Measurement of Prime Coat shall be the number of gallons of residual asphalt applied to the completed and accepted base course.

304.14 Basis of Payment. The quantity of base course, determined as provided in Subsection **304.13**, will be paid for at the contract unit price for Coquina Shell Base Course. The quantity of bituminous prime material, determined as provided Subsection **304.13**, will be paid for at the contract unit price for Prime Coat. These prices and payments shall be full compensation for furnishing, hauling, placing, mixing, compacting, and priming as directed and shall include all materials, as specified, tools, equipment, labor, maintenance, and incidentals necessary to complete the work.

Base course that is deficient in thickness will be paid for at the reduced unit price as provided in Subsection **304.09**.

Payment for each item includes all direct and indirect costs or expenses required to complete the work.

Payment will be made under:

Item No.	**Pay Item**	**Pay Unit**
30411XX	Coquina Shell Base Course (*(thickness)*" Uniform)	Square Yard
4010005	Prime Coat	Gallon

SECTION 305

GRADED AGGREGATE BASE COURSE

305.01 Description. This work shall consist of a graded aggregate base course composed of materials as described below, placed on a prepared foundation, mixed, shaped, compacted, and primed (when directed), all in accordance with these specifications. The base course shall conform to

the lines, grades, dimensions and cross-sections shown on the plans or as directed by the Engineer.

When the contract specifies a graded aggregate base course, the Contractor, at his/her option, may bid on one of the following alternates listed below. The Contractor must state which alternate is being selected in the bid documents.

1 - Macadam Base Course
2 - Marine Limestone Base Course
3 - Recycled Portland Cement Concrete Base Course

Marine limestone aggregate is generally found in the coastal plains of the state and is defined as any limestone aggregate not meeting the classification of dolomitic limestone. Fossiliferous limestone aggregate and recrystallized limestone aggregate are considered marine limestone aggregate.

MATERIALS

305.02 General Requirements.

A. Macadam Base Course. The base course materials shall be composed of crushed stone filled and bound with screenings. The aggregate shall be free from vegetable matter, sand, lumps or balls of clay, or other deleterious matter.

B. Marine Limestone Base Course. The limestone base course materials shall be produced from a single source or deposit that will yield a satisfactory mixture conforming to all requirements of these specifications. Limestone base course shall not contain clay, sand, organics, or other materials in sufficient quantity as to be considered detrimental to the proper bonding, finishing, or strength of the base course.

C. Recycled Portland Cement Concrete Base Course. The aggregate in the base course shall consist of coarse

aggregate of crushed, graded, recycled portland cement concrete mixed together with sand, sand-gravel, soil or other approved materials having similar characteristics, combined as necessary to give a mixture conforming to the requirements hereinafter prescribed.

The aggregate shall be free from lumps or balls of clay or other objectionable matter and shall not contain metals, wood, brick, plastics, or other unacceptable debris.

When Recycled Portland Cement Concrete Base Course is selected by the contractor, the source shall be inspected, sampled and tested, and approved by the Engineer before any material is used in the work. A minimum of four weeks should be allowed for this sampling, testing, and approval.

305.03 Coarse Aggregate. The material retained on the No. 4 sieve shall be known as coarse aggregate and shall consist of hard durable particles of aggregate and shall be reasonably free from thin or elongated pieces, disintegrated particles, vegetable matter, or other deleterious substances. The coarse aggregate shall have an abrasion loss of not more than 65% when subjected to the Los Angeles Abrasion Test (AASHTO T 96).

a. Coarse aggregate for Macadam Base Course shall consist of hard, durable particles of crushed slag or stone, excluding marine limestone. The aggregate shall be free from vegetable matter, sand, lumps or balls of clay, or other deleterious matter.

Crushed slag used in Macadam Base Course, when dry and rodded, shall not weigh less than 70 pounds per cubic foot and shall consist of angular fragments, reasonably uniform in density and quality, and reasonably free from glassy, thin, elongated pieces, dirt, or other objectionable material.

b. Coarse aggregate for Marine Limestone Base Course shall consist of sound, durable particles of marine limestone aggregate.

c. Coarse aggregate for Recycled Portland Cement Concrete Base Course shall consist of sound, durable particles of recycled portland cement concrete aggregate, excluding crushed concrete block or pipe.

