

Solicitation No. W912EQ-04-B-0001



Project Title:

STEELE BYPASS WEIR

Location:

PEMISCOT COUNTY, MISSOURI

TECHNICAL SPECIFICATIONS

THIS PROCUREMENT IS A 100% HUBZone Set-Aside

DECEMBER 2003

**STEELE BYPASS WEIR
PEMISCOT COUNTY, MISSOURI**

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TECHNICAL SPECIFICATIONS**

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SECTION 01025

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SECTION 01025

MEASUREMENT AND PAYMENT

PART 1 GENERAL

1.1 LUMP SUM PAYMENT ITEMS

1.1.1 General

Payment items for the work of this contract for which lump sum payments will be made are listed in the BIDDING SCHEDULE and described below. All costs for items of work, which are not specifically mentioned to be included in a particular lump sum or unit price payment item, shall be included in the listed lump sum item most closely associated with the work involved. The lump sum price and payment made for each item listed shall constitute full compensation for furnishing all plant, labor, materials, and equipment, and performing any associated Contractor quality control, meeting safety requirements, tests and reports, and for performing all work required for which separate payment is not otherwise provided.

1.1.2 Lump Sum Items

(1) "Mobilization and Demobilization"

a. Payment

Payment will be made for costs associated with operations necessary for mobilization and demobilization as specified in SECTION 00700 - CONTRACT CLAUSES, DFARS Clause 252.236-7004.

b. Unit of measure, lump sum: LS.

(2) "Clearing"

a. Payment

Payment for clearing, between stations 99+60 and 104+40, will be made at the contract lump sum price for "Clearing", which price and payment shall constitute full compensation for furnishing all

plant, labor, material and equipment and performing all operations necessary for clearing and disposal of all cleared materials, all as specified in SECTION 02114. No reduction of the contract quantity will be made for areas within the areas specified to be cleared which require no clearing or which are partly cleared.

b. Unit of measure, lump sum: LS.

(3) "Dressing, Fertilizing, and Seeding"

a. Payment

Payment for dressing, fertilizing, and seeding, will be made at the contract lump sum price for "Dressing, Fertilizing, and Seeding", which price and payment shall constitute full compensation for preparation of ground surfaces, furnishing and distributing fertilizer and seed; and performing all operations incidental thereto; as specified in SECTION 02935 paragraph 1.3.

b. Unit of measure, lump sum: LS.

(4) "Environmental Protection"

a. Payment

Payment will be made for costs associated with operations necessary for environmental protection as specified in Section 01130 and the SWPPP.

b. Unit of measure, lump sum: LS.

1.2 UNIT PRICE PAYMENT ITEMS

1.2.1 General

Payment items for the work of this contract on which the contract progress payments will be based are listed in the BIDDING SCHEDULE and described below. The unit price and payment made for each item listed shall constitute full compensation for furnishing all plant, labor, materials, and equipment, and performing any associated Contractor quality control, meeting safety requirements, tests and reports, and for performing all work required for each of the unit price items.

1.2.2 Unit Price Items

(1) "Excavation"

a. Measurement

A survey of the site for excavation of the channel will be made in accordance with Section 00700,

Contract Clauses, FAR 52.236-16 entitled "Quantity Surveys" and all measurement of excavation will be based on this survey. The quantity of channel excavation to be paid for will be computed between the ground surface, as determined by the above noted surveys, and the theoretical slope lines and grade lines for such excavation as indicated on the drawings and/or specified herein. No allowance will be made for over-depth excavation, for the removal of any material outside the required side slope lines, nor for additional surveys for the removal of shoaling as specified in SECTION 02114 paragraph 3.5, except as provided in SECTION 02114 paragraph 3.6.

b. Payment

Payment for excavation, measured as prescribed hereinabove, will be made at the applicable contract unit price per cubic yard for "Excavation", which price and payment shall constitute full compensation for furnishing all material and equipment and performing all labor for excavation for channel, disposal of excavated material including construction of structures for the control of excavated material and waste water; and all other operations incidental thereto as specified in SECTION 02114.

c. Unit of measure, cubic yard: CY.

(2) "Filter Material"

a. Measurement

If the filter material is delivered by railroad, weights as acceptable to the railroad for freight charge purposes will be accepted as measurement of the filter material. Copies of freight bills or certifications of weights acceptable to the railroad for freight charge purposes shall be furnished. If not delivered by railroad, but delivered by truck, the filter material will be measured for payment, in the presence of a Government Inspector unless waived by the Contracting Officer, by being weighed on approved, accurately calibrated scales furnished by and at the expense of the Contractor. Weight certificates furnished by a public weighmaster where available will be acceptable in lieu of such procedure when authorized by the Contracting Officer. Individual printed weight tickets that include gross, truck and net weights, plus contract number and project title shall be furnished the Government Inspector at the time of delivery.

b. Payment

Payment for filter material will be made at the contract unit price per ton for "Filter Material", which price and payment shall include all costs of furnishing, hauling, handling, placement and maintaining the filter material; all as specified in SECTION 02542.

c. Unit of measure, ton: TN.

(3) "Riprap "R-400rev""

a. Measurement

If the riprap material is delivered by railroad, weights as acceptable to the railroad for freight charge purposes will be accepted as measurement of the riprap material. Copies of freight bills or certifications of weights acceptable to the railroad for freight charge purposes shall be furnished. If not delivered by railroad, but delivered by truck, the riprap material will be measured for payment, in the presence of a Government Inspector unless waived by the Contracting Officer, by being weighed on approved, accurately calibrated scales furnished by and at the expense of the Contractor. Weight certificates furnished by a public weighmaster where available will be acceptable in lieu of such procedure when authorized by the Contracting Officer. Individual printed weight tickets that include gross, truck and net weights, plus contract number and project title shall be furnished the Government Inspector at the time of delivery.

b. Payment

Payment for riprap will be made at the applicable contract unit price per ton for "Riprap "R-400rev"", which price and payment shall include all costs of furnishing, hauling, handling, placement, and maintaining the riprap; all as specified in SECTION 02542.

c. Unit of measure, ton: TN

(4) "Grout"

a. Measurement:

Measurement of grout used for riprap will be made for the actual volume of grout placed as required. The total quantity of grout will be computed from the weights and specific gravities of the component materials used in accordance with the grout mix. The necessary test and computations for determining the volume of grout, except batch weighting of component materials, will be made by the Contractor at his expense. In lieu of measurement as specified hereinabove, certified volume tickets from the batch plant will be accepted as measurement if grout is mixed at a commercial batch plant and delivered by truck.

b. Payment

Payment for grout will be made at the contract unit price for "Grout", which price and payment shall constitute full compensation for furnishing all materials, equipment and labor, and manufacturing, transporting, placing the grout and curing as required, and performing all other incidental thereto; all as specified in SECTION 02542 and as shown on the drawings. The test panel as specified in Section 02542 paragraph 3.4.2 shall be considered as an incidental cost to the cost of the grout.

c. Unit of measure, cubic yard: CY.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION (Not Used)

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SECTION 01130

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SECTION 01130

ENVIRONMENTAL PROTECTION

PART 1 GENERAL

1.1 DEFINITIONS

For the purpose of this specification, environmental pollution and damage is defined as the presence of chemical, physical, or biological elements or agents which adversely affect human health or welfare; unfavorably alter ecological balances of importance to human life; affect other species of importance to man; or degrade the utility of the environment for aesthetic, cultural and/or historical purposes. The control of environmental pollution and damage requires consideration of air, water, and land, and includes management of visual aesthetics, noise, solid waste, radiant energy and radioactive materials, as well as other pollutants.

