

**WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION**

**OFFICE OF ABANDONED MINE LANDS
AND RECLAMATION**

**COUNTY
OF
BARBOUR**

**NAME OF PROJECT
LILBERN PRITT HIGHWALL**

N O T I C E

**ALL PAPERS BOUND WITH OR ATTACHED TO
THE BID FORM ARE A NECESSARY PART
THEREOF AND MUST NOT BE DETACHED**

PROJECT SPECIFICATION BOOK

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ARTICLE I - DEFINITIONS

ARTICLE I - DEFINITIONS

- 1.0 "Bidder" refers to the person, firm, or company offering to furnish the work called for by the specifications herein.**
- 2.0 "Chief" shall mean the Chief of the West Virginia Department of Environmental Protection's, Office of Abandoned Mine Lands & Reclamation.**
- 3.0 "Regional Engineer" refers to the head of the Construction Group of the Office of Abandoned Mine Lands & Reclamation of the West Virginia Department of Environmental Protection in each regional office.**
- 4.0 "Construction Supervisor" refers to the regional supervisor of the West Virginia Department of Environmental Protection, Office of Abandoned Mine Lands & Reclamation Construction Inspectors.**
- 5.0 "Contract" refers to a purchase order placed by the West Virginia Department of Administration on behalf of the Department of Environmental Protection and accepted by the Contractor together with these specifications and all other documents incorporated therein by reference.**
- 6.0 "Contract Documents" consist of all of the articles, sections, and attachments to the contract, including Information for Bidders, General Conditions, General Requirements, Special Conditions, drawings, specifications, all addenda issued prior to execution of the contract, and change orders and other written modifications issued after execution of the contract and executed by both parties to the contract.**
- 7.0 "Contractor" refers to the person, firm or company contracting with the West Virginia Department of Environmental Protection to furnish the work called for in the contract.**
- 8.0 "Cabinet Secretary" refers to the Cabinet Secretary of the West Virginia Department of Environmental Protection.**
- 9.0 "DEP" means the West Virginia Department of Environmental Protection.**
- 10.0 "Design Engineer" shall mean the representative of the Office of Abandoned Mine Lands & Reclamation's Engineering Section or the Architect/Engineering consulting firm, whichever designed the project.**
- 11.0 "Inspector" shall refer to DEP's Inspector, who monitors all construction operations at the project site.**
- 12.0 "Project" shall mean the Abandoned Mine Lands Project described and referred to by the specifications herein.**
- 13.0 "Sub-contractor" refers to the person, firm or company contracting directly with the Contractor and not with DEP to furnish the Contractor with any portion of the work called for by the contract.**

ARTICLE I - DEFINITIONS

- 14.0 "Work" shall be understood to mean and include any and all of the labor, supervision, services, materials, machinery, equipment, tools, supplies and facilities called for by and required to complete the contract.**
- 15.0 "Stabilization Measures" as noted in Section 5.1 Vegative Practices shall be understood to mean and include any/all measures necessary for preventing erosion & sediment to the project site. This may include seeding and mulching, mulching without seed, silt fence, wattles, check dikes, sumps or any other method required to stabilize a site that work has stopped for a time exceeding fourteen (14) days.**

ARTICLE II - GENERAL CONDITIONS

ARTICLE II - GENERAL CONDITIONS

Sections Included:

- 1.0 Enumeration of Contract Documents**
- 2.0 Correlation of Documents**
- 3.0 Examination of Premises**
- 4.0 Materials & Workmanship**
- 5.0 Guarantee & Maintenance**
- 6.0 Supervision & Construction Procedures**
- 7.0 Permits, Laws, Regulations, & Rights of Entry**
- 8.0 Safety Requirements**
- 9.0 Protection of Persons & Property**
- 10.0 Insurance & Worker's Compensation**
- 11.0 Labor Laws, Ordinances, Wages & Other Conditions**
- 12.0 Subcontractors**
- 13.0 Time**
- 14.0 Payments & Completion**
- 15.0 Surety Bonds**
- 16.0 Changes in the Work**
- 17.0 Uncovering & Correction of Work**
- 18.0 Assignment of Contract**

ARTICLE II - GENERAL CONDITIONS

1.0 ENUMERATION OF CONTRACT DOCUMENTS

1.1 Drawings

Construction drawings (20 sheets) for the reclamation of the project as prepared by for the West Virginia Department of Environmental Protection, Office of Abandoned Mine Lands and Reclamation, 601 57th Street, SE, Charleston, West Virginia 25304-2345, Telephone (304) 926-0485.

1.2 Specifications

See Index

1.3 Addenda

No. _____	Date _____
No. _____	Date _____
No. _____	Date _____
No. _____	Date _____

2.0 CORRELATION OF DOCUMENTS

- 2.1 The intent of the contract documents is to include all labor, materials, equipment, operations and transportation necessary for the proper execution and completion of the work. The contract documents are complementary and what is required by one is required by all.
- 2.2 The Contractor shall carefully study and compare the contract documents and shall at once report to DEP any error, inconsistency or omission it may discover. Contractor shall not proceed with the work affected by such error, inconsistency, or omission until resolved to the satisfaction of itself and DEP.
- 2.3 The drawings and specifications are correlative and shall be accepted and used as a whole and not separately. Should any item be omitted from the drawings and be included in the specifications, and be required to complete the work under the contract, it shall be executed as if shown on both and contained in both; except that it is not intended that items or work not applicable or required be provided unless it is consistent therewith and reasonably inferable therefrom as being necessary to produce the intended results.
- 2.4 In case of disagreement or conflict between drawings and specifications, or inconsistencies, errors, or if omissions be discovered in the drawings and specifications, or if in any part the meaning of either or both shall be considered obscure or uncertain, the Chief or his/her authorized

ARTICLE II - GENERAL CONDITIONS

representative shall be immediately notified thereof. No work so affected by such circumstances shall proceed until the Chief or his/her authorized representative renders a decision and/or interpretation thereon. Large scale drawing details shall take precedence over drawings of lesser scale. Words and abbreviations which have well known technical or trade meanings are used in the contract documents in accordance with such recognized meanings.

3.0 EXAMINATION OF PREMISES

- 3.1** Before submitting proposals for the work, each bidder will be held to have examined the premises and satisfied itself as to the existing conditions under which it will be obliged to operate, or that will in any manner affect the work under the contract. Bidders shall have become familiar with the drawings and specifications and have compared them with existent conditions.
- 3.2** By executing the contract, Contractor represents that it has visited the site, familiarized itself with the local conditions under which the work is to be performed, and correlated its observations with the contract documents. No allowance will subsequently be made by reason of neglect or error on the part of the Contractor for failing to inform itself of the requirements and conditions contained herein.

4.0 MATERIALS & WORKMANSHIP

- 4.1** All installed materials and equipment shall be new, and all materials, equipment, and workmanship shall be of kind and type specified, and in all cases, be of good quality. Contractor shall, if required, furnish satisfactory evidence as to kind and quality of its materials, equipment and workmanship.
- 4.2** The Contractor shall provide and pay for all labor, materials, equipment operations, tools, construction equipment, and machinery, transportation, water, heat, utilities, and other facilities and services necessary for the proper execution and completion of the work. The Contractor at all times shall supply sufficient skilled and other labor necessary to adequately fulfill the requirements of the drawings and specifications, and provide for expeditious and practicable execution of the work to its completion.
- 4.3** The installation or application of all devices and materials shall be in accordance with the manufacturer's installation application data, shop drawings and instructions, unless otherwise provided herein.

5.0 GUARANTEE & MAINTENANCE

- 5.1** The materials and workmanship affected by the Contractor are subject to the guarantee established by custom of the respective trades. In the absence

ARTICLE II - GENERAL CONDITIONS

of a trade guarantee custom or a special guarantee provision, the work, both as to the materials and workmanship, shall upon acceptance of final inspection by the Contractor be considered guaranteed by the Contractor for one (1) year from the date of the acceptance of the work. Neither the final acceptance nor the final payment shall relieve the Contractor of responsibility for negligence or faulty materials, and for defects appearing within the guarantee period shall be remedied at the expense of the Contractor upon written notice.

- 5.2** During the one-year guarantee period, the Contractor will maintain the project to the conditions existing at the date of the acceptance of the work. Any failures due to the negligence or workmanship of the Contractor in any of the work which develop during the guarantee period shall be corrected by the Contractor at its expense.
- 5.3** The one-year guarantee period shall not be construed as being an extension of the performance time allotted for work under the contract. Failure to perform warranty work shall extend performance time until work is completed and accepted.
- 5.4** Guarantees concerning revegetation may be further defined in the technical specifications contained herein.

6.0 SUPERVISION & CONSTRUCTION PROCEDURES

- 6.1** The Contractor shall supervise and direct the work, using its best skill and attention. It shall be responsible for all construction means, methods, techniques, and procedures, coordinating all portions of the work, and for cooperating with appropriate DEP personnel and with other contractors in every way possible.
- 6.2** The Contractor shall be responsible to DEP for the acts and omissions of its employees, its subcontractors and their agents or employees, and other persons performing any of the work under a contract with the Contractor.
- 6.3** The Contractor will be supplied with three (3) copies of the plans and specifications. It shall have available on the work site at all times one (1) copy of said plans and specifications. Additional copies of plans and specifications may be obtained by the Contractor for the cost of reproduction.

7.0 PERMITS, LAWS, REGULATIONS, & RIGHTS OF ENTRY

- 7.1** As indicated in Section 13 of the Special Provisions, the WVDEP-AML has obtained a Construction Storm Water General Permit for this project from WVDEP Division of Water and Waste Management (WVDEP DWWM). The registration for this reclamation project will be modified to include the Contractor as Co-Applicant #1, with the WVDEP-AML being Co-Applicant #2. As such, the Contractor shall assume responsibility for compliance with the terms and conditions of the permit including modifications and any future correspondence such as registration renewal invoices, inspection reports, and notices of violation shall be forwarded to the Contractor. Upon award of the contract, the Contractor shall complete a Co-Applicant #1 signature page and submit the completed form to WVDEP-AML prior to scheduling a Pre-Construction Conference.

Upon receipt of the completed form, WVDEP-AML will request the WVDEP DWWM to modify the existing NPDES registration for this project to make the Contractor the Co-Applicant #1 to the permit.

ARTICLE II - GENERAL CONDITIONS

The WVDEP DWWM will notify the Contractor and WVDEP-AML when the successful transfer of registration under WV/NPDES Storm Water Construction General Permit (No.WV0115924) is completed. A Notice to Proceed will not be issued until the successful submittal of registration has been completed. Once the transfer has been completed, the WVDEP will continue to be responsible for any modification fees and annual renewal fees incurred up until the date of the final inspection of the project that occurs after completion of construction activities at the site. The Contractor shall be responsible for any and all costs associated with violations and fines assessed against the project that are a result of the Contractor's negligence, carelessness, or failure to install permanent controls as part of the work as scheduled.

The Contractor shall apply for a Notice of Termination (NOT) from WVDEP DWWM via the Construction Storm Water website <http://www.dep.wv.gov/Programs/stormwater/csw/Documents/Construction> upon completion of construction activities at the site. The NOT shall be issued by WVDEP DWWM upon completion of the project. The Contractor will continue to be bound by the terms and conditions of the permit until the NOT has been approved by WVDEP DWWM. Once the project is complete, the Contractor will still bear responsibility for the NPDES registration until a NOT is received from the WVDEP DWWM.

- 7.2 The Contractor shall comply with all laws, ordinances, rules, orders and regulations relating to the performance of the work, the protection of adjacent property, the maintaining of passageways, guard fences, or other protective facilities.
- 7.3 All applicable Federal and State laws and regulations, municipal ordinances, and the rules and regulations of all public authorities having jurisdiction over construction of the project shall apply to the contract throughout, and are incorporated herein by reference.
- 7.4 DEP shall be responsible for obtaining all construction rights of entry for the project unless otherwise provided for in the Construction Specifications.
- 7.5 The Contractor agrees to indemnify and hold harmless the DEP 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 right of entry; failure to utilize appropriate language in the right of entry agreements; or failure to obtain the permission and signatures of all persons or entities holding a legal interest in the subject property(ies) covered by the rights of entry.
- 7.6 All right of entry agreements the Contractor obtains for borrow, disposal, access or other purposes for this project shall include a provision requiring the property owner to indemnify and hold harmless the DEP for the Contractor's actions and any injury or damages whatsoever resulting from the Contractor's use of the property.



Co-Applicant #1 Signature Page

Co-Applicant#1: _____

New and/or Modification of NPDES Storm Water of Construction Project

Name: _____

BY COMPLETING AND SUBMITTING THIS APPLICATION, I HAVE REVIEWED AND UNDERSTAND AND AGREE TO THE TERMS AND CONDITIONS OF THE GENERAL PERMIT ISSUED ON DECEMBER 05, 2012. I UNDERSTAND THAT PROVISIONS OF THE PERMIT ARE ENFORCEABLE BY LAW, VIOLATION OF ANY TERM AND CONDITION OF THE GENERAL PERMIT AND /OR OTHER APPLICABLE LAW OR REGULATIONS CAN LEAD TO ENFORCEMENT ACTION.

I CERTIFY UNDER PENALTY OF LAW THAT I HAVE PERSONALLY EXAMINED AND AM FAMILIAR WITH THE INFORMATION SUBMITTED ON THIS FORM AND ALL ATTACHMENTS AND THAT, BASED ON MY INQUIRING OF THOSE INDIVIDUALS IMMEDIATELY RESPONSIBLE FOR OBTAINING THE INFORMATION. THE INFORMATION SUBMITTED IS, TO THE BEST OF MY KNOWLEDGE AND BELIEF, TRUE, ACCURATE, AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION, INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT.

(CO- APPLICANT #1 SIGNATURE)

DATE

Print Name: _____

Print Title: _____

Address: _____

City: _____ State: _____ Zip: _____

Telephone Number: (____) _____ - _____

Email: _____

FEIN: _____

ARTICLE II - GENERAL CONDITIONS

8.0 SAFETY REQUIREMENTS

- 8.1** Particular attention is directed to the "West Virginia Safety Code for Building Construction" as published by the West Virginia Department of Labor. Observance of and compliance with said laws, regulations and codes shall be solely with and without qualification the responsibility of the Contractor.
- 8.2** The Contractor, subcontractors, other contractors and all employees and workers shall comply with the provisions of the Occupational Safety and Health Act 29 CFR 1926. The Contractor shall be held liable to DEP for any health and safety infractions, on the Contractor's part, which cause DEP to receive a citation and/or fine from any local, State or Federal agency. Actual costs involved will be paid by the Contractor to the satisfaction of DEP.

9.0 PROTECTION OF PERSONS & PROPERTY

- 9.1** The Contractor shall be responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the work.
- 9.2** Safety of Persons and Property: The Contractor shall take all reasonable precautions for the safety of, and shall provide all reasonable protection, preventing damage, injury, or loss to:
- (a)** All employees on the work, and all other persons who may be affected thereby;
 - (b)** All the work and all materials and equipment to be incorporated therein, whether in storage on or off the site, under the care, custody or control of the Contractor, or any of its subcontractors or their employees or subcontractors; and
 - (c)** Other property on the site or adjacent thereto, including, but not limited to, paving, roadways, structures, utilities and permanent property boundaries, monuments or markers not designated for removal, or relocation, or replacement in the course of construction. Any damage to these items shall be repaired or replaced at the expense of the Contractor and to the satisfaction of DEP.

ARTICLE II - GENERAL CONDITIONS

- 9.3** The Contractor shall give all notices and comply with all applicable laws, ordinances, rules, regulations, and lawful orders of any public authority, bearing on the safety of persons or property, or their protection from damage, injury, or loss.
- 9.4** The Contractor shall erect and maintain, as required by existing conditions and progress of the work, all reasonable and adequate safeguards for safety and protection. It shall post danger signs and provide other warnings as required against hazards and dangers to persons and property.
- 9.5** In case of an emergency which threatens injury, loss of life and/or damage to property, the Contractor will be permitted to act, without prior instruction from the Regional Engineer, in a diligent manner. It shall notify the Construction Supervisor immediately thereafter. Any claim for compensation by the Contractor due to such extra work shall be promptly submitted to the Construction Supervisor for verification and approval by the Regional Engineer.

Where the Contractor has not taken action, but has notified the Regional Engineer of an emergency threatening injury to persons or damage to the work or any adjoining property, it shall act as instructed or authorized by the Regional Engineer.

The amount of reimbursement claimed by the Contractor for work arising out of any emergency situation shall be determined by the Chief or his/her authorized representative.

- 9.6** The Contractor shall be responsible for the verification of existing utilities that may be affected by its work in the project area. It shall be held responsible for any damage to and for maintenance and protection of existing utilities and structures during the performance of the work.

10.0 INSURANCE & WORKER'S COMPENSATION

10.1 Contractor's and Subcontractor's Public Liability, Vehicle Liability and Property Damage Insurance

The Contractor shall maintain insurance as follows:

- (a)** Contractor's Public Liability Insurance and Comprehensive Vehicle Liability Insurance shall be in an amount not less than \$2,000,000.00 for bodily injury and property damage for each occurrence and not less than \$2,000,000.00 aggregate.

The required insurance must be written by a company or companies licensed to do business in West Virginia at the time the policy is issued and the policy must be countersigned by a licensed resident agent. Any property owner requiring additional insured shall be added to this policy.

- (b)** Contractor shall either (1) require each of the subcontractors to procure and to maintain, during the life of its subcontract, subcontractor's Public Liability and Property Damage Insurance of the type and in the same amounts as specified in paragraph (a) above, or (2) insure the activities of its subcontractors in its own policy.

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Contractor agrees to indemnify and hold harmless DEP from all liability for personal injury, including death resulting therefrom, and against all liability for property damage sustained by any person or persons, including persons employed by Contractor or subcontractors, which is caused in whole or in part by an act or omission, negligent or otherwise, of the Contractor, its agents, servants, or employees, and to assume the defense of any action brought by such persons to recover damages, and to pay all costs and expenses, including attorney's fees, incurred by DEP as result thereof.

Each party to the contract shall promptly notify the other of the assertion of any claim against which such party is held harmless pursuant to this Section, shall give such other party the opportunity to defend any such claim, and shall not settle any such claim without approval of the indemnifying party.

10.2 Proof of Carriage of Insurance

The Contractor shall provide DEP, before work commences, with certificates issued by the insurance company or companies issuing the insurance policies required by this Section. The certificates shall show the type, amount, class of operations covered, effective dates, and dates of expiration of such policies. Such certificates shall provide that written notice shall be given to DEP prior to expiration, cancellation, or modification of any such policy, and shall contain substantially the following representation: "The insurance covered by this certificate will not be canceled, or materially modified or altered, except after ten (10) days written notice has been verified as received by the West Virginia Department of Environmental Protection".

10.3 Worker's Compensation Insurance

All employees of the Contractor, and of subcontractors engaged in the work of this contract, shall be covered by West Virginia Worker's Compensation Insurance. Certificates shall be provided to DEP by the Contractor and subcontractors showing compliance with the Worker's Compensation Laws of West Virginia.

11.0 LABOR LAWS, ORDINANCES, WAGES, AND OTHER CONDITIONS

11.1 The Contractor shall obey and abide by all laws of the State of West Virginia, particularly with respect to the carrying out of public improvements.

The Contractor shall not pay less than the established prevailing minimum wage rate for each particular class of employment in the county in which the work is being performed. This rate shall include and and all time an employee is on the project.

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11.2 During the performance of this contract, the Contractor agrees as follows:

- (a) The Contractor will not discriminate against any employee or applicant for employment because of race, creed, color, or national origin. The Contractor will take affirmative action to ensure that applicants are employed, and that employees are treated during employment, without regard to their race, creed, color, or national origin. Such action shall include, but not be limited to, the following: employment, upgrading, demotion or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notice, to be provided by the contracting officer, setting forth the provisions of this nondiscrimination clause.
- (b) Contractor will, in all solicitations or advertisements for employees placed by or on behalf of the Contractor, state that all qualified applicants will receive consideration for employment without regard to race, creed, color or national origin.
- (c) Contractor will send to each labor union or representative of workers with which it has a collective bargaining agreement or other contract understanding, a notice, to be provided by the agency contracting officer, advising the labor union or worker's representative of the Contractor's commitments under Section 202 of Presidential Executive Order #11246 of September 24, 1965 (hereinafter "Executive Order #11246"), as amended by Presidential Executive Order #11375 and supplemented by U.S. Department of Labor regulations 41 CFR Part 60 and shall post copies of the notice in conspicuous places available to employees and applicants for employment.
- (d) Contractor will comply with all provisions of Executive Order #11246, and with all of the applicable rules, regulations, and relevant orders of the U.S. Secretary of Labor (hereinafter "Secretary of Labor").
- (e) Contractor will furnish all information and reports required by Executive Order #11246, and by the applicable rules, regulations and orders of the Secretary of Labor, or pursuant thereto, and will permit access to its books, records, and accounts by the contracting agency and the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations and orders. These provisions shall also apply to DEP or employees of the Federal Government or their designated representatives for the purpose of making audits, examinations, excerpts, or transcriptions.
- (f) In the event of the Contractor's noncompliance with these nondiscrimination clauses, this contract may be canceled, terminated, or suspended, in whole or in part, and the Contractor may be declared ineligible for further government contracts in accordance with procedures authorized in Executive Order #11246, and such other sanctions may be imposed and remedies invoked as provided in Executive Order #11246, or by rules, regulations, or orders of the Secretary of Labor, or as otherwise provided by law.

ARTICLE II - GENERAL CONDITIONS

- (g) The Contractor will include the provisions of these paragraphs (a) through (g) in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to Section 204 of Executive Order #11246, so that such provisions will be binding upon each subcontractor or vendor. The Contractor will take such action with respect to any subcontractor or purchase order as the contracting agency may direct as a means of enforcing such provisions, including sanctions for noncompliance: Provided, however, that in the event the Contractor becomes involved in, or is threatened with litigation with a subcontractor or vendor as a result of such direction by the contracting agency, the Contractor may request DEP to enter into such litigation to protect the interests of DEP.
- (h) Copeland "Anti-Kickback" Act Contractor or Subcontractor shall comply with the Copeland "Anti-Kickback" Act (18 USC 874) as supplemented in U.S. Department of Labor regulations (29 CFR Part 3). Said Act provides that each Contractor or subcontractor shall be prohibited from inducing, by any means, any person employed in the construction, completion, or repair of public works, to give up any part of the compensation to which it is otherwise entitled. The Contractor shall report all suspected or reported violations to DEP.
- (i) Clean Air & Water Acts Should the amount of this contract exceed one-hundred thousand dollars (\$100,000.00), compliance will be required with all applicable standards, orders, or requirements issued under Section 306 of the Clean Air Act (42 USC 1857[h]), Section 508 of the Clean Water Act (33 USC 1368), Presidential Executive Order #11738, and Federal Environmental Protection Agency regulations (40 CFR Part 15), which prohibit the use under non-exempt Federal contracts, grants or loans of facilities included on the EPA List of Violating Facilities. Contractor shall report violations to DEP and to the U.S. EPA Assistant Administrator for Enforcement (EN-329).
- (j) Energy Policy & Conservation Act The Contractor shall comply with mandatory standards and policies relating to energy efficiency which are contained in the State energy conservation plan issued in compliance with the Energy Policy and Conservation Act, Public Law 94-163.
- (k) Access to Records DEP, the U.S. Department of Interior's Office of Surface Mining Reclamation & Enforcement, and the U.S. Comptroller General or their duly authorized representatives shall have access to any books, papers, and records of the Contractor which are directly pertinent to that specific contract, for the purpose of making audits, examinations, excerpts, and transcriptions.
- (l) Maintenance of Records The Contractor shall maintain all required records for three (3) years after DEP processes final payments and all other pending matters are closed.
- (m) Termination of Contract by DEP This contract may be cancelled in whole or in part in writing by the Director of Purchasing, without prejudice to any other right or remedy it may have, provided that the contractor is given not less than thirty (30) calendar days written notice, (delivered by certified mail, return receipt requested) of intent to terminate.

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- (n) **Legal Remedies** Unless otherwise provided by law or elsewhere in this contract, all claims, counter-claims, disputes and other matters in question between DEP and the Contractor arising out of, or relating to, this contract or the breach of it will be decided by arbitration if the parties mutually agree, or in a court of competent jurisdiction within the State of West Virginia.

11.3 **Wages**

Attention is called to the prevailing rates of wages to be paid for labor on public improvements in Barbour County, West Virginia, as determined by the West Virginia Department of Labor. A copy of wage rates shall be posted in a conspicuous location on the job site. Copies of the wage rates are included herein, however, it is the responsibility of the Contractor to pay the wage rate in effect when the project was bid. The Contractor is to maintain and have available for inspection by DEP, upon request, certified copies of its payrolls.

The contractor/subcontractors shall pay the higher of the U.S. Department of Labor Davis-Bacon Act or the WV Prevailing wage rate as established for various county, pursuant to West Virginia Code 21-5A, Et, Seq. and 42CSR7 Rules & Regulations for the WV Prevailing Wage Act. For prevailing wage rates, please refer to <http://www.sos.wv.gov>

12.0 **SUBCONTRACTORS**

- 12.1 Unless otherwise required by the contract documents, the Contractor, as soon as practicable after award of the contract, shall furnish DEP in writing the names of subcontractors (including those who are to furnish materials or equipment fabricated to special design) proposed for performing portions of the work.
- 12.2 DEP reserves the right to disapprove any proposed subcontractor whose record of performance does not establish its experience, competence, and financial ability to perform the work for which it is proposed. Nothing contained in the contract documents shall create any contractual relation between any subcontractor and DEP.

13.0 **TIME**

- 13.1 The date of commencement of work is the date established in a written "Notice to Proceed" issued by DEP to the Contractor. The date of completion shall be the date that DEP finds the work acceptable under the contract documents and the contract fully performed.

ARTICLE II - GENERAL CONDITIONS

13.2 Delays & Extensions of Time

- (a) It is agreed that if the Contractor should be unavoidably delayed in fulfilling its obligations under this contract by acts of Providence or general strikes, or by Court injunctions, or by stopping of the work by DEP because of any Contractor toward final completion of the work hereunder, DEP may require the Contractor to prepare an itemized estimate of the amount of work performed, and material and equipment stored under the contract since the date of the last preceding estimate and Application for Payment. DEP may request that the Contractor submit such estimate along with supporting documentation in the form of certified payrolls, material invoices, weight slips, and Applications for Payment. Contractor is to maintain and have available such records for inspection by DEP upon request.
- (b) Upon approval by DEP of the Application and Certificate for Payment, DEP shall, as soon thereafter as practicable, process for the Contractor as a progress payment a sum equal to the contract value of the work performed since the last preceding estimate and Application for Payment in accordance with Paragraphs 14.4 and 14.5 of this Section, less the aggregate of previous payments.
- (c) No Certificate for a progress payment, nor any progress payment, shall constitute acceptance or be deemed or construed as acceptance of any part of the work not in accordance with the contract documents.
- (d) The Contractor warrants and guarantees that title to all work, materials, and equipment covered by an Application for Payment, whether incorporated in the project or not, will pass to DEP upon the receipt of such payment by the Contractor, free and clear of all liens.

13.3 Progress Schedule

The Contractor, immediately after being awarded the contract, shall prepare and submit, for DEP's information, an estimated progress schedule for the work. Such progress schedule shall be related to the entire project to the extent required by the contract documents, and shall provide for expeditious and practicable execution dates of the various stages of construction and may be revised as required by conditions of work, subject to DEP's approval.

14.0 PAYMENTS & COMPLETION

14.1 Contract Sum

The contract sum as stated in the Contractor's executed Contract Acceptance Form, including any authorized adjustment(s) thereto, is the total amount payable by DEP to the Contractor for the performance of the work under the contract documents.

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14.2 Schedule of Values

Before submitting its first Application for Payment, the Contractor shall submit to DEP a schedule of values allocated to the various portions of the work, prepared in such form and supported by such data to substantiate its accuracy, as DEP may require. This schedule shall be used only as a basis for the Contractor's Applications for Payment.

