Village of Roaming Shores
2500 Hayford Road
P.O. Box 237
Roaming Shores, Ohio 44084

Main: 440-563-3523, Administrator: 563-5083, (f) 563-5912, (c) 812-4032

Main Spillway Erosion Repair

Professional Engineer's Opinion of Probable Cost: $5,000

Project

To repair a significant void located in Lake Roaming Rock's earthen dam between the west training wall of the main concrete spillway and a shale embankment. The size of the area to be repaired and filled with rock is difficult to quantify without excavation, but is estimated to encompass a volume of between 5 and 8 cubic yards, or about 8 to 12 tons of aggregate.

Existing Conditions

Constructed in 1966, the 900 foot long Lake Roaming Rock Dam impounded the Rock Creek and created a 550-acre lake that is today surrounded by the Village of Roaming Shores. The earthen dam features two large main and auxiliary concrete spillways and is municipally owned and regularly monitored by the State of Ohio. After 40 years of service the structure remains in overall excellent shape.

Goals

1) Meet and exceed the maintenance recommendations set forth by ODNR;
2) Reinforce the general structural integrity of the existing spillway and training wall;
3) Take special care to protect the WWTP effluent outlet pipe during construction; and
4) Use only the best available construction materials for repairs.

Services Sought

- Excavate a wedge-shaped zone of weathered shale to create a horizontal platform at stream level on which to construct a grouted rock fill buttress. During excavation, use care to avoid disturbance to the existing, exposed steep-faced shale bank. Any shale disturbed by excavation shall be removed, leaving a relatively intact surface.

- After excavating a horizontal surface, carefully create a buttress, tight against the shale bank and against the end face of the training wall approximately as depicted on the rough sketch provided with these specifications. Use both machine and manual methods to interlock the aggregate to create an outside face at an approximately 45 degree slope. Buttress to be constructed of limestone, sandstone, or broken concrete pieces in accordance with ODOT item 703.19, Type D.

- Use care during placement to assure that the aggregate pieces intrude as far as practical into the 6 to 8 inch wide gap that exists between the back face of the training wall and the adjacent shale bank.

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- Use a two step grouting program to grout 1) the voids in the Type D aggregate buttress, and 2) the remaining void behind the training wall that is too narrow to be reached with aggregate. The grout is to be batched in accordance with ODOT item 601.05. And, the void behind the wall is to be grouted by driving grout pipes from above and introducing grout at a pressure in order to fill the void and not disturb the adjacent aggregate buttress. Depending on the weather, counter measures may be needed to allow the grout to properly cure.

Submittal

For a proposal to be considered responsive the form below must be completed and signed. Also, on a separate sheet of paper identify key staff and sub-contractors and list the current hourly rates for staff who may work on the project. We further require contact information of three concrete/erosion control project references. Submittals are due by 10:30 a.m. on Wednesday, November 16, 2011 at the Roaming Shores Village Hall. The village reserves the right to reject any and all proposals; prevailing wage is not a requirement for this project.

Not to exceed fee for the project outlined above: _____

Company: _____

Address: _____

Phone: _____

E-mail: _____

Project Manager: _____

Owner Signature: _____ Date _____

Questions

Any questions regarding what is requested shall be directed to the Village Administrator, Kevin Grippi, who will answer inquiries by e-mail, and copy all potential bidders on the clarification.

