This document covers the technical content for acceptance review of a subset of the Advanced LIGO (aLIGO) installation. See document [M1300468](https://dcc.ligo.org/LIGO-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).

# 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.

|  |  |
| --- | --- |
| **Interferometer** [*L1 or H1*]: | **H1** |
| **Building**(s)/**Room**(s): [*e.g. corner/LVEA*] | **LVEA** |
| **Vacuum Chamber**(s): | **LBSC2** |
| **Electronics Rack Designation**(s): | [H1-SEI-C5](https://dcc.ligo.org/LIGO-S1301866), [H1-SUS-C5](https://dcc.ligo.org/LIGO-S1301872), [H1-SUS-C6](https://dcc.ligo.org/LIGO-S1301873), [H1-SUS-R2](https://dcc.ligo.org/LIGO-S1301887) |
| **Optics Table(s)/Enclosure(s) Designation**(s): | Not applicable |

# 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.

|  |  |
| --- | --- |
| **Baseline or initial Installation Procedure**(s):  *[enter linked DCC document #(s); found under* [*E1200023*](https://dcc.ligo.org/LIGO-E1200023)*]* | [E1200971-v1](https://dcc.ligo.org/LIGO-E1200971-v1) was the initial procedure |
| **As-Built/Installed Procedure**(s), either:   1. Enter hyperlinked DCC number for revised or red-lined baseline install procedure, and/or 2. Enter hyperlinked DCC number for separate document with installation notes on deviations, changes in procedure, changes in tooling, etc., and/or 3. Enter a list of hyperlinked electronic log entries detailing the experience in applying the baseline installation procedure | [E1200971-v3](https://dcc.ligo.org/LIGO-E1200971) is revised version with updates based on as-built experience.  The cartridge installation was carried out on 6 March 2013, recorded in LHO elog [5689](https://alog.ligo-wa.caltech.edu/aLOG/index.php?callRep=5689). Weight info is also included in that elog.  The BS elliptical baffles installation was recorded in LHO elog [5875](https://alog.ligo-wa.caltech.edu/aLOG/index.php?callRep=5875). |
| **Baseline or initial Alignment Procedure**(s): *[enter linked DCC document #(s); found under* [*E1100734*](https://dcc.ligo.org/LIGO-E1100734)*]* | [E1200795-v1](https://dcc.ligo.org/LIGO-E1200795-v1) was the initial procedure.  [E1200971-v2](https://dcc.ligo.org/LIGO-E1200971-v2) has an associated JPG file from B. Bland containing installation notes.  [E1200971-V3](https://dcc.ligo.org/LIGO-E1200971) has updates from SYS, perhaps incorporating B. Bland notes. |
| **As-Built/Aligned Procedure**(s), either:   1. Enter hyperlinked DCC number for revised or red-lined baseline alignment procedure, and/or 2. Enter hyperlinked DCC number for separate document with alignment notes on deviations, changes in procedure, changes in tooling, etc., and/or 3. Enter a list of hyperlinked electronic log entries detailing the experience in applying the baseline alignment procedure | [E1200795-v6](https://dcc.ligo.org/LIGO-E1200795) is the as-built alignment procedure, including data.  The LBSC2 cartridge alignment was recorded in LHO elog [5380](https://alog.ligo-wa.caltech.edu/aLOG/index.php?callRep=5380). The BS elliptical baffles alignment was recorded in the same elog. |

# 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*](https://dcc.ligo.org/LIGO-E1200562) *and found linked under* [*D0901491*](https://dcc.ligo.org/LIGO-D0901491)*.*

|  |  |
| --- | --- |
| Applicable Building/Room Top-Level Drawing(s): | [D0901469](https://dcc.ligo.org/LIGO-D0901469) aLIGO Systems Layout LHO Corner Station |
| Top-Level Chamber Assembly Drawing(s): | [D0901142](https://dcc.ligo.org/LIGO-D0901142) aLIGO Systems, BSC2-H1 Top Level Chamber Assembly |
| Electronics Rack Drawing(s): | [D0901301](https://dcc.ligo.org/LIGO-D0901301) BSC SEI System Wiring Schematic  [D1100022](https://dcc.ligo.org/LIGO-D1100022) aLIGO SUS ITM and BS System Wiring Diagrams  Also links in Section 1. |
| Optics Table/Enclosure Drawing(s): | Not applicable since BSC2 has no associated tables. |

# Serial Number Records

*Serial numbers are used to track a subset of the parts, particularly active elements (see* [*M1000051*](https://dcc.ligo.org/LIGO-M1000051)*) and electronics (with S-numbered documents; see* [*T0900520*](https://dcc.ligo.org/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 |
| --- | --- | --- |
| [D0901142](https://dcc.ligo.org/LIGO-D0901142) | aLIGO Systems, BSC2-H1 Top Level Chamber Assembly | [D0901142 ICS entry](https://ics-redux.ligo-la.caltech.edu/JIRA/browse/ASSY-D0901142-NA) |
|  | Viewports | [T1200235](https://dcc.ligo.org/LIGO-T1200235) |
| [D0901301](https://dcc.ligo.org/LIGO-D0901301) | Rack H1-SEI-C5 | [S1301866](https://dcc.ligo.org/LIGO-S1301866) |
| [D1100022](https://dcc.ligo.org/LIGO-D1100022) | Rack H1-SUS-C5 | [S1301872](https://dcc.ligo.org/S1301872) |
| [D1100022](https://dcc.ligo.org/LIGO-D1100022) | Rack H1-SUS-C6 | [S1301873](https://dcc.ligo.org/S1301873) |
| [D1100022](https://dcc.ligo.org/LIGO-D1100022) | Rack H1-SUS-R2 | [S1301887](https://dcc.ligo.org/S1301887) |

# Testing

*All post-installation, stand-alone, in situ, checkout/testing (phases 2 and 3 per* [*M1000211*](https://dcc.ligo.org/LIGO-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*](https://dcc.ligo.org/LIGO-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 | BSC-ISI Unit#3 in [E1100990](https://dcc.ligo.org/LIGO-E1100990)  Test results in [E1100847](https://dcc.ligo.org/LIGO-E1100847) | |
| SEI | HEPI | N/A | [E1300839](https://dcc.ligo.org/LIGO-E1300839) |
| SUS | BS Suspension (under Test Results) | [E1300712](https://dcc.ligo.org/LIGO-E1300712)  (DCC doc points to phase 3 results in general. Phase 2 are on SVN) | |
| Viewports | Leak and pressure testing. | [E1300447](https://dcc.ligo.org/LIGO-E1300447) gives ICS link for viewport testing |  |
| AOS/OptLev | BS OptLev |  | [T1300563](https://dcc.ligo.org/LIGO-T1300563) |

# 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: | **All items are installed** |

# 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*](https://dcc.ligo.org/LIGO-M1300323) *for a description of the Integration Issue and ECR Tracker.*

|  |  |
| --- | --- |
| Tracker # *[hyperlinked]* | Title/description |
| [#989](https://services.ligo-wa.caltech.edu/integrationissues/show_bug.cgi?id=989) | WBSC2 Issue tracker |