

# **Project Specifications**

## **EARTHWORK**

### **SCOPE:**

The work shall consist of the required site preparation, excavation, and the shaping and finishing of the areas to the required lines, grades, and cross-sections.

### **MATERIALS:**

**Excavation:** All material removal shall be unclassified with the exception of Solid Rock as defined herein. It is anticipated that the material to be removed will consist of soil, rock that can be removed without blasting or hoe ram, vegetation, and pavement. The Owner has not performed borings on the project site and does not guarantee the type of material that will be encountered below the surface. A unit price bid has been requested for the removal of solid rock that cannot be reasonably removed by a large track loader. The unit price bid shall cover the use of a track hoe mounted rock hammer to remove the rock and the disposal of said material. Any areas of solid rock excavation shall be approved by the Owner. The Owner shall measure the amount of solid rock actually removed using conventional surveying methods in order to establish the payment amount for this item.

**Fill Material:** All earthen Fill Material shall not contain any sand, rock, organics, or any other material that may be detrimental to the function of the project. It is anticipated that all of the earthen fill material will be made available from the required excavations. The Contractor shall have the ability to add moisture if suitable compaction cannot be obtained because of a low moisture content in any of the Fill Material. The Contractor may use any excavated rock and pavement for fill if the material is not larger than Class II stone and it is mixed well with the earthen fill.

### **GENERAL:**

**Site Preparation:** All areas where fill material will be placed shall be stripped of all unsuitable material (i.e., top soil, rocks, sticks...) as described in these Specifications or indicated by the Owner. This shall consist of the removal and disposal of all trees and organic growth from the work limits. The Contractor shall be responsible for all tree and organic growth removal and disposal.

**Excavation:** All excavation shall be made according to the grades, lines, and sections located in the plans. Any surplus material must be removed from the site or placed on site as directed by the Owner. After excavation, the final earthen surface shall be in an undisturbed consolidated state. Any excavations made below specified grades shall be replaced with properly compacted earthen fill at the expense of the Contractor except when the Owner requests such additional excavation because he has determined the condition of the base material to be unsatisfactory.

Placement of Fill Material: All Placement of Fill shall begin with proper site preparation. All fill material shall be placed in one (1) foot lifts or less and compacted according to these Specifications. Material in soft spots shall be removed to the depth required to provide a firm foundation and shall be replaced with a material equal to, or better than, the best subgrade material on the site. The final grade shall be uniform and to a level that will allow any rock or concrete to be placed at plan grades and lines. The surface of the subgrade after compaction shall be hard, uniform, smooth and true to grade and cross-section.

Finish Grading: The final slopes and any other disturbed areas shall be graded to a smooth, sightly condition ready for seeding. All earthwork that will not be covered with rock shall be no steeper than a 2:1 slope. Finish grade work shall be performed in a timely manner and the Contractor shall seed and place straw on all exposed earth.

Seeding and Mulching: All exposed earthen areas shall be seeded and mulched to these specifications. Seeding and Mulching shall be performed immediately after any Finish Grading. The following seeding rate shall be applied;

Tall Fescue	15 lb / Acre
Annual Rye	4 lb / Acre

Straw shall be added at three tons per acre or one 74lb bale per 540 square feet.

**WASTE AREA:**

The Contractor must dispose of all unused excavated materials, organic matter, or any other debris in a proper area. All waste areas must be approved by the Owner prior to their utilization.

**COMPACTION:**

Placement, spreading, and compactive efforts shall comply with accepted engineering standards. Earthen materials shall be selectively placed in shallow, horizontal lifts, as specified elsewhere herein; and shall receive sufficient compaction to achieve 95 percent of the material's maximum dry density with an in-place moisture content within 3% (+/-) of the optimum moisture (ref. ASTM D-698). Specialized equipment shall be used for compaction, including the use of a sheepsfoot roller. The practice of tracking trucks or other hauling equipment or otherwise using rubber-tired equipment to achieve compaction will not be permitted.

