



MIDLANT BUILDING ENVELOPE AIR TIGHTNESS CRITERIA

PURPOSE: Provide a building envelope continuous air sealing barrier to reduce infiltration.

BUILDING ENVELOPE SEALING PERFORMANCE REQUIREMENT: Design and construct the building envelope with a continuous air seal barrier to control air leakage into, or out of, the conditioned space.

A. **DESIGN:** Clearly identify all air barrier components of each envelope assembly on construction documents; detail the joints, interconnections and penetrations of the air barrier components. Clearly identify the boundary limits of the building air barriers, and of the zone or zones to be tested for building air tightness on the drawings. Trace a continuous plane of air-tightness throughout the building envelope, and make flexible and seal all joints.

B. **CONSTRUCTION:** The air seal barrier material(s) must have an air permeance not to exceed 0.004 CFM/SF at 0.3" WG [0.02 L/s.m² @ 75 Pa] when tested in accordance with ASTM E 2178 (2003).

(1) Join and seal the air barrier material of each assembly to the air barrier material of adjacent assemblies in a flexible manner, allowing for the relative movement of these assemblies and components.

(2) Support the air seal barrier in a method to withstand the maximum positive and negative air pressure to be placed on the building without displacement or damage, and transfer the load to the structure.

(3) Seal all penetrations of the air seal barrier. If any unavoidable penetrations of the air barrier by electrical boxes, plumbing fixture boxes, and other assemblies are not airtight, make them airtight by sealing the assembly and the interface between the assembly and the air barrier, or by extending the air barrier over the assembly. The air seal barrier must be durable to last the anticipated service life of the assembly.

(4) Do not install lighting fixtures with ventilation holes through the air barrier.

(5) Provide a motorized damper in the closed position and connected to the fire alarm system to open on call and fail in the open position for any fixed open louvers such as at elevator shafts.

(6) Damper and control to close all ventilation or make-up air intakes and exhausts, atrium smoke exhausts and intakes, etc., when leakage can occur during inactive periods.

(7) Compartmentalize garages under buildings by providing airtight vestibules at building access points.

(8) Compartmentalize spaces under negative pressure such as boiler/mechanical rooms and provide make-up air for combustion.

PERFORMANCE CRITERIA AND SUBSTANTIATION: Submit the qualifications and experience of the testing entity for approval. Demonstrate performance of the continuous air barrier for the opaque building envelope by the following tests:

A. Test the completed building and demonstrate that the air leakage rate of the building envelope does not exceed 0.25 CFM/SF at a pressure differential of 0.3" w.g.(75 Pa) in accordance with ASTM E779 (2003) or E-1827-96 (R2007). Accomplish tests using either pressurization or depressurization or both. Divide the volume of air leakage in CFM @ 0.3" w.g. (L/s @ 75 Pa) by the area of the pressure boundary of the building, including roof or ceiling, walls and floor to produce the air leakage rate in CFM/SF @ 0.3" w.g. (L/s.m² @ 75 Pa). Do not test the building until verifying that the continuous air barrier is in place and installed without failures in accordance with installation instructions so that repairs to the continuous air seal barrier, if needed to comply with the required air leakage rate, can be done in a timely manner.

B. Test the completed building using Infrared Thermography testing. Use infrared cameras with a resolution of 0.1deg C or better. Perform testing on the building envelope in accordance with ISO 6781:1983 and ASTM C1060-90 (R2003). Determine air leakage pathways using ASTM E 1186-03

(R2009) Standard Practices for Air Leakage Site Detection in Building Envelopes and Air Seal Barrier Systems, and perform corrective work as necessary to achieve the whole building air leakage rate specified in above.

C. Notify the Government at least three working days prior to the tests to provide the Government the opportunity to witness the tests. Provide the Government written test results confirming the results of all tests.