1.2 ENVIRONMENTAL PROTECTION REQUIREMENTS

Provide and maintain, during the life of the contract, environmental protection. Plan for and provide environmental protective measures to control pollution that develops during normal construction practice. Plan for and provide environmental protective measures required to correct conditions that develop during the construction of permanent or temporary environmental features associated with the project. Comply with Federal, State, and local regulations pertaining to the environment, including but not limited to water, air, and noise pollution.

1.2.1 Environmental Protection Plan

Within 15 days after receipt of Notice of Award of the contract, the Contractor shall submit in writing an Environmental Protection Plan and, prior to starting work, meet with representatives of the Contracting Officer to develop mutual understanding relative to compliance with this provision and administration of the environmental protection program. Approval of the Contractor's plan will not relieve the Contractor of his responsibility for adequate and continuing control of pollutants and other environmental protection measures. The Government reserves the right to make changes in his environmental protection plan and operations as necessary to maintain satisfactory environmental protection performance. The Environmental Protection Plan shall include but not be limited to the following:

1.2.1.1 Protection of Features

The Contractor shall determine methods for the protection of features to be preserved within authorized work areas. The Contractor shall prepare a listing of methods to protect resources needing protection, i.e., trees, shrubs, vines, grasses and ground cover, landscape features, air and water quality, fish and wildlife, soil, historical, archaeological and cultural resources.

1.2.1.2 Procedures

The Contractor shall implement procedures to provide the required environmental protection and to comply with the applicable laws and regulations. The Contractor shall set out the procedures to be followed to correct pollution of the environment due to accident, natural causes or failure to follow the procedures set out in accordance with the Environmental Protection Plan.

1.2.1.3 Permit or License

The Contractor shall obtain all needed permits or licenses.

1.2.1.4 Drawings

The Contractor shall include drawings showing locations of any proposed temporary excavations or embankments for haul roads, stream crossings, material storage areas, structures, sanitary facilities, stockpiles of earth materials, and disposal areas for excess earth material and unsatisfactory earth materials.

1.2.1.5 Environmental Monitoring Plans

The Contractor shall include environmental monitoring plans for the job site which incorporate land, water, air and noise monitoring.

1.2.1.6 Traffic Control Plan

The Contractor shall include a traffic control plan for the job site.

1.2.1.7 Surface and Ground Water

The Contractor shall establish methods of protecting surface and ground water during construction activities.

1.2.1.8 Work Area Plan

The Contractor shall include a work area plan showing the proposed activity in each portion of the area and identifying the areas of limited use or nonuse. The plan shall include measures for marking the limits of use areas.

1.3 SUBCONTRACTORS

Assurance of compliance with this section by subcontractors will be the responsibility of the Contractor.

1.4 REGULATORY REQUIREMENTS

The Contractor shall comply with all state regulatory and statutory requirements.

1.4.1 Permits

This section supplements the Contractor's responsibility under the contract clause PERMITS AND RESPONSIBILITIES to the extent that the Government has already obtained some environmental permits. The Government has obtained permits for erosion control (SWPPP) and water quality certification for deposition into wetlands (Section 404). The Contractor shall comply with the terms and conditions of these permits. The Contractor shall obtain all other needed permits or licenses.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION

3.1 PROTECTION OF ENVIRONMENTAL RESOURCES

The environmental resources within the project boundaries and those affected outside the limits of permanent work under this contract shall be protected during the entire period of this contract. The Contractor shall confine his activities to areas defined by the contract drawings or specifications. Environmental protection shall be as stated in the following subparagraphs.

3.1.1 Protection of Land Resources

Prior to the beginning of any construction, the Contracting Officer will identify all land resources to be preserved within the Contractor's work area. The Contractor shall not remove, cut, deface, injure, or destroy land resources including trees, shrubs, vines, grasses, top soil, and land forms without special permission from the Contracting Officer. No ropes, cables, or guys shall be fastened to or attached to any trees for anchorage unless specifically authorized. Where such special emergency use is permitted, the Contractor shall provide effective protection for land and vegetation resources at all times as defined in the following subparagraphs.

3.1.1.1 Work Area Limits

Prior to any construction, the Contractor shall mark the areas where no work is to be performed under this contract. Isolated areas within the general work area which are to be saved and protected shall also be marked or fenced. Monuments and markers shall be protected before construction

operations commence and during all construction operations. Where construction operations are to be conducted during darkness, the markers shall be visible during darkness. The Contractor shall convey to his personnel the purpose of marking and/or protection of all necessary objects.

3.1.1.2 Protection of Landscape

Trees, shrubs, vines, grasses, land forms and other landscape features to be preserved, indicated and defined on the drawings submitted by the Contractor as a part of the Environmental Protection Plan, shall be clearly identified by marking, fencing, or wrapping with boards, or any other approved techniques.

3.1.1.3 Reduction of Exposure of Unprotected Erodible Soils

Earthwork brought to final grade shall be finished as indicated and specified. Side slopes and back slopes shall be protected as soon as practicable upon completion of rough grading. All earthwork shall be planned and conducted to minimize the duration of exposure of unprotected soils. Except in instances where the constructed feature obscures borrow areas, quarries and waste material areas, these areas shall not initially be cleared in total. Clearing of such areas shall progress in reasonably sized increments as needed to use the areas as approved by the Contracting Officer.

3.1.1.4 Temporary Protection of Disturbed Areas

Such methods as necessary shall be utilized to effectively prevent erosion and control sedimentation, including but not limited to the following:

a. Retardation and Control of Runoff

Runoff from the construction site shall be controlled by construction of diversion ditches, benches, and berms to retard and divert runoff to protected drainage courses, and the Contractor shall also utilize any measures required by area-wide plans approved under Paragraph 208 of the Clean Water Act.

3.1.1.5 Erosion and Sedimentation Control Devices

The Contractor shall construct or install all temporary and permanent erosion sedimentation control features. Temporary erosion and sediment control measures such as berms, dikes, drains, sedimentation basin, grassing and mulching shall be maintained until permanent drainage and erosion control facilities are completed and operable.

3.1.1.6 Location of Contractor Facilities

The Contractor's field offices, staging areas, stockpiles, storage, and temporary buildings shall be placed in areas approved by the Contracting Officer. Temporary movement or relocation of Contractor facilities shall be made only on approval by the Contracting Officer.

3.1.1.7 Disposal Areas on Government Property

Disposal areas on Government property shall be managed and controlled to limit material to areas designated on the contract drawings and prevent erosion of soil or sediment from entering nearby water courses or lakes. Disposal areas shall be developed in accordance with the grading plan indicated on the contract drawings.

3.1.1.8 Temporary Excavation and Embankments

Temporary excavation and embankments shall be controlled to protect adjacent areas from contamination.

