

Washington County Conservation District
JB#2 Abandoned Mine Discharge Treatment Cell Expansion
Smith Township, Washington County

TECHNICAL SPECIFICATIONS

SCOPE OF PROJECT

The intent of this project is to improve the water quality of an existing acid mine drainage treatment system by expanding the existing water treatment system in accordance with the Drawings and these Specifications.

The work involved essentially consists of providing erosion and sedimentation controls, earth moving for treatment cell expansion, installation of treatment cell aggregate, installation of flow controls, piping, and all other specifications required to properly construct the vertical flow wetlands to treat the abandoned mine discharge as described in these specifications and the attached project drawings.

This project is located approximately 1.25 miles north of the town of Cherry Valley in Smith Township, Washington County along State Route 4015.

PAYMENT PROCEDURES: The Contractor will submit all billing statements to the Conservation District's Site Representative for approval. After the Conservation District's Site Representative approves the payment a reimbursement request will be submitted to the Washington County Conservation District for issuance of payment.

All payment requests will follow the payment procedures indicated in these specifications and the contract.

The payment requests must have copies of material amounts and receipts for materials used on the job.

TECHNICAL SPECIFICATION NO. 1 - MOBILIZATION AND DEMOBILIZATION

1.1 SCOPE:

The work covered by this Specification consists of the mobilization and demobilization of the contractor's forces and equipment necessary for performing the work required under the contract including but not limited to: delivery to the project site and preparation of all plant, equipment, materials and supplies; removal of all such furnishings; and cleanup of disturbed areas and waste upon completion of the project in accordance with this Specification. Mobilization will not be considered as work in fulfilling the contract requirements for commencement of work.

1.2 PROCEDURE:

- A. Mobilization - This work refers to the delivery and assembly, at the project site, of all plant and equipment required to complete the Contract and to comply with all local, state and federal laws and regulations, and the satisfactory storage of all materials and supplies. Plant shall include shops, storage areas and sanitary or other required facilities. Work will include the installation of portable toilet facilities.

Prior to commencement of any work, the Contractor's plant and equipment shall be inspected for Contract compliance and for complete set-up in proper working order and shall be subject to the approval of the Conservation District's Representative.

The work also includes obtaining any required permits, insurance, bonds and any other initial items required for the start of work from any local, state, or federal agency. The Contractor will have the responsibility to bond the State Route 4015 through the Pennsylvania Department of Transportation and make all necessary repairs in accordance with the road bond.

The Contractor is responsible for contacting PA One Call and determining the location of all utilities and resolving any issues concerning utilities encountered in the construction of the project.

- B. Demobilization - This work refers to the removal of all plant and equipment from the project site upon completion of the project.

The work also includes cleanup and restoration of all work areas or any other areas disturbed as a result of the project. The Contractor shall be required to restore any disturbed areas to a condition equal to or better than that which existed prior to the work being done, such as replacing any improvement to the land, including but not limited to: roads, driveways, structures, fences, walls, culverts, channels, landscaping and other similar objects which may have been removed or damaged by or as a result of the work. The Contractor will also be responsible for cleaning up all trash associated with the project and disposing of it at an approved waste facility.

1.3 MEASUREMENT AND PAYMENT:

The item, "Mobilization and Demobilization," will be measured by the Conservation District's Representative as the work progresses and paid for as follows:

Forty percent (40%) of the lump sum price bid for this item will be paid following complete Mobilization as described herein.

Sixty percent (60%) of the lump sum price bid for this item will be paid following complete Demobilization as described herein and site inspection and approval by the Conservation District's Representative.

This item, "Mobilization and Demobilization," will be paid for according to the preceding schedule, and payment shall constitute full compensation for furnishing all plant, labor, equipment, materials and supplies required to satisfactorily complete the work described including any incidentals.

TECHNICAL SPECIFICATION NO. 2 – CLEARING, GRUBBING, EXCAVATION

2.1 SCOPE:

Work under this Specification shall include the removal of all natural growth, trees, stumps, logs, junk, and rubbish from within the limit of grading, the ditch locations and the completion of the access road locations as shown on the Drawings and disposal of the same.

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Limits of clearing and grubbing shall be marked in the field by the Contractor and approved by the Conservation District's Representative before commencing the work.

The Conservation District reserves the right to save individual trees, small stands of trees, or other areas of natural vegetation which do not significantly interfere with the work required by the Contract. **All work shall be done in such a manner that will prevent damage to existing vegetation outside of the clearing and grubbing limits.**

2.2 PROCEDURE:

- A. Clearing and Grubbing - Clearing and grubbing shall consist of the above-ground and below-ground removal and disposal of all natural growth, trees, shrubs, tree stumps, logs, timber, junk and rubbish encountered within the designated areas.
- B. Excavation – Excavation shall consist of the removal of the soil and rock to expand the existing treatment cell to the dimensions indicated on the design drawings. The soil will be separated and used to reline the expanded treatment cell. All waste rock will be deposited on the adjacent land at the location of the previous waste area. The waste rock will be covered with the remaining earthen fill that is not needed to reline the expanded treatment cell.
- C. Disposal - All cleared and grubbed material shall be disposed in a manner acceptable to the Conservation District's Representative. All trees and brush shall be **chipped and the chips piled adjacent to the work area**. No material shall be burned. Cleared and grubbed material shall not be buried within the Contractor's Work Area.

Hardwood trees eight inch (8") in diameter (DBH) and larger removed during clearing and grubbing operations shall be left in full log lengths, limbed, and stacked in stable piles on-site and shall remain the property of the property owner. Hardwood trees shall include but not be limited to ash, beech, birch, cherry, maple, oak and poplar. DBH is the diameter at breast height which is considered as being four and one-half feet (4½') off the ground.

Domestic trash and debris found on-site shall not be buried within the Contractor's Work Area, but shall be disposed of off-site at an approved waste disposal site. The Contractor should take reasonable care to prevent additional dumping while the project is under construction.

All materials disposed of off-site shall be disposed of at a DEP permitted disposal area. It shall be the Contractor's responsibility to obtain the DEP permitted disposal area.

- C. Top soil that is stripped from the construction area will be stock piled in the designated area. On completion of final grading of the project any excess topsoil will remain on the site as the property of the landowner and the topsoil stockpile will be permanently seeded using the seeding and mulching specifications listed in specification #8 "Seeding".

2.3 MEASUREMENT:

The item, "Clearing, Grubbing, and Excavation" when satisfactorily completed and approved by the Conservation District, will be considered and measured as a job. The percentage of

completion will be estimated by the Conservation District's Representative for inclusion in each progress estimate.

2.4 PAYMENT:

This item, "Clearing and Grubbing," will be paid for at the Contract lump sum price bid, which price shall constitute full compensation for furnishing all labor, equipment, and material required to perform the work described including any incidentals.

TECHNICAL SPECIFICATION NO. 3 - DIVERSION AND CARE OF WATER

3.1 SCOPE:

The Contractor shall be required to keep all water, including the existing mine water discharge, surface water, and groundwater, properly directed through the work area of the treatment cell and its associated facilities as they are being constructed and until after completion of cell construction/modifications.

3.2 PROCEDURE:

The Contractor shall use pumps, sumps, diversion ditches (in addition to those specified) or other suitable methods, approved by the Conservation District's Representative, to provide diversion of the water. If the Contractor elects to use temporary ditches to convey the existing abandoned mine drainage around the construction sites, the ditches must be lined in accordance with the erosion and sedimentation plan. No bare earth ditches will be permitted. Any temporary ditches constructed for purposes of water diversion shall be backfilled, compacted and revegetated, as outlined in the Technical Specification entitled, "Seeding," after water diversion has ceased. All diverted water shall be directed to existing drainage ways.

Upon completion of the treatment cell improvements and associated facilities and approval by the Conservation District's Representative, the Contractor will be permitted to direct the acid mine drainage into the normal flow of the treatment cell.

3.3 MEASUREMENT:

The item, "Diversion and Care of Water," when satisfactorily completed and approved by the Conservation District's Representative, will be measured as a job.

3.4 PAYMENT:

This item, "Diversion and Care of Water," will be paid for at the Contract lump sum price bid which price and payment shall constitute full compensation for furnishing all labor, equipment, and materials required to perform the work described, including any incidentals.

Payment for construction of the diversion ditches specified in other items will be handled under those items. Payment for construction of temporary diversion ditches added by the Contractor as a result of this item and all work described in this specification will be included in the lump sum payment for this item.

