

SHOTCRETE

1. APPLICABILITY

Construction Specification 33 is applicable to the placement of dry mix and wet mix shotcrete.

2. MATERIAL SPECIFICATIONS

The following specifications are complementary to Construction Specification 33:

- a. Portland Cement Specification 531
- b. Aggregates Specification 522
- c. Curing Compounds Specification 534

3. ITEMS TO BE INCLUDED IN CONTRACT SPECIFICATIONS AND DRAWINGS

- a. Complete engineering drawings and structural detail drawings as specified in Section 6, National Engineering Handbook, including as a minimum:
 - (1) Plans and cross sections showing the surface dimensions and thickness of all shotcrete slabs, walls, or layers and neat pay lines.
 - (2) Reinforcement details including bar placement diagrams.
 - (3) Finish lines and grades.
 - (4) Joint and edge details.
- b. The condition or orientation of subgrade materials or surfaces. Identify wet areas that will require special treatment. Detail the special treatment that will be required (special shotcrete mixtures that may include silica fume and/or accelerators for flash sets, drainage blankets, special subsurface treatment, etc.).
- c. Notes as necessary to indicate special placement or finishing requirements.
- d. Type of cement.
- e. Special admixtures. i.e., silica fume, fibers, high range water reducers, air entraining, and accelerators. Calcium chloride shall not be used in shotcrete containing steel embedments.
- f. Required compressive strength.
- g. Nozzleman qualifications as stated in Section 6 are considered appropriate for most complex jobs with significant amount of concrete. Qualification requirements may be reduced for small, simple jobs as determined by the designer.

- h. Volumetric batching is permitted in Section 7 for projects with difficult access, small volumes of shotcrete, or low placement rates. Volume batching where permitted shall be specified in Section 19 by aggregate and cement batching by the bag or pre-blended dry cement and aggregate.

4. DISCUSSION OF METHODS

a. Section 18, Measurement and Payment

- (1) Method 1 is intended for use where shotcrete in place is to be reasonably uniform in shape and thickness so that measurement of the surface area will be feasible and will be representative of the amount of shotcrete placed.
- (2) Method 2 is intended for use where measurement of shotcrete in place will not be feasible or when payment by materials in place will not be feasible or when payment by materials used rather than shotcrete in place is desirable for other reasons.

When specifications are prepared using electronic procedures and all but one measurement and payment method are deleted for use in the contract specification, delete "All Methods The following provisions apply to all methods of measurement and payment." and left justify the remaining text.