November 29, 2021

DEPARTMENT OF TRANSPORTATION

STATE OF GEORGIA

SPECIAL PROVISION

ATLANTA BELTLINE NORTHEAST TRAIL SEGMENT 2, PHASE 2

Section 441 – Miscellaneous Concrete

Add the following:

441.1 General Description

This Work includes installation of concrete trail pavement as shown on plans, and shall include, but is not limited to, the following components:

A. Concrete Trail Paving, Standard Finish, 6 In.

B. Concrete Trail Paving, Special Finish, 6 In.

C. Concrete Trail Paving, Special Finish, 8 In.

441.1.03 Submittals

A. Product Data

1. Submit manufacturer's technical data for each type of product indicated.

B. Samples

1. Submit samples of each type of concrete trail paving for approval by the Owner's Representative.

C. Construction Joint Layout

1. Indicate proposed construction joints required to construct the paving structure.
   a. Location of construction joints is subject to approval of the Owner's Representative.

D. Other Action Submittals

1. Design Mixtures: For each concrete paving mixture. Include alternate design mixtures when characteristics of materials, project conditions, weather, test results, or other circumstances warrant adjustments.

441.1.04 Quality Assurance

A. Installer Qualifications

1. An employer of workers trained and approved by manufacturer of decorative concrete paving systems.

B. Ready-Mix-Concrete Manufacturer Qualifications:

1. A firm experienced in manufacturing ready-mixed concrete products and one that complies with ASTM C 94/ C 94M requirements for production facilities and equipment.

C. ACI Publications: Comply with ACI 301 unless otherwise indicated.

D. Mockups: Build mockups of each type of decorative concrete paving not less than 120 x 168 inches to demonstrate typical joints; surface color, pattern, and texture; curing; and standard of workmanship.

E. Preinstallation Conference: Conduct conference at project site.

F. Review of Formwork Layout: Owner's Representative to review and approve form layout of each pour prior to installation of concrete.

Add the following:

441.2 Materials

For concrete trail paving, Standard Finish, 6 In, use Class "A" concrete as specified in Section 500.
For concrete trail paving, Special Finish, 6 In or 8 In, use Class "AA" concrete as specified in Section 500.

A. Definitions

1. For concrete trail paving, Standard Finish is defined as a medium to fine-textured broom finish.
2. For concrete trail paving, Special Finish Type I is defined as integral colored concrete with a lightly exposed aggregate finish.
3. For concrete trail paving, Special Finish Type II is defined as integral colored concrete with a medium sandblast finish.
4. "Concrete Trail Paving, Special Finish, 6 In" includes Special Finish Type I and Type II concrete, at 6 In thickness.
5. "Concrete Trail Paving, Special Finish, 8 In" includes Special Finish Type I and Type II concrete, at 8 In thickness.

Add the following:

441.2.02 Products

A. Forms

Form materials: Plywood, metal, metal-framed plywood, or other approved panel-type materials to provide full-depth, continuous, straight, and smooth exposed surfaces.

B. Steel Reinforcement

1. Plain-steel welded wire reinforcement: ASTM A 185/ A 185 M, fabricated from as-drawn steel wire into flat sheets.
2. Reinforcing Bars
   a. For concrete trail paving, Standard Finish, 6 in.: ASTM A 615/ A 615 M, Grade 60, deformed.
   b. For concrete trail paving, Special Finish Types I and II, 6 in. and 8 in.: ASTM A 615, Grade 60, deformed.
3. Dowel Bars:

   ASTM A 615/ A 615M, Grade 60 plain-steel bars; zinc coated (galvanized) after fabrication according to ASTM A 767/ A 767M, Class I coating. Cut bars true to length with ends square and free of burrs.
4. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars, welded wire reinforcement, and dowels in place. Manufacture bar supports according to CRSI's "Manual of Standard Practice" from steel wire, plastic, or precast concrete of greater compressive strength than concrete specified.

C. Concrete Materials:

1. Cementitious Material: Use the following cementitious materials, of same type, brand and source throughout project.
   a. Portland cement, ASTM C 150, gray portland cement.