TECHNICAL SPECIFICATION NO. 4 - TREATMENT CELL CONSTRUCTION

4.1 SCOPE:

The work covered by this Specification consists of furnishing all labor, equipment and materials required for the construction of the External and Internal dikes to the elevations, lines and grades indicated on the Drawings. The Contractor shall also demonstrate that the treatment cell will maintain the required water elevations.

4.2 PROCEDURE:

- A. General - All excavation under this Specification is unclassified and all material encountered, regardless of character or hardness, shall be removed to the lines and grades shown on the Drawings. Material from required excavation that is best suited for vegetative growth and approved by the Conservation District, shall be used as surface material. Stockpiling of this material will be required.

Any acid-forming material encountered in the excavation shall be placed outside of drainage courses and above any water bearing area or strata in fill areas approved by the Conservation District and covered with a minimum of four feet (4') of clean fill material. Any area having acid-forming material exposed at the proposed grade line shall be over-excavated a minimum of two feet (2') and such area backfilled with clean fill. Erosion gullies shall be backfilled to the adjacent ground elevation and compacted by making the maximum practical use of available hauling and spreading equipment.

When suitable topsoil is available on the site, the topsoil from excavation or embankment areas shall be stripped and stockpiled separately prior to commencement of grading operations. Stockpiles shall not be placed on areas which subsequently will require any excavation or embankment. If, in the judgment of the Conservation District, it is practical to place the salvaged topsoil at the time of excavation or stripping, the material shall be placed in its final position without stockpiling or further rehandling.

All earth for fill shall be provided from the required excavation.

Grade excess material to allow positive drainage of the area and of adjacent areas. Do not place excess material within the limits of any existing drainageway.

All grading shall be controlled so that the graded areas will blend into the adjacent topography. The final graded surface shall be free from stones or debris which would be detrimental to seeding or soil supplement operations. Both the rough grade and final grade shall be approved by the Conservation District before subsequent operations are performed.

B. Treatment Cell Embankments

1. Subgrade Preparation: Compact subgrade prior to embankment construction. Remove any soft, wet, or otherwise unsuitable material to limits directed by the District. All embankments will be "keyed" into the existing soil material.

2. Placement:

- a. Place, spread, condition, and compact treatment cell embankment material using approved equipment and methods.
- b. Reduce clods down to a maximum size of three inches (3") before placement.
- c. Do not place frozen material or place material on frozen material.
- d. Do not place material when the temperature is below 32°F, or during periods of precipitation.
- e. The Contractor shall finish each day's work with a smooth roller to create a smooth surface which will minimize moisture penetration.
- f. At the beginning of each day, the Contractor shall scarify or roughen the previously placed lift to promote bonding to the material to be placed above it.
- g. The Contractor shall plan and conduct operations to prevent drying of compacted lifts.
- h. The Contractor shall provide hand compaction at any confined area not accessible to normal equipment. Hand compacted material shall meet all specification requirements.
- i. Foundation preparation for each embankment will include the removal of vegetation and other unsuitable material, and the keying in of the fill for each embankment.
- m. The embankments for the Treatment Cell shall be "keyed" into the existing soil material at depth of at a minimum (3') three feet and a width of (3') three feet and compacted. If during construction of the embankments unsuitable materials are encountered, the materials shall be undercut and replaced with properly compacted suitable embankment materials.
- n. The moisture content of the fill material shall be maintained within the limits required to: (a.) prevent bulking or dilatance of the material under the action of the hauling or compacting equipment; (b) prevent the adherence of the fill material to the treads and tracks of the equipment; and (c) insure the crushing and blending of the soil clods and aggregations into a reasonably homogeneous mass.

D. Demonstration of Treatment Cell Operation - After the water intended to be treated in the structure has been directed into the constructed treatment cell the Contractor shall demonstrate that the constructed facility will maintain the water level designated on the Drawings for a period of 72 hours without experiencing appreciable leakage through the earthen dike. If said level cannot be reached or cannot be maintained or if level is reached but appreciable leakage occurs, the Contractor shall take what ever measures are necessary to prevent leakage through the dike to the extent that the appropriate water level can be met. No extra payment shall be made for any work required to eliminate leakage.

4.3 ACCESS ROAD REPAIR:

At the completion of the "Treatment Cell Construction" the contractor will repair the access road to the condition described in the attached access road detail. If necessary the contractor will replace the underlying geotextile material if this material is damaged during excavation of the Treatment Cell expansion. The contractor will also repair and/or replace any damaged gates or fence due to construction. This work will be included in the item "Treatment Cell Construction" and no additional compensation will be provided for these repairs.

4.4 MEASUREMENT:

The item, "Treatment Cell Construction," when satisfactorily completed and approved by the Conservation District, will be measured by the completion of the excavation for the treatment cell improvements as indicated on the construction drawings to the correct dimensions, testing of the treatment cell to demonstrate that the cell will hold water to the design depths and final grading of the excavation and waste areas to satisfaction of the Conservation District Representative.

4.5 PAYMENT:

This item, "Treatment Cell Construction", will be paid for at the Contract unit lump sum price bid which price shall include full compensation for all labor, equipment, material and borrow material required to perform the work described, including any incidentals.

No payment shall be made for any work required to eliminate leakage through any of the embankments.

TECHNICAL SPECIFICATION NO. 5 - PIPING

5.1 SCOPE:

The work shall consist of furnishing and installing plastic pipe, inlet box, valves and the necessary fittings as shown on the Drawings or as specified herein. The work shall further consist of furnishing and installing the required six inch (6") perforated pipe extensions, relocating the (6") PVC solid and (6") clean outs, installation of the (8") gate valve and dewatering (8") perforated standpipe, installation of the (10") solid pipe, installation of the (12") solid and PVC gate valve, installation of the drop inlet structure and trash rack all required fittings, caps, screw caps, connections and all miscellaneous specials and appurtenances in the treatment cells.

All twelve (12") pipe sections and fittings will be bolted together using stainless steel ½" lag bolts with washers. Glue will not be used on any of the 12" pipe fittings or sections for the lower settling pond.

5.2 MATERIALS:

Only Stainless Steel will be used for all metal fittings and hardware. Pipe, fittings, and gaskets shall conform to the requirements of ASTM D-1785, Schedule 40.

Perforated pipe shall conform to the requirements of ASTM D-1785, Schedule 40 pipe with four (4) rows of 5/8" holes at six inch (6") center-to-center spacing. Fittings shall conform to ASTM D-2466.

Pipe shall be delivered to the job site and handled by means which provides adequate support to the pipe and does not subject it to undue stresses or damage. When handling and placing plastic pipe, care shall be taken to prevent impact blows, abrasion damage, and gouging or cutting (by metal surfaces or rocks). All special handling requirements of the manufacturer shall be strictly observed. Special care shall be taken to avoid impact when the pipe must be handled at temperatures of forty degrees (40°F) or less.

Pipe shall be stored on a relatively flat surface so that the barrels are evenly supported. Unless the pipe is specifically manufactured to withstand exposure to ultraviolet radiation, it shall be covered with an opaque material when stored outdoors for a period of fifteen (15) days or longer.

- 1 - 8"
1 - 12"
- A. PVC Gate Valve - The valve shall be ten inch (8") diameter "non-rising stem" PVC gate valves with two inch (2") square operating nuts. The valve shall be as manufactured by Asahi/America, Inc., 19 Green Street, P.O. Box 653, Malden, MA 02148, telephone: 1-800-840-5525 or 1-617-321-5409, or approved equal. The Contractor shall provide the District with three (3) tools for operating the valve from outside the meter box. The tools shall be as recommended by the valve manufacturer and approved by the District.
- B. PVC Flange - The flanges necessary to connect the PVC gate valve to the PVC pipe shall be Schedule 80 PVC meeting the requirements of ASTM D1785.

Meter Box, Insulating Pad, Cover and Lid - The meter box shall be cylindrical in shape with a twenty-one inch (8") diameter and four foot (7') depth. The meter box shall be as manufactured by Mid-States Plastics, Inc. Lexington, KY, telephone: 1-606-498-7615, or approved equal. The insulating pad shall be a "Thermo-pak" insulating pad with removable center, available from Mid-States Plastics or approved equal. A cast iron cover with a twelve and a half inch (12½") diameter cast iron locking lid shall cover the meter box. The cast iron cover shall be four inches (4") in depth and include a lifter Worm Lock with a standard Pentagon Bolt. The cast iron cover and lid shall be a "Ford Type A Single Lid Cover", as supplied by U.S. Filter, New Derry, PA, telephone: 1-724-694-2900, or approved equal. The Contractor shall provide the District with three (3) tools for operating the pentagon bolt PVC Gate Valve - Eight inch (8") plastic gate valves with stainless steel extension arms shall be installed at the locations shown on the Drawings. The valve shall be equivalent or better than those manufactured by ASAHI/AMERICA, Malden, Massachusetts. The valve is available at Pipelines, Inc., phone 330-386-3646. The gate valves shall be constructed of Type 1, Grade 1 PVC and have no metal-to-media contact. The "gate" shall be a tapered cylindrical plug design. The valve shall come standard with a sealed position indicator, EPDM seals and be of the non-rising stem design. A water proof extension tube will be installed on the eight inch (8") gate valve above the deck surface and attached to the deck for support.

