



Section 002742

**SIDEWALKS, DRIVEWAYS, STREETS, PATHWAYS,
PARKING LOTS, CONCRETE GUTTER, CURB
ELEMENTS, AND TRAFFIC SEPARATOR**

PART 1 - GENERAL

The following specification is intended for use for the design, selection of materials, and construction of sidewalks, driveways, streets, pathways, parking lots, concrete gutter, curb elements, and traffic separator, etc.

These construction items shall meet the requirements of Charlotte County Community Development, Engineering Division (CCCDED) and the Florida Department of Transportation (FDOT).

1.1 SCOPE

1.1.1 General:

The work specified in this section consists of the preparation of sub-grade, construction of the stabilized sub-base, placement of the base material, and placement of the surfacing material.

1.1.1 Work Included

The Contractor shall, unless specified otherwise, furnish all labor, materials, equipment, tools and all other associated appurtenances, necessary to do the work required as specified in the Contract Documents.

1.1.2 Location of the Work

The location of this work is as shown on the contract documents.

1.1.3 Coordination of Work

The Contractor shall be responsible for the satisfactory coordination of the placement of these construction items with other construction and activities in the area. Delays in work resulting from lack of such harmony shall not in any way be a cause for extra compensation by any of the parties.

1.1.4 Working Hours

The work shall be carried out in accordance with local ordinance and not to cause any unreasonable nuisance to affected residents. Under emergency conditions, this limitation may be waived by the consent of Charlotte County Utilities (CCU).

1.2 METHOD OF MEASUREMENT & PAYMENT

The work shall be measured and the compensation determined in the following manner:

1.2.1 Sidewalk

The sidewalk including removal of existing concrete/bituminous and aggregate base sections, saw cutting of existing concrete/bituminous edges, preparation of subgrade, placement of aggregate base, construction of concrete/bituminous surfacing, testing, necessary permits and all other required appurtenances in accordance with the contract documents shall be measured and paid for on a square yard basis.

1.2.2 Driveway

The driveways including removal of existing concrete/bituminous and aggregate base sections, saw cutting of existing concrete/bituminous edges, preparation of subgrade, placement of aggregate base, construction of concrete/bituminous surfacing, testing, necessary permits and all other required appurtenances in accordance with the contract documents shall be measured and paid for on a square yard basis.

1.2.3 Streets

The streets including removal of existing concrete/bituminous and aggregate base sections, saw cutting of existing concrete/bituminous edges, preparation of subgrade, placement of aggregate base, construction of concrete/bituminous surfacing, replacement of pavement markings, testing, necessary permits and all other required appurtenances in accordance with the contract documents shall be measured and paid for on a square yard basis.

1.2.4 Pathways

The pathways including removal of existing concrete/bituminous and aggregate base sections, saw cutting of existing concrete/bituminous edges, preparation of subgrade, placement of aggregate base, construction of concrete/bituminous surfacing, testing, necessary permits and all other required appurtenances in accordance with the contract documents shall be measured and paid for on a square yard basis.

1.2.5 Parking Lots

The parking lots including removal of existing concrete/bituminous and aggregate base sections, saw cutting of existing concrete/bituminous edges, preparation of subgrade, placement of aggregate base, construction of concrete/bituminous surfacing, replacement of pavement markings, testing, necessary permits and all other required appurtenances in accordance with the contract documents shall be measured and paid for on a square yard basis.

1.2.6 Gutter/Swale

The gutter/swale including removal of existing concrete/bituminous and aggregate base sections, saw cutting of existing concrete/bituminous edges, preparation of subgrade, placement of aggregate base, construction of concrete/bituminous gutter/swale, replacement of pavement markings, testing, necessary permits and all other required appurtenances in accordance with the contract documents shall be measured and paid for on a linear foot basis.

1.2.7 Curb Elements

The curbs elements including removal of existing concrete/bituminous and aggregate base sections, saw cutting of existing concrete/bituminous edges, preparation of subgrade, placement of aggregate base, construction of concrete/bituminous curb elements, replacement of pavement markings, testing, necessary permits and all other required appurtenances in accordance with the contract documents shall be measured and paid for on a linear foot basis.

1.2.8 Traffic separator

The traffic separator including removal of existing concrete/bituminous and aggregate base sections saw cutting of existing concrete/bituminous edges, preparation of subgrade, placement of aggregate base, construction of concrete/bituminous traffic separator, replacement of pavement markings, testing, necessary permits and all other required appurtenances in accordance with the contract documents shall be measured and paid for on a square yard basis.

1.2.9 Pavement Markings

All pavement markings removed during the project construction shall be replaced in kind and shall be considered incidental to the project unless a specific bid item is provided.

1.2.10 Miscellaneous

All other items required for the completion of the project and not included as a specific bid item shall be considered incidental to the project and no direct compensation will be made therefore.

1.3 REFERENCED STANDARDS (latest revisions)

- ACI 301
- ASTM A82, A185, C150, D-155
- FDOT Standard Specifications for Road and Bridge Construction (applicable sections)
- FDOT Design Standards
- FDOT “Manual of Uniform Minimum Standards for Design, Construction and Maintenance for Streets and Highways” also known as the “Florida Green Book”.
- FDOT Specifications Division III
- FDOT Standard Index
- CCCDED Specifications
- AASHTO (applicable sections)
- ADA standards

1.4 PARTIAL LISTING OF RELATED SECTIONS

- 001570 - Erosion and Sediment Control
- 001760 - Surveying and Record Drawings
- 002240 - Dewatering
- 002340 - Valves
- 002530 - Submersible Sewage Pump Lift Station-Package Design
- 002540 - Submersible Sewage Pump Lift Station- Standard Design
- 002930 - Grassing
- 003300 - Precast Concrete Products
- 009900 - Surface Preparation, Painting and Coating
- 002310 - Pipe Removal, Disposal, Alteration, Modification or Pipe Abandonment

Note: This is only a partial listing of related sections. The Contractor shall be responsible to review the entire contract documents.