- (1) In the case of non-critical uses, the satisfaction of the compaction/moisture control efforts shall be based on continuous assessments of the color, moisture, and overall suitability of materials slated for placement; the equipment to be used for spreading and compaction; as well as the reaction of the in-place materials to the applied loadings -- to ensure that pumping, weeping, heaving, and other conditions normally accompanying or indicating unacceptable compaction or moisture levels are not present. In the event of conflicts between the Contractor

and Owner, or persistence of placement/compaction problems, standard density and moisture testing will be initiated and/or the Owner may require a modification in the Contractor's handling, placement, or compaction procedures.

Such testing, or the lack thereof, does not relieve the Contractor from ensuring that all lifts receive the appropriate amount of compactive effort. In-place material not meeting these specifications will be rejected and shall be removed and/or reworked until satisfactory results are obtained.

The Contractor will be responsible for the acquisition of all tests and costs associated with testing.

**CONSTRUCTION TOLERANCES:**

The Contractor shall make every reasonable effort to construct the project uniformly.

- (1) No payment will be made for any earthwork performed outside the limits shown on the Drawings unless approved by the Owner. No extra material shall be removed or placed outside of these limits without permission from the Owner.
- (2) A tolerance of **plus or minus three (3)** inches from the slope, lines and grades shown on the drawings will be allowed in the finished surface.

## **ROCK FILL & BASE**

### **SCOPE:**

The work shall consist of placing the following rock classifications, Class III, Class II, #2, #9, and D.G.A., to the grades, lines, and specifications listed on the plans and in these Specifications. The Contractor shall provide all rock for the project.

### **GENERAL:**

Site Preparation: Foundations for rock fill shall be stripped to remove vegetation and other unsuitable materials or shall be excavated as specified. All areas to be filled shall have the topsoil removed. The finished rock foundation surfaces shall be cleared of all loose materials not conforming to the specifications for the rock fill.

Placement of Rock Fill & Base: All Rock shall be placed to the grades and lines as listed in the plans. The roadway base shall be placed as shown on the plans with a compacted four (4) inch layer of #2 rock under a compacted four (4) inch layer of D.G.A. The Contractor shall also be responsible for constructing a suitable base for the boat ramp as shown in the plans. The Class II and Class III Rock shall be compacted with heavy equipment and the final three (3) inches of D.G.A. under the concrete shall be rolled smooth to obtain at least 90 percent maximum density.

Finish Grading: The Rock Fill shall be graded to a uniform slope that corresponds to the grades and lines on the plans. All rock subgrade shall be left in a smooth well-compacted condition ready for pavement.

### **MATERIALS:**

Class III Rock: The Class III Rock shall be an evenly graded rock conforming to the general size requirements specified in Section 805 of the 2012 Edition of the KYTC Standard Specifications. Abnormal amounts of over or under sized rock will not be accepted.

Class II Rock: The Class II Rock shall be an evenly graded rock conforming to the general size requirements specified in Section 805 of the 2012 Edition of the KYTC Standard Specifications. Abnormal amounts of over or under sized rock will not be accepted.

D.G.A. Rock: The D.G.A. Rock shall be an evenly graded rock conforming to the general size requirements specified in Section 805 of the 2012 Edition of the KYTC Standard Specifications. Abnormal amounts of over or under sized rock will not be accepted.

#2 Rock: The #2 Rock shall be an evenly graded rock conforming to the general size requirements specified in Section 805 of the 2012 Edition of the KYTC Standard Specifications. Abnormal amounts of over or under sized rock will not be accepted.

#9 Rock: The #9 Rock shall be an evenly graded rock conforming to the general size requirements specified in Section 805 of the 2012 Edition of the KYTC Standard Specifications. Abnormal amounts of over or under sized rock will not be accepted.

### **INSTALLATION:**

Ramp: The Installation of the Rock Fill and Rock Base shall be performed in a manner to allow the proper grades to be established in the river and on the bank. The required procedure for this placement is listed below.

