

INTRODUCTION

In the interest of increasing efficiency as well as proficiency in the design of plans and specifications for AML projects, AML is desirous of adopting standard drawing details and standard language for specifications wherever practical. The Design Section of AML intends to provide as much standardization of drawing details and specifications, both in format and in substance, as possible. To that end, AML has developed this guide for the preparation of reclamation designs utilizing standard details and specifications.

The Consultant is requested to consider the need for inclusion of items into the plans and specifications to address the following issues:

- Natural stream channel design
- Preservation of bat habitat
- Limited passive water treatment design
- Pavement repair design
- Horizontal boring design
- Reforestation

The Consultant is advised that he is responsible for obtaining the following permits, if they are required for the project, as part of his design services:

- NPDES Stormwater Permit
- WVDOH Encroachment Permit
- ACOE Regional Permit
- WVDEP 401 Certification

These Guidelines were developed by a committee comprised of Engineers and Construction Inspectors from both the Design Section and the Construction Section of AML. The Consultant is to adhere to these Guidelines as closely as is practical in the preparation of Design Plans and Specifications, but this does not preclude the development of site specific details or specifications where deemed necessary.

GUIDELINES FOR PREPARATION OF DESIGN PLANS AND SPECIFICATIONS

Plans

Design plans should include as follows:

A cover/title sheet,

A composite site plan sheet indicating access to the site(s) from a state or county route,

Existing conditions sheets showing the location of any borings that were drilled,

Reclamation plan sheets,

Tax map overlay sheets on the reclamation plan,

Sheets for cross sections where applicable,

Sheets for profiles where applicable, and

Sheets for design details where applicable.

Details for individual items should have an assigned number and this number should be referenced by the sheet number on which the detail is shown. Then this identification reference should be provided on the reclamation plan sheets at the locations where the detail applies.

Plan drawings should be 22" x 34" blackline drawings printed on 24" x 36" paper.

Please see the attached standard detail drawings. These details are to be utilized for reference in the preparation of specific details on design projects. Specific dimensions should be utilized in place of the dimensionless units of measurement indicated on the standard detail drawings as field investigations warrant.

Final plans should be signed and sealed by a Professional Engineer registered in West Virginia.

Specifications

There are two sections of specifications - I. Special Provisions and II. Technical Specifications. Design specifications should include both of these sections plus a Table of Contents, any Boring Logs, the Contractor's Bid Schedule, and the Engineer's Estimate.

I. SPECIAL PROVISIONS

This section includes:

1. LOCATION / SITE DESCRIPTION
2. REFERENCE SPECIFICATIONS / DEFINITIONS
3. SCOPE OF WORK
4. BIDDERS TO EXAMINE LOCATION
5. SCHEDULE OF WORK
6. MEASUREMENT OF QUANTITIES
7. BORROW (DISPOSAL) AREAS
8. DISPOSAL OF UNSUITABLE MATERIAL
9. INTERPRETATION OF APPROXIMATE ESTIMATE OF QUANTITIES
10. SAFETY
11. REGULATIONS
12. LAWS TO BE OBSERVED
13. PERMITS, LICENSES AND FEES
14. ELECTRICITY, WATER SUPPLY AND SANITARY FACILITIES
15. UTILITIES AND OTHER OBSTRUCTIONS
16. SITE CLEANUP
17. ROCK BLASTING
18. TEMPORARY ACCESS ROADS
19. TRAFFIC CONTROL
20. SITE CONDITIONS AND ENVIRONMENTAL PROTECTION
21. CONTROL AND REVIEW OF WORK BY THE ENGINEER
22. CITATION OF OTHER SPECIFICATIONS
23. NPDES STORMWATER PERMIT GUIDELINES

Generally, the language for each of these sections is standard. However, there are some sections that address items that are specific to the particular project concerned; e.g.,

1. Location/Site Description, 3. Scope of Work, 8. Permits, Licenses and Fees, and 15. Utilities and Other Obstructions.

1. LOCATION / SITE DESCRIPTION

[Enter a narrative description of the site and directions to the site here, and include a location map of the project area on a County highway map]

2. REFERENCE SPECIFICATIONS / DEFINITIONS

All references to “Owner” in these Specifications shall mean West Virginia Department of Environmental Protection (WVDEP), Office of Abandoned Mine Lands.

All reference to “Engineer” in these Specifications shall mean the Owner's Engineer or authorized representative or the WVDEP.

All reference to “ASTM” shall mean the American Society of Testing and Material Specifications, Latest Edition unless otherwise noted.

All reference to “AASHTO Specifications” shall mean the Standard Specifications for Transportation Materials and Methods of Sampling and Testing by the American Association of State Highway and Transportation Officials, latest edition, and all subsequent addenda thereto.

All reference to “WVDOH Standard Specifications” shall mean State of West Virginia Department of Transportation, Division of Highways Standard Specifications for Roads and Bridges, adopted 2000, and all-subsequent addenda thereto.

All references to the “Contractor” shall be understood to mean the successful bidder and or firm or corporation undertaking the execution of the work under the terms of these Specifications.

All reference to “OSHA” shall be understood to mean The Occupational Safety and Health Administration and the standards set in the Occupational Safety and Health Act of 1970.

All reference to “refuse” and/or “mine spoil” shall be understood to mean all coal refuse, shale, sandstone and other rock fragments that were generated and disposed of as such within the project area during mining and processing of coal.

All reference to “AMD” shall be understood to mean all acid or alkaline mine drainage discharges from the project site.

All reference to “OSMRE” shall be understood to mean Office of Surface Mining Reclamation and Enforcement.

3. SCOPE OF WORK

The work covered by the Special Provisions and Technical Specifications consists of furnishing all labor, plant, power, equipment and supplies, and performing all operations necessary for the completion of the project. The Contractor shall perform all operations necessary for:

[Enter the items included in the scope of work in bulletized format here]

The Contractor also shall be responsible for surveying, including establishing construction baseline, measuring and developing all completed quantities on the job, and for ordering, purchase and delivery of any and all materials required for construction or required for development of support areas. The Contractor shall perform all other operations as incidental to the program as specified herein.

4. BIDDERS TO EXAMINE LOCATION

Prospective bidders are required to examine the locations of the proposed work and to determine, each in their own way, the difficulties which may be encountered in the prosecution of the same. The submission of a bid shall be prima facie evidence that such examination and determinations have been made by the Bidder. No claims for additional compensation will be considered by the Owner based on obstruction or conditions at the location of the work, which may add to the difficulties or costs of construction, even though such obstructions or conditions are not shown on the contract plans or indicated in the other construction documents. Prospective bidders are advised that should they deem it necessary to obtain any subsurface samples of test borings etc., at the site, they should obtain their own permission from the landowners.

5. SCHEDULE OF WORK

Before commencing work on this project, the Contractor shall prepare and submit a schedule of construction activities for approval by the Owner.

The Contractor shall provide adequate supervision, labor, tools, equipment, and materials to prosecute the work energetically and complete the work within the time specified.

It is the intention not to delay the work for the checking of lines or grades, but if necessary, working operations shall be suspended for such reasonable time as the Engineer may require for the purpose. No special compensation shall be paid for the cost to the Contractor for any of the work or delay occasioned by checking lines and grades, by making other necessary measurements, or by inspection.

The Contractor's work hours for this project shall be from 7:00 a.m. to 7:00 p.m. Monday through Saturday. Work on Sunday and major holidays, as defined by the Engineer, will not be allowed on this project.

6. MEASUREMENT OF QUANTITIES

The Contractor shall be responsible for providing all necessary volumetric, dimension, and weight measurement equipment necessary to prosecute the work as shown on the Construction Drawings and to accurately determine quantities for payment of Contract Bid Items as approved by the Engineer. Such measurements and equipment shall be subject to the approval of the Engineer for use in this project.