5.3 PROCEDURES:

Plastic pipe conduits complete with fittings and other related appurtenances shall be installed to the lines and grades shown on the Drawings. The pipe shall be laid so that there is no reversal of grade between joints unless otherwise shown on the Drawings. The pipe shall not be dropped or dumped on the bedding.

Just prior to placement, each pipe section shall be inspected to insure that all foreign materials are removed from the inside of the pipe. The pipe ends and the couplings shall be free of foreign material when assembled. At the end of work each day or when work is stopped for any extended period, all open ends of the pipeline shall be closed off by a suitable cover or plug.

Care shall be taken to prevent distortion and damage during unusually hot or cold weather. During unusually hot weather, the pipe shall be lightly backfilled or shaded to keep it as near to ground temperature as possible until final backfill is placed.

Perforated pipe shall be laid so that no row of perforations is oriented at the pipe invert. Perforations shall be clear of any obstructions in the inside and outside of the pipe when the pipe is laid.

During installation, the pipe shall be firmly and uniformly bedded throughout its entire length, to the depth and in the manner specified, or as shown on the Drawings. Bell-holes shall be made in the bedding under bells or couplings and other fittings to assure the pipe is uniformly supported throughout its entire length. Blocking or mounding beneath the pipe shall not be used to bring the pipe to final grade.

Unless otherwise specified herein or shown on the Drawings, joint shall be bell and spigot type glued together with solvent cement and primer. When a lubricant is required to facilitate joint assembly, it shall be a type having no deleterious effect on the gasket or pipe materials.

Pipe shall be installed and joined in accordance with the manufacturer's recommendations. Laying deflections and stab depths shall be within the manufacturer's recommended tolerances.

For solvent cement joints for PVC pipe and fittings, they shall be made in accordance with ASTM D2855 for PVC pipe and fittings and related appendix. Contractor must use PVC primer prior to applying solvent cement on all glued joints.

Pipe ends shall be cut square and be deburred to provide uniform smooth surfaces for the jointing process. Reference marks shall be placed on the spigot ends to assist in determining when proper seating depth has been achieved at the joint.

Fittings for non-pressure pipe shall be of the same or similar materials as the pipe and shall provide the same durability, water tightness, and strength as the pipe, unless otherwise specified herein or shown on the Drawings.

The pipe shall be held down during backfilling to the top of the pipe to prevent its being displaced from its original placement.

The six inch (6") clean out pipe ends shall be anchored to the ground. The eight inch (8") valve stem access pipe and eight inch (8") perforated riser pipe shall be anchored to the deck and support with a cement support structure anchored to the pipe. **All metal anchoring fittings shall be made of stainless steel.**

A stainless steel metal trash rack will be permanently installed and bolted to the perforated riser pipe with stainless steel hardware.

5.4 MEASUREMENT:

Piping, when satisfactorily completed and approved by the Conservation District, will be measured by the proper installation of all pipe, stand box, vales, associated equipment and the demonstration to the Conservation District Representative that all devices operate properly.

5.5 PAYMENT:

Payment for Piping will be made on the completion of the entire piping system, which price shall include full compensation for all labor, equipment, materials and incidentals required to perform

the work described for each item and as shown on the Drawings. All costs for backfill, compaction, six inch (6") PVC cleanouts, pipe fittings, valves, valve stem extensions, casing pipe, bends, and other related work and materials will be considered incidental to the appropriate complete job price bid per linear feet for "12 inch solid pipe", "8 inch solid pipe", "8 inch perforated pipe", inlet box, "6 inch perforated pipe", gate valves, "10 inch solid pipe" and no separate payment will be made.

TECHNICAL SPECIFICATION NO. 6 - TREATMENT CELL MATERIAL

6.1 SCOPE:

The work covered by this Specification consists of furnishing all labor, equipment and materials necessary for the placement of the AASHTO No. 3 Limestone into the Treatment Cell at the locations and to the dimensions shown on the Drawings.

6.2 MATERIAL:

The Contractor shall furnish all of the material specified. Unless stated otherwise in the following paragraphs, all sampling and testing of these materials will be at the direction of the Conservation District's Representative and at the Contractor's expense. All material shall be furnished by suppliers who are approved by the Conservation District.

- A. AASHTO No. 3 Limestone - The material shall meet the gradation requirements of Section 703.2(c) of the current Pennsylvania Department of Transportation Specifications, Publication 408 and shall contain not less than eighty nine percent (89%) calcium carbonate equivalent (CaCO_3 equivalent) and not more than five percent (5%) magnesium oxide (MgO).

6.3 PROCEDURES:

After the treatment cell has been constructed and approved by the Conservation District, the Contractor shall place thereon a layer of geotextile material as described in Technical Specification No. 11, Geotextile Material. After approval of the installation of the geotextile material by the Conservation District Representative the contractor will install the underdrain extension as detailed in Technical Specification No. 5, Piping. After approval of the installation of the piping by the Conservation District Representative additional layers of the AASHTO No. 3 Limestone will be installed at the locations and to the dimensions shown on the Drawings.

To prevent damage to the PVC pipes the Contractor shall place the first two inch (2") layer of limestone. The Contractor shall then place the piping and the remainder of the limestone, covering the underdrain piping, to the specified depths on the Drawings. Care must be used in placing of the stone around and above the PVC pipes so as not to crush the pipes. Large heavy equipment will not be permitted to be used. Smaller lighter equipment must be used to place the layers closest to the pipe up to a level of two feet (24").

6.4 MAINTENANCE:

The Contractor shall maintain and make all necessary repairs to the materials for the duration of the Contract.

6.5 MEASUREMENT:

Measurement will be made of the number of tons of AASHTO No. 3 Limestone to the dimensions shown on the Drawings, for acceptably constructed treatment cells. The Contractor will supply weigh slips and chemical analysis of the stone to the Conservation District Representative.

6.6 PAYMENT:

Payment shall be made at the Contract unit price for the completion of the placement of the limestone. The price shall include all costs involved in providing materials, equipment and personnel required for the particular bid item, and for performing the work described.

TECHNICAL SPECIFICATION NO. 7 - FLOW CONTROL STRUCTURE

7.1 SCOPE:

The work covered by this Specification consists of furnishing all labor, equipment and materials, and performing all operations in connection with the construction of one (1) concrete inlet structure in accordance with the Drawings and this Specification.

7.2 MATERIALS:

- A. Concrete Inlet Structure: The Precast Concrete Inlet Structure shall meet all requirements of the Penn DOT RC Standards.
- B. The Inlet grate shall be a raised grate and be epoxy coated or painted and meet all requirements of the Penn DOT RC Standards.
- C. Sealing of the ten inch (10") PVC pipe, the eight inch (8") outlet control piping at the conjunction with the inlet box to meet all requirements of the Penn DOT RC Standards.
- D. The concrete shall be treated with Xypex or approved equal.
- B. Wooden Access Deck - A wooden deck shall be installed out to the treatment cell valve stem access pipe and the perforated riser structure as indicated on the Drawings. **The deck will be built by the Independence Conservancy however, the posts must be installed by the contractor prior to the limestone installation in the basin.** The deck will be constructed using 6"X 6" treated lumber for supports anchored a minimum of two (2') feet into the ground with concrete poured to completely fill the hole dug to install the posts. A railing will be installed along both sides of the deck according to the drawings.

7.3 SPILLWAY / PRIMARY OUTLET:

- A. This shall consist of reconfiguring the spillway/primary outlet as shown on the drawings.
- B. The spillway shall be cut down to the elevation shown on the plan drawings or 0.2 ft above the level of the lowest row of holes in the existing emergency spillway. The spillway shall be blended into the existing elevations with 2ft horizontal to 1ft. vertical slopes.

- C. The slopes to the spillway shall be graded and comply with the requirements of the National Crushed Stone Association for R-4 Riprap as follows:
 - a. Maximum size is 12", 15% of the tonnage
 - b. Average size is 6", 50% of the tonnage
 - c. Minimum size is 3"
 - d. Pieces smaller than the minimum size shall not exceed 5% of the total weight of tonnage shipped

- D. Rock stone, No. 3 limestone shall be used to fill in from the treatment cell to the inlet control structure and surrounding the valve and perforated riser pipe. The No. 3 limestone shall have a calcium carbonate (CaCO₃) content of 80% or greater as determined by ASTM C-114.