14.3 Progress Estimates, Applications for Payment

- (a) On the fifteenth (15th) and thirtieth (30th) day of each month during which progress has been made on the work under the contract by the Contractor toward final completion of the work hereunder, DEP may require the Contractor to prepare an itemized estimate of the amount of work performed since the date of the last preceding estimate and Application for Payment. DEP may request that the Contractor submit such estimate along with supporting documentation in the form of certified payrolls (not to include social security numbers), material invoices, weight slips, and Applications for Payment. Contractor is to maintain and have available such records for inspection by DEP upon request.**
- (b) Upon approval by DEP of the Application and Certificate for Payment, DEP shall, as soon thereafter as practicable, process for the Contractor as a progress payment a sum equal to the contract value of the work performed since the last preceding estimate and Application for Payment, in accordance with Paragraphs 14.4 and 14.5 of this Section, less the aggregate of previous payments.**
- (c) No Certificate for a progress payment, nor any progress payment, shall constitute acceptance or be deemed or construed as acceptance of any part of the work not in accordance with the contract documents.**
- (d) The Contractor warrants and guarantees that title to all work, materials, and equipment covered by an Application for Payment, whether incorporated in the project or not, will pass to DEP upon the receipt of such payment by the Contractor, free and clear of all liens, claims, security interests or encumbrances, and that no work, materials, or equipment covered by an Application for Payment will have been acquired by the Contractor or by any other person performing the work at the site or furnishing materials and equipment for the project, subject to an agreement under which an interest therein or an encumbrance thereon is retained by the Contractor or otherwise imposed by the Contractor or such other person.**

ARTICLE II - GENERAL CONDITIONS

14.4 Payments Withheld

The Regional Engineer or his representative may decline to approve an estimate or Application for Payment, to the extent necessary to protect DEP from loss because of:

- (i) Unsatisfactory, unrepresentative, and unverified amounts and items included in progress estimates of Paragraph 14.3(a) above.**
- (ii) Unfulfilled provisions of Paragraphs 14.3(d) above.**
- (iii) Defective work not remedied.**
- (iv) Unsatisfactory performance of the work by the Contractor.**
- (v) Failure of the Contractor to make payments properly to subcontractors, or for labor, materials, or equipment.**
- (vi) Reasonable doubt that the remaining work can be completed for the unpaid balance of the contract sum.**
- (vii) Reasonable indication that the work will not be completed within the contract time for completion.**
- (viii) Third party claims filed, or reasonable evidence indicating probable filing of such claims.**
- (ix) Damage to another contractor.**

When the above grounds under 14.4 (i)-(ix) are removed, payment shall be approved for the amounts that were withheld because of them.

14.5 Final Completion & Final Payment

- (a) Upon notice from the Contractor that the work is ready for final inspection, the Construction Supervisor will promptly make such inspection. If the Construction Supervisor upon his/her inspection finds the work acceptable under the contract documents and the contract fully performed, the Contractor shall submit a Final Estimate Application and Certificate for Payment to DEP for processing. Also, final quantity calculations shall be submitted to DEP by the Contractor prior to final inspection conference.**
- (b) Final payment to the Contractor will be processed by DEP upon fulfillment of the provisions of the contract documents and the conditions thereof.**

ARTICLE II - GENERAL CONDITIONS

- (c) The processing of final payment and the processing of payment of retained percentage shall constitute a waiver of all claims by DEP except those arising from:**
 - (i) Unsettled liens.**
 - (ii) Faulty or defective work appearing after final completion.**
 - (iii) Failure of the work to comply with requirements of the contract documents.**
 - (iv) Terms of any special warranties required by the contract documents.**
 - (v) Affidavate of Payment**
- (d) The acceptance of final payment shall constitute a waiver of all claims by the Contractor except those previously made in writing and identified by the Contractor as unsettled at the time of the final Application for Payment. No payment, however, final or otherwise, shall operate to release the Contractor or its sureties from any obligation under the contract documents, or the Performance Bond, and the Labor and Material Payment Bond. (See 15.1 below.)**

14.6 Application for Payment Forms

Bound herewith on the following pages are sample Application and Certificate for Payment forms which the Contractor shall use in the submittal of progress estimate Applications for Payment to DEP.

APPLICATION AND CERTIFICATE FOR PAYMENT

Project Name: _____

Application No: _____

Contractor: _____

Application Date: _____

Address: _____

Performance Period From: _____ To: _____

ATTN (AML & R Inspector): _____

CHANGE ORDER SUMMARY

Change Order Number	Approved (date)	Additions \$+	Deductions \$-

Application is made for payment, as shown below, in connection with contract. Continuation

Sheet is attached. The present status of the account for this contract is as follows:

ORIGINAL CONTRACT SUM \$ _____

Net Change by Change Orders \$ _____

CONTRACT SUM TO DATE \$ _____

TOTAL COMPLETED & STORED TO DATE \$ _____
(Column "G" on Continuation Sheet)

LESS PREVIOUS CERTIFICATES FOR PAYMENT \$ _____

CURRENT PAYMENT DUE \$ _____

Items listed hereon conform to specification, were received & are approved for payment.

Date: _____		Signed: _____		Inspector _____	
PO#: _____		Office/App _____		Date _____	
P#: _____		FEIN/SS#: _____		RMS Vendor # _____	
RUBB	EX	ORG	ACT	GRANT	PROJECT
8708	20		130	830	

% COMPLETE: _____ x 100 = _____

Contract Sum to Date

Contractor: _____
Original Signature (Blue Ink)

ARTICLE II - GENERAL CONDITIONS

15.0 SURETY BONDS

- 15.1 The Contractor shall provide and deliver to DEP's Buyer at the Purchasing Division of the Department of Administration at the time of execution of the contract, and prior to the performance of the work, satisfactory surety bonds in an amount of not less than one hundred percent (100%) of the contract sum which shall include a Performance Bond and Labor and Material Payment**

Bond, with sureties acceptable to DEP's Buyer, for the faithful fulfillment of the contract within the time specified. Said bonds shall also save and hold harmless DEP from all liens and claims arising out of the work. The Contractor shall pay for the bonds.

- 15.2 In the event that the surety on any contract or payment bond given by the Contractor becomes insolvent, or is placed in the hands of a receiver, or has its right to do business in this State revoked as provided by law, the Cabinet Secretary may at his/her election, withhold payment or any estimate until the Contractor shall give a good and sufficient bond in lieu of the bond so executed by such surety.**
- 15.3 Attorneys-in-Fact who execute surety bonds issued pursuant to this Section must provide with each such bond a certified and properly executed Power of Attorney.**
- 15.4 All performance bonds shall be in effect throughout the one-year guarantee period set out in Section 5.0 above. Bonds will be released upon completion of the guarantee period and acceptance of the project by DEP.**

16.0 CHANGES IN THE WORK

16.1 Change Orders

- (a) DEP, without invalidating the contract, may order or the Contractor may request changes in the work within the general scope of the contract consisting of additions, deletions, or other revisions, the contract sum and the contract time being adjusted accordingly. All such changes in the work shall be authorized by change order, and shall be executed under the applicable conditions of the contract documents.**
- (b) A change order is a written order to the Contractor, properly executed as to form, issued after the execution of the contract, authorizing a change in the work or an adjustment in the contract sum or contract time. The contract sum or contract time may be changed only by a change order. A change order issued to the Contractor indicates its agreement therewith, including the adjustment in the contract sum or contract time set forth therein.**

ARTICLE II - GENERAL CONDITIONS

- (c) The cost or credit to DEP resulting from a change in the work shall be determined in one or both of the following ways:**
 - (i) By mutual acceptance of a lump sum properly itemized.**
 - (ii) By unit prices stated in the contract documents or subsequently agreed upon.**
 - (d) If none of the methods set forth in 16.1(c) above is agreed upon, or the work to be performed is agreed by DEP and Contractor to be of such nature that it cannot be estimated in advance with sufficient exactness for mutual agreement, then DEP may direct the Contractor to perform the work by change order in accordance with the following provisions, and the Contractor shall promptly proceed with the work:**
 - (i) The work shall then be performed for an amount equal to the actual and necessary net cost to the Contractor for material and labor cost necessarily used therein, including all taxes and delivery costs for materials, all required extra costs on labor, plus cost for superintendents, power, use of tools, equipment, plant, plus the Contractor's normal charge under the contract for overhead and profit. The Contractor shall keep and present to DEP for inclusion in the change order complete itemized accounting for all materials, complete identified time and payment records for all employees, and workmen actually performing the work covered by the change order, the cost accounting of work performed by subcontractors for work covered by the change order. DEP reserves the right to require verifications of all costs covered under the change order.**
 - (ii) The amount of credit to be allowed by the Contractor to DEP for any deletion or change which results in a net decrease in the contract sum will be the actual net cost. When both additions and credits covering related work or substitutions are involved in one change, the allowance for overhead and profit shall be figured only on the basis of the increase, if any, with respect to that change.**
- 16.2 The Chief is the only individual who can execute a change order committing DEP to the expenditure of public funds. No person other than the Chief or his/her authorized representative can make any changes to the terms, conditions, contract clauses, or other stipulations of this contract.**

The Contractor shall not accept any instructions issued by any person other than the Chief or his/her authorized representative regarding changes in the work under the contract which affect the contract sum and/or contract time. No information, other than that which may be contained in an authorized modification to this contract, duly issued by the Chief or his/her authorized representative, which may be received from any person employed by DEP or otherwise, shall be considered grounds for deviation from any stipulation of the contract.

ARTICLE II - GENERAL CONDITIONS

16.3 Minor Changes in the Work

Notwithstanding the requirements of Section 16.2 above, the Regional Engineer or his/her authorized representative shall have authority to order minor changes in the work not involving an adjustment in the contract sum or an extension of the contract time and not inconsistent with the intent of the contract documents. Such changes may be affected by field order or by other written order. Such changes shall be binding on DEP and the Contractor. The Contractor shall carry out such written orders promptly.

16.4 Omissions

DEP may omit any item or items in the contract, provided that the notice of intent to omit such item or items is given to the Contractor before any material has been purchased or labor involved has been performed, and such omission shall not constitute grounds of any claim for damages or loss of anticipated profits. DEP may omit any item or items shown the estimate, at any time, by agreeing to compensate the Contractor for the reasonable expense already incurred and to take over at actual cost any unused material purchased in good faith for use for the item or items omitted.

17.0 UNCOVERING & CORRECTION OF WORK

17.1 Uncovering of Work

- (a) If any work should be covered contrary to the request of DEP, it must, if required by DEP, be uncovered for its observation and be replaced at the Contractor's expense.
- (b) If any other work has been covered which DEP has not specifically requested to observe prior to being covered, DEP may request to see such work and it shall be uncovered by the Contractor. If such work is found to be in accordance with the contract documents, the cost of uncovering and replacement shall, by appropriate change order, be charged to DEP. If such work is found not to be in accordance with the contract documents, the Contractor shall pay such costs unless it is found that such condition was caused by a separate contractor employed by DEP and in that event DEP shall be responsible for the payment of such costs.

17.2 Correction of Work

The Contractor shall promptly correct all work rejected by DEP as defective or as failing to conform to the contract documents whether observed before or after final completion and whether or not fabricated, installed or completed. The Contractor shall bear all cost of correcting such rejected work. All such defective or

ARTICLE II - GENERAL CONDITIONS

non-conforming work shall be removed from the site if necessary, and the work shall be corrected to comply with the contract documents at no cost to DEP. If the Contractor fails to correct such defective or non-conforming work, DEP may correct it in accordance with Section 17.3 below or Section 11.2(m) of these General Conditions.

17.3 Acceptance of Non-Conforming Work

If DEP prefers to accept non-conforming work, it may do so instead of requiring its removal and correction, in which case a change order will be issued to reflect an appropriate reduction in the contract sum, or, if the amount is determined after final payment, it shall be paid by the Contractor.

18.0 ASSIGNMENT OF CONTRACT

Contractor shall not assign or transfer this contract or sublet it as a whole without having first obtained the written consent of DEP to do so; and it is likewise agreed that the Contractor shall not assign legally or equitably any of the moneys payable to it under the contract, or its claim thereto, without having first obtained the written consent of DEP to do so.

Date	Signature	Title
IMPORTANT! In order to certify in Part C to the accuracy of existing information in AVS, you must obtain a copy of your business' Entity OFT. To obtain an Entity OFT, contact the AVS Office, toll-free, at 800-643-9748 or from the AVS website at https://avss.osmre.gov.		

Part D.

Contractor's Business Name: _____

If the current Entity OFT information for your business is incomplete or incorrect in AVS, or if there is no information in AVS for your business, you must provide all of the following information as it applies to your business. Please make as many copies of this page as you require.

- Every officer (President, Vice President, Secretary, Treasurer, etc.);
- All Directors;
- All persons performing a function similar to a Director;
- Every person or business that owns 10% or more of the voting stock in your business;
- Every partner, if your business is a partnership;
- Every member and manager, if your business is a limited liability company; and
- Any other person(s) who has the ability to determine the manner in which the AML reclamation project is being conducted.

Name	_____	Position/Title	_____
Address	_____	Telephone #	_____
	_____	% of Ownership	_____
Begin Date:	_____	Ending Date:	_____
Name	_____	Position/Title	_____
Address	_____	Telephone #	_____
	_____	% of Ownership	_____
Begin Date:	_____	Ending Date:	_____
Name	_____	Position/Title	_____
Address	_____	Telephone #	_____
	_____	% of Ownership	_____
Begin Date:	_____	Ending Date:	_____
Name	_____	Position/Title	_____
Address	_____	Telephone #	_____
	_____	% of Ownership	_____
Begin Date:	_____	Ending Date:	_____

PAPERWORK REDUCTION STATEMENT

The Paperwork Reduction Act of 1995 (44 U.S.C. 3501) requires us to inform you that: Federal Agencies may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number. This information is necessary for all successful bidders prior to the distribution of AML funds, and is required to obtain a benefit.

Public reporting burden for this form is estimated to range from 15 minutes to 1 hour, with an average of 22 minutes per response, including time for reviewing instructions, gathering and maintaining data, and completing and reviewing the form. You may direct comments regarding the burden estimate or any other aspect of this form to the Information Collection Clearance Officer, Office of Surface Mining Reclamation and Enforcement, Room 202 SIB, Constitution Ave., NW, Washington, D.C. 20240.

ARTICLE III - GENERAL REQUIREMENTS

ARTICLE III - GENERAL REQUIREMENTS

Sections Included:

- 1.0 Summary of the Work**
- 2.0 Quality Standards, Approvals**
- 3.0 Superintendents, Coordination**
- 4.0 Project Meetings**
- 5.0 Authority & Duties of Inspectors**
- 6.0 Shop Drawings, Product Data, Samples**
- 7.0 Measurements, Manufacturer's Directions**
- 8.0 Lines, Levels, Grades, Layout**
- 9.0 Documents, Shop Drawings, Etc., at Site**
- 10.0 Storage of Materials**
- 11.0 Protection of Work, Damages**
- 12.0 Temporary Facilities**
- 13.0 Construction Sign**
- 14.0 Cleaning and Final Clean-Up**
- 15.0 Testing**
- 16.0 Project Completion - Certificates**

ARTICLE III - GENERAL REQUIREMENTS

1.0 SUMMARY OF THE WORK

This Article briefly outlines and describes the work to be performed and is not intended to limit the faithful execution of the contract documents.

- 1.1 The scope of the work for this project, without attempting to restrict or limit the contractor's responsibility, consists of furnishing all plant, labor, materials, and equipment to construct abandoned mine drainage control structures described in the drawings and these specifications. The work shall include, but not be limited to, the following:**

The scope of work will include the installation of approximately 400 Rock Anchors and associated materials for the reinforcement of Highwall #1, including 1,680 linear feet of HDPE drainage blanket, 215 linear feet each of Temporary Jersey Barrier and Safety Fence and 250 linear feet of Chainlink Safety Fence. Site drainage conveyances consist of 740 linear feet of vegetated channels, 275 linear feet of riprap channels and 225 linear feet of concrete block matting channels and 160 linear feet of 24 inch HDPE culvert. Approximately 6,246 cubic yards of material will be moved to regrade areas above and below Site 1 Highwall #1 and to cover coal refuse on Site 3, and grade the project area to the lines and elevations depicted on the Plans. The Contractor will be required to provide smooth, aesthetically pleasing final grade slopes and place 12 inches, minimum, of material capable of supporting vegetation on all final regrade slopes. The Contractor will also be required to clear and grub the sites, 6 acres; re-establish vegetation on all disturbed areas in accordance with the Specifications; and install and maintain a sediment control plan, complying with the approved NPDES permit for this project, during all phases of construction. The Contractor will be required to upgrade and maintain all existing access roads, construct stabilized construction entrances, and leave all roads in a condition better or equal than what existed at the time of mobilization operation. All Contractor constructed temporary access roads shall be regarded to approximate original contours and revegetated. Sediment control measures shall be provided during and after construction and revegetation of disturbed areas shall be conducted upon completion of the project.

ARTICLE III - GENERAL REQUIREMENTS

2.0 QUALITY STANDARDS, APPROVALS

- 2.1** Notwithstanding reference in the specifications or on the drawings to any article, item, product, material, equipment, or system by name, brand, make, or manufacturer, such reference shall be intended and interpreted as establishing a standard of quality, and shall not be taken, regarded, or construed as limiting competition.
- 2.2** Any article, item, product, material, equipment, or system which will perform adequately and satisfactorily the duties imposed by the general design will be considered equally acceptable to that specified or referenced, providing the article, item, product, material, equipment, or system so proposed is equal in quality, substance, design, manufacture, function and performance as that specified or referenced, and adjudged and determined to be so in the opinion of the Construction Supervisor and is approved by him/her. The approval of the Regional Engineer is required before purchase and installation.
- 2.3** Approvals
- Where the term "of approved manufacture" appears in the specifications, or an "approved" or "approved as equal" article or item is referred to, it shall mean that the article, item, workmanship, or material must meet the approval of the Construction Supervisor.

3.0 SUPERINTENDENTS, COORDINATION

3.1 Superintendents

The Contractor shall employ and keep a competent superintendent and assistants who shall be capable of effective communication as required on the job at all times and who shall give efficient supervision to the work, using his/her best skill and attention, and shall have knowledge and control of all trades. The superintendent shall be acceptable to the Construction Supervisor and shall not be changed without the Construction Supervisor's knowledge and consent. The Contractor also shall see that each respective sub-contractor provides a competent foreman for each trade.

3.2 Coordination.

The Contractor and each sub-contractor shall coordinate the work and operations and shall cooperate with and assist each other on the job for the successful execution of the work within trade jurisdictional rulings. Each shall study all drawings and specifications and shall perform all work which properly comes under jurisdiction of the trade he/she represents.

4.0 PROJECT MEETINGS AND CONFERENCES

- 4.1** The following meetings shall be scheduled and held prior to commencement of the project and during execution of the work. DEP will schedule such

ARTICLE III - GENERAL REQUIREMENTS

meetings and advise all parties concerned by written notice of the date, time, and location of such meetings.

- (a) **Pre-Bid Conference** Conference with Engineer, bidders and appropriate DEP personnel as necessary, and others directly concerned for explanation of bidding and contract documents, project site familiarization as required, and for answering questions pertinent to the project. **Attendance by bidders is mandatory in order to be eligible to bid on the project.**

A date and time will be set for the on-site mandatory Prebid Conference. All interested parties are required to attend this meeting. Failure to attend the mandatory pre-bid shall result in disqualification of the bid. No one person may represent more than one bidder.

An attendance sheet will be made available for all potential bidders to complete. This will serve as the official document verifying attendance at the mandatory pre-bid. Failure to provide your company and representative name on the attendance sheet will result in disqualification of the bid. The State will not accept any other documentation to verify attendance. The bidder is responsible for ensuring they have completed the information required on the attendance sheet. The Purchasing Division and the state agency will not assume any responsibility for a bidder's failure to complete the pre-bid attendance sheet. In addition, we request that all potential bidders include their e-mail address and fax number.

All potential bidders are requested to arrive prior to the starting time for the pre-bid. Bidders who arrive late, but prior to the dismissal of the technical portion of the pre-bid will be permitted to sign in. Bidders who arrive after the pre-bid conference has ended will not be permitted to sign the attendance sheet or bid on the project work.

- (b) **Pre-Construction Conference** Conference with Engineer, appropriate DEP personnel, Contractor, Sub-Contractors, and others directly concerned, after award of the contract and prior to commencement of construction, for discussion of the project, contract documents, scheduling, and for resolving questions concerning project execution and administration as required.

- (c) **Project Meetings** Meetings shall be held at periodic intervals throughout the construction contract period for discussion of matters pertinent to the execution and administration of the project. The Regional Engineer, Construction Engineer, Construction Supervisor, Inspector, Contractor and/or its Superintendent, Subcontractors, Project Foremen, as required, and others directly concerned, as necessary, shall attend the meetings.

5.0 AUTHORITY & DUTIES OF INSPECTORS

- 5.1** The Inspector, as the Regional Engineer's authorized representative, is authorized to make minor field changes to the plans and specifications that do not involve an increase or decrease in the contract sum or an increase or decrease in the contract time. The Inspector shall be authorized to inspect all work done, all material furnished, payroll records of personnel, material invoices and relevant data and records of the work, and the preparation, fabrication, or manufacture of the materials to be used. The Inspector is not authorized to revoke, alter, or waive any requirements of the plans and specifications that result in an increase or decrease in the amount of compensation due the Contractor or an increase or decrease in the contract time. The Inspector is authorized to call to the attention of the Contractor any failure of the work or materials to conform to the plans and specifications. The Inspector shall have the authority to reject materials or suspend the work until any questions at issue can be referred to and decided by the Regional Engineer.
- 5.2** The Inspector shall in no case act as foreman or perform other duties for the Contractor, nor interfere with the management of the work by the Contractor. Any advice which the Inspector may give the Contractor shall in no way be construed as binding the Regional Engineer in any way, or releasing the Contractor from fulfilling all of the terms of the contract.

ARTICLE III - GENERAL REQUIREMENTS

- 5.3** If a problem arises that the contractor will not correct and the Contractor refuses to suspend operations on verbal order, the Inspector shall issue a written order giving the reason for ordering the work to stop. After placing the order in the hands of the person in charge, the Inspector shall immediately leave the job, and the Contractor shall cease all operations.

6.0 SHOP DRAWINGS, PRODUCT DATA, SAMPLES

6.1 Definitions

- (a) "Shop drawings" are drawings, diagrams, schedules, and other data, prepared for the project by the Contractor, Sub-contractor, manufacturer, or supplier, to illustrate and/or install some portion of the work.
- (b) "Product data" are illustrative data, brochures, schedules, catalog cuts, charts, informative material and specifications to illustrate materials, articles, items, or products for use in some portion of the work.
- (c) "Samples" are physical examples which show and illustrate materials, finishes, equipment or workmanship of products proposed for use in some portion of the work.

6.2 Submittals

- (a) The Contractor shall review, approve, and submit to the Regional Engineer with reasonable promptness, and in such sequence to cause no delay in the work, all shop drawings, product data, and samples required by the contract documents.
- (b) No shop drawings, product data, or samples shall be submitted to the Regional Engineer except by the Contractor, who shall, before submission, verify all materials, check all details, measurements, verify all field measurements and field construction conditions, and other job coordination requirements. Upon review, check, and approval by the Contractor, the Contractor shall place its stamp of approval thereon before submitting to the Regional Engineer.
- (c) The Contractor shall not be relieved of responsibility for any deviation from the requirements of the contract documents by the Regional Engineer's approval of shop drawings, product data, or samples, nor shall it be relieved of responsibility for errors or omissions therein.
- (d) Shop drawings, product data, and samples shall be submitted in sufficient number for all approvals, with a minimum of two (2) copies or samples being retained by the Regional Engineer, and a number of copies and samples being retained by the Contractor as required for the execution of its work.

ARTICLE III - GENERAL REQUIREMENTS

- (e) No portion of the work requiring submission of a shop drawing, product data, or sample shall be commenced until the submittal has been approved by the Regional Engineer. All such portions of the work shall be in accordance with approved submittals.**
- (f) Shop drawings, product data, and samples shall be submitted for work, systems, articles, items, and equipment as specified. Other additional shop drawings, product data, and samples as may be requested for the work by the Regional Engineer shall be submitted to him/her for approval.**

7.0 MEASUREMENTS, MANUFACTURER'S DIRECTIONS

7.1 Measurements

Before ordering any material, product, article, or doing any work, the Contractor shall take all necessary measurements at the project and shall be responsible for the correctness of same. No extra charge or compensation will be allowed on account of differences between actual dimensions and the dimensions indicated on the drawings. The Regional Engineer shall be notified of any differences found and work shall not proceed thereon until the Regional Engineer has rendered a decision.

7.2 Manufacturers' Directions

All manufactured articles, items, products, material, and equipment shall be applied, installed, connected, erected, used, cleaned, conditioned and put into operation or use as directed by the manufacturer's printed instructions, unless specified otherwise herein. The Contractor shall be responsible for obtaining all such instructions.

7.3 Measurement of Quantities

The Contractor shall be responsible for providing all necessary volumetric and weight measurement equipment necessary to measure quantities accurately for payment of contract unit items, and said equipment shall be subject to the Regional Engineer's approval. Volume and weight measurements shall be submitted to the Regional Engineer for approval.

8.0 LINES, LEVELS, GRADES, LAYOUT

8.1 Lines, Levels, Grades

- (a) Control points have been established in the field and are shown on the plans whereby the Contractor can properly control the work contracted for under these specifications. Such stakes and markings which the Engineer may have set for either his/her own guidance shall be scrupulously preserved by the Contractor, or its employees. If any**

ARTICLE III - GENERAL REQUIREMENTS

action by the Contractor should result in the destruction of such stakes or markings, an amount equal to the cost of replacing same may be deducted from subsequent estimates due the Contractor at the discretion of the Construction Supervisor. The Contractor shall satisfy itself as to the accuracy of all measurements before constructing any permanent structure and shall not take advantage of any errors which may have been made in laying out the work. Should any discrepancies become evident between the plans and the Contractor's field survey, the Contractor shall immediately notify the Inspector. If these discrepancies will create a change in any item in the Contractor's accepted final bid, the DEP reserves the right to re-design or negotiate. Should the Contractor fail to make notification of these discrepancies, DEP will not be held liable for any changes in the original quantities.

- (b) The Contractor shall make all field measurements necessary for its work and shall be responsible for the accuracy of all dimensions, lines, levels, and grades. If a survey is required, it shall be performed at the expense of the Contractor. All survey work shall be performed by a West Virginia Licensed Land Surveyor who shall certify as to the accuracy of the survey to DEP.

9.0 DOCUMENTS, SHOP DRAWINGS, ETC., AT THE SITE

- 9.1 The Contractor shall maintain at the project site for DEP one (1) record copy of all drawings, specifications, addenda, change orders, and other modifications, in good order, marked currently to record all changes made during construction, and all approved shop drawings, product data, and samples, properly filed and referenced. All such documents and samples shall be delivered to the Construction Supervisor upon completion of the work.
- 9.2 The Contractor shall furnish the Inspector in writing two (2) sets of daily reports showing all personnel (by classification), equipment, and tools engaged in the work, for use in accounting records.
- 9.3 The Contractor shall be responsible for submitting a daily activity summary which shall be used to report progress of the various construction activities performed at the subject site. The summary report shall be submitted to the Inspector on a weekly basis on the prescribed forms. Processing invoices may be delayed if summary reports are not submitted.

10.0 STORAGE OF MATERIALS

- 10.1 The Contractor, under and with the approval, supervision, and direction of DEP, shall assume full charge of the area or areas of the project premises allocated for the storage of materials and equipment as required, allocating the necessary site space to any sub-contractor(s) for storage sheds and space for the storage of materials and equipment. Such arrangement of storage facilities

ARTICLE III - GENERAL REQUIREMENTS

shall be orderly, convenient, shall not obstruct movement on the site, the work of others, or construction operations. All storage sheds, enclosures, and facilities shall fully protect the stored materials. The Contractor shall arrange with appropriate landowner(s) for any storage areas located outside of the project limits and such storage areas shall also be subject to DEP's approval.

- 10.2 All materials subject to damage by moisture, water, or weather shall be fully protected. All flammable, toxic, and explosive materials shall be safely stored in conformity with applicable safety requirements of State and Federal regulations and safety standards of the National Fire Protection Association.

11.0 PROTECTION OF WORK; DAMAGES

11.1 Protection and Replacement of Work

- (a) The Contractor shall protect its work from damage of any kind until completion of construction. Each contractor or sub-contractor shall adequately protect all preceding work from damage caused by it or its work. Should any part of the construction be subject to freezing or exposure to the elements, the same shall be fully protected to prevent damage.
- (b) The Contractor and each sub-contractor shall provide protection against weather, frost, freezing, storms, and heat, to maintain all work, materials, installations, and equipment safe from injury and damage. The Contractor shall provide temporary covering and closures in the construction as required to protect it from damage by weather, until permanent construction provides such protection.
- (c) Damaged or defective work must be replaced; all other work injured or damaged in the replacing of such work or in any way incidental thereto must be brought back to its original condition or replaced by the Contractor performing the work, without additional cost to DEP.

11.2 Damages to Existing Work

All masonry damage, glass breakage, and other damage caused to existing buildings and appurtenances by the Contractor or by other contractors in the performance of work shall be properly replaced or repaired at the option of DEP, without additional cost to DEP.

12.0 TEMPORARY FACILITIES

12.1 Utilities

- (a) General All concerned with providing temporary utilities for use on the project are advised to determine locations of sources of supply and the conditions under which services can be brought to points of use on the site.