3.1.1.9 Disposal of Solid Wastes

Solid wastes (excluding clearing debris) shall be placed in containers which are emptied on a regular schedule. All handling and disposal shall be conducted to prevent contamination. The Contractor shall transport all solid waste off Government property and dispose of it in compliance with Federal, State, and local requirements for solid waste disposal.

3.1.1.10 Disposal of Chemical Wastes

Chemical wastes shall be stored in corrosion resistant containers, removed from the work area and disposed of in accordance with Federal, State, and local regulations.

3.1.1.11 Disposal of Discarded Materials

Discarded materials other than those which can be included in the solid waste category shall be handled as directed by the Contracting Officer.

3.2 HISTORICAL, ARCHAEOLOGICAL AND CULTURAL RESOURCES

Existing historical, archaeological and cultural resources within the Contractor's work area will be so designated by the Contracting Officer and precautions shall be taken by the Contractor to preserve all such resources as they existed at the time they were pointed out to the Contractor. The Contractor shall install all protection for these resources so designated on the contract drawings and shall be responsible for their preservation during this contract. If during construction items of apparent archaeological or historical interest are discovered, they shall be left undisturbed and the Contractor shall report the find immediately to the Contracting Officer.

3.3 PROTECTION OF WATER RESOURCES

The Contractor shall keep construction activities under surveillance, management and control to avoid pollution of surface and ground waters. Special management techniques as set out below shall

be implemented to control water pollution by the listed construction activities which are included in this contract.

3.3.1 Cofferdam and Diversion Operations

The Contractor shall plan his operations and perform all work necessary to minimize adverse impact or violation of the water quality standard. Construction operations for dewatering, removal of cofferdams, tailrace excavation, and tunnel closure shall be controlled at all times to limit impact of water turbidity on the habitat for wildlife and impacts on water quality for downstream use.

3.3.2 Stream Crossings

Stream crossings shall be controlled during construction. Crossings shall not violate water pollution control standards of the Federal, State or local government.

3.3.3 Monitoring of Water Areas Affected by Construction Activities

Monitoring of water areas affected by construction activities shall be the responsibility of the Contractor. All water areas affected by construction activities shall be monitored by the Contractor.

3.4 PROTECTION OF FISH AND WILDLIFE RESOURCES

The Contractor shall keep construction activities under surveillance, management and control to minimize interference with, disturbance to and damage of fish and wildlife. Species that require specific attention shall be listed by the Contractor prior to beginning of construction operations.

3.5 PROTECTION OF AIR RESOURCES

The Contractor shall keep construction activities under surveillance, management and control to minimize pollution of air resources. All activities, equipment, processes, and work operated or performed by the Contractor in accomplishing the specified construction shall be in strict accordance with the laws of the State or States in which the work is being performed and all Federal emission and performance laws and standards. Special management techniques as set out below shall be implemented to control air pollution by the construction activities which are included in the contract.

3.5.1 Particulates

Dust particles, aerosols, gaseous by-products from all construction activities, processing and preparation of materials, such as from asphaltic batch plants, shall be controlled at all times, including weekends, holidays and hours when work is not in progress. The Contractor shall maintain all excavations, stockpiles, haul roads, permanent and temporary access roads, plant sites, spoil areas, borrow areas, and all other work areas within or outside the project boundaries free from particulates which would cause the air pollution standards mentioned in the paragraph "PROTECTION OF AIR RESOURCES" to be exceeded or which would cause a hazard or a

nuisance. Sprinkling, chemical treatment of an approved type, light bituminous treatment, baghouse, scrubbers, electrostatic precipitators or other methods will be permitted to control particulates in the work area. Sprinkling, to be efficient, must be repeated at such intervals as to keep the disturbed area damp at all times. The Contractor must have sufficient equipment available to accomplish this task. Particulate control shall be performed as the work proceeds and whenever a particulate nuisance or hazard occurs.

3.5.2 Hydrocarbons and Carbon Monoxide

Hydrocarbons and carbon monoxide emissions from equipment shall be controlled to Federal and State allowable limits at all times.

3.5.3 Odors

Odors shall be controlled at all times for all construction activities, processing and preparation of materials.

3.5.4 Monitoring Air Quality

Monitoring of air quality shall be the responsibility of the Contractor. All air areas affected by the construction activities shall be monitored by the Contractor.

3.6 INSPECTION

The Contracting Officer will notify the Contractor in writing of any observed noncompliance with the Contractor's environmental protection plan. The Contractor shall, after receipt of such notice, inform the Contracting Officer of proposed corrective action and take such action as may be approved. If the Contractor fails to comply promptly, the Contracting Officer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No time extensions will be granted or costs or damages allowed to the Contractor for any such suspension.

3.7 POST CONSTRUCTION CLEANUP

The Contractor shall clean up all area(s) used for construction.

3.8 RESTORATION OF LANDSCAPE DAMAGE

The Contractor shall restore all landscape features damaged or destroyed during construction operations outside the limits of the approved work areas. Such restoration shall be in accordance with the plans submitted for approval by the Contracting Officer.

3.9 MAINTENANCE OF POLLUTION FACILITIES

The Contractor shall maintain all constructed facilities and temporary pollution control devices for

the duration of the contract or for that length of time construction activities create the particular pollutant.

3.10 TRAINING OF CONTRACTOR PERSONNEL IN POLLUTION CONTROL

The Contractor shall train his personnel in all phases of environmental protection. The training shall include methods of detecting and avoiding pollution, familiarization with pollution standards, both statutory and contractual, and installation and care of facilities (vegetative covers and instruments required for monitoring purposes) to insure adequate and continuous environmental pollution control.

3.11 REPORTING OF POLLUTION SPILLS

In the event that an oil spill or chemical release occurs during the performance of this contract, the Contractor is required to contact the National Response Center, Telephone Number 1-800-424-8802 as soon as possible, or if telephone communication is not possible, the nearest U.S. Coast Guard office may be contacted by radio to report the spill, (33 CFR 153.203), and the following State(s) responsible Agency:

RESPONSIBLE STATE AGENCY

Missouri: Missouri Department of Natural Resources: 573-634-2436

The Contractor shall comply with any instructions from the responding agency concerning containment and/or cleanup of spills.

-- End of Section --

DIVISION 1 - GENERAL REQUIREMENTS

SECTION 01451

CONTRACTOR QUALITY CONTROL

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SECTION 01451

CONTRACTOR QUALITY CONTROL

PART 1 GENERAL

1.1 REFERENCES

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

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM D 3740 Minimum Requirements for Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction

ASTM E 329 Agencies Engaged in the Testing and/or Inspection of Materials Used in Construction

1.2 PAYMENT

Separate payment will not be made for providing and maintaining an effective Quality Control program, and all costs associated therewith shall be included in the applicable unit prices or lump-sum prices contained in the Bidding Schedule.

PART 2 PRODUCTS (Not Used)

PART 3 EXECUTION

3.1 GENERAL

The Contractor is responsible for quality control and shall establish and maintain an effective quality control system in compliance with the Contract Clause entitled "Inspection of Construction." The quality control system shall consist of plans, procedures, and organization necessary to produce an end product which complies with the contract requirements. The system shall cover all construction operations, both on-site and off-site, and shall be keyed to the proposed construction sequence.