1. After the proper earthen subgrade is obtained on the ramp it is recommended that all or a portion of the rock subgrade be placed to allow the rock trucks to traverse the area and assist in compacting the ramp grade. Any wet areas or pumping sections may need to be excavated and replaced with Class II rock **with approval of the Owner**. The excavation of these wet or pumping areas will be incidental to the project earthwork and only the Class II rock quantity will be specifically paid for at the unit price established.
2. After the subgrade has been established then the Class III rock shall be distributed as needed. The Rock Fill in the water shall be placed to a temporary grade where a piece of equipment can safely traverse into the river and reach the "End of Grade". The grade shall then be set as the equipment moves back towards the bank. The final grade shall conform to the grades and lines in the plans. The final graded rock shall be allowed to sit for 24 hours to insure that a failure due to settlement or slippage shall not occur. The grade shall be checked before concrete work is started and if settlement has occurred then more Class III Rock shall be placed to the proper grade. Any Class II or Class III Rock placement over the plan design amount must be approved by the Owner before it is placed.
3. The final grade after the Rock Fill and Rock Base has been placed shall conform to all grades, lines, and specifications listed in these documents. The Class II rock and D.G.A. shall be regraded to a smooth uniform slope to allow a proper base for the concrete. The D.G.A. shall not be greater than three (3) inches in thickness within two (2) feet of the edge of the proposed ramp to insure stability of the ramp. #9 rock shall replace the D.G.A. where the push-in slab is formed. This rock will assist in final placement of the push-in slab. After the concrete has been poured and finished the rock shoulders of the ramp shall be brought up even with the final grade of the ramp. This shall be accomplished by placing Class II Rock with a piece of equipment with rubber tires to insure no damage to the ramp.

Parking and Other Gravel Surface Areas: The Installation of the Rock Fill and Rock Base shall be performed in a manner to allow the proper grades to be established per the plans and profiles. The required procedure for this placement is listed below.

1. After the earthwork is completed a four (4) inch layer of #2 rock shall be

placed over all areas. The #2 rock shall be graded to a smooth surface and roller compacted to 90 percent maximum density. The earthen material must be consolidated and well drained at the time of this rock placement.

2. Next, a four (4) inch layer of D.G.A. shall be placed over the #2 rock. The D.G.A. shall be graded to a smooth surface and roller compacted to 90 percent maximum density.

### **CONSTRUCTION TOLERANCES:**

A tolerance of **plus or minus three (3)** inches from the slope and grade lines shown on the drawings shall be allowed in the placement of Rock.

### **MEASUREMENT AND PAYMENT:**

Measurement: "Class II Rock" and "Class III Rock" shall be measured in tons placed. The Contractor shall supply the Owner with weigh tickets that clearly identify the project location and type of rock delivered. The placement of stone shall be considered incidental to the Lump Sum Bid. Any rock placement over the plan quantities or that is performed in a manner not conforming to the Plans, Specifications, or Details will not be included in the Measurement unless the work was approved by the Owner.

Payment: Payment for "Class II Rock" and "Class III Rock" shall be based on the quantities shown on the Drawings and the Contract Price adjusted based on actual quantities used.

## **CONCRETE**

### **SCOPE:**

The work shall consist of the forming and pouring of the concrete ramp area shown on the plans. The Concrete shall consist of a mixture of Portland cement, fine aggregate, coarse aggregate, and water combined in the proportions and mixed to the consistency specified, and shall be formed or cast to dimensions indicated on the Plans. The Contractor shall provide materials, material proportions, equipment, and construction methods that will ensure that concrete produced meets the requirements of these specifications. **The Contractor is required to give the Owner seven (7) days notice before placing concrete.**

### **MATERIALS:**

#### Portland Cement Concrete:

Class A Concrete. This concrete shall be as specified in Section 601.03.03 of the 2012 Edition of the KYTC Standard Specifications. Class A concrete shall have a minimum 28-day compressive strength of 3,500 psi, a minimum slump of two (2) inches and a maximum slump of four (4) inches. For fiber reinforced concrete, a tolerance of + one (1) inch shall be allowed outside the minimum and maximum.