ARTICLE III - GENERAL REQUIREMENTS

- (b) **Drinking Water** The Contractor shall arrange for drinking water and containers to be provided on the site.
- (c) **Utility Connections** The Contractor is to furnish power, gas, compressed air and any other utilities required for its own use during construction. The Contractor shall remove all temporary wiring, switches, lights, piping and connections to service facilities used during construction. Such connections shall not be made without approval of the Inspector.
- (d) **Temporary Supports** The Contractor shall provide such temporary supports as may be required during construction, including those necessary to ensure the stability of the proposed excavation.
- (e) **Equipment** The Contractor shall furnish all special apparatuses, welding machines, air compressors, hoisting equipment, tools, implements, cartage, scaffolding, ladders, planks, acetylene gas, oxygen gas, expendable materials, temporary light and heat, construction materials, shims and all other materials that may be required for the proper execution of the work.
- (f) **Temporary Buildings** The Contractor will furnish, place, and equip, at its own expense, and as it deems necessary, any portable construction building(s) such as a trailer, storage sheds or chemical sanitary facilities. These portable facilities must be within the designated project limits; otherwise, the Contractor is solely responsible for making necessary arrangements with the proper landowner when the buildings are set up outside of the project limits. The type and number of buildings are subject to the approval of the Inspector. All written instructions, orders, and other communication delivered to the temporary construction office set up on the site shall be considered as having been delivered to the Contractor itself. The Contractor shall provide and pay for its own fire protection, watchman, temporary utility hookups, etc. The Contractor will promptly remove from the project any office facilities, equipment or materials when so instructed by the Inspector.
- (g) **Sanitation Facilities** The Contractor shall provide and pay for adequate temporary toilet facilities for personnel during the project construction period. Toilets shall be of types approved by DEP and the State Division of Health, and situated only in approved locations. The Contractor shall be responsible for operation and sanitary maintenance of the temporary toilets and shall have them removed upon completion of construction.

ARTICLE III - GENERAL REQUIREMENTS

13.0 CONSTRUCTION SIGN

13.1 Work Required

The work to be performed under this Section consists of providing all labor, material and equipment necessary to install a project sign as indicated on the detail included herein and as specified herein.

13.2 Materials

- (a) Paint Paint for the project sign shall be one (1) coat Exterior-Grade Wood Primer-Sealer, and two (2) coats Exterior Grade Low-Sheen Enamel by Glidden or another approved manufacturer.
- (b) Sign face shall be 3/4" Marine Exterior plywood, aluminum or composite material and posts and cross-brace shall be No. 2 Grade Pine or Fir, kiln dried and treated.
- (c) Hardware:
 - (1) All hardware shall be manufactured from good, commercial-quality material and meet all applicable ASTM standards.
 - (2) Spikes and nails shall be common wire-type and shall meet AISI steel specifications 1010 or 1020.
 - (3) All hardware shall be hot-dip galvanized in accordance with ASTM A-153.

13.3 Execution

- (a) Project Sign The sign board shall be cut to the dimensions shown on the detail herein. The sign shall be painted with one (1) coat of primer and two (2) coats of white enamel. All exterior cut edges shall be smooth sanded prior to painting. All edges shall be double primed. The letters, border and strips shall be painted as shown on the detail drawing. Posts and cross-brace shall be painted with two (2) finished coats of brown enamel.

The Contractor shall bolt the sign to posts and provide required cross-bracing. The posts and sign shall be erected and posts set in gravel base, as shown on the drawings. One (1) sign is required and is to be located at the discretion of the Inspector.

- (b) Payment Payment for the work which shall include installation of the project sign shall be part of the lump-sum bid for "Mobilization".



Earl Ray Tomblin
Governor



Randy C. Huffman
Cabinet Secretary

AML

Robert Rice
Chief

STATE OF WEST VIRGINIA

DEPARTMENT OF ENVIRONMENTAL PROTECTION

Office of Abandoned Mine Lands & Reclamation

Project Cost: \$XXX,XXX.00
Funding: US Department of the Interior – OSM with fees paid by the Coal Industry

Project Name:
DEP#

Contractor: Joe Smith Contracting

Project Start Date: 01/01/01

77 1/4"

1 1/2" 17 1/4" 1 1/8"

15 3/4"



STATE OF WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION

27 3/4"

7 7/8" Earl Ray Tomblin
Governor

3 3/4" dep

7 7/8" Randy C. Huffman
Cabinet Secretary

3" AML

8 5/8" Robert Rice
Chief

Office of Abandoned Mine Lands & Reclamation

Project Cost: \$XXX,XXX.00
Funding: US Department of the Interior – OSM with fees paid by the Coal Industry

Project Name:
DEP#

Contractor: Joe Smith Contracting

Project Start Date: 01/01/01

73 7/8"

48"

6"

36"

36"

6"

18"

2 1/4"

96"



STATE OF WEST VIRGINIA

DEPARTMENT OF ENVIRONMENTAL PROTECTION

Office of Abandoned Mine Lands & Reclamation

Earl Ray Tomblin
Governor


Randy C. Huftrman
Cabinet Secretary


Robert Rice
Chief

Project Cost: \$XXX,XXX.00
Funding: US Department of the Interior -- OSM with fees paid by the Coal Industry

Project Name:
DEP#

Contractor: Joe Smith Contracting

Project Start Date: 01/01/01

48"

5 1/4"

7 7/8"

9 3/8"

81 3/8"



STATE OF WEST VIRGINIA

DEPARTMENT OF ENVIRONMENTAL PROTECTION

Office of Abandoned Mine Lands & Reclamation

Project Cost: \$XXX,XXX.00

Funding: US Department of the Interior – OSM with fees paid by the Coal Industry

Project Name:

DEP#

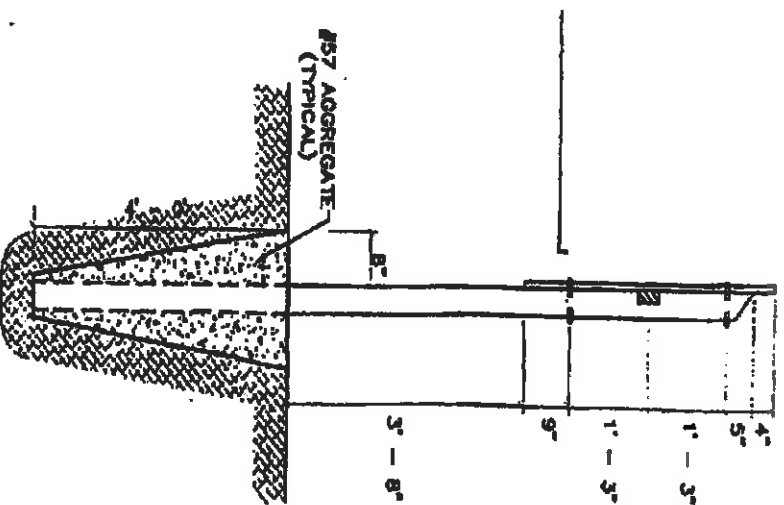
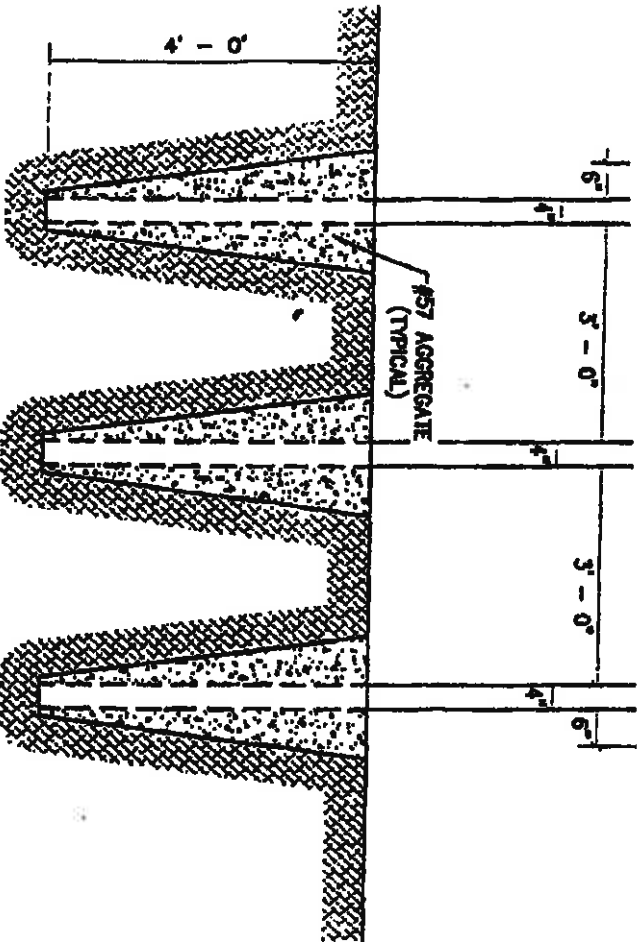
Contractor: Joe Smith Contracting

Project Start Date: 01/01/01

17 1/2"		6"
1 1/4"	Earl Ray Tomblin	2 1/4"
3/4"	Governor	1 1/2"
1 1/4"	dep	2 1/4"
9 1/2"		3 3/4"
1"	Randy C. Huffman	2"
3/4"	Cabinet Secretary	3 3/4"
1"		1 1/2"
8"		4 7/8"
1"	AML	2 1/4"
3/4"	Robert Rice	1 1/2"
1"	Chief	2 1/4"
3 3/4"		4 7/8"
		1 1/2"
		3 3/4"

Notes:

1. Sign board to be $\frac{3}{4}$ " by 4'X 8' marine plywood.
2. Sign board color is to be white and letter colors are to be dark green and sized as shown on the detail.
3. 2"X 4" treated cross brace let into posts.
4. Mount sign to posts using $\frac{3}{8}$ "X 5" galvanized carriage bolt.
5. Posts are to be treated 4"X 4"X 12' and panted brown.
6. Location determined by WVDEP.



ARTICLE III - GENERAL REQUIREMENTS

14.0 CLEANING & FINAL CLEAN-UP

14.1 Housekeeping - Periodic Cleaning

The Contractor shall at all times keep the construction site free of accumulations of waste materials and rubbish caused by its operations. Periodically during the progress of the work, and also when directed to do so by DEP, the Contractor shall remove, or cause to be removed by sub-contractors responsible, accumulated waste materials, rubbish, and debris, and leave the construction area in good order.

14.2 Final Clean-Up

The Contractor at all times shall dispose of all debris and waste resulting from work at the Contractor's dump site. The Contractor shall not put or spill any materials into any drainage system which would pollute area streams or waterways. The Contractor shall be liable for any stream pollution caused directly or indirectly by its own employees or those of its sub-contractors.

14.3 Final

Should disputes arise between Contractor and separate contractors, or sub-contractors as to responsibilities for cleaning-up, and refusals to do so result therefrom, DEP may hold final payment until the cleanup work is completed.

15.0 TESTING

15.1 When Testing Required

Testing shall be performed as required by the specifications or ordered by the Regional Engineer. The Regional Engineer will determine the need, location, extent, and time of any testing herein specified, or in addition to that which is herein specified.

15.2 Payment for Testing

The Contractor shall select an independent testing laboratory or utilize a laboratory run by the Contractor, to perform all testing for compaction, concrete, and soils as specified herein. All laboratory reports must be signed by a registered professional engineer. The Contractor shall be responsible for testing payments as an incidental to the various items of the bid schedule. If the Contractor allows work to proceed beyond a testing point resulting in the disassembly of structures or the uncovering of work for testing, payment for such will be the responsibility of the Contractor at no extra cost to DEP.

ARTICLE III - GENERAL REQUIREMENTS

16.0 PROJECT COMPLETION - CERTIFICATES

- 16.1 All certificates of testing, quality, compliance, and performance, as required, requested, and/or specified, shall be delivered to DEP upon delivery or completion of the work covered by the certificates.**
- 16.2 All certificates of approval, compliance, and completion as required by codes, inspection and regulatory agencies, and local, State and Federal governmental authorities, shall be delivered to DEP upon completion of the work and inspections covered by such certificates.**
- 16.3 The contractor shall submit to the WVDEP as built drawings certified by a Licensed Land Surveyor identifying all changes occurring on the project. The drawings shall be of professional quality. Unsuitable drawings will be returned for revisions. These drawings shall be approved by WVDEP prior to scheduling a Final Inspection.**

**DEPARTMENT OF ENVIRONMENTAL PROTECTION
OFFICE OF ABANDONED MILE LANDS & RECLAMATION**

Report for Week Ending: _____ Project Name: _____
By: _____ Location: _____
Title: _____ Contractor: _____

Daily Activity Summary

Sunday	
Monday	
Tuesday	
Wednesday	
Thursday	
Friday	
Saturday	

OFFICE OF ABANDONED MILE LANDS & RECLAMATION

Weekly Quantity Summary

Report By: _____

For Week Ending: _____

[illegible]

Attach any sheets applicable to this weeks work and check appropriate box.

Change Orders

Test Results

Other (explain)

Field Changes ☐

Explanation of work stoppages not due to weather ☐

ARTICLE IV - SPECIAL CONDITIONS

ARTICLE IV - SPECIAL CONDITIONS

Sections Included:

- 1.0 Use of Minority, Women's, & Small Business Enterprises**
- 2.0 Erosion & Sediment Control**
- 3.0 Debarment and Suspension Requirements**
- 4.0 Certification Regarding Lobbying**

ARTICLE IV - SPECIAL CONDITIONS

1.0 USE OF MINORITY, WOMEN'S, & SMALL BUSINESS ENTERPRISES

- 1.1** Should the Contractor intend to sublet a portion of the work on this project, it shall seek out and consider minority, women's, and small business enterprises as potential sub-contractors. The Contractor shall contact minority, women's, and small businesses to solicit their interest, capability, and prices, and shall retain proper documentation to substantiate such contacts.
- 1.2** The Contractor will sign and provide the enclosed Minority, Women's and Small Business Affirmative Action Certification to DEP along with the name(s) of any subcontractor(s) it submits for approval.

**WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION
CONSTRUCTION CONTRACTOR'S
MINORITY, WOMEN'S AND SMALL BUSINESS
AFFIRMATIVE ACTION CERTIFICATION**

We, _____, the undersigned, Construction Contractor on the Abandoned Mine Lands & Reclamation construction contract herein, intending to sub-contract a part of our contract work under Requisition No. _____, hereby certify as follows:

- 1) We will include qualified small, minority and women's businesses on solicitation lists;
- 2) We will assure that small, minority and women's businesses are solicited whenever they are potential sources;
- 3) We will, when economically feasible, divide total requirements into smaller tasks or quantities so as to permit maximum small, minority and women's business participation.
- 4) Where our requirements permit, we will establish delivery schedules which will encourage participation by small, minority and women's businesses.
- 5) We will utilize the services and assistance of the Small Business Administration, the Office of Minority Business Enterprise of the Department of Commerce and the Community Services Administration as required.

We understand that we may obtain the information required under the foregoing provisions from the Governor's Office of Community & Industrial Development's Small Business Development Center, 1115 Virginia Street, East, Charleston, West Virginia 25301, Phone 304/348-2960.

- 6) We will submit this certification to the Construction Supervisor when we submit proposed subcontractors for approval.
- 7) We agree that all documentation relative to affirmative action taken by us to seek out and consider the use of minority, women's and small business enterprises as subcontractors shall be made available for inspection by representatives of the West Virginia Department of Environmental Protection and the U.S. Office of Surface Mining Reclamation and Enforcement;
- 8) This certification is an integral part of our proposal for the construction contract.

Signed this _____ day of _____, 20____.

Signature of Authorized Representative

Title

ARTICLE IV - SPECIAL CONDITIONS

2.0 EROSION & SEDIMENT CONTROL

The manual entitled "West Virginia Department of Enviromental Sediment Contol Design Manual BMP", 2006, is incorporated herein by reference as a guide for erosion and sediment control, except that where any provision of said manual is in conflict with any special erosion and sediment control provision set out and contained in this specification book and/or in the plans for this project, the plans and/or specification book shall prevail and be followed.

**ASSURANCE REQUIREMENT REGARDING EQUAL EMPLOYMENT OPPORTUNITY
FOR VENDORS, SUPPLIERS AND CONTRACTORS ENGAGED IN
COMMERCIAL TRANSACTIONS WITH
THE WEST VIRGINIA DEPARTMENT OF ENVIRONMENTAL PROTECTION**

We, _____, the undersigned, desiring to avail ourselves of the benefits of engaging in commercial transactions with the West Virginia Department of Environmental Protection, hereby agree that:

- 1) All employment and personnel practices under this contract, Requisition No. _____, will be conducted without regard to race, sex, religion or national origin;
- 2) We will include in all recruitment advertisements the following wording:
"An Equal Opportunity Employer"; and
- 3) We will provide the Chief of the Abandoned Mine Lands and Reclamation Division or his/her authorized representative, upon request, documentation that will enable him/her to judge the extent of our compliance with the requirements of Governor's Executive Order No. 4-65, of December 15, 1965.

Signed this ____ day of _____, 20__.

Signature of Authorized Representative

Title

ARTICLE IV - SPECIAL CONDITIONS

3.0 GOVERNMENT-WIDE DEBARMENT & SUSPENSION REQUIREMENTS

U. S. Department of the Interior

Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion

Lower Tier Covered Transactions

1. By signing and submitting this proposal, the prospective lower tier participant is providing the certification set out below.
2. The certification in this clause is a material representation of fact upon which reliance was placed when this transaction was entered into. If it is later determined that the prospective lower tier participant knowingly rendered an erroneous certification, in addition to other remedies available to the Federal Government, the department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.
3. The prospective lower tier participant shall provide immediate written notice to the person to which this proposal is submitted if at any time the prospective lower tier participant learns that its certification was erroneous when submitted or has become erroneous by reason of changed circumstances.
4. The terms "covered transaction," "debarred," "suspended," "ineligible," "lower tier covered transaction," "participant," "person," "primary covered transaction," "principal," "proposal," and "voluntarily excluded," as used in this clause, have the meanings set out in the Definitions and Coverage sections of the rules implementing Executive Order 12549. You may contact the person to which this proposal is submitted for assistance in obtaining a copy of those regulations.
5. The prospective lower tier participant agrees by submitting this proposal that, should the proposed covered transaction be entered into, it shall not knowingly enter into any lower tier covered transaction with a person who is debarred, suspended, declared ineligible, or voluntarily excluded from participation in this covered transaction, unless authorized by the department or agency entering into this transaction originated.
6. The prospective lower tier participant further agrees by submitting this proposal, that it will include the clause titled "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transaction," without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions.
7. A participant in a covered transaction may rely upon a certification of a prospective participant in a lower tier covered transaction that is not debarred, suspended ineligible, or voluntarily excluded from the covered transaction, unless it knows that the certification is erroneous. A participant may decide the method and frequency by which it determines the eligibility of its principals. Each participant may, but is not required to, check the Non procurement List (Tel.#).
8. Nothing contained in the foregoing shall be construed to require establishment of a system of records in order to render in good faith the certification required by this clause. The knowledge and information of a participant is not required to exceed that which is normally possessed by a prudent person in the ordinary course of business dealings.
9. Except for transactions authorized under paragraph 6 of these instructions, if a participant in a covered transaction knowingly enters into a lower tier covered transaction with a person who is suspended, debarred, ineligible, or voluntarily excluded from participation in this transaction, in addition to other remedies available to the Federal Government, the department or agency with which this transaction originated may pursue available remedies, including suspension and/or debarment.

U. S. Department of the Interior
Certification Regarding
Debarment, Suspension, Ineligibility and
Voluntary Exclusion
Lower Tier Covered Transactions

This certification is required by the regulations implementing Executive Order 12549, Debarment and Suspension, 43 CFR Part 12, Section 12.510, Participants' responsibilities. The regulations were published as Part VII of the May 26, 1988 Federal Register (pages 19160-19211). For assistance in obtaining a copy of the regulations, contact the U.S. Department of the Interior, Acquisition and Assistance Division, Office of Acquisition and Property Management, 18th and C Streets, N.W., Washington D.C. 20240.

(1) The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any Federal department or agency.

(2) Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

Name and Title of Authorized Representative

Signature

Date

ARTICLE IV - SPECIAL CONDITIONS
Instructions for Certification Regarding Lobbying

1. This certification and a disclosure form should be filed by each person as required, with each submission that initiates agency consideration of such person for: (1) award of a Federal contract, grant, or cooperative agreement exceeding \$100,000 or (2) an award of a Federal loan or a commitment providing for the United States to insure or guarantee a loan exceeding \$150,000.
2. This certification and a disclosure form should be filed by each person as required, upon receipt by such person of (1) a Federal contract, grant, or cooperative agreement exceeding \$100,000, or (2) a Federal loan or a commitment providing for the United States to insure or guarantee a loan exceeding \$150,000, unless such person previously filed a certification, and a disclosure form, if required, at the time agency consideration was initiated.
3. Any person who requests or receives from a person referred to in paragraphs (1) and (2) above: (1) a subcontract exceeding \$100,000 at any tier under a Federal contract; (2) a subgrant, contract, or subcontract exceeding \$100,000 at any tier under a Federal grant; (3) a contract or subcontract exceeding \$100,000 at any tier under a Federal loan exceeding \$150,000; or (4) a contract or subcontract exceeding \$100,000 at any tier under a Federal cooperative agreement, shall file a certification, and a disclosure form, as required, to the next tier above.
4. All disclosure forms, but not certifications, shall be forwarded from tier to tier until received by the person referred to in paragraphs(1) or (2) above. That person shall forward all disclosure forms to the appropriate Bureau/Office within the Department of the Interior.
5. Any certification or disclosure form filed under paragraph (4) above shall be treated as a material representation of fact upon which all receiving tiers shall rely. All liability arising from an erroneous representation shall be borne solely by the tier filing that representation and shall not be shared by any tier to which the erroneous representation is forwarded. Submitting an erroneous certification or disclosure constitutes a failure to file the required certification or disclosure, respectively. If a person fails to file a required certification or disclosure, the United States may pursue all available remedies, including those authorized by Section 1352, Title 31, U.S. Code.

**U. S. Department of the Interior
CERTIFICATION REGARDING LOBBYING**

This certification is required by Section 1352, title 31, U. S. Code, entitled "Limitation on use of appropriated funds to influence certain Federal contracting and financial transactions."

(BEFORE COMPLETING CERTIFICATION, READ INSTRUCTIONS ON REVERSE)

Certification for Contracts, Grants, Loans, and Cooperative Agreements

The undersigned certifies, to the best of his or her knowledge and belief, that:

(1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, and officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.

(2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions. To obtain a Standard Form LLL, contact DEP or the U.S. Office of Surface Mining, 603 Morris Street, Charleston, WV 25301, phone number 347-7158.

(3) The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by Section 1352, title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

Signature _____ Date _____

DISCLOSURE OF LOBBYING ACTIVITIES

Complete this form to disclose lobbying activities pursuant to 31 U.S.C. 1352

(See reverse for public burden disclosure.)

Approved by OMB

0348-0046

1. Type of Federal Action: <input type="checkbox"/> a. contract <input type="checkbox"/> b. grant <input type="checkbox"/> c. cooperative agreement <input type="checkbox"/> d. loan <input type="checkbox"/> e. loan guarantee <input type="checkbox"/> f. loan insurance	2. Status of Federal Action: <input type="checkbox"/> a. bid/offer/application <input type="checkbox"/> b. initial award <input type="checkbox"/> c. post-award	3. Report Type: <input type="checkbox"/> a. initial filing <input type="checkbox"/> b. material change For Material Change Only: year _____ quarter _____ date of last report _____
4. Name and Address of Reporting Entity: <input type="checkbox"/> Prime <input type="checkbox"/> Subawardee Tier _____, if known: Congressional District, if known: 4c	5. If Reporting Entity in No. 4 is a Subawardee, Enter Name and Address of Prime: Congressional District, if known:	
6. Federal Department/Agency:	7. Federal Program Name/Description: CFDA Number, if applicable: _____	
8. Federal Action Number, if known:	9. Award Amount, if known: \$	
10. a. Name and Address of Lobbying Registrant (if individual, last name, first name, MI):	b. Individuals Performing Services (including address if different from No. 10a) (last name, first name, MI):	
11. Information requested through this form is authorized by title 31 U.S.C. section 1352. This disclosure of lobbying activities is a material representation of fact upon which reliance was placed by the tier above when this transaction was made or entered into. This disclosure is required pursuant to 31 U.S.C. 1352. This information will be available for public inspection. Any person who fails to file the required disclosure shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.	Signature: _____ Print Name: _____ Title: _____ Telephone No.: _____ Date: _____	
Federal Use Only:		Authorized for Local Reproduction Standard Form LLL (Rev. 7-97)

INSTRUCTIONS FOR COMPLETION OF SF-LLL, DISCLOSURE OF LOBBYING ACTIVITIES

This disclosure form shall be completed by the reporting entity, whether subawardee or prime Federal recipient, at the initiation or receipt of a covered Federal action, or a material change to a previous filing, pursuant to title 31 U.S.C. section 1352. The filing of a form is required for each payment or agreement to make payment to any lobbying entity for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with a covered Federal action. Complete all items that apply for both the initial filing and material change report. Refer to the implementing guidance published by the Office of Management and Budget for additional information.

1. Identify the type of covered Federal action for which lobbying activity is and/or has been secured to influence the outcome of a covered Federal action.
2. Identify the status of the covered Federal action.
3. Identify the appropriate classification of this report. If this is a followup report caused by a material change to the information previously reported, enter the year and quarter in which the change occurred. Enter the date of the last previously submitted report by this reporting entity for this covered Federal action.
4. Enter the full name, address, city, State and zip code of the reporting entity. Include Congressional District, if known. Check the appropriate classification of the reporting entity that designates if it is, or expects to be, a prime or subaward recipient. Identify the tier of the subawardee, e.g., the first subawardee of the prime is the 1st tier. Subawards include but are not limited to subcontracts, subgrants and contract awards under grants.
5. If the organization filing the report in item 4 checks "Subawardee," then enter the full name, address, city, State and zip code of the prime Federal recipient. Include Congressional District, if known.
6. Enter the name of the Federal agency making the award or loan commitment. Include at least one organizational level below agency name, if known. For example, Department of Transportation, United States Coast Guard.
7. Enter the Federal program name or description for the covered Federal action (item 1). If known, enter the full Catalog of Federal Domestic Assistance (CFDA) number for grants, cooperative agreements, loans, and loan commitments.
8. Enter the most appropriate Federal identifying number available for the Federal action identified in item 1 (e.g., Request for Proposal (RFP) number; Invitation for Bid (IFB) number; grant announcement number; the contract, grant, or loan award number; the application/proposal control number assigned by the Federal agency). Include prefixes, e.g., "RFP-DE-90-001."
9. For a covered Federal action where there has been an award or loan commitment by the Federal agency, enter the Federal amount of the award/loan commitment for the prime entity identified in item 4 or 5.
10. (a) Enter the full name, address, city, State and zip code of the lobbying registrant under the Lobbying Disclosure Act of 1995 engaged by the reporting entity identified in item 4 to influence the covered Federal action.

(b) Enter the full names of the individual(s) performing services, and include full address if different from 10 (a). Enter Last Name, First Name, and Middle Initial (MI).
11. The certifying official shall sign and date the form, print his/her name, title, and telephone number.

According to the Paperwork Reduction Act, as amended, no persons are required to respond to a collection of information unless it displays a valid OMB Control Number. The valid OMB control number for this information collection is OMB No. 0348-0046. Public reporting burden for this collection of information is estimated to average 10 minutes per response, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to the Office of Management and Budget, Paperwork Reduction Project (0348-0046), Washington, DC 20503.