3.2 QUALITY CONTROL PLAN

3.2.1 General

The Contractor shall furnish for review by the Government, not later than 15 calendar days after receipt of Notice of Award of the contract, the Contractor Quality Control (CQC) Plan proposed to implement the requirements of the Contract Clause entitled "Inspection of Construction." The plan shall identify personnel, procedures, control, instructions, test, records, and forms to be used. The Government will consider an interim plan for the first 15 days of operation. Construction will be permitted to begin only after acceptance of the CQC Plan or acceptance of an interim plan applicable to the particular feature of work to be started. Work outside of the features of work included in an accepted interim plan will not be permitted to begin until acceptance of a CQC Plan or another interim plan containing the additional features of work to be started.

3.2.2 Content of the CQC Plan

The CQC plan shall include, as a minimum, the following to cover all construction operations, both on-site and off-site, including work by subcontractors, fabricators, suppliers, and purchasing agents:

a. A description of the quality control organization, including a chart showing lines of authority and acknowledgment that the CQC staff shall implement the three phase control system for all aspects of the work specified. The staff shall include a CQC system manager and an alternate CQC system manager. Each shall report to the project manager or someone higher in the Contractor's organization. Project manager in this context shall mean the individual with responsibility for the overall management of the project including quality and production. Both the CQC system manager and the alternate CQC system manager shall have completed, within the last five years, the Corps sponsored course on Construction Quality Management for Contractors and shall submit copies of certificates as part of the CQC plan. No work shall be performed on this contract without the presence of the CQC system manager or the alternate CQC system manager at the job site.

b. The name, qualifications (in resume format), duties, responsibilities, and authorities of each person assigned a CQC function.

c. A copy of the letter to the CQC System Manager and to the alternate CQC System Manager signed by an authorized official of the firm which describes the responsibilities and delegates sufficient authority to adequately perform the functions of the CQC System Manager or the alternate CQC System Manager, including authority to stop work which is not in compliance with the contract. The CQC System Manager or the alternate CQC System Manager shall issue letters of direction to all other various quality control representatives outlining duties, authorities, and responsibilities. Copies of these letters will also be furnished to the Government.

d. Procedures for scheduling, reviewing, certifying, and managing submittals, including

those of subcontractors, off-site fabricators, suppliers, and purchasing agents. These procedures shall be in accordance with SPECIAL CONTRACT REQUIREMENT entitled "Submittals".

e. Control, verification, and acceptance testing procedures for each specific test to include the test name, specification paragraph requiring test, feature of work to be tested, test frequency, testing laboratory, and person responsible for each test.

f. Procedures for tracking preparatory, initial, and follow-up control phases and control, verification, and acceptance tests including documentation.

g. Procedures for tracking construction deficiencies from identification through acceptable corrective action. These procedures will establish verification that identified deficiencies have been corrected.

h. Reporting procedures, including proposed reporting formats.

i. A list of the definable features of work. A definable feature of work is a task which is separate and distinct from other tasks and has separate control requirements. It could be identified by different trades or disciplines, or it could be work by the same trade in a different environment. Although each section of the specifications may generally be considered as a definable feature of work, there are frequently more than one definable feature under a particular section. This list will be agreed upon during the coordination meeting.

3.2.3 Acceptance of Plan

Acceptance of the Contractor's plan is required prior to the start of construction. Acceptance is conditional and will be predicated on satisfactory performance during the construction. The Government reserves the right to require the Contractor to make changes in his CQC plan and operations including removal of personnel, as necessary, to obtain the quality specified.

3.2.4 Notification of Changes

After acceptance of the QC plan, the Contractor shall notify the Contracting Officer in writing a minimum of seven calendar days prior to any proposed change. Proposed changes are subject to acceptance by the Contracting Officer.

3.3 COORDINATION MEETING

After the Preconstruction Conference, before start of construction, and prior to acceptance by the Government of the Quality Control Plan, the Contractor shall meet with the Contracting Officer or Authorized Representative and discuss the Contractor's quality control system. During the meeting, a mutual understanding of the system details shall be developed, including the forms for recording

the CQC operations, control activities, testing, administration of the system for both on-site and off-site work, and the interrelationship of Contractor's Management and control with the Government's Quality Assurance. Minutes of the meeting shall be prepared by the Government and signed by both the Contractor and the Contracting Officer. The minutes shall become a part of the contract file. There may be occasions when subsequent conferences will be called by either party to reconfirm mutual understandings and/or address deficiencies in the CQC system or procedures which may require corrective action by the Contractor.

3.4 QUALITY CONTROL ORGANIZATION

3.4.1 CQC System Manager

The Contractor shall identify an individual within his organization at the worksite who shall be responsible for overall management of CQC and have the authority to act in all CQC matters for the Contractor. This CQC System Manager shall be subject to acceptance by the Contracting Officer. The CQC System Manager shall be assigned as System Manager but may have other duties in addition to quality control.

3.4.2 CQC Staff

A staff shall be maintained under the direction of the CQC System Manager to perform all CQC activities. An alternate will be identified to serve in the absence of the CQC System Manager. The staff must be of sufficient size to ensure adequate CQC coverage of all work phases, work shifts, and work crews involved in the construction. These personnel may perform other duties, but must be fully qualified by experience and technical training to perform their assigned CQC responsibilities and must be allowed sufficient time to carry out these responsibilities. The CQC plan will clearly state the duties and responsibilities of each staff member. All CQC Staff members or replacements shall be subject to acceptance by the Contracting Officer.

3.4.3 Additional Requirement

In addition to the above requirements, the CQC System Manager and alternate, and also includes individuals appointed as alternates, shall have completed the course entitled "Construction Quality Management for Contractors". This course is generally offered every quarter starting with the month of February. This course is periodically offered by the Memphis District as well as other Corps Districts. For further details and for the actual class schedule see the following website: http://155.76.117.11/conops/const_quality.htm.

3.5 SUBMITTALS

Submittals shall be in accordance with SPECIAL CONTRACT REQUIREMENT entitled "Submittals". The CQC organization shall be responsible for certifying that all submittals are in compliance with the contract requirements.

3.6 CONTROL

The controls shall include at least three phases of control to be conducted by the CQC System Manager for all definable features of work, as follows:

3.6.1 Preparatory Phase

This phase shall be performed prior to beginning work on each definable feature of work and shall include:

- a. A review of each paragraph of applicable specifications.
- b. A review of the contract drawings.
- c. A check to assure that all materials and/or equipment have been tested, submitted, and approved.
- d. A check to assure that provisions have been made to provide required control inspection and testing.
- e. Examination of the work area to assure that all required preliminary work has been completed and is in compliance with the contract.
- f. A physical examination of required materials, equipment, and sample work to assure that they are on hand, conform to approved shop drawings or submitted data, and are properly stored.
- g. A review of the appropriate activity hazard analysis to assure safety requirements are met.
- h. Discussion of procedures for constructing the work including repetitive deficiencies. Document construction tolerances and workmanship standards for that phase of work.
- i. A check to ensure that the portion of the plan for the work to be performed has been accepted by the Contracting Officer.
- j. The Government shall be notified at least 24 hours in advance of beginning any of the required action of the preparatory phase. This phase shall include a meeting conducted by the CQC System Manager and attended by the superintendent, other CQC personnel (as applicable), and the foreman responsible for the definable feature. The results of the preparatory phase actions shall be documented by separate minutes prepared by the CQC System Manager and attached to the daily CQC report. The Contractor shall instruct applicable workers as to the acceptable level of workmanship required in order to meet contract specifications.