Portland Cement. Portland cement shall meet requirements set forth in ASTM C 150, Standard Specification for Portland Cement, for Type I or Type II cement.

Water. Water used in mixing or curing Portland cement concrete shall meet the requirements set forth in Section 803 of the 2012 Edition of the KYTC Standard Specifications.

Fine Aggregates. Fine aggregates shall meet the requirements set forth in Section 804 of the 2012 Edition of the KYTC Standard Specifications.

Coarse Aggregates. Coarse aggregates shall meet the requirements set forth in Section 805 of the 2012 Edition of the KYTC Standard Specifications.

#### Concrete Reinforcement:

Steel Bars: #4 Steel reinforcing bars meeting the requirements of ASTM A 615, Standard Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement. All bar reinforcement shall be Grade 60 bars epoxy coated.

Polypropylene Fibers: Fibers shall be 100 percent polypropylene fibers specifically designed for use as concrete reinforcement and shall contain no reprocessed olefin materials. No textile waste materials or other textile products will be allowed. The polypropylene fibers shall meet the following requirements:

Melt Temperature: 320<sup>^</sup> F

Specific Gravity: 0.87 - 0.93

Tensile Strength: 70 - 110 ksi.

Fiber Fineness: Less than 100 Denier

Fiber Length: 3/4 inch

Dosage Rate: 2 Lbs/Cy

### **INSTALLATION:**

Form Work: All forms shall be mortar-tight, true to the dimensions, lines, and grades of the structure, and of sufficient strength to prevent appreciable deflection during placing concrete. The inside surfaces of forms shall be cleaned of all dirt, mortar, and foreign material. Forms shall be of sufficient strength and tightness to provide straight, uniform, and smooth concrete. Forms shall be mortar tight, well braced, tied and so supported to maintain the desired position, shape, and grade during and after concrete is placed. All debris, water, and ice shall be removed from spaces to be occupied by concrete.

Before Form Work begins for the Push-In Slab, the grade in the water shall be checked again to insure no settlement or slippage has occurred in the fill material. #4 Reinforcing bars shall be installed in the Push-In slab as shown in the plans. The Re-Bar shall extend out of the Push-In slab as shown in order to properly connect the final concrete slab.

Steel Reinforcement: All steel reinforcement shall be accurately placed in positions shown on the plans and firmly held in position during placement and hardening of concrete. All steel reinforcement shall be spaced to within a horizontal tolerance of plus or minus one inch and placed to within a vertical tolerance of plus or minus 1/2 inch of specified clearance from the face of concrete. Dimensions shown from the face of concrete to bars are clear distances. Bar spacings are from center to center of bars. Bars shall be tied at all intersections, except where spacing is less than one (1) foot in both directions, and then alternate intersections shall be tied. The steel placed in reinforced concrete slabs shall also be securely tied down to prevent any possibility of steel rising above the specified elevation during placing and finishing the concrete. The use of pebbles, pieces of broken stone or brick, metal pipe, and wooden blocks shall not be permitted as separators. Lapped splices shall have lengths of not less than 40 times the nominal diameters of the reinforcement being spliced, unless otherwise shown on the Plans.

When pouring against a cold joint #6 bars 3' in length shall be placed on 2' centers along the joint. 1.5' of the bar shall be drilled into the existing slab.



Placing: Unless other provisions are agreed upon, the Contractor shall give the Owner 7-days advance notice before concrete placement. Concrete shall be delivered to its final position of placement within the time required for delivery after mixing in accordance with ASTM C 94. Forms and reinforcement shall be moistened with water immediately before placing the concrete. Water shall be completely removed from all excavations before concrete is deposited. The method and manner of placing concrete shall be such as to avoid segregation or separation of aggregates or displacement of reinforcement.

