Logical lifting

Removing a bridge slab calls for caution

The accident: An operator was using a hydraulic excavator on a bridge demolition project. While removing a concrete slab, the operator extended the arm of the excavator to raise the load in order to clear the guardrail. The excavator became unbalanced, tipping to the edge of the bridge deck. The excavator went over the side of the bridge, falling 60 feet to the river below. Following a rescue operation, the operator was declared dead from blunt force chest trauma.

Illustration by Don Lomax

The bottom line: A post-accident investigation determined the employer did not have load charts specific to the make and model of excavator being used, and used the load chart for a similar, but not identical, machine. Once the arm was extended, the weight of the concrete slab suspended over the side of the bridge surpassed the load capacity of the excavator. As the excavator began to slide, the operator attempted to decrease the distance of the load from the excavator by arming-in. However, arming-in the load forced the excavator past its tipping point, and the machine slid over the edge quickly.

No room for guesswork

Excavators have a diminished lifting capacity when the load is over the side, so making an educated guess on load weight won't work. Understanding not only the accurate load weight of your machine, but also the weight of the material to be lifted is crucial. In this accident, the concrete slabs being removed were of different thicknesses, sizes and shapes, so it's likely the operator underestimated the weight of the slab. Take the following precautions to ensure your excavator is both stable and within the guidelines of your load limit:

Perform a Job Hazard Analysis. Prior to starting the project, your employer will perform a Job Hazard Analysis to determine potential dangers. Be on hand for all parts of the analysis so you will be familiar with any dangers that could arise. Use the information to safely perform the work, and don't make changes to the operational plan that could change the dynamics of the lift, such as arming-out with a load when that scenario has not been tested.

Work within machine limits. If the load weight limit is not visible in the cab, ask the foreman to provide you with a load limit chart for the machine you'll be operating. If you are unsure of the weight of the material you'll be lifting, perform a load test prior to beginning work. Remember, as you extend the load, swing from side to side or suspend the load over a drop, the machine's load limit decreases.

Plan your picks properly. Excavator picks should be planned to ensure the operator is able to maintain the stability of the machine while lifting freely suspended loads. The excavator should be on as flat a surface as possible, and compact. Crawlers should be on pads or cribbing, and outrigger blocking must be used. Load, load radius, center of gravity, and boom length and angle must all be determined exactly. If wind speeds are in excess of 30 mph, do not make the lift.

Information for this Safety Watch is from an accident report, the California Department of Public Health's Fatality Assessment and Control Evaluation program and the National Institute for Occupational Safety and Health. It is meant for general information only.

Date of safety talk:_____ Leader:_____
Attending:_____