



COMMISSIONING PLAN

FOR

**710 Wilshire
Santa Monica, CA**

APPROVAL:

(Owner Representative)

(Date)

Prepared by Gaia Development, LLC

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1. Project Description

710 Wilshire is a mixed-use hotel project with ground floor retail and six stories of hotel accommodations for a total of 7 stories above grade, and four levels of underground parking. The project consists of a renovation of the historic Landmark building and the addition of a new building adjacent to the Landmark and connected by a sky bridge. There is a total of 164,219 gross sq. ft. between the two buildings, with 14,963 sq. ft. dedicated to ground floor retail. There are a total of 275 hotel rooms. The breakdown between the two buildings is as follows:

- i. Landmark Building:
 1. 34,328 total sq. ft.
 2. 6,670 retail sq. ft.
 3. 55 rooms
- ii. Landmark Addition:
 1. 129,891 total sq. ft.
 2. 8,293 retail sq. ft.
 3. 220 hotel rooms

There are 2 chillers serving the buildings. Energy conservation measures include high efficiency HVAC, VFD's on pumps and fans, high efficiency lighting and controls, and high performance building envelope constructions. The project is pursuing certification under the USGBC's LEED rating system.



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2. Scope of Commissioning

The purpose of the commissioning process is to achieve the following objectives:

- Clearly define and document the Owner's Project Requirements (OPR). This document serves as a reference for the project, providing guidance for all team members. It outlines, in detail, the Owner's expectations for the performance of the building. The OPR can be updated as circumstances change during the project's progress.

- Clearly document the Basis of Design (BOD) of each design team member for the systems to be commissioned. The BOD includes the design data necessary to accomplish the OPR, including system descriptions, indoor environmental quality requirements, weather data, and references to applicable codes and standards.

- Review OPR and BOD and design documents prior to mid-construction documents phase and back-check review comments in subsequent design submission.

- Develop and incorporate commissioning requirements into the construction documents

- Ensure proper installation and operational inspection of applicable systems and equipment

- Verify and document that all commissioned systems perform according to the OPR and BOD

- Develop manuals for all commissioned systems that provide operating staff and occupants information needed to understand and optimally operate the systems.

- Verify that the requirements for training operating personnel and occupants are completed.

- Schedule and perform a follow-up building performance review within 10 months after substantial completion of construction. Include a plan for resolution of outstanding commissioning issues.

- Prepare a final report summarizing activities and results of commissioning process

- The following systems are to be commissioned:

1. HVAC systems
2. Domestic Hot Water system

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3. Lighting Controls (daylight and motion sensors)
4. Renewable Energy Systems
5. Landscape Irrigation Systems

3. Commissioning Tasks

To accomplish the above mentioned objectives, the Commissioning Authority (CxA) will complete the following tasks during the commissioning process:

Design Phase:

- Coordinate with the project Owner and Architect to define and document the Owner's Project Requirements (OPR).

- Assemble the Basis of Design (BOD) and review to ensure that OPR can be satisfied.

- Document a Sequence of Operations for the commissioned systems.

- Conduct at least one commissioning design review of the OPR, BOD and design documents prior to mid-construction documents. Review comments will be back-checked in subsequent design submissions.

- Review the LEED scorecard and determine if commissioned systems satisfy the requirements of the attempted LEED credits.

- Make sure proper access for commissioning testing is ensured into the project.

- Review Design Documents and specifications and ensure that commissioning requirements are incorporated into construction documents.

Construction Phase:

- Commissioning Kick-off meeting. Introduce the CxA to the rest of the project team and provide details of the commissioning process and schedule.

- Incorporate commissioning activities into the construction schedule. CxA works with GC to ensure that adequate time is allotted to perform observations and functional tests.

- Review equipment submittals relating to all commissioned systems for compliance with OPR and BOD.

- Project site observation. Visit building site as needed to ensure construction and installation of commissioned systems will facilitate the commissioning process. Any issues relating to commissioning will be documented.

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- Prepare System Verification Checklists for all commissioned systems. Checklists shall be prepared by CxA or by the installing sub-contractor for a given system. If developed by a sub-contractor, checklist will be reviewed by CxA.

