120 PSI REINFORCED CONCRETE SEAL
MSHA SEAL APPROVAL NUMBER 120-75.336.1.07.06.1

120-PSI Reinforced Concrete Seal (for openings up to 7 feet high and 28 feet wide)

This reinforced-concrete seal is designed to withstand an overpressure of 120 psi from a mine explosion. The overpressure was applied to the seal with instantaneous rise time and 1.5 second duration. The seal is designed for a maximum seal height of 7 feet and a maximum seal width of up to 28 feet (as measured after site preparation work is completed).

The seal original construction requirements are provided in a report entitled "120 PSI Reinforced Concrete Retrofit Seal," prepared by Environmental Risk Management Consulting Company, LLC. The seal design is certified by a registered professional engineer as being in accordance with current, prudent engineering practices. MSHA Seal Approval Number 120-75.336.1.07.06.0 was issued on July 18, 2007.

The seal is 24-inches thick with two mats of vertical and horizontal steel reinforcement each 2 1/2 inches in from the faces of the seal. The vertical reinforcement is doweled into the roof and floor. The concrete is required to have a minimum compressive strength of 4000 psi; all rebar is Grade 60 (60,000 psi yield strength). The design requires that the pull strength of the roof and floor be determined. The vertical rebar are required to be embedded to the depth needed to develop the yield strength of the rebar.

REVISION 1

The approved design was revised to allow the seal to be constructed using a flyash-cement mix as an alternative to conventional concrete. All other aspects of the design, including the 4000-psi compressive strength requirement, are the same as the original approval. Since the optional mix does not contain aggregate, the mix supplier must be able to demonstrate that shrinkage of the material will be controlled to no greater than conventional concrete in order that cracking does not compromise the seal. MSHA approval number 120-75.336.1.07.06.1 was issued for the revision on August 17, 2007.

For details on the seal design, contact Todd Beavan, P.E., Manager – Engineer, Environmental Risk Management Consulting Company, LLC, 2265 Harrodsburg Road, Suite 200, Lexington, Kentucky, 40504; phone 859-381-1000.