

Bridging The Technology Gap

Escape Exits Constructed With Reinforced Concrete Pipes

By L. Steve Hiner

Rinker Materials – Concrete Pipe Division CEMEX

832-590-5351

Recent mining disasters in the USA were heartbreaking reminders of the dangers of mining, and the significance of on-the-job safety. Modern technology has improved workplace safety, and innovations have saved lives and prevented injuries. Now, after its use as sewers for the past 150 years, [reinforced concrete pipe](#)¹ has another industrial application. It can be used for [escape exits](#)², or conduits. The concrete pipe [escapeways](#)³ are simple and easy to replicate, with precast products available from local suppliers.

In 2006, the ACPA shared information with members about concrete pipe being used as escape tunnels in [Australia](#)⁴. The tunnels were used at a coal mine in Hunter Valley, New South Wales. Coal is removed from a 25-meter high stockpile from below via reclaim valves at the center of the pile, then transported by conveyor belt. Safety regulations require dual egress for the reclaim equipment operators.

A concrete pipe producer designed a custom 2550mm diameter (>Class 6) pipe for a load of 28 meters of fill, using much of the on-site backfill material. The concrete pipe was used to construct a separate escape tunnel running from the reclaim valves to the side of the stockpile, 100 meters in the opposite direction of the conveyor tunnel.

In late 2007, the U.S. Department of Labor's [Mine Safety and Health Administration](#)⁵ (MSHA) debuted "[The Great Escape](#)" [rescue system](#)⁶. In a press release, MSHA said that the system provides miners a constant and uncontaminated supply of breathable air, along with a rapid, safe means of escape through an isolated, structurally protected escape path. The system could safely protect communications and tracking systems from fire and explosive forces.

The prototype demonstration system consisted of reinforced concrete pipe (RCP) measuring approximately 42 inches in diameter, accessible at various points along the pipe. Doors and vents are installed in the unit's access points and end caps. Actual escape system installations may be able to use smaller diameter pipe and may be installed between a mine's working sections and an escape shaft or, depending on the mine layout, run completely to the surface. The standard 42-inch diameter RCP with a 4-inch wall was supplied by [Rinker Materials Concrete Pipe Division CEMEX](#)⁷ from its facility outside of Pittsburgh. The prototype was designed with pipe that could withstand a 50-ton collapse or methane explosion. The escape-way can be made watertight, if flooding were a concern.

There are likely many more industries that could make good use of locally produced reinforced concrete pipe to enhance safety programs. [Concrete pipe producers](#)⁸ are the people who are best informed about the performance of concrete pipe, and have a long history of working with clients to provide innovative applications with their products.

LINKS

Info Links

1. www.concrete-pipe.org/why.htm
- 2, 4. www.concpipe.asn.au (click on Newsletter "Pipeline" November 2006 Issue)
- 3, 6. www.msha.gov/FocusOn/GreatEscape/GreatEscape.asp
5. www.msha.gov
7. www.rinkerpipe.com/default.shtml



Photos: www.msha.gov/FocusOn/GreatEscape/GreatEscape.asp



Miner emerges from MSHA prototype escape-way.

Installation of the mine tunnel in New South Wales, Australia.
www.concpipe.asn.au

