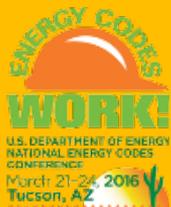


Compliance - Taking it from the Book to the Building

Anthony Floyd, FAIA, LEED-AP
City of Scottsdale
Office of Environmental
Initiatives

SCOTTSDALE

AZ



DOE National Energy Codes Conference 2016





IMC 403.7 – System Balancing

403.7 System Balancing. The ventilation air distribution system shall be provided with means to adjust the system to achieve at least the minimum ventilation airflow rate as required by Sections 403.3 and 403.4. Ventilation systems shall be balanced by an approved method. Such balancing shall verify that the ventilation system is capable of supplying and exhausting the airflow rates required by Sections 403.3 and 403.4.

Plan Review Note:

A copy of the AIR BALANCE REPORT shall be provided to the Building Inspector to show compliance with IMC 403.7 at or before Final Mechanical Inspection.

Omega
Test & Balance, L.L.C. Office: 900-441-0700
Fax: 900-441-0400

Outside Air Test Report

Project: Apollo Physicians System: Existing FCU 6-3 Outside Air
Drawing No. IM1.2 Location: Collins

UNIT NUMBER	OUTLET TYPE	DESIGN			PRELIMINARY			FINAL			NOTES
		BDP (M)	AS	VEL	CFM	VEL	CFM	VEL	CFM		
WSP-6-01	Out	0	130	714	140	808	134	723	142		
WSP-6-02	Out	0	349	444	181	215	180	438	153		
WSP-6-03	Out	0	136	489	80	67	13	481	84		
WSP-6-04	Out	0	349	344	120	579	202	335	117		
WSP-6-05	Out	0	348	801	178	801	210	833	178		
WSP-6-06	Out	0	136	714	140	777	152	733	140		
WSP-6-07	Out	0	136	526	188	318	101	818	191		
WSP-6-08	Out	0	349	573	200	832	225	812	214		
WSP-6-09	Out	0	136	561	110	345	107	888	109		
WSP-6-10	Out	0	136	485	08	386	109	487	88		
WSP-6-11	Out	0	136	561	110	372	112	581	113		
TOTAL					1440		1940		1488		

REMARKS: * Outside air tested prior to final air balance.

[Signature]
Omega Test & Balance, L.L.C.
1000 N. Scottsdale Rd., Suite 100
Scottsdale, AZ 85258
Tel: 900-441-0700
Fax: 900-441-0400

IMC 403.7
Test Date: 12/15/15 Reading By: JH Page: 1

Christopher John
 City of Scottsdale - Inspection Services
INSPECTION REPORT

Job # 108693 Address Shop 21 SCOTTSDALE ROAD Phone 708693

The Jobsite has been inspected for compliance with city codes, amending ordinances & approved plans
 The following corrections must be made prior to re-inspection
 Reinspection can be requested by calling 480-312-5700 or 480-312-5796

#029-079-078-079-031

- 1) RED SE ROSSERS
- 2) RED FIRE OCE APPROX - #030
- 3) RED APPROX W/ #037 - #043
- 4) RED AIR MOUNT - SMOKE DUCT APPROX
- 5) RED GARAGE ~~CONCRETE~~ CONCRETE SLAB @ DOOR
- 6) LINE OUT ALL OPEN ROOFING - SIGNAGE
- 7) RAG LAYOUT NOT FOR PLAN P 1-0
- 8) DOOR MOUNTING TO MATCH RAG P 4-D
- 9) ENSURE ROOF OF JOINTS ARE NOT F.O.O.
- 10) RED SCOURING AREA - POI
- 11) FRAME ALL RED ROOF ARE MET

RECALL LISTING COMPLETE

If you were charged a re-inspection fee, the fee must be paid prior to subsequent inspections
 Re-inspection fees & after hour inspection fees can be paid for with a credit card at:
 One Stop Shop 7447 E. Indian School Rd. Scottsdale, AZ 85251

RE-INSPECTION FEE REQUIRED: YES NO

Inspector J. F. Christopher John

My Phone Number 480-312-5753 I can be reached at 7 AM 3:30 PM

THIS LIST MUST REMAIN AT THE JOBSITE TO AVOID A COMPLETE RE-INSPECTION

customer copy page 1



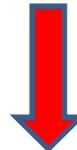
Southwest LLC
 Testing and Balancing

Test and Balance Analysis
 For
 Goldwater Brewing Co.
 3608 N. Scottsdale Road
 Scottsdale, AZ. 85251

