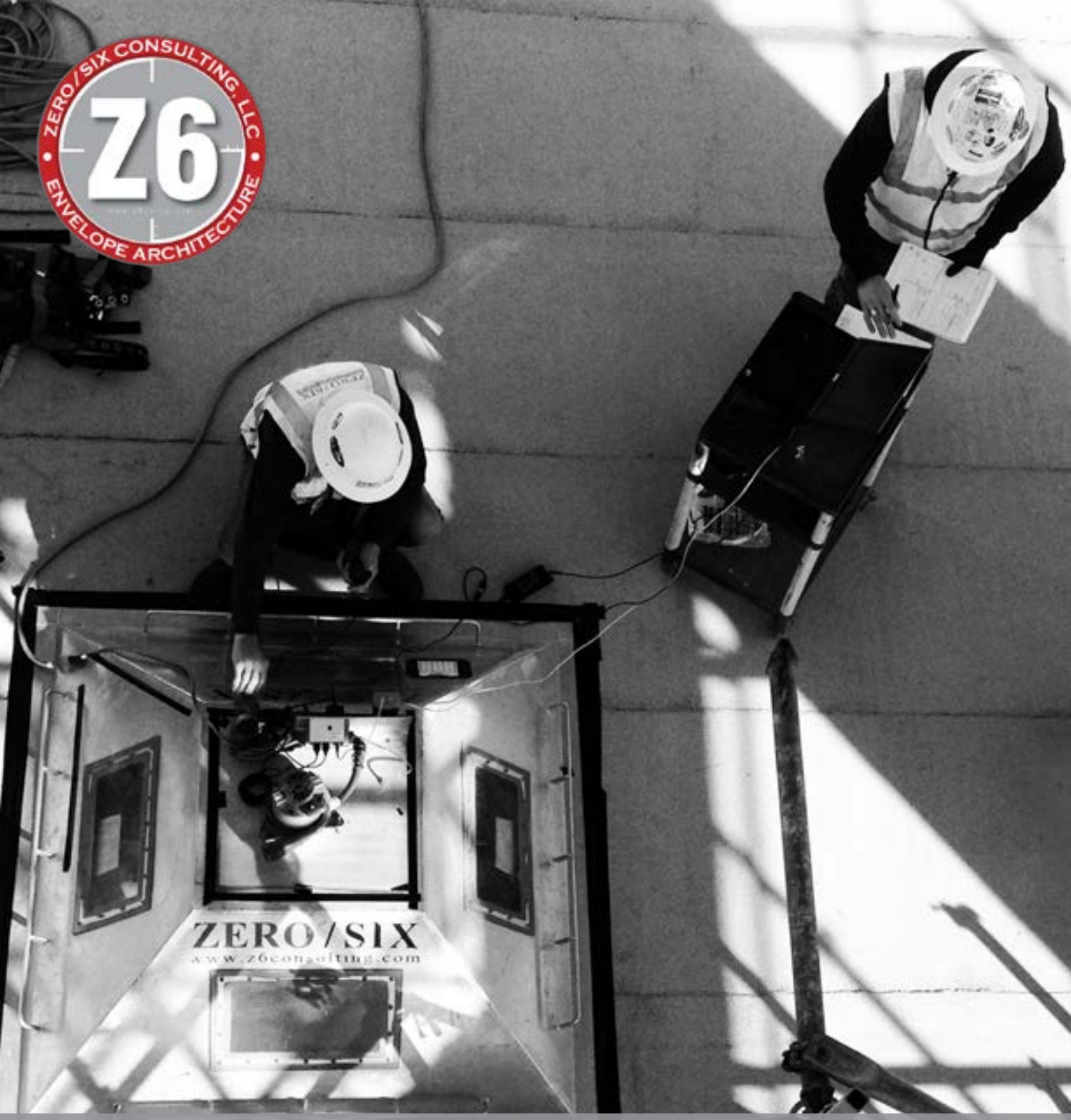


ROOF MEMBRANE UPLIFT RESISTANCE TESTING
PERFORMANCE ASSURANCE

ZERO/SIX CONSULTING, LLC | WWW.Z6CONSULTING.COM

ROOF MEMBRANE UPLIFT RESISTANCE TESTING

Unlike a building's interior components, roofs are susceptible to severe weathering, foot traffic, expansion, contraction and abuse, which can result in accelerated roof system degradation. To assure a roof system performs optimally and meets warranty compliance, roof membrane uplift resistance testing is the industry accepted international standard that:

- Identifies installation and design deficiencies that could lead to premature degradation, catastrophic building damage on the interior and exterior and may even pose a danger to occupant safety.
- Remaining life expectations
- Provides security in knowing your installed asset complies with the designed wind load.
- Meets the manufacturer's warranty requirements and the Texas Department of Insurance requirements.
- Is a requirement of some insurance providers to determine the quality of an insured asset.

Zero/Six Consultin, LLC (Z6) is one of the few companies in Texas who are ISO/IEC 17025 accredited in roof uplift test FM Global 1-52 and ASTM E907. As such, we are uniquely positioned to assure your roof meets all applicable building codes and insurance/warranty requirements.

