

DEPARTMENT OF TRANSPORTATION

STATE OF GEORGIA

SPECIAL PROVISION

ATLANTA BELTLINE

NORTHEAST TRAIL SEGMENT 2, PHASE 2

Section 318 – Selected Material Surface Course

Add the following:

318.1 General Description

318.1.01 Definitions

A. Section Includes:

1. Crushed stone surfacing Type A
2. Crushed stone surfacing Type B
3. Aggregate base
4. Aluminum edging
5. Stabilizer binder

318.1.02 Related References

A. Standard Specifications

Section 210 – Grading Complete

318.1.03 Submittals

A. Product Data: For each type of product indicated. Include technical data and tested physical and performance properties.

1. Crushed Stone: 5-pound sample of material demonstrating size gradation and color of each type.
2. Aluminum Edging: 24-inch length, including one spiral steel spike.
3. Stabilizer binder. Submit sample of crushed stone to manufacturer of the Stabilizer binder for testing. The results of this testing must be shared with the owner's representative.

318.1.04 Quality Assurance

A. Mockups

1. Build mockups of each type of crushed stone surfacing not less than 96 inches by 96 inches to demonstrate surface color, texture, binding material (if any), and edging.

B. Preinstallation Conference

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1. Conduct conference at Project site.

318.1.05 Project Conditions

A. Environmental Limitations

1. Do not apply crushed stone and binder materials if subgrade is wet or excessively damp, or if rain is imminent or expected before time required for a dequate drying of binder.

318.2 Materials

318.2.01 Aggregates

- A. Aggregate for base course shall be a dense graded crushed granite stone that shall consist of inert angular material derived from a stone quarry that is hard, durable stone and stone screenings, free from loam and clay, surface coatings, and plastic materials. (Aggregate base is used for Type A and Type B Crushed Stone.)

<u>Sieve No.</u>	<u>Percent Passing by Weight</u>
2"	100
1 – ½"	70 – 100
¾"	50 – 85
No. 4	30 – 55
No. 50	8 – 24

318.2.02 Crushed Stone

- A. Type A: Crushed stone shall be decomposed granite meeting the following gradation:

<u>Sieve No.</u>	<u>Percent Passing by Weight</u>
No. 4	100
No. 8	90 – 100
No. 40	20 - 40
No. 100	10 - 30
No. 200	0 - 20

1. Crushed stone shall be warm gray in color with color relatively uniform and shall be subject to the approval of the Owner's Representative.

2. Type B Crushed stone shall be dense graded granite meeting the following gradation:

<u>Sieve No.</u>	<u>Percent Passing by Weight</u>
2"	100
1 – ½"	70 – 100
¾"	50 – 85
No. 4	30 – 55
No. 50	8 – 24
No. 200	3 – 10

3. Crushed stone shall be warm gray in color with color relatively uniform and shall be subject to the approval of the Owner's Representative.

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318.2.03 Stabilizer Binder

- A. Natural, non-toxic, non-staining, odorless, environmentally safe powder consisting of 95 percent Psyllium with 70 percent Mucilliod content; of a size that not more than 10 percent is retained on a U.S. Standard No. 40 Mesh Sieve.

318.2.04 Aluminum Edging

- A. Aluminum edging shall be 0.210 inch thick x 4 inch deep extruded aluminum, alloy 6005, T-5 hardness, mill finish. Edging shall be furnished in 8 foot lengths.
 1. “AsphaltEdge” as manufactured by Permaloc Corporation, Holland, Michigan (www.permaloc.com), or approved equal.
 2. Aluminum edging shall have holes in base for anchoring a aluminum edging every 4 inches.
 3. Spiral steel spikes shall be 10 inches long.
 4. Concrete Base Application: 3/16 inch x 1-1/2 inches (4.8 mm x 38mm) or longer Ardox concrete nail, or drive pin fastener equal to Hilti DX 40 powder actuated pin or Ramset Trakfast Automatic Fastening System pin.
- B. Provide manufacturer’s end stake and splicer unit.