7. BORROW (DISPOSAL) AREAS

All borrow (disposal) areas must be approved by WVDEP. Should the Contractor decide to obtain and utilize any borrow areas outside of construction limits, or move material from one property owner to another unless designated, the Contractor shall be responsible to obtain from the property owner(s) of the borrow areas, all necessary rights of entry, including rights of entry for WVDEP and OSMRE for inspection purposes. The said rights of entry agreement must state that the property owner(s) agree to indemnify and hold harmless the WVDEP from all liability and/or damages resulting from the contractor's use of property for which the contractor was to obtain rights of entry for borrow, disposal, access or other purposes. Said indemnification shall include, but is not limited to, liability and damages resulting from the contractor's failure to obtain any or not all the rights of entry; failure to obtain the proper rights of entry; failure to utilize appropriate language in the rights of entry agreements; or failure to obtain permission and signature of all persons or entities holding a legal interest in the subject property(ies) covered by the rights of entry.

The Contractor also shall submit a borrow area reclamation plan for prior approval by WVDEP. The Contractor shall observe the following NEPA compliance schedule relative to selecting and utilizing any off site borrow areas and or any waste disposal areas.

- a. No borrow (disposal) site operations will affect a site listed in, eligible or proposed to be listed in the National Register of Historic Places.
- b. No borrow (disposal) operations will be located within one-quarter mile of any Federally listed established or prospective component of the National Wild and Scenic River System under 16 USC 1274 and 1276.
- c. Borrow (disposal) site operations will not cause a significant encroachment within the base floodplain (CE.O. 11988: Floodplain Management).
- d. Borrow (disposal) site operations will not be located in or affect a critical habitat of a Federally listed endangered or threatened species under 16 USC 1531, et. seq.
- e. No borrow (disposal) operations will occur in wetland areas which are designated by appropriate agencies.

- f. Borrow (disposal) site operations will be consistent with any approved plans governing ambient air quality.
- g. Adherence to these mitigation measures does not relieve the Contractor of the obligation or responsibility to obtain any other Federal, State, or local approvals required to use borrow (disposal) areas and conduct such activities.
- h. Documentation: Copies of borrow (disposal) site approvals and concurrences will be submitted to the WVDEP prior to the commencement of reclamation activities.
- i. Site Monitoring: Borrow (disposal) activities will be monitored by the State to ensure compliance with contractual requirements, applicable Federal, State, and local laws, and any permit conditions.

8. DISPOSAL OF UNSUITABLE MATERIAL

All waste areas shall be obtained in accordance with Special Provisions Section VII. of these specifications. All unsuitable materials (wood, trash, debris, and garbage) as determined by the Engineer, shall be wasted by the Contractor, at his/her expense, outside the limits of work conforming to the requirements of the applicable sub-sections of Section 4.0 of these Specifications. Wood may be burned in conformity with the applicable sub-sections of Sections 4.0 of these Specifications.

The Contractor shall observe the NEPA compliance schedule relative to selecting and utilizing any off-site disposal areas in accordance with Special Provisions Section VII of these Specifications.

9. INTERPRETATION OF APPROXIMATE ESTIMATE OF QUANTITIES

The estimate of quantities of work to be done and/or materials to be furnished under the Special Provisions and Technical Specifications, as shown on the Contract Bid Schedule, is approximate and is given only as a basis of calculation upon which the award of the Contract is to be made. WVDEP reserves the right to increase or decrease any or all of the quantities of work or to omit any of them, as it may deem necessary.

10. SAFETY

All regulations of the Occupational Safety and Health Act of 1970 (OSHA) are in effect for this Contract. WVDEP shall not be liable for any citations received by the Contractor as a result of failure to comply with applicable OSHA standards. Compensation is to be included in the various items of the Contract for the expense involved in complying with these standards. In addition, the Contractor shall comply with Section 107.7 of the WVDOH Standard Specifications regarding public convenience and safety.

11. REGULATIONS

All appropriate Township, County, State, and Federal Regulations shall apply to this Contract. It shall be the Contractor's sole responsibility to be aware of these regulations and to comply with them. WVDEP shall not be liable for any citations received by the Contractor. The Contractor shall keep the existing roads open and safe to public vehicular traffic at all times and shall provide appropriate barriers and warning devices as directed by the Engineer.

12. LAWS TO BE OBSERVED

The Contractor shall at all times, observe, comply with, and post as required all Federal, State, and local laws, ordinances, and regulations in any manner affecting the conduct of the work or applying to employees on the project as well as all orders or decrees which have been or may be promulgated or enacted by any legal bodies or tribunals having authority or jurisdiction over the work, materials, employees, or Contract. The Contractor shall protect and indemnify WVDEP and its representatives against any claim or liability arising from or based on the violation of any such law, ordinance, regulation, order, or decree whether by the Contractor or by the Contractor's employees.

13. PERMITS, LICENSES AND FEES

The WVDEP shall provide the NPDES Stormwater permit from the Division of Water and Waste Management, a WVDOH Encroachment permit if required, the Water Quality Certification from the Division of Water and Waste Management and an ACOE Regional permit if required. The Contractor shall procure all other permits and licenses, pay all charges and fees, and give all notices necessary and incidental to the due and lawful prosecution of the work. Permits required for this project may include but are not limited to: a Stream Activity permit from the WV Division of Natural Resources and burning permits from the WV Division of Forestry and WVDEP, Division of Air Quality. A copy of the permits as procured shall be furnished to the Owner prior to initiation of the work under this Contract.

[List the permits provided by WVDEP and/or required to be obtained by the contractor for this project here]

14. ELECTRICITY, WATER SUPPLY AND SANITARY FACILITIES

There are no available supplies at the site of electricity and water and, additionally, there are no sanitary facilities. Arrangements for electric service, water supply and sanitary facilities shall be made by the Contractor, and all costs for such arrangements shall be borne by the Contractor at no additional cost to the Department.

15. UTILITIES AND OTHER OBSTRUCTIONS

The Contractor shall be solely responsible to correctly locate all existing active underground and overhead utilities at the project sites and take precautions to avoid damage to them. Any existing utility lines damaged by the Contractor shall be replaced by the Contractor or repaired at no cost to the Owner. The Contractor shall notify the utility companies likely to be affected well in advance and before beginning any work within the project sites. In the event of damage to the existing utilities or other facilities, the Contractor shall notify the affected utility Owner(s) and the Engineer immediately and make, or have made, all necessary repairs and bear the expense thereof and resulting damaged caused thereby. It shall be the responsibility of the Contractor to arrange for relocating the utility lines, where required and as directed by the Engineer, in accordance with the guidelines set forth by the utility company, prior to beginning construction. The Contractor will be reimbursed for actual charges invoiced by the Utility Company, except for utilities that are subject to regulation by the Public Service Commission, in which case, payment will be made directly to the affected utility by the WVDEP. The utility companies (and WVMIS) must be contacted by the Contractor at least one week prior to commencement of construction activities for the purpose of field locating and marking utility owned facilities within the project area.

The name, address, and phone number of the WVMIS Utility location service and of the utility companies are as follows:

WVMIS
1-800-245-4848

[For projects where it is known that utility relocation is necessary, specific information regarding the affected utilities shall be provided here]

[For utilities that are subject to regulation by the Public Service Commission, language should be provided here indicating that payment will be made directly to the affected utility by the WVDEP, as opposed to reimbursement to the contractor for actual charges invoiced by the utility company]

16. SITE CLEANUP

Before the project shall be considered as having been satisfactorily completed, the Contractor shall clean and remove, from the project site, all surplus and discarded materials, and equipment and shall further remove all debris and objectionable materials of any kind from areas used or disturbed by the construction operations within or within sight of the project area.

17. ROCK BLASTING

All blasting operations shall be conducted in strict accordance with applicable State and Federal laws relating to rock blasting and the storage and use of explosives. The contractor shall maintain and keep in full force and effect blasting insurance to protect

and indemnify the Owner and/or his agents or representative from claims for damages and shall defend all suits at law. The Contractor shall submit to the Owner a request for permission to blast rock, a reclamation plan for the area to be disturbed, and proof of blasting insurance coverage prior to initiating blasting operations. Failure to obtain approval for blasting prior to initiating the work will result in no payment for items utilizing this rock.