WAGE AND HOUR INFORMATION

PREVAILING WAGE RATES

can be obtained by contacting:

**WV Division of Labor
Capitol Complex
Bldg. 6, Room 749B
Charleston, WV 25305**

Phone: (304) 558-7890

Website: www.sos.wv.gov

CONSTRUCTION SPECIFICATIONS

**TECHNICAL SPECIFICATIONS
LILBERN PRITT HIGHWALL
BARBOUR COUNTY, WV
DEP15596**

Prepared for:

**West Virginia Department of Environmental Protection
Division of Land Restoration
Office of Abandoned Mine Lands and Reclamation
Charleston, West Virginia**

Prepared by:

**TERRADON Corporation
PO Box 519
Nitro, West Virginia 25143
(304) 755-8291**

October 6, 2014

LILBERN PRITT HIGHWALL
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III. LILBERN PRITT HIGHWALL

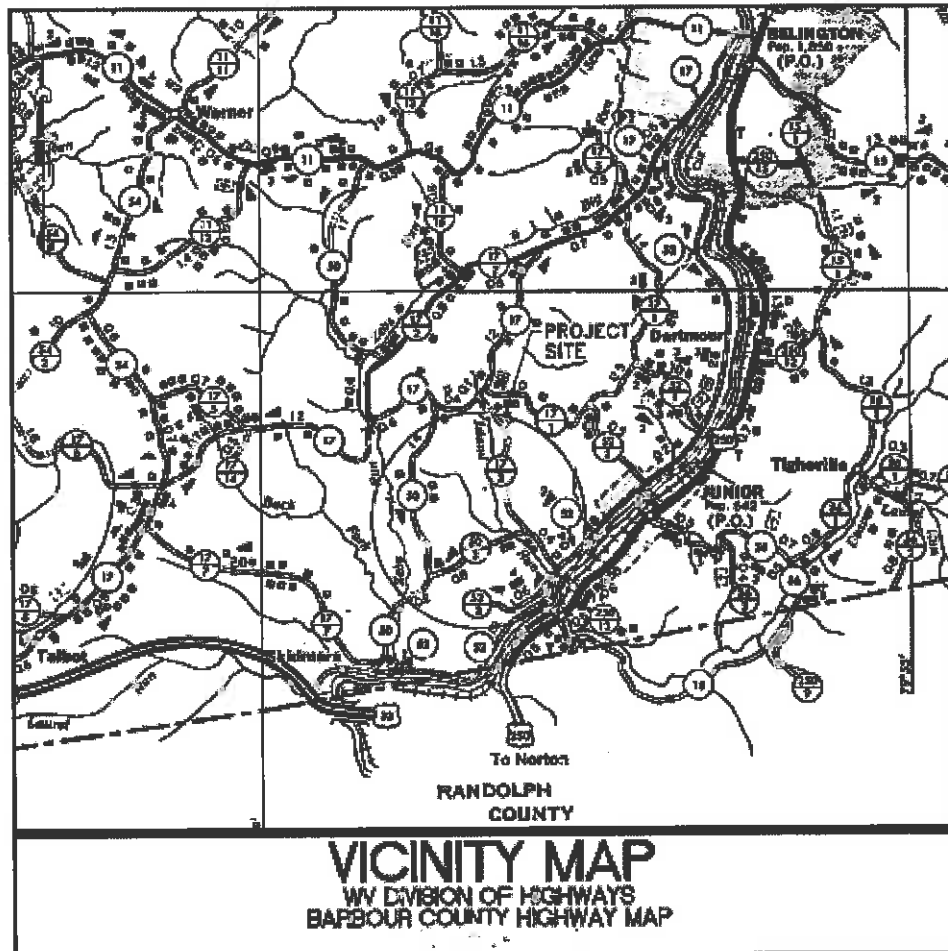
I. SPECIAL PROVISIONS

I. LOCATION / SITE DESCRIPTION

The site is located in Barbour County, West Virginia, near the Town of Junior.

Directions to Site:

From Philippi, take Route 250 and proceed to Junior. Turn right (west) onto Bridge Street, crossing the Tygart Valley River. Turn left (south) on River Ave. and drive 0.7 miles to unmarked Island Run Road on right. Turn right and drive 0.6 miles to an unmarked access road on left. Turn left and drive approximately 200 feet uphill to the bench of Highwall #1. Highwalls 3 through 6 lie to the north and east across Island Run.



II. REFERENCE SPECIFICATIONS / DEFINITIONS

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

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

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 "WVDOT 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 mine drainage discharges from the project site.

All reference to "OSM" shall be understood to mean the Office of Surface Mining.

All reference to "NEPA" shall be understood to mean the National Environmental Protection Act.

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

III. 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:

- clearing and grubbing at the site, and removal or burning of debris, trash, tree roots, and associated materials;
- construction and installation of support areas, and maintenance of access roads to the site;
- construction and installation of drainage control items including channels, pipes, drop inlets and riprap headwalls;
- track and backblade existing refuse pile to eliminate rolling and adding soil cover;
- providing sediment control;
- revegetation of disturbed areas.

The Contractor shall also 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.

IV. 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.

V. 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's work hours shall be limited to between 7:00 a.m. and 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.

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.

VI. 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.

VII. 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 the 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) indemnify and hold harmless the WVDEP for Contractor's action for any injury or damages whatsoever resulting from the use of the property.

The Contractor shall also submit a borrow area reclamation plan for prior approval by the 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.

VIII. 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 Sections 4.2.8 of these Specifications. Wood may be burned in conformity with Sections 4.2.7 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.

IX. 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 Contractor's 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.

X. 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.

XI. 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. The 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.

XII. 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.

XIII. 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, after the award of the Contract, shall become Co-Applicant to the NPDES permit as per the Article III, Section 7 of these specifications. 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. The permits required for this project include, but are not limited to: NPDES Stormwater General Construction Permit.

XIV. 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 WVDEP.

XV. 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. The utility companies (and Miss Utility of West Virginia (MUWV)) 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 and phone number of the MUWV Utility location service and of the utility companies are as follows:

MUWV	1-800-245-4848
First Energy Corporation	1-888-544-4877
Mountaineer Gas Company	1-800-834-2070
PDC Mountaineer	1-304-842-3597
Energy Corporation of America	1-304-926-3100
Frontier Communications	1-800-752-2415
Petroleum Development Company	1-800-826-0867

XVI. 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 the project area. The contractor shall be responsible for the removal of the project sign prior to the final inspection of the project, and upon approval from the WVDEP

XVII. ROCK BLASTING

It is anticipated that blasting will not be required on this project, but if necessary, all blasting will 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. No pre-splitting will be allowed.

XVIII. 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 his 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.

XIX. 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. Contractor is to follow any traffic control notes located on the Construction Plans.

XX. 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 ensure 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.

XXI. 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.

XXII. 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.

XXIII. 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. Maintain all erosion and sediment controls during construction period.
8. Remove and dispose of all erosion and sediment controls after completion of all construction activities once vegetation is established (at an approved landfill).

II. TECHNICAL SPECIFICATIONS

1.0 MOBILIZATION AND DEMOBILIZATION

1.1 Description

This work shall consist of the performance of construction preparatory operations, including the movement of personnel and equipment to the project sites and for the establishment of the Contractor's offices, buildings and other facilities including the construction of all temporary access roads as necessary to begin work on a substantial phase of the contract. The location of Contractor's office to be established shall be approved by WVDEP. It also shall include all demobilization activities involving the removal from the sites of all plant, equipment, supplies and personnel after completion of the work including cleanup of all rubbish and waste materials generated during the construction of this project; and restoration of any damage to existing site improvements resulting from the Contractor's activities at the site; and installation of the project sign; and a completed and approved set of as-built plans of the completed restoration work.

There are no equipment and material storage areas identified on the plans. It shall be the Contractor's responsibility to obtain approval for equipment and material storage areas located within the Construction Limits from the WVDEP and from the landowner for storage areas located outside of the Construction Limits.

1.2 Method of Measurement

The method of measurement will be per lump sum.

1.3 Basis of Payment

The bid for "Mobilization and Demobilization" shall be a lump sum and cannot be more than 10% of the TOTAL AMOUNT BID for the project. Partial payments 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 the WVDEP.

Nothing herein shall be construed to limit or preclude partial payments otherwise

provided for by the Contract. No deduction will be made nor will any increase be made, in the lump sum mobilization and demobilization item amount regardless of decreases or increases in the final total contract amount or for any other cause.

1.4 Pay Item

Item 1.0 "Mobilization and Demobilization" per lump sum. Cannot be more than 10% of the TOTAL AMOUNT BID for the project.

2.0 CONSTRUCTION LAYOUT

2.1 Description

This item consists of furnishing, placing, and maintaining construction layout stakes necessary for the proper performance of the work under this contract including borrow areas. It shall further consist of determining the exact units of measure for payment. It also consists of checking and making any field adjustment to the plan alignment, grades and elevations as considered necessary by the Engineer. Additionally, this item shall also include the preparation of "As-Built" Plans including the Reclamation Plan and any others specifically requested by the Division of Environmental Protection. All of these "As-Built" Plans shall be provided prior to the Final Inspection Meeting. "As-Built" submittals shall include, two (2) hard copies and an electronic submission in Adobe (.pdf) and AutoCAD 2007 (.dwg) formats. "As-Built" shall be certified by a Registered Professional Engineer or a Licensed Land Surveyor. Upon receipt and approval of the "As-Built" Plans by WVDEP, the final one-half of the amount bid for Mobilization under Section 1 shall be released with the estimate payable.

2.2 Materials

Conventional survey stakes, hubs, batter boards, flagging, templates, straightedges and other devices necessary for laying out all parts of the work.

2.3 Construction Methods

2.3.1 The Contractor shall be responsible for the proper layout of the work. The Owner will provide the Contractor with survey information regarding the baselines and the existing surface features shown on the Construction Drawings. The Contractor shall make all calculations involved and shall furnish and place all layout stakes.

2.3.2 The Contractor shall provide field forces and shall set all additional stakes as needed, such as offset stakes, reference point stakes, slope stakes, grade stakes, stakes for drainage, or other structures, supplementary bench marks, and any other horizontal or vertical controls necessary to secure a correct layout of the work including the re-establishment of the survey and construction baselines (as necessary), as shown on the Construction Drawings. The Contractor shall also perform any necessary cross-section surveying of the existing ground surface at the intervals shown within the Construction Drawings, provide an overlay of the surveyed cross-sections on the cross-sections shown on the Construction Drawings, and submit the same to the Engineer for comparison prior to initiating

earthwork. The original grade line and proposed final grade line shall be included on all sections. Incomplete cross-sections will be returned to the Contractor for necessary additions. Cross-sections, which do not encompass all areas of both earthwork excavation (including borrow excavation) and fill placement shall be considered incomplete without exception. The Contractor shall also include the locations of baselines used showing cross section locations on a copy of the reclamation plan when submitting cross sections.

- 2.3.3** The Contractor shall be responsible for assuring the layout staking work is in conformance to the lines, grades, elevations, dimensions, and locations shown on the Construction Drawings or as required by the Engineer. The Contractor shall furnish a copy of his/her survey records for checking by the Engineer and for the Owner's permanent file. These records shall be furnished as they are completed during the progress of the work.

Any inspection or checking of the Contractor's layout by the Engineer and the acceptance of all or any part of it shall not relieve the Contractor of his/her responsibility to secure the proper dimensions, grades, and elevations of the various parts of work.

- 2.3.4** The Contractor shall exercise care in the preservation of stakes and benchmarks, including existing property line markers, and shall have them reset at his/her expense when any are damaged, lost, displaced or removed. The Contractor shall use competent personnel and suitable equipment for the layout work required and shall provide that it be done under the supervision of, or directed by, a Registered Professional Civil Engineer or Licensed Land Surveyor registered in the State of West Virginia.

2.4 Method of Measurement

Measurement for furnishing, setting, maintaining, and resetting the stakes when necessary, and for furnishing all engineering personnel, equipment, materials, and all incidentals thereto, shall be by the lump sum bid for "Construction Layout".

2.5 Basis of Payment

The lump sum payment also shall include the cost for providing the Engineer pre-and post- construction ground line cross-sections for all disturbed or regraded areas including borrow areas and "As-Built" Plans as described herein. Said lump sum bid cannot be more than 5% of the TOTAL AMOUNT BID for the project. No deduction will be made, nor will any increase be made, in the lump sum "Construction Layout" item

amount regardless of decreases or increases in the final total contract amount or for any other cause.

2.6 Pay Item

Item 2.0, "Construction Layout", per lump sum. Cannot be more than 5% of the TOTAL AMOUNT BID for the project.

3.0 QUALITY CONTROL

3.1 Description

This work shall consist of testing for verification that the materials supplied and the work performed are in accordance with these specifications.

3.1.1 **Fill and Compaction**

The Contractor shall be responsible to perform laboratory tests of the various fill materials (soils and rock) to identify the Standard Proctor Density. If, in the opinion of the Engineer, the Standard Proctor Density has changed, then a re-test may be required.

Unless otherwise specified, excavated material and soil is to be used on this project as fill. Fill shall be placed in maximum two (2) foot thick lifts and compacted to achieve a minimum of ninety percent (90%) of the laboratory maximum dry Proctor density as determined by ASTM D 698 except at Highwall 4 in the existing DOH right of way, where fill shall be placed in maximum one (1) foot thick lifts and compacted to achieve a minimum of ninety-five percent (95%) of the laboratory maximum dry Proctor density as determined by ASTM D 698. Normally, material shall be placed between plus and minus three percent (3%) of optimum moisture content. The Engineer reserves the right to reduce lift thicknesses as conditions dictate in order to achieve satisfactory compaction or material placement. Frequency of density tests shall be required every lift or 5,000 cubic yards of material placed, whichever comes first, or as requested by the Engineer. **All tests shall be submitted to the Engineer for approval prior to compacting the fill and after fill compaction to verify that the compaction criterion is obtained.** Tests at the Contractor's cost shall be conducted by a testing firm approved by the Engineer. Large rock and coal refuse shall be disposed of onsite as approved by the Engineer.

No frozen material shall be placed as fill or shall fill be placed over frozen material. No fill shall be placed in standing water. Excessively wet material shall be allowed to dry prior to incorporating it as fill. Excessively wet material on the subgrade shall be bladed off and allowed to dry prior to using as fill or disposed of as unsuitable material as approved by the Engineer.

3.2 Materials

3.2.1 The Contractor shall submit a minimum of two (2) copies of shop drawings, catalog cuts and material certifications (as applicable) to the Engineer of all

off-site materials to be incorporated into the work. Written approval from the Engineer will be required prior to incorporation of these items into the work.

- 3.2.2** The Contractor shall submit at least two (2) copies of the results of all tests conducted on in-situ material and concrete to be used in this project. As a minimum, these tests will include moisture content & density tests of the soil in accordance with the provisions of ASTM D698 (Standard Proctor), field density tests following compaction, soil tests to determine the lime and nutrient requirements of the areas to be revegetated, and for concrete in accordance with ASTM C31 & C39.

3.3 Construction Methods

- 3.3.1** The Contractor shall furnish the services of his own testing laboratory or select an independent testing laboratory, as long as the laboratory is under the direct supervision of a Registered Professional Civil Engineer. The laboratory must be approved by the Owner.
- 3.3.2** Testing for compaction, soil nutrient and lime requirements for soil; compressive strength tests for concrete and grout; shall be performed as required by these specifications and/or ordered by the Engineer in writing. The Engineer will determine the locations and time of any testing herein specified and the need and extent of any testing in addition to that which is herein specified.
- 3.3.3** The contractor shall be responsible for performing laboratory tests of the coal refuse, mine spoil, and any natural soil to identify the compaction requirements for their use as fill and cover material, respectively. In addition, field density tests shall be performed in accordance with the Construction Specifications. All test results shall be submitted to the Engineer for approval of compaction criteria prior to compacting the fill and after fill compaction to verify that the required compaction is obtained.
- 3.3.4** Only new and first class materials, which conform to the requirements of these Specifications, shall be used unless specified otherwise. When requested by the Owner, the Contractor shall furnish a written statement of the origin, composition, and manufacturer of any or all materials (manufactured or produced) that are to be used in the work. The sources of supply of each material used shall be approved by the Engineer before delivery is started. If, at any time, sources previously approved fail to produce materials acceptable to the Owner, the Contractor shall furnish materials from other approved sources.

3.4 Method of Measurement

The method of measurement for determining the quantity of quality control work done as described above will be on a lump sum basis.

3.5 Basis of Payment

The quantity of quality control work done will be paid at the contract lump sum price bid for this item. Said lump sum bid cannot be more than 3% of the TOTAL AMOUNT BID for the project. No deduction will be made nor will any increase be made in the lump sum "Quality Control" item amount regardless of decreases or increases in the final total contract amount or for any other cause.

3.6 Pay Item

Item 3.0, "Quality Control", per lump sum. Cannot be more than 3% of the TOTAL AMOUNT BID for the project.

4.0 SITE PREPARATION

4.1 Description

4.1.1 Clearing & Grubbing

Work performed under this section shall include the removal and disposal of all trees, stumps, shrubs and any other vegetation, wood, debris, garbage of any nature from those areas specified below and/or shown on the plans and/or any other areas as approved by the WVDEP. This work shall also include the preservation from damage to all vegetation, septic fields, utilities or other objects to remain.

4.1.2 Gravel Access Road Rehabilitation

Gravel access road rehabilitation shall be constructed as shown on the plans. The Contractor shall resurface existing access roads per the detail shown in the Construction Plans.

4.2 Construction Methods

4.2.1 The specific areas to be cleared and grubbed are as shown on the Construction Plans and are generally described as, but not limited to, those specific areas of excavation, backfill, soil borrow or drainage structure installation.

4.2.2 The Contractor shall clear the site within the Limit of Disturbance for the areas to be disturbed. The WVDEP shall exercise control over clearing and shall designate all trees, plants and other objects to be removed or to remain.

4.2.3 Clearing and grubbing shall be completed prior to initiation of earthwork operations only to the extent necessary to complete the work. The Contractor shall confine his operations strictly to required areas. If the Contractor clears and grubs beyond the required areas, whether knowingly or accidentally, the Contractor shall, at their expense, replant and otherwise restore all areas outside the Limit of Construction to a condition equal to that existing prior to the start of work.

4.2.4 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 on wide bench areas or locations approved by the WVDEP. Timber to be stockpiled shall not be pushed down by equipment prior to

being cut nor can it be indiscriminately shoved into a stockpile.

- 4.2.5** All stumps, roots, buried logs and brush shall be removed. Grass, however, may be incorporated into the resoiling material. Taproots and other projections over 1-½ inches in diameter shall be grubbed out to a depth of at least ten (10) inches below the planned subgrade or slope elevation. All holes remaining after the grubbing operation shall have the sides broken down to flatten out the slopes, and shall be filled with suitable materials, moistened and properly compacted.
- 4.2.6** Cleared and grubbed areas shall be worked such that positive drainage is provided to prevent ponding of water except for the purpose of Temporary Sediment Traps as approved by the WVDEP.
- 4.2.7** 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.
- 4.2.8** 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. 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 Limit of Construction, 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.
- 4.2.9** It shall be the sole responsibility of the Contractor to correctly locate and avoid all underground, on-ground, and overhead utilities, facilities and other structures and constructions, and for that purpose, shall employ all necessary precautions and methods to ensure avoidance of and damage to such constructions. In the event damage does occur, the Contractor shall notify the affected Owner and the WVDEP immediately and make or have made all necessary repairs and bear the expense thereof and resulting damage caused thereby. See "Special Provisions", Section XV "Utilities and Other Obstructions", of these specifications for more information on utilities.

- 4.2.10** Buildings, mining related structures, existing ruins and foundation structures, shall be removed to the existing ground level, which operation shall include removal of concrete slabs or any other type of floors and/or walls resting upon the ground. Basement floors shall be shattered. Pits, trenches, holes or basements shall be backfilled. Coal and/or refuse spillage, concrete, cinder blocks, and foundation ruins shall be excavated and/or removed and incorporated into an approved landfill, as approved by the Engineer, unless otherwise directed.
- 4.2.11** 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. Bricks and stone blocks shall be disposed of as per Section 4.2.10 of these specifications.
- 4.2.12** 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.
- 4.2.13** Should offsite disposal or borrow be necessary, the Contractor shall observe the NEPA Compliance Schedule.
- 4.2.14** Existing site access roads shall provide safe, all-weather access to the site. These existing roads, including stoned roads, shall be maintained during construction and left in a better than or equal to condition. The Contractor is responsible for locating and avoiding all underground and overhead utilities and constructions during access road grading and maintenance.

4.3 Method of Measurement

- 4.3.1** There shall be no measurement of the "Site Preparation" item as it is a lump sum.
- 4.3.2** Measurement for "Gravel Access Road Rehabilitation" shall be on a per ton basis.

4.4 Basis of Payment

- 4.4.1** Site Preparation shall be paid at the bid lump sum price. The amount shall not exceed 10% of the TOTAL AMOUNT BID for each bid. Payment shall be full compensation for doing all the work herein prescribed in a workmanlike and acceptable manner; including the furnishing of all labor, materials, tools, equipment, supplies, and incidentals necessary to complete the work. Included in this item is Temporary Access Roads.

No deduction will be made, nor will any increase be made, in the lump sum "Site Preparation" amount regardless of decreases or increases in the final total contract amount or for any other cause.

4.4.2 Payment for Gravel Access Road Rehabilitation shall be by the unit bid price per ton and shall include the furnishing of all labor, materials, tools, equipment, supplies, and incidentals necessary to complete the work.

4.4 Pay Items

Item 4.1, "Site Preparation", per lump sum. Cannot be more than 10% of the "Total Amount Bid" for the project.

Item 4.2, "Gravel Access Road Rehabilitation", per ton.

5.0 EROSION AND SEDIMENT CONTROL

5.1 Description

This item shall consist of furnishing all materials, equipment, labor and incidentals necessary for the installation of sediment control structures including: temporary straw wattles, temporary silt fence, temporary super silt fence, temporary triangular silt dikes, temporary rock check dams, temporary sediment traps, temporary erosion control matting, temporary diversion berms, temporary inlet protection and temporary stabilized construction entrances as designated in the Construction Plans. Temporary Silt fence and temporary super silt fence shall be installed prior to any excavation activities, in locations shown on the Construction Plans. In addition, sediment controls shall be placed on regraded outslope areas concurrent with construction and prior to revegetation. Additional quantities may be added at the discretion of the WVDEP.

The Contractor shall submit an erosion and sediment control plan to the WVDEP at the pre-construction meeting for approval if his/her plan differs from the Engineer's Construction Plans. This plan shall include measures to be utilized for temporary and permanent erosion and sediment control. This plan shall also include the measures as outlined herein. The WVDEP's approval of this plan does not relieve the Contractor of his/her responsibility to be in compliance with any and all permits. All costs associated with meeting the Federal and/or State Regulations shall be the sole responsibility of the Contractor.

All temporary erosion control items shall be removed after permanent vegetation is established and upon completion of project unless otherwise specified.

The Nature and Sequence of Construction Activity shall be as follows:

1. Review the Construction Limits and mark any particular trees and buffer areas for protection.
2. Install Temporary Construction Entrance/Exit according to Construction Plans and Detail.
3. Install silt fence and super silt fence as the next construction activity. Place silt fence and super silt fence below grading limits for erosion and sediment control as shown on Construction Plans and Details.
4. Remove and dispose of any trash and debris located within the Construction Limits.
5. Construct all other temporary devices as soon as construction will permit. Sediment Traps, Triangular Silt Dikes and Rock Check Dams shall be placed as shown according to Construction Plans and Details.
6. Grade refuse pile and Highwalls, soil cover, seed and place temporary erosion control matting on Scattered refuse/barren area according to Construction Plans, Detailed Specifications and Details. Place straw wattles on side slopes according

to Construction Plans and Details. Seed and Mulch regraded slopes as shown on Construction Plans and Details. Mulch all bare areas if grading is to be discontinued for more than one week (7 days).

7. Place pipes, grade and construct channels and appropriate ditch lining according to the Construction Plans, Detailed Specifications and Details.
8. Complete site grading and permanently vegetate according to the Detailed Specifications.
9. All erosion and sediment control practices will be inspected weekly and after rainfall events. Needed repairs will be made immediately.
10. After site is stabilized, remove all temporary measures and install permanent vegetation on the disturbed areas caused by removing temporary measures.
11. The estimated time before final stabilization is 9 months.

5.2 Materials

- 5.2.1 Temporary Straw Wattles:** The Temporary Straw Wattles shall consist of cylinders of recycled, compressed, 100% agricultural straw, and are wrapped in photodegradable black synthetic netting. Twelve (12) inch diameter wattles, 25-foot in length shall be utilized and shall be North American Green (NAG) WS1210, or approved equal.
- 5.2.2 Temporary Stakes:** The temporary stakes shall consist of 1" X 1" stakes, 24 inches in length made from suitable hardwoods. Temporary Stakes shall be spaced 4-feet minimum on each temporary straw wattle. Other methods of anchoring may be used if specifically approved by the WVDEP.
- 5.2.3 Temporary Silt fence:** Temporary Silt fence shall be utilized on this project in locations as shown on the Construction Plans. Temporary Silt fence is to be placed as shown on the detail. The posts shall consist of 48" long steel or wood posts, spaced 10' maximum apart. The filter cloth shall be attached with wire ties or staples. The fence shall be 30" above ground and 4" buried below existing ground.
- 5.2.4 Temporary Super Silt Fence:** Temporary Super Silt Fence shall be utilized on this project in locations as shown on the Construction Plans. Temporary Super Silt Fence is to be placed as shown on the detail. The posts shall consist of 2.5" diameter galvanized or aluminum posts, spaced 10' maximum apart. The fence shall be 48" chain link fence, 14 gauge minimum, with maximum 6" mesh spacing with filter cloth over it. The fence shall be 36" above ground and 12" buried below existing ground.
- 5.2.5 Temporary Triangular Silt Dikes:** Temporary Triangular Silt Dikes shall be utilized in channels at locations shown on the plans. Temporary Triangular Silt Dikes shall be ACF Environmental TRISILTD7 or approved equal.

- 5.2.6** Temporary Sediment traps shall be constructed as shown on the Construction Plans. D_{max} of 9 inches aggregate riprap shall be used to construct the traps as well as filter fabric (AMOCO 4510, or equal), per the detail shown in the Construction Plans.
- 5.2.7** Slope Protection Temporary Erosion Control Matting shall be placed on the soil cover area below Highwall 5 as shown on the Construction Plans. The matting shall be NAG SC150, or approved equal. Slope Protection Temporary Erosion Control Matting is to remain in place.
- 5.2.8** Slope Protection Permanent Erosion Control Matting shall be placed on the slope below Highwall 1 as shown on the Construction Plans. The matting shall be NAG SC250, or approved equal. Slope Protection Permanent Erosion Control Matting is to remain in place
- 5.2.9** Temporary Inlet Protection shall be constructed as shown on the Construction Plans and Detail.
- 5.2.10** Temporary Stabilized Construction Entrance: A Temporary Stabilized Construction Entrance is required as shown on the plans where traffic shall leave or enter the construction site onto a public road. There are two (2) locations on the Construction Plans. The detail for the Temporary Stabilized Construction Entrance is shown in the Construction Plans. The Stabilized Construction Entrance is to be removed after project completion, unless prior written approval is obtained from WVDEP for the Stabilized Construction Entrance to remain.

5.3 Maintenance

During the course of the project, sediment control structures shall be maintained in sound condition and accumulations of silt which may threaten their effectiveness shall be removed. Silt removed from the temporary sediment control structures shall be taken to an approved disposal area.

5.4 Installation

- 5.4.1** The Temporary Straw Wattles shall be installed end to end at locations shown on the plans, per the detail. Temporary Straw Wattles shall be set in a 2"-3" deep trench by 12" wide. Stakes shall be placed every 3 to 4-feet, driven thru the middle of the wattle, with 2"-3" of the top of the stake exposed.
- 5.4.2** Temporary Silt Fence shall be installed at locations shown on the Construction Plans per the detail. Posts for the temporary silt fence shall penetrate the ground a

minimum of 14 inches into the ground.

- 5.4.3** Temporary Super Silt Fence shall be installed at locations shown on the Construction Plans per the detail. Posts for the temporary super silt fence shall penetrate the ground a minimum of 36 inches into the ground.
- 5.4.4** Temporary Triangular Silt Dikes shall be installed at locations shown on the Construction Plans per the detail. The temporary silt dikes for this project are 7 feet in length shall be installed using staples as required.
- 5.4.5** Temporary Sediment Traps shall be constructed at locations shown on the Construction Plans per the detail.
- 5.4.6** The Slope Protection Temporary Erosion Control Matting shall be constructed as shown on the Construction Plans and Detail.
- 5.4.7** The Slope Protection Permanent Erosion Control Matting shall be constructed as shown on the Construction Plans and Detail.
- 5.4.8** Temporary Inlet Protection shall be constructed according to the Detail at locations shown on the Construction Plans.
- 5.4.9** The Temporary Stabilized Construction Entrance shall consist of No. 3 stone. Entrances shall be installed according to the Detail located in the Construction Plans.

5.5 Method of Measurement

- 5.5.1** The method of measurement for Temporary Straw Wattle installation and maintenance in conformance with the specifications and accepted by the WVDEP shall be on a per lineal foot basis to include wattles, stakes, all necessary materials, supplies, labor and equipment for installation and maintenance including sediment removal and disposal. This will include removal at the end of the project.
- 5.5.2** The method of measurement for Temporary Silt Fence installation and maintenance in conformance with the specifications and accepted by the WVDEP shall be on a per lineal foot basis to include all necessary materials, supplies, labor and equipment for installation and maintenance including sediment removal and disposal. This will include removal at the end of the project.
- 5.5.3** The method of measurement for Temporary Super Silt Fence installation and maintenance in conformance with the specifications and accepted by the WVDEP shall be on a per lineal foot basis to include all necessary materials, supplies, labor and equipment for installation and maintenance including sediment removal and

disposal. This will include removal at the end of the project.

