



**COMMONWEALTH OF KENTUCKY
TRANSPORTATION CABINET**
Frankfort, Kentucky 40622
www.transportation.ky.gov/

Matthew G. Bevin
Governor

Greg Thomas
Secretary

December 1, 2016

CALL NO. 204
CONTRACT ID NO. 162041
ADDENDUM # 1

Subject: Nicholas County, 091GR16P101-FD05 & HSIP
Letting December 9, 2016

(1) Revised/Added - Special Note - Pages 19-19(e) of 137

Proposal revisions are available at <http://transportation.ky.gov/Construction-Procurement/>.

If you have any questions, please contact us at 502-564-3500.

Sincerely,

A handwritten signature in cursive script that reads "Rachel Mills".

Rachel Mills, P.E.
Director
Division of Construction Procurement

RM:ks
Enclosures



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SPECIAL NOTE FOR SOIL NAIL WALL

Specifications of Commodity and/or Service Requirements

Except as provided herein, conform to all requirements of the Transportation Cabinet/Department of Highways' 2012 Standard Specifications for Road and Bridge Construction. Section references are to the Standard Specifications.

The Standard Specifications can be found at:

<http://transportation.ky.gov/Construction/Pages/Kentucky-Standard-Specifications.aspx>

Drilled Soil Nails

Furnish Titan brand or equivalent Soil Nails that are self drilling, self grouting and hollow of 75 KSI (min.) steel that is nominally 1.5 inches in outside diameter. Install neat cement grout within 24 hours of the nail being drilled or sooner depending upon conditions so that the inside and outside of the Soil Nail is completely encased.

Furnish self drilling, self grouting hollow nails, equipment and incidentals necessary to complete the work. The individual Soil Nails must drill the hole and remain in the hole once drilling is complete. Grout each Soil Nail within 24 hours of the Soil Nail being drilled.

Wire Mesh Surface Treatment

Surface Treatment may be galvanized wire mesh attached to the Nails with 8" x 8" x 3/8" steel plates.

Shotcrete

Furnish shotcrete complying with the requirements of ACI 506.2, "Specifications for Materials, Proportioning and Application of Shotcrete", except as otherwise specified. Shotcreting consists applying of one or more layers of concrete conveyed through a hose pneumatically projected at a high velocity against a prepared surface.

Produce shotcrete by either a wet-mix or a dry-mix process. The wet-mix process consists of thoroughly mixing all the ingredients except accelerating admixtures, but including the mixing water, introducing the mixture into the delivery equipment and delivering it, by positive displacement, to the nozzle. Air jet the wet-mix shotcrete from the nozzle at high velocity onto the surface. The dry-mix process consists of producing shotcrete by delivering the dry ingredients conveyed pneumatically with the mixing water introduced at the nozzle. For additional descriptive information, refer to the American Concrete Institute ACI 506R "Guide to Shotcrete."

Use materials for shotcrete conforming to the following requirements:

Cement AASHTO M85/ ASTM C150, Type I, II, III or V.

Fine Aggregate AASHTO M6/ASTM C33 clean, natural.

Coarse Aggregate AASHTO M80, Class B for quality

Water Clean and Potable. AASHTO M157/ASTM C94

Chemical Admixtures

Accelerator Fluid type, applied at nozzle, meeting requirements of AASHTO M194/ASTM C494/ASTM C1141.

Water-reducer and AASHTO M194/ASTM C494 Type A, C, D, E, F, or G

Superplasticizer

Retarders AASHTO M194/ ASTM C494 Type B or D

Mineral Admixtures

Fly Ash AASHTO M295/ASTM C618 Type F or C, cement replacement up to 35 percent by weight of cement

Silica Fume ASTM C1240, 90 percent minimum silicon dioxide solids content, not to exceed 12 percent by weight of cement.

Welded Wire Fabric AASHTO M55/ASTM A185 or A497

Prepackaged Shotcrete ASTM C928

Deliver, store, and handle materials to prevent contamination, segregation, corrosion or damage. Store liquid admixtures to prevent evaporation and freezing.

Obtain Engineer's approval for the proposed mix design and method of placement prior to beginning shotcrete placement.

Use aggregate for shotcrete meeting the strength and durability requirements of AASHTO M6/M80, as applicable, and the following gradation requirements:

Sieve Size	Percent Passing by Weight
"	100
3/8"	90-100
No. 4	70-85
No. 8	50-70
No. 16	35-55
No. 30	20-35
No. 50	8-20
No. 100	2-10

Proportion the shotcrete to be pumpable with the concrete pump furnished for the work, with a cementing materials content of at least 24.3 pounds per cubic foot and water/cement ratio not greater than 0.50. Do not use admixtures unless approved by the Engineer. Thoroughly mix admixtures into the shotcrete at the rate specified by the manufacturer. Use only accelerators compatible with the cement used, non-corrosive to steel, and not promoting other detrimental effects such as cracking or excessive shrinkage. The maximum allowable chloride ion content of all ingredients is 0.10% when tested to AASHTO T260.