7.4 PROCEDURE:

The concrete inlet structure shall be installed at the location and to the dimensions shown on the Drawings.

7.5 MEASUREMENT:

The item, "Flow Control Structure," shall be paid for when satisfactorily completed and approved by the Conservation District's Representative.

7.6 PAYMENT:

This item, "Flow Control Structure," will be paid for at the Contract unit price, which price and payment shall constitute full compensation for furnishing all labor, equipment, and materials required to perform the work described, including any incidentals.

TECHNICAL SPECIFICATION NO. 8 – SEEDING (waste area only)

8.1 SCOPE:

The Contractor shall seed all areas disturbed within the limits of the Contractor's Work Area, except, the rock-lined ditches, and those areas of the treatment cells below the proposed water surface elevations. The work covered by this Specification shall consist of preparation of the seed bed, furnishing and placing pulverized agricultural limestone, commercial fertilizer, seed and mulch, and maintaining the seeded areas. The time of seeding may be selected by the Contractor who shall be responsible for securing a satisfactory stand of grass. Seeding should be performed as soon as possible following the completion and approval of final grading, and the incorporation of soil supplements. If erosion occurs between the time of final grading and time of seeding, the Contractor shall replace the fine soil materials which were eroded away and regrade all eroded areas to reestablish the final grade. The Contractor shall also reapply and reincorporate soil supplements in the eroded areas. The Contractor may, at his own expense, perform temporary seeding operations in order to maintain finished graded areas until the optimum time for performing permanent seeding.

8.2 MATERIALS:

The Contractor shall furnish all of the materials specified. Unless stated otherwise in the following paragraphs, all sampling and testing of these materials will be at the direction of the Conservation District and at the Contractor's expense. All materials shall be furnished by suppliers who are approved by the Conservation District.

A. Seed

Grass Seed - Grass seed shall consist of:

TEMPORARY SEEDING

	Maximum Weed Seed <u>Percent</u>	Minimum Purity <u>Percent</u>	Minimum Germination <u>Percent</u>	Minimum Quantity of Seed <u>Lbs./Acre</u>
<u>Annual Ryegrass</u>	0.5	95	85	40

PERMANENT SEEDING

	Maximum Weed Seed <u>Percent</u>	Minimum Purity <u>Percent</u>	Minimum Germination <u>Percent</u>	Minimum Quantity of Seed <u>Lbs./Acre</u>
<u>Tall Fescue</u> (Johnstone Variety)	0.25	95	80	25
<u>Red Top</u> (Common Seed)	--	92	80	7
<u>Birdsfoot Trefoil</u> (Empire Variety)	0.25	98	80*	13
<u>Perennial Ryegrass</u> (Common Seed)	--	95	85	25
<u>TOTAL POUNDS PER ACRE</u>				70

*Minimum 60% Ready Germination, 20% Hard Seed

Winter Wheat or Spring Oats will be considered an acceptable substitute for Annual Ryegrass provided said substitutes meet the required minimum seed specifications as stated in Section X of "The Penn State Agronomy Guide," dated 1993-1994. Subject to the approval of the Conservation District's Representative, the Contractor may add other grass seeds to the mixture to secure a cover crop, but no additional payment will be made therefore.

Kentucky 31 Tall Fescue grass seed shall not be used on this project.

No seed shall contain any of the following noxious weed seeds: Canada Thistle, Field Bindweed, Johnson Grass, Perennial Peppergrass, Perennial Sow Thistle, Quack Grass, Horse Nettle, Bedstraw, Corn Cockle, Brassica Kaber, Brassica Nigra, Wild Onion or Wild Garlic.

All seed shall conform to the Pennsylvania Seed Act of 1965, Act No. 187, as amended, and regulations of the Pennsylvania Conservation District of Agriculture, Bureau of Plant Industry.

Certification of purity and germination analysis must be supplied under the current Rules for Testing Seeds of the Association of Official Seed Analysts by the Commonwealth of Pennsylvania, Conservation District of Agriculture, Bureau of Plant Industry.

Seed shall be furnished fully tagged and delivered by separate varieties, separately packaged or bagged. All pre-mixed seed shall have an inspection tag, stamped, dated and signed by the Conservation District Inspector, sewn into the inside top of each bag. No seed shall be utilized which has a mix date older than nine (9) months. No seed shall be used unless it has been inspected and sampled as described, or sampled by individual species and mixed on the project under Conservation District supervision.

The seed furnished shall not be more than two (2) years old and shall have been tested for germination not more than nine (9) months prior to seeding operations. A certificate of test results shall be furnished to the Conservation District before approval for use of the seed is given.

Seed which has become wet, moldy or otherwise damaged in transit or storage, will not be accepted.

- B. Inoculant - The inoculant for treating leguminous seed (vetch, clover, trefoil, etc.) shall be a standard commercial product consisting of a suitable carrier containing a culture of nitrogen fixing bacteria specifically for the seed to be inoculated. All containers must remain sealed until contents are used in their entirety. Inoculant shall not be used after the expiration date indicated on the container.

Suitable storage in a moderate temperature shall be provided at all times. All inoculant shall be subject to approval of the Conservation District's Representative.

- C. Commercial Fertilizer - Commercial fertilizer shall be a free-flowing material, uniform in composition, and suitable for application with approved standard equipment.

The commercial fertilizer shall conform to applicable Commonwealth fertilizer laws and shall be delivered in bags or other convenient containers each fully labeled and bearing the name, trademark, and warranty of the producer.

- D. Pulverized Agricultural Limestone - Pulverized agricultural limestone shall be agricultural ground limestone and shall contain not less than eighty-nine percent (89%) calcium carbonate equivalent (CaCO_3 equivalent) and be ground to such fineness that at least ninety-five percent (95%), sixty percent (60%) and fifty percent (50%) by weight will pass standard twenty (20), sixty (60) and one hundred (100) mesh sieves, respectively. If moisture content exceeds five percent (5%), the maximum percentage of moisture shall be clearly indicated and the application rates shall be adjusted accordingly

to reflect moisture content. Such limestone shall contain magnesium in the amount recommended by the agricultural soil testing report(s).

- E. Mulching Materials - All mulching materials shall be free from mature seed-bearing stalks or roots of prohibited or noxious weeds as defined in the Pennsylvania Seed Act of 1965, Act No. 187.

Mulches for seeded areas shall be either hay or straw, or a combination of both. Hay or straw mulching material shall be well cured to less than twenty percent (20%) moisture content by weight, and shall contain no stems of tobacco, soybeans, or other coarse or woody material.

1. Hay - This shall consist of timothy hay, mixed clover and timothy hay, or other approved native or forage grasses.
2. Straw - Straw mulching material shall be either wheat or oat straw reasonably free of viable seed.
3. Non-asphaltic Emulsion - Either water soluble natural vegetable gum blended with gelling and hardening agents or a water soluble blend of hydrophyllic polymers, viscosifiers, sticking aids, and gums.

- F. Water - Water shall be fresh and free from injurious amounts of oil, acid, alkali, salts, or other materials harmful to the growth of grass.

8.3 PROCEDURE:

The Contractor shall adhere to the following procedures in his seeding operations. The Contractor shall, upon completion of rough grading, take a soil sample and submit it for testing as specified in the Special Requirement entitled, "Material Samples Requiring Laboratory Tests."

- A. Preparation of Seed Bed - After the areas to be permanent seeded have been brought up to grade and approved by the Conservation District's Representative, **two (2) tons per acre of agricultural limestone shall be applied initially over the entire area.** This application of limestone shall be incorporated into the soil to a minimum depth of eight inches (8") by harrowing, plowing or other approved methods. **After the initial application of limestone has been satisfactorily incorporated, the Contractor shall then apply two (2) additional tons of agricultural limestone, per acre, in conjunction with the specified amount of commercial fertilizer.** The tillage operation shall be sufficient to insure that the condition of the soil is satisfactory for seeding and that this application of commercial fertilizer and limestone are thoroughly incorporated into the soil to a depth of at least four inches (4"). The area shall then be smoothed and brought to grade. Immediately prior to the sowing of seed, the soil shall be scarified to an approximate depth of three-fourth inch (3/4"). All scarifying shall be done in a direction parallel to the contour of the slope and not uphill or downhill. When commercial fertilizer and the second application of limestone are incorporated with hydroseeding, the surface need not be tilled to a depth of four inches (4"), but the surface shall be scarified to an approximate depth of three-fourth inch (3/4") prior to seed application.