3.6.2 Initial Phase

This phase shall be accomplished at the beginning of a definable feature of work. The following shall be accomplished:

- a. A check of preliminary work to ensure that it is in compliance with contract requirements. Review minutes of the preparatory meeting.
- b. Verification of full contract compliance. Verify required control inspection and testing.
- c. Establish level of workmanship and verify that it meets minimum acceptable workmanship standards. Compare with sample panels as appropriate.
- d. Resolve all differences.
- e. Check safety to include compliance with and upgrading of the safety plan and activity hazard analysis. Review the activity analysis with each worker.
- f. The Government shall be notified at least 24 hours in advance of beginning the initial phase. Separate minutes of this phase shall be prepared by the CQC System Manager and attached to the daily CQC report. Exact location of initial phase shall be indicated for future reference and comparison with follow-up phases.
- g. The initial phase should be repeated for each new crew to work on-site, or any time acceptable specified quality standards are not being met.

3.6.3 Follow-up Phase

Daily checks shall be performed to assure continuing compliance with contract requirements, including control testing, until completion of the particular feature of work. The checks shall be made a matter of record in the CQC documentation. Final follow-up checks shall be conducted and all deficiencies corrected prior to the start of additional features of work which may be affected by the deficient work. The Contractor shall not build upon or conceal non-conforming work.

3.6.4 Additional Preparatory and Initial Phases

As determined by the Government, additional preparatory and initial phases may be conducted on the same definable features of work if the quality of on-going work is unacceptable, if there are changes in the applicable CQC staff, on-site production supervision or work crew, if work on a definable feature is resumed after a substantial period of inactivity, or if other problems develop.

3.7 TESTS

3.7.1 Testing Procedure

The Contractor shall perform specified or required tests to verify that control measures are adequate to provide a product which conforms to contract requirements. Testing includes operation and/or acceptance tests when specified. The Contractor shall procure the services of a Corps of Engineers approved testing laboratory or establish an approved testing laboratory at the project site, in accordance with paragraph 3.7.2 below. The Contractor shall perform the following activities and record and provide the following data:

- a. Verify that testing procedures comply with contract requirements.
- b. Verify that facilities and testing equipment are available and comply with testing standards.
- c. Check test instrument calibration data against certified standards.
- d. Verify that recording forms and test identification control number system, including all of the test documentation requirements, have been prepared.
- e. Results of all tests taken, both passing and failing tests, will be recorded on the CQC report for the date taken. Specification paragraph reference, location where tests were taken, and the sequential control number identifying the test will be given. If approved by the Contracting Officer, actual test reports may be submitted later with a reference to the test number and date taken. An information copy of tests performed by an off-site or commercial test facility will be provided directly to the Contracting Officer. Failure to submit timely test reports as stated may result in nonpayment for related work performed and disapproval of the test facility for this contract.

3.7.2 Testing at Validated Laboratories

3.7.2.1 Laboratory Validation.

All testing of soil, gravel, aggregate, stone, concrete, and asphalt shall be performed by a testing laboratory validated by the Material Testing Center (MTC) of the Corps of Engineers. Refer to the MTC website <http://www.wes.army.mil/SL/MTC/ValStatesTbl.htm> for a complete and current list of validated commercial laboratories. If the Contractor proposes to use a commercial laboratory that is not validated or set up an on-site laboratory, he shall make arrangements for validation by contacting the Material Testing Center at Waterways Experiment Station, Vicksburg, Mississippi, telephone number: 601-634-3974, www.wes.army.mil/SL/MTC/inspection.htm. The Government will not be responsible for any cost associated with the validation of laboratories that are not currently validated. The validation process could take 60 to 90 days or more. The Contractor shall be responsible for determining the amount of time required for the validation of the proposed laboratory and accounting for this event in his progress schedule. If the Contractor elects to use a non-validated laboratory, work requiring testing shall not commence until the laboratory has been

validated by MTC.

3.7.2.2 Capability Check

The Contracting Officer reserves the right to check laboratory equipment in the proposed laboratory for compliance with the standards set forth in the contract specifications and to check the laboratory technician's testing procedures and techniques. Laboratories utilized for testing soils, concrete, asphalt, and steel shall meet criteria detailed in ASTM D 3740 and ASTM E 329.

3.7.2.3 Capability Recheck.

If the selected laboratory fails the capability check, the Contractor will be assessed a charge to reimburse the Government for each succeeding recheck of the laboratory or the checking of a subsequently selected laboratory. Such costs will be deducted from the contract amount due the Contractor. There will be no extension of time allowed due to necessity to perform capability rechecks.

3.7.3 On-Site Laboratory

The Contracting Officer reserves the right to utilize the Contractor's control testing laboratory and equipment to make assurance tests and to check the Contractor's testing procedures, techniques, and test results at no additional cost to the Government.

3.7.4 Furnishing or Transportation of Samples for Testing

Costs incidental to the transportation of samples or materials will be borne by the Contractor. Samples of materials for test verification and acceptance testing by the Government shall be delivered by the Contractor to a location specified by the Contracting Officer.

3.8 COMPLETION INSPECTION

At the completion of all work or any increment thereof established by a completion time stated in the Special Contract Requirements entitled "Commencement, Prosecution, and Completion of Work," or stated elsewhere in the specifications, the CQC System Manager shall conduct an inspection of the work and develop a "punch list" of items which do not conform to the approved drawings and specifications. Such a list of deficiencies shall be included in the CQC documentation, as required by paragraph DOCUMENTATION below, and shall include the estimated date by which the deficiencies will be corrected. The CQC System Manager or staff shall make a second inspection to ascertain that all deficiencies have been corrected and so notify the Government. These inspections and any deficiency corrections required by this paragraph will be accomplished within the time stated for completion of the entire work or any particular increment thereof if the project is divided into increments by separate completion dates.

3.9 DOCUMENTATION

The Contractor shall maintain current records providing factual evidence that required quality control activities and/or tests have been performed. These records shall include the work of sub-contractors and suppliers and shall be on an acceptable form that includes, as a minimum, the following information:

- a. Contractor/subcontractor and their area of responsibility.
- b. Operating plant/equipment with hours worked, idle, or down for repair.
- c. Work performed each day, giving location, description, and by whom. When Network Analysis (NAS) is used, identify each phase of work performed each day by NAS activity number.
- d. Test and/or control activities performed with results and references to specifications/drawings requirements. The control phase should be identified (Preparatory, Initial, Follow-up). List deficiencies noted along with corrective action.
- e. Quantity of materials received at the site with statement as to acceptability, storage, and reference to specifications/drawings requirements.
- f. Submittals reviewed, with contract reference, by whom, and action taken.
- g. Off-site surveillance activities, including actions taken.
- h. Job safety evaluations stating what was checked, results, and instructions or corrective actions.
- i. Instructions given/received and conflicts in plans and/or specifications.
- j. Contractor's verification statement.

