Technical Bulletin # 02

About Roof Anchorage Installations, Testing & Certification

When a rope descending system (RDS) is used on a building, OSHA regulations require a building owner to inform the employer, in writing, that the building owner has identified, tested, certified, and maintained each anchorage so it is capable of supporting at least 5,000 pounds (2268 kg), in any direction, for each employee attached.

There is no definition for certification in OSHA, but all related American National Safety Standards define certified as “accepted by design, evaluation or inspection by a registered professional engineer.”

When a professional engineer (P.E.) certifies a roof anchorage system, their evaluation and acceptance at a minimum, should state the anchorages are certified to be capable of supporting 5,000lbs in any direction for each employee attached. Variations could be considered if the intent is clear and verifies compliance with OSHA and American National Safety Standards.

Some anchor companies state their anchors (anchorage connectors) are capable of supporting 5000lbs in any direction and will not break or become detached. They also defer the ability of the structure to support the loads applied by the anchor to be verified by someone else. That someone will need to be the P.E. who is certifying the system.

Anchorage Connector

Exposing Roof Structure

Attached to Structure

Certifiable Roof Anchorage

When a roof anchorage system on a building is going to be properly certified, it requires the P.E. to analyze the design of the anchorage connector (anchor), how it is connected to the building along with the strength of the building at each location where it is connected. This enables the P.E. to verify the strength of the structure combined with the anchorage connector to certify that the entire assembly can support the required loads. The P.E. may be present during an anchorage installation to ensure the components they are verifying were assembled and installed properly.

In addition, the P.E. should also confirm that the anchorages are located properly on the building to allow for proper rigging and use of the type of equipment that will be attached to them.

In summary, it should be confirmed that the P.E. stamp on a buildings roof anchorage certification clearly proves at least the following three items:

1. The anchorages and the building structural component they are attached to can support the required loads in any direction per worker attached.
2. Reinforcement of the building structure if needed to meet number 1 above, has been properly done.
3. The anchorages are located to enable workers ability to use accepted rigging practices.

Roof Anchorage Testing

Performing testing on a roof anchorage without engineering analysis and evaluation will not provide a valid roof anchorage certification. Testing of the anchorage is just one component of the certification process.

There is a misunderstanding that simply testing a roof anchorage to 2,500lbs without providing engineering analysis and evaluation will verify that the anchorage can support 5,000lbs. There is no scientific evidence available that can be used to justify this.

This is another critical reason why a P.E. needs to be used for the certification of a roof anchorage system. When the P.E. sufficiently analyzes the system, a determination may be made as to how the anchorages should be tested.

Anchorages Tested Without Measuring Movement

Measuring Anchorage Movement During Testing

Load testing of roof anchorage only proves it will hold the test load, nothing more. When a test load is applied to a roof anchorage and movement is not measured, the test is inconclusive. The picture on the left shows a worker pulling on two anchors without any measuring devices. The anchors will elastically bend or yield and should return to their original position. The picture on the right shows this movement being measured so it can be recorded. It is an additional way to determine what is going on with the attachment to the structure that is covered over by the roof membrane.

Roof Anchorage Installation, Testing & Certification Checklist

- ☑ Check the qualifications and validate the training of anyone you may hire for designing, installing, inspecting, testing or certification of roof anchorage systems.
- ☑ Be sure the company is using a professional engineer (P.E.) to analyze and verify the anchorage connector detail and the building structure in combination as the anchorage to be certified. If your structure needs to be reinforced, make sure this is included as part of the installation process.
- ☑ Be sure the certification of the roof anchorage is stamped or sealed by the P.E and it specifically states that the anchorages are capable of supporting 5,000lbs. in any direction a load may be applied, per worker attached.
- ☑ If anchorages are going to be tested, be sure the testing is only done after the P.E. has determined what the design load is and what the test load should be. Make sure the movement of the anchorages are recorded and acquire all field photos and test results for your records.