18. TEMPORARY ACCESS ROADS

The Contractor shall construct and maintain temporary access roads for convenient access to the various parts of the work, and for other necessary purposes incidental to the performance of this Contract. The location of access roads shall be approved by the Engineer prior to construction. No separate payment for construction and maintenance of such roads will be made. The Contractor shall erect such temporary fences or guards as may be necessary to keep unauthorized persons away from the work. Grading and surfacing of temporary access roads, excavations, fills and embankments for purposes of construction, or for convenience, beyond the limits of ordered excavations and all temporary fences and guards, shall be provided by the Contractor and shall be maintained in good condition. The Contractor shall be required to maintain all roads used by the hauling equipment in a dust-controlled condition. Upon completion, the Contractor shall return the disturbed areas to the approximate original condition as approved by the Engineer.

The contractor shall be required to obtain a right of entry agreement from any property owner(s) prior to the utilization or construction of any access outside of the construction limits shown on the plans. Such agreement shall require the property owner(s) to indemnify and hold WVDEP harmless from any and all injuries or damages, whatsoever, resulting from the Contractor's use of the property.

19. TRAFFIC CONTROL

The Contractor shall maintain and protect traffic, protect the work in progress, protect adjacent property from excess dust resulting from the construction and maintain traffic through, around, or adjacent to the construction area. All materials used for traffic control shall be in accordance with the current WVDOH manual: "Traffic Control for Streets and Highway Construction and Maintenance Operations." A copy of the operational plan accepted by the WVDOH shall be submitted to the WVDEP for approval prior to its implementation. All traffic control required during the work shall be considered incidental to the project.

20. SITE CONDITIONS AND ENVIRONMENTAL PROTECTION

Conditions at the site shall be examined by the Contractor, and the Contractor shall assume responsibility as to the contours and the character of the earth, rock, water and other items that may be encountered during the excavation and filling operations.

The Contractor shall be responsible for controlling and handling water encountered during construction, including dewatering of mine pools for mine seal installations, by providing equipment and labor to insure safe and proper construction. The Contractor shall submit a plan to the WVDEP at the pre-construction meeting for approval. The WVDEP's approval of this plan does not relieve the Contractor of his responsibility for controlling water.

The Contractor shall be responsible for the operation and maintenance of any required diversion or pumping facilities for removing ground water from work areas during the progress of the work under this Contract.

The Contractor shall be responsible for furnishing all materials, equipment, labor and incidentals necessary for the installation of silt barriers and check dams as designated in the drawings. Sediment control shall be placed on regraded areas concurrent with construction and prior to revegetation.

The Contractor shall be responsible for implementing the measures called for in the NPDES Stormwater permit provided by the WVDEP for erosion and sediment control. Sediment control measures shall be in-place and operational prior to any disturbance occurring in the project area. The WVDEP's approval of this plan does not relieve the Contractor of his responsibility to be in compliance with any laws and/or permits.

The Contractor shall take any necessary steps to prevent erosion or silting problems from occurring and to minimize pollution or sedimentation of the stream. If any such problems develop, the Contractor shall be responsible to take immediate corrective action.

The Contractor shall be responsible for the repair or replacement of streets or driveways (blacktop, gravel & concrete), trees, shrubs, fences, and any other physical features that are disturbed by construction which were not included in the proposed scope of work for the project to original condition or better at his own expense.

The Contractor shall be responsible for the replacement of any existing boundary or corner markers disturbed by construction activities.

21. CONTROL AND REVIEW OF WORK BY THE ENGINEER

All services rendered by the Engineer consist of professional opinions and recommendations made in accordance with generally accepted engineering practice. Under no circumstances is it the intent of the Engineer to directly control the physical activities of the Contractor or the Contractor's workmen's accomplishment of work on this project.

The presence of the Department's Field Representative and/or Engineer at the site is to provide the Department a continuing source of professional advice, opinions and recommendations based upon the Field Representative's and/or Engineer's observations of the Contractor's work and does not include any superintending, supervision or direction of the actual work of the Contractor or the Contractor's workmen.

Any construction review of the Contractor's performance conducted by the Engineer is not intended to include review of the adequacy of the Contractor's safety measures in, or near, the construction site.

22. CITATION OF OTHER SPECIFICATIONS

Whenever the Specifications for this Contract refer to the specifications of any society, institute, association or government organization, then such specifications cited shall become a part of this Contract as if written in full. Commonly used abbreviations have the following meanings:

ASTM - American Society for Testing Materials

ASA - American Standards Association

AWWA - American Water Works Association

AASHTO - American Association of State Highway and Transportation Officials

ACI - American Concrete Institute

WVDOT - West Virginia Department of Transportation

WVDOH - West Virginia Division of Highways

Where reference is made to a specification, it shall be the latest revision at the time called for bids, except as noted on the Plans or elsewhere herein.

23. NPDES STORMWATER PERMIT GUIDELINES

VEGETATIVE PRACTICES

Except as noted below, stabilization measures shall be initiated as soon as practicable in portions of the site where construction activities have temporarily or permanently ceased, but in no case more than seven days after the construction activity in that portion of the site has permanently ceased.

- Where the initiation of stabilization measures by the fourth day after construction activity temporarily or permanently ceases is precluded by snow cover, stabilization measures shall be initiated as soon as conditions allow.
- Where construction activity will resume on a portion of the site within 21 days from when activities ceased, (e.g., the total time period that construction activity is temporarily halted is less than 21 days) then stabilization measures do not have to be initiated on that portion of the site by the seventh day after construction activities have temporarily ceased.

Areas where the seed has failed to germinate adequately (uniform perennial vegetative cover with a density of 70%) within 30 days after seeding and mulching must be reseeded immediately, or as soon as weather conditions allow.

Diversions must be stabilized prior to becoming functional.

MAINTENANCE & INSPECTION

At a minimum, all erosion and sediment controls on the site will be inspected at least once every seven calendar days and within 24 hours after any storm event of greater than 0.5 inches of rain per 24-hour period.

All controls should be cleaned out when sediment reaches one half the sediment capacity of that control.

Inspection and maintenance records must be kept onsite.

EROSION & SEDIMENT CONTROL CONSTRUCTION SEQUENCE

1. Install stabilized construction entrance as shown on site plans.
2. Install perimeter sediment control devices as shown on site plans.
3. Clear and grub site.
4. Provide sediment control for any topsoil stockpiles.
5. Commence rough grading of site. Continue to maintain and inspect all erosion and sediment controls.
6. Install additional erosion and sediment controls as shown on site plans.

7. Fine grade site.
8. Permanently seed and mulch all disturbed areas within 7 days of reaching final grade.
9. Upon completion of project including adequate stabilization, remove all remaining erosion and sediment controls.

II. TECHNICAL SPECIFICATIONS

The first ten numbered sections of the Technical Specifications are reserved for the following items:

- 1.0 MOBILIZATION AND DEMOBILIZATION
- 2.0 CONSTRUCTION LAYOUT STAKES
- 3.0 QUALITY CONTROL
- 4.0 SITE PREPARATION
- 5.0 EROSION AND SEDIMENT CONTROL
- 6.0 REVEGETATION
- 7.0 DRAINAGE STRUCTURES
- 8.0 UNCLASSIFIED EXCAVATION
- 9.0 MINE SEALS
- 10.0 SUB-SURFACE DRAINS

If a particular section is not applicable to the project then it shall be skipped over, but the designated identification number shall be retained. Any additional sections required shall begin with number 11.0. Boring Logs, if applicable, shall be the last designated section. The boring logs should reflect the water level at a minimum of 24 hours after completion of drilling for those that had piezometers installed. The Contractor's Bid Schedule and the Engineer's Estimate shall be provided as attachments to the Design Specifications.

The following sub-sections are common to every section of the Technical Specifications except Boring Logs:

- x.1 Description
- x.2 Method of Measurement
- x.3 Basis of Payment
- x.4 Pay Items

The "Description" sub-section shall be utilized to describe the work involved in the Section of the specifications in which it is included.

The "Method of Measurement" sub-section in the specifications is to be utilized to indicate the units by which each particular pay item will be measured and paid.

The "Basis of Payment" sub-section is to be utilized to indicate what the payment covers; e.g., labor, materials, equipment, incidental items, etc.