1.5 SUBMITTALS

- 1.5.1 Submittals are required in accordance with the CCCDED Specifications requirements or as required by CCU.

PART 2 - PRODUCTS

2.1 MATERIALS

2.1.1 General

- a. The materials used in this work shall be in accordance with the appropriate section of the current FDOT Standard Specifications for Road and Bridge Construction.
- b. The materials used in this work shall be all new, and conform to the requirements for class, kind, size and material as specified below.
- c. This specification includes references to designated manufacturers to illustrate minimum acceptable requirements for products.
- d. Material of equal quality, detail, function, and performance may be proposed for substitution. All requests for substitutions shall be submitted to Charlotte County Utilities (CCU) for approval.

2.1.2 Concrete

2.1.2.1 Additives

The following additives shall not be used unless otherwise approved by CCU:

- Accelerating admixtures.
- Retarding admixtures.

- Damp-proofing admixtures.
- Water repelling admixtures.
- Series "100" or "15" type admixtures.
- Calcium chloride.

2.1.2.2 Streets

- a. The streets concrete shall meet the requirements specified in FDOT Standard Specifications Section 346-3 Class I (Special) having a minimum compressive strength of 3,000 PSI after 28 days, and shall have fibermesh reinforcement. "Reinforcement shall be achieved by the addition and distribution of either glass fibers or virgin polypropylene fibers throughout freshly mixed concrete. ASTM C-1116 establishes standards and covers the mixing of fiber-reinforced concrete at the batching plant and its delivery to the job site. Reinforcing fibers shall be used in strict accordance with the fiber-reinforcement manufacturer's instructions and recommendations as to type and amount for uniform and complete distribution. The fiber manufacturer or approved supplier shall provide the services of a qualified technical representative for a pre-job meeting and initial concrete driveway construction. Only fibers designed and manufactured specifically for use in concrete so certified by the manufacturer shall be acceptable. In the event that the specified test taken on the job site indicates that the mixture of fibers does not produce concrete of the desired strength, the Contractor shall adjust the mix accordingly to obtain the required strength, at no additional cost to the County."
- b. Curing compound shall be applied in accordance with FDOT Section 520-8.

2.1.2.3 Sidewalks, Driveways and Pathways

- a. Sidewalk, driveways and pathway concrete shall meet the requirements specified in FDOT Standard Specifications Section 346-3 Class I (Special).
- b. Sidewalks, driveways, pathway and curb cut ramps concrete shall be reinforced using fibermesh. The fibermesh fibers will be mixed in accordance to standards set forth in ASTM C-1116. Reinforcing fibers shall be used in strict accordance with the manufacturer's instructions and recommendations as to the type and amount for uniform distribution. Only fibers specifically designed and manufactured for use in concrete and so certified by the manufacturer shall be acceptable. The curb ramps shall be supplied with detectable warning devices per FDOT Standard Specifications Section 527.
- c. Contraction joints caps with removable cap strips as manufactured by Vinylex Corporation.
- d. Expansion joint sealer shall be Sikaflex-1CSL as manufactured by Silka.

2.1.2.4 Concrete Gutter, Curb Elements, and Traffic Separator

- a. Concrete gutter, curb elements, and traffic separator shall conform to the requirements of Section 520 of the current FDOT Standard Specifications for Road and Bridge Construction.

2.1.2.5 Preformed cork joint filler

- a. No. 4323 Standard Cork Expansion Joint Filler as manufactured by Construction Products Division - W. R. Grace and Company or CCU approved equal.
- b. Sealtight Cork Expansion Joint as manufactured by W. R. Meadows of Pennsylvania, Inc. or CCU approved equal.

2.1.2.6 Dowels and reinforcing bars:

- a. Dowels and reinforcing bars shall be of new billet steel deformed bars, Grade 60, sized to match existing reinforcement.

2.1.2.7 Hot Poured Joint Sealer:

- a. Joint seal, Product #9005 as manufactured by Allied Materials Corp. or CCU approved equal.
- b. No. 2350 Para-plastic (R) as manufactured by Construction Products Division, W. R. Grace and Co. or CCU approved equal.

2.1.3 Base Materials

2.1.3.1 Stabilized Subgrade

- a. Stabilized subgrade shall conform to the requirements of Section 160 of the current FDOT Standard Specifications for Road and Bridge Construction.

2.1.3.2 Optional Base Group 9

- a. Optional Base Group 9 shall conform to the requirements of Section 285 of the current FDOT Standard Specifications for Road and Bridge Construction and FDOT Index 514 utilizing one (1) of the following materials below:

- Limerock – LBR 100
- Shell Rock - LBR 100
- ABC-3 (minimum Marshall Stability 1500) (*)

(*) **Note:** Type S-1 (minimum Marshall Stability 1800) may be substituted in lieu of ABC-3, upon written request. All references to asphalt shall be in conformance with Section 285 of the FDOT Standard Specifications for Road and Bridge Construction, latest edition.

The Contractor shall notify CCU of the specific material he intends to utilize. Volume of base material will increase or decrease depending on the type of base used.

2.1.3.3 Soil Cement Base

(To be used only if specifically approved in writing by CCCDED and CCU)

The base shall be designed to have in-situ strength of 300 psi. Seven-day laboratory design compressive strength shall be a minimum of 300 psi for plant mixed unless statistical data for the materials used justifies a lesser laboratory strength.

The materials used in this work shall be all new, and conform to the requirements for class, kind, size and material as specified below.