Limitations of plans and specifications provided

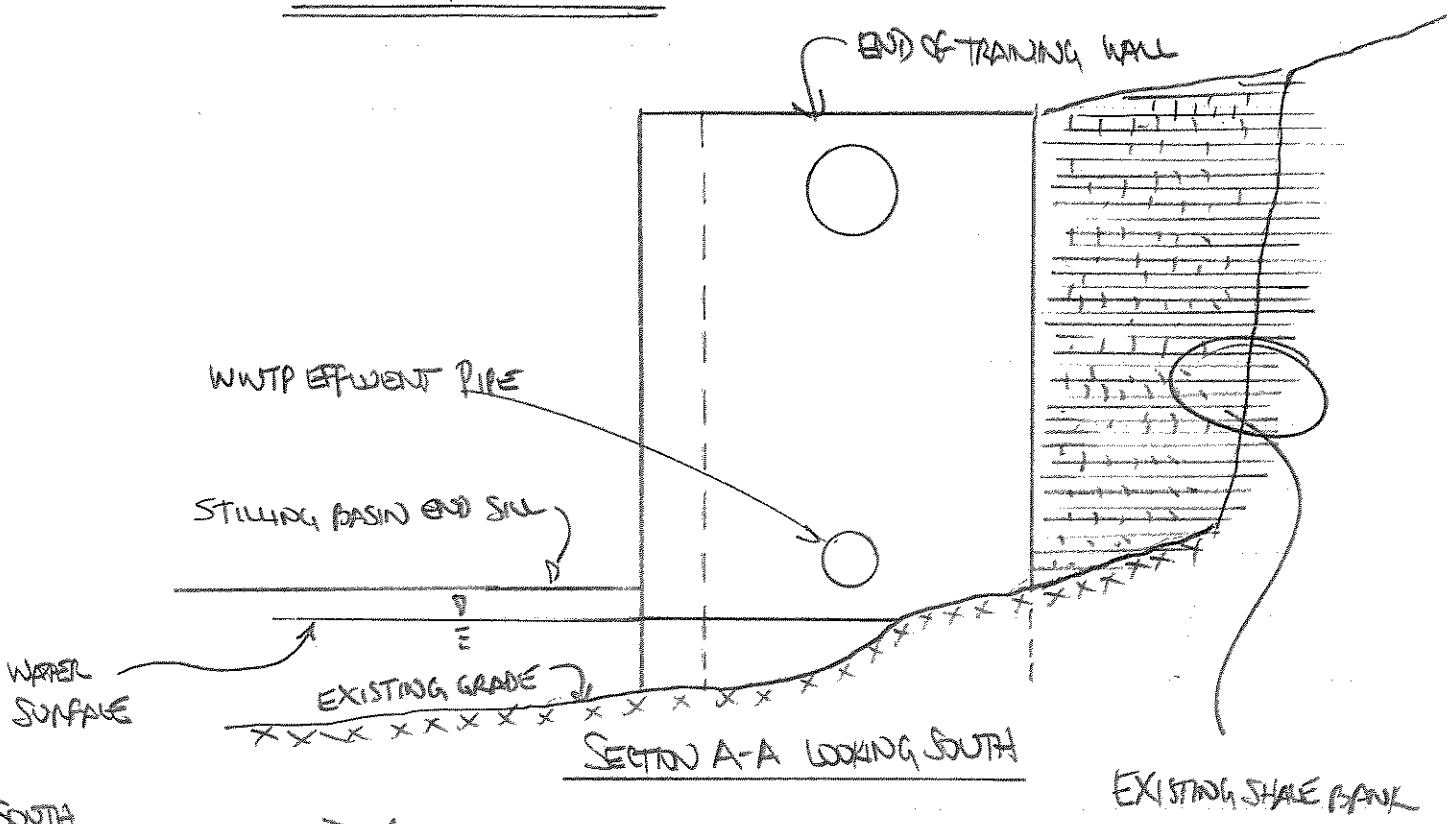
The provided sketches are generalized and are not intended to cover every detail of what might be required to complete the project in a manner satisfactory to the Village. Contractors bidding this project are requested to visit the site and satisfy themselves regarding access and what will be required to successfully complete the project without claims for extras.