The "Pay Items" sub-section shall list the individual pay items that are addressed in the Section of the specifications in which it is included. Each pay item shall be identified by an item number, a description of the item, and the units of payment. The item numbers shall indicate the applicable section of the specifications followed by "point 1, 2, 3, etc. in consecutive ascending order". The pay items should be listed in sequential order as they are addressed in the section of the specifications. If there is only a single pay item

for the Section, then it shall be identified by the section number followed by “point 0”.

Additionally, if the “Materials” and/or “Construction Methods” sub-sections are applicable to a particular section, then **the specifications should address the “specific” materials and construction methods identified by the standard details in the appropriate section of the specifications for each particular detail.**

1.0 MOBILIZATION AND DEMOBLIATION

This section should include sub-sections as follows:

- 1.1 Description
- 1.2 Method of Measurement
- 1.3 Basis of Payment
- 1.4 Pay Item

Language should be provided under sub-section 1.3 indicating that partial payments for this pay item will be as follows:

- (a) One-half of the amount bid will be released to the Contractor with the first estimate payable, not less than 15 days after the start of work at the project site.
- (b) The final one-half of the amount bid shall be released with the estimate payable after the work is accepted by the WVDEP and when all “As-Built” drawings are submitted and approved by WVDEP.

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2.0 CONSTRUCTION LAYOUT STAKES

This section should include sub-sections as follows:

- 2.1 Description
- 2.2 Materials
- 2.3 Construction Methods
- 2.4 Method of Measurement
- 2.5 Basis of Payment
- 2.6 Pay Item

The preparation of as-built plans shall be addressed in this section. Language should be provided indicating that the final one-half of the amount bid for “Mobilization and Demobilization” will be held until submittal and approval of the as-built drawings. The as-builts shall consist of hard copies and two copies on CD-ROM in AutoCad Release 2007 format.

The as-built plans shall include the vertical and horizontal locations of all buried components depicted on the plans and herein specified:

- a. As-built plans shall include the vertical and horizontal locations of all installed pipes and associated drop inlets.
- b. In addition, as-built plans shall show the vertical and horizontal location of any and all mine seals and subsurface drains, including bottom of drain, pipe inverts, and top of buried subsurface drain, installed for this project.

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3.0 QUALITY CONTROL

This section should include sub-sections as follows:

- 3.1 Description
- 3.2 Materials
- 3.3 Construction Methods
- 3.4 Method of Measurement
- 3.5 Basis of Payment
- 3.6 Pay Item

Specifications should be provided in this section identifying the testing requirements for all quality control work associated with compressive strength of concrete and grout; compaction of mine spoil, soil, rock, coal refuse, or any other materials encountered in the grading operations or placement of fill material for embankments; soil nutrient and lime requirements for soil; gradation, durability, and acid/base requirements for riprap and/or aggregate; and any other items relevant to quality control for the project.

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4.0 SITE PREPARATION

This section should include sub-sections as follows:

- 4.1 Description
- 4.2 Materials
- 4.3 Construction Methods
- 4.4 Method of Measurement
- 4.5 Basis of Payment
- 4.6 Pay Items

If applicable to the project, “Clearing and Grubbing”, “Demolition of Structures”, “Access Road Construction”, “Access Road Rehabilitation”, “Fence Replacement”, “Temporary Fencing”, and/or “Gate Installation” should be addressed as sub-sections under sub-section 4.1, “Description” of the specifications.

This section may or may not include pay items for Clearing and Grubbing, Demolition of Structures, Access Road Construction, Access Road Rehabilitation, Fence Replacement, Temporary Fencing, and/or Gate Installation. If any of these items are required they shall be addressed as sub-sections under 4.1 Description. If none of these items is required, then the pay item should be identified as 4.0 "Site Preparation", in which case any work associated with these items, including Clearing and Grubbing, shall be included in the lump sum price bid for "Site Preparation". If any of the listed items need to be provided, and one of them is Clearing and Grubbing, then the term "Clearing and Grubbing" should be used instead of the term "Site Preparation" to identify one of the pay items and the applicable term from the above listed items for the others. "Site Preparation" is an all inclusive term to be used when none of the items involved warrant separate pay items.

The bid amount limitation for Items 1.0 through 4.0 is typically as follows:

Item 1.0, "Mobilization and Demobilization", per lump sum. Cannot exceed 10% of the total amount bid for the project.

Item 2.0, "Construction Layout Stakes", per lump sum. Cannot exceed 5% of the total amount bid for the project.

Item 3.0, "Quality Control", per lump sum. Cannot exceed 3% of the total amount bid for the project.

Item 4.0, "Site Preparation", per lump sum. Cannot exceed 10% of the total amount bid for the project.

If multiple bid items are provided for Section 4.0, and one of them is Clearing and Grubbing, then the 10% limitation shall be applied to Item 4.1, "Clearing and Grubbing", per lump sum.

Bear in mind that the stipulated percentages may and should be revised up or down, when conditions warrant, to reflect the level of work being performed, such as when limited clearing and grubbing is proposed on the project.

The following standard specifications shall be provided in sub-section 4.3 if Clearing and Grubbing is applicable to the project:

4.3.1 All timber eight (8) inches in diameter and larger at stump height shall be saw cut prior to grubbing operations. Timber shall be topped with the branches removed and stacked and stockpiled in an appropriate manner in an accessible location approved by the WVDEP on the property from which it was cut. Timber to be stockpiled shall not be pushed down by equipment prior to being cut nor can it be indiscriminately shoved into a stockpile.

4.3.2 All organic material shall be burned completely to ash or otherwise removed from the site and disposed of in a manner approved by the WVDEP. Burning of

the combustible material will not be permitted on or near refuse, mine portals or within close proximity to coal seams or utilities. The Contractor shall obtain all permits and licenses required prior to burning the material. A plan showing the location of material to be burned and all fire control measures to be implemented, including copies of permits and licenses, shall be submitted to the WVDEP's representative at the site for approval.

- 4.3.3 All other materials generated from required clearing and grubbing operations shall be removed and disposed of by the Contractor. All garbage, construction debris, mining debris, etc., shall be disposed of in approved waste areas or landfills. It shall be the responsibility of the Contractor to obtain, at no expense to the WVDEP, all necessary waste and borrow areas or landfills for the disposal of waste materials in accordance with any applicable local, state, and/or federal regulations including compliance with NEPA requirements (See Section 7. for NEPA Compliance Schedule). All waste and borrow areas must be approved by the WVDEP and, the Contractor must provide a reclamation plan for approval. In addition, for all waste and borrow areas outside the construction limits, the Contractor must obtain from the property owner a right-of-entry agreement in which the property owner indemnifies and holds the WVDEP harmless from any injury or damages whatsoever resulting from the use of the property.

The following standard specifications shall be provided in sub-section 4.3 if Demolition of Structures is applicable to the project:

- 4.3.4 Trash, garbage, railroad ties, roofing shingles, tires, plastic, metal and other unsuitable material resulting from demolition shall be disposed of by the Contractor at his/her own responsibility and expense outside the work limits in an approved landfill, as approved by the Engineer, unless otherwise directed.
- 4.3.5 Demolished concrete, foundation ruins, bricks, stone and cinder blocks, to be incorporated into the fill shall be of size less than two feet in any dimension and shall be buried at least one foot below finished grade. Hollow core cinder blocks shall be crushed prior to incorporation into the fill.
- 4.3.6 In the area where structures and buildings are demolished and removed, the removal operation shall extend to 1 foot below finished grade. The area shall then be regraded as necessary to blend into adjacent finished grades. Regrading shall be such that all areas are free draining and surface runoff will not pool or impound as directed by the Engineer.

The following standard specification shall be provided in sub-section 4.3 if Access Road Rehabilitation is applicable to the project:

- 4.3.7 Stone to be placed for "Access Road Rehabilitation" shall conform to the requirements for Class 1 Aggregate as described in Table 704.6.2A and Section

704.6 of the WVDOH **Standard Specifications for Roads and Bridges**, Adopted 2000. After final reclamation work has been completed, all utilized access roads will be covered with a 4-inch layer of stone to be paid by the tonnage used.