Date: 3/26/2015

Architect: Aline Architecture Concepts
 Mechanical Engineer: ArdebitBorum Consulting Engineers
 Prepared for: Tri-Mega Mechanical

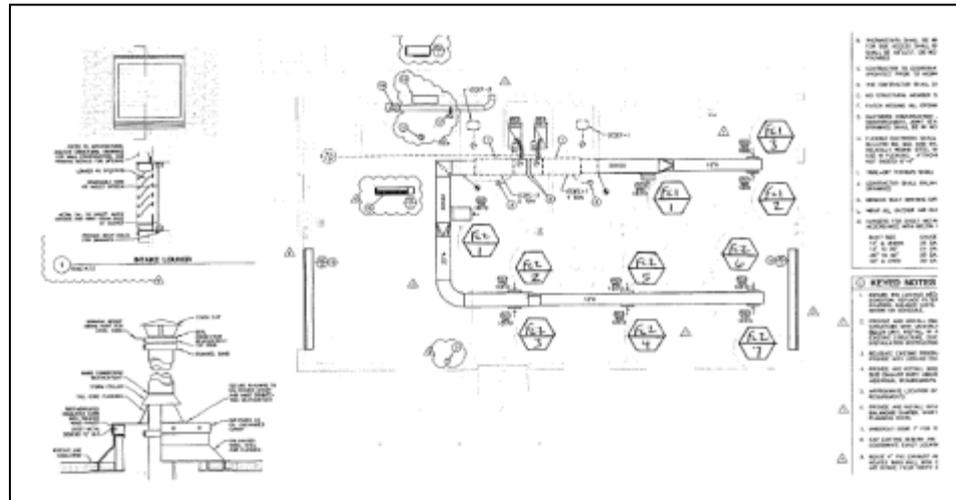
34122 W. McDowell Rd., Ste. 104 Goldwater, AZ 85395
 southwest.tob@gmail.com
 RUCP 270027



System Balancing



IMC 403.7



- Adjustments
- Corrections
- Sometimes Revised Plans



C408 System Commissioning

HVAC systems and Lighting Controls

- Commissioning Plan
 - Systems adjusting and balancing
 - Functional performance testing
- Preliminary Commissioning Report
 - Operation and maintenance manual
 - System balancing report
- Final Commissioning Report





C408 System Commissioning

Most Scottsdale Projects are Exempt Except for IgCC Projects

The following systems are exempt from commissioning:

1. Mechanical equipment capacity is less than 40 tons cooling capacity and 50 tons heating capacity
2. Mechanical systems that serve dwelling units and sleeping units in hotels, motels, boarding houses or similar units.
3. Air systems balancing for fans with motors of 1hp or less





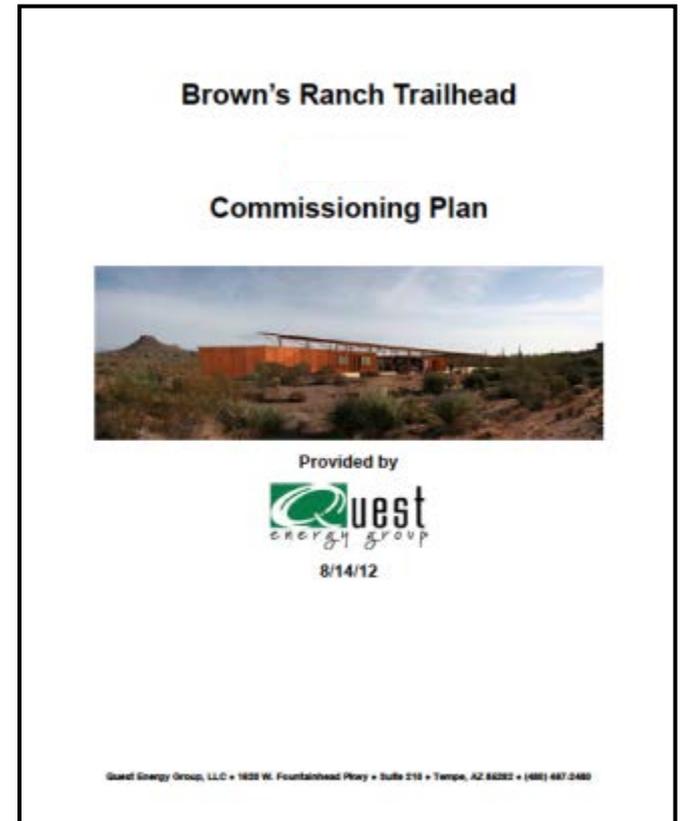
C408 System Commissioning

Commissioning Plan

C408.2.1 Commissioning Plan.