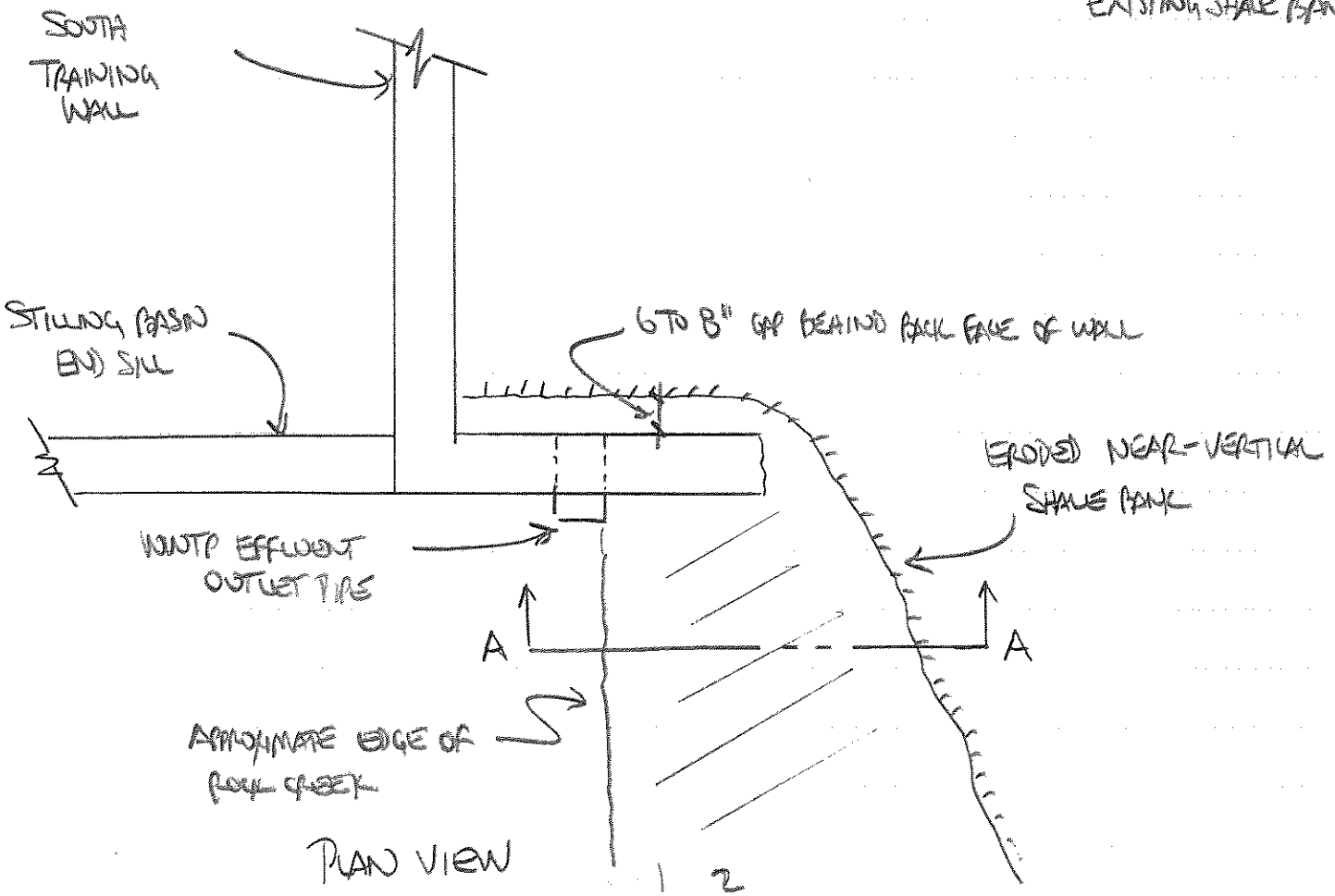
EDP Consultants, Inc.