The following standard specification shall be provided in sub-section 4.3 if Fence Replacement and/or Temporary Fencing are applicable to the project:

4.3.8 Any existing fence lines encountered during construction activities shall be removed, repaired or replaced to an “as good as” or “better than” condition and as approved by the WVDEP. In situations where fencing is used to control or contain cattle and livestock, the Contractor shall also be responsible for any temporary fencing required to assure the safety and containment of the livestock.

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5.0 EROSION AND SEDIMENT CONTROL

This section should include sub-sections as follows:

- 5.1 Description
- 5.2 Materials
- 5.3 Maintenance
- 5.4 Installation
- 5.5 Removal
- 5.6 Method of Measurement
- 5.7 Basis of Payment
- 5.8 Pay Item

Silt fence may be utilized for erosion control in addition to sediment control with the approval of the WVDEP, but straw bales may only be utilized for erosion control and not sediment control. Therefore, the pay items for erosion and sediment control should be identified by the type of material utilized for erosion or sediment control; e.g., straw bale barrier, silt fence, super silt fence, rock check dams, etc. In addition, a pay item should be provided for “Stone Construction Entrance”, per each, if required by the NPDES Stormwater Permit.

In addition, this section should specifically address the conditions set forth in the NPDES Stormwater Permit and should be in strict compliance with the Division of Water and Waste Management’s policies regarding best management practices for erosion and sediment control. The website for Guidelines and Specifications for Best Management Practices for Control of Sedimentation may be accessed at www.dep.wv.gov/wwe/permit/pages/default.aspx.

6.0 REVEGETATION

This section should include sub-sections as follows:

- 6.1 Description
- 6.2 Materials
- 6.3 Construction Methods
- 6.4 Method of Measurement
- 6.5 Basis of Payment
- 6.6 Pay Item

Language should be provided under sub-section 6.2 indicating the following:

- 6.2.1 Fertilizer to be used shall be 10-20-20 grade and shall be applied at a rate of 1000 lbs/acre.
- 6.2.2 Lime to be used shall be an agricultural grade limestone consisting of not less than 75% total carbonates. The application rate shall be formulated from soil test results, but in the absence of testing, a rate of three (3) tons per acre shall serve as the preferred minimum.
- 6.2.3 The following seed mixtures shall be considered as the standard:

TEMPORARY SEED MIXTURE				
Variety of Seed	Spring 3/15-5/15	Summer 5/15-8/15	Fall 8/15-10/15	Winter 10/15-11/15
	-----lbs./acre-----			
Annual Ryegrass (Lolium multiflorum)	40		40	
German Millet (Setaria italica)		40		
Cereal Rye (Secale cereale)				170
*Do not use Japanese Millet				

LAWN SEED MIXTURE			
Rate of Application	Seed Variety	Minimum Specifications	
---lbs. / 1,000 sq. ft.---		% Purity	% Total Germination
0.45	Red Fescue (Pennlawn)	98	85
0.90	Kentucky Bluegrass	85	75
0.70	Merion Bluegrass	90	75
0.20	Annual Ryegrass*	95	85

*Use Annual ryegrass only in mixtures seeded after August 15 and before May 15.

PERMANENT SEED MIXTURE		
	SPRING 3/15-5/15	FALL 8/15-10/15
Variety of Seed*	-----lbs./acre-----	
Orchardgrass (<i>Dactylis glomerata</i>)	30	30
Birdsfoot Trefoil 1. (<i>Lotus corniculatus</i>)	15	15
Red Clover (<i>Trifolium pretense</i>)	10	10
Annual Ryegrass 2. (<i>Lolium multiflorum</i>)	25	25
Spring Oats Or	35	0
Winter Wheat	0	90

1. Herbaceous legumes must be treated with the appropriate bacterium before seeding. *On areas that are steeply sloping (steeper than 1.7:1), slide prone, swales, or drainage conveyance structures substitute Crownvetch (*Coronilla varia*) at 20 lbs./acre for Birdsfoot Trefoil.*

2. Use Annual Ryegrass only in mixtures seeded after August 15 and before May 15.

* Use only certified “blue tag” seed. Seed-rate suggested is for pure live seed (PLS) in lbs/acre.

6.2.4 Mulch shall consist of baled straw mulch or wood cellulose fiber. Straw mulch shall be applied at a rate of 2 tons/acre. The straw mulch shall be anchored with 100 gals/acre asphalt emulsion or 750 lbs/acre wood cellulose fiber. Wood cellulose fiber mulch may only be used on slopes steeper than 2H:1V at a rate of 1,500 lbs/acre, and only with the approval of the WVDEP.

Language should be provided in sub-section 6.3 giving the contractor the option of utilizing permanent seed mix instead of temporary seed mix when seeding outside of the

designated seeding season dates for permanent vegetation for seeding operations conducted on areas that have reached final grade (areas that will not require further disturbance) provided that these areas shall be reseeded with permanent seed mix at no additional cost to the WVDEP should adequate vegetation (as determined by the WVDEP) fail to be established from the initial seeding.

Additionally, if “Reforestation” is to be part of the scope of work for the project, then it should be addressed in this section.

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7.0 DRAINAGE STRUCTURES

This section should include sub-sections as follows:

- 7.1 Description
- 7.2 Materials
- 7.3 Construction Methods
- 7.4 Method of Measurement
- 7.5 Basis of Payment
- 7.6 Pay Items

Drainage channels shall be designed on the 10 yr – 24 hr precipitation event. One-half foot of freeboard shall be added to the design flow depth to arrive at the total depth of the channel. The total depth shall be rounded to the nearest half foot. Riprap and grouted riprap channels may be “vee” ditch or trapezoidal ditch. However, no trapezoidal design ditch shall be acceptable with less than a 4.0-foot minimum bottom width. Riprap for drainage channels shall be in accordance with the riprap sizing chart included in the standard details. The thickness of riprap for the channels shall be $1.5D_{50}$. Drainage channels should be extended to outlet into an existing stable drainway if practical. If not practical, then the end of the drainage channel should be transitioned to spread out the flow and reduce the hydraulic energy.

The following standard specifications, if applicable to the project, shall be provided in sub-section 7.2 of these specifications:

- 7.2.1 The Contractor should be aware that no provisions have been made to obtain rock on site. All rock riprap used throughout the project site shall consist of locally available, commercially purchased, calcareous stone (except as noted otherwise) meeting the following requirements. The rock riprap required for the drainage channels shall have a calcium carbonate equivalency of 70% or greater. The rock riprap shall have a maximum weighted loss of thirty percent when subjected to five (5) cycles

of the Sodium Sulfate Soundness Test – ASTM C88 (ASTM C88-99a Standard Test Method for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate), as modified by the American Association of State Highway and Transportation Officials (AASHTO) T-104. The use of on-site rock materials for riprap may be permitted with prior approval from the WVDEP in special circumstances. In order to be considered for use as riprap, the rock shall be subjected to laboratory testing and is required to be certified by the testing laboratory as non-acid producing. A certification on calcium carbonate equivalency and sodium sulfate soundness test shall be submitted to the WVDEP prior to delivery.

- 7.2.2 Grout to be used in the grouted riprap ditches shall consist of a mixture of one part Type II sulfate resistant Portland Cement and three parts sand, using water to produce a workable consistency. The amount of water shall be as approved or as designated by the WVDEP.

The minimum required compressive strength of the grout shall be 2000 psi @ 28 days. All testing shall be the responsibility of the contractor as part of Section 3.0 of these specifications.

- 7.2.3 Backfill for the pipes extending beneath the paved roads shall be Controlled Low Strength Material (Flowable Fill) in accordance with **Section 219** of the WVDOH Standard Specifications for Roads and Bridges, Adopted 2000. The Controlled Low Strength Material composition and mixture shall also comply with said **Section 219**, type B of the WVDOT Specifications. The Controlled Low Strength Material shall have a minimum 28 day compressive strength of 50 psi.

The following standard specifications, if applicable to the project, shall be provided in subsection 7.3 of these specifications.