A commissioning plan shall be developed by a registered design professional or approved agency and shall include -

1. Narrative description of the activities that will be accomplished during each phase
2. Listing of the specific equipment, appliances or systems to be tested.
3. Functions to be tested
4. Conditions under which the test will be performed
5. Measurable criteria for performance





City of Scottsdale Commissioning Compliance Certificate



CITY OF SCOTTSDALE
PLANNING, NEIGHBORHOODS AND TRANSPORTATION
COMMISSIONING COMPLIANCE CERTIFICATE
2012 International Energy Conservation Code (IECC)

Project Name: _____	Date: _____
Address: _____ Plan Check No.: _____ Permit No.: _____	

Commissioning is a performance verification process that involves the owner, design professional in responsible charge and contractor. Commissioning begins during the design process, where the design professional's basis of design (BOD) is checked against the International Energy Conservation Code (IECC) and owner's project requirements (OPR). A commissioning plan identifies the mechanical systems and performance testing requirements. During construction, functional performance testing verifies compliance with the design and approved construction documents. Commissioning ensures the mechanical, electrical power and lighting systems are properly installed and function as designed and required under the IECC. The result is better performing buildings with reduced energy use, maintenance and operating costs.

OWNER'S NOTIFICATION OF COMMISSIONING
To be filled in and signed by Owner before a building permit is issued.

The International Energy Conservation Code requires a registered design professional or approved agency to ensure buildings are designed, constructed and commissioned in accordance with the approved plans, specifications and commissioning plan.

I, as owner/legal agent, do hereby certify that I have retained _____ to be responsible for building commissioning services in accordance with this certificate.

Signed: _____ Print name: _____
(signature of owner or legal representative)

Relation to Project (owner/legal agent): _____ Date: _____

COMMISSIONING RESPONSIBILITY

To be filled in and signed by the registered design professional or approved agency before a building permit is issued.

As the commissioning agency for the above named project, I certify that I am familiar with the design of the project and hereby assume full responsibility for carrying out the required commissioning responsibilities in accordance with this certificate.

Signed: _____ Print name: _____
(signature of commissioning agency representative)

Name of Commissioning Agency: _____ Date: _____
(commissioning agency must be independent from the contractor responsible for the work being inspected)

Processed by _____ Date _____
City Plans Examiner

COMMISSIONING REQUIREMENTS (IECC C408.1, C408.2, C408.3)

The 2012 International Energy Conservation Code (IECC), Section C408.1 requires commissioning of the building mechanical systems and electrical power/lighting systems. Construction documentation shall clearly indicate provisions for commissioning and completion requirements in accordance with the provisions of the code.

Exception: The following mechanical systems are exempt from commissioning requirements:

1. Mechanical systems and electrical power/lighting systems in buildings where the total mechanical equipment capacity is less than 480,000 Btu/h (140 680 W) cooling capacity and 800,000 Btu/h (175 860 W) heating capacity.
2. Systems included in Section C403.3 that serve dwelling units and sleeping units in hotels, motels, boarding houses or similar units.

COMMISSIONING PLAN (IECC C408.2.1)

A commissioning plan shall be developed by a registered design professional or approved agency and shall include the following items:



Owner's Notification of Commissioning and Certificate of Compliance

OWNER'S NOTIFICATION OF COMMISSIONING

To be filled in and signed by Owner before a building permit is issued.

The International Energy Conservation Code requires a registered design professional or approved agency to ensure buildings are designed, constructed and commissioned in accordance with the approved plans, specifications and commissioning plan.

I, as owner/legal agent, do hereby certify that I have retained _____ to be responsible for building commissioning services in accordance with this certificate.

Signed : _____ Print name: _____
(signature of owner or legal representative)

Relation to Project (owner/legal agent): _____ Date: _____

COMMISSIONING RESPONSIBILITY

To be filled in and signed by the registered design professional or approved agency before a building permit is issued.

As the commissioning agency for the above named project, I certify that I am familiar with the design of the project and hereby assume full responsibility for carrying out the required commissioning responsibilities in accordance with this certificate.

