

<u>Sieve Size</u>	<u>Percent Passing</u>
3/8 inch (9.5 mm)	100
No. 200 (75 μ m)	0-10

2. **Class C Bedding Material.** Class C bedding material shall be 1 inch (25 mm) maximum size granular material meeting the requirements of AASHTO M145 A-1 or A-3.
- (d) **Sampling and Testing.** Sampling and testing shall be in accordance with the applicable methods of Subsection 703.01(e).

SECTION 704 SOIL AGGREGATES

704.01. SOIL AGGREGATES FOR SUBBASES.

Description. These Specifications cover the material for use in the construction of a subbase foundation course in Section 306.

- (a) **Materials.** Subbase material shall conform to the requirements listed herein for the type of material designated on the Plans or in the Proposal. Unless otherwise shown on the Plans, furnish soil aggregate for subbases, and make such preliminary investigations as may be necessary to locate the proposed source of acceptable material. Information obtained by the Department in its preliminary investigations will be available to prospective bidders at the Materials Laboratory. Subbase materials shall meet the specified requirements before incorporation in the work.

NOTE: No material shall be delivered to the roadbed when the plasticity index exceeds the specified requirements by more than 2 points.

Type I. Subbase material to be used in Type I work shall pass a 3 inch (75 mm) sieve. If any material hauled on the project does not reduce to 3 inch (75 mm) or less, remove it from the right-of-way limits.

The material passing the 3 inch (75 mm) sieve and retained on the No. 10 (2.00 mm) sieve shall be composed of sound, durable particles. Lumps or clods will be broken down for testing. Material produced from a rock or rocklike formation shall have a slake durability index of 80 or more.

The fraction passing the No.10 (2.00 mm) sieve shall conform to the following:

<u>Sieve Size</u>	<u>Percent Passing</u>
No. 200 (75 μ m)	5 - 45
Liquid Limit, %, maximum	30
Plasticity Index, %, maximum	10

Type II. Subbase material to be used in Type II work shall be a soil aggregate obtained from an approved source. Material retained on the No.10 (2.00 mm) sieve shall be composed of sound, durable particles or fragments of sand, gravel, crushed stone, crushed concrete, mine chat, disintegrated granite,

stone screening— or a blend of these materials. Material produced from a rock or rocklike formation shall have a slake durability index of 80 or more. The gradation and soil constants shall conform to the requirements of the table for Grading A, B, C, and D. The Grading for Type II subbase shall be as specified on the Plans or in the Proposal.

Processing, including blending, may be necessary to comply with the grading or soil constants requirements for the grading specified.

TABLE REQUIREMENTS FOR GRADING AND SOIL CONSTANTS

<u>Sieve Size</u>	<u>Grading A</u>	<u>Grading B</u>	<u>Grading C</u>	<u>Grading D</u>
		<u>Percent Passing</u>		
2 1/2 inch (63 mm)	100			
2 inch (50 mm)	90-100	100	100	100
1 1/2 inch (37.5 mm)	60-100	95-100	95-100	95-100
3/8 inch (9.5 mm)	30-75			
No. 4 (4.75 mm)		45-100		45-100
No. 10 (2.00 mm)	15-50	25-100	55-100	25-100
No. 40 (425 μm)	8-35	10-50	30-70	10-50
No. 200 (75 μm) ^a	3-20	3-20	3-20	8-25
Liquid Limit, %, maximum	35	35	30	25
Plasticity Index, %, maximum	15	12	10	6

^a The fraction passing the No.200 (75 μm) sieve shall not be greater than 2/3 of the fraction passing the No.40 (425 μm) sieve.

(b) **Sampling and Testing.** Sampling and testing shall be done in accordance with the following AASHTO methods:

Sampling	T 2
Sieve Analysis	T 88
	(omitting Hydrometer Test)
Preparing Samples	T 87
Liquid Limit	T 89
Plastic Limit and Plasticity Index	T 90
Slake Durability	ASTM D4644
Standard Density	T 99

704.02. SOIL AGGREGATE FOR SAND CUSHION.

Description. These Specifications cover the material for use as sand cushion for concrete pavement.

- (a) **Materials.** Sand cushion shall all pass a 1 inch (25.0 mm) sieve and shall contain 5 to 35 percent of material passing the No. 200 (75 μ m) sieve. The final material shall have a liquid limit not exceeding 35 and a plasticity index not to exceed 8.

The material shall consist of natural sand-or, subject to approval, combinations of manufactured and natural sand- having hard, strong, durable particles, and it shall conform to these Specifications.

When manufactured sand is approved for use in combination with natural sand, at least 50 percent of the total material shall be natural sand.

- (b) **Sampling and Testing.** Sampling and testing shall be in accordance with AASHTO methods except where otherwise specified.