Construction Phase (continued):

- Perform or observe pre-functional tests as required. Document pre-functional testing procedures for all commissioned systems. Inform Owner of any failures or inconsistencies.

- Coordinate correctional actions and retesting if necessary.

- Collect documentation from HVAC airflow testing and balancing work (TAB). The TAB will be performed before functional performance testing and conducted by the installing sub-contractor.

- Conduct functional performance testing of all commissioned systems. Testing shall be conducted under fully operational conditions and in various modes, including heating, cooling, alarm, power failure, and others. The systems will be run through the control sequences, and any failures or inconsistencies will be documented and reported to the project Owner.

Acceptance/Operation Phase:

- Develop a systems manual that provides future operating staff the information needed to understand and optimally operate the commissioned systems.

- Verify that the requirements for training operating personnel and building occupants are completed.

- Review building operation within 10 months after substantial completion with O&M staff and occupants. Include a plan for resolution of outstanding commissioning-related issues.

Documentation:

The CxA will deliver a Final Commissioning Report to the Owner in a paper bound as well as an electronic format. The report will include a Final Acceptance Page that will be signed by the Owner's representative, the General Contractor, and the CxA. The report will also include the following documents:

- Final Acceptance Page
- Executive Summary
- Commissioning Plan
- Owner's Project Requirements (OPR)

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- Basis of Design (BOD)
- Completed Start-Up and Verification Checklists (SVC's)
- Completed Test and Balance (TAB) documentation
- Completed Functional Performance Test (FPT) documentation
- Site Visit Reports and Issues Log
- Operations and Maintenance Manuals
- Training Schedule and Verification

4. Commissioning Team

The commissioning team information is as follows:

Team Member	Company	Contact Name	Contact Information
Owner	Masser & Associates	Alex Gorby	310-394-6100
Architect	HIA	Howard Laks	howard@hlaarch.com 310-393-4455
General Contractor	TBD		
Construction Manager			
Commissioning Authority	Gaia Development	Duke Graham	duke@gaiadevelopment.com 310-591-8172
Mechanical Engineer	DFDA	Phil Traflet	pmtraflet@dfda1.com
Electrical Engineer	DFDA	Phil Traflet	pmtraflet@dfda1.com
Plumbing Engineer	DFDA	Phil Traflet	pmtraflet@dfda1.com
LEED AP	Gaia Development	Annie Argento	annie@gaiadevelopment.com 310-591-8172
TAB			

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Commissioning Team members have the following responsibilities:

1. Commissioning Authority (CA)

- Coordinate commissioning activities and develop commissioning requirements
- Review design and construction documents
- Coordinate commissioning schedule between owner, design team and general contractor
- Prepare commissioning plan
- Conduct commissioning kickoff meeting
- Review OPR, BOD and design documents prior to mid-construction documents and back-check review comments in subsequent design submissions
- Create and circulate pre-functional tests and checklists
- Witness and document equipment and system start-up and testing
- Create functional performance testing (FPT) procedures for systems and equipment
- Coordinate, witness and document FPTs
- Document any equipment deficiencies and assist GC with corrective actions
- Assist in coordinating O&M training sessions
- Prepare final commissioning report and submit all documentation to LEED Online
- Conduct follow-up building performance review within 10 months after substantial completion

2. General Contractor/Construction Manager

- Coordinate with CxA to integrate commissioning activities into construction schedule
- Attend commissioning kickoff meeting
- Communicate commissioning requirements to subcontractors
- Provide adequate accessibility to all commissioned systems and equipment for maintenance, replacement or repair
- Review pre-functional test forms and checklists
- Witness start-up, pre-functional and functional tests of systems and equipment
- Resolve deficiencies identified during testing and commissioning
- Ensure punch-list completion
- Obtain final inspection approvals

3. Design Team Members (MEP Engineers)

- Participate in resolution of commissioning related deficiencies
- Respond to RFI's generated by commissioning team
- Provide Basis of Design (BOD) document
- Review and approve O&M manuals for the applicable system
- Review functional performance testing documents
- Review and approve Test and Balance (TAB) report
- Create punch-lists

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4. Subcontractors for Commissioned Systems