In any given layer, consecutive batches shall be placed and compacted before the preceding batch has taken its initial set. Each layer of concrete shall retain a rough surface in order to secure efficient bonding with the next layer. A succeeding layer placed before the underlying layer has set shall be compacted in a manner that will entirely break up and obliterate the tendency to produce a cold joint between layers. When any section of concrete is defective, it shall be removed and satisfactorily replaced or repaired as directed.

Weather Limitations and Protection: Concrete shall be maintained at a minimum temperature of 45°F for three (3) calendar days after placement and at a minimum temperature of 40°F for an additional four (4) calendar days. In cold weather, 40°F or below, all water and/or aggregate shall be heated so the temperature of the mixed concrete shall be no less than 50°F or more than 90°F at the time of placement. When artificial heat is used, means shall be provided to maintain adequate moisture in the air within the enclosure. Surfaces of all concrete shall be maintained in a moist condition. The temperature of the concrete mixture immediately before placing shall be between 50°F and 90°F. Excess water shall be allowed to drain or shall be removed from the forms before concrete is placed. The Contractor shall assume all risks connected with placing concrete under these conditions and permission given by Owner to do the Work will in no way relieve the Contractor of responsibility for proper results. Should concrete placed under such conditions prove unsatisfactory, it shall be removed and replaced with satisfactory concrete and no allowance will be made for removing and replacing the defective concrete.

Finishing: After concrete has been brought up to the grades, lines, and sections, the surface shall be finished by placing an excess of materials in the form and removing or striking off such excess with a wooden template, forcing coarse aggregate below the mortar surface. After the concrete has been struck off as described, the surface shall be thoroughly worked and floated by hand with a concrete float leaving a fine grained, smooth-sanded surface. After the floated surface has stiffened sufficiently a V-Groove finish shall be applied where specified in the plans. All final surfaces shall receive a broom finish, prior to beginning the curing process.

The Contractor is required to have the Owner or their representative present during the initial concrete pouring. An unsatisfactory Finish shall not be accepted due to lack of knowledge in the Grooving process or a lack of personnel to finish the process before the concrete cures.

Special Push-In Procedures: Due to the requirement of a push-in slab to be placed in the water there will be certain procedures and conditions that need to be followed.

1. If high water conditions exist the length of the push-in slab may need to be increased and this can only be done with the approval of the Owner.
2. Two layers of four (4) mil. plastic shall be placed under the forms and on the #9 rock to keep the concrete from bonding to the rock. The concrete shall be placed on the plastic and finished according to these specifications.
3. After the Grooved Concrete Push-In Slab has cured for at least 5 days, the forms shall be removed, except for the header board on the upper side of the slab, and the site made ready for the moving of the slab. The last grade check in the water must be made and corrected if needed. A suitable dozer shall then place the grading blade against the header board on the slab without damaging the re-bar or concrete. The dozer will slowly push the slab at the correct line until about 3 feet of slab is left out of the water or the end of the slab reaches the end of the ramp grade. Forming and pouring of the stationary slab can now be started.

Any questions concerning this detailed procedure can be answered by contacting the Owner. Lack of compliance to these plans and specifications shall not be accepted due to lack of knowledge in the Push-In process.

Testing Procedures:

Test Cylinders. The Contractor shall provide the Owner with Test Cylinders. The Concrete test cylinders shall be made and cured in accordance with the procedures set forth in ASTM C 31, Standard Practice for Making and Curing Concrete Test Specimens in the Field. Unless otherwise specified, two test cylinders shall be molded for every other load of concrete and each cylinder shall be identified by a number that can reference the location in the finished surface.

The Owner reserves the right to perform Compressive Strength Tests on the cylinders as needed during the project.

**CONSTRUCTION TOLERANCES:**

A tolerance of **plus or minus three (3)** inches from the slope and grade lines shown on the drawings shall be allowed in the placement of Concrete.

## **SHOULDER PROTECTION AND CHANNEL LINING**

### **SCOPE:**

This portion of the project shall consist of drainage channels that will be lined with Class II Rock and shoulder protection that shall be provided in the form Class II Rock shoulders on the concrete ramp and roadways as described in the plans.

