

**DOCKETED**

<b>Docket Number:</b>	21-BSTD-01
<b>Project Title:</b>	2022 Energy Code Update Rulemaking
<b>TN #:</b>	238383
<b>Document Title:</b>	CAL SMACNA Comments - on Draft 2022 Energy Code Update
<b>Description:</b>	N/A
<b>Filer:</b>	System
<b>Organization:</b>	CAL SMACNA
<b>Submitter Role:</b>	Public
<b>Submission Date:</b>	6/21/2021 4:17:02 PM
<b>Docketed Date:</b>	6/21/2021

*Comment Received From: CAL SMACNA  
Submitted On: 6/21/2021  
Docket Number: 21-BSTD-01*

**CAL SMACNA -- Comments on Draft 2022 Energy Code Update**

*Additional submitted attachment is included below.*



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Executive Vice President

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VIA DOCKET SUBMITTAL

Docket No. 21-BSTD-01  
California Energy Commission  
Dockets Office MS-4  
1516 Ninth Street  
Sacramento, CA 95814-5512

RE: COMMENTS ON DRAFT 2022 ENERGY CODE EXPRESS TERMS (TN # 237717) AND DRAFT 2022 REFERENCE APPENDICES EXPRESS TERMS (TN# 237714)

Dear Commission Staff:

I write on behalf of the members of the California Association of Sheet Metal and Air Conditioning Contractors' National Association (CAL SMACNA) to provide comment on the Draft 2022 Energy Code Express Terms (TN# 237717) and Draft 2022 Reference Appendices Express Terms (TN# 237714).

CAL SMACNA is a non-profit statewide trade association representing over 300 sheet metal and air conditioning contractors who employ more than 25,000 union employees and administrative personnel throughout the state of California. These contractors perform commercial and residential heating, ventilating, and air conditioning; architectural and industrial sheet metal; as well as stainless steel kitchen equipment, manufacturing, testing and balancing, siding and decking. Their range of work includes public works, private commercial and residential projects.

**HVAC SYSTEM LEAKAGE TESTING PROCEDURES**

National SMACNA worked extensively with the CASE team and staff to utilize a "systems" approach to HVAC leakage testing. In fact, National SMACNA expedited the publication of their most recent Systems Air Leakage Test (SALT) standard in 2020 so that it could be used and referenced in the 2022 Energy Code update. The SALT approach goes beyond testing just the duct and includes procedures for any item included in a forced air system. This proposed shift in how we measure and analyze HVAC leakage is predicated on the broad understanding that the identification and mitigation of leaking ductwork alone will not yield the higher energy efficiency rates intended or desired.

The current Express Terms, however, do not presently include SALT or an air systems approach that includes leakage rates from HVAC related equipment. We remain hopeful the CASE team and staff will continue to pursue a systems approach with National SMACNA in lead-up to the next code cycle to better achieve higher accuracy of an HVAC system's actual leakage rates (*not just the percent leakage in the ductwork*) resulting in the opportunity for comprehensive mitigation efforts and higher energy efficiency savings for all buildings.

## DUCT LEAKAGE TESTING PROCEDURES

CAL SMACNA believes that the Energy Code should be amended to clarify that all non-residential duct systems including light commercial buildings and structures be tested in accordance with California Mechanical Code (CMC) Section 603.10.1, including the requirements for representative testing and the requirements to use trained Testing, Adjusting and Balancing technicians to perform the tests.

There can and should be large energy efficiency gains made in the area of light commercial HVAC systems. The current Express Terms language for NA7.5.3.2 only require conformance to the leakage standards in sections 120.4(g) and 141.0(b)2Dii, which will still allow excessive leakage. Section 141.0(b)2Dii also allows for visual inspection for leak sealing verification, which is insufficient to ensure leaks will be sealed and energy savings realized. CAL SMACNA is concerned that these sections, as currently drafted, will allow light commercial applications and HVAC systems operating in stripmalls to become improperly exempted from appropriate testing requirements.

**REQUESTED CHANGES – SET #1** -- As such, we request Section 120.4(g) and Section 141.0(b)2Dii be amended to read as follows:

### Section 120.4(g)

(g) Duct Sealing. Duct systems shall comply with subsections 1 or 2 below:

1. New duct systems that meet the criteria in Subsections A, B, C, and D below shall be sealed to a leakage rate not to exceed 6 percent of the nominal air handler airflow rate as confirmed through HERS field verification and diagnostic testing, in accordance with the applicable procedures in Reference Nonresidential Appendices NA1 and NA2;
  - A. The duct system does not serve a healthcare facility;
  - B. The duct system provides conditioned air to an occupiable space for a constant volume, single zone, space-conditioning system;
  - C. The space conditioning system serves **a building with** less than 5,000 square feet of conditioned floor area; and
  - D. The combined surface area of the ducts located outdoors or in unconditioned space is more than 25 percent of the total surface area of the entire duct system.
2. New duct systems that are not subject to testing under Section 120.4(g)1 shall instead meet the duct leakage testing requirements of CMC Section 603.10.1.