These records shall indicate a description of trades working on the project; the number of personnel working; weather conditions encountered; and any delays encountered. These records shall cover both conforming and deficient features and shall include a statement that equipment and materials incorporated in the work and workmanship comply with the contract. The original and one copy of these records in report form shall be furnished to the Government daily within 24 hours after the date(s) covered by the report, except that reports need not be submitted for days on which no work is performed. As a minimum, one report shall be prepared and submitted for every seven days of no work and on the last day of a no work period. All calendar days shall be accounted for throughout the life of the contract. The first report following a day of no work shall be for that day only. Reports shall be signed and dated by the CQC System Manager. The report from the CQC System Manager shall include copies of test reports and copies of reports prepared by all subordinate quality

control personnel.

3.10 NOTIFICATION OF NONCOMPLIANCE

The Contracting Officer will notify the Contractor of any detected noncompliance with the foregoing requirements. The Contractor shall take immediate corrective action after receipt of such notice. Such notice, when delivered to the Contractor at the worksite, shall be deemed sufficient for the purpose of notification. If the Contractor fails or refuses to comply promptly, the Contracting Officer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. No part of the time lost due to such stop orders shall be made the subject of claim for extension of time or for excess costs or damages by the Contractor.

-- End of Section --

DIVISION 1 - GENERAL REQUIREMENTS

SECTION 01452

PROJECT SIGNS

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SECTION 01452

PROJECT SIGNS

PART 1 GENERAL

1.1 SCOPE

The work covered by this section consists of furnishing, erecting, maintaining, and removing project signs.

1.2 PROJECT SIGNS

The Contractor shall furnish, erect, and maintain two single faced project sign at the location designated by the Contracting Officer. The signs shall be constructed of 3/4-inch marine grade plywood or 22 gauge metal, mounted on a substantial framework of 2-inch material. Size, lettering, color and paint shall conform to the details shown on the drawing "Temporary Project Sign" included at the end of this section. In lieu of two signs, the Contractor may double-face a single sign at the specified location, provided such a sign and its erection and supports are approved by the Contracting Officer. Upon request, the Government will furnish without cost to the Contractor two decals of the Engineer Castle. The signs shall be erected as soon as practicable, but not later than 15 calendar days after the date established for commencement of work. The signs shall be removed upon completion of all other construction work under the contract and will become the property of the Contractor.

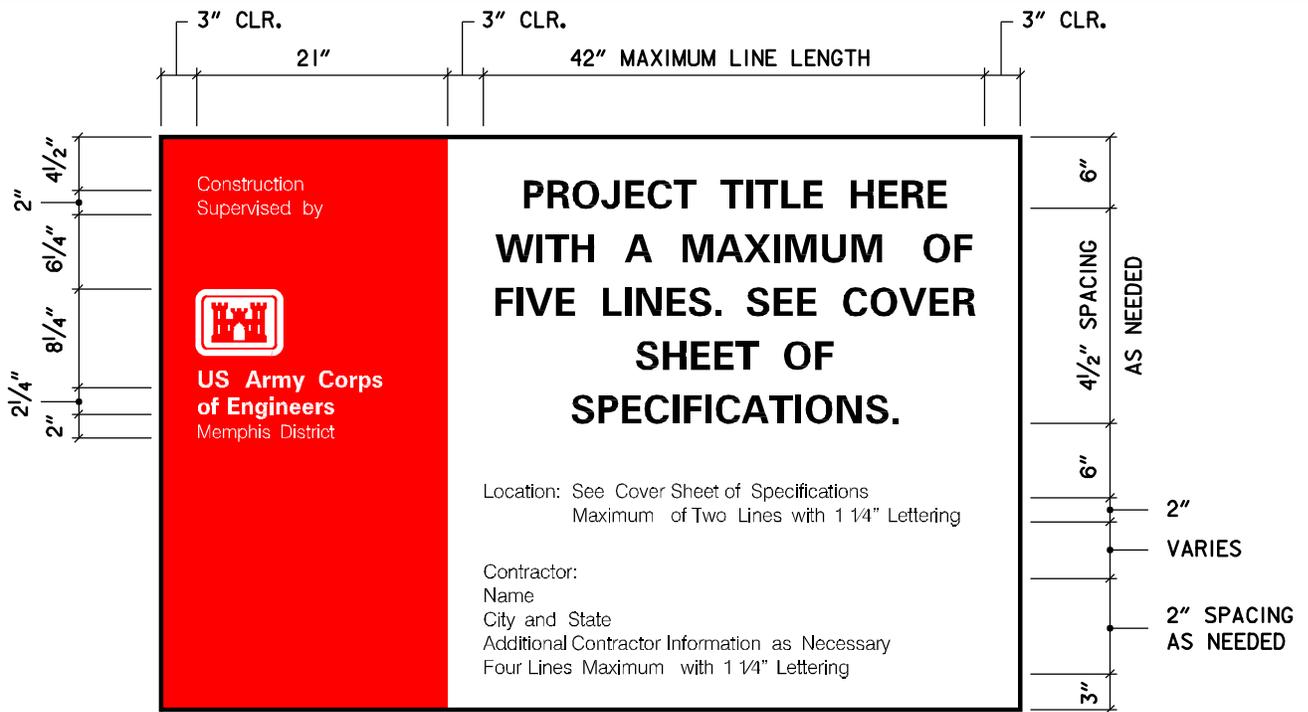
1.3 PAYMENT

No separate payment will be made for erecting, maintaining, and removing project signs; and all costs in connection therewith will be considered an incidental obligation of the Contractor.

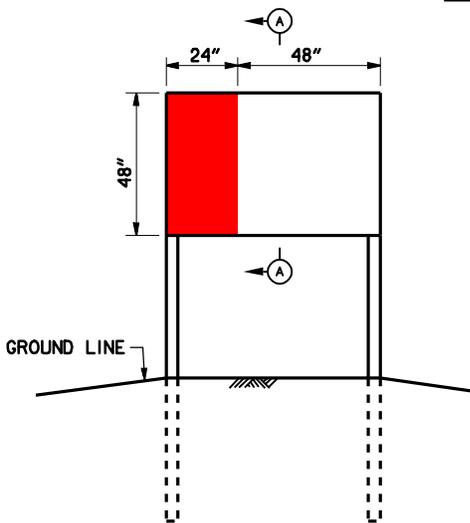
PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION (Not Applicable)