### **MATERIALS:**

Class II Rock: The Class II Rock shall be an evenly graded rock conforming to the general size requirements specified in Section 805 of the 2012 Edition of the KYTC Standard Specifications. Abnormal amounts of over or under sized rock will not be accepted.

### **INSTALLATION:**

#### Channel Lining

1. Excavate the ditch or ramp shoulder to the required subgrade. The subgrade should allow for a 1.5-foot thickness of Class II Rock.
2. Class II Rock shall be placed in the proper 1.5-foot thickness and compacted using heavy equipment. The finished ditch and shoulder grades shall be uniform and match the plan elevations.

#### Shoulder Protection

1. The earthen fill, excavation, or rock fill below the shoulder shall be compacted and graded smooth as specified in the plans and specifications.
2. Class II Rock shall then be placed in the required 1.5-foot thickness to the required grades and lines.

### **CONSTRUCTION TOLERANCES:**

A tolerance of **plus or minus three (3)** inches from the lines shown on the drawings shall be allowed in the placement of the Slope Protection and Channel Lining.

### **MEASUREMENT AND PAYMENT:**

Measurement: "Class II Rock" shall be measured in tons placed. The Contractor shall supply the Owner with weigh tickets that clearly identify the project location and type of rock delivered. Any rock placement over the plan quantities or that is performed in a manner not conforming to the Plans, Specifications, or Details will not be included in the Measurement unless the work was approved by the Owner. ■

Payment: Payment for "Class II Rock" shall be based on the quantities shown on the Drawings and the Contract Price adjusted based on actual quantities used.



## **SILT PROTECTION**

### **SCOPE:**

This portion of the project shall consist of installation and maintenance of Silt Fence and Stone Silt Trap Dams in ditches.