305.04 Fine Aggregate. The material passing the No. 4 sieve shall be known as fine aggregate or binder material subject to the following requirements:

1. Fine Aggregate for Macadam Base Course shall consist of material produced by crushing operations excluding marine limestone.

2. Fine Aggregate for Marine Limestone Base Course shall consist of marine limestone produced by the mining or crushing operation. No sand will be permitted as fine aggregate.

3. Fine Aggregate for Recycled Portland Cement Concrete Base Course shall consist of material produced by the crushing operation, sand, soil, or other acceptable material, and shall be obtained from sources approved by the Engineer.

305.05 Composite Mixture. After the base course materials have been spread on the subgrade, mixed, and shaped, but prior to the beginning of compaction operations, the composite mixture shall meet the following requirements:

A. Macadam Base Course:

Sieve Designation	Percentage by Weight Passing
2"	100
1 1/2"	95 – 100
1"	70 – 100
1/2"	48 – 75
No. 4	30 – 50
No. 30	11 – 30
No. 200*	0 – 12
Liquid Limit	25 Max.
Plasticity Index	6 Max.

*The amount passing the No. 200 sieve shall be determined by AASHTO T11.

B. Marine Limestone Base Course:

Sieve Designation	Percentage by Weight Passing
2"	100
1 1/2"	95 – 100
1"	70 – 100
1/2"	50 – 85
No. 4	30 – 60
No. 30	17 – 38
No. 200*	0 – 20
Liquid Limit	25 Max.
Plasticity Index	6 Max.

*The amount passing the No. 200 sieve shall be determined by AASHTO T11.

C. Recycled Portland Cement Concrete Base Course:

Sieve Designation	Percentage by Weight Passing
2"	100
1 1/2"	95 - 100
1"	70 - 100
1/2"	48 - 75
No. 4	30 - 50
No. 30	11 - 30
No. 200*	0 - 12
Liquid Limit	25 Max.
Plasticity Index	6 Max.

*The amount passing the No. 200 sieve shall be determined by AASHTO T11.

305.06 Bituminous Materials. The Contractor, with the approval of the Engineer, may use MC-30, RC-30, or EA-P Special for priming the base course. The material used shall meet the requirements as specified in Section **406**.

CONSTRUCTION REQUIREMENTS

305.07 Equipment. A steel wheel roller capable of developing a pressure of 250 to 350 pounds per inch of roller width in the compression wheel shall be required. Other rollers may consist of self-propelled or tractor drawn pneumatic tired rollers, or vibratory rollers. A combination of the above rollers may be necessary to produce a finished product that complies with these specifications.

305.08 Preparation of Subgrade. The subgrade for the graded aggregate base course shall be constructed in accordance with the requirements as specified in Section **208**. The subgrade shall be rolled and compacted for at least 500 feet ahead of the placing of base course materials where practicable.

The shoulders shall be constructed in accordance with the requirements of Section **209** and accurately trimmed to the alignment and grade of the base course so as to form a trench or channeled section as prescribed on the plans.

305.09 Placing of Base Course Material. The base course material may be delivered to the project with the necessary fines already included. Fines may be added if necessary to obtain the desired density and stability; however, the final gradation shall meet the requirements shown in Subsection **305.04**.

The base course aggregate shall be placed on the prepared roadbed. The spreading shall be accomplished in such a manner that the finished base course will conform to the lines grades, dimensions, and the typical cross-sections as shown on the plans or as directed by the Engineer.

When the required compacted thickness is 8 inches or less, the base course may be constructed in one layer. Where the required thickness is more than 8 inches, the base course shall be constructed in two or more layers of approximately equal thickness, the maximum compacted thickness of any one layer not to exceed 8 inches. Each layer shall be constructed and compacted as specified herein before the succeeding layer is placed.

Care shall be taken to prevent segregation of the fine from the coarse aggregates during the handling, spreading or shaping of the materials. All areas of segregated coarse or fine material shall be corrected.