All areas that will be mowed for long term maintenance will be raked smooth and all debris, including stones and rocks larger than 1.5 inches in diameter and limbs, removed prior to seed and mulch application.

Preparation of seed bed for the required temporary seeding areas shall consist of applying one (1) ton of agricultural limestone, per acre, in conjunction with the specified amount of Commercial Fertilizer for required temporary seeding. These soil supplements shall be worked into the soil to a depth of one inch (1").

- B. Commercial Fertilizer - Commercial Fertilizer for permanent seeding shall be applied at the following rates per acre:

100 pounds of nitrogen
200 pounds of phosphate
200 pounds of potash

No more than forty (40) pounds of nitrogen, eighty (80) pounds of phosphate and eighty (80) pounds of potash, per acre, shall be placed in the hydroseeder with the seed. Any remaining amount of fertilizer required shall be applied separately. Commercial Fertilizer for temporary seeding shall be applied at the following rates per acre:

50 pounds of nitrogen
50 pounds of phosphate
50 pounds of potash

- C. Inoculant - All leguminous seed shall be inoculated or treated with an approved culture as recommended by the supplier. The seed shall then be sown within twenty-four (24) hours after treatment. If seed is to be applied by hydroseeding, four (4) times the manufacturer's recommended amount of inoculant shall be added just prior to seeding. Inoculant must be kept at temperatures below 75° F.

The inoculant shall be viable and made up of several bacterial strains which are specified for the legume group to be inoculated. Inoculant shall not be used later than the date indicated on the container or specified by the supplier.

- D. Method of Sowing - The seed shall be sown on a still day at the rate specified. For conventional seeding applications, the seed shall be sown either by hand or by approved sowing equipment in two (2) applications, one-half the seed while the seeder is traveling in one direction and the other half while traveling at right angles to the first application direction.

Hydroseeding or drilling may be used for seed application at the option of the Contractor. All methods and equipment shall be subject to the approval of the Conservation District's Representative. In the case of hydroseeding, commercial fertilizer and limestone (second application, only) may be applied during the seeding operation. Inoculated seed shall not be held in a slurry with commercial fertilizer for more than one (1) hour. Reinoculation or application of legumes separate from commercial fertilizer will be required where this time limit cannot be accomplished. If a grain drill is used, fertilizing with commercial fertilizer (second application only) may be done at the same time as the seeding, provided the fertilizer does not come in contact with the seed. Drilling shall be done only parallel to the contour.

- E. Mulching - Within forty-eight (48) hours of sowing the seed, mulch shall be applied at a uniform depth over the entire surface. **Mulch shall be applied at an average rate of three (3) tons (dry weight) per acre.** The mulch shall be in a moist condition at the

time of placement or shall be sprinkled immediately after placing. While moist, the material shall be anchored in the soil by an approved method to secure the material firmly in the ground to form a soil-binding mulch and prevent loss or bunching by wind. The use of a disc harrow for securing mulch is an acceptable method. On slopes where machinery cannot be used, the mulch material shall be retained in place by a shallow covering of earth, by some suitable means which will not be detrimental to subsequent maintenance. Approved nonasphaltic emulsion may be used as an alternate "tie down" at the Contractor's option, provided it is applied uniformly over and through the mulch at a rate not less than one hundred fifty (150) gallons per acre. It shall be non-toxic to plants and seeds. A mechanical blower may be used to apply the mulch if it is specifically designed and approved for that purpose. Mulch material cut into lengths less than six inches (6") will not be acceptable.

8.4 MAINTENANCE:

The Contractor shall maintain the areas completed in accordance with the requirements of this Specification until all work under the Contract has been completed and has been accepted by the Conservation District's Representative. The maintenance shall consist of refilling rain-washed gullies with the same or better type of soils than were eroded, reapplying soil supplements and mulch, and/or reseeding, as directed by the Conservation District.

Within the one (1) year remedy guarantee period, as specified in Subsection 5.18 of the General Conditions, the Contractor shall reseed in accordance with this Specification any areas where satisfactory growth has not been obtained, in the opinion of the Conservation District's Representative.

8.5 MEASUREMENT:

The item, "Seeding," when satisfactorily completed and approved by the Conservation District, will be considered and measured as a job.

8.6 PAYMENT:

This item, "Seeding," will be paid for at the Contract lump sum price bid, which price and payment shall constitute full compensation for furnishing all labor, equipment, and materials required to perform the work described including any incidentals.

The price bid shall include all costs involved in providing the materials, equipment and personnel required for performing the necessary work. No additional payment will be made for required reseeding of unsatisfactory areas and areas disturbed outside of the Contractor's Work Area.

All temporary seeding work shall be considered incidental to this item.

TECHNICAL SPECIFICATION NO. 9 - IMPLEMENTATION OF EROSION AND SEDIMENT POLLUTION CONTROL PLAN

9.1 SCOPE:

The work covered by this Specification consists of furnishing all plant, labor, equipment and materials and performing all operations in connection with the "Implementation of the Erosion and Sediment Pollution Control Plan" in accordance with the Drawings and this Specification.

The Contractor is responsible for preparing and submitting an Erosion and Sedimentation Control Plan to the Washington County Conservation District. It will be the sole responsibility of the Contractor to secure the approval of the Erosion and Sedimentation Control Plan and implement the plan accordingly. The Conservation District will not be held responsible for failure on the part of the Contractor to implement the plan or the discharge of sediment into the Waters of the Commonwealth. The Contractor will accept full responsibility for this work item and any fines or penalties charged for failure to implement the Erosion and Sedimentation Control Plan.

9.2 DEFINITION:

For the purpose of this Specification, STABILIZATION shall be defined as, “the proper placing, grading and/or covering of soil, rock or earth to insure their resistance to erosion, sliding or other movement.” The attainment of STABILIZATION in the field shall be determined by the Conservation District’s Representative.

9.3 STAGING OF CONSTRUCTION ACTIVITIES:

The following is the sequence of major construction activities as intended by the project design:

The Contractor must comply with the following guidelines for this site:

All grading shall be done to deter any run-off from leaving the proposed project boundaries before passing through the erosion and sediment pollution control facilities.

The Contractor shall conduct clearing and grubbing operations in conjunction with the construction of the erosion and sediment pollution control facilities within each phase.

9.4 MATERIALS:

- A. Geotextile for Filter Fabric Fence - The geotextile used for the filter fabric fence shall meet the requirements of a Class 3, Type B, Geotextile, as specified in Section 735, “Geotextiles” of the current edition of the Pennsylvania Department of Transportation, Publication 408. **Only Super Silt Fence as described in the Department of Environmental Protection publication “Erosion and Sediment Pollution Control Program Manual” page 149, page 91 and page 92 will be used.**
- B. Soil Supplements, Temporary Seeding and Mulch - Soil supplements, temporary seeding and mulch shall be as specified in the Technical Specification entitled, “Seeding.”
- C. Rock Construction Entrance – All construction entrances off of State Route 4015 will comply with the DEP “Erosion and Sediment Pollution Control Program Manual” page 79 through page 81.

9.5 PROCEDURE:

All erosion and sediment pollution controls must be constructed and approved by the Conservation District’s Representative prior to any earthmoving at each site.

- A. Filter Fabric Fence - Filter fabric fence with rock filters shall be installed according to the appropriate Detail on the Drawings. The filter fabric fence shall be located as shown on the Drawings. The rock filters shall be located in conjunction with the filter fabric fence

at any low point along the filter fabric fence line or where the filter fabric fence cannot be installed on contour, such as in an erosion gully, and as approved by the Conservation District's Representative.

9.6 MAINTENANCE:

- A. Inspection - All erosion and sediment pollution control facilities shall be inspected, at a minimum, at the beginning of each work week and after each storm event. Any necessary repairs shall be made immediately.
- B. Filter Fabric Fence - Any damaged fence supports or fence fabric shall be repaired immediately. Sediment deposits shall be removed as required to keep the fence functional and will not be allowed to accumulate beyond one-half (1/2) the above ground height of the fence. All undercutting or erosion of the toe anchor shall be repaired immediately with compacted backfill material.
- C. Disposal of Sediment - When removing sediment which has accumulated the Contractor shall take all precautions necessary to avoid the possibility of any sediment leaving the project boundaries. The sediment shall be disposed on-site and placed in any remaining pit areas or spread by mechanical means across the surface and stabilized with seeding.