Portland cement shall comply with the latest specifications for Portland cement, AASHTO M-85, or AASHTO M-134, or ASTM C-150, for the type specified. A one (1) cubic foot sack of Portland cement shall be considered to weigh 94 pounds.

Water for use with cement shall be clean and free of substances deleterious to the hardening of the soil-cement.

The base course soil shall consist of on-site material in the area to be paved, approved borrow material, or a combination of these materials proportioned as approved by the County. The soil shall not contain gravel or stone retained on a two (2) inch sieve or more than 45 percent retained on a No. 4 sieve. The soil shall be free of organic debris, trash, roots, or any other substance considered deleterious to the hardening of the soil cement.

2.1.4 Prime and Tack Coats

- a. Prime and Tack Coats shall conform to the requirements of Section 300-2 of the FDOT Standard Specifications for Road and Bridge Construction and the FDOT Specifications Division III, latest edition.

2.1.5 Asphaltic Concrete Mix

2.1.5.1 Recycled Asphaltic Concrete Mix

- a. Recycled asphaltic concrete mix shall conform to the requirements of Section 320 and 330 of the FDOT Standard Specifications for Road and Bridge Construction and the FDOT Specifications Division III, latest edition and as specifically noted below:
 - **Recycled Aggregate:** The recycled aggregate shall consist of a mixture of milled asphalt pavement.
 - **Fine Aggregate:** The fine aggregate used in combination with the recycled aggregate to meet final mix tolerance shall conform to the requirement of FDOT Specifications Section 902.
 - **Coarse Aggregate:** The coarse aggregate used in combination with the recycled aggregate to meet final mix tolerances shall conform with the requirements of FDOT Specifications Section 901.
 - **Recycling Agent/Asphalt Rejuvenator:** The asphalt rejuvenator shall be an asphalt cement or asphalt cement blended with a softening agent or flux oil conforming to the following criteria:

TABLE I

Absolute Viscosity, (V60) after TFOT (Thin Film Oven Test)	3:1 Ratio Minimum
Smoke Point	260 F. Minimum
Flash Point	400 F. Minimum
Solubility	97.5 Percent

The asphalt rejuvenator shall contain an approved anti-stripping agent.

- **Asphalt Emulsion/Rejuvenator:** The asphaltic emulsion rejuvenator shall meet the following criteria:

TABLE II

Storage Stability	24 Hr. 1.0 percent maximum
Sieve Test	0.1 percent maximum
Residue by Evaporation	65.0 percent maximum

Residue from the asphaltic emulsion rejuvenator shall conform to the requirements of TABLE I. The asphaltic emulsion rejuvenator shall contain an approved anti-stripping agent.

- **Recycled Mixture:** The recycled asphaltic concrete, new aggregate (as required), new bituminous material (as required) conforming to the requirements of the "TYPE" of asphaltic concrete mix specified for the project. The milled material shall constitute a maximum thirty percent (30%) for ABC-3, Type S-1 and Type S-III Asphalt of the total aggregate used in the job mix formulas. The established target values for the job mix formula for the recycled asphalt concrete mixture shall be maintained within the following tolerance:

½" Sieve	±7%
No. 10 Sieve	±5.5%
No. 200 Sieve	±2%
Asphalt Content	±0.55%
Mix Temperature	±30° F from design

2.1.5.2 Asphalt Concrete Type "S"

- a. Asphalt Concrete Type "S" shall conform to the requirements of Section 320 and 330 of the latest edition of the FDOT Standard Specifications for Road and Bridge Construction.

2.1.6 Pavement Marking

- a. Pavement markings shall be in accordance with Section 710 of the current FDOT Standard Specifications for Road and Bridge Construction.

PART 3 - EXECUTION

3.1 GENERAL

- 3.1.1 Construction shall be in compliance with the applicable FDOT Specification(s) and Design Standard(s), CCCDED permits, MOT and all other requirements as outlined in the Contract Documents.
- 3.1.2 All MOT considerations shall apply as it relates to egress and ingress of residents, roadway traffic and any and all pedestrian traffic.
- 3.1.3 Contractor shall provide a diligent means of ensuring safety for pedestrians, vehicles, and the working crew. The Contractor shall maintain traffic in both directions while crossing a secondary street in a perpendicular direction as it relates to the direction of the pipe path.
- 3.1.4 All test results shall be reported in writing to CCCDED, Engineering Division and CCU. The costs of all tests shall be borne by the contractor.

3.2 DRIVEWAYS

- 3.2.1 The driveways, if necessary, shall be saw cut and removed at the locations determined by the County. No work shall be performed beyond the County right of way unless so directed by the County.
- 3.2.2 Driveways shall not be removed until the actual day of the utility installation.
- 3.2.3 Driveways shall be restored by the end of each construction day, and made operational, allowing full egress and ingress, by employing existing stone base, if applicable, or installing a new stone base.
- 3.2.4 Temporary driveways, only if specifically authorized by CCU, may be allowed in those cases where the permanent driveways cannot be restored by the end of each construction day.
- 3.2.5 The driveway shall be maintained daily until the asphalt and/or concrete driveway has been reconstructed.
- 3.2.6 Final driveway repair shall be completed within 10 calendar days from original disturbance.
- 3.2.7 Driveways shall be reconstructed to match their original configuration or as designated by the County. This work shall include the disposal of all unwanted materials associated with the driveway reconstruction, i.e. concrete, asphalt, pipes, etc.
- 3.2.8 All concrete driveways shall have, as indicated on CCU Standard Details; a footer with two (2) #5 rebar, set one (1) above the other, adjacent to the roadway.

3.2.9 Residential driveways:

Asphalt driveways shall have a minimum 6 inch shell base. (Min. LBR 100, 98% compaction by AASHTO T-180), 6" stable subgrade, and 1 inch type S-III asphalt concrete surface.

