

PART 1 - GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM C 29/ C 29M	(1991; Rev. A) Unit Weight and Voids in Aggregate
ASTM C 117	(1995) Materials Finer than 75- Micrometer (No. 200) Sieve in Mineral Aggregates by Washing
ASTM C 131	(1996) Resistance to Degradation of Small- Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine
ASTM C 136	(1996; Rev. A) Sieve Analysis of Fine and Coarse Aggregates
ASTM D 75	(1987; R 1992) Sampling Aggregates
ASTM D 1556	(1990; R 1996) Density and Unit Weight of Soil in Place by the Sand- Cone Method
ASTM D 1557	(1991) Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft- lbf/ ft (2,700 kN- m/ m))
ASTM D 1883	(1994) CBR (California Bearing Ratio) of Laboratory- Compacted Soils
ASTM D 2217	(1985; R 1993) Wet Preparation of Soil Samples for Particle- Size Analysis and Determination of Soil Constants
ASTM D 2922	(1996) Density of Soil and Soil- Aggregate in Place by Nuclear Methods (Shallow Depth)
ASTM D 3017	(1996) Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth)
ASTM D 4318	(1995; Rev. A) Liquid Limit, Plastic Limit, and Plasticity Index of Soils

1.2 SUBMITTALS

Submit the following in accordance with Section 01330, "Submittal Procedures."

1.2.1 SD- 11 Factory Test Reports

- a. Gradation
- b. Bearing ratio
- c. Liquid limit
- d. Plasticity index
- e. Percentage of wear
- f. Dry weight of slag
- g. Density

1.2.2 SD- 12 Field Test Reports

- a. Gradation
- b. Smoothness
- c. Density
- d. Thickness

1.3 DELIVERY AND STORAGE

Inspect materials delivered to site for damage and store as to prevent segregation and contamination.

1.4 WEATHER LIMITATIONS

Do not construct base course when atmospheric temperature is below 35 degrees F or when rainfall or other weather conditions detrimentally affect the quality of the finished course.

1.5 CONSTRUCTION EQUIPMENT

Equipment shall be dependable and adequate for the purpose intended. Maintain equipment in satisfactory and safe operating condition. Subject to approval, special equipment dictated by local conditions may be used. Calibrated equipment, such as scales, batching equipment, spreaders, and similar items, shall have been recalibrated by an approved calibration laboratory within 12 months of commencing work.

PART 2 - PRODUCTS

2.1 MATERIALS

2.1.1 Aggregates

Consist of durable and sound crushed gravel, crushed stone, or crushed slag, free of lumps or balls of clay or other objectionable matter. Crushed stone and gravel shall be free from flat, elongated, soft, or disintegrated pieces. Crushed gravel retained on a No. 4 sieve shall have at least 90 percent by weight with at least two fractured faces and 100 percent by weight with at least one fractured face. Base course materials samples shall have a bearing ratio of at least 100 as determined by laboratory tests on a 4-day soaked specimen in accordance with ASTM D 1883; compact specimen in accordance with ASTM D 1557, Method D. Determine grain size in accordance with ASTM C 136 and amount of material finer than 200 mesh sieve in accordance with ASTM C 117. Aggregate, other than slag, shall have a percentage of wear not exceeding 45 when tested in accordance with ASTM C 131, Grading A. Slag shall be an air-cooled, blast furnace product having a dry weight of not less than 65 pounds per cubic foot when tested in accordance with ASTM C 29/ C 29M and shall consist of angular fragments uniform in density and quality, reasonably free from thin, elongated pieces, dirt, or other objectionable material. Soil binder material, that portion of material passing the No. 40 sieve, shall be of such composition that the composite material conforms to the requirements specified herein. The base course shall be of such nature that it can be compacted readily with watering and rolling to a firm, stable base and shall conform to one of the following sizes:

Percentage by Weight Passing
Square Mesh Laboratory Sieves

Size Numbers Sieves	% Passing
1 inch	100
3/4 inch	80-100
3/8 inch	-
No. 4	30-60
No. 10	20-45
No. 200	3-10

That portion of the material passing the No. 40 sieve shall have a liquid limit of not more than 25 and a plasticity index of not more than 5 as determined by ASTM D 4318. Prepare samples in accordance with ASTM D 2217, Procedure A.

PART 3 - EXECUTION

3.1 BASE COURSE

Construct the graded aggregate base course on a prepared subgrade, as indicated. Provide line and grade stakes for control. Place grade stakes in lanes parallel to the centerline of areas to be paved and space for string lining or other control methods. The base course shall consist of aggregate processed, deposited, spread, and compacted on a prepared surface. The Contractor shall be responsible for protection of completed areas against detrimental effects. Recondition, reshape, and recompact areas damaged by freezing, rainfall, or other weather conditions.