9.7 MEASUREMENT AND PAYMENT:

"Implementation of Erosion and Sediment Pollution Control Plan" shall be measured by the Conservation District's Representative as the work progresses and paid at the lump sum item at the completion of the entire job and complete stabilization of the site:

This item, "Erosion and Sediment Pollution Control Plan" will be paid according to the preceding schedule, and payment shall constitute full compensation for furnishing all plant, labor, equipment, materials and supplies required to satisfactorily complete the work described including any incidentals.

Temporary seeding required by this item shall be considered incidental to this item as described in the Technical Specification entitled, "Seeding."

TECHNICAL SPECIFICATION NO. 10 – ON SITE TOILET FACILITIES

10.1 SCOPE:

The work covered by this Specification consists of providing a Port-A-John or similar temporary toilet facility, on site, for the duration of the project.

10.2 PROCEDURE:

The toilet facility will be provided for the use of the Conservation District's Representative and the contractor's workers. It will be properly maintained by periodic cleaning and removal of waste material on at a minimum a biweekly schedule. The toilet facility will be provided by a DEP permitted company and maintained by the same company. A copy of the DEP permit for the company and the name and address of the company will be provided by the contractor to the Conservation District's representative. The Conservation District's representative will have the authority to call the Outside Toilet Facility Contractor and request maintenance of the facility if

the Contractor fails to have the facility maintained in a proper condition. The Contractor will pay for all installation, maintenance, and removal costs associated with this specification including maintenance requested by the Conservation District's Representative. Location of the installation of the toilet facility will be determined by the Conservation District's Representative.

10.3 MEASUREMENT:

Measurement will be determined by the completion of the installation, maintenance, and removal of the toilet facility and determined to be acceptable by the Conservation District's Representative.

10.4 PAYMENT:

Payment will be made at the Contract unit price for "On Site Toilet Facility," which price and payment will constitute full compensation for furnishing all labor, equipment, material and necessary incidentals required to satisfactorily complete this item of work.

TECHNICAL SPECIFICATION NO. 11 - GEOTEXTILE LINING OF EXTENDED TREATMENT CELL:

11.1 SCOPE:

This work consists of furnishing all material, equipment, and labor necessary for the installation of geotextiles.

11.2 QUALITY

Geotextiles shall conform to the requirements of Material Specification 592 and this specification.

11.3 STORAGE

Before use, the geotextile shall be stored in a clean, dry location out of direct sunlight, not subject to extremes of either hot or cold temperatures, and with the manufacture's protective cover undisturbed. Receiving, storage, and handling at the job site shall be in accordance with the requirements listed in ASTM D 4873.

11.4 SURFACE PREPARATION

The surface on which the geotextiles is to be placed shall be graded to the neat lines and grades as shown on the drawings. It shall be reasonably smooth and free of loose rock and clods, holes, depressions, projections, muddy conditions, and standing or flowing water.

11.5 PLACEMENT

Before the geotextile is placed, the soil surface will be reviewed for quality assurance of the design and construction by the Conservation District Representative. The geotextile shall be placed on the approved prepared surface at the locations and in accordance with the details shown on the drawings and these specifications.

The geotextile shall be joined by overlapping a minimum of 18 inches and secured against the underlying foundation material. Securing pins, approved and provided by the geotextile manufacturer, shall be placed along the edge of the panel or roll material to adequately hold it in place during installation. Pins shall be fiberglass formed as a U, L, or T shape or contain "ears" to prevent total penetration through the geotextile. Steel washers shall be provided on all but the U-shaped pins. The upstream or upslope geotextile shall overlap the abutting downslope geotextile. At vertical laps, securing pins shall be inserted through the bottom layers along a line through approximately the mid-point of the overlap. At horizontal laps and across slope labs, securing shall be inserted through the bottom layer only. Securing pins shall be placed along a line about 2 inches in from the edge of the placed geotextile at intervals not to exceed 12 feet unless otherwise specified. Additional pins shall be installed as necessary and where appropriate to prevent any undue slippage or movement of the geotextile. The use of securing pins will be held to the minimum necessary. Pins are to remain in place unless otherwise specified.

Should the geotextile be torn or punctured, or the overlaps disturbed, as evidenced by visible geotextile damage, subgrade pumping, intrusion, or grade distortion, the backfill around the damaged or displaced area shall be removed and restored to the original approved condition. The repair shall consist of a patch of the same type of geotextile being used and overlaying the existing geotextile. When the geotextile panels joined by overlap shall have the patch extend a minimum of 2 feet from the edge of any damaged area.

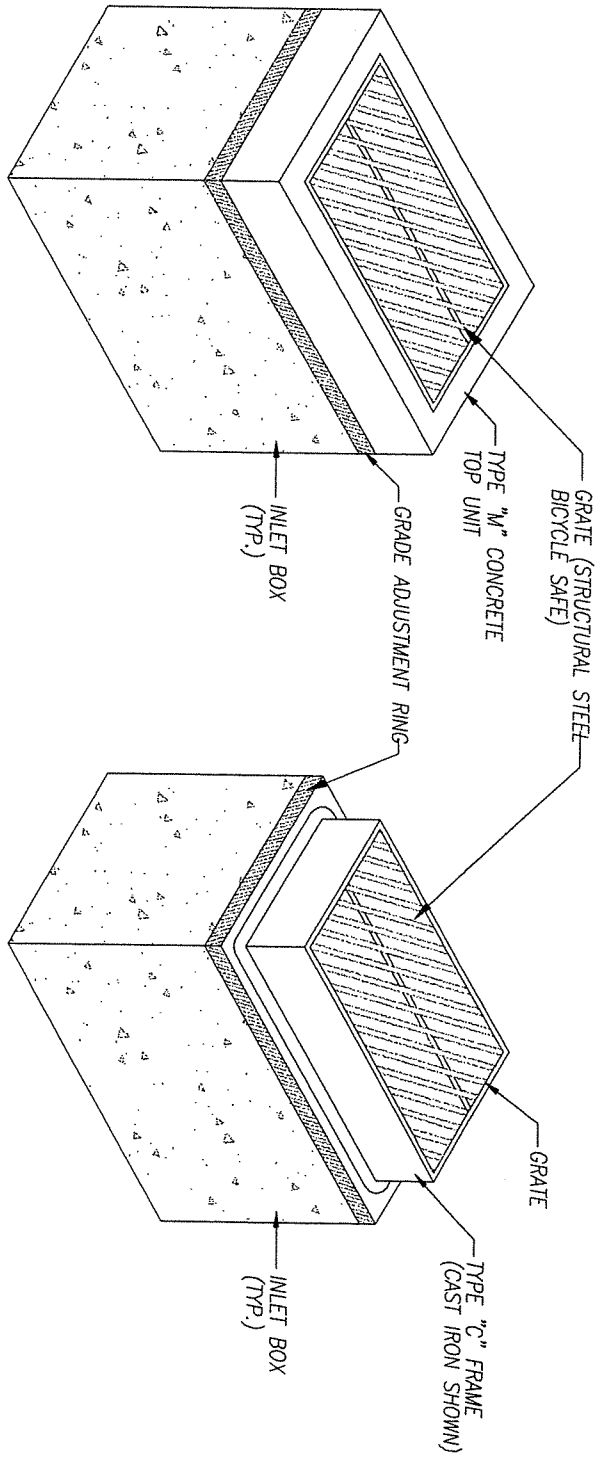
Geotextile shall not be placed until it can be anchored and protected with the specified covering with 48 hours or protected from exposure to ultraviolet light. In no case shall material be dropped on uncovered geotextile from a height of more than 3 feet. For road stabilization the geotextile shall be unrolled in a direction parallel to the roadway centerline in a loose manner permitting conformation to the surface irregularities when the roadway fill material is placed on its surface. In no case shall material be dropped on uncovered geotextile from a height of more than 5 feet.

11.6 MEASUREMENT AND PAYMENT

Measurement will be determined by the completion of the installation for geotextile installation, and determined to be acceptable by the Conservation District's Representative.

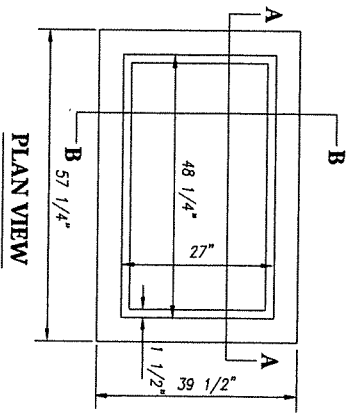
11.7 PAYMENT:

Payment will be made at the Contract unit price for "Geotextile Lining of Extended Treatment Cell," which price and payment will constitute full compensation for furnishing all labor, equipment, material and necessary incidentals required to satisfactorily complete this item of work.