Air entrainment is not required for temporary shotcrete construction facings.

Provide shotcrete with a design compressive strength of 2000 psi in 3 days and 4000 psi in 28 days.

Batch aggregate and cement by weight or by volume in accordance with the requirements of ASTM C94 or AASHTO M241/ASTM C685. Use mixing equipment that thoroughly blends the materials in sufficient quantity to maintain placing continuity. Produce ready mix shotcrete complying with AASHTO M157. Batch, deliver, and place shotcrete within 90 minutes of mixing. The use of retarding admixtures may extend application time beyond 90 minutes if approved by the Engineer.

Premixed and packaged shotcrete mix may be provided for on-site mixing. Use packages containing materials conforming to the Materials section of this Appendix. Placing time limit after mixing is per the manufacturers' recommendations.

Use 4 inch diameter PVC Drain Pipes, ASTM 1785 Schedule 40 PVC, solid and perforated wall, cell classification 12454-B or 12354-C, wall thickness SDR 35, with solvent weld or elastomeric gasket joints.

Construct shotcrete with a thickness of 6" with welded-wire fabric 2" from the surface. At least 14 calendar days before the planned start of shotcrete placement, submit the following information, in writing, to the Engineer for review:

1. Written documentation of the nozzle men's qualifications. Resubmit at any subsequent time for new or additional nozzle men.
2. Proposed methods of shotcrete placement and of controlling and maintaining facing alignment and location and shotcrete thickness.
3. Shotcrete mix design performed by a Certified ACI Level II Technician including:
 - a. Type of Portland cement.
 - b. Aggregate source and gradation.
 - c. Proportions of mix by weight and water-cement ratio.
 - d. Proposed admixtures, manufacturer, dosage, technical literature.
4. Previous strength test results for the proposed shotcrete mix completed within one year of the start of shotcreting may be submitted for initial verification of the required compressive strengths at start of production work.

The Engineer will accept or reject the Contractor's submittals within 10 calendar days after receipt of a complete submission. Do not begin shotcrete construction or incorporate materials into the work until the submittal requirements are satisfied and accepted by the Engineer. Re-submit changes or deviations from the accepted submittals. No adjustments in contract time will be allowed due to incomplete submittals.

Ensure the minimum thickness of shotcrete using shooting wires, thickness control pins, or other devices acceptable to the Engineer. Install thickness control devices normal to the surface such that they protrude the required shotcrete thickness outside the surface. Ensure that the front face of the shotcrete does not extend beyond the limits established by the Engineer.

Clean the face of the excavation and other surfaces to be shotcreted of loose materials, mud, rebound, overspray or other foreign matter that could prevent or reduce shotcrete bond. Protect adjacent surfaces from overspray during shooting. Avoid loosening, cracking, or shattering the ground during excavation and cleaning. Remove any surface material that is so loosened or damaged, to a sufficient depth to provide a base that is suitable to receive the shotcrete. Remove material that loosens as the shotcrete is applied. The cost of additional shotcrete is incidental to the work. Divert water flow and remove standing water so that shotcrete placement will not be detrimentally affected by standing water. Do not place shotcrete on frozen surfaces.

Maintain a clean, dry, oil-free supply of compressed air sufficient for maintaining adequate nozzle velocity at all times. Use equipment capable of delivering the premixed material accurately, uniformly, and continuously through the delivery hose. Control shotcrete application thickness, nozzle technique, air pressure, and rate of shotcrete placement to prevent sagging or sloughing of freshly-applied shotcrete.

Begin shotcrete production work only upon initial approval of the design mix and nozzle men's qualifications and continue if the specified strengths are obtained. Suspend the shotcrete work if the test results of the work do not satisfy the strength requirements and change all or some of the following: the mix, the crew, the equipment, or the procedures. Before resuming work, submit additional test panels using the new crew, materials and/or methods that demonstrate to the satisfaction of the Engineer that the shotcrete in the panels satisfies the specified strength requirements. Provide all work required to obtain satisfactory strength tests at no additional cost to the Department.

Apply the shotcrete from the lower part of the area upward to prevent accumulation of rebound. Orient nozzle at a distance and approximately perpendicular to the working face so that rebound will be minimal and compaction will be maximized. Pay special attention to encapsulating reinforcement. Do not work rebound back into the construction. Where shotcrete is used to complete the top ungrouted zone of the nail drill hole near the face, position the nozzle into the mouth of the drillhole to completely fill the void.

