The Devil is in the Details:
Why Connections are Critical

NPCA file photo

Structural engineers understand that most failures are the result of poor connections. From the Kansas City Hyatt Regency walkway collapse that took more than 100 lives to a broken child's swing resulting in a bruised knee, the strength of the link between adjoining elements is critical to safety. Bolts, tiebacks, welds, straps, anchors, chains, wedges, links, pins, hooks, hinges, nails or, sometimes, glue: It's usually the integrity of connections that make or break any man-made system.

We all know construction is an inherently dangerous business. Precast concrete fabrication, for example, entails moving, transporting, hoisting and erecting massive concrete components. In the construction industry, safe and strong connections will always require careful attention to detail. This Safety Toolbox will test your knowledge of chain sling safety.

Do's and don'ts of chain slings

Inspection is foremost in the do's and don'ts of chain slings. Yes, the sling may be properly hitched and have the correctly rated capacity for the load to be lifted, but if a damaged sling is not removed from service, its lifting capacity means nothing. How often should chain slings be inspected? What are the rules for using chain slings safely?Take the following test to check your precast "hoisting" knowledge (Answers on next page).

Safety Quiz

Answer True or False for each question:

1. Chain slings and fastenings must be inspected for damage and defects once per month. **True False**
2. Slings used in a basket hitch must have balanced loads to prevent slippage. **True False**
3. Lifting chains must be labeled to show size, grade, reach and rated capacity. **True False**
4. High temperatures can adversely affect the rated capacities of chain slings. **True False**
5. It is permissible to shorten a sling as long as high-strength steel bolts are used. **True False**
6. Alloy steel hooks, rings, oblong links, or welded or mechanical couplings may be used with chain slings as long as the load being lifted is less than the sling's rated capacity. **True False**
7. It is up to the precast employer, not the manufacturer, to ensure that any new or repaired chain sling be proof tested. **True False**
8. Precasters must keep a record of ALL chain sling inspections in addition to proof test certifications from the manufacturer. **True False**
9. The OSHA definition of a "mechanical coupling link" is: a welded, mechanically closed steel link used to attach master links, hooks, etc., to alloy steel chain. **True False**
10. And finally, a freebie: Hands or fingers shall not be placed between the sling and its load while the sling is being tightened around the load. **True False**

Answers to Safety Quiz

1. False. Each day before use, all slings, fastenings and attachments must be inspected for damage, defects and wear by a competent person; OSHA 1910.184(d). Daily inspections do not need to be recorded.

2. True. OSHA 1910.184(c)(5).

3. True. OSHA 1910.184(e)(1).

4. True. OSHA Table N-184-1 lists reductions to chain-rated capacities when a chain is exposed to high temperatures.

5. False. Slings shall not be shortened with knots, bolts or other makeshift devices per OSHA 1910.184(c)(3).

6. False. Hooks, rings and other coupling devices must have a rated capacity at least equal to the steel chain with which they are used. A sling can never be used in excess of the rated capacity of the weakest component per OSHA 1910.184(e)(2)(i).

7. True. It is up to the employer to ensure than each new or repaired chain sling has been proof tested by the manufacturer in accordance with ASTM specifications per OSHA 1910.184(e)(4).

8. False. Employers must maintain a record of the most recent month in which each alloy steel chain sling was inspected per OSHA 1910.184(e)(3)(ii), and proof testing certificates must be available for examination per OSHA 1910.184(e)(4). It is important to understand that frequency of documented inspection (monthly or annually) depends on severity of use.

9. False. According to OSHA, a "mechanical coupling link" is a *nonwelded*, mechanically closed steel link used to attach master links and hooks to steel chain.

10. True. If you didn't have the correct answer to this one, you are probably overpaid.