



SECTION 621

FLOWABLE BACKFILL

621.1 Description. This work shall consist of furnishing flowable backfill as specified on the plans or otherwise allowed for compacted backfill and other cavity filling uses.

621.2 Material.

621.2.1 All material shall conform to Division 1000, Materials Details, and specifically as follows:

Item	Section
Fly Ash	1018
Cement	1019
Admixtures	1054
Water	1070

Fine aggregate shall meet the quality requirements of [Sec 1005.2](#), except for the percent passing the No. 200 (75 μ m) sieve. It shall be fine enough to stay in suspension in the mortar to the extent required for proper flow and shall conform to the following gradation:

Sieve Size	Percent Passing
3/4 inch (19.0 mm)	100
No. 200 (75 μ m)	0-10

621.2.2 Mixture. The contractor shall submit to the engineer a mix design including the proportions and source of material, admixtures, dry cubic yard (cubic meter) batch weights (masses) and actual 28 day compressive test results which shall exceed 50 psi (345 kPa).

621.2.2.1 Mix Design. Unless otherwise specified, the mix shall contain a minimum of 100 pounds (60 kg) of cement and 250 pounds (148 kg) of fly ash per cubic yard (cubic meter), with the remainder of the volume composed of sand, water and any approved admixtures.

621.2.2.2 Consistency. Consistency of the fresh mixture shall be that of batter, not thin and watery. It shall be tested by filling an open-ended three inch (75 mm) diameter, six inch (150 mm) high cylinder to the top with the mixture and immediately pulling the cylinder straight up. The correct consistency of the mixture will produce an approximate eight inch (200 mm) diameter circular-type spread with no segregation. Adjustments of the proportions of fine aggregate or water may be made to achieve proper solid suspension and optimum flowability with the approval of the engineer, however the theoretical yield shall be maintained at one cubic yard (1 m³) for the given batch weights (masses).

621.2.3 Approved commercial brand mixtures intended specifically for use as flowable backfill may be used provided the specified strengths are obtained. If approved for use, the material shall be placed in accordance with the manufacturer's recommendations which shall be furnished to the engineer. All commercial mixtures shall use 100 pounds (60 kg) or more of cement per cubic yard (cubic meter) of fill in place.

621.2.3.1 To obtain approval of a commercial brand mixture, the manufacturer shall submit a request along with appropriate documents to the Division Engineer, Materials, for testing and evaluation. Upon approval of the material, the brand name will be placed on a list of prequalified commercial brand flowable backfill material.

621.3 Construction Requirements. The open ends of the area to be backfilled shall be plugged and the void area filled without the use of a vibrator.

621.3.1 Care shall be taken to prevent the movement of any structure from its designed location or intrusion of flowable backfill into undesirable locations. If such movement or intrusion occurs, affected structures may be required by the engineer to be excavated and replaced to the proper grade at the contractor's expense.

621.3.2 If flowable backfill is placed in more than one layer, the base layer shall be thoroughly roughened and all loose and foreign material removed before placing the next layer.

621.3.3 No flowable backfill shall be covered or accepted until a minimum compressive strength of 30 psi (205 kPa) has been attained, as demonstrated by failure to deform or crush underfoot when a pressure of approximately 30 psi (205 kPa) is applied. Note that the material may scuff in this condition. If the backfill does not harden to support the required load, it shall be removed and replaced with an acceptable material.

621.4 Method of Measurement. If flowable backfill is specified, measurement will be made by the computed volume to the nearest 1/10 cubic yard (0.1 m³) of the voids to be filled, as determined from the dimensional area of the open area. Final measurement will not be made except for authorized changes during construction or where appreciable errors are found in the contract quantity.

621.4.1 If flowable backfill is used as an alternate to compacted backfill specified in the contract or as shown on the plans, measurement will be made as required for the item specified.

621.5 Basis of Payment. If flowable backfill is specified, the accepted quantity will be paid for at the contract unit price for "Flowable Backfill", cubic yards (cubic meters).

621.5.1 No additional payment will be made if flowable backfill is used as an alternate to compacted backfill. The accepted quantity will be paid for at the contract unit price for the item specified.