1. For Concrete Trail Paving, Standard Finish, 6 In, supplement with the following:
    a. Fly ash: ASTM C 618, Class C
2. For Concrete Trail Paving, Special Finish Types I and II, 6 In and 8 In, supplement with the following:
    a. Fly ash: ASTM C 618, Class C or F
    b. Slag: ASTM C 989

2. Normal-Weight Aggregates:
    a. For Concrete Trail Paving, Standard Finish, 6 In, use the following:
    ASTM C 33, Class 4M, uniformly graded. Provide aggregates from a single source.
    b. For Concrete Trail Paving, Special Finish, 6 In and 8 In, use the following:
        1. Granite aggregate: ASTM C 33, no. 57 stone.
        2. Natural sand: ASTM C 33.
        3. Manufactured sand: ASTM C 33.

3. Water:
    a. For Concrete Trail Paving, Standard Finish, 6 In, potable and complying with ASTM C 94/ ASTM C 94M.
    b. For concrete Trail Paving, Special Finish, 6 In and 8 In, potable and complying with ASTM C 94.
4. Air-entraining admixture: ASTM C 260.
    a. For Concrete Trail Paving, Special Finish, 6 In and 8 In:
        1. Manufacturer: WR Grace & Co., or approved equal.
        2. Product: Darex II AEA, or approved equal.
5. Chemical admixtures: Admixtures certified by manufacturer to be compatible with other admixtures and to not contain more than 0.1 percent water-soluble chloride ions by mass of cementitious material.
    a. For Concrete Trail Paving, Special Finish, 6 In and 8 In:
        1. Manufacturer: WR Grace & Co., or approved equal.
        2. Product: Water-reducing admixture – Zyla 620 by Grace Construction Products, or approved equal.
6. For Concrete Trail Paving, Special Finish, 6 In and 8 In:
    Top Surface Retarder applied to freshly placed concrete for duration recommended by manufacturer. Hosing and brushing to produce light exposed aggregate finish.
    a. Product:
        1. Manufacturer: Dayton Superior by WR Grace & Co. or approved equal.
        2. Product: Topcast 05, or approved equal

D. Curing Materials:

1. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.
2. Evaporation Retarder: Waterborne, monomolecular, film forming, manufactured for application to fresh concrete.
3. Water: For Concrete Trail Paving, Standard Finish, 6 In: Potable.
4. For Concrete Trail Paving, Special Finish, 6 In and 8 In:
    Clear Acrylic Sealer: Manufacturer's standard, waterborne, nonyellowing, and UV-resistant, membrane forming, medium gloss, acrylic copolymer emulsion solution, manufactured for colored concrete, containing not less than 15 percent solids by volume.

a. Product: L.M. Scofield Company; Cureseal W, matte or approved equal.

b. Application: For Concrete Trail Paving, Special Finish, Type I – Apply after hosing and brushing.
For Concrete Trail Paving, Special Finish, Type II – Apply after sandblasting.

E. Related Materials:

1. Joint Fillers: ASTM D 1751, asphalt-saturated cellulosic fiber in preformed strips.

F. Concrete Mixtures:

1. Prepare design mixtures, proportioned according to ACI 301, with the following properties:

a. Compressive Strength (56 days): For Concrete Trail Paving, Standard Finish, 6 in. – 3,000 psi..
Compressive Strength (56 days): For Concrete Trail Paving, Special Finish, 6 in. or 8 in. – 3,500 psi

2. Chemical admixtures: Use admixtures according to manufacturer's written instructions.

3. For Concrete Trail Paving, Special Finish, 6 In and 8 In:

a. Color Pigment: Add color pigment to concrete mixture according to manufacturer's written instructions and to result in hardened concrete color consistent with approved mockup.

G. Concrete Mixing:

1. Ready-Mixed Concrete:

a. For Concrete Trail Pavement, Standard Finish, 6 In: Measure, batch and mix concrete materials and concrete according to ASTM C 94/ C 94M and ASTM C 1116/ C 1116M. Furnish batch certificates for each batch discharged and used in the Work.

b. For Concrete Trail Pavement, Special Finish, 6 In and 8 In: Measure, batch, and mix concrete materials and concrete according to ASTM C 94/ C 94M. Furnish batch certificates for each batch discharged and used in the work.