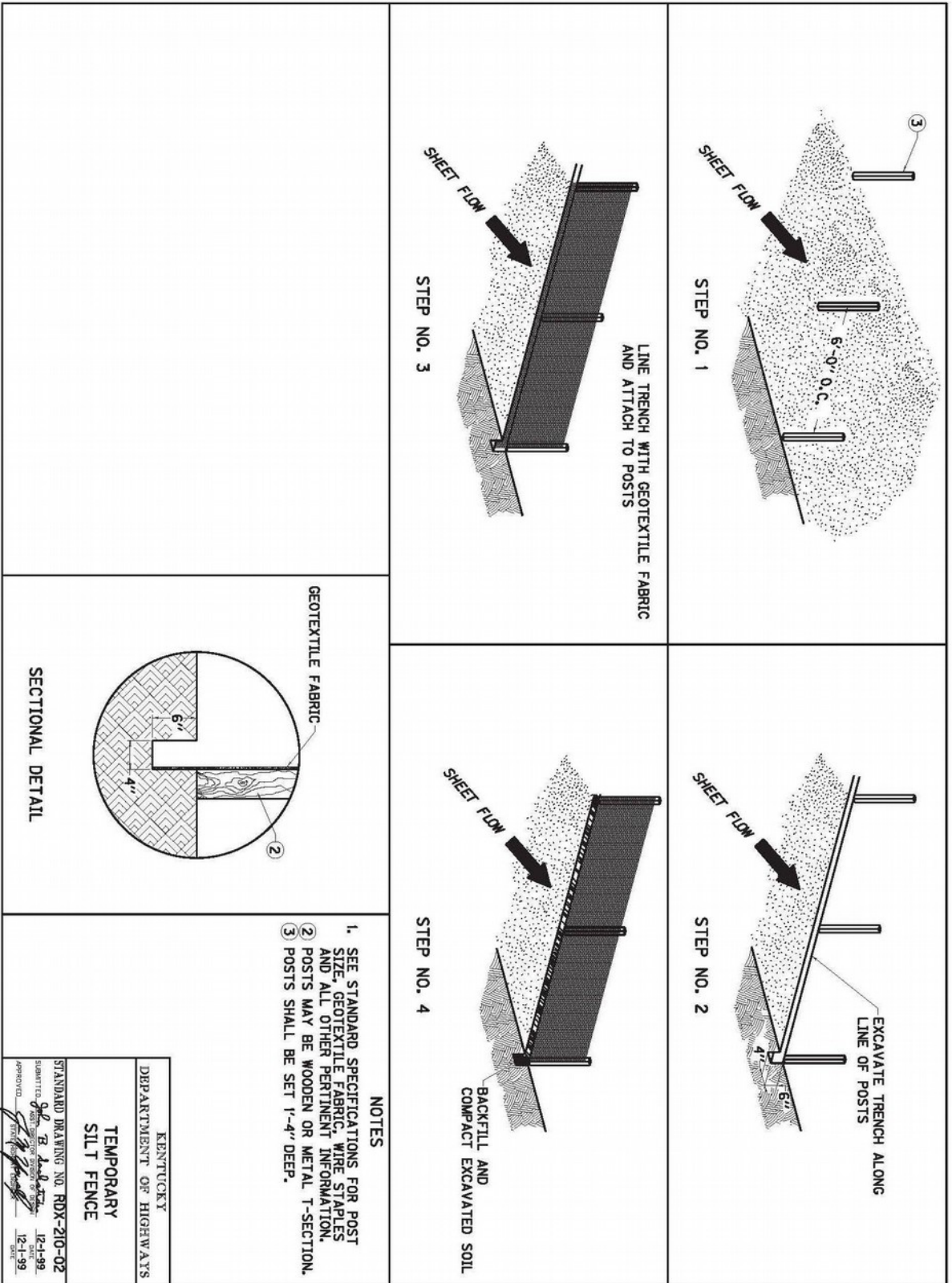
### **MATERIALS:**

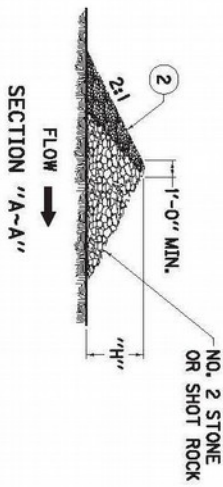
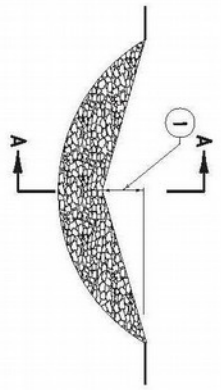
Temporary Silt Fence: Conform to 2012 Edition of KYTC Standard Specifications Section 827.08.

Temporary Silt Trap: Conform to 2012 Edition of KYTC Standard Specifications Section 213.03.05.

