOCUMENT		Document No    Rev.
	Date:		Mar. 10, 2014
			Sheet 1 of 5
<b>Title: aLIGO Installation Acceptance Document for LBSC2</b>			

This document covers the technical content for acceptance review of a subset of the Advanced LIGO (aLIGO) installation. See document [M1300468](#) for an overview of the aLIGO acceptance process. Acceptance by Systems Engineering is to be indicated in the metadata for this document in the LIGO Document Control Center (DCC).

## 1 Installation Instance/Subset Definition

*Insert a brief description of the subset of the aLIGO equipment which is covered under this installation acceptance document. Complete the entries in the following table. If elements of the table are not applicable, enter "not applicable".*

This installation covers the BSC chamber LBSC2 and all of the equipment within and attached plus associated electronics racks.

<b>Interferometer</b> [ <i>L1 or H1</i> ]:	<b>L1</b>
<b>Building(s)/Room(s)</b> : [ <i>e.g. corner/LVEA</i> ]	<b>LVEA</b>
<b>Vacuum Chamber(s)</b> :	<b>LBSC2</b>
<b>Electronics Rack Designation(s)</b> :	L1-SEI-C5, L1-SUS-C1, L1-SUS-C2, L1-SUS-C5, L1-SUS-C6, L1-SUS-R2  Note that the Capacitive Position Sensor readout boxes which sit on the cable trays do not have an official designation.
<b>Optics Table(s)/Enclosure(s) Designation(s)</b> :	Not applicable

## 2 Procedures

If there are any caveats or explanatory notes regarding the procedure documentation cited in the table below, then add these notes to the table entries.

<b>Baseline or initial Installation Procedure(s)</b> : <i>[enter linked DCC document #(s); found under <a href="#">E1200023</a>]</i>	<a href="#">E1200329-v2</a> was the initial procedure
<b>As-Built/Installed Procedure(s)</b> , either: a) Enter hyperlinked DCC number for revised or red-lined baseline install procedure, and/or b) Enter hyperlinked DCC number for separate document with installation notes on deviations, changes in procedure, changes in tooling, etc., and/or c) Enter a list of hyperlinked electronic log entries detailing the experience in applying the baseline installation procedure	<a href="#">E1200329-v3</a> was revised to reflect the as-built sequence. However, no as-built notes were recorded in this document. Actual documents used with some notes are filed under "Other Files" on <a href="#">E1200344</a> .  The result of cartridge weighing is recorded in the <a href="#">LLO elog #4577</a>  This installation event was recorded in <a href="#">LLO elog #4592</a>



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**Baseline or initial Alignment Procedure(s):**

[enter linked DCC document #(s); found under [E1100734](#)]

[E1200392-v6](#) was the initial procedure

**As-Built/Aligned Procedure(s), either:**

- Enter hyperlinked DCC number for revised or red-lined baseline alignment procedure, and/or
- Enter hyperlinked DCC number for separate document with alignment notes on deviations, changes in procedure, changes in tooling, etc., and/or
- Enter a list of hyperlinked electronic log entries detailing the experience in applying the baseline alignment procedure

[E1200392-v8](#) is the as-built alignment procedure, with embedded notes.

The LBSC2 cartridge alignment was recorded in [LLO elog #4284](#)

The BS elliptical baffle alignment was recorded in [LLO elog #4425](#)

### 3 Drawings

Enter hyperlinked DCC document number(s) for each drawing in the table below. If elements of the table are not applicable, enter "not applicable". All chamber-level, assembly drawings can be found listed at [E1200562](#) and found linked under [D0901491](#).

Applicable Building/Room Top-Level Drawing(s):	<a href="#">D0901466</a> aLIGO Systems Layout LLO Corner Station
Top-Level Chamber Assembly Drawing(s):	<a href="#">D0900428</a> aLIGO Systems, LBSC2-L1 Top Level Chamber Assembly
Electronics Rack Drawing(s):	All drawings for the racks can be found by navigating through <a href="#">G1001032</a> .
Optics Table/Enclosure Drawing(s):	Not applicable since BSC2 has no associated tables.

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#### 4 Serial Number Records

Serial numbers are used to track a subset of the parts, particularly active elements (see [M1000051](#)) and electronics (with S-numbered documents; see [T0900520](#)). Enter the hyperlinked DCC document number(s), and name(s) for the highest level assembly(ies) covered by this installation acceptance document in the table below. Also enter the hyperlink to the ICS entry for the instance of this assembly in the Inventory Control System (ICS). If elements of the table are not applicable, enter "not applicable". If elements of the table are not available/missing, then enter "not available".