- 5.5.4** Temporary Triangular Silt Dikes shall be paid per each dike installed as shown on the Construction Plans and detail, or where it may be deemed necessary per the Engineer. It shall include all necessary materials, supplies, labor and equipment for installation and maintenance including sediment removal and disposal. This will include removal at the end of the project.
- 5.5.5** Temporary Sediment Traps shall be paid per each constructed, and shall include all necessary materials, supplies, labor and equipment for installation and maintenance including sediment removal and disposal. This will include removal at the end of the project.
- 5.5.6** The Slope Protection Temporary Erosion Control Matting shall be installed per square yard installed and shall include all necessary materials, supplies, labor and equipment for installation.
- 5.5.7** The Slope Protection Permanent Erosion Control Matting shall be installed per square yard installed and shall include all necessary materials, supplies, labor and equipment for installation.
- 5.5.8** Temporary Inlet Protection shall be paid per each installed and shall include all necessary materials, supplies, labor and equipment for installation and maintenance including sediment removal and disposal. This will include removal at the end of the project.
- 5.5.9** Measurement for Temporary Stabilized Construction Entrance shall be per each. This will include removal at the end of the project.

5.6 Basis of Payment

- 5.6.1** The quantity of work completed will be paid at the contract unit price bid for the following items, which price and payment shall be full compensation for all materials, labor, equipment and incidentals necessary to perform the work. Additionally, payments shall constitute full compensation for any required maintenance, sediment removal and disposal. The bid price will include the removal of all temporary erosion control items after vegetation is established.
- 5.6.2** Payment for the Temporary Stabilized Construction Entrance shall be by the unit price bid per each and shall include the furnishing of all labor, materials, tools, equipment, supplies, and incidentals necessary to complete the work. The bid price will include the removal of the Temporary Stabilized Construction Entrance after project completion.

5.7 Pay Items

Item 5.1, "Temporary Straw Wattles", per linear foot.

Item 5.2, "Temporary Silt Fence", per linear foot.

Item 5.3, "Temporary Super Silt Fence", per linear foot.

Item 5.4, "Temporary Triangular Silt Dikes", per each.

Item 5.5, "Temporary Sediment Traps", per each.

Item 5.6, "Slope Protection Temporary Erosion Control Matting", per square yard.

Item 5.7, "Slope Protection Permanent Erosion Control Matting", per square yard.

Item 5.8, "Temporary Inlet Protection", per each.

Item 5.9, "Temporary Stabilized Construction Entrance", per each.

6.0 REVEGETATION

6.1 Description

This work shall cover all operations incidental to the establishment of vegetation within the Limit of Construction as shown on the Construction Plans and any other areas as approved by the WVDEP. This work also includes the furnishing and the application of fertilizer, agricultural limestone and mulch and the furnishing and sowing of seed, all in accordance with these Specifications and as designated herein.

No areas outside the Limit of Construction shall be disturbed without prior approval from the WVDEP in order to ensure that Right-of-Entry has been obtained.

The Contractor, at no expense to the WVDEP, shall revegetate any areas outside the Limit of Construction, disturbed by the Contractor.

6.2 Materials

6.2.1 Fertilizer

The commercial fertilizer to be used shall consist of 10-20-10 grade of uniform composition and be furnished in standard containers. These containers, in accordance with applicable state and federal laws, must be clearly marked with the following information:

- a. Weight
- b. Name of Plant Nutrients
- c. Guaranteed Nutrients Percentages

Fertilizer shall be applied at a minimum rate of 1,000 lbs/acre. Fertilizer shall be applied immediately to all areas reaching final grade by one of the two following methods:

- a. Apply and incorporate fertilizer during seedbed preparation.
- b. Apply fertilizer in hydro seeding mixture following seedbed preparation.

6.2.2 Limestone

The lime to be used will be an agricultural grade pulverized limestone containing a minimum of 10% $MgCO_3$ and not less than 75% total carbonates. Fineness will be such that no less than 75% will pass through a #100 sieve and 100% will pass through a #10 sieve.

Lime rate shall be formulated from soil test results. In the absence of soil testing,

a rate of five (5) tons per acre will serve as a preferred minimum.

Lime shall be applied immediately to all areas requiring seeding reaching final grade by 1 of the 2 methods listed in Section 6.2.1, "Fertilizer".

6.2.3 Seed Mixtures

The variety of grass and legume seed furnished for the project shall bear a tag, in accordance with applicable state and federal laws, with the following information listed:

1. Lot Number
2. Seed Producers Name
3. Percent Purity
4. Percent Germination
5. Date of Germination Testing
6. Weed Seed Content (should be <0.25% by weight)

All leguminous seed shall be inoculated with the specified strain of rhizobia which shall be a pure culture of bacteria selected for maximum vitality. No rhizobia shall be used which has passed the expiration date on each package. The inoculant shall be applied at five times the recommended rate except when used in a hydroseeding mixture when the rate will be ten times the recommended rate.

6.2.3.1 Temporary Seed Mixture

All stockpiles or other disturbed areas, including temporary access roads, which will require further disturbance in which the additional disturbance will be delayed for a period of seven (7) days or longer shall be vegetated according to the following guidelines.

Variety of Seed	SPRING	SUMMER	FALL	WINTER
	3/15-5/15	5/31-8/15	3/15-10/15	10/15-11/15
	-----lbs/acre-----			
Annual Ryegrass (<i>Lolium multiflorum</i>)	20		20	
German Millet * (<i>Setaria italica</i>)		50		
Cereal Rye (<i>Secale cereale</i>)				90

*Do not use Japanese Millet

All areas to be temporarily seeded which are to be redisturbed shall be fertilized with 500 lbs/acre of 10-20-10. All areas reaching final grade to be temporarily seeded shall be fertilized according to Section 6.2.1. Lime shall be applied according to Section 6.2.2 and mulched according to Section 6.2.4

6.2.3.2 Lawn Seed Mixture

Existing lawn areas disturbed by construction shall be reseeded using the following mixture:

Rate lb/1000 sq. ft.	Seed Variety	Minimum Specifications	
		0% 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 1 and May 14.

6.2.3.3 Permanent Seed Mixture

Permanent vegetation shall be established on all areas reaching final grade or other areas not likely to be destroyed by further construction activities. Any areas which reach final grade between May 31 - August 15 or October 15 - November 15 shall be seeded with the appropriate temporary seed mixture according to Section 6.2.3.1. These areas shall then be reseeded with a permanent seed mixture, without Annual Ryegrass, during the next defined seeding period according to this section. The actual date of permanent seeding will require the Engineer's approval.

Variety of Seed *	SPRING 3/15 - 5/15	FALL 8/15 - 10/15 -----lbs/acre-----
Orchardgrass (Dactylis glomerata)	20	20
Birdsfoot Trefoil (1) (Lotus corniculatus)	15	15
Red Clover	15	15

(*Trifolium pratense*)

Annual Ryegrass (2) (<i>Lolium multiflorum</i>)	20	20
Rye Grain or Winter Wheat	30 0	0 30

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

(2) Use Annual Ryegrass only in mixtures seeded after August 1 and before May 1.

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

6.2.4 Mulch Material

Mulching procedures shall take place immediately following seeding. Mulch material shall consist of straw or wood cellulose fiber.

6.2.4.1 Straw

Straw mulch shall include baled wheat or oats straw, or baled grass hay. Straw mulch shall be dry and reasonably free of weed, seeds, sticks, or other foreign material. Straw mulch shall be applied at a rate of 2 tons/acre. The straw mulch shall be anchored with 100 gallons/acre asphalt emulsion or 750 lbs/acre wood cellulose fiber. However, baled grass hay will not be allowed as mulch for seeding lawn areas.

6.2.4.2 Wood Cellulose Fiber

Wood cellulose fiber may be used only on slopes steeper than 2H:1V at a rate of 1,500 lbs/acre. Mulch for use with the hydraulic application of seed, fertilizer, and lime shall consist of wood cellulose fiber. It shall be processed in such a manner that it will contain no growth or germination inhibiting factors and shall be dyed green. It shall be manufactured in such a manner that (1) after addition and agitation in slurry tanks with fertilizers, lime seeds, and water, the fibers in the material will become uniformly suspended to form a homogeneous slurry and (2) the material, when hydraulically sprayed on the ground, will form a blotter-like ground

cover impregnated uniformly with seed, will allow rainfall to percolate to the underlying soil. Wood cellulose shall only be used on areas that have been approved by WVDEP.

The wood cellulose fiber shall be supplied in packages having a gross weight not to exceed 100 pounds. Weight specifications of this material from suppliers, and for all applications, shall refer only to air dry weight of the fiber material. Air dry weight is based on the normal weight standard of the Technical Association of the Pulp and Paper Industry for Wood Cellulose and is considered equivalent to 10 percent moisture. Each package of the cellulose fiber shall be marked by the manufacturer to show the air dry weight content.

6.2.4.3 Water

Water shall be reasonably free of injurious and other toxic substances harmful to plant life. The source of water is subject to the approval of the WVDEP.

6.3 Construction Methods

- 6.3.1** All revegetation activities shall be conducted immediately following completion of final grading so as to utilize the fine soil material as a seedbed before this material is lost via subsequent rainfall.
- 6.3.2** On sites where appropriate equipment can operate the seedbed shall be prepared by breaking up surface crusts and loosening the soil material to a minimum of three (3) inches. Disking, harrowing, cultipacking or other acceptable tillage operations may be used to prepare the seedbed. On sites where appropriate equipment cannot operate, the seedbed shall be prepared by "tracking in" with a dozer or scarifying by other approved methods. Lawn areas are to be hand raked. Rocks larger than six (6) inches in diameter in field areas or one (1) inch in diameter in lawn areas shall be removed and disposed of as approved by the WVDEP. Trash, weeds and other debris that will interfere with seeding or maintenance shall be removed and disposed of as approved by the WVDEP. Seedbed preparation shall be suspended when soil moisture conditions are not suitable for the preparation of a satisfactory seedbed as determined by the WVDEP.
- 6.3.3** Seedbed preparation and seeding shall take place progressively as various regraded areas are brought to final grade.
- 6.3.4** All seeding operations shall be performed immediately following seedbed preparation in such a manner that the seed is applied in the specified quantities uniformly on the designated areas.

- 6.3.5** Seed Application shall consist of approved hydroseeding methods where feasible. Any seed left in hydroseeder overnight shall be reinoculated before that seed shall be applied. Other methods of seed application may be utilized for site-specific reasons when approved by the WVDEP.
- 6.3.6** Any area failing to establish a vegetative stand due to weather or adverse soil conditions shall be reseeded, relimed, refertilized and remulched as approved by the WVDEP.
- 6.3.7** The Contractor shall maintain all seeded areas until final acceptance of the project. All areas shall be protected from any further equipment traffic and any damaged areas shall be repaired and reseeded. Maintaining seeded areas shall consist of watering, refilling, refertilizing, reliming, reseeding, and remulching erosion gullies and all bare areas.
- 6.3.8** A second and third seeding will be applied as needed, or as approved by the WVDEP.

6.3.8.1 Second Step Seeding

The second step seeding will take place during the first defined seeding period following the initial seeding. No payment shall be made for second step seeding, this work is part of the contract if completed before the final inspection or shall be considered warranty if completed after the final inspection. The following shall be used as a guide for second step application.

- a. For areas with less than a 50 percent stand or subject to severe erosion, apply the complete amount of seed, fertilizer, lime and mulch as specified.
- b. For areas with over 50 percent stand apply one half the original fertilizer, lime and seed. If erosion is a problem, apply one half of the original mulch specified in Section 6.2.4.

6.3.8.2 Third Step Seeding

The third step seeding shall consist of spot applications on areas not showing a satisfactory stand. The seeding shall take place at the next defined seeding period following the second step application. The quantity of material to be used shall be determined on the same basis as the second step application in Section 6.3.8.1.

6.4 Method of Measurement

The method of measurement for revegetation shall be per plan acre.

6.5 Basis of Payment

6.5.1 Payment will be made at the Contract unit price bid for these items, which price and payment shall be full compensation for doing all the work herein described in a workmanlike and acceptable manner; including the furnishing of all labor, materials, tools, equipment, supplies and incidentals as necessary to complete the work. Payment for seeding includes all seeding (i.e. – temporary, first and second seeding). No additional payment will be made for second or third seeding.

6.5.2 Temporary seeding will be incidental to the seeding item and no separate measurement or payment will be made for temporary seeding. There will be no separate payment for maintaining seeded areas. No payment will be made for seeding after the final inspection. All work performed after the final inspection will be done under warranty.

6.6 Pay Items

Item 6.0 “Revegetation”, per plan acre.

7.0 DRAINAGE STRUCTURES

7.1 Description

- 7.1.1 This work shall consist of furnishing all labor, equipment and materials necessary to construct the drainage structures shown on the drawings. Permanent drainage structures shown include but are not limited to drainage channels, inlets, culverts, riprap headwalls, and pipes.

7.2 Materials

- 7.2.1 Rock for riprap channels and riprap headwalls shall consist of hard durable rock and shall be D_{max} of 18 inches to a D_{min} of 6 inches diameter, and D_{50} of 12 inches as shown on the plans and details. No more than 15 percent by weight less than D_{min} for each type where riprap is to be used. Section 7.3.10 and 7.3.11 contains information as to the type and size of riprap required for each channel.

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 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, regardless of its quality or durability, will not be permitted.

- 7.2.2 Erosion Control Matting: Matting shall be NAG SC250 or equal for use on the Type I and Type II Channels.
- 7.2.3 HDPE Pipes: The HDPE pipes shall consist of corrugated, smooth wall interior high density polyethylene pipe, such as Hancor's Hi-Q pipe, or approved equal, in accordance with Section 714.19 of the WVDOT Standard Specifications for Roads and Bridges, Adopted 2010.
- 7.2.4 Pipe bedding shall consist of fine aggregate meeting the requirements of Section 704.6 of the WVDOT Standard Specifications for Roads and Bridges, Adopted 2010, except that the gradation shall meet the requirements of Section 702.6 of the WVDOT Standard Specifications for Roads and Bridges, Adopted 2010.
- 7.2.5 Pre-manufactured drainage structures required for this Project include WVDOT Type G Inlets.

7.2.5.1 The WVDOT Type G Inlet shall be installed at the location shown on the

Plans. The WVDOH Type G Inlets require a WVDOH Type 1 frame and grate. Pre-manufactured Type G Inlets shall comply with Section 605 of the WVDOT Standard Specifications for Roads and Bridges, Adopted 2010.

- 7.2.6 All pipes and fittings for construction of the HDPE Drainage Blanket shall be made of polyethylene with a minimum cell classification of 424420C as defined and described in ASTM D3350.

7.3 Construction Methods

- 7.3.1 The ditches shall be constructed to the approximate line, grade, and templates as shown on the plans or as directed by the WVDEP. Excess material from ditch and pipe trench excavation that is suitable for soil cover may be segregated, stockpiled and utilized to support "Revegetation" operations. Otherwise, excess material from ditch and pipe trench excavation will be required to be disposed of by the Contractor in an off-site disposal area obtained by the Contractor in accordance with Section VIII of the Special Provisions for these specifications. Sections of ditches that are cut to rock shall not require rock riprap but shall be paid the appropriate size riprap ditch.

- 7.3.2 Riprap shall be placed in accordance with Section 218.3.2 of the WVDOT Standard Specifications for Roads and Bridges, Adopted 2010.

- 7.3.3 Pre-manufactured drainage structures shall be placed on a level, prepared and compacted subgrade as directed and approved by the Engineer. Pre-manufactured structures shall have lifting hooks that will be out of sight after placement and sufficient reinforcement to resist handling stresses.

- 7.3.4 The HDPE culverts shall be installed at the location shown on the plans. The trench for the culvert shall be excavated in accordance with the detail provided in the plans. Pipe bedding shall conform to the details. Fine aggregate shall be placed in the bottom of the trench to the dimensions indicated by the details for leveling purposes.

7.3.4.1 Trench width for the pipe culvert shall be the pipe diameter divided by 2 or a minimum of 12" on each side of the pipe measured to the face of the trench or to the sheeting when used, and shall be excavated to depth, line and grade, as shown on the Construction Drawings. Trenching will involve excavation of in-place material including soil. Trench bottom shall be thoroughly cleaned of any rock debris prior to the placement of the pipe.

7.3.4.2 Trench excavation exceeding 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.

7.3.4.3 Culvert bedding and trench backfilling for at least one foot above the top of the culvert shall be 1 1/2" crusher run stone. The bedding shall be placed at the bottom of the trench and shall be properly shaped to receive the culvert providing a minimum of six (6) inches of bedding for the culvert. The trench shall be kept dry during installation of the culvert.

7.3.4.4 When the bedding is in place, the culvert shall be positioned in the trench, as shown on the Construction Drawings, and all joints (if any) sealed, as per manufacturer's recommendations.

7.3.4.5 After the culvert is placed, the trench shall be backfilled as shown on the Construction Drawings. The backfill material shall be placed in maximum six (6) inch lifts and shall be compacted using a tamper. The aggregate backfill shall extend to at least one (1) foot above the top of the culvert as shown on the Construction Drawings. The remainder of the trench will be backfilled with select backfill as shown in the details. Compaction of the backfill material shall be at least 95 percent of the maximum dry density obtained by ASTM Method D698 (Standard Proctor). Field density testing and testing frequency shall be as directed by the WVDEP.

7.3.5 The Type I channel shall be a "V" shaped, Grass Lined channel, as detailed in the plans. Before application of the Revegetation items, permanent erosion control matting shall be applied to each Grass Lined Channel, and it shall be a NAG S250 or equal type matting.

7.3.6 The Type II channel shall be a trapezoidal shaped, Grass Lined channel, as detailed in the plans. Before application of the Revegetation items, permanent erosion control matting shall be applied to each Grass Lined Channel, and it shall be a NAG S250 or equal type matting.

7.3.7 The Type III channel shall be a trapezoidal shaped, block mat channel, as detailed in the plans. This channel shall be a Flex-A-Mat, or approved equal, channel. Details are shown in the plans for the Flex-A-Mat channel.

7.3.8 The Type IV channel shall be a "V" shaped, riprap channel, as detailed in the plans. The rock shall range in size from a D_{max} of 18 inches to a D_{min} of 6 inches diameter, and D_{50} of 12 inches with no more than 15 percent by weight less than D_{min} .

7.3.9 The Type V channel shall be a trapezoidal shaped, riprap channel, as detailed in the plans. The rock shall range in size from a D_{max} of 18 inches to a D_{min} of 6 inches diameter, and D_{50} of 12 inches with no more than 15 percent by weight less

than D_{min} .

- 7.3.10** The HDPE Drainage Blanket shall be constructed at the locations shown in the construction plans and according to the details provided. The HDPE Drainage Blanket shall be and 18" wide panel of AdvanEdge flat pipe or an approved equal installed vertically as shown in the construction details and anchored per the manufacturer's recommendations.

7.4 Method of Measurement

All headwall construction shall be included in the cost of the channel.

- 7.4.1** The method of measurement for Type I Channel shall be on a linear foot basis and shall include all equipment, labor, materials and all other incidental items necessary to complete this item of work.
- 7.4.2** The method of measurement for Type II Channel shall be on a linear foot basis and shall include all equipment, labor, materials and all other incidental items necessary to complete this item of work.
- 7.4.3** The method of measurement for Type III Channel shall be on a linear foot basis and shall include all equipment, labor, materials and all other incidental items necessary to complete this item of work.
- 7.4.4** The method of measurement for Type IV Channel shall be on a linear foot basis and shall include all equipment, labor, materials and all other incidental items necessary to complete this item of work.
- 7.4.5** The method of measurement for Type V Channel shall be on a linear foot basis and shall include all equipment, labor, materials and all other incidental items necessary to complete this item of work.
- 7.4.6** The method of measurement for the WVDOH Type G Inlet shall be on a per each basis. It shall include all equipment, labor, materials and all other incidental items necessary to complete this item of work, which includes the Standard WVDOH Frame and Grate.
- 7.4.7** The method of measurement for 24" Diameter HDPE Pipe shall be on a linear foot basis acceptably installed. It shall include all equipment, labor, materials and all other incidental items necessary to complete this item of work.
- 7.4.8** The method of measurement for riprap headwalls shall be incidental to the channels, and no additional compensation will be paid for this item.
- 7.4.9** The method of measurement for HDPE Drainage Blanket shall be on a linear foot

basis and shall include all equipment, labor, materials and all other incidental items necessary to complete this item of work.

7.5 Basis of Payment

The quantity of work done for each pay item shall be paid at the Contract unit price bid for these items, which price and payment shall be full compensation for doing all the work herein described in a workmanlike and acceptable manner; including the furnishing of all labor, materials, tools, equipment, supplies and incidentals as necessary to complete the work.

7.6 Pay Items

Item 7.1, "Type I Channel", per linear foot.

Item 7.2, "Type II Channel", per linear foot.

Item 7.3, "Type III Channel", per linear foot.

Item 7.4, "Type IV Channel", per linear foot.

Item 7.5, "Type V Channel", per linear foot.

Item 7.6, "WVDOH Type G Inlet", per each.

Item 7.7, "24" Diameter HDPE Pipe", per linear foot.

Item 7.8, "HDPE Drainage Blanket", per linear foot.

8.0 UNCLASSIFIED EXCAVATION

8.1 Description

The work to be performed under this Section shall be in accordance with the Plans and as specified herein. The terms for earthwork used in the remainder of this Section shall imply excavating and regrading sections of Dangerous Highwall on Highwall. The intent of the project is to completely balance the earthwork associated with the regrading of the highwall on the project. (i.e., no material to be hauled off of the project). The Contractor, with approval of the Engineer, shall adjust the final grades as necessary to create a balanced project.

Over-excavation and/or fill not shown on the Plans or specified herein shall be at the Contractor's expense, unless approved by the Engineer prior to commencing such work.

The Contractor shall not begin excavation on the regrading of the highwall until pre-existing cross sections are approved by the Engineer. Surveyed cross sections are to be on the dangerous highwall and are to cover both cut and fill areas; payment will not be made without the fill areas shown. The work under Unclassified Excavation shall include, but not necessarily be limited to, the following:

- a. Excavating the spoil/refuse and highwall.
- b. Final grading, shaping, and contouring of the excavation areas and the fill areas.
- c. Subsidence

The items excluded from unclassified excavation include, but are not necessarily limited to, the following:

- a. Excavation for erosion and sediment control – Payment for erosion and sedimentation control excavation is included in the item for sediment control (see Section 5.0, "Sediment Control").
- b. Excavation for drainage channels – Payment for this excavation is incidental to each channel type.

8.2 Water Handling

The Contractor must provide a system for diverting water around the work area(s) to the proper down-gradient drainage systems. This shall improve working conditions, and decrease the potential sediment load carried by the water as a result of excavation in the area. The Contractor shall install any water handling systems that will maintain relatively dry excavation areas.

The Contractor shall submit a water handling plan for approval by the Engineer prior to the start of construction. The Contractor shall handle all surface and/or ground water so as not to damage adjacent property, pollute streams and/or waterways. The Contractor's plan for diversion of ground water and/or surface water during construction shall be subject to approval by the Engineer. The plan may be placed in operation upon approval. Nothing in this Section shall relieve the Contractor from full responsibility for the adequacy of the diversion and protective works.

Excavation areas shall be maintained so that they shall drain properly at all times. The Contractor shall construct and maintain any and all necessary channels, flumes, pipes, sumps and/or other temporary diversion and protective works; shall furnish all materials required, therefore; and shall furnish, install, maintain, and operate all necessary pumps and other equipment for removal of ground water and/or surface water from the work area. After having served their purpose, all of the above shall be removed from the work area. The water handling/diversions described above shall be considered incidental to the project.

8.3 Construction Methods

All areas to be excavated or filled shall be cleared and grubbed as specified in Section 4.2.3, "Clearing and Grubbing". In areas to receive fill such as the toe of a slope, the Engineer may require "proof rolling" by the Contractor to determine if unsuitable foundation soil materials exist. The Engineer shall be the judge as to what materials constitute unsuitable foundation material.

The Contractor shall excavate to the lines and grades shown on the Plans. The Contractor shall perform all excavation of every description and of whatever materials encountered to the depths indicated on the Plans. No additional compensation shall be considered for rock (or reddog clinkers) excavation, if encountered. Over-excavation and/or fill not shown on the Plans or specified herein shall be at the Contractor's expense, unless

approved by the Engineer prior to commencing such work. If unsuitable materials exist below the grades shown on the Plans, this material shall be removed and stockpiled with the prior approval of the Engineer and shall be paid per the unit price for "Unclassified Excavation" (Item 8.0). Unsuitable material shall be dried, if necessary, and blended into the proposed fill. Excavation operations shall be conducted so that material outside the construction limits shown on the Plans shall not be removed or loosened; material removed or loosened shall be restored to its original condition at the Contractor's expense. Bottoms of excavations shall be shaped to a smooth and uniform surface, free from bumps and depressions, and sloped as indicated.

The Contractor shall immediately inform the Engineer of any signs of instability of soil or rock slopes during the course of the reclamation program. Work shall be halted until a plan of action for construction of the work is agreed to by the Engineer.

8.4 Excavation

Excavation shall conform to WVDOT Section 207 and 212. All current Local, State (including WVDOT Section 107.7) and Federal regulations covering safety for excavation and for construction shall be followed as applicable specifically, or by similarity of operation, or as may be necessary for personal and property safety. The Contractor must provide any shoring, bracing, and roof support as necessary to properly protect workers in excavations.

Approval by the Engineer of the Contractor's procedures does not relieve the Contractor of responsibility for site safety. Excavation shall take place to the lines and grades shown on the Plans.

8.5 Excavated Materials

All suitable material which is excavated during construction shall be retained for later use as backfill and re-contouring off the site. Unsuitable material shall be disposed within the limits of construction as approved by the Engineer.

After completion of construction, all suitable excess excavated material shall be used in regrading and recontouring the construction areas such that it shall not interfere with the drainage of the slopes indicated on the Plans, as approved by the Engineer.

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 in 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 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 lot (5 tests) 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 is 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."

8.6 Final Shaping and Contouring

Except at locations where excavation of unsuitable material is required, care shall be taken not to excavate beyond lines and grades specified on the Construction Plans, Cross Sections and Profiles. Over-excavation shall be backfilled and compacted in accordance with the Specification to the proper grade with suitable material at the expense of the Contractor, unless approved by the Engineer prior to commencing such work. Final

grade elevation tolerance for the benches shall be within +/- 6" of the final grade shown on the plan.

8.7 Method of Measurement

8.7.1 The method of measurement for unclassified excavation shall be per cubic yard of excavation (cut). The unit bid shall also include all soil and soil covering, coal, coal refuse, and black or dark gray shale. Acceptable volume calculations of cut material are: The average end method based on as-built cross-sectional areas. Or the contractor has the option of performing a topographic survey of the finished ground to produce a surface that can be compared to the original (existing) ground surface using a computer-aided program. It is recommended that the comparison of the finished and original ground surfaces be calculated using the grid volume method with a cut/fill factor of one foot (1'). Field survey and volume calculations shall be certified by a Professional Land Surveyor or Professional Engineer.

8.8 Basis of Payment

The quantity of work done shall be paid at the Contract unit price bid for these items, which price and payment shall be full compensation for doing all the work herein described in a workmanlike and acceptable manner; including the furnishing of all labor, materials, tools, equipment, supplies and incidentals as necessary to complete the work. No payment shall be made for unclassified material excavated below the grades shown on the Plans without prior acceptance by the Engineer.

8.9 Pay Items

Item 8.0, "Unclassified Excavation", per cubic yard.

9.0 UTILITIES

The Contractor shall be reimbursed for the relocation of utilities, if necessary, per utility company invoice. **The Contractor shall first submit a written cost estimate for all utility relocations required to the Engineer for approval prior to performing or arranging for any utility relocation.**

If the Contractor encounters any underground utilities not shown on the Construction Plans, the Contractor shall not disturb the utility and shall notify the Engineer immediately for determination of subsequent actions.

Utility Ownership Information

MUWV	1-800-245-4848
First Energy Corporation	1-888-544-4877
Mountaineer Gas Company	1-800-834-2070
PDC Mountaineer	1-304-842-3597
Energy Corporation of America	1-304-926-3100
Frontier Communications	1-800-752-2415
Petroleum Development Company	1-800-826-0867

The Contractor shall not bid on utility relocation work, but will be reimbursed the actual approved utility relocation invoice cost. The Contractor shall obtain approval from the Engineer prior to commencing utility work.

9.1 Pay Items

No Pay items

10. UNDERDRAIN

10.1 Description

This work shall consist of constructing subsurface drains to control seepage at the locations and to the dimensions shown on the plans. This shall also consist of additional underdrains as required and approved by the WVDEP during construction. The underdrains are to be constructed in accordance with the typical plan detail. Pipe clean-outs may be installed if lengths exceed 100 feet or whenever required by the WVDEP.

10.2 Materials

10.2.1 Stone for underdrain shall consist of sound 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 WVDOT Standard Specifications for Roads and Bridges, Adopted 2010. Stone shall have a maximum weight loss of 12% 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 underdrain shall be non-woven type, meeting the requirements of Section 714.11.4 of the WVDOT Standard Specifications for Roads and Bridges, Adopted 2010.