Project RSV TRAINING WALL REPAIRS Prepared By JWP Date 10/1/11

Project No. _____ Reviewed By _____ Date _____

EXISTING CONDITIONS



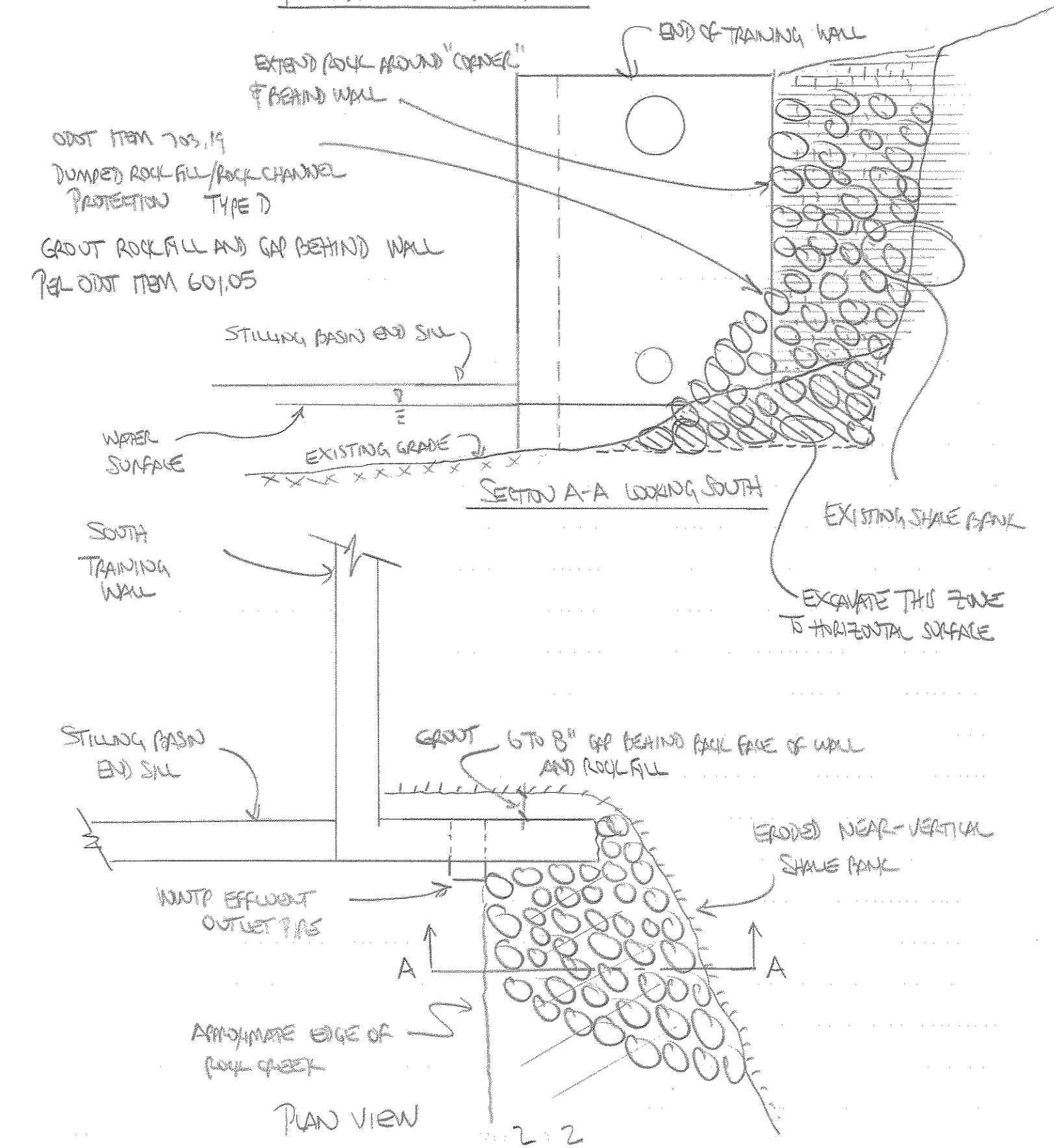


EDP Consultants, Inc.

Project RSV TRAINING WALL REPAIRS Prepared By JWJ Date 10/1/11

Project No. _____ Reviewed By _____ Date _____

RECOMMENDED STABILIZATION



PLAN VIEW

Furnish Size No. 1 or 2 from Table 703.01-1, or according to the following gradation for crushed aggregate slope protection:

Sieve Size	Total Percent Passing
4 inch (100 mm)	100
3 1/2 inch(90 mm)	90 to 100
2 1/2 inch(63 mm)	25 to 90
1 1/2 inch(37.5 mm)	0 to 25
3/4 inch (19.0 mm)	0 to 10

For a filter for rock channel protection, use Size No. 3 or 4 from Table 703.01-1.

Physical properties.

Percent of wear, Los Angeles Test, maximum (CCS or gravel)	50 %
Loss, sodium sulfate soundness test, maximum (except for RPCC)	15 %
Percent by weight of fractured pieces minimum (CCS or gravel)	90 %
Loss for RPCC, AASHTO T 103 Soundness of Aggregates by Freezing and Thawing	20 % [1]

[1] Use Method C using 25 cycles.

B. Dumped Rock Fill and Rock Channel Protection. Furnish gravel, broken recycled portland cement concrete (RPCC), broken sandstone, broken siltstone, and broken limestone for dumped rock fill and rock channel protection. Furnish sandstone, siltstone, and limestone that is free of laminations, seams, and fractures, or injury due to blasting.

Except for RPCC, test for soundness according to ASTM D 5240. Use materials having a maximum 30 percent single slab loss and a maximum 20 percent cumulative loss. Slab heights and lengths will be a minimum of 8 inches. For RPCC, test for soundness according to AASHTO T 103 as stated in 703.18.A.