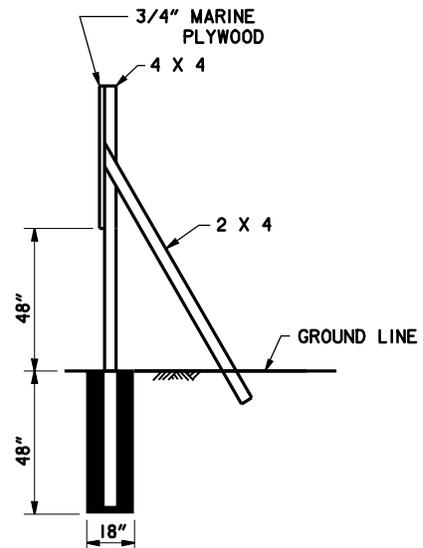
--End of Section--



ELEVATION



ELEVATION



SECTION A-A

SPECIFICATIONS

1. SIGN PANEL SHALL BE 4' x 6' x 3/4" MARINE PLYWOOD OR 22 GAGE SHEET METAL.
2. POSTS AND BRACING SHALL BE TREATED, NO.1 GRADE YELLOW PINE.
3. ALL EXPOSED SURFACES SHALL BE GIVEN ONE COAT OF LINSEED OIL AND WIPED PRIOR TO PRIMING.
4. ALL EXPOSED SURFACES SHALL BE GIVEN ONE COAT OF WHITE AS PRIMER. SECOND COAT SHALL BE COMMUNICATIONS RED ON LEFT AND WHITE ELSEWHERE.
5. THE LEFT SECTION SHALL BE RED WITH WHITE LEGEND. THE RIGHT SECTION SHALL BE WHITE WITH BLACK LEGEND.
6. PAINT SHALL BE BENJAMIN MOORE NO. 120-60 POLY-SILICONE ENAMEL OR APPROVED
7. ALL LETTERING SHALL BE 1/4" EXCEPT FOR THE WORDS "US Army Corps of Engineers" AND THE PROJECT TITLE. THE WORDS "US Army Corps of Engineers" SHALL BE 1/2" TALL. THE PROJECT TITLE LETTERING SHALL BE A MINIMUM OF 1/2" TALL AND A MAXIMUM OF 3/2" TALL. THE LETTERING SIZE SHALL BE CHOSEN SUCH THAT LARGEST POSSIBLE LETTERS ARE USED WITHOUT EXCEEDING A MAXIMUM LINE LENGTH OF 42". THE NUMBER OF LINES IN THE PROJECT TITLE SHALL MATCH THAT SHOWN ON THE COVER SHEET OF THE SPECIFICATIONS.

SCALE: NONE

JUNE 1998

U.S. ARMY ENGINEER DISTRICT, MEMPHIS
CORPS OF ENGINEERS
MEMPHIS, TENNESSEE

**TEMPORARY
PROJECT SIGN**

DIVISION 2 - SITE WORK

SECTION 02114

CLEARING AND EXCAVATION

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SECTION 02114

CLEARING AND EXCAVATION

PART 1 GENERAL

1.1 SCOPE

The work covered by this section consists of furnishing all plant labor, equipment, and materials, and performing all operations necessary for the clearing and excavation to the lines and grades indicated therefor on the drawings, and/or specified herein. Such work includes clearing and disposal of debris therefrom; channel excavation; lateral ditch and inlet drain excavation; excavation for placement of stone protection; disposal of excavated material; and performing all work incidental thereto.

1.2 QUALITY CONTROL

The Contractor shall establish and maintain quality control for the work specified in this section to assure compliance with contract requirements and maintain records of his quality control for all construction operations including; but, not limited to, the following:

(1) Clearing

Location, heights, limits, removal of lodgments in channel

(2) Disposal of Cleared Materials

Method and location of burning, and/or burying, damage to timber and/or areas within rights-of-way which are not to be cleared.

(3) Excavation

Layout, bottom grades and widths, side slopes, berm widths, lateral ditches, V-type roadside ditches, inlet drains, riprap paved inlet drains, excavation for placement of stone protection, transitions.

(4) Disposal of Excavated Material

Layout, limits, maximum elevations, restricted areas, drainage, slopes, minimum elevations.

(5) Slides and Shoals

Location, limits, methods and equipment used where remedial work has been directed.

(6) Existing Channel

Temporary traps to catch drift, location, limits, right-of-way agreements between the Contractor and landowners where work is outside the right-of-way shown on the drawings.

A copy of these records and tests, as well as the records of corrective action taken, shall be furnished the Government.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION

3.1 CLEARING

3.1.1 General

Clearing shall consist of the removal of all timber, standing or felled in previous cuttings, snags, stumps from previous cuttings, rootwads, bushes, partially buried logs, debris from clearing operations, and driftwood. Within the station limits of work, the following areas of work shall be cleared:

(1) Within the areas of 100 foot transition

Areas within the areas of 100 foot transition where actual excavation is required.

(2) Berms

Berm areas between the theoretical top bank of the channel excavated for the construction of the weir and the channelward toe of excavated material embankment placed under this contract.

(3) Disposal of Excavated Material

Areas to be used for disposal of excavated material.

(4) Clearing Where Channel Excavation is Required

Within areas of the existing channel where channel excavation is required all growth, stumps, partially buried logs, snags, and other projections shall be removed by uprooting.

3.1.2 Removal of Rafted Driftwood and Maintenance of Channel

Within the station limits of the work, all floating rafts or other lodgments and accumulation of driftwood which exist at the beginning of the contract period or which may form during the life of the contract within portions of the existing or improved ditch shall be removed and disposed of as prescribed for other clearing debris below. Prior to the commencement and removal of such rafted driftwood, the Contractor shall install traps or other suitable devices to prevent the rafts from being dislodged and floating away. The cutting and/or removal of logs and other pieces which key the rafts together shall be last in order of removal.

3.1.3 Miscellaneous

Clearing in areas within the right-of-way limits which are not specified hereinabove to be cleared shall be only that necessary for construction purposes and operation of equipment, and shall be subject to the approval of the Contracting Officer. Optimum effort shall be exercised by the Contractor to preserve as many trees as practicable outside the required clearing areas.

3.2 DISPOSAL OF CLEARING DEBRIS

3.2.1 General

All debris resulting from clearing operations on this contract shall be disposed of by burial or removal from the site. The Contractor shall channel materials of value resulting from clearing operations into beneficial use.

3.2.2 Burying

The Contractor shall bury all organic debris resulting from clearing operations, in the excavated material disposal embankments, as directed by the Contracting Officer.

3.2.3 Removal from Site

The Contractor shall remove and dispose of all inorganic debris such as washers, driers, refrigerators, hot water tanks, old tires, bottles, cans, etc. offsite. Such disposal shall comply with all applicable Federal, State and local laws. The Contractor may, at his option, retain for his own use or disposal by sale or otherwise any such materials of value. The Government assumes no responsibility for the protection or safekeeping of any materials retained by the Contractor. Such materials shall be removed from the site of the work before the date of completion of the work under this contract. The locations and manner of placement of clearing and grubbing debris on the right-of-way by the Contractor for his convenience prior to removal of the debris from the site of the work shall be subject to the approval of the Contracting Officer. When debris from clearing operations is placed on adjacent property, the Contractor shall obtain, without cost to the Government, additional rights-of-way for such purpose. Such material shall be placed so as not to interfere with roads, drainage, or other improvements and in such a manner as to eliminate the possibility of its entering the channel.