10.2.3 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 channel. Clean-outs shall consist of necessary wye fittings and connections compatible with SDR 35 PVC pipe and extend from the outlet pipe to within a maximum of six inches above final grades shown on the Construction Plans. End caps shall consist of 12-inch diameter PVC SDR 35 grade.

10.3 Construction Methods

10.3.1 The underdrains shall be constructed at the locations and to the lines, grades, and cross-section as directed by the Engineer based on the field conditions encountered.

10.3.2 Trench width for the underdrain shall not be less than four (4) feet, measured at the bottom of the trench. Trenching will involve excavation of in-place material including soil and rock.

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

10.3.4 Filter fabric shall be installed in the trench as shown on the Construction Plans. 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 underdrains where the rock shall daylight directly into existing or modified drainage channels.

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

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

10.4 Method of Measurement

10.4.1 The method of measurement for constructing underdrain shall be on a linear foot basis measured along the centerline of the underdrain. Excavation necessary to construct the underdrain; furnishing and placement of filter fabric, AASHTO No. 4 aggregate, erosion control matting (where required), cleanouts, animal guards and all other work necessary for the acceptable installation of the underdrain will not be measured but shall be considered incidental to the construction of the respective underdrains. The cost of these incidental items shall be included in the unit price bid for aggregate underdrains.

10.5 Basis of Payment

The quantity of work done shall be paid at the Contract unit price bid for this item, which price and payment shall be full compensation for doing all the work herein described in a workmanlike and acceptable manner; including the furnishing of all labor, materials, tools, equipment, supplies and incidentals as necessary to complete the work.

The cost of animal barriers shall be included in the cost of the Underdrain.

10.6 Pay Items

Item 10.0, "Underdrain", per linear foot.

11.0 SOIL COVER

11.1 Description

This work consists of covering the refuse piles and/or any other area required by the WVDEP with a minimum twelve (12) inch thick layer of soil cover material.

11.2 Materials

Soil cover material shall be natural occurring earthen material from Highwall 1. This material shall be capable of supporting vegetation. The Contractor shall obtain soil cover material from Highwall 1 within the Limit of Construction. *The WVDEP will obtain Right-of-Entry agreements for soil movement from one land owner to another. This will include material from Site 1 – Highwall 1 to Site 3 – Highwall 5 for scattered refuse soil cover.*

If offsite borrow areas are used, it shall be the responsibility of the Contractor to obtain such areas at no expense to the WVDEP, and in accordance with any applicable local, state, and/or federal regulations including compliance with NEPA requirements (Special Provisions Section VII). All offsite borrow areas must be approved by the Engineer and the Contractor must provide an erosion and sediment control plan, and reclamation plan for approval by the WVDEP. In addition, for all offsite borrow areas outside the Limit of Construction, 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 property.

11.3 Construction Methods

11.3.1 Prior to placement of soil cover material the areas to receive the soil cover shall be graded to remove all surface irregularities.

11.3.2 All areas cut to grade in topsoil (or soil material) do not require soil cover. All areas cut to grade otherwise shall be covered with a minimum of twelve (12) inches of soil cover material.

11.3.3 Soil cover material shall neither be frozen nor shall it be placed on frozen ground or under moisture conditions that prevent grading equipment from producing a uniform surface.

- 11.3.4** After placement, the soil cover material shall be tracked-in to ensure proper bonding of the soil cover material to the regraded area. Equipment shall be capable of operating on the slopes shown on the Construction Plans and shall produce a uniform surface free of ruts and loose soil. No minimum density shall be required for compaction, but soil cover material shall be "tracked-in" with on-site equipment. "Tracking-in" shall take place by operating the equipment up and down the soil covered slope such that the cleat marks are parallel to the final contours.
- 11.3.5** The final grade of the soil cover shall be free of surface irregularities and shall be built to the lines and grades shown on the Construction Plans.
- 11.3.6** As the soil cover material is placed and compacted, it shall be protected from erosion by installation of silt barriers and shall be fertilized, limed, seeded and mulched in accordance with Section 6.0, "Revegetation".
- 11.3.7** Upon completion of the work, the borrow area and related disturbance shall be neatly trimmed and all debris and soil disposed of in an acceptable manner. All final graded soil slopes shall not be steeper than 2H:1V unless otherwise proven to be stable or compatible to the reclamation project. All borrow areas outside the Limit of Construction shall require that a reclamation plan be submitted to the WVDEP for approval. The borrow areas and related disturbance shall be graded, fertilized, limed, seeded, and mulched in accordance with Section 6.0, "Revegetation" of these specifications.
- 11.3.8** It shall be the responsibility of the Contractor to obtain, at no expense to the WVDEP, all necessary offsite borrow areas or waste areas in accordance with any applicable local, state, and/or federal regulations including compliance with NEPA requirements.
- 11.3.9** The Contractor shall maintain and keep in full force and effect insurance to protect and indemnify the WVDEP and/or its agents or representative, from claims for damages and shall defend all suits at law.

11.4 Method of Measurement

The method of measurement for Soil Cover placed on the refuse and maintained in conformance with the specifications and accepted by the WVDEP will be by field surveying measured horizontally and rounded to the nearest 1/10 acre. Payment shall include excavating, stockpiling, hauling, spreading, and compacting/tracking-in of soil cover material and maintenance of soil cover.

11.5 Basis of Payment

Payment for covering regraded refuse areas and any other areas as approved by Engineer with soil cover material will be by the contract unit price bid for "Soil Cover."

Reclaiming and revegetating soil cover borrow areas is incidental to this item and no separate payment will be made.

No payment for this material will be made under any other item, including "Unclassified Excavation".

11.6 Pay Items

No Pay Items

12.0 GUARDRAIL

12.1 Description

This work consists of the placement of guardrail in locations shown in the Construction Plans. Terminal section buffer ends shall be placed at each end of a guardrail section.

12.2 Materials

The guardrail shall be WVDOH Type 1, Class III.

12.3 Construction Methods

The guardrail shall be constructed based on WVDOH Standard Detail Book Volume 1 Sheets GR1 and GR2 and Section 607 of the WVDOT **Standard Specifications for Roads and Bridges**, Adopted 2010.

12.4 Method of Measurement

The method of measurement for guardrail shall be by the linear foot. The quantity for terminal section buffer ends shall be included in the quantity of guardrail.

12.5 Basis of Payment

The Contractor shall be reimbursed for the placement of guardrail.

The quantity of work done shall be paid at the Contract unit price bid for these items, which price and payment shall be full compensation for doing all the work herein described in a workmanlike and acceptable manner; including the furnishing of all labor, materials, tools, equipment, supplies and incidentals as necessary to complete the work.

The price for terminal section buffer ends will be included in the price of the guardrail.

12.6 Pay Items

Item 12.0, "Guardrail", per linear foot.

13.0 SOIL AND ROCK ANCHORS

13.1 Description

This item shall consist of furnishing all material, equipment, labor, and incidentals necessary for the proprietary design and installation of soil and rock anchors in accordance with the Construction Plans. Alternatively, this item shall consist of furnishing all material, equipment, labor, and incidentals necessary for the construction of the soil and rock anchors as shown in the construction plans, and in accordance with these specifications.

The General Contractor shall be required to select a qualified soil nail/rock anchor installer listed on the General Notes sheet of the Construction Plans, regardless of the method of construction chosen (i.e. Proprietary Design or As Per Plan Installation). The selected soil nail/rock anchor installer shall have a minimum of five years of experience installing similar anchors to those for this project, and the selected soil nail/rock anchor installer shall have a minimum of three projects of like size and scope performed within the last five years of experience.

13.1.1 Definitions

The following definitions are in addition to those given in PTI DC35.1, Section 2.0:

Anchored Structure - The wall, foundation, or other structure to which the anchor is to transfer force.

Demonstration Test Anchor - An anchor which is performance tested to verify design assumptions and installation practices.

13.1.2 System Description

Prior to commencing any work on the anchors, the Contractor, including all field personnel to be involved in drilling and installation of the anchors, shall meet with the WVDEP Field Engineer to review the drawings and specifications, work plans, and submittals. Drilling may commence upon approval of the anchor installation plan and procedures described in paragraph SUBMITTALS and after the Preparatory Meeting has occurred.

13.1.2.1 General Requirements

Submit drawings and detailed installation procedures and sequences showing complete details of the installation procedure and equipment; anchor fabrication; grouting methods; grout mix designs; anchor placement and installation; corrosion protection for bond length, stressing length and anchorage; anchorage and trumpet; stressing and testing procedures with lengths, forces, deformations, and elongations for the approval by the WVDEP. Shop drawings for anchors shall include locations and details of the spacers, centralizers, and banding. If different types of anchors are to be installed, each anchor type shall be readily identifiable. Once reviewed by the WVDEP, no changes or deviation from shop drawings will

be permitted without further review by the WVDEP. The work includes design, fabrication, and installation of the soil or rock anchor system. The anchors shall be fabricated and installed as shown on the drawings. Prepare fabrication and installation drawings and an installation plan for approval. Soil or Rock anchors shall be threaded bar or strand type.

13.1.2.2 Scope of work

Provide the design of the soil or rock anchor system that will be completely the Contractor's responsibility. The materials, design, stressing, load testing, and acceptance shall be in accordance with PTI DC35.1 and these specifications.

- a. Soil and Rock anchors may be threaded bar or strand type. The Contractor is responsible for the design of the anchor and bearing plate, determining top of rock, determining drilling methods, and determining hole diameter and bond length. Submit design computations and data for the soil or rock anchors, bearing plates, and bond zones.
- b. The computations shall include drawings, design assumptions, calculations, and other information in sufficient detail to verify the design proposed. The design shall be certified by a registered Professional Engineer with proven experience in design of soil and rock anchor components as stated in paragraph Qualifications. Calculations shall be included for the stressing frames.
- c. The WVDEP will approve the Contractor's design calculations. Approval of the Contractor's design calculations will not relieve the Contractor of responsibility for unsatisfactory performance of the installed soil or rock anchors. All design computations shall be furnished at least 30 calendar days prior to the proposed commencement of drilling. The complete design, including design computations, fabrication and installation drawings and installation plan, shall be certified by a registered Professional Engineer and shall be submitted for approval.
- d. Submit a plan for installing the soil and rock anchors for review and comment. The proposal shall describe the sequence for installation and other restrictions as outlined on the drawings or specified. The anchor installation procedures shall be determined by the Contractor as part of the anchor design. The installation plan shall also include descriptions of methods and equipment to be used for alignment checking of anchor holes. Payment for soil and rock anchors, as specified in Section 13.5.10 SOIL AND ROCK ANCHORS, COMPLETE, and shall include all costs in connection with designing, fabricating, and installing the anchors.

13.1.2.3 Anchor Design

Design the individual soil or rock anchors to meet the following criteria:

- a. Anchor Location – as per details for top portion and bottom portion of walls. Anchors shall be placed in vertical columns such that anchors do not interfere with drainage network.
- b. Horizontal Spacing - 5 feet for top portion and bottom portion of wall
- c. Vertical Spacing - 7 feet for top portion of wall, 4 feet for bottom portion of wall.
- d. Hole Diameter - 6 inches minimum, 10 inches maximum.
- e. Design Load - 44.6 kips for top portion of wall, 25.9 kips for bottom portion of wall.
- f. Assumed Soil-Grout Bond Strength 5 psi for clay.
- g. Assumed Rock-Grout Bond Strength: 19 psi for weathered shale, 50 psi for competent shale.
- h. Minimum Unbonded Length - 0 feet.
- i. Minimum Required Bond Length 30 feet.
- j. Maximum Bond Length 40 feet.
- k. Minimum Length of Anchor: 40 feet for top portion wall, 35 feet for bottom portion of wall.
- l. Corrosion Protection - Class II, Grout Protected Tendons.
- m. Angle of Anchor Inclination – 15 degrees from horizontal, as shown in the plans, with a tolerance of 3 degrees.

The Design Load shall not exceed 60 percent of the ultimate strength of the prestressing steel. The Lock-off Load shall not exceed 70 percent of the ultimate strength of the prestressing steel. The maximum Test Load shall not exceed 80 percent of the ultimate strength of the prestressing steel. The designer shall include consideration of group effect of closely spaced anchors when determining design load and minimum spacing. Design the bearing plates so that the bending stresses in the plate do not exceed the yield strength of the steel when a load equal to 95 percent of the minimum specified ultimate tensile strength of the prestressing steel is applied and so that the average bearing stress on the structure does not exceed 3500 psi. Design the anchorage assembly connection to the structure in accordance with AISC 325 and ACI 318.

- n. Submit a design schedule for the anchors which includes the following:
 1. Anchor number.
 2. Anchor design load.
 3. Type and size of tendon.

4. Minimum total anchor length.
5. Minimum bond length.
6. Minimum tendon bond length.
7. Minimum unbonded length.
8. Details of corrosion protection, including details of anchorage and installation.
9. Submit the design schedule at least 30 days prior to commencement of work on the anchors covered by the schedule.

Anchors shall consist of a single reinforcing bar of 1 1/8" diameter, grade 60 steel, or equivalent cross section shall be provided for pre stressing steel should pre stressing steel be used in lieu of reinforcing steel bars. Reinforcing steel bars with yield strength below 60 ksi shall not be permitted.

13.1.3 Submittals

WVDEP approval is required for submittals with a "WVDEP" designation; submittals not having a "WVDEP" designation are for Contractor Quality Control approval. Submit the following:

SD-01 Shop Drawings

Fabrication and Installation Drawings; WVDEP

SD-02 Product Data

Equipment; WVDEP

Designer Qualifications; WVDEP

Fabricator Qualifications; WVDEP

Installer Qualifications; WVDEP

Core Logging and Soil Sampling; WVDEP

Installation Plan; WVDEP

SD-03 Design Data

Design Computations; WVDEP

Anchor Design; WVDEP

SD-04 Test Reports

Prestressing Steel; WVDEP

SD-05 Cement Grout Mixture Proportions

Certificates; WVDEP

Epoxy-Coated Steel Bars; WVDEP

SD-06 Manufacturer's Instructions

SD-07 Polyester Resin Grout
SD-08 Resin Grouted Anchors
Closeout Submittals; WVDEP
Driller Logs; WVDEP
Anchor Records; WVDEP

13.1.4 Quality Assurance

Submit anchor designer, fabricator, and installer qualifications for approval in accordance with paragraph 1.3 SUBMITTALS. The submittals shall, where applicable, identify individuals who will be working on this contract and their relevant experience. No changes shall be made in approved personnel without prior approval of the WVDEP.

13.1.4.1 Fabricator Qualifications

The anchors shall be fabricated by a manufacturer that has been in the practice of designing and fabricating soil and rock anchors similar in size and scope to this project for at least five years.

13.1.4.2 Installer Qualifications

Submit the qualifications and experience records for approval. Experience records shall identify all the individuals responsible for the anchors and shall include a listing of projects of similar scope performed within the last five years along with points of contact. The anchors shall be installed by a firm which is regularly engaged in the installation of soil and rock anchors and has at least five years experience in the installation of similar anchors. The superintendent shall have installed anchors on at least five projects of similar scope and size.

13.1.5 Delivery, Storage, and Handling

Materials shall be suitably wrapped, packaged, or covered at the factory or shop to prevent being affected by dirt, water, oil, grease, and rust. Protect materials against abrasion or damage during shipment and handling. Place materials stored at the site above ground on a well supported platform and covered with plastic or other approved material. Materials shall be protected from adjacent construction operations. Grounding of welding leads to prestressing steel will not be permitted. Reject and remove from the site prestressing steel which is damaged by abrasion, cuts, nicks, heavy corruptions, pitting, welds, or weld spatter. Inspect tendons prior to insertion into anchor holes for damage to corrosion protection. Any such damage shall be repaired in a manner recommended by the tendon manufacturer and approved by the Contracting Officer.

13.1.6 Site Conditions

A foundation investigation has been made at the site by the WVDEP and data is presented on the foundation exploration drawings. Logs of core borings are shown on the drawings. While the foundation information is representative of subsurface conditions at the respective locations, local variations in the characteristics of the subsurface materials may be anticipated. Local variations which may be encountered include, but are not

limited to, classification and thickness of rock strata, fractures, and other discontinuities in the rock structure, and variation in the soil classifications. Such variations will not be considered as Differing Site Conditions. Core borings indicated on the drawings are available for inspection upon request.

The Contractor is responsible for verifying the location of all utilities that may be affected by construction or the installation of the anchors.

13.2 Products

13.2.1 Materials

13.2.1.1 Prestressing Steel

Submit certified test reports for each heat or lot of prestressing steel with materials delivered to the site. Test reports for strands shall include bond capacity test results in accordance with ASTM A981/A981M. Submit five copies of mill reports and five copies of a certificate from the manufacturer stating chemical properties, ultimate strengths, yield strengths, modulus of elasticity, and any other physical properties needed for the required computations, for each type of steel furnished.

13.2.1.1.1 High-Strength Steel Bars

ASTM A722/A722M, Type II, meeting all supplementary requirements.

13.2.1.1.2 Steel Bar

ASTM A615/A615M, Grade 60.

13.2.1.1.3 Strand

ASTM A416/A416M, Grade 270, low relaxation strand. Strand shall not be welded.

13.2.1.1.4 Compact Strand

ASTM A779/A779M, Type 270, low relaxation strand. Strand shall not be welded.

13.2.1.1.5 Epoxy Coated Strand

ASTM A882/A882M, Grade 270, including Supplementary Requirements S1.

13.2.1.2 Structural Steel

ASTM A572/A572M Grade 50.

13.2.1.3 Steel Pipe

ASTM A53/A53M, Type E or S, Grade B.

13.2.1.4 Ductile Iron Castings

ASTM A536.

13.2.1.5 Polyethylene Tubing

13.2.1.5.1 Smooth Polyethylene Tubing

ASTM D1248, Type III.

13.2.1.5.2 Corrugated Polyethylene Tubing

AASHTO M 252, with average minimum wall thickness of 0.06 inch.

13.2.1.6 Smooth Polypropylene Tubing

ASTM D4101, designation PP 210 B5542-11.

13.2.1.7 Polyvinyl Chloride (PVC) Pipe

ASTM D1785, Schedule 40.

13.2.1.8 Polyvinyl Chloride (PVC) Tubing

13.2.1.8.1 Smooth Polyvinyl Chloride (PVC) Tubing

ASTM D1784.

13.2.1.9 Heat Shrinkable Sleeve

Radiation crosslinked polyolefin tube internally coated with and adhesive sealant.

13.2.1.10 Corrosion Inhibiting Compound

The corrosion inhibiting compound shall conform to the requirements of Section 3.2.5 of PTI M10.2.

13.2.2 Manufactured Units

13.2.2.1 Anchor Head

Anchor head shall consist of steel bearing plate with wedge plate and wedges for strand anchors or steel bearing plate with nut for bar anchors, trumpet and corrosion protection. Anchorage devices shall be capable of developing 95 percent of the guaranteed ultimate strength of prestressing steel. The anchorage devices shall conform to the static strength requirements of Section 14.3.1.6 (1) and Section 3.1.8 (1) and (2) of PTI TAB.1. Wedges shall be designed to not cause premature failure of the prestressing steel due to notching or pinching. Provide special wedges as required for epoxy coated strand. Removal of epoxy coating to permit use of standard wedges will not be permitted. Threaded anchorage items for epoxy coated bars shall be designed to fit over the epoxy coating and maintain the capacity of the prestressing steel. The trumpet used to provide a transition from the anchorage to the unbonded length corrosion protection shall be fabricated from steel pipe or steel tube. The minimum wall thickness shall be 0.125 inch for diameters up to 4 inches and 0.20 inch for larger diameters. The trumpet shall be welded to the bearing plate.

13.2.2.2 Prestressing Steel Couplers

Prestressing steel couplers for bars shall be capable of developing 100 percent of the minimum specified ultimate tensile strength of the prestressing steel. Splicing of strand will not be permitted.

13.2.2.3 Centralizers and Spacers

Centralizers and spacers shall be fabricated from plastic, steel or other approved material which is nondetrimental to the prestressing steel. Wood shall not be used. The centralizer shall be able to support the tendon in the drill hole and position the tendon so a minimum of 0.5 inch of grout cover is provided. Centralizers and spacers shall permit grout to freely flow up the drill hole.

13.2.2.4 Casing

Casing shall be steel pipe or steel tube selected and sized by the Contractor where required. Casing shall be the necessary type and size to permit proper drilling of anchor holes and placing of anchors as specified herein and shown on the drawings. Straightening of casings and machining of joints may be necessary in order to meet specified alignment tolerances.

13.2.2.5 Anchorage Covers

Fabricate anchorage covers from steel or plastic. The material used shall not be subject to attack by cement, corrosion-inhibiting greases, or the environment. If plastic is used, it shall not be susceptible to ultraviolet light degradation. Securely attach the cover to the bearing plate. If the cover is to be grease filled, the cover shall form a permanent watertight enclosure for the anchorage device.

13.2.3 Equipment

The Contractor's Quality Control manager shall verify that the equipment used on site is the same as the equipment submitted for approval. Submit catalog cuts, brochures, or other descriptive literature describing the equipment to be used for drilling, grouting, handling, and installing the soil and rock anchors. Submit sketches, drawings, or details showing the access and temporary supports where required for the drilling equipment and stressing frames. Provide descriptions of stressing jacks, gages, dynamometers, load cells, or other devices for measuring stressing load, certified calibration records for each set of jacking equipment, and current testing curves for stress measurement gages which show that gages have been calibrated for the jacks for which they are used 30 days prior to the start of the testing operations.

13.2.3.1 Drilling Equipment

Provide drilling equipment suitable for advancing the drill tools to the depths and at the alignment specified.

13.2.3.2 Grouting Equipment

13.2.3.2.1 Grout Mixer

The grout mixer shall be a high-speed, high-shear, colloidal type grout mixer capable of continuous mechanical mixing that will produce uniform and thoroughly mixed grout which is free of lumps and undispersed cement. The mixer shall be equipped with a suitable water and admixture measuring devices calibrated to read in cubic feet and tenths and so designed that after each delivery the hands can be conveniently set back to zero.

13.2.3.2.2 Grout Pump

The grout pump shall be of the positive displacement type, and shall be capable of pumping at all flow rates below 20 gpm, shall be capable of pumping at the pressure of at least 50 psi at zero flow rate. For neat cement grout, the pump shall have a screen with 0.125 inch maximum clearance to sieve the grout before being introduced into the pump. Screens are not required for shear type mixers. Make available a pump which is capable of pumping both neat cement grout mixes and sanded grout mixes. The pumping equipment shall have a pressure gage capable of measuring pressures of at least 150 psi or twice the required grout pressure, whichever is greater.

13.2.3.3 Stressing Equipment

Stressing equipment shall be hydraulically operated and shall have a capacity sufficient to stress the anchors to the required Test Loads within the rated capacity in one stroke. Pumps shall be capable of applying each load increment in less than 60 seconds and shall be capable of maintaining the hydraulic pressure within 50 psi. The equipment shall permit stressing of the tendon in increments and raising or lowering the load in the tendon. Stressing equipment for strands shall be capable of stressing all elements equally and simultaneously. The equipment shall be calibrated with an accuracy of ± 2 percent and the calibration certificate and graphs shall be available at the site. The production gage shall have graduations of 100 psi or less. A second certified gage shall be maintained for periodic verification of the production gage. A dial gage or approved device shall be provided to measure total tendon elongation at each load increment to the nearest 0.001 inch. The dial gage shall be capable of measuring the entire anchor movement without being reset. Calibration of gages shall be verified no more than 30 calendar days prior to commencing work under this contract and at six-month intervals throughout the period of use.

13.2.3.4 Testing Equipment

Provide testing equipment consisting of a hydraulic jack with calibrated pressure gage for applying the load and a dial gage or vernier scale to measure anchor movement. The ram travel of the stressing equipment shall be not less than the theoretical elastic elongation of the total anchor length at the maximum Test

Load. The pressure gage shall be graduated in 100 psi increments. The stressing equipment and pressure gage must have been calibrated as a unit no more than 30 calendar days prior to commencing work under this contract and at six-month intervals throughout the period of use. The movement measuring device shall have a minimum travel equal to the theoretical elastic elongation of the total anchor length at the maximum Test Load without resetting the device.

13.2.4 Grout

13.2.4.1 Cement

ASTM C150/C150M, Type I, II, III or V.

13.2.4.2 Water

Provide fresh, clean, potable water free from injurious amounts of sewage, oil, acid, alkali, salts, or organic matter.

13.2.4.3 Aggregates

Fine aggregate for sand-cement grout shall conform to ACI 301. Aggregates shall not contain substances which may be deleteriously reactive with alkalis in the cement.

13.2.4.4 Admixtures.

Admixtures which control bleed, improve flowability, reduce water content and retard set may be used in the grout subject to the approval of the WVDEP. Any admixtures used shall be compatible with the prestressing steel and shall be mixed in accordance with the manufacturer's recommendations.

13.2.4.5 Grout for Anchors

13.2.4.5.1 Cement Grout

Cement grout mixture proportions are the responsibility of the Contractor. Submit the mixture proportions that will produce grout of the quality required, thirty days prior to installation of anchors. Provide applicable test reports to verify that the grout mixture proportions selected will produce grout of the quality specified. Grout for grouting anchors shall consist of a homogenous, pumpable, stable mixture of portland cement and water. Submit the proposed mix design to the WVDEP for approval. The water content shall be the minimum necessary for proper placement but the water-cement ratio shall not exceed 0.45 by weight. Final proportions of materials shall be based on results of tests made on sample mixtures of grout. The minimum compressive strength of two-inch cubes, molded, cured, and tested in accordance with ASTM C109/C109M, shall be 4,500 psi at the time of stressing. The Contractor is responsible for taking, curing, and breaking of grout test cubes for determining mix design, and all testing shall be done by an independent laboratory approved by the WVDEP. Soil and Rock conditions and temperatures shall be replicated in the curing process.

13.2.4.5.2 Polyester Resin Grout

Polyester resin grout shall not be used for anchors installed in wet holes. Single stage grouting can be accomplished with polyester resin grout by using fast setting resin grout in the bond zone and slower setting resin grout in the free stressing zone.

Polyester resin grout shall consist of high strength, unsaturated polyester resin filled with nonreactive, inorganic aggregate and a separated catalyst contained in a tube of polyester film or glass. Gel time and cure time shall be appropriate for the installation procedures. The polyester resin grout shall have the following minimum properties:

Compressive Strength - 12000 psi. Tensile Strength 4000 psi. Shear Strength 3000 psi.

Resin cartridges with expired shelf life are not allowed.

13.2.4.6 Sand-Cement Grout

Grout for backfilling holes which are abandoned shall consist of a mixture of portland cement, fine aggregate, and water. The grout mix proportions are the responsibility of the Contractor. Submit the proposed mix design to the WVDEP for approval. The water content shall be the minimum necessary for proper placement. Final proportions of materials shall be based on results of tests made on sample mixtures of grout. The minimum compressive strength of two-inch cubes, molded, cured, and tested in accordance with ASTM C109/C109M, shall be 3,000 psi. The Contractor is responsible for taking, curing, and breaking of grout test cubes for determining mix design, and all testing shall be done by an independent laboratory approved by the WVDEP.

13.2.4.7 Grout for Anchor Pads

Use nonshrink grout conforming to ASTM C1107/C1107M for leveling bearing plates.

13.2.5 Tendon Fabrication

13.2.5.1 General

Fabrication of the anchors shall be as recommended by the suppliers. Anchors shall be completely assembled with all centralizers, spacers, grout and vent tubes, and corrosion protection prior to insertion into the hole. Fabricated anchors shall be protected, transported and stored in a manner to prevent contamination or damage to any components.

13.2.5.2 Tendon

All spacers for multiple element tendons shall be located as indicated on the approved shop drawings. Furnish strands full length with no splicing or coupling permitted. Tendon material shall be unblemished and free of pitting, nicks, grease,

or injurious defects. When required to maintain the tendon location within the hole, provide centralizers at a maximum of 10 foot intervals center-to-center throughout the bond length. Spacers shall be provided at a maximum 10 foot intervals center-to-center throughout the bond length. The entire bond length of the tendon shall be free of dirt, lubricants, loose rust, corrosion-inhibiting coatings or other contaminants.

13.2.5.3 Bond Breaker

Bond breaker for free stressing length of unbonded anchors shall consist of smooth polyethylene tubing, minimum wall thickness 0.04 inch, or smooth PVC tubing, minimum wall thickness 0.04 inch.

14.2.5.4 Vent Tubes

Vent tubes used during grouting operations, if necessary, shall be any appropriate type for the job, as recommended by the supplier of the anchors.

13.2.5.5 Grout Tubes

Grout tubes shall be polyethylene tubing or as recommended by the anchor manufacturer and approved by the WVDEP. Inside diameter of grout tubes shall be adequate to fully grout the entire hole.