Concrete shall have a minimum 6-inch shell base (min. LBR 100, 98% compaction by AASHTO T-180), a 6" stable subgrade, and (a 6-inch x 6-inch #6 Section 2.1.2.3 indicates fibermesh mesh) and have fibermesh reinforcement with a minimum thickness of 4-inch 3000 PSI concrete.

3.2.10 Commercial driveways:

Asphalt driveways shall have a minimum 8 inch shell base (Min. LBR 100, 98% compaction by AASHTO T-180), 6" stable subgrade and 1" type S-III asphalt concrete surface minimum.

Concrete shall have a minimum 8-inch shell base, (min. LBR 100, 98% compaction by AASHTO T-180), a 6" stable subgrade, and (a 6-inch x 6-inch #6 Section 2.1.2.3 indicates fibermesh mesh) and have fibermesh reinforcement with a minimum thickness of 6-inch 3000 PSI concrete.

3.2.8 Concrete driveways contraction joints shall be tooled.

3.2.9 All driveways shall be sloped in such a manner that they do not hold water or pond water. Driveways with "birdbaths" (according to County) shall be reconstructed at the Contractor's expense. The surface shall show no variation more than ¼ inch under a 10 foot straight edge. All drives not falling within tolerances shall be reconstructed at the Contractor's expense. The Contractor shall be required to schedule driveway construction with resident and to maintain access to residence.

3.2.10 The County, at his discretion, will sample the fresh concrete and perform the appropriate tests at frequencies established in FDOT's 1988 "Sampling, Testing and Reporting Guide", or as otherwise required.

3.2.11 Concrete, which fails to comply with the specifications, shall be removed and replaced at the Contractor's expense. Concrete shall not be delivered to the site until the County has approved all forms and sub-grade compaction tests.

3.2.12 In the event that the specified test taken on the job site indicates that the mixture of fibers does not produce concrete of the desired strength, the Contractor shall adjust the mix accordingly to obtain the required strength, at no additional cost to the County.

3.2.13 Curing compound shall be applied in accordance with FDOT Section 520-8.

3.3 SIDEWALKS AND PATHWAYS

3.3.1 Construction of concrete sidewalks and curb cut ramps shall be in accordance with Section 522 of the current FDOT Standard Specifications and FDOT Design Standards, except as

modified herein, and shall be in conformity with the lines, grades, dimensions and notes shown in the plans.

- 3.3.2 Prior to placing concrete sidewalk the subgrade shall be stabilized with commercial stabilizing material to provide a firm and unyielding base, achieving a minimum Limerock Bearing Ratio (LBR) of 40. No sidewalk concrete shall be placed until the subgrade has been accepted by the County.
- 3.3.3 Materials shall meet the requirements specified in FDOT Standard Specifications Section 346-3 Class I (Special). Sidewalks and curb cut ramps concrete shall be reinforced using fibermesh. The fibermesh fibers will be mixed in accordance to standards set forth in ASTM C-1116. Reinforcing fibers shall be used in strict accordance with the manufacturer's instructions and recommendations as to the type and amount for uniform distribution. Only fibers specifically designed and manufactured for use in concrete and so certified by the manufacturer shall be acceptable. The curb ramps shall be supplied with detectable warning devices per FDOT Standard Specifications Section 527.
- 3.3.4 Contraction joints shall be tooled. Tooled joints shall be straight and perpendicular to the edge of the sidewalk. Saw cutting of contraction joints will not be allowed. All contraction joints shall be tooled $\frac{1}{4}$ of the pavement depth. Expansion joints shall be provided between existing sidewalks and curbs or driveways and at intersections between sidewalk and other fixed objects, at new pours, and at all cold joints. In no case shall the distance between two consecutive expansion joints exceed a length of 30 feet. The Contractor shall use expansion joint caps with removable cap strips as manufactured by Vinylex Corporation. Expansion joint sealer shall be Sikaflex-1CSL as manufactured by Silka.
- 3.3.5 Expansion joint sealer shall not be placed in depths greater than $\frac{3}{4}$ inch at any one time. If the joint requires greater than $\frac{3}{4}$ inch of joint sealer, the Contractor shall place the material in two placements, only after the first placement has sufficiently cured. All removable cap strips shall be placed above the finished sidewalk surface and shall not be tooled over. The removable cap strips shall be pulled and filled with joint sealer within twenty-four (24) hours of the placement of the concrete. The Contractor shall use expansion joint caps with removable cap strips and joint sealer for all sidewalks.
- 3.3.6 All sidewalks proposed for construction shall adhere to all current applicable ADA standards including, but not limited to, cross slopes of 1.75%, +/-0.25% max, longitudinal slopes no steeper than 5% and all edge treatment standards. Sidewalks having cross slopes greater than 2% shall be corrected by the Contractor at no additional cost to the County. Sidewalks having a longitudinal slope greater than 5% are considered ramps under current ADA standards. If the Contractor's grading of the proposed sidewalk necessitates a longitudinal slope greater than 5% than the Contractor shall be responsible for providing all necessary ramp features as specified under current ADA standards. Such necessary ramp features shall not be placed as to impact vehicle turning movements or vehicle sight distances in accordance with the current addition of the FDOT "Manual of Uniform Minimum Standards for Design, Construction and Maintenance for Streets and Highways" also known as the "Florida Green Book". Any additional ramp features as may be necessary based on the Contractors grading of the proposed sidewalk, not specifically called out or itemized within the proposed plan set shall be

supplied and installed by the Contractor at no additional cost to the County. The cross slope of the proposed sidewalk shall be no less than 1%.