3.2 MIXING OF MATERIALS

Mix aggregates in a stationary or traveling plant. Proportion aggregates by weight or volume in such quantities that specified gradation, liquid limit, and plasticity index requirements are met after the base course has been placed and compacted. Incorporate, during the mixing operation, water in quantities sufficient to provide the necessary moisture content for the specified compaction. Mixing operations shall produce satisfactory uniform blending and the method of discharging into trucks shall not produce segregation.

3.3 PLACING

Do not dump mixed materials in piles, but place on prepared subgrade or subbase in layers of uniform thickness with a spreader. When a compacted course 6 inches in thickness is required, place material in a single layer. When a compacted course in excess of 6 inches is required, place material in layers of equal thickness. Do not exceed 6 inches or have less than 3 inches in thickness for any compacted layer. Place layers so that when compacted, they will be true to grades or levels required with the least possible surface disturbance. Where the base course is constructed in more than one layer, clean previously constructed layers of loose and foreign matter. Maintain material water content during the placing period to obtain the compaction specified. Make adjustments in placing procedures or equipment to obtain true grades, to minimize segregation and degradation, to reduce or increase water content, and to insure a satisfactory base course.

3.3.1 Stationary- Plant Method

Mix aggregates, binder material and water until a uniform homogeneous mixture is obtained. Do not dump materials in piles; place in layers of essentially uniform thickness, not to exceed 6 inches after compaction, by an approved spreader. Tail gate spreading will be acceptable only with permission, under conditions such as where space limitations prohibit use of the spreader.

3.4 COMPACTING AND FINISHING

Immediately following the placing, spread the finished mixture uniformly in a layer and bring to optimum moisture content. The loose thickness and the surface of the layer shall be such that the specified density and the required thickness shall be obtained after compaction. Compact the layer with steel-faced, vibrating or pneumatic-tired rollers, or other suitable compacting equipment or combinations thereof. Continue compacting until the layer is compacted through the full depth to a field density of at least 98 percent of the maximum density at optimum moisture content tested in accordance with ASTM D 2992/3017. In areas not accessible to rollers or compactors, compact the mixture with mechanical hand tampers. If the mixture is excessively moistened by rain, aerate by blade graders, or other suitable equipment. Aerate until the moisture content of the material is that needed to obtain the required density. Finish the surface of the layer by a combination of rolling and blading. Final surface shall be smooth and free from waves, irregularities, and ruts or soft yielding spots.

3.5 FINISHING AT EDGES OF BASE COURSE

Place earth or other approved materials along the edges of the base course in such quantity that it will compact to the thickness of the course being constructed. When the course is being constructed in two or more layers, place material to the thickness of each layer. In each operation, allow at least a one foot width of the shoulder to be rolled and compacted simultaneously with the rolling and compacting of each layer.

3.6 FIELD QUALITY CONTROL

3.6.1 Testing

3.6.1.1 Aggregates

Test each sample of base course material without delay. Make gradation tests from each sample in accordance with ASTM C 136. Make sieve analysis on material passing the No. 200 sieve in accordance with ASTM C 117.

3.6.1.2 Smoothness Tests

Test with a 10 foot straightedge, applied parallel with and at right angles to the center line of the paved area. Correct deviations in the surface in excess of 1/ 2 inch by loosening, adding or removing material, reshaping, watering, and compacting. The smoothness requirements specified herein apply only to the top layer when base course is constructed in more than one layer.

3.6.1.3 Field Density Tests

ASTM D 2922/3017. Take one test for each 500 square yards of each layer of base course.

3.6.1.4 Laboratory Density Tests

In accordance with ASTM D 1557, Method D.

3.6.1.5 Thickness Tests

Measure thickness of base course at intervals such that there will be a depth measurement for at least each 500 square yards of complete base course. Make depth measurements by test holes, at least 3 inches in diameter, through the base course. Where base course deficiency is more than 1/ 2 inch, correct by scarifying, adding mixture of proper gradation, reblading, and recompacting. Where the measured thickness is more than 1/ 2 inch thicker than indicated, consider it as the indicated thickness plus 1/ 2 inch for determining the average. The average thickness is the average of the depth measurements and shall not under run the thickness indicated.

3.7 MAINTENANCE

After construction of base course is completed, and until the succeeding course is constructed, maintain the base course throughout, except where portion of the succeeding course is under construction thereon. Maintenance includes drainage, rolling, shaping, and watering, as necessary, to maintain the course in proper condition. Correct deficiencies in thickness, composition, construction, smoothness, and density, which develop during the maintenance, to conform to the requirements specified herein. Maintain sufficient moisture by light sprinkling with water at the surface to prevent a dusty condition.

END OF SECTION