318.3 Construction Requirements

318.3.03 Grading

- A. Areas to receive crushed stone surfacing shall be compacted and brought to subgrade elevation and all work required under the Section 210, Grading Complete, is performed. Provide final fine grading, furnishing and installing base course, and crushed stone surface and compaction of these materials as required to form a firm, uniform, accurate, and unyielding crushed stone surface. Surface shall be constructed at required elevations and to required lines.
- B. Excavation required in subgrade shall be completed before fine grading and final compaction of subgrade are performed. Where excavation must be performed in completed subgrade or base course, subsequent backfill and compaction shall be performed as directed by the Owner’s Representative and as specified under the Section 210, Grading Complete. Completed subgrade after filling such areas shall be uniformly and properly graded.
- C. Areas being graded or compacted shall be kept shaped and drained during construction. Ruts greater than or equal to one inch deep in subgrade shall be graded out, reshaped as required, and recompacted before placing crushed stone surfacing.
- D. Materials shall not be stored or stockpiled on subgrade.

318.3.04 Base Course

- A. Base course shall be spread in layers from self-spreading vehicles equipped with a automated grade controlled equipment for cross sections greater than 10 feet in width and by hand for cross sections less than or equal to 10 feet in width. Power graders or conventional self-spreading vehicles may be used only with prior written approval of the Owner’s Representative. Base course shall be compacted until the surface is even and true to the required lines and grades within a tolerance of 3/8 inch above or below the required cross sectional elevations and to a maximum irregularity not exceeding 3/8 inch under a 10 foot line longitudinally.
- B. Any specific area of base course which, after being rolled, does not form a satisfactory, solid, stable foundation shall be removed, replaced and recompacted by the Contractor at no additional cost to the Owner.
- C. Compaction of base course shall be to 95 percent of maximum density as determined by ASTM D 1557.

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- D. Width of base course shall be greater than or equal to the width of crushed stone surface, if continuous lateral support is provided during rolling, and shall extend at least 2x base thickness beyond edge of the course above, if not so supported.
- E. Material shall be applied in lifts less than or equal to 3 inches thick, compacted measure. Each lift shall be separately compacted to specified density.
 - 1. Rolling shall begin at sides and progress to center of crowned areas, and shall begin on low side and progress toward high side of sloped areas. Rolling shall continue until material does not creep or wave ahead of roller wheels.

318.3.05 Edging

- A. Aluminum edging shall be installed at locations indicated on the Drawings. Where required, edging shall be cut square and accurately to required length.
 - 1. Install edging leaving 3/8" between sections for expansion.
 - 2. Drive spikes through edging holes in base of a asphalt restraint edging (or drive nails through aluminum base when using powder actuated fastening system) at spaces for following applications:
 - a. Anchor each section end with anchor.
 - b. Aggregate Base: Spiral steel spikes at 4 inches to 12 inches on center.
 - c. Concrete Base: Hilti DX A41 Fully Automatic Powder Actuated Tool is desirable where sufficient hold can be obtained. Provide 3/4 inches to 1 inch nail at 4 inches to 12 inches on center spacing with applicable charge recommended. Anchor into outer 1 inch of base of restrained edging and not less than 2.5 inches from edge of concrete.
 - 3. Adjacent lengths of edging shall be spliced together with manufacturer's standard splicer unit.
 - 4. Edging shall be set plumb and vertical at required line and grade. Straight sections shall not be wavy; curved sections shall be smooth and shall have no kinks or sharp bends.
- B. Edging shall be installed in the locations and elevations shown on the drawings. Edging shall be straight and true when located on tangents. Curves in the edging shall be to a single radius as shown on the drawings. Install edging so that there is a smooth transition between pieces. There shall be no kinks or bends in the alignment of any portion of the edging.

318.3.06 Crushed Stone Surfacing: Type A

- A. Crushed stone surfacing shall be placed only after excavation and construction work that might injure the surfacing have been completed. Damage to edging, crushed stone surfacing, adjacent grades or materials occurring during construction shall be repaired by the Contractor before acceptance at no additional cost to the Owner.
- B. Crushed stone surfacing shall be constructed on the compacted base course.
- C. Pre-soak compacted base course with water prior to installing stabilized crushed stone.
- D. Stabilizer binder shall be thoroughly pre-mixed with the crushed stone at the rate of 16 pounds of binder per 2000 pounds of crushed stone as determined by test analysis by manufacture of stabilizer binder. The crushed stone shall be damp before mixing, but not wet. Drop spreading of binder over pre-placed crushed stone or mixing by rototilling will not be acceptable. Binder shall be mechanically pre-mixed on site per manufacturer's recommendations, using a cement mixer or flowable mixer that will adequately mix and blend binder with crushed stone while controlling the specified water content. The binder shall not be applied during, prior to or immediately following rainfall or when the temperature is 40 degrees Fahrenheit and falling.
- E. After mixing, spread crushed stone and binder mixture evenly over the base course and rake smooth to the required grade and cross section as shown on the Contract Documents. Place material to sufficient depth to allow 4-inch depth after compaction. Wait a minimum of 6 hours or until such time that the paving material is able to accept compaction from a one-ton roller without separation, plowing or any other physical

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compromise of the paving material. Compact the material with a compactor as specified above moving 3 to 4 passes. Use of vibrator compactors shall be prohibited.