- 3.3.7 TESTING - The County, at its discretion, will sample and perform the appropriate quality assurance tests at frequencies established in FDOT's 1988 "Sampling, Testing and Reporting Guide," or as otherwise required.
- 3.3.8 Concrete, which fails to comply with the specifications, shall be removed and replaced at the Contractor's expense. Concrete shall not be delivered to the site until the County has approved all forms and sub-grade compaction tests.
- 3.3.9 In the event that the specified test taken on the job site indicates that the mixture of fibers does not produce concrete of the desired strength, the Contractor shall adjust the mix accordingly to obtain the required strength, at no additional cost to the County.
- 3.3.10 Curing compound shall be applied in accordance with FDOT Section 520-8.

3.4 STABILIZED SUBGRADE

- 3.4.1 General: The work specified in this Technical Specification consists of the stabilizing of designated portions of the roadbed to provide a firm and unyielding subgrade, having the required bearing value specified in the plans.
- 3.4.2 All submerged stumps, roots, or other organic matter encountered in the preparation of the subgrade shall be removed.
- 3.4.3 Subgrade thickness will be a minimum of 12". The subgrade shall be stabilized to the minimum bearing ratio and depth shown on the engineering drawings and/or as specified herein. If the natural in-situ soils do not meet the required stability, sufficient borrow materials for stabilization shall be uniformly mixed with in-place soils to produce the load bearing ratio. For roadways classified as either "Local or Urban Collector/Rural Minor Collector", the lime rock bearing ratio (LBR) shall be not less than forty 40 with a compaction of 98% of the maximum density. For roadways classified "Rural Major Collector, Minor Arterial or Principal Arterial" the limerock bearing ratio (LBR) shall be not less than seventy (70) with a compaction of 98% of the maximum density.
- 3.4.4 The subgrade shall be shaped prior to making the density tests. Density tests shall be made before work proceeds. The required density shall be maintained until the base of pavement has been laid or until the aggregate material for the base of pavement course has been spread in place.
- 3.4.5 After the subgrade has been prepared and immediately before the base course is laid, the subgrade shall be tested for substantial compliance as to crown and elevation. Material shall be removed or added as the conditions necessitate and again stabilized and compacted to bring all portions of the subgrade to the specified elevation, stability, and density.

3.5 OPTIONAL BASE GROUP 9

3.5.1 This work consists of base construction of one (1) of the optional materials. It shall be constructed on the prepared subgrade in accordance with these specifications and in conformity with the lines, grades and notes and typical cross-section shown in the plans and in conformance with Section 285 of the FDOT Standard Specifications for Road and Bridge Construction, current edition, and FDOT Index 514 except as amended herein. The materials shall meet the requirements set forth for Optional Base Group, according to FDOT Index 514, utilizing one (1) of the following materials below:

Limerock – LBR 100

Shell Rock – LBR 100

ABC-3 (minimum Marshall Stability 1500) *Note: Type S-I (minimum Marshall Stability 1800) may be substituted in lieu of ABC-3, upon written request. All references to asphalt shall be in conformance with Section 285 of the FDOT Standard Specifications for Road and Bridge Construction, dated 2000.

3.5.2 When alternate pavement sections are shown on the plans, they shall be constructed in accordance with the FDOT Standard Specifications for Road and Bridge Construction. An optional base course shall be used if approved by the County in accordance with FDOT Specification Section 285, Optional Base Course of the Standard Specifications for Road and Bridge Construction.

3.5.3 Spreading of Base

- a. The base material shall be spread uniformly. All segregated areas of fine or coarse material shall be removed and replaced with well graded product. For double course base, the material shall be spread in two (2) courses. The thickness of the first course shall be approximately one-half (1/2) the total thickness of the finished base or a sufficient thickness to bear the weight of the construction equipment without disturbing the subgrade.

3.5.4 Compacting and Finishing Base

- a. After spreading the base is completed, the entire surface shall be scarified and shaped to produce the exact grade and cross section after compaction. For double course bases, the scarifying shall extend to a depth sufficient to penetrate slightly the surface of the first course.
- b. As soon as proper conditions of moisture are attained, the material shall be compacted to an average density of ninety-eight (98%) percent of the maximum density. Where the base is being constructed in one course and the specified thickness is more than six (6) inches, the density specified above shall be obtained in both the bottom half and the top half of the base. If blading of any areas during final compacting operations is necessary to obtain the true grade and cross section, the compacting operations shall be completed prior to testing the density of the finished base.
- c. If the subgrade material becomes mixed with the base course material, the contractor shall excavate and remove the mixture and shall reshape and compact the subgrade and replace

the removed materials with clean base materials. The clean base material shall be shaped and compacted as specified above.

3.5.5 Base Testing

- a. One density test for every 1,000 square yards of material shall be taken with a minimum of one density test taken at each location under 1,000 square yards. The base material shall be compacted to not less than 98% maximum density (ASTM D-1557).
- b. One LBR sample shall be taken for every 4,500 square yards of material or at every change in material and shall have a minimum value of 100. A minimum of one LBR sample shall be taken at each location under 4,500 square yards.

3.6 SOIL CEMENT BASE

(To be used only if specifically approved in writing by CCCDED and CCU)

3.6.1 General

- a. The construction of the cement treated aggregate base shall be in general conformance with FDOT specification 270, of the Standard Specifications for Road and Bridge Construction 2000. The sub-grade shall be constructed to FDOT specification section 270-5 and be compacted to 98 percent AASHTO T-180 density. The sub-grade shall be a minimum of 12" thick, constructed of material having a minimum LBR of 40.
- b. The cement treated base shall have a minimum laboratory cured field mix seven (7) day compressive strength of 300 psi by bag sample. Base material shall be mixed with minimum cement content by weight of two (2%) percent.
- c. Base material shall have a minimum LBR of 100 prior to mixing with cement unless otherwise stated in the contract specifications.
- d. Any area represented by a 400 psi seven-day break or greater is subject to rejection by CCU representative after observation, evaluation, and testing. Values from 350 psi to 400 psi shall be subject to review and comparison to the design mix.
- e. Since the moisture content, rapidity of compaction effort and final compaction results may influence the compressive strength as well as the cement content, in order to give the contractor and CCCDED a referenced acceptance standard, lower and upper values of 300 psi and 350 psi respectively shall be provided.