The Department may waive testing when the stone source has a known durability history.

Do not use thin, slab-like pieces, or any pieces having a dimension larger than 36 inches (1 m). Do not use RPCC with reinforcing steel protruding more than 1 inch (25 mm) beyond the outside surface of the concrete pieces.

Furnish dumped rock fill and rock channel protection materials consisting of the four material types defined below:

1. Type A material has at least 85 percent of the total material by weight larger than an 18-inch (0.5 m) but less than a 30-inch (0.8 m) square opening and at least 50 percent of the total material by weight larger than a 24-inch (0.6 m) square opening. Furnish material smaller than an 18-inch (0.5 m) square opening that consists predominantly of rock spalls and rock fines, and that is free of soil.

2. Type B material has at least 85 percent of the total material by weight larger than a 12-inch (0.3 m) but less than a 24-inch (0.6 m) square opening and at least 50 percent of the total material by weight larger than an 18-inch (0.5 m) square opening. Furnish material smaller than a 12-inch (0.3 m) square opening that consists predominantly of rock spalls and rock fines, and that is free of soil.

3. Type C material has at least 85 percent of the total material by weight larger than a 6-inch (150 mm) but less than an 18-inch (0.5 m) square opening and at least 50 percent of the total material by weight larger than a 12-inch (0.3 m) square opening. Furnish material smaller than a 6-inch (150 mm) square opening that consists predominantly of rock spalls and rock fines, and that is free of soil.

4. Type D material has at least 85 percent of the total material by weight larger than a 3-inch (75 mm) but less than a 12-inch (0.3 m) square opening and at least 50 percent of the total material by weight larger than a 6-inch (150 mm) square opening. Furnish material smaller than a 3-inch (75 mm) square opening that consists predominantly of rock spalls and rock fines, and that is free of soil.

704 MASONRY UNITS

704.01 Clay or Shale Brick. Furnish clay or shale brick conforming to ASTM C 32, with the following modifications:

4.1 Furnish bricks of such size and shape as to allow their incorporation in the structure in conformance with the specified dimensions of the structure.

6.1 Furnish materials according to the Department's Qualified Products List (QPL).

704.02 Concrete Brick. Furnish concrete brick according to ASTM C 55, with the following modifications:

4.1.1 and 4.1.2 Use cement conforming to 701 Portland Cement.

4.2 Use aggregate that conforms to the quality requirements of 703.02.

8.1 Furnish materials according to the Department's Qualified Products List (QPL).

8.2 Sample and test the brick according to ASTM C 140. Furnish bricks of such size and shape as to allow their incorporation in the structure in conformance with the specified dimensions of the structure. Furnish bricks that have a rectangular cross-section with square corners. Ensure that the ends, edges, and one face are plain surfaces.

704.03 Concrete Masonry Blocks. Furnish concrete masonry blocks conforming to ASTM C 139, with the following modification:

4.1.1 and 4.1.2 Use cement conforming to 701 Portland Cement.

7.1 Furnish materials according to the Department's Qualified Products List (QPL).

7.2 Furnish blocks of such size and shape as to allow their incorporation in the structure in conformance with the specified dimensions of the structure.

For tied concrete block mats, the articulating concrete blocks are held together by galvanized steel wire, HDPE mesh, stainless steel wire, or any 75 year mat material. The size of the concrete blocks, the space between the concrete blocks, and the required wire or mesh area shall conform to designs on file with the Office of Structural Engineering.

601.03 General Construction. Cure gutters, concrete slope protection, and grouted riprap according to Item 451, except apply all the membrane cures at the rate of not less than 1 gallon per 200 square feet (1 L/5 m^2) of surface.

Mix and place all concrete according to Item 511. Finish to produce a sandy texture.

601.04 Riprap. Construct riprap according to one of the following four alternatives unless specifically itemized in the Contract. The Contractor may elect to use a different alternative at each location on the project.

A. Provide Flat Stones or Broken Concrete. Ensure that individual pieces are roughly rectangular in cross-section with a minimum volume of 1/3 cubic foot (0.01 m^3) and a minimum thickness of 3 inches (75 mm). Place individual pieces by hand in courses and so that the pieces overlap the joints in the course below. Place riprap with the flat surfaces roughly perpendicular to the slope and in contact with the courses immediately below and above. Fill spaces between larger pieces with spalls that are rammed into place to present an even and tight surface, pleasing in appearance and varying not more than 3 inches (75 mm) from that shown on the plans. When required by the plans, fill riprap with grout. Compact the backing as riprap construction progresses. Ensure that the thickness of the riprap, measured perpendicular to the slope, is not flatter than 9 inches (230 mm) and averages not flatter than 12 inches (0.3 m).