A clearly defined pattern of continuous horizontal or vertical ridges or depressions at the reinforcing elements after they are covered with shotcrete will be considered an indication of insufficient reinforcement cover or poor nozzle techniques. In this case immediately suspend the application of shotcrete and implement corrective measures before resuming the shotcrete operations. Correct the shotcreting procedure by adjusting the nozzle distance and orientation, by insuring adequate cover over the reinforcement, by adjusting the water content of the shotcrete mix or other means. Adjustment in water content of wet-mix will require requalifying the shotcrete mix.

Repair shotcrete surface defects as soon as possible after placement. Remove and replace shotcrete that exhibits segregation, honeycombing, lamination, voids, or sand pockets. In-place shotcrete not meeting the specified strength requirement will be subject to remediation. Possible remediation options include placement of additional shotcrete thickness or removal and replacement, at no additional cost to the Department.

Taper construction joints uniformly toward the excavation face over a minimum distance equal to the thickness of the shotcrete layer. Provide a minimum reinforcement overlap at reinforcement splice joints as shown in the Construction Plans. Clean and wet the surface of a joint before adjacent shotcrete is applied. Where shotcrete is used to complete the top ungrouted zone of the nail drill hole near the face, to the maximum extent practical, clean and dampen the upper grout surface to receive shotcrete, similar to a construction joint.

Use either an undisturbed gun finish as applied from the nozzle or a rough screeded finish. Remove shotcrete extending into the CIP finish face section beyond the tolerances specified herein.

Do not place shotcrete if the ambient air or ground temperature is below 40oF. Maintain cold weather protection if the temperature after place is below 40oF until the in-place compressive strength of the shotcrete is greater than 725 psi. Cold weather protection includes blankets, heating under tents, or other means acceptable to the Engineer. Deposit the shotcrete mix at a temperature of not less than 50oF or more than 100oF.

Suspend shotcrete application during high winds and heavy rains unless suitable protective covers, enclosures or wind breaks are installed. Remove and replace newly placed shotcrete exposed to rain that washes out cement or otherwise makes the shotcrete unacceptable. Provide a polyethylene film or equivalent to protect the work from exposure to adverse weather.

The Contractor shall be responsible for meeting all federal, state, and local safety code requirements.

1.05-Weepholes

Provide weepholes through the construction facing to drain water from behind shotcrete facing. Cover the end of the pipe contacting the soil with a drainage geotextile fabric. Prevent shotcrete intrusion into the discharge end of the pipe. The Engineer will determine locations and quantity of weepholes at the time of construction.

Sampling and testing

Acceptance of the Soil Nails will be by Manufacturer's and/or Vendor's certification to the Engineer stating the material composition conforms to these notes and visual inspection of the in place nails by the Engineer. The Department reserves the right to test Soil Nails.

Acceptance of shotcrete will be by visual inspection by the Engineer of the work, preconstruction test panels (for nozzlemen without previous ACI certification), and production test panels from the wall facing. Perform shotcreting of test panels using qualified personnel in the presence of the Engineer. Furnish at least one production test panel during the first production application of shotcrete. Construct the production test panels simultaneously with the shotcrete facing installation at times designated by the Engineer. Make production test panels with minimum dimensions of 18"x18" square and at least 4" thick.

Materials found not in compliance with the requirements of this Contract may be rejected, removed and replaced at the Vendor's expense, or accepted at a reduction in Contract price determined by the Engineer.

Deliveries

Vendor may be called out for a site visit prior to installation of the soil nail wall. The purpose of the site visit will be for the vendor to evaluate and prepare an estimate of the materials and services needed to repair the site to the engineer's specifications. The vendor shall submit a proposal of Soil Nail spacing, depth and pattern prior to beginning work that has been stamped by Professional Engineer registered in the Commonwealth of Kentucky. Vendor shall coordinate the site visit with the Department.

Following submittal of estimates and PE stamped drawings, the Department will evaluate and provide approval.

All supplies, equipment and services shall be subject to inspection or tests by the Commonwealth prior to acceptance. In the event supplies, equipment or services are defective in material or workmanship or otherwise not in conformity with specified requirements, the Commonwealth shall have the right to reject the items or services or require acceptable correction at the vendor's expense.

SPECIAL NOTE FOR STAKING

In addition to the requirements of Section 201, perform the following:

- Contrary to Section 201.03.01, perform items 1-3 usually performed by the Engineer; and
- Field survey the existing pavement in order to establish the existing cross slopes, transitions and profile. Irregularities in the existing pavement are to be eliminated with the construction of a smooth line and grade of the new JPC pavement to ensure the best rideability possible.
- Verify intersection and lane profile and alignment and prepare a Drainage Development Worksheet to provide for positive drainage upon completion of construction; and
- Prior to incorporating into the work, obtain the Engineers approval of all designs and revisions to be provided by the Contractor; and
- Produce and furnish to the Engineer "As Built" plans; and
- Perform any and all other staking operations required to control and construct the work.
- No direct payment will be made for staking. Staking will be incidental to other items of work.