Should the subgrade become unstable after the base course has been placed, the affected section shall be repaired. The base course material and unsatisfactory subgrade material shall be removed and replaced with approved subgrade material. The subgrade shall be re-constructed to the required compaction and shape and then the base course replaced at the required cross-section, grade, and compaction.

305.10 Compaction, Rolling, and Finishing. After the base course material is spread, it shall be continually machined with motor graders or other suitable equipment,

maintaining the required section until the base course is thoroughly compacted. Each layer shall be compacted by the use of equipment as specified in Subsection **305.07**. Should the subgrade become unstable after the base course has been placed, the affected section shall be repaired. After removing the base course material and the unsatisfactory subgrade material, suitable subgrade material shall be placed at the required compaction and shape, and then the base course material replaced to the required cross-section, grade and compaction.

Rolling of the base course shall start at the edge and proceed toward the center except on superelevated curves where rolling shall proceed from the lower to the upper side. On areas not accessible for the operation of standard rollers, compaction shall be performed by approved rollers. Rolling shall continue until the layer is satisfactorily compacted for the full width and depth. Wetting of the base course will be required when necessary. Rolling shall extend over the edges of each layer of base course materials for a distance of 2 feet on the shoulders. Blading and rolling shall continue until a dense, smooth, unyielding and well-bonded base course is obtained.

If initial compaction has been performed and the voids have not been filled, fine aggregate shall be placed upon the base course in an amount only sufficient to fill the voids. The base course shall be broomed, wetted and rolled until the coarse aggregate is firmly set, bonded, and the base course thoroughly compacted for the full width and depth. When the total compacted thickness of the graded aggregate base course is 8 inches or more, the material shall be placed in layers as specified in Subsection **305.09**. Each layer of the macadam base course while near optimum moisture shall be compacted with equipment capable of obtaining the required density to the full depth. The rolling shall continue until the entire base course is compacted to not less than 100% of maximum laboratory density as determined by AASHTO T 180 (Method D).

The in-place density and moisture content of the graded aggregate base course shall be determined with a nuclear moisture-density gauge or by other approved means.

On shoulder work or other applicable construction, steel wheel rollers will not be permitted upon the finished pavement except at locations necessary for turning around. During all phases of the work, extreme care shall be taken to protect structures.

305.11 Smoothness Test. The finished surface of the base course shall not vary more than 3/8 inch from a straightedge 10 feet long when applied parallel to the centerline of the roadway nor more than 1/2 inch from the typical cross-section shown on the plans. Any surface irregularities that exceed the above limitations shall be corrected.

305.12 Tolerance in Thickness. The thickness of the completed base course shall be measured at staggered intervals not to exceed 250 feet for two-lane roads. The depth measurements shall be made by test holes through the base course. Where the base course is deficient by more than 1/2 inch, the Contractor shall correct such areas by scarifying, adding base course material and re-compacting as directed by the Engineer.

When the base course is paid for on a square yard basis, any measurement that exceeds the specified thickness by more than 1/2 inch shall be considered as the specified thickness plus 1/2 inch. The average of these depth measurements is the Average Job Thickness. When the average thickness is more than 1/4 inch below the specified thickness and payment is by the square yard, the unit price will be adjusted. This adjusted unit price shall bear the same ratio to the contract unit price as the average thickness bears to the specified thickness. When the contract includes more than one road, each road shall be considered separately.

305.13 Samples and Tests. Each layer of graded aggregate base course shall be sampled and tested by the Engineer at intervals not to exceed 1000 feet for two lane roads,

with at least one test per road. The base course shall be sampled promptly after it has been mixed and laid down but before initial compaction operations have begun. The material shall be sampled by taking three portions for the full depth of the layer, one on the center and one approximately 2 feet from each edge of the base course. Samples will be sent to the Research and Materials Laboratory for tests to determine compliance with gradation and other specified requirements.