Sampling	T 2
Sieve Analysis	T 27
Liquid Limit	T 89
Plastic Limit & Plasticity Index	T 90
Standard Density	T 99

704.03. SOIL AGGREGATE FOR CALICHE BASE.

Description. This Subsection covers the material for use in the construction of caliche base in Section 305.

- (a) **Materials Covered.** The caliche base course material shall consist of an intimate mixture of graded aggregate, coarse and fine, together with a calcareous binder, and it shall be practically free from vegetation or other deleterious substances. Material retained on the No. 4 (4.75 mm) sieve shall be composed of gravel, stone, caliche type material or a combination of these materials.

The material passing the No. 4 (4.75 mm) sieve shall be a caliche type material and may contain sand, stone dust, or other inert finely divided matter, provided that not less than 1/2 shall be a calcareous material.

- (b) **Gradation.** The graded aggregate with calcareous binder, when uniformly blended and sampled from windrows, shall conform to the limits as follows:

<u>Sieve Size</u>	<u>Percent Passing</u>
2 inch (50 mm)	100
No.4 (4.75 mm)	0-60
No.40 (425 μ m)	0-40
Liquid Limit, %, maximum	35
Plasticity Index, %, maximum	10

- (c) **Crushed Particles.** At least 25 percent of that portion of the completed mixture retained on the No. 4 (4.75 mm) sieve shall be composed of uniformly graded crushed particles (pieces of aggregate with one or more fractured faces resulting from artificial crushing).
- (d) **Sampling and Testing.** Sampling and testing shall be done in accordance with AASHTO methods except where otherwise specified.

Sampling	T 2
Preparation of Sample for Test & Sieve Analysis	OHD L-20
Determination of Crushed Particles	OHD L-18
Liquid Limits	T 89
Plastic Limit & Plasticity Index	T 90
Standard Density	T 99 Method C or D

704.04. SOIL AGGREGATE FOR FLY ASH TREATED BASE.

Description. This Subsection covers the requirements and test methods for soil aggregate for fly ash treated base in Section 322.

- (a) **Source of Materials.** Suitable soils meeting these requirements shall be obtained from sources furnished by the Contractor and approved by the Engineer. The Contractor will be responsible for both the suitability and adequacy of the source proposed for use.

Make such preliminary investigations as may be necessary to locate the proposed source of suitable material. Information obtained by the Department in its preliminary investigations will be available to prospective bidders at the Materials Division.

Open the proposed source of suitable soil for the Engineer to inspect and obtain samples. Make such explorations as are necessary for the Engineer to obtain sufficient samples that are fully representative of the deposit. Each sample shall be representative of the full depth proposed for use. Tests of these samples, which must be obtained by the Engineer, will be made to determine if the material is suitable, the extent of the suitable material, and the proportioning of fly ash required. Allow a minimum of 30 days for sampling and testing the proposed source in advance of construction operations.

Excavation and production of the suitable material shall be done in a manner to deliver to the mixer a homogenous mixture represented by the samples which were used to determine the fly ash requirement.

- (b) **Soil.** The soil aggregate to be used in the fly ash treated base shall be sand, sand-gravel, silty sand, sand-clay, silt clay soil, limestone screenings, sandstone, or jig sand obtained from approved sources and shall be free of roots, sticks and sod tufts and reasonably free of deleterious concentrations of other organic matters, acids and minerals. It shall meet the following requirements prior to addition of fly ash:

<u>SIEVE SIZE</u>	<u>PERCENT PASSING</u>
2 inch (50 mm)	100
1 inch (25.0 mm)	95-100
No. 4 (4.75 mm)	55-100
Silt and clay fraction, maximum (smaller than 50 μ m)	50
Clay and colloid fraction, maximum (smaller than 5 μ m)	20
Liquid Limit, %, maximum	35
Plasticity Index, %, maximum	9

- (c) **Mixtures.** The proportions of soil-fly ash and water for each soil shall be determined by laboratory tests.
- (d) **Sampling and Testing.** Sampling and testing shall be done in accordance with the following AASHTO methods:

Sampling	T 2
Water	T 26
Preparation of Samples	T 87
Mechanical Analysis	T 88
Liquid Limits	T 89
Plastic Limit and Plasticity Index	T 90
Target Density	T 134

The target density shall be determined in the field by moisture density tests on representative samples of fly ash treated mixture obtained from the roadway. The test method for the target density is AASHTO T 134 modified to provide one compacted specimen of the soil-fly ash mixture as obtained from the roadway, with separate portions of the sample used for additional specimens with the moisture reduced or increased. The soil-fly ash mixture shall be mixed and compacted within ± 2 percentage points of optimum moisture content specified by the Engineer before there is any appreciable moisture loss.