City of FRESNO

2600 Fresno Street, Third Floor
Fresno, California 93721-3604
(559) 621-8277 FAX (559) 498-1012

Planning and Development Department
Jennifer Clark, AICP, Director

BUILDING INDUSTRY BULLETIN

EFFECTIVE DATE: March 27, 2023

TO: ARCHITECTS, ENGINEERS, GENERAL CONTRACTORS, and ASSOCIATIONS

SUBJECT: FLEXIBLE DUCTWORK

FROM: Charles Clark
Chuck Clark, MBA, CBO
Building Official/Building and Safety Manager

GENERAL:

Flexible Air Ducts: A preformed, flexible, tubular passage for supply, return and exhaust air in HVAC systems.

Rigid Air Ducts: Metal pipes, constructed of galvanized steel or aluminum, used in HVAC systems.

The 5 feet flexible air duct length limitation was enforced in the 2016 California Mechanical Code. The 5 feet limitation for flexible air duct and connectors coincides with the 2009 ASHRAE Handbook and "HVAC Flexible Duct Pressure Loss Measurements" which is a study submitted by Texas A&M University.

CODE REQUIREMENTS:

1. *California Mechanical Code section 603.4.1*
   a. Factory-made flexible air ducts and connectors shall be not more than 5 feet in length and shall not be used in lieu of rigid elbows or fittings. Flexible air ducts shall be permitted to be used as an elbow at a terminal device.
      i. Exception: Residential occupancies

2. *California Mechanical Code section 603.5*
   a. Flexible air ducts shall comply with UL 181, and shall be installed in accordance with the manufacturer's installation instructions and SMACNA HVAC duct Construction Standards – Metal and Flexible. Flexible air duct installation shall comply with the following:
      i. Ducts shall be installed using the minimum required length to make the connection.

ii. Horizontal duct runs shall be supported at not more than 4 feet intervals.
iii. Vertical risers shall be supported at not more than 6 feet intervals.
iv. Sag between support hangers shall not exceed ½ inch per foot of supporting spacing.
v. Supports shall be rigid and shall be not less than 1 ½ inches wide at point of contact with the duct surface.
vi. Duct bends shall be not less than one duct diameter bend radius.
vii. Screws shall not penetrate the inner liner of non-metallic flexible ducts unless permitted in accordance with the manufacturer's installation instructions.
viii. Fittings for attaching non-metallic ducts shall be beaded and have a collar length of not less than 2 inches for attaching the duct.
(1) Exception: A bead shall not be required where metal worm-gear clamps are used or where attaching metallic ducts using screws in accordance with the manufacturer's installation instructions.
ix. Duct inner liner shall be installed at not less than 1 inch on the collar and past the bead prior to the application of the tape and mechanical fastener. Where mastic is used instead of tape, the mastic shall be applied in accordance the mastic manufacturer's instructions.
x. Duct outer vapor barriers shall be secured using two wraps of approved tape. A mechanical fastener shall be permitted to be used in place of, or in combination with, the tape.
xi. Flexible air ducts shall not penetrate a fire-resistance-rated assembly or construction.
xii. The temperature of the air to be conveyed in a flexible air duct shall not exceed 250°F (121 °C).
xiii. Flexible Air ducts shall be sealed in accordance with Section 603.10.

3. *California Mechanical Code section 1.2.3*
   a. The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative has been approved. An alternative material, design, or method of construction shall be approved where the building official finds that the proposed design is satisfactory and complies with the intent of the provisions of this code, and that the material, method or work offered is for the purpose intended, at least the equivalent of that prescribed in this code in quality, strength, effectiveness, fire resistance, durability, and safety.

4. *California Mechanical Code section 1.2.3.1*
   a. Supporting data, where necessary to assist in the approval of materials or assemblies not specifically provided for in this code, shall consist of valid research reports from approved sources.

5. *California Mechanical Code section 1.2.3.2*

a. Whenever there is insufficient evidence of compliance with the provisions of this code, or evidence that a material or method does not conform to the requirements of this code, or in order to substantiate claims for alternative materials or methods, the building official shall have the authority to require tests as evidence of compliance to be made at no expense to the jurisdiction. Test methods shall be as specified in this code or by other recognized test standards. In the absence of recognized and accepted test methods, the building official shall approve the testing procedures. Tests shall be performed by an approved agency. Reports of such tests shall be retained by the building official for the period required for retention of public records.

POLICY:

New building construction, shall comply with the following criteria:

1. Mechanical HVAC system shall be a rigid duct system per California Mechanical Code.

Tenant Improvement construction shall comply with the following criteria:

2. A single 5-ton unit or less installed shall be permitted to install flexible duct system.

3. A complete build out with a mechanical system(s) shall install a rigid duct system. In the case where a flexible duct system is proposed this will require an Alternate Materials, Design and Methods of Construction (AMMR) to be completed and submitted to the Building and Safety department for review.

4. Existing flexible duct system that is completely removed and replaced with a new flexible duct system will require an Alternate Materials, Design and Methods of Construction (AMMR) to be completed and submitted to the Building and Safety department for review.

5. Where 50 percent or less of the flexible duct system is removed and replaced, the ductwork can be a like for like replacement.

6. Existing rigid duct system shall remain a rigid duct system.

Fire repair shall comply with the following criteria:

1. The scope of fire repair work shall be limited to replacing and repairing damaged building components listed in the fire report. In the case when the flexible ductwork is existing, a like for like replacement shall be permitted.

Alternate Materials, Design and Methods of Construction (AMMR) shall include supporting documentation along with the AMMR to substantiate claims for alternate methods. The

alternate method of construction shall be reviewed by the Building Official. Be advised, an AMMR is subject to additional plan check review and fees.