Thank you for your query regarding fall arrest and lifeline anchor loading and engineering assessment requirements in the 2018 IBC.  In response to your query, we offer the following comments.

Per the 2018 IBC:

1607.10.4 Fall arrest and lifeline anchorages. In addition to any other applicable live loads, fall arrest and lifeline anchorages and structural elements that support these anchorages shall be designed for a live load of not less than 3,100 pounds (13.8 kN) for each attached lifeline, in every direction that a fall arrest load can be applied.

SECTION 1708 IN-SITU LOAD TESTS

1708.1 General. Whenever there is a reasonable doubt as to the stability or load-bearing capacity of a completed building, structure or portion thereof for the expected loads, an engineering assessment shall be required. The engineering assessment shall involve either a structural analysis or an in-situ load test, or both. The structural analysis shall be based on actual material properties and other as-built conditions that affect stability or load-bearing capacity, and shall be conducted in accordance with the applicable design standard.  The in-situ load tests shall be conducted in accordance with Section 1708.2. If the building, structure or portion thereof is found to have inadequate stability or load-bearing capacity for the expected loads, modifications to ensure structural adequacy or the removal of the inadequate construction shall be required.

1708.2 In-situ load tests. In-situ load tests shall be conducted in accordance with Section 1708.2.1 or 1708.2.2 and shall be supervised by a registered design professional. The test shall simulate the applicable loading conditions specified in Chapter 16 as necessary to address the concerns regarding structural stability of the building, structure or portion thereof.

ICC Commentary to the 2018 IBC:

•             Commentary to Section 1607.10.4: Lifeline anchorages, also known as fall arrest anchorages, are called on to resist impact loads when a suspended worker on the face of a building experiences a fall. Because the loads are highly variable depending on the weight of the worker, the fall distance and the energy-absorbing characteristics of the fall arrest system, and because the lifeline is the last defense against a fall, OSHA requires that lifeline anchorages be capable of sustaining without failure an ultimate load of 5,000 pounds (22.2 kN) per person. Using a design live load of 3,100 pounds (13.8 kN), when combined with a live load factor of 1.6, results in a total factored load of 4,960 pounds (22.1 kN), which matches OSHA’s requirements for lifeline anchorages within an acceptable margin of error. The load is used to design the lifeline anchorage and the structural elements that support the anchorage.

•             Commentary to Section 1708.1: This section is intended to verify the adequacy of a structure via structural analyses and/or load tests where there is reasonable doubt whether the structure has sufficient capacity.  A load test procedure must simulate the actual load conditions to which the structure will be subjected (see Section 1708.2 for details).

•             Commentary to Section 1708.2: The criteria for in-situ load tests are set forth for two categories: procedures specified, which are regulated by Section 1708.2.1, and procedures not specified, which are regulated by Section 1708.2.2.

Hence, in response to your queries:

•             Whenever there is a reasonable doubt as the capacity, an engineering assessment shall be required.  The engineering assessment can involve either a structural analysis or a load test, or both can be performed.  i.e.: if a structural analysis provides a sufficient and adequate engineering assessment, then an in-situ load test is not necessarily required.

•             Only if a ‘in-situ load test’ is selected out of the options above, then the in-situ load test shall be conducted in accordance with Section 1708.2.  Section 1708.2 does not require an in-situ test to be performed.  Section 1708.2 provides the requirements for how to perform an in-situ test, if one is selected to be done (see comments above).  Naturally, depending on the approach of the individual or group performing the engineering assessment, the results of in-situ tests, either positive or negative, could be used to influence the structural analysis engineering assessment of other similar elements – similar to the phrase “one test is worth a thousand opinions”.

•             Please note: ICC cannot comment on the letter you provided from OSHA which is dated 1999.

If you feel the code needs further development, we naturally encourage everyone to participate in the code development process.  You can submit proposals that can shape the regulations that ensure the health, safety and welfare of the people who live in, work in and visit the community you serve.  The International Code Council develops construction and public safety codes through a governmental consensus process. The governmental consensus process leaves the final determination of code provisions in the hands of public safety officials who, with no vested financial interest, can legitimately represent the public interest. This system of code development has provided the highest level of safety in the world for more than 90 years.  For additional information on the ICC code development process: <https://www.iccsafe.org/products-and-services/i-codes/code-development/>

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Best Regards and Stay Strong,

Larry Novak

**Lawrence C. Novak, SE, F.SEI, CERT, LEED AP**

*Chief Structural Engineer*

*Codes and Standards Development*

**International Code Council**

Cell: 312-513-7504

Direct: 888-ICC-SAFE (422-7233) Ext. 4405

LNovak@iccsafe.org