on the net free area of each opening. Where the free area through a design of louver or grille is known, it shall be used in calculating the size opening required to provide the free area specified. Where the design and free area are not known, it shall be assumed that wood louvers will have 25 percent free area and metal louvers and grilles will have 75 percent free area. Nonmotorized louvers and grilles shall be fixed in the open position. [NFPA 54:9.3.7.1]

(B) Minimum Screen Mesh Size. Screens shall be not less than one-fourth (¼) inch mesh. [NFPA 54:9.3.7.2]

(C) Motorized louvers shall be interlocked with the appliance so they are proven in the full open position prior to main burner ignition and during main burner operation. Means shall be provided to prevent the main burner from igniting should the louver fail to open during burner start-up and to shut down the main burner if the louvers close during burner operation. [NFPA 54:9.3.7.3]

507.9 Combustion Air Ducts. Combustion air ducts shall comply with the following:

(1) Ducts shall be of galvanized steel or a material having equivalent corrosion resistance, strength, and rigidity. [NFPA 54:9.3.8.1]

Exception: Within dwelling units, unobstructed stud and joist spaces shall not be prohibited from conveying combustion air, provided that not more than one (1) fireblock is removed.

(2) Ducts shall terminate in an unobstructed space, allowing free movement of combustion air to the appliances. [NFPA 54:9.3.8.2]

(3) Ducts shall serve a single space. [NFPA 54:9.3.8.3]

(4) Ducts shall not service both upper and lower combustion air openings where both such openings are used. The separation between ducts serving upper and lower combustion air openings shall be maintained to the source of combustion air. [NFPA 54:9.3.8.4]

(5) Ducts shall not be screened where terminating in an attic space. [NFPA 54:9.3.8.5]

(6) Intakes for combustion air ducts located exterior to the building shall have the lowest side of the combustion air intake openings located at least twelve (12) inches (300 mm) vertically from the adjoining finished grade level.

(7) Horizontal upper combustion air ducts shall not slope downward toward the source of combustion air. [NFPA 54:9.3.8.6]

(8) The remaining space surrounding a chimney liner, gas vent, special gas vent, or plastic piping installed within a masonry chimney flue, metal or factory-built chimney, shall not be used to supply combustion air [NFPA 54:9.3.8.7], unless it is listed and shown in the manufacturer's installation instructions.

508.0 Other Water Heater Installation Requirements.

508.1 The Authority Having Jurisdiction shall have the authority to require the use of an approved dielectric insulator on the water piping connections of water heaters and related water heating appliances.

508.2 Protection from Seismic Damage. *Water heaters shall be anchored or strapped to resist horizontal displacement due to earthquake motion. Strapping shall be at points within the upper one third (⅓) and lower one-third (⅓) of its vertical dimensions. At the lower point, a minimum distance of four (4) inches (102 mm) shall be maintained above the controls with the strapping.*

Note: [HCD 1 & HCD 2] *Reference Health and Safety Code Section 19211(a) which addresses new, replacement, and existing water heaters.*

Note: *The applicable subsection of Health and Safety Code Section 19211(a) which addresses new, replacement, and existing water heaters is repeated here for clarity and reads as follows:*

Section 19211(a) Notwithstanding Section 19100, all new and replacement water heaters, and all existing residential water heaters shall be braced, anchored, or strapped to resist falling or horizontal displacement due to earthquake motion. At a minimum, any water heater shall be secured in accordance with the California Plumbing Code, or modifications made thereto by a city, county, or city and county pursuant to Section 17958.5.

508.3 A water heater supported from the ground shall rest on level concrete or other approved base extending not less than three (3) inches (76 mm) above the adjoining ground level.

508.4 When a water heater is located in an attic, attic-ceiling assembly, floor-ceiling assembly, or floor-subfloor assembly where damage results from a leaking water heater, a water-tight pan of corrosion-resistant materials shall be installed beneath the water heater with not less than three-quarters (¾) of an inch (20 mm) diameter drain to an approved location.

508.5 Relief Valve Discharge. Discharge from a relief valve into a water heater pan shall be prohibited.

508.6 Added or Converted Appliances. When an additional or replacement appliance is installed or an appliance is converted to gas from another fuel, the location in which the appliance is to be operated shall be checked to verify the following [NFPA 54:9.1.2]:

508.6.1 Air for combustion and ventilation is provided where required, in accordance with the provisions of Section 507.0. Where existing facilities are not adequate, they shall be upgraded to Section 507.0 specifications. [NFPA 54:9.1.2(1)]

508.6.2 The installation components and appliances meet the clearances to combustible material provisions of NFPA 54:9.2.2. It shall be determined that the installation and operation of the additional or replacement appliance does not render the remaining appliance unsafe for continued operation. [NFPA 54:9.1.2(2)]

(The following reference was extracted from NFPA 54, National Fuel Gas Code).

9.2.2 Clearance to Combustible Materials. Appliances and their vent connectors shall be installed with clearances from combustible material so their operation will