

RESCUE SUPPORT SYSTEMS

Rescue Struts

FAQs

Paratech Struts for Building Collapse Shoring

From the FEMA US&R Structural Collapse Technician, Student Manual, Module 2a, Shoring Basics, it describes Shoring for US&R as “the temporary support of only that part of the structure that is required for conducting operations at reduced risk”.

The basic theory of a shoring system is the Double Funnel Principle. You collect the load, support the load and redistribute the load. To accomplish this you need three things, a header or wall plate to collect the load. A post or other load bearing element and a sole plate or bearing plate to transfer the load to the ground or other structure below.

Paratech recommends using a wood header and sole plate and a Paratech strut as the post on vertical shores. The wood header and sole plate will do two things for you. It will make it easier and safer to install your wood post and wedges so that you can remove and reuse the Paratech struts. Secondly, FEMA states “a most desirable property for emergency shoring is to have a system that will give a warning when it is becoming overloaded, so that one can mitigate the situation”. The wood header and sole plate used with a Paratech strut provide just such a warning as evidenced by the picture below.



The photo at the left is from a parking garage collapse in Hackensack, NJ in July of 2010. The shoring team erected 3 post vertical Class 1 shores. Wood 6 X 6 headers and sole plates were used with Paratech Acme Thread struts to shore up two levels of the parking structure. The insertion height of the struts was approximately 9’.

This photo was taken about twenty-two hours after the struts were originally installed.

The struts are perfectly vertical but the sole plate and headers are severely crushed to a total of about 5” indicating a severe overloading of the shoring system. This gave ample warning for the rescuers to evacuate.

Shoring is described as being a Class 1, Class 2 or Class 3 System. A class 1 shore is one dimensional i.e. a single post, double post or even a three post shore with no lateral or diagonal bracing. A Class 2 shore is two dimensional. Imagine the two or three post vertical shore with lateral and / or diagonal shoring. That would be a Class 2 system. A laced post or raker system are good examples of a Class 3 shore. Both are three dimensional shoring systems.

4 X 4 and 6 X 6 wood is typically used in US&R shoring systems. This wood is nominal not dimensional which means that a 4 X 4 actually measure 3.5" X 3.5" and a 6 X 6 measures 5.5" X 5.5". This is important to know when we talk about Length to Diameter ratios. The L to D ratio is important in shoring systems because the longer the post in relationship to its diameter the less load it can support. There is a load table label on every Paratech strut that indicates the load a strut can support from its fully retracted position to fully extended plus the maximum amount of extension allowed. There is no guessing required. This is for the safety of the rescuers.

A 4 X 4 wood post is rated at 8,000 lbs. at 8' with a 2:1 safety factor. In comparison a Paratech gray Acme Thread Strut can support up to 24,050 lbs. with a 2:1 safety margin at 8'. A gold Paratech Long Shore strut at 8' can support up to 40,000 lbs. with a 2:1 safety factor.

Things to consider when choosing your temporary shoring system are the overall strength of the shores as well as the ease and speed at which they can be erected.

The Paratech struts when used in a collapsed building can be easily and quickly installed to protect the rescuers in their search efforts. After the struts are initially installed the backup rescue team can enter and erect the supplemental wood shores all the while being protected by the Paratech shoring. After the wood posts are pressurized with wedges and secured with cleats and gussets the Paratech struts can be easily removed and reused elsewhere in the structure.

This method of "leap frogging" is a safe and quick way to solve a building collapse shoring problem and keep everyone safe.

The ease of use, quickness to set up and superior strength of the Paratech Rescue Struts is why the US Department of Homeland Security, FEMA US & R teams have standardized on the Paratech Rescue Support System for their shoring needs.

Paratech Rescue Equipment is proudly made in the USA & used worldwide

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