

Railroad Working Safety

By Ted Sofis

Shotcrete, over the years, has had a long common history with the North American railroads. It was in the railroad magazine, *Iron Age*, where the term “shotcrete” first appeared, to refer to what was then commonly called “gunite.” During the time of steam engines, structural steel over railroad tracks was often encased with shotcrete to protect the overhead steel from the locomotive’s hot, wet steam. Shotcrete has long been used by the railroads, as an efficient concrete repair method and in the rehabilitation of bridge piers and abutments. Railroad tunnels are lined and repaired with shotcrete and it has long been a method used by railroads for rock and slope stabilization (Fig. 1). Our railroads provide access for products and materials in steel mills, power plants, and other industrial facilities, where shotcrete services are routinely performed. In plant railroads, transport shotcrete lined iron ladles from blast furnaces to Basic Oxygen Furnace (BOF) shops, where steel is made. Rail cars are commonly used for transporting coke from coke ovens to quench towers,



Fig. 1: A Snooper inspection crane being used for hillside access above railroad line during shotcrete placement

where the red-hot coke is quenched and cooled. Coal is transported by rail into many coal-fired power plants and tanker cars of chemicals in chemical plants.

Working around railroads can present many dangers and it is very important to take every precaution available to avoid and reduce the possibility of accidents (Fig. 2 and 3). Construction personnel need training to become familiar with the dangers involved. When working on piers or abutments, safe distances for shotcrete operations must be observed. Coordination with railroad personnel must always be maintained. All railroad safety regulations must be followed. When working on or around railroad tracks or on railroad property, safety is our responsibility. We as contractors are responsible to ensure that all of our employees have received the necessary training. This often includes specific training courses mandated by the various railroads. A few things to be aware of are listed as follows:

Prior to Working on Railroad Property—

- The contractor should secure owner permission and fill out and complete a Right of Entry permit;
- Notify the railroad representative at least 48 hours before starting work and at least 24 hours from any person or equipment, including boom extensions, coming closer than 25 ft (8 m) to the track. This can vary for different owners; and
- Ensure that all employees have received the required training for the work being performed.

Personal Protective Equipment (PPE)—

- At a minimum, the contractor should require that their employees wear the proper personal protective equipment (PPE). This includes clothing that covers the torso and at least quarter-length sleeves, and pants or trousers must be ankle-length. Protective eyewear, hardhats, protective footwear, high-visibility apparel, and hearing protection should meet the latest ANSI or CSA standards.

Safety Shooter

On-Track Safety—

- Maintain a distance of at least 25 ft (8 m) to any track unless the railroad's Employee-in-Charge (EIC) is present to authorize movements;
- Wearing PPE is mandatory at all times when working on railroad property; and
- Participate in a job briefing. The railroad's EIC will specify the type of on-track safety precautions necessary for the work being performed.

In-Plant Railroads—

- When working on tracks in a plant location, accessed by rail traffic, make sure there is a derailer in place and that all personnel are locked out in accordance with OSHA lock-out tag-out procedures (Fig. 4); and
- Make sure all equipment and motor vehicles are parked no closer to the railroad tracks than the plant safety requirements.

Shotcrete work in itself has its own set of safety considerations. These include dealing with plugs, whip checks, tying off hoses, communication between the nozzleman and equipment operator, and fall protection. In addition to railroad safety requirements, maintaining safe distances, and being aware of rail traffic, all general OSHA safety procedures need to be followed.



Ted Sofis and his brother, William J. Sofis Jr., are the Principal Owners of Sofis Company, Inc. After graduating from Muskingum College, New Concord, OH, with his BA in 1975, Ted began working full-time as a shotcrete nozzleman and operator servicing the steel industry. He began managing Sofis Company, Inc., in 1984 and has over 40 years of experience in the shotcrete industry. He is Chair of the ASA Publications Committee, a member of multiple other ASA committees, and an ACI Examiner. Over the years, Sofis Company, Inc., has been involved in bridge, dam, and slope projects using shotcrete and refractory installations in power plants and steel mills. Sofis Company, Inc., is a member of the Pittsburgh Section of the American Society of Highway Engineers (ASHE) and ASA.



Fig. 2: In many cases, the shotcrete repair areas are close to the railroad tracks and special precautions have to be taken on active lines



Fig. 3: This bridge pier scheduled for repair in the spring is adjacent to active rail traffic



Fig. 4: During the shotcrete repairs to this coke plant quench tower, the railroad tracks are locked out with a derailer to prevent the use of the track while work is being done