3.6.2 Equipment

The Contractor shall use any machine, combination of machines, or equipment that produce the completed soil cement base course meeting the requirements for soil pulverization, cement application, mixing, water application, incorporation of materials, compaction, finishing, and curing as controlled by these specifications. Special attention is directed to the necessity of utilizing compaction equipment which will produce the required density in a particular soil cement blend.

3.6.3 Construction Methods

- a. Preparation: Before other construction operations begin, the area to be paved shall be graded and shaped as required to construct the soil cement base in conformance with the grades, lines, thickness, and typical cross-sections shown on the plans. Additional soil shall be placed as approved by the County. The sub-grade shall be firm and able to support without displacement the construction equipment and compaction hereinafter specified. Any unsuitable soil or materials, including material retained on 3-inch sieve, shall be removed and replaced with acceptable material. Soft or yielding sub-grade shall be corrected and made stable before construction proceeds.

The sub-grade in both cuts and fills shall be compacted to a density of 98% of the maximum density as determined by AASHTO T-180 (modified). The sub-grade shall be shaped prior to making the density tests.

- b. Pulverization: The soil shall be pulverized such that, at the completing of moist-mixing, one hundred (100) percent by dry weight passes a one (1) inch sieve and a minimum of eighty (80) percent passes a No. 4 sieve.
- c. Application of Cement: The specified quantity of Portland cements outlined by the laboratory design strength shall be applied uniformly on the soil. When bulk cement is used, equipment suitable for handling, weighing, and uniformly spreading the cement shall be used. The percentage of moisture in the soil at the time of cement application shall be continuous. Spread cement that has been displaced shall be replaced before mixing is started. The amount of cement used shall be sufficient to obtain the required compressive strength. Under no circumstances shall the amount be less than six (6) percent by weight. No cements shall be applied when the soil or sub-grade is frozen. The air temperature shall be at least forty (40) degrees Fahrenheit in the shade and rising or over fifty (50) degrees Fahrenheit.
- d. Mixing: After applied, the cement shall be mixed with the soil. Mixing shall continue until the cement has been sufficiently blended with the soil to prevent formation of cement balls when water is applied. Any soil cement mixture not compacted and finished shall not remain undisturbed for more than 30 minutes.
- e. Application of Water and Moist-Mixing: Immediately after the soil and cement have been mixed, water shall be applied uniformly and incorporated into the mixture. Excessive concentrations of water on or near the surface shall be avoided. Water supply and pressure-distribution equipment shall be provided to assure all required water will be applied within three (3) hours. After all water has been applied, mixing shall continue until a homogenous mixture of soil, cement, and water has been obtained. When the water application and mixing have been completed, the percentage of moisture in the mixture and in un-pulverized soil lumps, based on dry weights, shall be within 2% of the specified optimum moisture content and shall be less than that quantity which will cause the soil cement mixture to become unstable during compaction and finishing. The specified optimum moisture content and density shall be determined in the field by a moisture density test (AASHTO T-99 standard) on representative samples of soil cement mixture obtained from the area being processed. The average density required of all tests shall be ninety-

eight (98) percent. A density of less than ninety-five (95) percent shall not be accepted. Densities above one hundred (100) percent shall be calculated as one hundred (100) percent.

- f. Plant Mix Contractor Option: The contractor may use a plant mixture of soil cement material if approved by the County. The plant shall demonstrate the ability to properly proportion the cement to obtain a uniform mix meeting all specifications.
- g. Compaction: Prior to the beginning of compaction, the mixture shall be in a loose condition for its full depth and shall be within 2% of optimum moisture. As a continuation of mixing operations, the loose mixture shall be uniformly compacted to the specified density within three (3) hours. During compaction operations, shaping may be required to obtain uniform compaction, required grade, and cross-section.
- h. Finishing: After the mixture has been compacted, the surface of the soil cement shall be shaped to the required lines, grades, and cross-section. During shaping operations, the surface shall be lightly scarified to loosen any imprints left by the compacting or shaping equipment. The resulting surface shall be compacted to the specified density with steel-wheel or pneumatic-tire rollers or both. Rolling shall be supplemented by broom-dragging as required. Surface compaction and finishing shall be done in such a manner to produce, in not longer than three (3) hours, a smooth, dense surface free of surface compaction planes, cracks, ridges, or loose materials.
- i. Uniformity: Any portion of soil cement that has a density less than ninety-five (95) percent of the maximum density shall be corrected by additional rolling. If the time limits set forth herein have been exceeded, the base shall be left undisturbed and shall be tested after 7 days of curing to determine its suitability. If unsuitable, it shall be removed and replaced by the contractor without additional compensation. The contractor, at his option, shall remove and replace the deficient base rather than wait the results of the 7-day test.

3.6.4 Construction Joints

At the end of each day's construction, a straight transverse construction joint shall be formed by cutting back into the completed work to form a true vertical face. The formed construction joint shall be located to exclude all of the part of the base at the end of the run from being considered a part of the finished base if it does not have full depth, is not thoroughly compacted, is not properly proportioned, or is not properly mixed.