- 7.3.1 Riprap shall be placed in accordance with Section 218.3.2 of the WVDOH Standard Specifications for Roads and Bridges, Adopted 2000.
- 7.3.1.1 The riprap stone furnished on the project shall be certified by the supplier as meeting or exceeding the requirements for size, gradation, durability, and calcium carbonate equivalency as established by these specifications.
- 7.3.2 Grout, where required to be placed on riprap, shall be applied as soon as possible after placement of riprap. The stone shall be thoroughly wet immediately before grout is applied. As soon as grout is deposited on the surface it shall be thoroughly worked into the joints to achieve 100 percent penetration. The stones shall then be brushed so that their top surfaces are exposed. The grout shall be protected from running water to prevent

damage until sufficiently cured.

Curing shall be accomplished by one of two means. A liquid membrane-forming compound for curing concrete may be sprayed on the brushed grouted surface. Curing compounds shall conform to the requirements of Section 707.9 of the WVDOH **Standard Specifications for Roads and Bridges**, Adopted 2000. Alternately, the grouted surface may be covered with white polyethylene sheeting (film) for curing concrete immediately after the stones have been brushed. The sheeting shall conform to the requirements of Section 707.10 of the WVDOH **Standard Specifications for Roads and Bridges**, Adopted 2000. Grouting of riprap channels shall not be initiated unless adequate materials for curing the grouted channels are available on-site. Curing by liquid membrane-forming compound shall be left for 72 hours prior to introduction of water. Likewise, grouted riprap shall remain covered for 72 hours prior to sheeting removal and introduction of water.

7.3.2.1 The contractor is required to prepare one set of test cylinders for every 20 cubic yards of grout applied to ditches for compressive strength testing in accordance with the specifications. For ditches that receive less than 20 cubic yards of grout, a minimum of one set of test cylinders shall be prepared per ditch. A set shall be comprised of three (3) cylinders sampled and made in accordance with ASTM C31 and C39.

7.3.3 Pipe backfill for HDPE culverts extending beneath the paved roads shall be Controlled Low Strength Material according to these specifications. The Controlled Low Strength Material backfill shall extend five (5) feet, minimum, upstream and downstream from existing edge of pavements.

7.3.3.1 For every ten (10) cubic yards of Controlled Low Strength Material placed to backfill culverts extending beneath paved roads, a cylindrical sample shall be prepared for unconfined compression testing according to AASHTO T-22 and determination of the flow mixture shall be made. At a minimum, one flow mixture and sample will be prepared for Controlled Low Strength Material placed on each side of the pipe regardless of the backfill quantity. The samples shall be field cured in accordance with AASHTO T-23 and shall meet or exceed a 28 day break of 50 psi.

7.3.4 Trench excavation exceeding five (5) feet in depth shall be supported with suitable shoring or sides of the excavation shall be cut to stable slopes as recommended in the OSHA Publication "Excavating and Trenching Operations", OSHA 2226 and approved by the Engineer to prevent caving,

slipping or cracking of the sides to protect workmen from any injury. Any shoring installed shall be removed following backfilling the trench.

- 7.3.5 Drainage channels constructed in coal refuse shall be excavated one foot below planned grade and soil material shall be placed and compacted to 95% of Standard Proctor Maximum Dry Density to a thickness of one foot over the refuse prior to placement of channel lining.

(Page Break)

8.0 UNCLASSIFIED EXCAVATION

This section shall include sub-sections as follows:

- 8.1 Description
- 8.2 Materials
- 8.3 Borrow/Disposal Areas
- 8.4 Soil Cover
- 8.5 Construction Methods
- 8.6 Method of Measurement
- 8.7 Basis of payment
- 8.8 Pay Items

Material excavated for soil cover from designated borrow areas shall be paid per cubic yard under “Unclassified Excavation”. Otherwise, designated soil cover material shall be paid per acre of area covered with soil one foot thick.

Language should be provided in this section indicating that the regrading plan shall be conducted in a manner such that a 12-inch thick layer of soil material is uniformly spread over any areas of exposed refuse resulting from the regrading operation and that any exposed refuse within the construction limits that is not being regraded shall be covered with a one foot thick layer of suitable soil material as depicted on the Plan. Language should also be provided indicating that regrading shall be to the lines and grades shown on the Plan and the final grade line includes the one foot thick layer of soil cover.

Any burning refuse located within the construction limits should be addressed by site specific language regarding a plan for extinguishing and handling burning refuse. Burning refuse is defined as refuse that has a temperature of 140 degrees F. or greater.

The Consultant is further advised that the cut and fill areas of the regrading plan should balance according to each individual property owner unless otherwise approved by the WVDEP. Excavated material cannot be moved from one property owner to another without prior authorization from the WVDEP.

The following standard specification shall be provided in sub-section 8.5 of this section:

8.5.1 Excavation

Material excavation shall consist of the required removal of materials from the areas shown and the sloping and finishing of the areas to the required lines and grades as shown on the drawings. The slopes may be varied only by permission of the WVDEP. Any excavation beyond planned grades will not be paid for unless prior authorization is obtained from the Engineer. Slopes shall be trimmed neatly to present a uniform surface, free from hollows and protrusions and loose or overhanging rocks. The tops of all slopes shall be rounded to form a smooth, uniform transition to the existing ground. Areas cut to grade in refuse are to be undercut one foot below the final grades shown on the reclamation plan with final grades achieved with soil cover material.

The reclamation approach described in these construction specifications is intended to provide a lasting, stable configuration. The Contractor is required to exercise care to avoid conditions which may result in unstable conditions during the construction process. The Contractor shall be responsible for protecting residences from damage.

The Contractor must utilize material removal techniques, which are generally considered to be conducive to retaining slope stability. Additionally, disturbed slopes shall be brought to the design template as soon as practical and shall be protected in accordance with Section 6.0, "Revegetation".

8.5.2 Material Placement

Depositing and compacting fill in layers shall be started at the lowest point in the fill below grade, at the bottom of ravines and at the toe of the slope on side hills fills. Prior to fill placement, existing foundation for the embankment will be proof-rolled and all unsuitable material, as determined by the WVDEP, will be removed.

Excavated material shall be placed in embankments in successive layers not to exceed one (1) foot in thickness before compaction. The layers shall be constructed approximately horizontal. Each layer, before starting the next, shall be leveled and smoothed by means of power driven graders, dozers, or other suitable equipment with adequate weight, capacity, and power to do the work. Layers shall be extended across the entire fill at the level of deposition unless otherwise authorized by the WVDEP. Each layer, before starting the next, shall be compacted.

Fill materials to be used in any area of an embankment shall be free from trash, debris, frozen soil, organic material or other foreign material.

Embankment fill and embankment subgrade materials shall be compacted to at least 90% of Standard Proctor maximum dry density at a moisture content of not less than 2% below nor greater than 3% above optimum. Testing shall be at a frequency approved by the WVDEP. One test per day during fill placement shall serve as a minimum.

Embankment fill material which does not contain sufficient moisture to be compacted to the requirements specified herein shall receive applications of water necessary for compaction. Water shall be applied with suitable sprinkling devices and shall be thoroughly incorporated into the material which is to be compacted. Embankment fill material which contains excess moisture shall be dried prior to compaction. Sufficient discing equipment shall be continuously available at the site and shall be used to add water or remove excess moisture from fill materials.

At the close of each day's work, or when work is to be stopped for a period of time, the entire surface of the compacted fill shall be sealed by a method approved by the WVDEP. If, after a prolonged rainfall, the top surface of the embankments are too wet and plastic to work properly, the top material shall be removed to expose firm material. Ruts in the surface of any layer shall be suitably filled or eliminated by grading before compaction. The disturbed areas will be revegetated according to Section 6.0, "Revegetation".

(Page Break)

9.0 MINE SEALS

This section should include sub-sections as follows:

- 9.1 Description
- 9.2 Materials
- 9.3 Construction Methods
- 9.4 Method of Measurement
- 9.5 Basis of Payment
- 9.6 Pay Items

There are three or four types of mine seals that potentially should be addressed under this section. They are: wet mine seal, modified mine seal, and bat gate mine seal. Dry mine seals shall consist of backfilling the mine opening with available on-site material unless otherwise indicated on the Plan.

The Consultant is advised that the design cross-sectional area for a bat gate culvert should approximate the total area of the openings into the mine prior to excavation for installation of the bat gate mine seal as closely as practical.