### Section 141.0(b)2Dii

ii. If the new ducts are an extension of an existing duct system; and the combined new and existing duct system meets the criteria in Subsections 1, 2, 3, and 4 below, the duct system shall be sealed to a leakage rate not to exceed 15 percent of the nominal air handler airflow rate as confirmed through HERS field verification and diagnostic testing, in accordance with the applicable procedures in Reference Nonresidential Appendices NA1 and NA2:

1. The duct system does not serve a healthcare facility;
2. The duct system provides conditioned air to an occupiable space for a constant volume, single zone, space-conditioning system;
3. The space conditioning system serves **a building with** less than 5,000 square feet of conditioned floor area; and

4. The combined surface area of the ducts located outdoors or in unconditioned space is more than 25 percent of the total surface area of the entire duct system.

shall meet one of the following requirements:

a. The measured duct leakage shall be equal to or less than 15 percent of the system air handler airflow as confirmed by field verification and diagnostic testing utilizing the procedures in Reference Nonresidential Appendix Section NA2.1.4.2.1; or

b. If it is not possible to comply with the duct leakage criterion in Subsection 141.0(b)2Dii, then all accessible leaks shall be sealed and verified through a visual inspection and a smoke test performed by a certified HERS Rater utilizing the methods specified in Reference Nonresidential Appendix NA2.1.4.2.2.

~~EXCEPTION 1 to Section 141.0(b)2Dii: When it is not possible to achieve the duct leakage criterion in Section 141.0(b)2Dii, then all accessible leaks shall be sealed and verified through a visual inspection and a smoke test performed by a certified HERS Rater utilizing the methods specified in Reference Nonresidential Appendix NA2.1.4.2.2.~~

EXCEPTION 2 to Section 141.0(b)2Dii: Duct Sealing. Existing duct systems that are extended, which are constructed, insulated or sealed with asbestos are exempt from the requirements of subsection 141.0(b)2Dii.

**SINGLE-FAMILY HOMES ARE DIFFERENT THAN MULTI-FAMILY STRUCTURES -- ACCEPTANCE TESTING FOR MULTI-FAMILY BUILDINGS SHOULD NOT REQUIRE HERS RATER FIELD VERIFICATION OR FOLLOW HERS PROCEDURE**

Single-family and multi-family structures are not the same. HERS training and the entire program itself is designed for evaluating single-family residences. The Express Terms language for NA7.18.1.1 and NA7.18.1.2, however, both require multi-family dwellings ventilation and enclosure leakage acceptance to be verified by a HERS rater. This is non-sensical.

Furthermore, the Express Terms also require multi-family mechanical acceptance testing to be completed by a Certified Mechanical Acceptance Test Technician (MATT), and then requires a HERS rater-verification of that work. MATT technicians are required to have far more extensive knowledge, experience and training than a HERS rater. Having a HERS rater verify the work of a certified MATT technician is redundant, costly and unnecessary for building owners.

**REQUEST CHANGES – SET #2** -- To avoid confusion and reduce unnecessary cost, burden and energy waste, NA7.18.1.1.2 and NA7.18.1.2.2 should be removed.

Finally, Section 120.5 of the Express Terms requires four new acceptance tests exclusively for multifamily dwellings, but the Express Terms Reference Appendices require the HERS method. NA7.18.3.2 should be amended to require testing in conformance with the CMC.

**REQUEST CHANGES – SET #3** -- As such, we request NA7.18.3.2 be amended to read as follows:

**NA7.18.3.2**

**Duct systems shall meet the duct leakage testing requirements of CMC section 603.10.1**

~~Step 1: Measure and record environmental data at the beginning and conclusion of each test including ambient temperature, indoor temperature and barometric pressure.~~

~~Step 2: Install static pressure probe in main plenum pointing into airstream induced by the test. If the test fan is on the roof, the static pressure probe will need to be connected to the measurement device at the test site with a tube long enough to make the connection.~~

~~Step 3: If the test fan is mounted inside, with the building open to the outside, use the building as reference pressure. If the test fan is located on the roof, use the outside as the reference pressure.~~

Step 4: Attach the test fan to the duct system

a) For roof top and wall mounted exhaust systems, remove the fan from the curb or opening and seal the test fan to the curb following test equipment manufacturer's instructions, making sure the dampers are open (NOP);

b) Alternatively, the test fan may be applied to a grille opening on the inside of the building following test equipment manufacturer's instructions;

Step 5: Temporarily seal the system including:

a) All of the grilles on the system using masking tape and air impermeable sheeting or duck mask made for this application;

b) Air handler access door or panel (do not use permanent sealing material, metal tape is acceptable);

e) For systems with an air handler with supply and return plenums, the entire duct system including the air handler shall be included in the test;

Step 6: Adjust the test fan speed to maintain 25 Pa or 50 Pa at the static pressure probe location;

Step 7: Record the air flow (CFM) and temperature;

Step 8: Determine the nominal fan airflow using the product specifications of the installed equipment for the design static pressure;

Step 9: Divide the duct leakage flow by the nominal fan flow and convert to a percentage. If the duct leakage flow percentage is equal to or less than the target compliance criterion of 6% leakage the system passes. The leakage test can be conducted at rough-in or after the grilles or registers are installed. If the leakage test is conducted at rough-in, the spaces between the grille or register boots and the wallboard shall be sealed, and at least one grille or register must be removed to verify proper sealing. For compliance with the leakage requirements in Section 160.2(b)2C1, an ATT shall identify a group of up to three central ventilation duct systems in the building from which a sample will be selected for testing;

CAL SMACNA appreciates the opportunity to provide these comments. Please feel free to contact me at (916) 363-7460 if you should have questions or need additional information.

Sincerely,



Chris Walker  
EVP, CAL SMACNA  
[chris@cal-smacna.org](mailto:chris@cal-smacna.org)  
(916) 363-7460