### **INSTALLATION:**

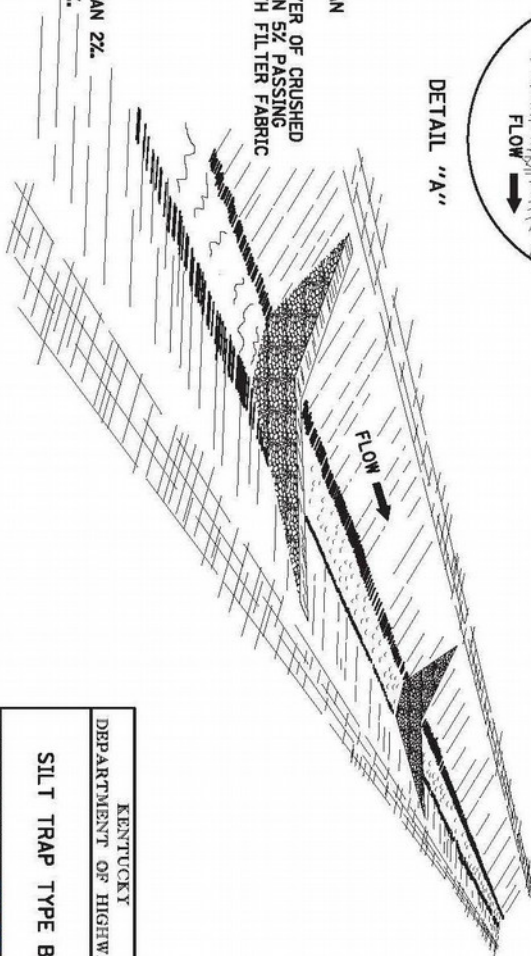
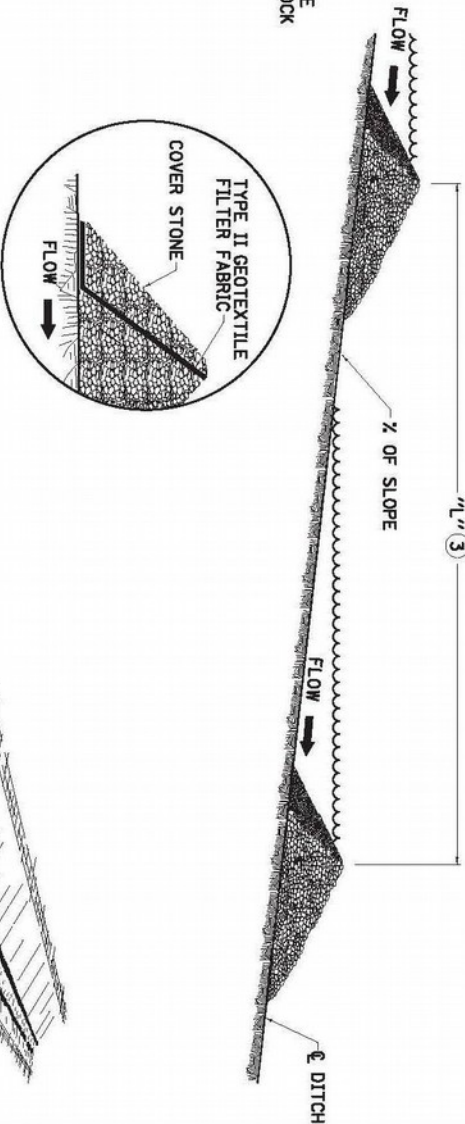
All silt protection devices shall be installed as per KYTC Standard Drawings No. RDX-205 & RDX-210-02 and conform to the 2012 Edition of KYTC Standard Specifications Section 213.03.05.





~NOTES~

- | BID ITEM AND UNIT TO BID:   | PAY ITEM | PAY UNIT |
|-----------------------------|----------|----------|
| 2704 SILT TRAP TYPE B       |          | EACH     |
| 2707 CLEAN SILT TRAP TYPE B |          | EACH     |
- 1 MIDDLE OF SILT TRAP SHALL BE A MINIMUM OF 1'-0" LOWER THAN SIDES SO FLOW WILL NOT BYPASS TRAP OR ERODE BANKS.
  - 2 UPSTREAM FACE OF SILT TRAP SHALL BE A FOUR INCH MIN. LAYER OF CRUSHED AGGREGATE HAVING 100% PASSING A 3" SIEVE AND NO MORE THAN 5% PASSING A NO. 8 SIEVE (SEE SECTION "A-A"), LINE UPSTREAM FACE WITH FILTER FABRIC UP TO BOTTOM OF THE V AND COVER FABRIC WITH STONE TO HOLD IN PLACE (SEE DETAIL "A").
  - 3 "L" = SLOPE OF DITCH
  - 4 SPACE SILT TRAPS AT LOCATIONS AS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER.
  - 5 SILT TRAP TYPE B SHALL BE USED ON ALL SLOPES GREATER THAN 2%.
  - 6 SILT TRAP TYPE B MAY BE USED ON ALL SLOPES LESS THAN 2%.



KENTUCKY  
DEPARTMENT OF HIGHWAYS

**SILT TRAP TYPE B**

STANDARD DRAWING NO. RDX-225

APPROVED: *[Signature]* 11-21-07  
DATE

APPROVED: *[Signature]* 11-21-07  
DATE