In accordance with the **Programmatic Consultation on the Abandoned Mine Lands Reclamation Program between the Office of Surface Mining Reclamation and Enforcement Charleston West Virginia Field Office and the U. S. Fish and Wildlife Service Elkins West Virginia Field Office**, the installation of culverted bat gates shall be based upon the specifications provided below.

In the absence of surveys conducted to determine if bats are utilizing an open portal, it shall be assumed that bats are present. If presence of bats is assumed, then bat gates should only be installed between May 1 and August 31 to avoid disturbing hibernating bats. However, there may be an opportunity to finish gate installation between September 1 and October 1, if the weather is warm enough that bats have not begun to hibernate and the construction equipment will not block the portal entrance at night when bats will be exiting to forage.

The following standard specifications shall be provided in sub-section 9.2 of this section:

9.2.1 Stone

The bulkhead stone for wet and modified mine seals shall consist of sound, durable 3” to 6” non-calcareous stone such as that commercially available. Crushed stone shall consist of particles of clean, hard, tough, durable rock, free from adherent coating and meeting the requirements of **Section 703.1** of the **WVDOH Standard Specifications**. Stone shall have a maximum weighted loss of twelve (12) percent when subjected to five (5) cycles of the Sodium Sulfate Soundness Test – **ASTM C88** (ASTM C99-99a Standard Test Method for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate), as modified by the American Association of State Highway and Transportation Officials (**AASHTO**) **T-104**. Non-calcareous stone shall exhibit a fizz of 0 when subjected to dilute hydrochloric acid. A laboratory certification of soundness and fizz shall be submitted to the WVDEP prior to delivery.

In addition, sufficient 3” to 6” non-calcareous crushed stone shall be obtained to level the pipe in the wet and/or modified mine seals as shown on the Plans.

9.2.1.1 The bulkhead stone for bat gate mine seals shall comply with the requirements of Section 9.2.1 of these specifications, except that the stone shall conform to the requirements for #57 stone as described in Table 703.4 of the WVDOH **Standard Specifications for Roads and Bridges**, Adopted 2000.

9.2.2 Filter Fabric

Filter Fabric shall be as specified in Section 715.11.4 of the WVDOH **Standard Specifications for Roads and Bridges**, Adopted 2000.

The following standard specifications shall be provided in sub-section 9.3 of this section:

- 9.3.1 Excavation of the mine opening shall proceed in a manner which will control the release of the mine pool. The opening shall be cleaned of debris to the satisfaction of the Engineer. Once the opening has been cleaned, filter fabric shall be placed on the mine floor and a 6-inch layer of stone shall be placed as pipe bedding. The pipes with risers shall be attached to steel plates and placed in the openings as shown on the attached Plans. The Gravel Bulkhead will be constructed and covered with one layer of Filter Fabric and compacted clay and soil cover as shown on the Plans. Solid pipe shall extend from the mine seal to a riprap channel discharging one foot above the invert of the channel. All pipes shall have a minimum grade of 2 percent.
- 9.3.2 A Dewatering Plan shall be submitted and approved by the Engineer prior to any work taking place. The Contractor shall install and operate a water treatment system utilizing soda ash briquettes in a manner approved by the engineer to maintain a pH between 6.0 and 9.0 in all water above base flow while dewatering mine. The Contractor shall be solely responsible for any damages caused by dewatering activities.
- 9.3.3 The wet mine seals, modified mine seals and bat gate seals will require excavation into the mine entries/collapsed portals for proper installation. The Contractor shall perform this work after taking all necessary precautions with regard to control and treatment of the impounded water, with all work being performed at the risk of the Contractor. The WVDEP accepts no responsibility or liability for any related construction activities. A dewatering plan shall be submitted to the WVDEP for approval prior to seal construction, with pool reduction possibly being provided from above with a well-point system or a similar dewatering scheme.

Construction of wet mine seals, modified mine seals and bat gate seals shall be in accordance with the plan details. Filter fabric shall separate all aggregate/soil interfaces. The clay seal and pipe outlet trenches shall be compacted in accordance with Section 7.3.5 of these specifications. The Contractor shall adhere to OSHA Regulation 29 CFR Part 1926 during all excavation and trenching activities.

- 9.3.4 Any monitoring wells or piezometers which have been left on this project for whosoever's use must be removed and abandoned by a person who has been certified by the State of West Virginia in accordance with 47CSR59, "Monitoring Well Regulations". This certification is necessary for any person to operate in the State of West Virginia and includes construction, installation, alteration and/or abandonment of any monitoring wells and select boreholes. The costs for removal and abandonment shall be considered as incidental to mine seal installation.

Also, language should be provided in this section to address the requirements for the installation and payment of Conveyance Pipe and for the dewatering/treatment and payment of impounded water in the mine.

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10.0 SUB-SURFACE DRAINS

This section should include sub-sections as follows:

- 10.1 Description
- 10.2 Materials
- 10.3 Construction Methods
- 10.4 Method of Measurement
- 10.5 Basis of Payment
- 10.6 Pay Items

There are two types of sub-surface drains; a low flow and a high flow. Specific language should be provided for each as the size, materials, and functionality varies between the two. Also, it should be understood that No. 1 stone bedding will be required under the 3" to 6" stone in the high flow sub-surface drain if there will be a significant load (dead or live) over the constructed drain. Otherwise, the bedding is not required.

Bear in mind that a separate pay item will be required in this section for conveyance pipe for the low flow sub-surface drain since it utilizes eight inch diameter pipe as opposed to twelve inch in the high flow sub-surface drain. The low flow sub-surface drain will hereafter be referred to as seep collector and the high flow sub-surface drain as underdrain.

For just having a sub-surface drain included in the design in anticipation of as needed circumstances, the one that should be provided is the seep collector.

The following standard specifications, if a seep collector is proposed for the project, shall be provided in sub-section 10.2.

- 10.2.1 Stone for seep collector shall consist of crushed, non-calcareous stone aggregate meeting the gradation requirements of AASHTO No. 1 aggregate. Crushed stone shall consist of particles of clean, hard, tough, durable rock, free from adherent coating and meeting the requirements of Section 703.1 of the WVDOH **Standard Specifications for Roads and Bridges**, Adopted 2000. Stone shall have a maximum weighted loss of twelve (12) percent when subjected to five cycles of the Sodium Sulfate Soundness Test – **ASTM C88** (ASTM C99-99a **Standard Test Method for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate**), as modified by the American Association of State Highway and Transportation Officials (**AASHTO**) **T-104**. Non-calcareous stone shall exhibit a fizz of 0 when subjected to dilute hydrochloric acid. A laboratory certification of soundness and fizz shall be submitted to the WVDEP prior to delivery.
- 10.2.2 Filter fabric for the seep collector shall be non-woven type, meeting the requirements of Section 715.11.4 of the WVDOH **Standard Specifications for Roads and Bridges**, Adopted 2000.
- 10.2.3 Pipe shall consist of perforated 8-inch diameter PVC SDR 35 grade within the seep collector and solid 8-inch diameter PVC SDR 35 grade from the seep collector to the riprap channel. Clean outs shall consist of necessary wye fittings and connections compatible with SDR 35 PVC pipe. End caps shall consist of 8-inch diameter PVC SDR 35 grade.

The following standard specifications, if an underdrain is proposed for the project, shall be provided in sub-section 10.2.

- 10.2.4 Stone for underdrain shall consist of sound, durable 3” to 6” inch non-calcareous stone such as that commercially available. Crushed stone shall consist of particles of clean, hard, tough, durable rock, free from adherent coating and meeting the requirements of Section 703.1 of the WVDOH **Standard Specifications for Roads and Bridges**, Adopted 2000. Stone shall have a maximum weighted loss of twelve (12) percent when subjected to five cycles of the Sodium Sulfate Soundness Test – **ASTM C88** (ASTM C88-99a **Standard Test Method for Soundness of Aggregates by Use of Sodium Sulfate or Magnesium Sulfate**), as modified by the American Association of State Highway and Transportation Officials (**AASHTO**) **T-104**. Non-calcareous stone shall exhibit a fizz of 0 when subjected to dilute hydrochloric acid. A laboratory certification of soundness and fizz shall be submitted to the WVDEP prior to delivery.