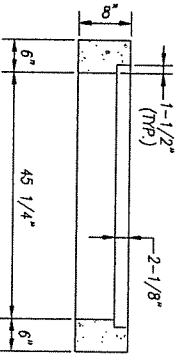


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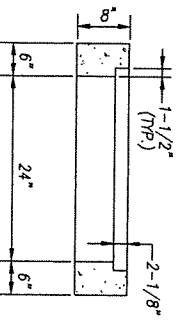
SCALE N.T.S.



PLAN VIEW

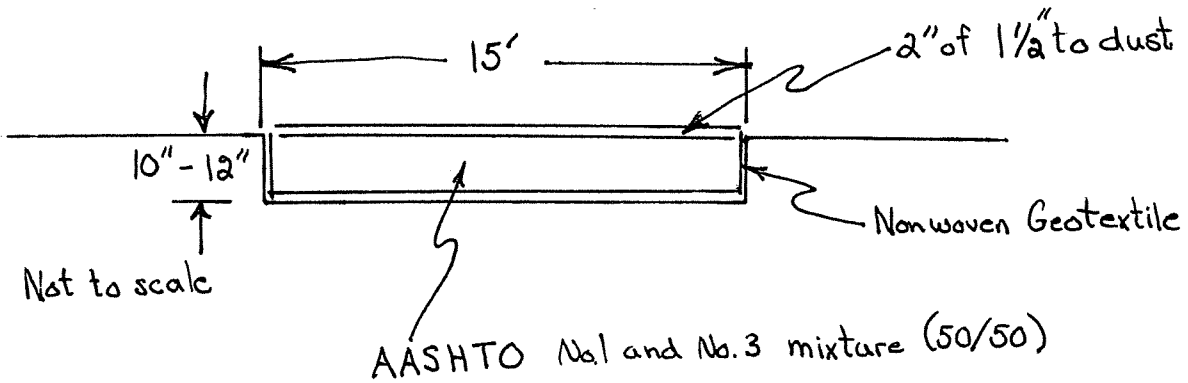


SECTION A-A

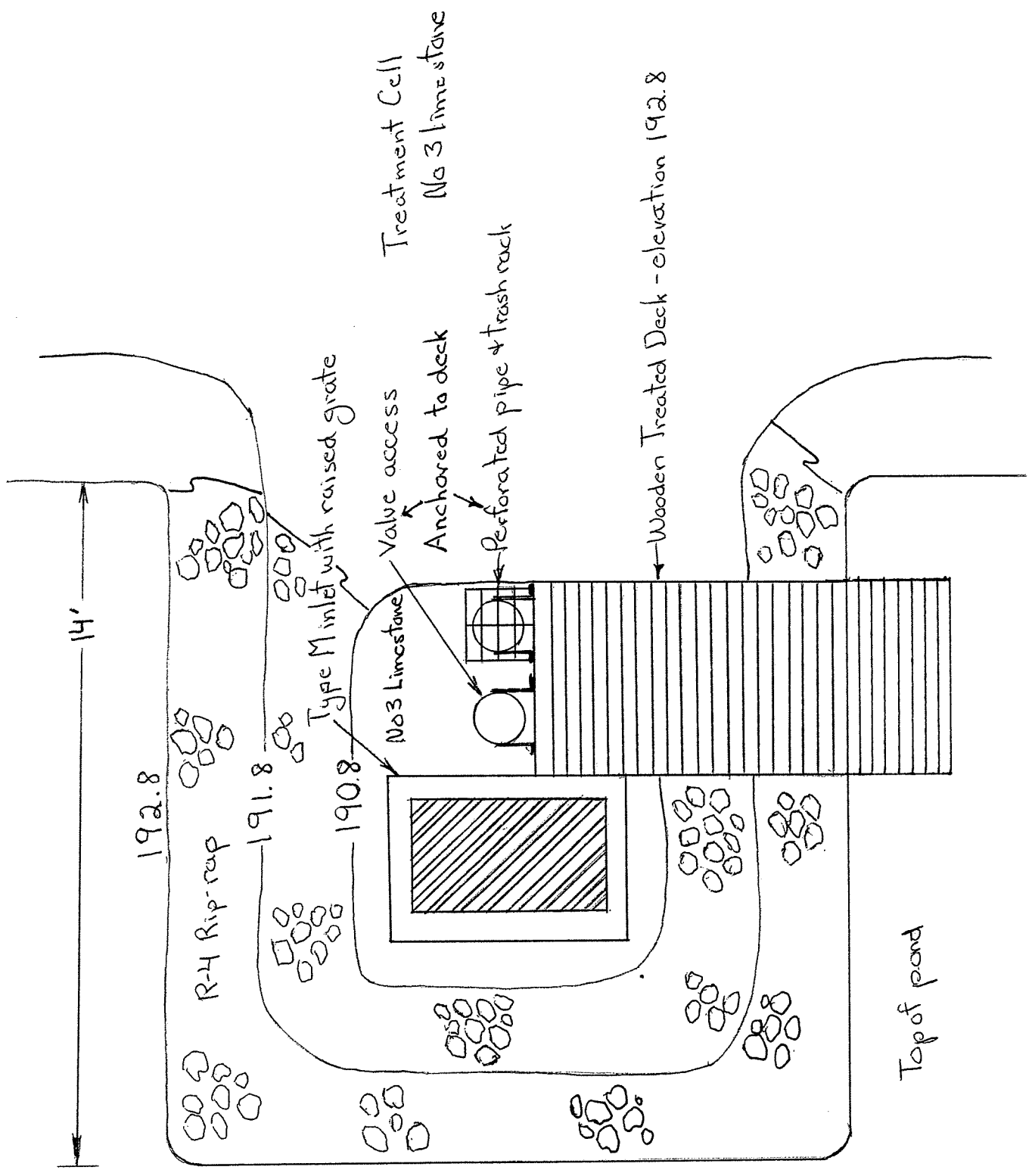


