

Controlled Density Fill (CDF)

What is Controlled Density Fill?

Controlled Density Fill is a self-compacting, cementitious material used primarily as a backfill in lieu of compacted backfill. Several terms are currently used to describe this material, including flowable fill, controlled low-strength material, flowable mortar, plastic soil-cement, soil-cement slurry, and K-Krete. CDF is defined as a material that results in a compressive strength of 1200 psi or less. Most current applications of CDF require unconfined compressive strengths of 300 psi or less. This allows for future excavation of the material.

Why Controlled Density Fill?

1. Offers numerous cost advantages
2. Readily available
3. Does not settle
4. Easy to deliver
5. Versatile
6. Improves worker safety
7. Easy to place
8. Allows for quick traffic return
9. Strong and durable
10. Can be excavated
11. Requires less inspection



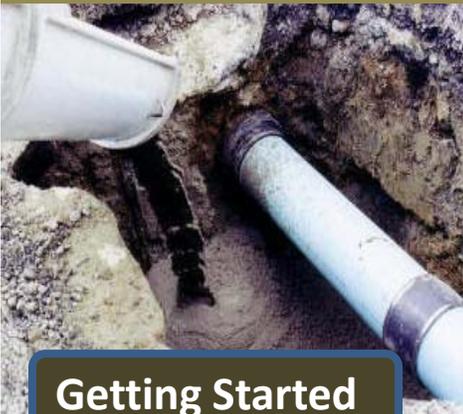
Flowable fill is placed as a flowable liquid, yet hardens and rapidly develops load-bearing properties with no compaction. The properties of flowable fill make it an economical alternative to compacted granular material due to savings of labor and time during placement. A constant supply of material will make it flow horizontally a distance of 300 feet (90 m) or more. Flowable fill also has the advantage of displacing any standing water left in a trench. The flowable characteristics of this material mean it can readily be placed into a trench and into tight or restricted-access areas where placing and compacting fill is difficult.

Controlled Density Fill (CDF)

Where can I Use Controlled Density Fill?

CDF, or flowable fill is composed of water, portland cement, fine aggregate, and fly ash or slag cement. It is a fluid material with typical slumps of 10 inches or more, and has the consistency of a milk shake. Flowable fill is used as a bedding material for pipe, electrical, telephone, and other types of conduits because the mixture easily fills voids beneath the conduit and provides uniform support. Flowable fill is used to fill large voids such as abandoned underground storage tanks, basements, tunnels, mines, and sewers. Other uses include paving sub-base, bridge abutment, and retaining wall backfill. Flowable fill is an ideal pavement base material because it will not settle or rut under loads. It can be placed quickly and support traffic load within hours of placement thereby minimizing repair time and allowing a rapid return of traffic. Costs are often less than the cost of using standard compacted backfill.

Placing Controlled Density Fill (CDF)



Getting Started

A ready mix concrete producer can aid in developing a mix design for flowable fill.

However, when ordering, consider the following properties:

Strength: Applications that require removal of flowable fill at a later date usually limit the maximum compressive strength to less than 200 psi .

Setting and Early Strength: Hardening time can be as short as one hour, but can take up to eight hours depending on mix design and trench conditions (e.g moisture, temperature).

Density in Place: The in-place density of normal flowable fill typically ranges from 90 to 125 pcf

Flowability: can be enhanced through the use of fly ash or air entraining admixtures.

Durability: Flowable fill is not designed to resist freezing and thawing, abrasive or erosive actions, or aggressive chemicals.