305.14 Application of Prime Coat. When a hot mix asphalt or a bituminous surface treatment is specified as the subsequent layer on a Graded Aggregate Base Course, the base course shall be primed in accordance with Subsection **401.28**. Before placing the prime coat, all irregularities in the base course shall have been repaired, the base course shall have seasoned sufficiently to permit a uniform penetration, and the density of the base course shall have been approved by the Engineer. The base course shall be cleaned of all mud, dirt, dust, and caked or loose material of any description by brooming, blowing, or other methods so as to expose the coarse aggregate in the base course.

When, in the opinion of the Engineer, the bituminous material used to prime the base course may present a hazard to adjacent properties the prime coat may be deleted from a section of roadway.

The rate of application of the prime coat material shall be as follows:

Base Course Material	Application Rate in Gallons per Square Yard of residual asphalt (gal/yd^2)
Macadam Base Course	0.25 - 0.30
Marine Limestone Base Course	0.10 - 0.15
Recycled Portland Cement Concrete Base Course	0.25 - 0.30

The method of application shall be as prescribed in perti-

nent portions of Section **406**.

When it is necessary to maintain traffic on a road, or a section of road, before the prime coat has time to sufficiently dry to prevent pickup, the Contractor shall apply sand or some other approved granular material as a cover as directed by the Engineer. The cost of furnishing this material and performing this work shall be included in the price of the base course or other items of work and no direct payment will be made.

305.15 Weight Tickets. When the base course is measured by the ton, the requirements set forth in Subsection **302.04** regarding weight tickets shall apply in all respects.

305.16 Maintenance. The Contractor will be required to machine the base course as often as is necessary to maintain it smooth and true to grade and cross-section, and to prevent raveling by the application of water as may be required to keep the base course tightly bound until the prime is applied. Any defects that develop shall be repaired.

305.17 Method of Measurement. Graded Aggregate Base Course will be measured as the pay unit called for in the contract.

When paid for by the square yard, the quantity of Graded Aggregate Base Course shall be the number of square yards of base course completed, accepted, and measured in place. Material placed outside the area designated shall be disregarded in computing the number of square yards.

Variable thickness base courses of or base courses of thickness for which there is no contract unit price shall be converted to square yards of equivalent areas of base course for which there is a contract unit price. The conversion shall be based on the base course whose thickness is nearest that of the base course in question.

When paid for by the ton, the quantity for Graded Aggre-

gate Base Course shall be the number of tons, including water contained in the delivered base course material, weighed on approved scales and actually incorporated in the completed and accepted work.

Deductions shall be made for the base course wasted or lost due to the negligence of the Contractor; base course applied in excess of the rate specified or directed in writing; and for any material applied beyond the limits of the work. Should the visual inspection indicate excessive moisture in the base course, a deduction shall be made for the weight of water applied in excess of 2% above optimum moisture as determined by the Engineer.

Measurement for Prime Coat of shall be the number of gallons of residual asphalt applied to the completed and accepted base course.

305.18 Basis of Payment. The quantity of graded aggregate base course, determined as provided above, will be paid for at the contract unit price for Graded Aggregate Base Course. The quantity of prime coat, determined as provided above, will be paid for at the contract unit price for Prime Coat. The above prices and payments shall be full compensation for furnishing, mixing, addition of water, hauling, placing and compacting of all materials, priming as directed, and includes all labor, equipment, tools, maintenance, and incidentals necessary to complete the work.

Base course paid for on a square yard basis and is deficient in thickness will be paid for at the reduced unit price as provided in Subsection **305.12**.

Payment for each item includes all direct and indirect costs or expenses required to complete the work.

Payment will be made under:

Item No.	Pay Item	Pay Unit
30501XX	Graded Aggregate Base Course (*(thickness)*" Uniform)	Square Yard
3050199	Graded Aggregate Base Course	Ton
4010005	Prime Coat	Gallon

SECTION 306

(RESERVED)

SECTION 307

CEMENT STABILIZED EARTH BASE COURSE

307.01 Description. This work shall consist of the construction of a base course composed of a combination of local soil and portland cement uniformly mixed, moistened, compacted and shaped, and the applying of a curing coat in accordance with these specifications. The completed base course shall conform to the typical cross-section shown on the plans and to the lines and grades furnished by the Engineer.