Signed : _____ Print name: _____
(signature of commissioning agency representative)

Name of Commissioning Agency: _____ Date: _____
(commissioning agency must be independent from the contractor)

Processed by _____
City Plans Examiner

CERTIFICATE OF COMPLIANCE

To be signed by commissioning agency prior to Certificate of Occupancy issuance.

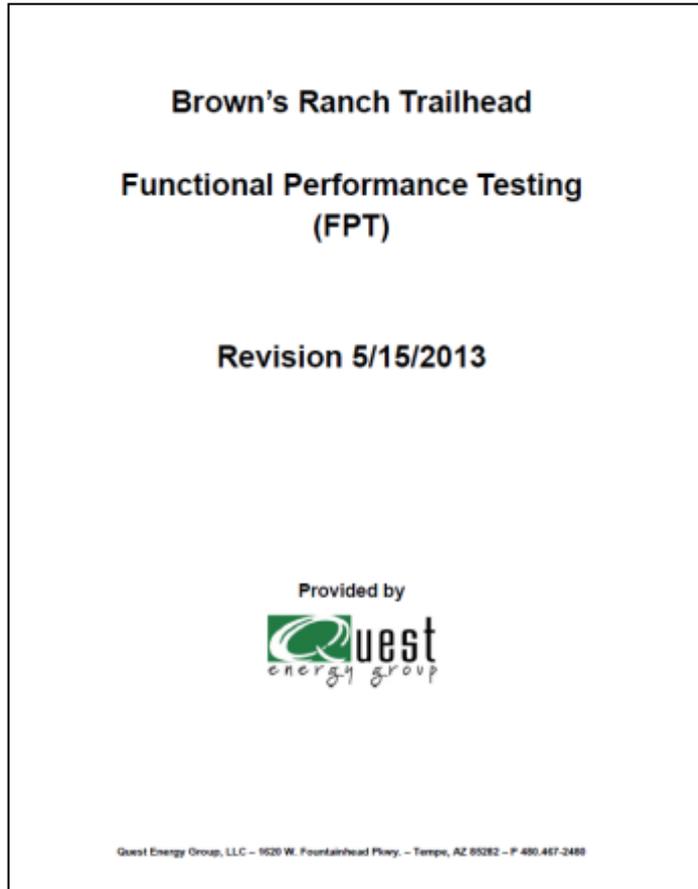
I certify that, to the best of my knowledge, the requirements of the International Energy Conservation Code and the approved plans and specifications have been complied with, insofar as the portion of the work requiring verification and commissioning in accordance with the responsibilities listed on this certificate. A preliminary commissioning report has been provided to the building owner indicating that the work was or was not completed in conformance with the approved construction documents and discrepancies have been brought to the attention of the contractor for correction.

Within 90 days of the date of receipt of the Certificate of Occupancy, an operating and maintenance manual, system balancing report and final commissioning report shall be provided to the building owner in accordance with this certificate. Contractor's responsibilities shall be in accordance with the performance obligations set by the Arizona Registrar of Contractors.

Signed : _____ Print name: _____
(signature of approved commissioning agency representative)

Name of Commissioning Agency: _____ Date: _____
(commissioning agency must be independent from the contractor responsible for the work being inspected)

Functional Performance Testing



Commissioning Reports

Preliminary Report

BROWN'S RANCH TRAILHEAD – FINAL COMMISSIONING REPORT – REVISED JUNE, 2013

Preliminary Commissioning Report

Per IgCC Section 612.1.4 Preliminary Commissioning Report (see below), a preliminary report has been provided.

A preliminary report of *commissioning* test procedures and results shall be completed and certified by the *registered design professional or approved agency* and provided to the *building owner*. The report shall be identified as "Preliminary Commissioning Report" and shall identify all of the following:

1. Itemization of deficiencies found during testing required by this section that have not been corrected at the time of report preparation.
2. Deferred tests that cannot be performed at the time of report preparation because of climatic conditions.
3. Climatic conditions required for performance of the deferred tests.

- Itemization of deficiencies found during testing
- Deferred tests



- Drawings
- O & M manuals
- System balancing report

Final Report

BROWN'S RANCH TRAILHEAD FINAL COMMISSIONING REPORT



Provided by

Weddle Gilmore
Black Rock Studio
&
Quest Energy Group

Revised July, 2013



Office of Environmental Initiatives

Community and Economic Development

Green Building Program

Anthony Floyd, FAIA, LEED-AP

afloyd@scottsdaleaz.gov

www.scottsdaleaz.gov/greenbuilding