

**Title: aLIGO Installation Acceptance Document for WBSC10 (Y)**

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 WBSC10 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>WBSC10 (Y ARM)</b>
<b>Electronics Rack Designation(s)</b> :	<a href="#">H1-SUS-C1 ETMY</a> , <a href="#">H1-SUS-C2 ETMY</a> , <a href="#">H1-SUS-R1 EY</a> , <a href="#">H1-SEI-YC1 BSC10</a> <a href="#">H1-ISC-YC3</a> , <a href="#">H1-ISC-YC4</a> , <a href="#">H1-ISC-YR1</a> .  TCS rack layouts in <a href="#">D1200259</a>  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> , and other equipment/assemblies related to this installation:	<a href="#">ETMY Cryo-Pump Baffle</a> , <a href="#">Optical Lever and Photon Calibrator</a> , <a href="#">ISCTEY Table</a>  Position of Ground Seismometer at end Y is recorded on page 1 of Systems layout drawing <a href="#">D0901467</a> .

**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>	Install procedure document is <a href="#">E1300266</a> .
<b>As-Built/Installed Procedure(s)</b> , either:	Checklist which was used to assist with the actual order of tasks that were performed is included under

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<p>a) Enter hyperlinked DCC number for revised or red-lined baseline install procedure, and/or</p> <p>b) Enter hyperlinked DCC number for separate document with installation notes on deviations, changes in procedure, changes in tooling, etc., and/or</p> <p>c) Enter a list of hyperlinked electronic log entries detailing the experience in applying the baseline installation procedure</p>	<p>“Other Files” at <a href="#">E1300266</a>.</p> <p>Cartridge installation occurred 24<sup>th</sup> Feb 2014 and was reported in LHO alogs <a href="#">10287</a> and <a href="#">10295</a></p>
<p><b>Baseline or initial Alignment Procedure(s):</b> [enter linked DCC document #(s); found under <a href="#">E1100734</a>]</p>	<p><a href="#">E1200953</a> is the initial procedure.</p>
<p><b>As-Built/Aligned Procedure(s)</b>, either:</p> <p>a) Enter hyperlinked DCC number for revised or red-lined baseline alignment procedure, and/or</p> <p>b) Enter hyperlinked DCC number for separate document with alignment notes on deviations, changes in procedure, changes in tooling, etc., and/or</p> <p>c) Enter a list of hyperlinked electronic log entries detailing the experience in applying the baseline alignment procedure</p>	<p><a href="#">E1200953-v5</a> is the as-built alignment procedure.</p> <p>The WBSC10 ETMy Final Alignment was recorded in LHO alog <a href="#">10737</a>.</p> <p>The CMBY installation was recorded in LHO alog <a href="#">8722</a>.</p> <p>TMSy alignment was recorded in LHO alog <a href="#">10913</a>.</p> <p>The ETMy ACB installation is noted in LHO alog <a href="#">10404</a>. The alignment is recorded in LHO alog <a href="#">10737</a>.</p> <p>OpLev install, alignment and functionality tests in LHO alog entries <a href="#">4112</a>, <a href="#">11131</a> and <a href="#">11487</a>.</p>

### 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="#">D0901467</a> aLIGO Systems Layout LHO Y-End Station
Top-Level Chamber Assembly Drawing(s):	<a href="#">D0901154</a> aLIGO Systems, WBSC10-H1 Top Level Chamber Assembly
Electronics Rack Drawing(s):	<a href="#">H1-SUS-C1 ETMY</a> , <a href="#">H1-SUS-C2 ETMY</a> , <a href="#">H1-SUS-R1 EY</a> , <a href="#">H1-ISC-YR1</a> , <a href="#">H1-ISC-YC4</a> .



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	<a href="#">H1-ISC-YC3</a> <a href="#">H1-SEI-YC1 BSC10</a> TCS rack layouts in <a href="#">D1200259</a> ISC end station field rack <a href="#">D1001423</a> ISC end station remote rack <a href="#">D1001459</a> BSC SEI System Wiring Schematic <a href="#">D0901301</a>
ETM Optical Lever Drawing(s):	<a href="#">G1000739</a> Floor Occupancy, OpLev & PCal, LHO Y-End Station
Cryopump Manifold Baffle Dwg(s):	<a href="#">D1003228</a> Manifold_Cryo_Baffle_Assembly, ETMY
PCAL Video CAM Periscope	<a href="#">D1200174</a> : aLIGO, PCAL-VIDEO CAM, PERISCOPE
Photon Calibrator Transmission Pier Assembly	<a href="#">D1000676</a> aLIGO AOS PhotCal TX Pier Assembly.
ISCTEY	ISC Table containing ALS optics etc. The drawing is <a href="#">D1400241</a> .

## 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
<a href="#">D0901154</a>	aLIGO Systems, WBSC10-H1 Top Level Chamber Assembly	<a href="#">ICS Record: D0901154</a>
<a href="#">D1000513</a>	HEPI	<a href="#">ICS Record: D0901154</a> (sub-assembly)



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### 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="#">E1100846</a>	
SEI	HEPI	N/A	<a href="#">E1300841</a>
SUS	BSC3 Suspension (under <i>Test Results</i> )	<a href="#">E1300866</a>	
AOS/SLC/Viewports	Leak and pressure testing.	LHO viewport testing status <a href="#">T1200362</a> needs updating - no tests shown	???
AOS/OpLev	OpLev Impulse Hammer Modal Testing at CIT.	<a href="#">T1100152</a>	Not Completed
AOS/CMB	Impulse Hammer Modal Testing		Equivalent LLO measurement <a href="#">8194</a> . No record found for LHO
AOS/TCS/RHy	Collection, refer to links.	N/R	<a href="#">T1300495</a> Testing is now on TCS to-do list Install recorded in <a href="#">8913</a>
TMSy	Transfer Functions  B&K Hammer Test	Phase 3a in <a href="#">10970</a> , <a href="#">10978</a>	Phase 3b in <a href="#">11915</a> B&K in <a href="#">10931</a>
AOS/ACB	Photodiode continuity testing.	Baffle photodiodes used for OpLev calibration, reported in LHO aLOG <a href="#">14321</a> .	



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	In-situ operation.		
AOS/ACB	Impulse Hammer Modal Testing	One instance of testing completed, refer to LHO e-log entry <a href="#">8656</a> .	
ESD	ESD install/testing for the quads	( <a href="#">E1300848</a> captures ESD documentation and ESD driver noise performance and first article testing)	Testing reported in various alogs: <a href="#">11674</a> (initial test) <a href="#">12034</a> (wiring test) <a href="#">14961</a> (some TF data) Feedthrough repair <a href="#">15656</a>

### 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>

### 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.

WBSC10 issues will be kept in the WBSC10 Issue Tracker listed as bug [986](#) in the Bugzilla list.