507.4 Minimum Capacity of Closed-Type Tank. The minimum capacity of the closed-type expansion tank shall be determined from Table 5-2 and Table 5-3 or from the following formula:

$$Vt = \frac{(0.00041t - 0.0466)\ Vs}{\left(\frac{Pa}{Pf} - \frac{Pa}{Po}\right)}$$

Where:

Vt = minimum volume of expansion tank, L.

Vs = volume of system, not including expansion tank, L.

t = average operating temperature, ºC.

Pa = atmospheric pressure, m H_2O absolute.

Pf = fill pressure, m H_2O absolute.

Po = maximum operating pressure, m H_2O absolute.

507.5 Test Pressure for Tanks Used in Solar Systems. The test pressure for tanks that are subject to water pressure from utility mains (with or without a pressure reducing valve) shall be two times the working pressure but not less than 21bar (300 psi).

508.0 Collectors.

508.1 Construction. Frames and braces exposed to the weather shall be constructed of materials for exterior locations, and protected from corrosion or deterioration, as approved by the Authority Having Jurisdiction.

508.1.1 Support. Panels shall be anchored to roof structures or other surfaces in a manner to resist wind or seismic loadings in compliance with the Building Code. Anchors secured to and through a roofing material shall be made to maintain the water integrity of the roof covering. Roof drainage shall not be impaired by the installation of collectors. Panels that are not an integral part of the roofing system shall be installed to preserve the integrity of the roof surface.

508.1.2 Minimum Height. Panels installed at ground level shall be not less than 15cm above the ground level.

508.1.3 Glass. Glass used in collector construction shall be tempered.

508.1.4 Plastic. Plastic used in collector construction shall be installed in accordance with its listing and the manufacturer's instructions.

508.1.5 Listed. Collectors that are manufactured as a complete component shall be listed or labeled by an approved listing agency.

508.2 Location. Collectors shall be located and oriented in accordance with the manufacturer's installation instructions to optimize the sun's energy, consistent with the intended purpose of the system.

508.3 Air Collectors.

508.3.1 Materials Exposed Within Collectors. Materials exposed within collectors shall be noncombustible or shall have a flame spread index not exceeding 25 and a smoke developed index not exceeding 50, when tested as a composite product in accordance with one of the following test methods: NFPA 255, *Method of Test of Surface Burning Characteristics of Building Materials*, ASTM E84, *Surface Burning Characteristics of Building Materials*, or UL 723, T*est for Surface Burning Characteristics of Building* or equivalent International Standard(s) approved by the Authority Having Jurisdiction.

508.3.2 Materials Used Within Air Collectors. Materials used within an air collector shall not smoke, smolder, glow, or flame when tested in accordance with ASTM C411 *Test for Hot Surface Performance of High Temperature Thermal Insulation* or equivalent International Standard(s) approved by the Authority Having Jurisdiction, at temperatures exposed to in service. In no case shall the test temperature be less than 121ºC (250ºF).

508.4 Fire Safety Requirements.

508.4.1 Building Components. Collectors that function as building components shall comply with the Building Code.

508.4.2 Location Within Building Components. Collectors located above or on roofs and functioning as building components shall not reduce the required fire-resistance nor fire-retardance classification of the roof covering materials.

Exceptions:

(1) One- and two-family dwellings.

(2) Collectors located on buildings not exceeding 3 stories in height and/or 836m^2 (9,000 ft.^{2}) total floor area, providing:

(a) The collectors are noncombustible.

(b) Collectors with plastic covers have noncombustible sides and bottoms, and the total area covered and the collector shall not exceed the following:

(i) Plastic CC1 – 33-1/3 percent of the roof area, or

(ii) Plastic CC2 – 25 percent of the roof area.

(3) Collectors with plastic film covers having a thickness of 0.25mm (0.010 in.) or less shall have noncombustible sides and bottoms, and the total area covered by the collector shall not exceed 33-1/3 percent of the roof area.