

4727.0980 GROUTING OF TEMPORARILY SEALED EXPLORATORY BORINGS.

Subpart 1. **Grouting requirements.** All annular space surrounding the casing of a temporarily sealed exploratory boring must be grouted from the bottom of the casing to the established ground surface. When constructing the exploratory boring with a method such as mud or air rotary, auger, coring, or jetting that creates an open annular space, a grouting material specified in subpart 2 and the grouting methods specified in subpart 3 must be used to fill the annular space between the casing and the bore hole. Driven casing must be grouted according to subpart 6.

Subp. 2. **Grouting materials.** The following grout materials are approved for use in temporarily sealed exploratory borings:

- A. neat cement grout, except that rapid setting cement must not be used with plastic casing;
- B. concrete grout when used in the dry portion of the open annular space;
- C. high solids bentonite grout when used in unconsolidated materials; and
- D. kaolin clay in the kaolin clay portion of the boring.

Subp. 3. **Grouting methods.** Grouting must start immediately on completion of drilling and testing an exploratory boring. Grout must be pumped into the annular space from the bottom up through the casing, drill rods, or a tremie pipe. Neat cement grout or concrete grout must be allowed to set a minimum of 48 hours. Rapid setting cement must be allowed to set a minimum of 12 hours. Drilling is prohibited during the time the cement is setting.

Subp. 4. **Alternative methods and materials for grout loss.**

A. If the grout level fails to rise after insertion of more than one cubic yard of grout or the quantity of grout necessary to fill ten vertical feet of hole, or if a cavity more than twice the diameter of the bore hole exits, then the following grouting materials and methods may be used in the portions where the conditions exist:

- (1) pouring a mixture of gravel or stone aggregate not larger than one-half inch in diameter while simultaneously pumping neat cement grout or concrete grout in a ratio not to exceed five parts aggregate to one part grout;
- (2) pumping a mixture of gravel or stone aggregate not larger than one-half inch in diameter and concrete grout or neat cement grout in a ratio not to exceed five parts aggregate to one part Portland cement; or
- (3) alternately pumping concrete or neat cement grout and pouring gravel or stone aggregate not larger than one-half inch in diameter in layers of equal thickness.

Individual layers of aggregate must not exceed ten feet in thickness. Aggregate must not be placed in a confining layer.

B. Neat cement grout or concrete grout must be pumped through the casing or a tremie pipe. The aggregate must be poured into the bore hole at a rate that prevents bridging.

Subp. 5. **Grouting between casings.** The annular space between an inner casing and an outer casing must be filled with neat cement grout according to subpart 3.

Subp. 6. **Driving casing.** When driving casing, a cone-shaped depression or temporary outer casing filled with high solids bentonite grout, bentonite powder, or granular bentonite must be maintained around the outside of the casing. The bottom of driven casing must be equipped with a drive shoe. Casing may only be driven in unconsolidated materials or sandstone bedrock.

Statutory Authority: *MS s 103I.101*

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