- F. Following compaction, crushed stone surface shall be watered with light spray. Take care as to not disturb the crushed stone surface with the spray action.
- G. Variations in smoothness of finished crushed stone surface shall be less than or equal to 1/8 inch when tested with a 10-foot straightedge, applied both parallel to and at right angles to centerline of crushed stone surface areas. Irregularities exceeding these amounts or which retain water on surface shall be corrected by removing defective work and replacing with new material conforming to this specification.
- H. The finished crushed stone surface material shall have a 30 percent to 35 percent swell volume in accordance with the requirements of ASTM D4546.

318.3.07 Crushed Stone Surfacing: Type B

- A. Crushed stone surfacing shall be placed only after excavation and construction work that might injure the surfacing have been completed. Damage to edging, crushed stone surfacing, adjacent grades or materials occurring during construction shall be repaired by the Contractor before acceptance at no additional cost to the Owner.
- B. Crushed stone surfacing shall be constructed on the compacted base course.
- C. Crushed stone surfacing shall be applied in lifts less than or equal to 2 inches thick, compacted measure. Each lift shall be separately compacted to specified density.
 - 1. Material shall be placed adjacent to wall, manhole, catch basin, and other structures only after they have been set to required grade and level.
 - 2. Roller compaction shall begin at sides and progress to center of crowned areas, beginning on low side and progressing toward high side of sloped areas. Rolling shall continue until material does not creep or wave ahead of roller wheels.
- D. Variations in smoothness of finished crushed stone surface shall be less than or equal to 1/2 inch when tested with a 10-foot straightedge, applied both parallel to and at right angles to centerline of crushed stone surface areas. Irregularities exceeding these amounts or which retain water on surface shall be corrected by removing defective work and replacing with new material conforming to this specification.
- E. The finished crushed stone surface material shall have a 30 percent to 35 percent swell volume in accordance with the requirements of ASTM D4546.

318.3.08 Warranty

- A. Provide a warranty installation of the stabilized crushed stone surface product against cracking, spalling or loss of more than 1/4 inch of crushed stone surface material for the time of one year.
- B. Provide, for a period of 60 days, unconditional maintenance to include complete repairs to any area of the stabilized crushed stone surface that fails. Repairs shall be as specified herein.

318.3.09 Maintenance

- A. Engage an experienced product representative from the aggregate binder manufacturer during installation of the crushed stone paving. Product representative shall be experienced in work similar to that required for this Work and shall be approved as such by the Owner's Representative.
- B. Furnish and install construction fence after installation of stabilized crushed stone paving in such a way as to prevent public access to the area of new paving. Fencing shall be maintained in place for a minimum of 72 hours after completion of the paving installation and then removed from the site, and as directed by the Owner's Representative.
- C. Repair all cracks during the maintenance period by sweeping fines into the cracks, watering thoroughly and hand tamping with hand tamper with a 10-inch plate.

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318.3.10 Stabilized Crushed Stone Repairs: Type A Only

- A. All damaged areas shall be repaired by excavating extent of damage to the depth of the stabilized crushed stone and removing the damaged material from the site and disposing of the material in a legal manner.
- B. After removing the damaged stabilized crushed stone cut the edge of the damaged area to produce a vertical edge.
- C. Moisten with a light spray the exposed base course.
- D. Mix in a concrete mixer the dry aggregate binder with the specified crushed stone to the proportions noted in this Section.
- E. Add water to the pre-blended crushed stone and aggregate binder. Thoroughly moisten mixture with 25 to 35 gallons per 2,000 pounds of pre-blended mixture or to approximately 10 percent moisture content.

318.4 Measurement

- E. Crushed stone surfacing, Type A and Type B, is measured by the ton, complete in place with all ancillary materials, and all equipment required for installation included in the unit price.

318.5 Payment

- E. Crushed stone surfacing, Type A and Type B, complete and accepted will be paid for at the full contract unit price per ton. Payment is full compensation for furnishing and placing materials, equipment, supplies and incidentals necessary to complete the work.

Payment will be made under:

Item No. 318	Aggregate Surface Course	Per Ton
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End of Section 318