- Integrate commissioning activities into their installation and construction schedule
- Ensure participation of equipment manufacturers in training and testing activities, if required
- Assist during start-up verification, pre-functional testing and functional performance testing processes and demonstrate proper performance of commissioned systems
- Prepare and submit Operation and Maintenance manuals
- Address inconsistencies and failures identified during testing process
- Ensure punch-list completion

5. Manufacturers and Vendors

- Provide equipment submittals and O&M manual sections
- Participate in training of operation staff

6. Owner

- Assist in preparation of Owner's Project Requirements (OPR) document
- Attend commissioning kickoff meeting
- Arrange for O&M staff to participate in training sessions and follow-up visit
- Review and approve change orders, O&M manuals, checklists and testing performance
- Provide final approval of commissioning documents and report

Communication Protocol:

The CxA reports to the Owner's Representative. Unless directed otherwise, written reports, requests for information, meeting requests, outstanding commissioning issues, discrepancies and other communications between the CxA and the Project team members should go through the Owner's Representative.

Meetings:

Meetings will be requested as needed by the CxA. Site visits will be coordinated between the CxA and the GC, informing the Owner's Representative each time. There will be one Commissioning "kick-off" meeting, held at the beginning of the construction phase, which the Owner's Representative, the CxA, GC and Design Team members for the systems to be commissioned need to attend.

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5. System Specific Details

The following table illustrates the specific systems that are to be commissioned and the activities that will be conducted:

Commissioned System	Qty	SVC	TAB	FPT
HVAC Systems				
Chiller (CH)	2	Y	Y	Y
Boiler (B)	2	Y	Y	Y
Cooling Tower (CT)	2	Y	Y	Y
Chilled Water Pumps (CHWP)	4	Y	Y	Y
Condenser Water Pumps (CWP)	2	Y	Y	Y
Hot Water Pumps (HPW)	2	Y	Y	Y
Make up Air Units (AC)	1	Y	Y	Y
Garage Fans (GF)	15	Y	Y	Y
Air Handling Unit (AHU)	1	Y	Y	Y
Fan Coils (FCU)	TBD	Y	Y	Y
Electrical Systems				
Lighting System	1	NA	NA	Y
Lighting Controls	1	NA	NA	Y
Plumbing Systems				
Domestic Hot Water System	1	Y	Y	Y
Renewable Energy Systems				
Solar Thermal System	1	N/A	N/A	Y
Landscape Irrigation Systems				
Irrigation Controls	1	N/A	N/A	Y

See below for detailed descriptions of System Verification Checklists (SVC), Test and Balance (TAB), and Functional Performance Testing (FPT).

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System Verification Checklists (SVC):

SVCs may be prepared by the sub-contractors or the CxA. If prepared by the sub-contractor, the CxA will review them for appropriateness. The SVC's are meant to augment, not replace, the procedures recommended by the manufacturers. They ensure that the equipment is ready for functional testing. Items are checked off as they are completed or verified, and the completed SVC's will be submitted to the CxA within 2 days of the completion of testing. CxA will coordinate deficiencies noted on the checklists, and installing contractors or equipment manufacturers will be responsible for correcting any outstanding issues. Completed SVCs will be included in the final Commissioning Report. An example (blank) SVC is provided at the end of this section.

Test and Balance (TAB):

TAB procedures will be verified by CxA. A sample of tests will be witnessed as needed to assure completeness and consistency. These tests ensure that the proper volumes of air and water flow as designed for proper performance, comfort, efficiency and pressure relationships. Completed TAB reports will be included in the final Commissioning Report.

Functional Performance Testing (FPT):

FPT tests the system as a whole, and its ability to function and achieve the OPR under real conditions. They involve more detail than the SVC's and occur after the start-up and TAB tests have been completed. This ensures valid results when the systems are operated under normal conditions. The CxA will develop the FPT procedures by considering the design documents, OPR BOD sequences of operation, and any other items that are presented. The tests are performed by people manipulating equipment and/or analyzing performance with trend loggers, if applicable. The CxA will determine the most appropriate way to assure the proper performance of each system under normal operating conditions. A sampling rate of 10% will be used for multiple identical pieces of equipment, in most cases. All deficiencies identified during FPT will be documented. Any deficiencies that cannot be corrected during FPT will be tracked, resolved, and retested with cooperation of the GC or the design team member, whichever is appropriate. Completed FPTs will be included in the final Commissioning Report.

