

News, Notes and Discussion from the Simpson Strong-Tie Engineering Department

Pier Decking Fasteners

This week's post is a case study featuring a recent restoration job on the central coast of California and how Simpson Strong-Tie® hot-dipped galvanized screws proved to be a better option than traditional spikes.

A pier originally constructed in the 1800s was closed a few years ago as general deterioration caused the structure to become unsafe. As preparation for rebuilding the pier began, one of the major concerns was the attachment of the deck boards to the framing.

Traditionally, the deck boards have been attached with hot-dip galvanized 60d (0.283" x 6") spikes. However, spikes have a low withdrawal resistance, are typically predrilled and have a multi-step installation process. In addition, spikes, over time, can begin to back out so that the heads protrude above the top of the deck boards. This creates an unsafe condition for pedestrians and also results in ongoing maintenance work. Here you can see one of the old spikes.



Corroded spike for deck board fastening.

Simpson Strong-Tie provided two options for replacing these spikes: the Strong-Drive® Timber-Hex HDG screw, SDWH27800G, and its stainless-steel counterpart, the Strong-Drive Timber-Hex SS screw, SDWH27800SS. The SDWH27800G screw measures 0.276" x 8" and has a hot-dip galvanized coating, conforming to ASTM A153 Class-C. The SDWH27800SS screw measures 0.276" x 8" and is made from Type 316 stainless steel. Both of these screws have integral washer, hex-drive heads and are self-drilling. They are not intended to be self-countersinking though, and as a result, installation with the heads below the deck surface requires a shallow dapped hole.

A comparison of the load values was provided to Shoreline Engineering, Inc. engineers Bruce S. Elster, P.E., and Jonathan T. Boynton, P.E., for their review and approval. In addition, Simpson Strong-Tie Fastening Systems/Dealer Sales Representative Darwin Waite expertly conducted on-site demonstrations for numerous decision makers including the contractor and city officials. These demonstrations allowed the contractor and owners to compare the labor costs and finished appearance of the different fastening methods.



Simpson Strong-Tie Fastening Systems Dealer Sales Representative Darwin Waite takes selfie on the completed dock.

Below is a comparison of the allowable load values* of the potential fasteners. We can see how each of the Simpson Strong-Tie screw options exceeds the spike load values in all load conditions.

Fastener	Diameter (in.)	Length (in.)	Wood Specific Gravity	Withdrawal, W (lbs/in)	Length of Spike or Screw Threads in Main Member	Maximum Withdrawal (lbs)	Lateral Shear (lbs)
60d Round Spike	0.283	6	0.50	69	2.5	43	182
60d Round Spike	0.283	8	0.50	69	4.5	78	182
SDWH27800G	0.276	6	0.50	255	2.5	414	370
SDWH27800G	0.276	8	0.50	255	3	497	459
SDWH27800SS	0.276	6	0.50	182	2.5	455	235
SDWH27800SS	0.276	8	0.50	182	3	546	235

Table 1. Comparative allowable properties for hot-dip galvanized spikes (60d), hot-dip galvanized screws (SDWH27600G, SDWH27800G) and stainless steel screws (SDWH27600SS and SDWH27800SS).

*Not to be used for design purposes as footnotes have been left out of this blog post. Table values include wet service factor adjustments.

In the end, the SDWH27800SS stainless-steel screw was specified for the project.

Some might consider a 316 stainless steel screw to be cost prohibitive, but when you factor in the lower cost of installation, the lower maintenance requirements and the actual cost of the fastener, this screw turned out to be the lowest cost

Leave a Reply

Your email address will not be published. Required fields are marked *

Comment

Name *

Email *

Website