Add the following:

441.3.05 Construction

A. Extent and Thickness of Pavement

1. For Concrete Trail Paving, Standard Finish, 6 In and Concrete Trail Paving, Special Finish, 6 In and 8 In, comply with tolerances in ACI 117 and as follows:

a. Elevation: 3/4 inch

b. Thickness: Plus 3/8 inch, minus 1/4 inch.

c. Surface: Gap below 10-foot-long, unleveled straightedge not to exceed 1/2 inch.

d. Joint Spacing: 3 inches.

e. Contraction Joint Depth: Plus 1/4 inch, no minus.

f. Joint Width: Plus 1/8 inch, no minus.

B. Preparation of Subgrade

6. Examination and Preparation:
For Concrete Trail Paving, Standard Finish, 6 In and Concrete Trail Paving, Special Finish, 6 In and 8 In, comply with tolerances in ACI 117 and as follows:

a. Proof-roll prepared sub-base surface below decorative concrete paving to identify soft pockets and areas of excess yielding.

b. Remove loose material from compacted subbase surface immediately before placing concrete.

c. Set, brace, and secure edge forms, bulkheads, and intermediate screed guides to required lines, grades and elevations. Install forms to allow continuous progress of work and so forms can remain in place at least 24 hours after concrete placement.

d. Owner's Representative to review and approve form layout of each pour prior to installation of concrete.

e. For Concrete Trail Paving, Standard Finish, 6 In: Clean forms after each use and approve form layout of each pour prior to installation of concrete.

f. Comply with CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement.

7. Steel Reinforcement:
General – Comply with CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement.

8. Edge Forms and Screed Construction

a. Set, brace, and secure edge forms, bulkheads, and intermediate screed guides to required lines, grades and elevations. Install forms to allow continuous progress of work and so forms can remain in place at least 24 hours after concrete placement.

C. Concrete

Delete Section 441.3.05.c.2.c.2 and replace with the following:

2. Placing and Finishing
c.
2. Concrete Placement
a. Moisten subbase to provide a uniform dampened condition at time concrete is placed.

b. Comply with ACI 301 requirements for measuring, mixing, transporting, placing and consolidating concrete.

c. Deposit and spread concrete in a continuous operation between transverse joints. Do not push or drag concrete into place or use vibrators to move concrete into place.

d. Screed paving surface with a straightedge and strike off.

e. Commence initial floating using bull floats or darbies to impart an open-textured and uniform surface plane before excess moisture or bleed water appears on the surface. Do not further disturb concrete surfaces before beginning finishing operations or spreading surface treatments.

Add the following:

3. Finishing

a. Float Finish:

1. General: Do not add water to concrete surfaces during finishing operations.

2. Begin the second floating operation when bleed-water sheen has disappeared and concrete surface has stiffened sufficiently to permit operations. Float surface with power-driven floats or by hand floating if area is small or inaccessible to power units. Finish surfaces to true planes. Cut down high spots and fill low spots. Refloat surface immediately to uniform grain texture.

b. Final Finish

1. Concrete Trail Paving, Standard Finish, 6 In - Medium to fine-textured broom finish: After final floating, draw a soft-bristle broom across float finished concrete surface perpendicular to line of traffic to provide a uniform, fine-line texture. Match existing concrete texture where concrete paving abuts existing curbs and gutters, sidewalks, or trails.

2. Concrete Trail Paving, Special Finish Type I, 6 In and 8 In: Integrally colored concrete. After final floating apply surface retardant per manufacturer's recommended length of time. Hosing and brushing to occur after manufacturer's recommended period of time to produce lightly exposed aggregate finish.

3. Concrete Trail Paving, Special Finish Type II, 6 In and 8 In: Integrally colored concrete. After final floating, apply surface retardant applied per manufacturer's recommended length of time. Hosing and brushing to occur after manufacturer's recommended period of time to produce lightly exposed aggregate finish.

a. Sandblast Finish: After producing lightly-exposed aggregate finish, apply medium sandblast finish to Special Finish Type II, 6 In and 8 In areas only. Perform sandblasting at least 72 hours after placement of concrete. Coordinate schedule to ensure that surfaces to be sandblasted are treated at the same age to ensure uniform results.