13.2.5.6 Corrosion Protection

Corrosion protection shall be Class II (Grout Protected Tendons). Corrosion protection shall be provided for the entire anchor and shall include anchorages covers and trumpets filled with corrosion inhibiting compound or grout and encapsulation of the free stressing length and bond length.

13.2.5.6.1 Anchorage Protection

The trumpet shall be sealed to the bearing plate and shall overlap the free stressing length encapsulation by at least 4 inches. The anchorage cover shall be completely filled with corrosion inhibiting compound or grout.

13.2.5.6.2 Free Stressing Length Encapsulation.

Encapsulation for free stressing length shall consist of a sheath of smooth polyethylene tubing, minimum wall thickness 0.06 inch; smooth polypropylene tubing, minimum wall thickness 0.06 inch; smooth PVC tubing, minimum wall thickness 0.04 inch; or steel pipe or tube with minimum wall thickness 0.02 inch. Sheath for bars and strands may be heat shrinkable sleeve with a minimum thickness of 0.024 inch. Free stressing length encapsulation shall extend at least 4 inches into the trumpet, but shall not contact the bearing plate during testing and stressing of the tendon.

13.2.6 Shotcrete

This section includes pneumatically applied concrete.

13.2.6.1 The following specifications are incorporated herein by reference:

ACI 506R, Guide to Shotcrete
ACI 506.2, Specifications for Shotcrete
ASTM C33, Standard Specification for Concrete Aggregates
ASTM C150, Standard Specification for Portland Cement
ASTM C1140, Standard Practice for Preparing and Testing Specimens
from Shotcrete Test Panels
ASTM C1141, Standard Specification for Admixtures for
Shotcrete

13.2.6.2 Submittals

13.2.6.2.1 Qualifications of shotcrete applicator and personnel performing the work.

13.2.6.2.2 Mix designs including compressive test data used to establish proportions. Material certificates for shotcrete materials, including cements, aggregates and admixtures. Submit to Testing Laboratory for record purposes.

13.2.6.2.3 Submit batch tickets to Testing Laboratory for each batch of shotcrete, indicating weight of cement, aggregate, water, and admixtures.

13.2.6.2.4 Samples as requested by the Testing Laboratory.

13.2.6.3 Quality Assurance

13.2.6.3.1 Perform shotcrete work in accordance with the requirements of ACI 506.2, "Specifications for Materials, Proportioning, and Application of Shotcrete"

13.2.6.3.2 Shotcrete Mix Design: Testing laboratory shall, under direction of its West Virginia registered Civil Engineer, design shotcrete mixes. Each mix shall bear the signature and registration number of the responsible engineer.

13.2.6.3.3 Test Panels: Prepare preconstruction test panels at least 21 days prior to job placement, using the mix and equipment proposed for the project.

13.2.6.3.4 Each proposed nozzleman shall prepare a panel demonstrating each shooting orientation.

13.2.6.3.5 Fabricate test panels in accordance with ASTM C1140 and CBC 1924.5 and as approved by the WVDEP's Representative.

13.2.6.3.6 Notify Testing Laboratory to observe placement of panels. Maintain panels at point of fabrication for 7 days and until Testing Laboratory has taken cores.

13.2.6.3.7 Samples taken from test panel shall achieve a mean core grade of 2.0, in accordance with Section 1.7 of ACI 506.2, "Shotcrete Core Grades". In the event of failure, nozzleman shall be permitted one retest.

Any nozzleman failing the second test shall not be permitted on the project.

13.2.6.3.8 Certificates of Compliance: Acceptability of the following materials will be based upon documentation furnished by the manufacturer identifying each batch of material and certifying compliance with the requirements specified.

13.2.6.3.9 Portland cement

13.2.6.3.10 Fly Ash

13.2.6.3.11 Admixtures

13.2.6.3.12 Certified laboratory test reports: Before delivery of materials, certified copies of the reports of all tests required in referenced publications or otherwise specified here shall be submitted. Certified test reports are required for the following:

13.2.6.3.13 Cement

13.2.6.3.14 Aggregates

13.2.6.3.15 Admixtures

13.2.6.4 Environmental Requirements

13.2.6.4.1 Ensure materials and surrounding air temperature are a minimum 40 deg F (4.4 deg C) prior to, during, and seven days after completion of work.

13.2.6.4.2 During freezing or near freezing weather, provide equipment and cover to maintain minimum 40 deg F (4.4 deg C) and to protect work completed or work in progress.

13.2.6.4.3 Suspend shotcrete operations during high winds, rainy weather, hot weather, or near freezing temperatures when work cannot be protected.

13.2.6.5 Materials

13.2.6.5.1 Concrete materials shall conform to the appropriate requirements of ACI 506R and ACI 506.2 except as specified herein for adjustment of aggregate and mix for placing.

13.2.6.5.2 Addmixtures: ASTM C1141.

13.2.6.5.3 Aggregate: ASTM C33, combined Gradation No. 2 as specified in ACI 506.R.

13.2.6.6 Shotcrete Mix

13.2.6.6.1 Proportion shotcrete mix in accordance with ACI 506.2 to achieve 4,500 psi compressive strength at 28 days.

13.2.6.6.2 Provide a mix that is plastic enough to give good compaction and low percentage of rebound, but stiff enough not to sag.

13.2.6.7 Equipment

13.2.6.7.1 Equipment: Equipment of design and size which has given good results in similar work; pneumatic feed type; capable of maintaining continuous placement.

13.2.6.7.2 Air Supply: Clean, dry air adequate for maintaining sufficient nozzle velocity, uniformly steady for work while simultaneously operating blow pipe for cleaning away rebound.

13.2.6.7.3 Delivery Equipment: Capable of discharging aggregate-cement-water mixture accurately, uniformly, and continuously through the delivery hose.

13.2.6.8 Examination

13.2.6.8.1 Verify that field conditions are acceptable and are ready to receive work.

13.2.6.8.2 Verify fabricated forms are true to line and dimension, adequately braced against deflection and vibration, and constructed to permit escape of air and rebound during gunning operations.

13.2.6.8.3 Ensure correct placement of reinforcement. Ensure sufficient clearance around reinforcement to permit complete encasement.

13.2.6.8.4 Ensure easy access to shotcrete surfaces for screening and finishing, to permit uninterrupted application.

13.2.6.8.5 Beginning of installation means the Subcontractor accepts that the existing conditions meet the above criteria.

13.2.6.9 Preparation

13.2.6.9.1 Prepare smooth, even surfaces. Minimize abrupt changes in thickness of repair. Remove square external corners from substrate by radiating the edge.

13.2.6.9.2 Ensure that forms are true to line and dimension, adequately braced against deflection and vibration, and constructed to permit escape of air and rebound during gunning operations.

13.2.6.9.3 Do not place shotcrete on any surface which is frozen, spongy, or where there is standing water.

13.2.6.9.4 Shotcrete placed against existing concrete or masonry - Remove unsound material before applying shotcrete. Chip or scarify any area to be repaired to remove off-sets which would cause an abrupt change in thickness without suitable reinforcement. Taper edges to leave no square shoulders at the perimeter of a cavity. Remove loose material from areas receiving shotcrete. Wet the surface until it is damp, but without visible free water.

13.2.6.10 Alignment Control

13.2.6.10.1 Provide alignment wires to establish thickness and plane of required surfaces.

13.2.6.10.2 Install alignment wires at corners and offsets not established by forms.

13.2.6.10.3 Tighten alignment wires true to line. Position adjustment devices to permit additional tightening.

13.2.6.11 Application

13.2.6.11.1 Ensure sufficient clearance around reinforcement to permit complete encasement.

13.2.6.11.2 Allow easy access to shotcrete surfaces for screening and finishing to permit uninterrupted application.

13.2.6.11.3 Establish, and adhere to, operating procedures for placement in close quarters, at extended distances, or around unusual obstructions where placement velocities and mix consistency must be adjusted.

13.2.6.11.4 When shotcreting walls, begin the application at the bottom and work upwards. Ensure that the work does not sag.

13.2.6.11.5 Direct nozzle perpendicular to surface to ensure maximum compaction with minimum rebound.

13.2.6.11.6 Build up thickness by layers, in multiple passes of the nozzle over the work area. Follow a routing that will fill and completely encase reinforcement, using maximum layer thickness.

13.2.6.11.7 Allow each layer to take initial set before applying succeeding layers.

13.2.6.11.8 After initial set, remove excess material outside of forms and alignment lines.

13.2.6.11.9 Remove laitance that has taken final set by sandblasting. Clean with air-water jet.

13.2.6.11.10 Sound work with hammer for voids. Cut out voids and replace with new shotcrete layers.

13.2.6.11.11 Remove trapped rebound at construction and expansion joints.

13.2.6.11.12 Remove rebound material which does not fall clear of the work. Discard salvaged rebound.

13.2.6.11.13 Keep rebound and other loose or porous material out of new construction.

13.2.6.11.14 Remove and replace all shotcrete which exhibits sags or sloughs, segregation, honeycombing, sand pockets, or other obvious defects.

13.2.6.11.15 Keep completed surfaces wet for a minimum of seven days. Immediately after placement, protect shotcrete from premature drying, excessively hot or cold temperatures, and mechanical injury.

13.2.6.11.16 Protect shotcrete repair work from frost action or heavy water flow.

13.2.6.12 Field Quality Control

13.2.6.12.1 Testing Laboratory will:

13.2.6.12.1.1 Test and inspect materials as required to ensure compliance with specifications.

13.2.6.12.1.2 Collect and review tickets for each batch of shotcrete delivered. Annotate water added subsequent to batching.

13.2.6.12.1.3 Observe placement of preconstruction test panels. Take six cores from each panel; three with reinforcement and three non-reinforced. Visually inspect and grade in accordance with "Quality Assurance" article. Test non-reinforced cores for compressive strength at 7 days.

13.2.6.12.1.4 Special Inspect shotcrete placement for conformance with the Contract Documents.

13.2.6.12.2 The Subcontractor shall:

13.2.6.12.2.1 Patch areas cored for testing.

13.2.6.12.2.2 Pay Testing Laboratory for investigating of low-strength compressive test results.

13.2.7 Tests, Inspections, and Verifications

Perform required material tests, on prestressing steel and accessories, by an approved laboratory to demonstrate that the materials are in conformance with the specifications. Test grout in accordance with ASTM C109/C109M. These tests shall be at the Contractor's expense. Furnish to the WVDEP prestressing steel test results prior to beginning fabrication of any anchors and within 24 hours of testing.

13.3 Execution

13.3.1 Drilling Holes

13.3.1.1 General

The top of bond zone elevations and other physical conditions indicated on the drawings are the result of soil sampling and core borings. Holes shall be drilled at the locations and inclinations shown and to the depths and diameters determined by the Contractor to provide the design bond length and capacity indicated on the drawings. The locations of the holes may be changed only as approved by the WVDEP. Any redesign of the anchor due to relocation of anchor holes shall be performed by the Contractor. Unless otherwise specified, the Contractor shall

determine the drilling method to be used. No holes shall be drilled within 50 feet of a grouted hole until the grout has set at least 24 hours. Pressure grouting and drilling shall not be simultaneously performed within a distance of 50 feet. Care shall be taken while drilling to avoid damage of any kind to the existing structures. Damages of any nature will be evaluated by the WVDEP and repairs or replacements shall be made as required at the contractors expense. Holes shall be drilled a maximum of 3 feet beyond the required anchor bond length. Provide a temporary plug for all holes drilled more than 10 days prior to installation of the anchor. Waste water from drilling operations shall be collected and recycled or treated; it shall not be discharged directly on the ground.

13.3.1.2 Drilling In Soil

Holes in soil may be drilled by rotary drilling, rotary percussive, or vibratory driven casing. Holes in soil shall be provided with steel casing where required for support of the surrounding material. Casing shall be removed during anchor grouting. Hollow-stem augers which are used for installation of the tendon shall be removed during anchor grouting. Where soil is susceptible to caving, holes through soil shall be drilled by the duplex method using an inner and outer casing with return water flow between the casings.

13.3.1.3 Casing

Casing shall be utilized for drilling through unstable soil formations. The casing shall be advanced by rotary drilling or driving.

13.3.1.4 Drilling in Rock

Unless otherwise specified, holes in rock may be drilled by rotary drilling, percussion drilling or down-the-hole hammer using equipment suitable for the intended purpose. Overdrilling of holes by a maximum of three feet will be permitted if complete removal of cuttings and other material cannot be accomplished. If the hole is overdrilled, the tendon must be supported so that the free length corrosion protection extends the required length into the trumpet and so that the anchor can be stressed.

13.3.1.5 Records

Submit driller logs and records as specified in paragraph Driller Logs. The presence of a WVDEP inspector or the keeping of separate drilling records by the WVDEP shall not relieve the Contractor of the responsibility for the work specified in this paragraph. Payment will not be made for any work for which the required records have not been furnished by the Contractor.

13.3.1.6 Alignment

13.3.1.6.1 Tolerances

The anchor hole shall be located within 12 inches of the plan location. The entry angle shall be within 3 degrees of the specified inclination. The alignment of the drilled hole shall be within 3 degrees of the theoretical

alignment. If the hole alignment is not within these tolerances, the hole shall be backfilled with cement or sand-cement grout and a new hole drilled adjacent to the rejected hole.

13.3.2 Installation of Anchors

13.3.2.1 General

The Contractor is responsible for each drilled hole until the anchor has been installed, grouted, stressed, and accepted. Holes in rock and casings shall be cleaned by pressurized air and/or water to remove drill cuttings and mud. The anchors designated as demonstration test anchors shall be installed and tested prior to drilling the bond zone for other anchors within the area represented by the demonstration test anchor.

13.3.2.2 Placing

All the equipment used in handling and placing the anchors shall be such that it does not damage or deteriorate the prestressing steel, corrosion protection, or the anchorages. Each anchor shall be inspected prior to insertion into the hole. Any damage to corrosion protection shall be repaired prior to insertion or, if determined by the WVDEP to be not repairable, the anchor shall be replaced. Insertion of anchors shall be in accordance with PTI DC35.1.

13.3.2.3 Resin Grouted Anchors

Insertion of resin-grouted anchors shall be in accordance with the resin manufacturer's written recommendations and recommendations for hole diameter, cartridge selection, and tendon installation and rotation prior to installing the anchors. Tendons shall be inserted until contact is made with the first cartridge. The tendon shall then be rotated and advanced at the rate recommended by the resin grout manufacturer. After reaching its final position, the tendon shall be rotated as recommended by the resin grout manufacturer to ensure complete mixing of the resin.

13.3.2.4 Cement Grouted Rock Anchors

Grouting equipment shall be of type and capacity required for successful installation of the rock anchors. All anchors shall use single stage grouting to encase the anchor. Grouting shall be performed by a method in accordance with PTI DC35.1, paragraph 7.6. Grouting shall commence at the bottom of the grout zone and proceed to the top of the zone. Grouting shall be gravity flow. If casings are used, the casing shall be withdrawn as the grouting proceeds.

13.3.2.5 Grouting of Soil Anchors

13.3.2.5.1 General

Within the bond length, grout placement shall proceed such that the hole is filled in a manner to prevent air voids. The soil anchor hole shall be progressively filled with grout and maintained completely full from bottom to top of the zone until the grout has set. Grouting of a soil anchor

hole shall be performed within 48 hours of the time the hole is drilled. Grouting may be accomplished through the casing pipe, grout tubes, hollow-stem augers or hollow drill rods. The grouting procedure used shall provide soil anchors which meet the specified design capacity.

13.3.2.5.2 Gravity Grouting

Gravity grouting shall proceed from the bottom of the hole to the top of the hole.

13.3.2.5.3 Pressure Grouting

The method of pressure grouting shall be determined by the Contractor and proven in the demonstration anchor. Production anchors shall be grouted using the methods and target pressures that were used on the acceptable demonstration anchor. Grouting pressures and pumping rates shall be controlled to prevent ground surface heave or fracturing. Grouting pressures shall be incrementally increased until a refusal is reached or an acceptable amount of grout is pumped.

13.3.2.5.4 Post-Grouting

The number of phases of post-grouting shall be determined by the Contractor and proven in the demonstration anchor. Production anchors shall be grouted using the methods and target pressures that were used on the acceptable demonstration anchor. Grouting pressures and pumping rates shall be controlled to prevent ground surface heave or fracturing. Grouting pressures shall be incrementally increased until a refusal is reached or an acceptable amount of grout is pumped.

13.3.2.6 Anchorage Installation

The bearing plate and nut shall be installed perpendicular to the tendon, within 3 degrees, and centered on the tendon without bending of the stressing steel. Wedges, wedge holes, and tendons shall be free of dirt, grout, or other contaminants.

13.3.3 Stressing

13.3.3.1 General Requirements

After the anchor grout has reached sufficient strength in accordance with the Contractor's design, the specified strength, as verified by grout cube break, the anchors shall be stressed. Prior to stressing, surfaces upon which the stressing equipment is resting must be clean and the stressing equipment shall be aligned as nearly with the center of the hole as possible. An Alignment Load of 10 percent of the Design Load shall be applied to the anchor prior to setting dial gauges. Stress the anchor in accordance with the anchor manufacturer's recommendation, subject to the approval of the WVDEP. Design load in the upper portion of the wall is 44.6 kips, and the design load in the lower portion of the wall is 25.9 kips. Lock-off loads shall be 60% of the design load. Determine the lock-off procedure so

that the lift-off results meet the acceptance criteria specified in paragraph Acceptance. The maximum stress shall never exceed 80 percent of the guaranteed ultimate strength of anchor steel. The process of stressing the anchors shall be so conducted that accurate elongation of the anchor steel can at all times be recorded and compared with the computations submitted to, and accepted by the WVDEP. Stressing elements of strand anchors shall be stressed simultaneously. Safety precautions shall be taken to prevent workers from being behind the stressing equipment during stressing. Stressing of the anchors shall be performed in a sequence submitted by the Contractor for review by the WVDEP. All stressing shall be done in the presence of a representative of the WVDEP. At no time during the stressing and testing of an anchor shall the stressing equipment be disconnected from the temporary stressing head or anchor.

Each anchor to be performance tested shall be declared acceptable before proceeding with drilling for other anchors within the section represented by that anchor.

13.3.3.2 Lock-off

After completion of all required tests, the load shall be returned to the Alignment Load and the specified Lock-off Load shall be applied to the anchor. A lift-off test shall be made to verify the load in the anchor tendon before the tendon is locked-off and the stressing equipment is removed. The lift-off reading shall be within five percent of the specified lock-off load. If the lift-off reading is not within five percent of the specified lock-off load, the anchorage shall be reset and another lift-off reading shall be made. This procedure shall be repeated until a satisfactory lift-off reading is obtained. After lock-off, the trumpet shall be filled with grout and the anchorage recess shall be fully grouted flush with the adjacent surfaces.

13.3.4 Field Quality Control

13.3.4.1 General

The first three anchors and a minimum of 2 percent of the remaining anchors shall be designated as demonstration test anchors. Designated demonstration test anchors shall be used to verify rock and soil quality and the adequacy of the Contractor's anchor design and installation procedures. Demonstration test anchors shall pass the performance test prior to placing other anchors within the section represented by the respective demonstration test anchor. All other anchors shall be proof tested. During the stressing of each anchor, a record shall be kept of gage pressure and of anchor elongation at each stage of stressing to the specified test or Lock-off Load, as applicable. The Test Load shall not be exceeded. Provide a qualified engineer to evaluate the anchor test results and determine the acceptability of the anchors in accordance with the criteria indicated hereunder. Final acceptance of each anchor will be made by the WVDEP. All tests shall be run in the presence of the WVDEP or his representative.

13.3.4.2 Performance Test

Performance test shall consist of cyclically and incrementally loading and unloading the anchor, and shall be conducted in accordance with PTI DC35.1, Paragraph 8.3.2. During the testing of each anchor, a record shall be kept of gage pressure and of anchor elongation at each stage of stressing to each Test Load required by PTI DC35.1. Measurements of the elongation of prestressing steel shall be made in accordance with PTI DC35.1. If the total movement at the end of 10 minutes at the Test Load exceeds 0.040 inch, the Test Load shall be held an additional 50 minutes and the movement readings shall be taken at the interval specified in PTI DC35.1, Paragraph 8.3.2. Test records, including plots and graphical analysis of test data, shall be furnished upon acceptance of each performance tested anchor in accordance with paragraph SUBMITTALS.

13.3.4.3 Proof Test

Proof test shall consist of incrementally loading the anchor and shall be conducted in accordance with PTI DC35.1, Paragraph 8.3.3. During the testing of each anchor, a record shall be kept of gage pressure and of anchor elongation at each stage of stressing to the Test Load required by PTI DC35.1. Measurements of the elongation of prestressing steel shall be made in accordance with PTI DC35.1. If the total movement at the end of 10 minutes at the Test Load exceeds 0.040 inch, the Test Load shall be held an additional 50 minutes and the movement readings shall be taken at the interval specified in PTI DC35.1, Paragraph 8.3.3. Test records, including plots and graphical analysis of test data, shall be furnished upon acceptance of each proof tested anchor in accordance with paragraph SUBMITTALS. The proof test results shall be compared with similar anchors in which performance tests have been performed. If any significant variation from the performance tests occurs, the WVDEP may require additional performance tests. These additional tests, if required, are the responsibility of the contractor and no additional compensation will be paid for these tests.

13.3.4.4 Driller Logs

Submit the original handwritten log and three (3) copies in typed format within two days of the completion of each hole. Keep accurate driller logs and records of all work accomplished under this contract and deliver complete, legible copies of these logs and records to the WVDEP upon completion of the work or at such other time or times as may be directed. All such records shall be preserved in good condition and order by the Contractor until they are delivered and accepted, and the WVDEP shall have the right to examine such records at any time prior to their delivery. Separate logs shall be made for each hole. Use DRILLING LOG, ENG FORM 1836 and 1836A or other approved form which provides the required information for the logs. The following information shall be included on the logs or in the records for each hole:

- a. Hole number or designation and elevation of top of hole.
- b. Inclination of the hole.
- c. Make and manufacturer's model designation of drilling equipment.

- d. Dates and time when drilling operations were performed.
- e. Time required for drilling each run.
- f. Elevation of top of rock.
- g. Steel casing seat elevation.
- h. Depths and elevations at which core was recovered or attempts made to core including top and bottom depth of each run.
- i. Geologic classification or description by depths of each stratigraphic unit cored. This classification or description shall be made immediately following the taking of the core.
- j. Percentage of core recovered and rock quality designation per run.
- k. Depth and elevation of rod drops and other unusual occurrences.
- l. Depth and elevation at which groundwater is encountered.
- m. Depths and elevations at which drill water is lost and regained and amounts.
- n. Depth and elevation of bottom of hole, determined by measuring the drill steel length.

13.3.4.5 Anchor Records

Upon completion of installation of each anchor, the anchor records shall be furnished to the WVDEP with bond length, free stressing length of anchor, grout mix, grouting pressure, bags of cement injected, and a report of performance test or proof test. The performance test and proof test results shall include measured lengths of drill holes and anchors, the loads and elongations recorded during testing, monitoring and stressing of the anchors, and graphs of test results as specified in paragraph SUBMITTALS. In addition as-built drawings showing the completed installation of the anchors shall be furnished upon completion of installation of all anchors.

13.3.5 Acceptance

13.3.5.1 General

Acceptance of anchors shall be determined by the WVDEP. The following criteria will be used in determination of the acceptability of each anchor:

- a. Creep - Creep movement shall not exceed 0.040 inch at maximum Test Load during the first 10 minutes of the performance or proof test. If the creep movement exceeds this limit, it shall not exceed 0.080 inch at the maximum Test Load at the end of 60 minutes. If the creep movement exceeds 0.080 inch at the maximum Test Load at the end of 60 minutes, the anchor shall be rejected.
- b. Movement - Apparent free length shall be calculated from the observed elastic movement in accordance with PTI DC35.1, Section 8.3.2.

If the anchor is not returned to the Alignment Load after testing, only total movement data will be available. In this case, only the minimum apparent free length criteria will apply.

- 1) Minimum Apparent Free Length - The calculated free length shall be not less than 80 percent of the designed free tendon length plus the jack length. If the anchor does not meet this criteria, the anchor shall be restressed from the Alignment Load to the Test Load and the apparent free length shall be recalculated. If the anchor does not meet this criteria after 3 attempts (original plus 2 restresses), the anchor shall be rejected.
- 2) Maximum Apparent Free Length - The calculated free length shall be not more than 100 percent of the designed free tendon length plus 50 percent of the bond length plus the jack length. If the anchor does not meet this criteria, and the cause of the behavior is not investigated and explained to the satisfaction of the WVDEP, the anchor shall be rejected.
- c. Initial Lift-Off Reading - The initial lift-off reading shall be within 5 percent of the specified Lock-off Load. If the anchor does not meet this criteria, the anchor shall be adjusted as necessary and the lift-off reading shall be repeated.

13.3.5.2 Replacement of Rejected Anchors

Any anchor that fails the performance or proof test or is rejected by the WVDEP shall be replaced. A replacement anchor, including a new anchor hole, shall be provided by the Contractor at no expense to the WVDEP. The location of the replacement anchor shall be as directed by the WVDEP. Provide all materials, supplies, equipment, and labor necessary to provide a new anchor assembly to the satisfaction of the WVDEP. No drilling shall be performed for a replacement anchor until the grouting of all rock anchors within 50 feet of the replacement anchor location has been allowed to set for at least 24 hours. Payment will not be made for rejected or failed anchors. Either remove failed anchors and thoroughly ream and clear the anchor hole or remove the load and cut the anchor and casing flush. Anchors that are removed shall have the hole backfilled with cement or sand-cement grout prior to installing the replacement anchor, and the backfilled hole shall be allowed to set for at least 24 hours prior to drilling for a replacement anchor.

13.4 References

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION
OFFICIALS (AASHTO)

AASHTO M 252	(2009) Standard Specification for Corrugated Polyethylene Drainage Pipe
AMERICAN CONCRETE INSTITUTE INTERNATIONAL (ACI)	
ACI 301	(2010; Errata 2011) Specifications for Structural Concrete
ACI 318	(2011; Errata 1 2011; Errata 2 2012; Errata 3-4 2013) Building Code Requirements for Structural Concrete and Commentary
AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC)	
AISC 325	(2011) Steel Construction Manual
AMERICAN PETROLEUM INSTITUTE (API)	
API Spec 5CT	(2011; Errata 2012) Specification for Casing and Tubing
ASTM INTERNATIONAL (ASTM)	
ASTM A108	(2013) Standard Specification for Steel Bar, Carbon and Alloy, Cold-Finished
ASTM A36/A36M	(2012) Standard Specification for Carbon Structural Steel
ASTM A416/A416M	(2012) Standard Specification for Steel Strand, Uncoated Seven-Wire for Prestressed Concrete
ASTM A500/A500M	(2010a) Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes
ASTM A53/A53M	(2012) Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless
ASTM A536	(1984; R 2009) Standard Specification for Ductile Iron Castings
ASTM A572/A572M	(2012) Standard Specification for High-Strength Low-Alloy Columbium-Vanadium Structural Steel
ASTM A588/A588M	(2010) Standard Specification for High-Strength Low-Alloy Structural Steel with 50 ksi (345 MPa)

	Minimum Yield Point, with Atmospheric Corrosion Resistance
ASTM A615/A615M	(2012) Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement
ASTM A709/A709M	(2013) Standard Specification for Structural Steel for Bridges
ASTM A722/A722M	(2012) Standard Specification for Uncoated High-Strength Steel Bar for Prestressing Concrete
ASTM A775/A775M	(2007b) Standard Specification for Epoxy-Coated Steel Reinforcing Bars
ASTM A779/A779M	(2012) Standard Specification for Steel Strand, Seven-Wire, Uncoated, Compacted, Stress-Relieved for Prestressed Concrete
ASTM A882/A882M	(2004a; R 2010) Standard Specification for Filled Epoxy-Coated Seven-Wire Prestressing Steel Strand
ASTM A981/A981M	(2011) Standard Specification for Evaluating Bond Strength for 14.2 mm (0.6 in.) Diameter Prestressing Steel Strand, Grade 270, Uncoated, Used in Prestressed Ground Anchors
ASTM C109/C109M	(2012) Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-in. or (50-mm) Cube Specimens)
ASTM C1107/C1107M	(2013) Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink)
ASTM C144	(2011) Standard Specification for Aggregate for Masonry Mortar
ASTM C150/C150M	(2012) Standard Specification for Portland Cement
ASTM C33/C33M	(2013) Standard Specification for Concrete Aggregates
ASTM D1248	(2012) Standard Specification for Polyethylene Plastics Extrusion Materials for Wire and Cable
ASTM D1784	(2011) Standard Specification for Rigid Poly(Vinyl Chloride) (PVC) Compounds and Chlorinated Poly(Vinyl Chloride) (CPVC) Compounds

ASTM D1785	(2012) Standard Specification for Poly(Vinyl Chloride) (PVC), Plastic Pipe, Schedules 40, 80, and 120
ASTM D3350	(2012) Polyethylene Plastics Pipe and Fittings Materials
ASTM D4101	(2011) Standard Specification for Polypropylene Injection and Extrusion Materials
POST-TENSIONING INSTITUTE (PTI)	
PTI DC35.1	(2004) Recommendations for Prestressed Rock and Soil Anchors
PTI M10.2	(2000) Specifications for Unbonded Single Strand Tendons
PTI TAB.1	(2006) Post-Tensioning Manual

13.5 Unit Prices

13.5.1 Soil and Rock Anchor Wall, Complete

Payment will be made for costs associated with furnishing and installing Soil and Rock Anchors, Complete, which are accepted. The price shall include installation of anchors for soil and rock as specified and shall include payment for drilling holes in soil, drilling holes in rock, welded wire fabric, bearing plates, grout, reinforcing, shotcrete, and testing as specified.