3.6.5 Curing

After being finished, the soil cement base shall be protected against drying for 14 days. The finished soil cement base shall be maintained in a moist condition by application of water until the curing material is applied. The curing material shall not be applied until the finished soil cement base has been inspected by the County and such inspection has determined that the base material is hardening in a uniform and satisfactory manner. The bituminous material and construction shall be in accordance with the Charlotte County Community Development, Engineering Division specifications. The actual rate of application shall be sufficient to provide complete coverage without excessive runoff. At the time the bituminous material is applied,

the soil cement surface shall be dense and free of all loose and extraneous material and shall contain sufficient moisture to permit penetration of the bituminous material. Water shall be applied in sufficient quantity to fill the surface voids of the soil cement immediately before the bituminous curing material is applied.

3.6.6 Opening to Traffic

After 14 day curing period, the completed portion shall be open to all traffic provided that soil cement is either protected or has hardened sufficiently to prevent marring or distorting of the surface by the equipment or traffic and provided the curing as specified is not impaired.

- a. The curing material shall be adequately maintained during the 7 day protection period so that all of the soil cement shall be covered effectively during this period.
- b. Finished portions of soil cement that are used by equipment during the construction of an adjoining section shall be protected in such a manner as to prevent the equipment from marring or damaging the completed work.
- c. If the air temperature may reach the freezing point, sufficient protection from freezing shall be given the soil cement for 7 days after its construction and until it has hardened. Other curing materials such as moist earth, straw, or hay may be used upon approval by the County.

3.6.7 Maintenance

The contractor shall maintain the base to a true and satisfactory surface until the wearing surface is constructed. Any repairs or patching shall extend to the full depth of the base and shall be made in a manner to assure restoration of a uniform base course conforming to the requirements of these specifications. No repairs shall be made by adding a thin layer of soil cement to the completed work. With County approval, the contractor shall make full depth repairs with concrete to small or minor areas such as manholes, inlets, or the like.

3.6.8 Testing and Inspection

- a. All sampling, collecting, testing, and inspection shall be performed by an independent certified laboratory approved by County.
- b. All material shall be collected by the sack method and shall be transported to lab in a sealed/moisture retaining enclosure and tested within two hours of field sampling.
- c. The contractor shall make available all materials to the laboratory for the purpose of performing routine tests as specified. This includes samples for soil cement mixture design, maximum density determination, sieve analysis, or other tests as directed by the County.
- d. The pills cast from project operations shall break at 300 psi or higher at seven days.

- e. Cores shall be taken at 14 day intervals to provide additional information regarding the strength of the cement treated base. All cores obtained shall meet current ASTM Standards.
- f. Before the asphalt concrete surface course is placed, the compressive strength of the base shall achieve a minimum in-situ strength of 250 psi.
- g. In-place density tests shall be made on the sub-grade and base course. At least one test shall be performed for every 500 square yard maximum area of pavement. A minimum of two (2) strength test value specimens shall be taken each day (one in the morning and one in the afternoon). Tests are a necessary part of soil cement base construction. The following tests shall be made by a certified laboratory:
 - Determination of Cement Applied
 - Moisture-Density Test
 - Bag Samples shall be taken at least once daily at intervals not to exceed 5,000 square yards and molded in the laboratory at field moisture content based on standard proctor density test (AASHTO T-99). Each specimen shall be 4 inches in diameter and 6 inches in height. The specimens shall be cured for 7 days and tested for compressive strength. The bag samples shall be a minimum strength of 250 psi.
 - Field cores shall be taken after 7 days curing time for each day's placement of base material at intervals of one every 500 square yards. or at intervals closer, if necessary, to isolate areas showing below minimum requirements. The cores shall be used to determine thickness of base and compression tested to determine strength of base material. The cores shall have an average compressive strength of 200 psi. The minimum compressive strength core break shall be 180 psi. Cores with less than 180 psi shall require the Contractor to isolate the area of base with additional cores and compressive tests for determining limits of the unacceptable base. The contractor shall remove that portion determined unacceptable, replace with new material, and retest after 7 days as outlined above.
- h. Test Results: the County may allow the wearing surface to be placed after receipt of the test reports from the laboratory stating there is a satisfactory soil cement base.
- i. All tests shall be performed by a certified testing laboratory approved by the County. The testing laboratory shall be under the direction of a Professional Engineer with at least five years of materials testing experience. All tests shall be performed at the contractor's expense.

3.6.9 THICKNESS

- A. After the base is completed, test cores shall be taken at intervals of one every 500 square yards or at closer intervals if necessary. Where the base is more than 1/2 inch deficient in thickness, the area covered by this deficient base shall be replaced. The 1/2 inch deficiency in

thickness will be accepted only if found in minor isolated areas as approved by the County. Additional cores shall be required to determine size of deficient area at no cost to CCU.

3.7 PRIME AND TACK COATS

3.7.1 General: This work consists of applying bituminous materials as a Prime Coat on the specified base course, and a Tack Coat between the specified asphalt surface courses including existing pavements to be resurfaced. All items and all work shall conform to the lines, grade, dimensions, and notes as specified on the plans.

3.7.2 Cleaning the Base: Before any bituminous material is applied, all loose material, dust, caked clay and foreign materials, which might prevent proper bond with the existing surface, shall be removed. Where the prime or tack coat is applied adjacent to driveways, curb and gutter or valley gutter, such concrete surfaces are to be protected and kept free of bituminous material. The Contractor shall utilize dust abatement measures at all times. All related dust abatement measures shall be considered incidental to the work under this section and no additional compensation will be made.