SECTION B-B

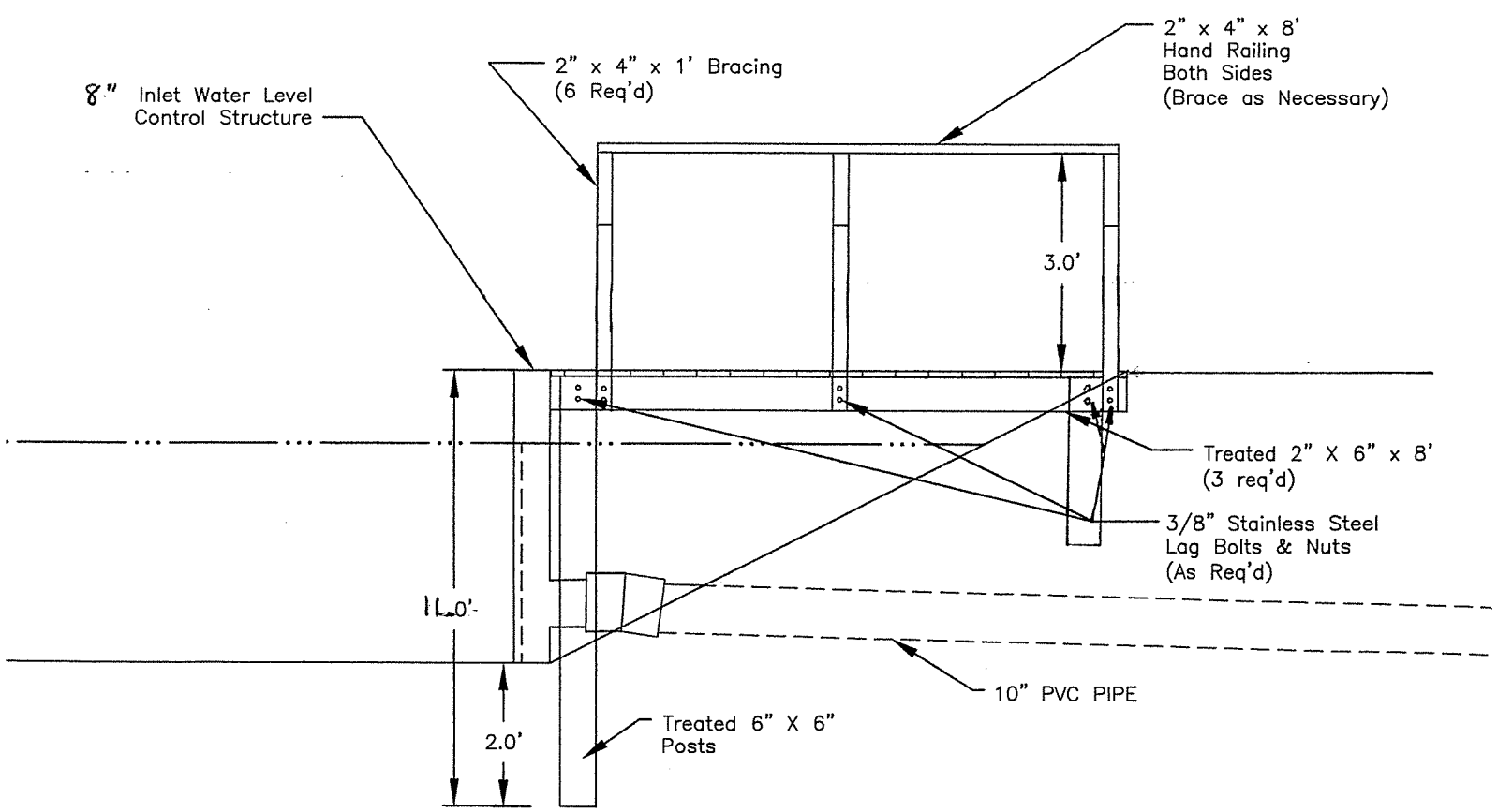
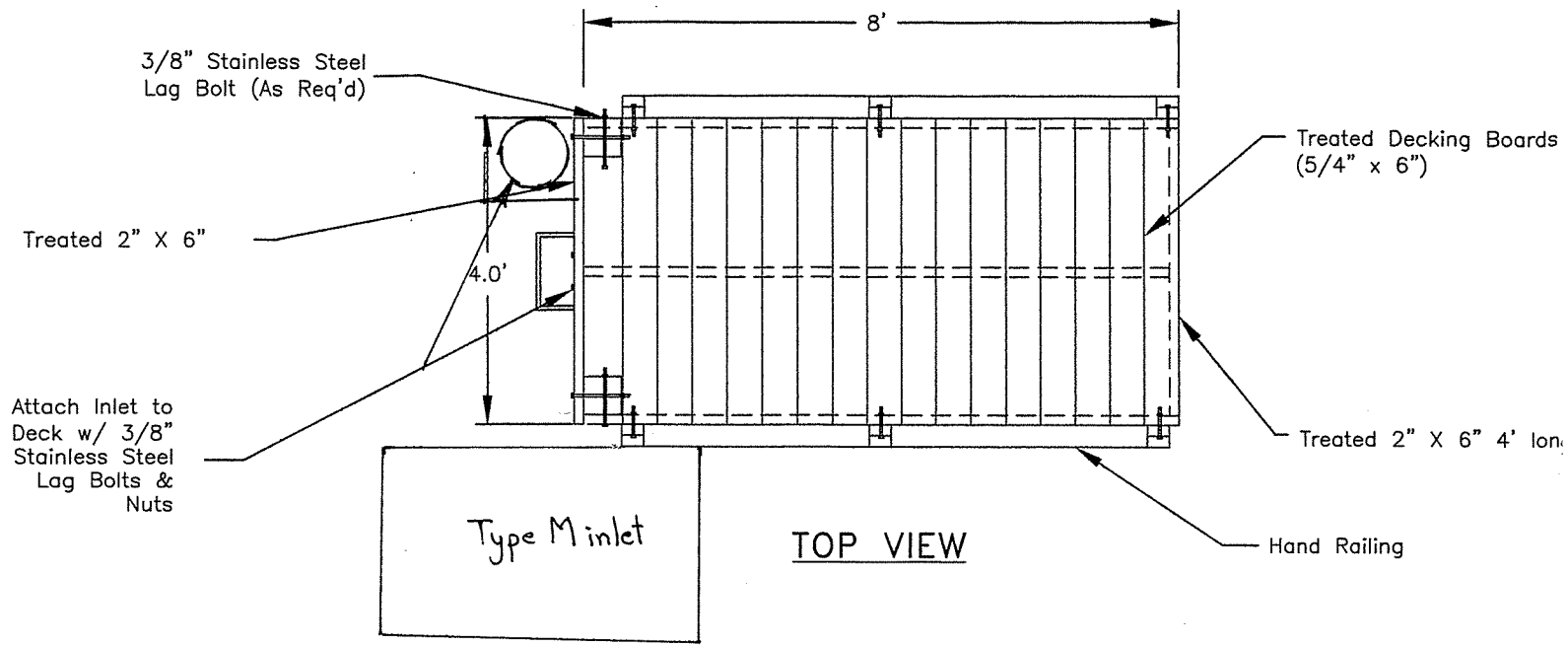
Access Road detail



Outlet Structure Overhead View

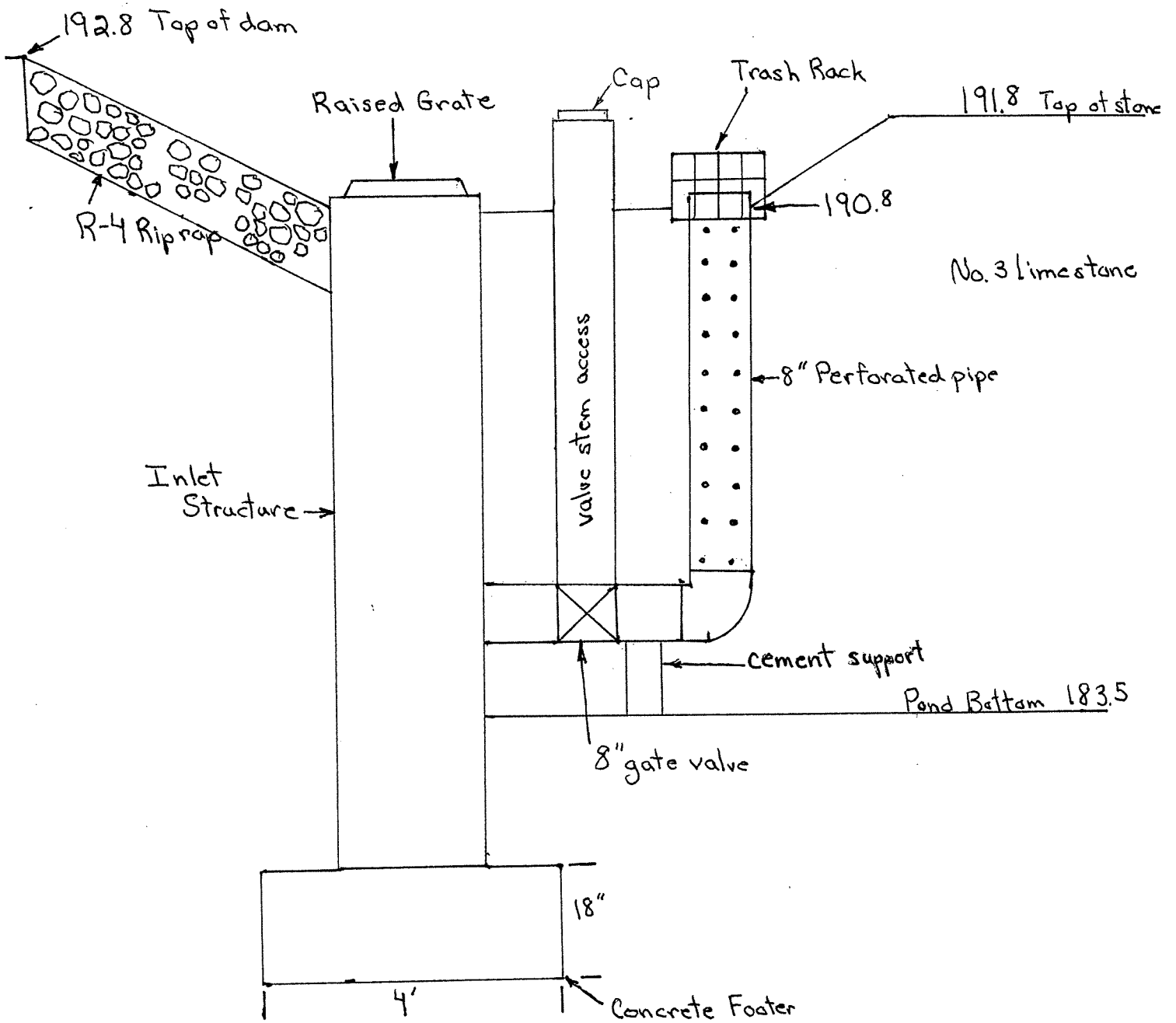


1" = 3'



DECK DETAIL

Outlet Structure Side View



scale: 1" = 2'