Installed anchors which do not meet the acceptance criteria shall be replaced at the contractor's expense, and no additional compensation will be paid for anchors which must be replaced.

13.5.2 Performance Tests

13.5.2.1 Payment

Cost of Performance Tests as per these specifications shall be incidental to the cost of Soil and Rock Anchors, Complete, and no additional payment will be made for costs associated with performing Performance Tests on anchors, except in such case as the WVDEP directs the contractor to perform additional Performance Tests, above those identified in these specifications. A minimum of four performance tests shall be included in the lump sum price for soil and rock anchor wall, complete. A minimum of two performance tests shall be performed in both the upper portion and lower portion of the wall. The contractor may perform additional performance tests, at no cost to the WVDEP, if conditions are encountered that may either reduce the number of anchors or reduce the length of anchors as specified.

13.5.2.2 Measurement

Performance Tests will be measured based upon the number of tests performed.

13.5.2.3 Unit of Measure

Unit of measure: lump sum, price included in item 13.5.1, quantity as included in the specifications, and no additional compensation will be paid for these tests.

13.5.3 Proof Tests

13.5.3.1 Payment

Cost of Proof Tests as per these specifications shall be incidental to the cost of Soil and Rock Anchors, Complete, and no additional payment will be made for costs associated with performing Proof Tests on anchors. A total of 16 Proof tests shall be included in the lump sum price for soil and rock anchor wall, complete. A minimum of eight proof tests shall be performed in both the upper and lower portion of the wall. Additional proof tests on each anchor shall be performed until the anchor passes the test in accordance with paragraph 13.3.4.3.

13.5.3.2 Measurement

Proof Tests will be measured based upon the number of tests performed.

13.5.3.3 Unit of Measure

Unit of measure: lump sum, price included in item 13.5.1, quantity as included in the specifications, and no additional compensation will be paid for these tests.

13.5.4 Additional Performance Tests

13.5.3.1 Payment

Cost of these Performance Tests shall be on a per each basis, and shall be performed at the request of the WVDEP. The contractor shall provide a unit price for additional performance tests as the WVDEP may request additional tests above those required elsewhere by these specifications. Execution of the additional performance tests shall be in accordance with section 13.3.4.2 of these specifications. The cost of additional tests, as requested by the WVDEP, will be considered extra work, and the unit cost of the additional tests shall be paid to the contractor for all additional tests requested.

13.5.3.2 Measurement

Performance Tests will be measured based upon the number of tests performed.

13.5.3.3 Unit of Measure

Unit of measure: per each.

13.6 Pay Items

Item 13.1 "Performance Tests", per each

Item 13.2 "Soil and Rock Anchors, Complete", lump sum

14.0 TEMPORARY JERSEY BARRIER

14.1 Description

This work consists of the placement of Temporary Jersey Barrier in locations shown in the Construction Plans. Safety fence shall be placed on the Temporary Jersey Barrier as specified herein.

14.2 Materials

14.2.1 The Temporary Jersey Barrier shall be as shown WVDOT-DOH Standard Details Book, Volume 1, Standard Sheet GR13.

14.2.2 Manufacturers

14.2.2.1 Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work.

14.2.3 Chain-link fence fabric

14.2.3.1 Steel Chain-Link Fence Fabric: Height indicated on Drawings. Provide fabric fabricated in one-piece widths for fencing in height of 12 feet (3.6 m) and less. Comply with CLFMI's "Product Manual" and with requirements indicated below:

A. Mesh and Wire Size:

a. 2-inch mesh, 9 gauge wire

B. Zinc-Coated Fabric: ASTM A 392, with zinc coating applied to steel wire before weaving according to ASTM A 817, with the following minimum coating weight:

a. Class 2: Not less than 2 oz./sq. ft. (610 g/sq. m) of uncoated wire surface.

b. Selvage: Knuckled at both selvages.

14.2.4 Industrial Fence Framing

14.2.4.1 Round Steel Pipe: Standard weight, Schedule 40, galvanized steel pipe complying with ASTM F 1083. Comply with ASTM F 1043, Material Design Group IA, external and internal coating Type A, consisting of not less than 1.8-oz./sq. ft. (0.55-kg/sq. m) zinc; and the following strength and stiffness requirements:

A. Line, End, Corner, and Pull Posts and Top Rail: Per requirements for Heavy Industrial Fence.

B. Line, End, Corner, and Pull Posts and Top Rail: Per requirements for Light Industrial Fence.

14.2.4.2 Roll-Formed Steel Shapes: Hot-rolled H-beams or other shape, produced from structural steel. Comply with ASTM F 1043, Material Design Group III, with minimum yield strength of 45,000 psi (310 MPa); Heavy Industrial Fence strength and stiffness for line posts, and external and internal coating Type A, consisting of not less than minimum 2.0-oz./sq. ft. (0.61-kg/sq. m) average zinc coating per ASTM A 123/A 123M or 4.0-oz./sq. ft. (1.22-kg/sq. m) zinc coating per ASTM A 653/A 653M.

14.2.4.3 Post Brace Rails: Match top rail for coating and strength and stiffness requirements. Provide brace rail with truss rod assembly for each gate, end, and pull post. Provide two brace rails extending in opposing directions, each with truss rod assembly, for each corner post and for pull posts. Provide rail ends and clamps for attaching rails to posts.

14.2.4.4 Top Rails: Fabricate top rail from lengths 21 feet (6.4 m) or longer, with swaged-end or fabricated for expansion-type coupling, forming a continuous rail along top of chain-link fabric.

14.2.4.5 Intermediate Rails: Match top rail for coating and strength and stiffness requirements.

14.2.4.6 Bottom Rails: Match top rail for coating and strength and stiffness requirements on all fencing over 4' in height.

14.2.5 Tension Wire

14.2.5.1 General: Provide horizontal tension wire at the following locations:

A. Location: As indicated on Drawings.

14.2.6 Fittings

14.2.6.1 General: Provide fittings for a complete fence installation, including special fittings for corners. Comply with ASTM F 626.

14.2.6.2 Tie Wires, Clips, and Fasteners: Provide the following types according to ASTM F 626:

A. Standard Round Wire Ties: For attaching chain-link fabric to posts, rails, and frames, complying with the following:

a. Hot-Dip Galvanized Steel: 0.148-inch- (3.76-mm-) diameter wire; or galvanized coating thickness matching coating thickness of chain-link fence fabric.

14.2.7 Attachment Plate

14.2.7.1 Attachment plate shall be 3/8" steel plate as shown on detail and formed as to provide for attachment to top of concrete jersey barrier.

14.2.7.2 A 3" steel sleeve shall be welded to the center of the attachment plate as per the detail to allow for schedule 40, galvanized steel pipe corner or line post insertion.

14.2.7.3 Steel bolts 1/2" diameter and 4" length shall be used to attach anchor plate to top of concrete jersey barrier. 1/2" holes shall be drilled into concrete jersey barrier as shown on detail.

14.3 Construction Methods

14.3.1 The Temporary Jersey Barrier shall be based on WVDOT Standard Detail Book Volume 1 Sheet GR13 and Section 636 of the WVDOT **Standard Specifications for Roads and Bridges**, Adopted 2010.

14.3.2 Examination

14.3.2.1 Examine areas and conditions, with Installer present, for compliance with requirements for site clearing, earthwork, pavement work, and other conditions affecting performance.

A. Installation of Temporary Jersey Barrier must be complete before any grading is started, unless otherwise permitted by Engineer.

14.3.2.2 Proceed with installation only after unsatisfactory conditions have been corrected.

14.3.3 Preparation

14.3.3.1 Stake locations of Temporary Jersey Barrier. Indicate locations of utilities, lawn sprinkler system, and underground structures.

14.3.4 Installation, General

14.3.4.1 General: Install Temporary Jersey Barrier safety fence to comply with ASTM F 567 and more stringent requirements specified.

14.3.4.3 Post Setting: Hand-excavate holes for post foundations in firm, undisturbed or compacted soil. Set terminal, line and gate posts in concrete footing. Protect portion of posts aboveground from concrete splatter. Place concrete around posts and vibrate or tamp for consolidation. Using mechanical devices to set line posts per ASTM F 567 is not permitted. Verify that posts are

set plumb, aligned, and at correct height and spacing, and hold in position during placement and finishing operations until concrete is sufficiently cured.

A. Dimensions and Profile: As indicated on Drawings.

14.3.5 Temporary Jersey Barrier Safety Fence Installation

14.3.5.1 Revise paragraph below for unusual load conditions. Posts are usually spaced at 10 feet (3.05 m) o.c.

14.3.5.2 Terminal Posts: Shall be spaced at a distance to allow for one at each end of the concrete jersey barrier as shown per detail.

14.3.5.3 Post Bracing Assemblies: Install according to ASTM F 567, maintaining plumb position and alignment of fencing. Install braces between all terminal posts. Locate horizontal braces at midheight of fabric on fences with top rail and at two-thirds fabric height on fences without top rail. Install so posts are plumb when diagonal rod is under proper tension.

14.3.5.4 Tension Wire: Install according to ASTM F 567, maintaining plumb position and alignment of fencing. Pull wire taut, without sags. Fasten fabric to tension wire with 0.120-inch- (3.05-mm-) diameter hog rings of same material and finish as fabric wire, spaced a maximum of 24 inches (609 mm) o.c. Install tension wire in locations indicated before stretching fabric.

A. Top Tension Wire: Install tension wire through post cap loops.

B. Bottom Tension Wire: Install tension wire within 6 inches (150 mm) of bottom of fabric and tie to each post with not less than same gage and type of wire.

14.3.5.5 Top Rail: Install according to ASTM F 567, maintaining plumb position and alignment of fencing. Run rail continuously through line post caps, terminating into rail end attached to posts or post caps fabricated to receive rail at terminal posts.

14.3.5.6 Intermediate Rails: Install in one piece at as indicated on Drawings, spanning between posts, using fittings, special offset fittings, and accessories.

14.3.5.7 Bottom Rails: Install, spanning between posts, using fittings and accessories.

14.3.5.8 Chain-Link Fabric: Apply fabric to inside of enclosing framework. Leave 1 inch (25.4 mm) between finish grade or surface and bottom selvage, unless otherwise indicated. Pull fabric taut and tie to posts, rails, and tension wires. Anchor to framework so fabric remains under tension after pulling force is released.

14.3.5.9 Tension or Stretcher Bars: Thread through fabric and secure to end, corner, and pull posts with tension bands spaced not more than 15 inches (380 mm) o.c.

14.3.5.10 Tie Wires: Use wire of proper length to firmly secure fabric to line posts and rails. Attach wire at one end to chain-link fabric, wrap wire around post a minimum of 180 degrees, and attach other end to chain-link fabric per ASTM F 626. Bend ends of wire to minimize hazard to individuals and clothing.

A. **Maximum Spacing:** Tie fabric to line posts 12 inches (304 mm) o.c. and to braces 24 inches (609 mm) o.c.

14.3.5.11 Fasteners: Install nuts for tension bands and carriage bolts on the side of the fence opposite the fabric side. Peen ends of bolts or score threads to prevent removal of nuts.

14.4 Method of Measurement

14.4.1 The method of measurement for Temporary Jersey Barrier shall be by the linear foot.

14.4.2 The method of measurement for Temporary Jersey Barrier Safety Fence shall be on a linear foot basis and shall include all equipment, labor, materials and all other incidental items necessary to complete this item of work.

14.5 Basis of Payment

14.5.1 The Contractor shall be reimbursed for the placement of Temporary Jersey Barrier. The quantity of work done shall be paid at the Contract unit price bid for these items, which price and payment shall be full compensation for doing all the work herein described in a workmanlike and acceptable manner; including the furnishing of all labor, materials, tools, equipment, supplies and incidentals as necessary to complete the work.

14.5.2 The quantity of work done shall be paid at the Contract unit price bid for these items, which price and payment shall be full compensation for doing all the work herein described in a workmanlike and acceptable manner; including the furnishing of all labor, materials, tools, equipment, supplies and incidentals as necessary to complete the work.

14.6 Pay Items

Item 14.1, "Temporary Jersey Barrier", per linear foot.

Item 14.2, "Temporary Jersey Barrier Safety Fence", per linear foot.

15.0 6' HEIGHT CHAINLINK SAFETY FENCE

15.1 Description

This work consists of the placement of 6' height chainlink safety fence in locations shown in the Construction Plans. The 6' chainlink safety fence is a permanent structure and will remain in place upon completion of construction activities.

15.2 Materials

15.2.1 Manufacturers

15.2.1.1 Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work.

15.2.2 Chain-link fence fabric

15.2.2.1 Steel Chain-Link Fence Fabric: Height indicated on Drawings. Provide fabric fabricated in one-piece widths for fencing in height of 12 feet (3.6 m) and less. Comply with CLFMI's "Product Manual" and with requirements indicated below:

A. Mesh and Wire Size:

a. 2-inch mesh, 9 gauge wire

B. Zinc-Coated Fabric: ASTM A 392, with zinc coating applied to steel wire before weaving according to ASTM A 817, with the following minimum coating weight:

a. Class 2: Not less than 2 oz./sq. ft. (610 g/sq. m) of uncoated wire surface.

b. Selvage: Knuckled at both selvages.

15.2.3 Industrial Fence Framing

15.2.3.1 Round Steel Pipe: Standard weight, Schedule 40, galvanized steel pipe complying with ASTM F 1083. Comply with ASTM F 1043, Material Design Group IA, external and internal coating Type A, consisting of not less than 1.8-oz./sq. ft. (0.55-kg/sq. m) zinc; and the following strength and stiffness requirements:

A. Line, End, Corner, and Pull Posts and Top Rail: Per requirements for Heavy Industrial Fence.

B. Line, End, Corner, and Pull Posts and Top Rail: Per requirements for Light Industrial Fence.

15.2.3.2 Roll-Formed Steel Shapes: Hot-rolled H-beams or other shape, produced from structural steel. Comply with ASTM F 1043, Material Design Group III, with minimum yield strength of 45,000 psi (310 MPa); Heavy Industrial Fence strength and stiffness for line posts, and external and internal coating Type A, consisting of not less than minimum 2.0-oz./sq. ft. (0.61-kg/sq. m) average zinc coating per ASTM A 123/A 123M or 4.0-oz./sq. ft. (1.22-kg/sq. m) zinc coating per ASTM A 653/A 653M.

15.2.3.3 Post Brace Rails: Match top rail for coating and strength and stiffness requirements. Provide brace rail with truss rod assembly for each gate, end, and pull post. Provide two brace rails extending in opposing directions, each with truss rod assembly, for each corner post and for pull posts. Provide rail ends and clamps for attaching rails to posts.

15.2.3.4 Top Rails: Fabricate top rail from lengths 21 feet (6.4 m) or longer, with swedged-end or fabricated for expansion-type coupling, forming a continuous rail along top of chain-link fabric.

15.2.3.4 Intermediate Rails: Match top rail for coating and strength and stiffness requirements.

15.2.3.5 Bottom Rails: Match top rail for coating and strength and stiffness requirements on all fencing over 4' in height.

15.2.4 Tension Wire

15.2.4.1 General: Provide horizontal tension wire at the following locations:

A. Location: As indicated on Drawings.

15.2.5 Fittings

15.2.5.1 General: Provide fittings for a complete fence installation, including special fittings for corners. Comply with ASTM F 626.

15.2.5.2 Tie Wires, Clips, and Fasteners: Provide the following types according to ASTM F 626:

A. Standard Round Wire Ties: For attaching chain-link fabric to posts, rails, and frames, complying with the following:

a. Hot-Dip Galvanized Steel: 0.148-inch- (3.76-mm-) diameter wire; or galvanized coating thickness matching coating thickness of chain-link fence fabric.

15.2.6 Cast-In-Place Concrete

15.2.6.1 General: Comply with ACI 301 for cast-in-place concrete.

15.2.6.2 Materials: Portland cement complying with ASTM C 150 aggregates complying with ASTM C 33, and potable water for ready-mixed concrete complying with ASTM C 94.

A. Concrete Mixes: Normal-weight concrete air entrained with not less than 3000-psi (20.7- MPa) compressive strength (28 days), 3-inch (75-mm) slump, and 1-inch (25-mm) maximum size aggregate.

15.2.7 Grout and Anchoring Cement

15.2.7.1 Non-shrink, Nonmetallic Grout: Premixed, factory-packaged, non-staining, noncorrosive, nongaseous grout complying with ASTM C 1107. Provide grout, recommended in writing by manufacturer, for exterior applications.

15.2.7.2 Erosion-Resistant Anchoring Cement: Factory-packaged, nonshrink, nonstaining, hydraulic-controlled expansion cement formulation for mixing with potable water at Project site to create pourable anchoring, patching, and grouting compound. Provide formulation that is resistant to erosion from water exposure without needing protection by a sealer or waterproof coating and that is recommended in writing by manufacturer for exterior applications.

15.2.8 Fence Grounding

15.2.8.1 Conductors: Bare, solid wire for No. 6 AWG and smaller; stranded wire for No. 4 AWG and larger.

Material Above Finished Grade: Copper, Aluminum.

Material On or Below Finished Grade: Copper.

Bonding Jumpers: Braided copper tape, 1 inch (25 mm) wide, woven of No. 30 AWG bare copper wire, terminated with copper ferrules.

15.2.8.2 Connectors and Ground Rods: Listed in UL 467.

A. Connectors for Below-Grade Use: Exothermic welded type.

B. Ground Rods: Copper-clad steel.

a. Size: 5/8 inch by 96 inches (16 by 2400 mm).

15.3 Construction Methods

15.3.1 Examination

15.3.1.1 Verify that survey is specified in Division 1 Section "Field Engineering" or is otherwise available. Consider using sleeves to leave voids in new concrete substrates.

15.3.1.2 Examine areas and conditions, with Installer present, for compliance with requirements for site clearing, earthwork, pavement work, and other conditions affecting performance.

A. Do not begin installation before final grading is completed, unless otherwise permitted by Engineer.

15.3.1.3 Proceed with installation only after unsatisfactory conditions have been corrected.

15.3.2 Preparation

15.3.2.1 Stake locations of fence lines, gates, and terminal posts. Do not exceed intervals of 500 feet (152.5 m) or line of sight between stakes. Indicate locations of utilities, lawn sprinkler system, underground structures, benchmarks, and property monuments.

15.3.3 Installation, General

15.3.3.1 General: Install chain-link fencing to comply with ASTM F 567 and more stringent requirements specified..

15.3.3.2 Post Excavation: Drill or hand-excavate holes for posts to diameters and spacings indicated, in firm, undisturbed or compacted soil.

15.3.3.3 Post Setting: Hand-excavate holes for post foundations in firm, undisturbed or compacted soil. Set terminal, line and gate posts in concrete footing. Protect portion of posts aboveground from concrete splatter. Place concrete around posts and vibrate or tamp for consolidation. Using mechanical devices to set line posts per ASTM F 567 is not permitted. Verify that posts are set plumb, aligned, and at correct height and spacing, and hold in position during placement and finishing operations until concrete is sufficiently cured.

A. Dimensions and Profile: As indicated on Drawings.

15.3.4 Chain-Link Fence Installation

15.3.4.1 Where fencing changes direction by 15 degrees or more, at abrupt changes in grade, and for long stretches of fence in the range of 300 to 500 feet (91.4 to 152.5 m), manufacturers may recommend locating pull posts with braces at both sides.

15.3.4.2 Terminal Posts: Locate terminal end, corner, and gate posts per ASTM F 567 and terminal pull posts at changes in horizontal or vertical alignment as indicated on Drawings.

15.3.4.3 Posts are usually spaced at 10 feet (3.05 m) o.c.

15.3.4.4 Line Posts: Space line posts uniformly at 8 feet (2.44 m) o.c.

15.3.8.5 Post Bracing Assemblies: Install according to ASTM F 567, maintaining plumb position and alignment of fencing. Install braces at end and gate posts and at both sides of corner and pull posts. Locate horizontal braces at midheight of fabric on fences with top rail and at two-thirds fabric height on fences without top rail. Install so posts are plumb when diagonal rod is under proper tension.

15.3.8.6 Tension Wire: Install according to ASTM F 567, maintaining plumb position and alignment of fencing. Pull wire taut, without sags. Fasten fabric to tension wire with 0.120-inch- (3.05-mm-) diameter hog rings of same material and finish as fabric wire, spaced a maximum of 24 inches (609 mm) o.c. Install tension wire in locations indicated before stretching fabric.

A. Top Tension Wire: Install tension wire through post cap loops.

B. Bottom Tension Wire: Install tension wire within 6 inches (150 mm) of bottom of fabric and tie to each post with not less than same gage and type of wire.

15.3.4.7 Top Rail: Install according to ASTM F 567, maintaining plumb position and alignment of fencing. Run rail continuously through line post caps, bending to radius for curved runs and terminating into rail end attached to posts or post caps fabricated to receive rail at terminal posts. Provide expansion couplings as recommended by fencing manufacturer.

15.3.4.8 Intermediate Rails: Install in one piece at as indicated on Drawings, spanning between posts, using fittings, special offset fittings, and accessories.

15.3.4.9 Bottom Rails: Install, spanning between posts, using fittings and accessories.

15.3.4.10 Chain-Link Fabric: Apply fabric to inside of enclosing framework. Leave 1 inch (25.4 mm) between finish grade or surface and bottom selvage, unless otherwise indicated. Pull fabric taut and tie to posts, rails, and tension wires. Anchor to framework so fabric remains under tension after pulling force is released.

15.3.4.11 Tension or Stretcher Bars: Thread through fabric and secure to end, corner, and pull with tension bands spaced not more than 15 inches (380 mm) o.c.

15.3.4.12 Tie Wires: Use wire of proper length to firmly secure fabric to line posts and rails. Attach wire at one end to chain-link fabric, wrap wire around post a minimum of 180 degrees, and attach other end to chain-link fabric per ASTM F 626. Bend ends of wire to minimize hazard to individuals and clothing.

A. Maximum Spacing: Tie fabric to line posts 12 inches (304 mm) o.c. and to braces 24 inches (609 mm) o.c.

15.3.4.13 Fasteners: Install nuts for tension bands and carriage bolts on the side of the fence opposite the fabric side. Peen ends of bolts or score threads to prevent removal of nuts.

15.3.5 Grounding and Bonding

15.3.5.1 See Evaluations for other considerations.

15.3.5.2 Fence Grounding: Install at maximum intervals of 1500 feet (450 m) except as follows:

15.3.5.2.1 Fences within 100 Feet (30 m) of Buildings, Structures, Walkways, and Roadways: Ground at maximum intervals of 750 feet (225 m).

a. Gates and Other Fence Openings: Ground fence on each side of opening.

1. Bond metal gates to gate posts. Coordinate subparagraph below with Drawings in projects where intentional discontinuities are provided in metal fencing conductivity to localize lightning effects to the vicinity of strokes. See Evaluations.

2. Bond across openings, with and without gates, except openings indicated as intentional fence discontinuities. Use No. 2 AWG wire and bury it at least 18 inches (460 mm) below finished grade.

15.3.5.3 Protection at Crossings of Overhead Electrical Power Lines: Ground fence at location of crossing and at a maximum distance of 150 feet (45 m) on each side of crossing.

15.3.5.4 Fences Enclosing Electrical Power Distribution Equipment: Ground as required by IEEE C2, unless otherwise indicated.

15.3.5.5 Grounding Method: At each grounding location, drive a ground rod vertically until the top is 6 inches (150 mm) below finished grade. Connect rod to

fence with No. 6 AWG conductor. Connect conductor to each fence component at the grounding location.

15.3.5.6 Bonding Method for Gates: Connect bonding jumper between gate post and gate frame.

15.3.5.7 Connections: Make connections so possibility of galvanic action or electrolysis is minimized. Select connectors, connection hardware, conductors, and connection methods so metals in direct contact will be galvanically compatible.

A. Use electroplated or hot-tin-coated materials to ensure high conductivity and to make contact points closer in order of galvanic series.

B. Make connections with clean, bare metal at points of contact.

C. Coat and seal connections having dissimilar metals with inert material to prevent future penetration of moisture to contact surfaces.

15.3.5.8 Bonding to Lightning Protection System: If fence terminates at lightning-protected building or structure, ground the fence and bond the fence grounding conductor to lightning protection down conductor or lightning protection grounding conductor complying with NFPA 780.

15.3.6 Field Quality Control

15.3.6.1 Ground-Resistance Testing Agency: Engage a qualified independent testing agency to perform field quality-control testing.

15.3.6.2 Ground-Resistance Tests: Subject completed grounding system to a megger test at each grounding location. Measure ground resistance not less than two full days after last trace of precipitation, without soil having been moistened by any means other than natural drainage or seepage and without chemical treatment or other artificial means of reducing natural ground resistance. Perform tests by two-point method according to IEEE 81.

15.3.5.2 Desired Maximum Grounding Resistance Value: 25 ohms.

15.3.6.3 Excessive Ground Resistance: If resistance to ground exceeds desired value, notify Architect promptly. Include recommendations to reduce ground resistance and proposal to accomplish recommended work.

15.3.6.4 Report: Prepare test reports, certified by testing agency, of ground resistance at each test location. Include observations of weather and other phenomena that may affect test results.

15.4 Method of Measurement

The method of measurement for 6' Height Chainlink Safety Fence shall be on a linear

foot basis and shall include all equipment, labor, materials and all other incidental items necessary to complete this item of work.

15.5 Basis of Payment

The quantity of work done shall be paid at the Contract unit price bid for these items, which price and payment shall be full compensation for doing all the work herein described in a workmanlike and acceptable manner; including the furnishing of all labor, materials, tools, equipment, supplies and incidentals as necessary to complete the work.

15.6 Pay Items

Item 15.0, "6' Height Chainlink Safety Fence", per linear foot.

LILBERN PRITT HIGHWALL

Contractor's Bid Schedule

Company Name: _____

Address: _____

The DEP reserves the right to request additional information and supporting documentation regarding unit prices when the unit price appears to be unreasonable.

ITEM NO.	QUANTITY	DESCRIPTION	UNIT PRICE	AMOUNT
1.0	LS	Mobilization and Demobilization (Limited to 10% of Total Bid)	LS	\$
2.0	LS	Construction Layout (Limited to 5% of Total Bid)	LS	\$
3.0	LS	Quality Control (Limited to 3% of Total Bid)	LS	\$
4.1	LS	Site Preparation (Limited to 10% of Total Bid)	LS	\$
4.2	677 TN	Gravel Access Road Rehabilitation		\$
5.1	1,015 LF	Temporary Straw Wattles		\$
5.2	680 LF	Temporary Silt Fence		\$
5.3	955 LF	Temporary Super Silt Fence		\$
5.4	17 EA	Temporary Triangular Silt Dikes		\$
5.5	1 EA	Temporary Sediment Traps		\$
5.6	12,700 SY	Slope Protection Temporary Erosion Control Matting		\$
5.7	510 SY	Slope Protection Permanent Erosion Control Matting		\$
5.8	1 EA	Temporary Inlet Protection		\$
5.9	2 EA	Temporary Stabilized Construction Entrance		\$
6.0	6.4 AC	Revegetation (Per Plan Acre)		\$
7.1	450 LF	Type I Channel		\$
7.2	290 LF	Type II Channel		\$
7.3	255 LF	Type III Channel		\$
7.4	175 LF	Type IV Channel		\$
7.5	100 LF	Type V Channel		\$
7.6	1 EA	WVDOH Type G Inlet		\$
7.7	160 LF	24" Diameter HDPE Pipe		\$
7.8	1,680 LF	HDPE Drainage Blanket		\$
8.0	6,246 CY	Unclassified Excavation		\$
10.0	50 LF	Underdrain		\$
12.0	450 LF	Guardrail		\$
13.1	1 EA	Performance Tests		\$
13.2	LS	Soil Nail and Rock Anchors, Complete	LS	\$
14.1	215 LF	Temporary Jersey Barrier		\$
14.2	215 LF	Temporary Jersey Barrier Safety Fence		\$
15.0	280 LF	6' Height Chainlink Safety Fence		\$
		TOTAL		\$