Delete 441.3.05.c.3.c and replace with the following:

3. Joints

c. Concrete Sidewalk

1. General: Form construction, isolation, and contraction joints and tool edges true to line, with faces perpendicular to surface plane of concrete. Construct transverse joints at right angles to centerline unless otherwise indicated.

2. Construction Joints: Set construction joints at side and end terminations of paving and at locations where paving operations are stopped for more than one-half hour unless paving terminates at isolation joints.

3. Isolation Joints: Form isolation joints of preformed joint-filler strips abutting concrete curbs, catch basins, manholes, inlets, structures, other fixed objects, and where indicated.

4. Contraction Joints: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of the concrete thickness, to match jointing of existing adjacent concrete paving.

5. Edging: After initial floating, tool edges of paving, gutters, curbs, and joints in concrete with an edging tool to a ¼ inch radius. Repeat tooling of edges after applying surface finishes. Eliminate edging-tool marks on concrete surfaces.

Add the following:

4. Concrete Protection and Curing

a. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperature.

b. Comply with ACI 306.01 for cold-weather protection.

c. Comply with ACI 305.01 for hot-weather concrete placement.

d. Curing Methods: Cure concrete by moisture curing, moisture-retaining cover curing, or a combination of these as follows:

1. Moisture Curing: Keep surfaces continuously moist for not less than seven days with the water, or water-fog spray.
2. Moisture-Retaining Cover Curing: Cover concrete surfaces with moisture-retaining cover, placed in widest practicable width, with sides and ends lapped at least 12 inches and sealed by waterproof tape or adhesive. Immediately repair any holes or tears during curing period using cover material and waterproof tape.

e. Evaporation Retarder: Apply evaporation retarder to concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x ht. before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete but before float finishing.

f. Begin curing after finishing concrete but not before free water has disappeared from concrete surface.

5. Sealer: For Concrete Trail Paving, Special Finish, Types I and II, 6 In and 8 In:

a. Clear acrylic sealer: Apply uniformly in two coats according to manufacturer's written instructions. Allow first coat to dry before applying second coat, at 90 degrees to the direction of the first coat.

1. Begin sealing dry surface no sooner than 14 days after concrete placement.
a. Comply with tolerances in ACI 117.

E. Clean-Up

1. Repairs and Protection

a. Remove and replace standard finish or special finish concrete paving that is broken or damaged or does not comply with requirements in this Section. Remove work in complete sections from joint to joint unless otherwise approved by Owner's Representative.

b. Protect standard finish or special finish concrete paving from damage. Exclude traffic from paving for at least 14 days after placement. When construction traffic is permitted, maintain paving as clean as possible by removing surface stains and spillage of materials as they occur.

c. Maintain standard finish or special finish concrete paving free of stains, discoloration, dirt, and other foreign material. Sweep paving not more than two days before date scheduled for Substantial Completion inspections.

Add the following:

441.4 Measurement

B. Concrete Trail Paving, Standard Finish, 6 in. and Concrete Trail Paving, Special Finish, 6 In and 8 In are measured in square yards, of the specified thickness, complete in place and accepted. Concrete Trail Pavement, Special Finish Type II is included in the overall cost of Special Finish, 6 In and 8 In. All joints are to be included in the overall price bid for the Concrete Trail Paving, Standard Finish, 6 In, and Concrete Trail Paving, Special Finish, 6 In and 8 In.

Add the following:

441.5 Payment

These Items, measured as specified above, will be paid for at the Contract Unit Price per each, per square yard (meter). Payment will be made under:

B. Sidewalks

Item No. 441	Concrete Trail Paving, Standard Finish, 6 In	SY
Item No. 441	Concrete Trail Paving, Special Finish, 6 In	SY
Item No. 441	Concrete Trail Paving, Special Finish, 8 In	SY

End of Section 441