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(EXAMPLE)

SYSTEM COMMISSIONING VERIFICATION/START-UP CHECKLIST EXHAUST FAN	
PROJECT: _____	
Equipment Name/Tag: _____	Location: _____
System/Area Served: _____	Related Equipment: _____
ITEM	COMMENTS
PRE-START-UP INSPECTION	
- Commissioning lock-out procedures reviewed	
- Operation and maintenance information	
- Flowing report system and vibration isolation	
- Flexible connections	
- Torque estimates	
- Equipment alignment	
- Alignment & V-belt tension	
- Protection of rotation	
- Lubrication	
- Remove valves closed and line of hose material	
- Check system tested and cleared	
- Fire & Smoke Emergency procedures	
- Exhaust fan/duct tested (pressure or resistance)	
- Building & fan noise conditions	
- Check for proper rotation	
- Motor rated for V-belt service	
- Check for proper rotation (correctly)	
- Disconnect switch identified	
- Control system - power to power checks complete	
START-UP	
- Start-up by manufacturer's rep. (report attached)	
- Direction of rotation	
- Electrical interlocks - engage	
- Locks or Solenoid accessible	
- Vibration & noise level acceptable	
- Motor Amps - Rated - Actual	
- Motor V-belt - Rated - Actual	
Pre-start checks by: _____ Date: _____	
Start-up checks by: _____ Date: _____	

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6. O&M Manuals and Personnel Training

Operations & Maintenance:

The final commissioning report will include copies of the O&M manuals for all commissioned equipment. Additionally, the CxA will develop a general "Systems Manual" which generally focuses on operation, rather than maintenance, of commissioned systems, particularly on the interactions between equipment.

The systems manual will include the following for each commissioned system:

- Final version of the BOD
- System single line diagrams
- As-built sequences of operations, control drawings and original setpoints
- Operating instructions for integrated building systems
- Recommended schedule of maintenance requirements and frequency, if not already included in the project O&M manuals
- Recommended schedule of retesting of commissioned systems with blank test forms from the original Commissioning Plan
- Recommended schedule for calibrating sensors and actuators

Personnel Training:

After substantial completion of construction, the CxA will verify that operating personnel are trained in the use of the commissioned systems. Personnel will be familiarized with the following documents:

- OPR
- BOD
- Construction Documents for the commissioned system
- Start-up Verification Checklists
- TAB reports
- Functional Performance Tests
- O&M manuals
- Warranties

For each commissioned system, operating personnel will be given hands-on training after being familiarized with the above-mentioned documents. Training will include preventative maintenance recommendations, equipment inspections, and time for Q&A. The training should be videotaped for future use.

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7. Commissioning Schedule

The following is a list of commissioning activities and the approximate dates:

Commissioning Activity	Approximate Dates	Completed
Commissioning Kick-off meeting	3/20/2014	
Review of Owner's Project Requirements (OPR)	8/9/2013	
Review of Basis of Design (BOD)	8/16/2013	
Prepare Commissioning Plan	8/23/2013	
Coordinate Commissioning Activities	3/20/2014	
Perform Site Observations	6/21/2014	
Prepare System Verification Checklists (SVCs)	7/14/2015	
Prepare Functional Performance Tests (FPTs)	8/1/2015	
Observe TAB procedures and provide review comments	8/1/2015	
Conduct Functional Performance Testing	8/20/2015	
Functional Performance Test Report	9/1/2015	
Prepare Final Commissioning Report	9/2/2015	
Approval of Final Commissioning Report	9/9/2015	
Submit LEED Documentation	10/1/2015	

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8. Reference Documents

This section contains any relevant drawings, specifications, standards and guidelines for the project. Please refer to the following documents:

- LEED NC Scorecard
- EA prerequisite 1: Text from LEED NC v2.2 Rating System
- EA credit 3: from LEED NC v2.2 Rating System

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REVISION	DATE	DESCRIPTION
1	05/07/2015	Revision 02
2	08/04/2015	Revision 03
3	10/29/2015	Revision 04
4	06/27/2016	Revision 05



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COMMISSIONING PLAN

DRAWN	SKH
CHECKED	HIA
APPROVED	-
SCALE	NTS
SHEET	
A-002E	
DATE	June 25, 2013
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