10.2.5 Filter fabric for the underdrain shall be non-woven type, meeting the requirements of Section 715.11.4 of the WVDOH **Standard Specifications for Roads and Bridges**, Adopted 2000.

10.2.6 Pipe shall consist of perforated 12-inch diameter PVC SDR 35 grade within the underdrain and solid 12-inch diameter PVC SDR 35 grade from the underdrain to the riprap channel. Clean outs shall consist of necessary wye fittings and connections compatible with SDR 35 PVC pipe. End caps shall consist of 12-inch diameter PVC SDR 35 grade.

The following standard specifications, if applicable to the project, shall be provided in sub-section 10.3 of these specifications.

10.3.1 Trench width for the sub-surface drains shall be as indicated on the typical details provided in the plans. Trenching will involve excavation of in-place material including soil and rock.

10.3.2 Trench exceeding five (5) feet in depth shall be supported in compliance with OSHA requirements. Trench bottom shall be cleared of any loose debris and any standing water.

10.3.3 Filter fabric shall be installed in the trench as shown on the Construction Drawings. The aggregate shall be placed carefully to prevent puncturing, tearing or shifting of the filter fabric. The filter fabric shall not be installed over the ends of the sub-surface drains where the rock shall daylight directly into existing or modified drainage ways.

10.3.4 Animal guards shall be constructed and installed on the downstream end of each outlet pipe as detailed on the Plans. These guards will be installed the same day to prevent animal entry during non-work time.

10.3.5 End caps shall be installed on the upstream end of the SDR 35 PVC pipe within the sub-surface drain.

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11.0 PAVEMENT REPAIR

This section should include sub-sections as follows:

11.1 Description

- 11.2 Materials
- 11.3 Method of Construction
- 11.4 Method of Measurement
- 11.5 Basis of Payment
- 11.6 Pay Item

Reference shall be made to the applicable sections of Division 400 and Division 500 of the WVDOH **Standard Specifications for Roads and Bridges**, Adopted 2000 for asphalt and/or concrete repair.

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12.0 HORIZONTAL BORING

This section should include sub-sections as follows:

- 12.1 Description
- 12.2 Materials
- 12.3 Equipment
- 12.4 Construction Methods
- 12.5 Method of Measurement
- 12.6 Basis of Payment
- 12.7 Pay Items

Separate pay items should be provided in this section for “Pilot Holes”, per linear foot and “12-inch Diameter Mine Drains”, per linear foot.

The Technical Specifications should be followed by the Bid Schedule followed by the Engineer’s Estimate.

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Bid Schedule

Every bid item on the Bid Schedule should have a corresponding pay item identified in the specifications.

The number identification, description, and method of payment of each bid item should exactly match in the Pay Items section as well as the Method of Measurement section to the Bid Schedule.

The maximum allowable percentages for Items 1.0 through 4.0 should match what is indicated in the specifications.

The following statement shall be provided on the Bid Schedule. “The DEP reserves the right to request additional information and supporting documentation regarding unit prices when the unit price appears to be unreasonable.”

STANDARD DRAWING DETAILS

4.0 Site Preparation

- a) Constructed Access Road
 - i. Cut Slope
 - ii. Crowned
- b) Access Road Rehabilitation
- c) Temporary Fence
- d) Permanent Fence
- e) Farm Gate
- f) Pipe Gate

5.0 Erosion and Sediment Control

- a) Silt Fence
- b) Super Silt Fence
- c) Hay Bale Erosion Control
- d) Rock Check Dam

7.0 Drainage Structures

- a) Vegetated “Vee” Channel
- b) Riprap or Grouted Riprap Channel
 - i. 3H:1V “Vee” Channel
 - ii. 2H:1V “Vee” Channel
 - iii. 3H:1V Trapezoidal Channel
 - iv. 2H:1V Trapezoidal Channel
- c) Pipe Trench Detail

- i. Paved Surface (Flowable Fill Backfill)
 - ii. Paved Surface (Aggregate Backfill)
 - iii. Concrete Surface
 - iv. Aggregate Surface
 - v. Vegetated Surface
- d) Culvert Profile
 - i. Flowable Fill Backfill
 - ii. Aggregate Backfill
- e) Grout Key
 - i. Profile
 - ii. “Flat Bottom” Ditch Cross Section
 - iii. “Vee” Ditch Cross Section
- f) Grout Anchor
 - i. Profile
 - ii. “Flat Bottom” Ditch Cross Section
 - iii. “Vee” Ditch Cross Section
- g) Splash Pad Details
- h) Road Crossing
 - i. Riprap “Vee” Channel
 - ii. Grouted Riprap “Vee” Channel
 - iii. Riprap Trapezoidal Channel
 - iv. Grouted Riprap Trapezoidal Channel
- i) TemporaryStream Crossing
 - i. X-Section View

- ii. Profile View
- iii. Plan View
- j) Drop Inlets
 - i. Type B Inlet
 - ii. Type G Inlet
- k) Type A Manhole
- l) Concrete Headwall
- m) Concrete Wingwall

8.0 Unclassified Excavation

- a) Bench Construction, Typical Section

9.0 Mine Seals

- a) Wet Mine Seal
 - i. Profile View
 - ii. Clay Seal Details
 - iii. Plan View Top of Bulkhead Elevation
- b) Wet Mine Seal Pipe Details
 - i. Wet Mine Seal Outlet Pipe Longitudinal View
 - ii. Wet Mine Seal Outlet Pipe Cross-Section View
 - iii. Wet Mine Seal Riser Pipes and Stubs Cross-Section
 - iv. Wet Mine Seal Riser Pipes Elevation View
 - v. Wet Mine Seal Stubs Longitudinal View
 - vi. Riser Cap Detail
 - vii. "Tee" Riser Detail
 - viii. Perforated End Cap

- c. Modified Mine Seal
 - i. Profile View
 - ii. Clay Seal Details
 - iii. Plan View Top of Bulkhead Elevation
- d) Modified Mine Seal Pipe Details
 - i. Modified Mine Seal Outlet Pipes Longitudinal View
 - ii. Modified Mine Seal Outlet Pipes Cross-Section View
 - iii. Modified Mine Seal Cross-Over Pipe Longitudinal View
 - iv. Modified Mine Seal Cross-Over Pipe Cross-Section View
- e) Bat Gate Mine Seal
 - i. Profile View
 - ii. Clay Seal Details
 - iii. Plan View
- f) Bat Gate Pipe Details
 - i. Bat Gate Seal Outlet Pipe Longitudinal View
 - ii. Bat Gate Seal Outlet Pipe Cross-Section View
 - iii. Bat Gate Seal Cross-Over Pipe and Stubs Longitudinal View
 - iv. Bat Gate Seal Cross-Over Pipe and Stubs Cross-Section View
 - v. Perforated End Cap
- g) Bat Gate Details
 - i. 35 by 24 to 64 by 43 Culvert
 - ii. 71 by 47 to 150 by 96 Culvert
- h) Animal Guard Details
 - i. 12" Pipe
 - ii. 8" Pipe

10.0 Sub-Surface Drains

- a) Seep Collector Detail
- b) Underdrain Detail
- c) Clean-out Details
 - i. Inline Clean-out 8"
 - ii. Inline Clean-out 12"
- d) Seep Collector Pipe Details
 - i. Seep Collector Pipe Longitudinal View
 - ii. Seep Collector Pipe Cross-Section View
- e) Underdrain Pipe Details
 - i. Underdrain Pipe Longitudinal View
 - ii. Underdrain Pipe Cross-Section View

11.0 Pavement Repair

- a) Pavement Resurfacing Overlay Detail
- b) Pavement Resurfacing with Base Repair
- c) Pavement Patching Detail

12.0 Horizontal Boring

- a) Horizontal Boring Grouting Detail
 - i. Boring Pipe Longitudinal View
 - ii. Boring Pipe Cross-Section View
- b) Horizontal Boring Perforation Detail
 - i. Boring Pipe Longitudinal View
 - ii. Boring Pipe Cross-Section View

c) Casing Detail

d) Packer Detail