3.7.3 Application of Prime Coat: The surface to be primed shall be cleaned and shall not contain more than 90% of the optimum moisture content. The surface shall be "hard-planed" with a blade grader immediately prior to the application of the prime coat to remove the thin glazed or cemented surface leaving a granular porous condition that will allow free penetration of the prime material. The materials planed from the base shall be removed from the base area. Bituminous material shall be applied at the rate established within the current FDOT Standard Specifications for Road and Bridge Construction, and shall be sufficient so as to coat the surface thoroughly. Bituminous material shall not be applied in excess so as to pool or run off of the base material. The base shall be sufficiently moist in order to obtain maximum penetration of the asphalt. In all cases, upon application of bituminous material, the primed base shall be covered by a light uniform application of sand or screenings for protection prior to opening the primed base to vehicular travel. The sand or screenings shall be lightly dragged with a drag broom, after which the entire area shall be rolled with a traffic roller. If warranted by traffic conditions, the application may be made on one-half (1/2) of the width of the base at a time; care shall be taken to apply the correct amount of bituminous material at the joint.

3.7.4 Application of Tack Coat:

- a. Where a bituminous surface is to be laid and tack coat is required, both shall be applied as per the current FDOT Standard Specifications for Road and Bridge Construction. On the newly constructed base course, application of the tack coat (when one is required) shall follow the application of the prime coat and be applied immediately before the surface course is applied. A tack coat is not required on primed bases except in areas which have become excessively dirty and cannot be cleaned or in areas where the prime has cured and lost bonding effect. The bituminous material shall be applied only in the amount necessary to bond the asphalt surface to the base. Bituminous material shall not be applied in such a way that it is exposed to dust or other foreign material that may impact its adhesiveness. The tack coat shall be kept free from traffic until the wearing course is laid.
- b. The rate of application shall be between 0.02 and 0.08 gallons per square yard on standard overlay sections and between 0.08 and 0.12 on milled surfaces. The tack coat shall be applied

sufficiently in advance of the wearing surface to permit drying. NOTE: it shall not be applied so far in advance or over such an area as to lose it's adhesiveness as a result of being covered with dust or other foreign material.

3.8 MILLING EXISTING ASPHALT PAVEMENT

The work in this section shall conform to Section 327 of the current FDOT Standard Specifications for Road and Bridge Construction.

3.9 RECYCLED ASPHALTIC CONCRETE MIX

- a. Recycled asphaltic concrete mix placement shall conform to the requirements of Section 320 and 330 of the current FDOT Standard Specifications for Road and Bridge Construction.
- b. The density control shall be in accordance with the Nuclear Method as specified in the current FDOT Standard Specifications for Road and Bridge Construction Section 330.

3.10 ASPHALT CONCRETE, TYPE 'S'

- a. Asphaltic concrete type 'S' placement shall conform to the requirements of Section 320 and 330 of the latest edition of the FDOT Standard Specifications for Road and Bridge Construction.
- b. All items and all work shall conform to the lines, grade, thickness, dimensions, cross sections, and notes as specified on the Construction Plans.
- c. Materials shall not be placed on private property. All hazardous material(s) from paver at the clean-out or from any other equipment shall be legally disposed of by the Contractor offsite.
- d. Allowable temperature variances for application of asphalt mixes shall be as specified within the 2000 edition of the FDOT "Standard Specifications for Road and Bridge Construction", except as follows. Any load of asphalt, or portion of a load of asphalt mix, at the plant or on the project, with a temperature exceeding 330° F or under 270° F shall be categorically rejected for use on the project.
- e. The mixture shall be delivered on the road in ample time to permit the spreading and rolling and surface testing during daylight hours. The mixture shall be compacted to a minimum of ninety-five (95) percent of the laboratory compacted density.
- f. Depressions developing after the initial rolling shall be remedied by loosening or removing the mixture laid and by adding new material to bring such depressions to a true surface. Such portions of the completed course defective in surface, compressions, or composition or that do not comply with the requirements of these specifications shall be taken up and replaced with a suitable mixture properly laid in accordance with these specifications.
- g. Testing of the finished surface in the areas that are suspected of ponding water will be performed by the County after a rain storm or by applying water to the area. Any area that will

pond water over 1/8 of an inch shall be repaired to provide positive drainage. This work shall be performed at no extra cost to CCU and the method of repair is subject to approval by CCU.

- h. Tests: Any or all of the following tests may be required by the County:
 - Determination for the job-mix formula
 - Test of the asphalt cement
 - Sieve analysis of the aggregate
 - Determination of bitumen content of the asphaltic concrete
 - Plant inspection and verification of aggregate mix
 - Smoothness of finished pavement by use of a 15' rolling straight edge from which the paved surface shall not vary more than 3/16"
- i. In place density shall be determined by the nuclear density method (FM-1-T-238) during placement of pavement. Any correction to rolling patterns shall be adjusted at time of placement. The asphalt producer shall supply laboratory density (FM-T166) results prior to the placement of the asphalt pavement. In place density tests shall be taken at a frequency determined by the County.
- j. Extraction and gradation testing shall be in accordance with FM 5-563 and shall be performed on each material type for each day's placement to assure mixture quality.
- k. A thickness determination shall be made by taking 2 inch cores. No core shall exceed 1/4" in deficient thickness.

3.11 CONCRETE GUTTER, CURB ELEMENTS, AND TRAFFIC SEPARATOR

Concrete gutter, curb elements, and traffic separator shall conform to the requirements of Section 520 of the latest editions of the FDOT Standard Specifications for Road and Bridge Construction and FDOT Standard Index.

3.12 PAVEMENT MARKING

- a. Pavement markings shall be in accordance with Section 710 of the current FDOT Standard Specifications for Road and Bridge Construction and FDOT Design Standards.
- b. Contractor shall provide a diligent means of ensuring safety for pedestrians, vehicles, and the working crew. The Contractor shall maintain traffic in both directions while crossing a secondary street in a perpendicular direction as it relates to the direction of the pipe path.

END OF SECTION