Assembly DCC D-Number	Assembly Name	ICS entry
D0900428	aLIGO Systems, LBSC2-L1 Top Level Chamber Assembly	<a href="https://ics-redux.ligo-la.caltech.edu/JIRA/browse/ASSY-D0900428-NA">https://ics-redux.ligo-la.caltech.edu/JIRA/browse/ASSY-D0900428-NA</a>
D1000513	HEPI	N/A (assembly and install done in 2004, before ICS)

#### 5 Testing

All post-installation, stand-alone, in situ, checkout/testing (phases 2 and 3 per [M1000211](#)) must be completed, be successful and be documented:

- phase 2: pre-installed, post-storage, test results for the assembly (testable item)
- phase 3: stand-alone, in situ test results for the assembly (testable item)

Note that integrated testing (phase 4 testing per [M1000211](#)) is covered under the system acceptance review, not this installation acceptance review. In the table below, enter hyperlinked DCC document number(s) for all of the relevant testing for the major subassemblies/subsystems covered within this installation instance/subset. If elements of the table are not applicable, enter "not applicable". If elements of the table are not available/missing, then enter "not available".

Subsystem	Testable Item	DCC document numbers	
		Phase 2	Phase 3
SEI	BSC-ISI	<a href="#">E1100855</a>	
SEI	HEPI	N/A	<a href="#">E1300929</a>
SUS	BS Suspension (under <i>Test Results</i> )	?	<a href="#">E1300699</a>
Viewports	Leak and pressure testing.	<a href="#">E1200445</a>	?
AOS/OptLev	BS OptLev	?	?



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### 6 Installation Completeness

If/as applicable, provide a hyperlink reference to a list of remaining tasks to be completed before the installation is finished (i.e. a 'punch' list).

Installation tasks remaining to be completed:	<b>All items are installed.</b>
ICS Assembly Record needs to be updated	There are some issues with ICS which are affecting this task. Some TCS and SLC records have been added but do not appear. Still need to add viewports, Oplev periscope and perhaps misc. other items to the ICS records.

### 7 Installation/Integration Issues and ECRs

If/as applicable, provide a hyperlinked list of integration issues and Engineering Change Requests (ECRs) encountered during installation and which are relevant to the installation subset/instance covered by this acceptance document. See [M1300323](#) for a description of the Integration Issue and ECR Tracker.

Tracker # [hyperlinked]	Title/description
<a href="#">#47</a> closed	ECR: BS Stay Bracket Improvement ECR
<a href="#">#63</a> closed	ECR: Dog Clamps for SLC suspended baffles
<a href="#">#66</a> closed	ECR: ITM Elliptical Baffle Suspension Flexure has inadequate strength
<a href="#">#118</a> closed	ECR: HEPI medm screen update
<a href="#">#182</a> closed	ECR: BSC-ISI and HEPI MEDM
<a href="#">#186</a> closed	ECR: Topology Changes to SUS models as a result of ISC Informed Interaction
<a href="#">#205</a> closed	ECR: Add Cartesian bias monitoring and offsets to the ISI models
<a href="#">#207</a> closed	ECR: Model and screens update to allow sensor correction to the ISI using Ground seismometers (STS-2)
<a href="#">#217</a> closed	Coil Driver was giving over-temp warnings. Replaced with a spare
<a href="#">#283</a>	CPS Circuit Modification to eliminate a high frequency oscillation
<a href="#">#355</a> closed	ECR: Modify HAM-ISI and BSC-ISI simulink control filters to monitor gain for ODC
<a href="#">#375</a> closed	ECR: Migrate the ISI Checker Script functions to the frontend code

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<a href="#">#385</a> closed	ECR: create science frame channels for the SEI models
<a href="#">#445</a> closed	ECR: Update the SAFE level for the BSC and HEPI model watchdog
<a href="#">#477</a> closed	Two small cross-coupling features in L1 beamsplitter suspension
<a href="#">#482</a>	ECR: ODC changes in SUS, SEI, HPI and PSL
<a href="#">#487</a> closed	ECR: Remove ISI IPC links which come from SUS offload
<a href="#">#500</a> closed	ECR: HEPI MEDM Update
<a href="#">#505</a>	Drift in pitch alignment due to differential heating of the wires.
<a href="#">#530</a> closed	ECR: update to the HEPI master model and related MEDM screens
<a href="#">#551</a> closed	ECR: HEPI script update
<a href="#">#650</a>	ECR: ISI model update - Jan 2014
<a href="#">#679</a>	This will serve as a collection point for any longer term issues associated with the BSC2 chamber.
<a href="#">#721</a>	ECR: Replace the custom cartesian-bias-ramping code with cdsFiltCtrl2 parts
<a href="#">#722</a>	ECR: Adding Independent ASC IPC Paths for Dither Alignment to Most SUS
<a href="#">#723</a>	ECR: Modification of SUS BS Infrastructure to allow damping of highest bounce and roll modes