

**SPECIAL PROVISION FOR
FLOWABLE FILL FOR UTILITY TRENCHES
(UTILITY PERMITS ONLY)**

1. **Description.**-Flowable fill will be placed as indicated on the plans or as directed by the Engineer. All requirements for Flowable Fill and related work will be according to the Standard Specifications for Construction and as specified herein.
2. **Materials.**-Flowable fill will consist of a mixture of Portland cement, ground granulated blast furnace slag (optional), granular material (fine aggregate), fly ash, water, air entraining admixture (optional) and performance enhancing admixture (optional).

Portland cement will be either Type I or IA and will conform to Section 901 of the Standard Specifications for Construction. Portland cement used for flowable fill will be from the department's qualified product list and certified as meeting MDOT requirements. Ground granulated blast furnace slag will conform to Section 901 of the Standard Specifications for Construction .

Fly ash will be Class F or Class C and will conform to ASTM C 618 except that the limit for Loss on Ignition will be deleted.

Granular material will meet the requirements of Class II material as specified in Section 902 of the Standard Specifications for Construction except that 100 percent will pass the 13 mm sieve. Fine aggregate will meet the requirements of 2NS material as specified in Section 902 of the Standard Specifications for Construction .

Water will meet Section 911 of the Standard Specifications for Construction.

Performance enhancing admixtures are stable high air generators that produce a low water content flowable fill. Performance enhancing admixtures are used to improve flowability, lower densities, eliminate segregation and settlement, and control strength development. If used, the performance enhancing admixture must be included in the mix design and trial batch, and must be used according to the Manufacturer's recommendation.

3. **Mix Design, Strength Requirements.**-The mixture selected will meet the following requirements. The Contractor will submit a flowable fill mix design and trial batch documentation to the Engineer for review a minimum of 7 days prior to placement. The mix design will show source and type or class of materials and batch proportions. The compressive strength of the flowable fill mixture will not be less than 0.35 MPa at 3 days, nor less than 0.50 MPa and will not exceed 1.0 MPa at 28 days.

If an air entraining admixture or performance enhancing admixture is used, then the air content of the flowable fill will not exceed 35 percent of the Flowable Fill volume.

4. **Construction Methods and Transportation.**-Twenty-four hours will elapse from start to start of each subsequent placement.

The temperature of the flowable fill mixture as manufactured and delivered will be at least 10 C. No placement of flowable fill will be allowed if the anticipated air temperature will be 2 C or less in the 24 hour period following proposed placement.

The batching equipment will have devices designed to measure the specified quantities of each component material, and mixing will be of sufficient duration to insure uniform consistency of the mixture. No water will be added to the flowable fill mixture after batching. Water content will be maintained such that compressive strengths are achieved and a uniform, flowable mixture is developed that is essentially self-leveling when placed.

During trench flowable fill placement operations, care will be used to avoid dislocating any pipes, due to fluid pressure from the flowable fill. All pipes within the backfill area will be secured to avoid buoyant effect of flowable fill if necessary. Pipelines, manholes, and other areas not intended to receive flowable fill will be sealed tightly to prevent infiltration of fill material.

Upon completion of the filling operation, the casing ends shall be sealed with a minimum 300 mm (1 ft) thick bulkhead of commercial grade concrete, or approved alternate.