Z6 set out to be the leader in roof uplift testing by building our own improved version of a typical testing chamber. Uplift testing used to be referred to as "bubble test" as it was often conducted with a high-strength skylight dome. FM Global was on hand during our "maiden voyage" and was so impressed with our chamber design; they suggested we put the system on the market. Z6 Commissioning built our roof uplift chamber with the mindset of eliminating the controversial "spiking" test pressures issue. We do this by showing the readings for pressure and deflection in a real-time computer generated graph during the test and on the report. Our custom roof uplift chamber, calibrated tooling and extensive protocols evaluate and record pressure and deflection measurements in real-time.

> Field uplift tests are used for confirmation of acceptable wind uplift resistance on completed roof systems, especially those in hurricane prone regions. These tests also may be needed where inferior construction is suspected (or known to be present) or where a partial blow-off has occurred.
>
> **- Factory Mutual (FM) Global Insurance Company Property Loss Prevention Data Sheet 1-52 (Field Verification of Roof Wind Uplift Resistance)**

HOW IT WORKS

An uplift chamber test is nondestructive on properly installed roofs and utilizes our custom 5'x5' aluminum chamber that simulates wind uplift pressure by suctioning critical areas of the roof one pressure step at a time to the required pressure.

Roofs typically fail uplift testing one of three ways:

1. Exceeding the allowable deflection,
2. A sudden ballooning of the cover, or
3. Roof fastener failure with mechanically attached system

Allowable deflection of the roof cover for a FM Global 1-52 test is ¼ – ½ inch (6.35-12.7mm), depending on the roofing substrate and test pressure. The ASTM E907 test allows for a 1 inch (25.4 mm) deflection. Considering that the allowable deflection is so minute, especially for the FM Global test, Z6 has taken every effort to remove human error by investing in technology that gathers data digitally instead of relying on analog dials and manual recording of the data. Our digital system exceeds the requirements in the accepted standard which allows deflection in roofing to be measured via dial indicators. Z6's digital indicators provide calibrated digital readings up to .001" while tracking and recording test pressures throughout the test.

Should an obvious failure occur, or if excessive deflection is recorded, per the standard, the section of the roof that failed must be carefully cut out to determine the cause of the failure.

PERFORMANCE ASSURANCE

The following process shows how negative pressure testing is conducted using an uplift chamber:

Step 1

The uplift chamber is placed on a randomly selected critical area of the roof & obtain an airtight seal between the roof & chamber.

Step 2

A 10-foot perimeter is established & isolated to restrict foot traffic to ensure any movement from walking is eliminated during the test.

Step 3

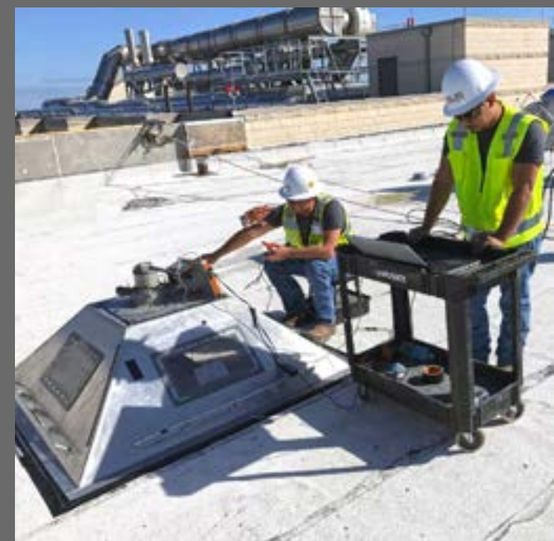
A pre-established series of testing pressures is initiated with each pressure held for one minute until the test pressure is reached.

Step 4

The required number of test specimens per standard are tested at the required design pressure for the corresponding zone.

TYPICAL ISSUES DISCOVERED

- Deficiencies in metal decking or fastener placement
- Roof boards unable to resist pressures prescribed for the project due to improper storage
- Various installation defects (i.e. insufficient or improperly installed adhesives)
- Adhesive materials that were improperly stored or deviations from installation instructions with regards to temperature or cure time.
- Inability of the system to withstand pressures prescribed by ASCE 7-10



WHY ZERO/SIX CONSULTING?

Z6 is accredited to the highest possible standard of this testing through the ANAB/ILAC ISO/IEC 17025 standards organization. This accreditation reinforces our commitment to adhering to the ASTM E907/FM Global 1-52 (Field Testing Uplift Resistance of Adhered Membrane Roofing Systems) standards for all roof uplift testing. This allows Z6 to provide the building owner with an ISO/IEC accredited report that identifies any installation and design deficiencies to assure the roof system performs optimally and meets warranty compliance. ISO/IEC 17025 accreditation requires an audited adherence to the highest international standards in the industry, as well as, provides evidence of integrity and impartiality in all testing procedures undertaken.

ANAB
ACCREDITED
ISO/IEC 17025
TESTING LABORATORY

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