

**Title: aLIGO Installation Acceptance Document for WHAM3**

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 HAM chamber WHAM3 and all of the equipment within and attached plus associated electronics racks.

<b>Interferometer</b> [ <i>L1 or H1</i> ]:	<b>H1</b>
<b>Building(s)/Room(s):</b> [ <i>e.g. corner/LVEA</i> ]	<b>LVEA</b>
<b>Vacuum Chamber(s):</b>	<b>WHAM3</b>
<b>Electronics Rack Designation(s):</b>	H1-ISC-R2, H1-SUS-R2, H1-SUS-C2, H1-SEI-C2. Note that the Capacitive Position Sensor readout boxes which sit on the cable trays do not have an official designation. <b>(this statement was in L1 doc – not sure it applies at H1?)</b>
<b>Optics Table(s)/Enclosure(s) Designation(s), and other equipment/assemblies related to this installation:</b>	None

**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="#">E1200450</a> (early versions) was the initial procedure. <b>Refers to D1101249, which notes "not currently available for H1. In the mean time use L1 documents". Still awaiting new doc?</b>
<b>As-Built/Installed Procedure(s), either:</b> 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	Notes and comments were added in v5 of E1200450. The installation of HAM3 HEPI is recorded in LHO elog <a href="#">2144</a> and operation in elog <a href="#">8046</a> The installation of the WHAM3 ISI is recorded in LHO elog <a href="#">3145</a>

c) Enter a list of hyperlinked electronic log entries detailing the experience in applying the baseline installation procedure	The installation of MC2 is recorded in elogs <a href="#">3740</a> and <a href="#">3776</a> The installation of PR2 is recorded in elog <a href="#">3875</a>
<b>Baseline or initial Alignment Procedure(s):</b> <i>[enter linked DCC document #(s); found under <a href="#">E1100734</a>]</i>	<a href="#">E1200470</a> (early version) was the initial procedure
<b>As-Built/Aligned Procedure(s), either:</b> a) Enter hyperlinked DCC number for revised or red-lined baseline alignment procedure, and/or b) Enter hyperlinked DCC number for separate document with alignment 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 alignment procedure	<a href="#">E1200470</a> (latest version) is the as-built alignment procedure. The WHAM3 HAM-ISI initial alignment is recorded in elog <a href="#">3484</a> . PR2 alignment is recorded in elog <a href="#">5784</a> . MC2 alignment is noted in elog's , <a href="#">4811</a> , <a href="#">5771</a> , <a href="#">5786</a> , <a href="#">5825</a> .

### 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="#">D0901469</a> aLIGO Systems Layout LHO Corner Station
Top-Level Chamber Assembly Drawing(s):	<a href="#">D0901094</a> aLIGO Systems, HAM3-H1 Top Level Chamber Assembly
Electronics Rack Drawing(s):	<a href="#">D1000599</a> HAM 3-4 System Wiring Diagrams <a href="#">D1101576</a> HAMs 2&3 ISI System Wiring <a href="#">D1001425</a> ISC Drawing R2 <a href="#">D1001427</a> ISC LVEA Equipment Room Racks
Optics Table/Enclosure Drawing(s):	None.
ITM Optical Lever Drawing(s):	<a href="#">G1000740</a> Floor Occupancy, Optical Levers, LHO Corner Station

### 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".



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Assembly DCC D-Number	Assembly Name	ICS entry
<a href="#">D0901094</a>	aLIGO Systems, HAM3-H1 Top Level Chamber Assembly	ICS entry click here <a href="#">D0901094</a>
<a href="#">D1000514</a>	HEPI ASSEMBLY, HAM, aLIGO SEI	ICS entry click here <a href="#">D0901094</a> (sub assembly)

**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	HAM-ISI	<a href="#">E1200507</a>	
SEI	HEPI	N/A	<a href="#">E1300829</a>
SUS	PR2 and MC2 Suspension	<a href="#">E1400122</a> and <a href="#">E1400119</a> (under <i>Test Results</i> )	
AOS/SLC/ Viewports	Leak and pressure testing.	<a href="#">T1200356</a> LHO Viewport Assembly and Preparation Status	???
ISC QPD Sled		Words in LLO doc: No in-situ tests performed apart from continuity test in chamber. For post assembly / pre-installed tests refer to ISC Acceptance link <a href="#">E1300833-x0</a>	
MC2 and PR2 Scrapper Baffle	B&K Hammer Testing	Has not been carried-out	



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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:	All items are installed.

### 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.*

WHAM3 issues will be kept in the WHAM3 Issue Tracker listed as bug [983](#) in the Bugzilla list.