Approved manufacturers are on file with the office of Materials Management. For approval, manufacturers will submit product information to the Office of Structural Engineering.

B. Provide Interlock Precast Concrete Blocks. Interlock precast concrete blocks are approved by the Office of Structural Engineering. A list of manufacturers is on file with the Laboratory. Place the interlock precast concrete blocks per the manufacturer's recommendations.

C. Construct Concrete Riprap Using Cloth or Burlap Bags. After soaking the bags with water, fill them with approximately 2/3 cubic foot (0.02 m^3) of concrete and place the bags by hand to the limits on the plans. Provide bags with approximate dimensions of 6 × 12 × 16 inches (150 × 300 × 400 mm).

Stack the bags on the slope to ensure a minimum of 1/3 cubic yard (0.3 m^3) of concrete for each square yard (square meter) of riprap in place as measured along the slope.

Tie the open end of each bag and fold the tie under the bag. Place each tie or fold so that it overlaps the joint in the lower layer. After placing, pierce each bag in the lower layer to allow some concrete to flow out and bond with the top overlying layer.

Stretchers are bags placed with the long length parallel to the streambed flow. Headers are bags placed with the long length perpendicular to the streambed flow. A layer runs horizontally at approximately the same elevation perpendicular to the protected slope grade.

If the slope is 1.5:1 or steeper, make the bottom layer with two bags laid as stretchers. Place the next overlying layer as a header. Place the rest of the overlying upslope layers as stretchers.

If the slope is flatter than 1.5:1, make the bottom layer with two bags as stretchers. Place all remaining layers as headers.

Push or drive No. 4 (No. 13M) reinforcing bars approximately 18 inches (0.5 m) long and spaced approximately 12 inches (0.3 m) apart through the top three layers. When required by the plans, fill voids with grout.

D. Construct a 6-inch (150 mm) Reinforced Concrete Slab. Reinforce the slab approximately midway between the top and bottom of the slab with steel bars or fabricated reinforcement equivalent to No. 3 (No. 10M) round bars, spaced at 24-inch (0.6 m) centers in two directions, or wire fabric according to the standard construction drawing for pavement reinforcing. The Contractor may use formed construction joints. Extend reinforcement through all formed construction joints. Include cutoff walls as shown on the plans in the unit price bid for reinforced concrete slab.

601.05 Grouted Riprap or Rock. When specified, grout in place riprap cloth bags, riprap burlap bags, flat stones, precast blocks, broken concrete, rock, or tied concrete block mats. Make the grout by mixing one part portland cement, three parts sand, and enough water to allow the grout to flow into the joints and cracks.

Prepare the grout in a mixing machine of an approved design and equipped with an accurate graduated regulating device for controlling the amount of water in each batch. Accurately measure and proportion the quantities for each batch, and ensure that the quantities are exactly sufficient for one or more sacks of cement.

Immediately before applying grout, thoroughly wet all surfaces. Place the grout, filling all the joints or voids. Do not add water to the grout after it has been placed.

601.06 Crushed Aggregate Slope Protection. Furnish material conforming to 703.19. Place the material on the filter fabric so that the surface is flush with the embankment slopes. Use a thickness of 12 inches (300 mm) unless a different thickness is specified. Extend the aggregate from the face of the abutments down to the toe of the slope or to normal water elevation, and a minimum of 3 feet (1 m) beyond the outer edges of the superstructures or as shown on the plans.

601.07 Concrete Slope Protection. Construct a concrete slab, 6 inches (150 mm) thick, extending over the embankment area under a bridge from the face of the abutment down to the toe of the slope and extending a minimum of 3 feet (1 m) beyond the outer edges of the superstructure or as shown on the plans. Thicken the bottom 3 feet (1 m) of the concrete slab from 6 to 18 inches (150 to 460 mm) to provide resistance to sliding.

Lake Roaming Rock Dam

Main Spillway Erosion - West

Roaming Shores, Ohio