3.3 EXCAVATION

3.3.1 General

Within the station limits of the work, the Contractor shall excavate and remove all material of whatever nature encountered as may be necessary to produce the theoretical cross sections, and alignments for the channel excavation as shown on the drawings and/or specified herein. Smooth transitions shall be effected between sections at the changes in side slopes and bottom widths. At the downstream and upstream limits of excavation, a smooth transition shall be excavated to existing channel dimensions as indicated on the drawings and also where the channel width changes as indicated on the drawings. The approximate theoretical centerline of the channel improvement is as indicated on the drawings and may be field adjusted by the Contracting Officer to conform to conditions at the time of excavation. A tolerance of plus 6-inches above to a minus 3- inches below the theoretical bottom grade will be allowed, provided that the theoretical cross-sectional area is obtained and the side slopes are not steeper than specified. Changes in the width and/or depth of the channel shall be made gradually. Dressing of side slopes will not be required except as specified in SECTION 02935 - ESTABLISHMENT OF TURF. Refill of over-excavation will not be required except as necessary to meet the requirements specified hereinabove. Excavation shall commence at the downstream limits of the work and shall be carried continuously upstream. Excavation of channel slopes shall proceed from the top bank to the channel bottom. Should any riprap be encountered, it shall be buried in the excavated material disposal areas as directed by the Contracting Officer. If weather, stream elevations, or other conditions are such that work cannot be effectively prosecuted in the above order and work at other locations can be performed without endangering the work or other property, a change in the order of work may be authorized.

3.3.2 Embedment of Stone Protection

The Contractor shall excavate, in areas where filter material and riprap are required, in such a manner that the filter material and riprap are placed beneath the theoretical cross section as indicated on the drawings. Tolerances for such excavation shall be subject to the tolerances for filter material and riprap as specified in SECTION 02542 paragraphs 3.2 and 3.3.2. The finished grade of the adjacent channel excavation shall conform to the finished riprap grade at and in the vicinity of the junctions of these surfaces.

3.4 DISPOSAL OF EXCAVATED MATERIAL

3.4.1 General

Materials resulting from channel excavation which, in the opinion of the Contracting Officer, are suitable for roads work, shall be used as needed for improvement of access roads as specified in paragraph 3.7 below. The Contractor shall, when directed, remove any materials that the Contracting Officer considers objectionable in the embankment. Material that remains after use in the access embankments shall be disposed of by placing in the excavated material disposal areas as shown on the drawings.

3.4.2 Excavated Material Embankment

Excavated material shall be disposed of within the right-of-way limits as indicated on the drawings and/or specified herein. Bottom sediments excavated from the bottom of the existing channel shall be placed within the interior of excavated material embankment and shall be covered with at least 2 feet of other earth material. There may not be a sufficient amount of suitable material from the required excavation adjacent to the areas where dry walls will need to be constructed to contain bottom sediments. Slopes on the drawings and those prescribed hereinafter define the limits of the area within which excavated material must be confined but do not necessarily indicate stable slopes for such material. The Contractor shall be responsible for placing the various materials to be disposed of in such locations within the prescribed disposal areas that they will not flow or slide outside the disposal areas. The height of excavated material embankment may vary but shall at no time exceed the maximum elevation or height indicated therefor on the drawings, whichever is lowest. The crown width, end slopes, and back slopes of excavated material embankment adjacent to the channel shall be variable as indicated on the drawings. The crown of excavated material embankment shall be sloped to drain as indicated on the drawings. Berm areas shall be filled to the extent necessary with material suitable for such work as directed by the Contracting Officer to prevent impoundment of water between the excavated material embankment placed under this contract and the channel. Material placed in berm areas shall be placed in layers not exceeding 12 inches in thickness and each layer shall be compacted by at least three passes of a crawler-type tractor weighing at least 20,000 pounds and exerting a unit tread pressure of at least 6 pounds per square inch, or by other approved compacting equipment which will attain comparable compaction. A pass is defined as the complete coverage of the surface by the treads of the tractor or other approved compacting equipment. Placement of excavated material shall be such that water will not be impounded within the excavated material disposal areas. Dressing of the material will be required as necessary to provide drainage and the specified dimensions and slopes and as specified in SECTION 02935 - ESTABLISHMENT OF TURF. Some material may have to be placed upstream or downstream at some locations in order that excavated material be disposed of as specified herein and/or as indicated on the drawings. The Contractor shall perform all drifting of material as may be necessary to dispose of excavated material as specified herein and/or indicated on the drawings and no separate payment will be made therefor. Compaction will not be required except as specified hereinabove. Sunken logs, stumps, driftwood, and other debris removed concurrently with the excavation shall be disposed of as specified for clearing above. Placement of excavated material shall be restricted as specified in the tabulation below:

(1) Closer Than Top Banks

No excavated material shall be placed closer to the theoretical top banks of the channel than the 40 foot and 30 foot berm widths indicated on the drawings.

3.5 SLIDES AND SHOALS

3.5.1 Channel

In case sliding or shoaling occurs in any part of the channel or inlet drain excavation after excavation as prescribed above has been completed, but prior to the final acceptance of all work under the contract, the Contractor shall remove such portions of the slides or shoals as the Contracting Officer may direct. In case the slide or shoal is due to no fault of the Contractor, an equitable adjustment in the contract price will be made under the CONTRACT CLAUSE entitled "Changes." Material removed from the slides and/or shoals shall be disposed of in the excavated material disposal embankments areas in accordance with 3.4 above. Shoaling from failure of the Contractor to keep the channel clear of obstructions until final acceptance of the entire work will be considered to be the fault of the Contractor. Such shoals shall be removed by the Contractor at his expense.

3.5.2 Excavated Material Embankment

3.5.2.1 General

In the event slides occur in any part of the excavated material embankment placed under this contract, during construction or after completion, but prior to final acceptance of all work under the contract, the Contractor, upon receipt of written order of the Contracting Officer, shall repair the slides as directed.

3.5.2.2 Slides Caused by Foundation Failure

In case the slide was caused by a foundation failure not due to the fault of the Contractor, the Contractor will be paid for its repair. An equitable adjustment in the contract price will be made in accordance with the CONTRACT CLAUSE entitled "Changes." In case the slide is caused through the fault of the Contractor, the repairs shall be made at no additional cost to the Government.

3.5.2.3 Slides Not Caused by Foundation Failure

Except as provided in 3.5.2.2 above and except as required for fill in berm areas as specified above, any material which flows or slides outside of the excavated material disposal limits shall be removed by the Contractor and replaced within the prescribed disposal limits at no cost to the Government.

3.6 EXISTING CHANNEL

The Contractor shall construct temporary traps to catch drift and/or conduct his operations in such manner that the existing channel below the limits of the work will not be deteriorated. Shoals, drift racks, temporary crossings or other obstructions within such channel caused through the fault or negligence of the Contractor shall be removed as directed by the Contracting Officer at the expense of the Contractor. In the performance of this work, the necessary right-of-way for ingress, egress and operation of equipment and area for disposal of excavated material and debris resulting from such obstruction removal outside the right-of-way limits indicated on the drawings shall be obtained by the Contractor from the landowners at the expense of the Contractor. Three copies of the

agreement between the Contractor and each landowner granting the Contractor permission for the use of lands for such purpose shall be furnished the Contracting Officer before the Contractor's entry thereon.

3.7 ACCESS ROADS

The Contractor shall use the access roads as indicated on the drawings. Should fill material be needed for the improvement of the existing access roads, suitable material from the excavation for the weir may be used. The access roads shall be left in place at end of the job and they shall be at least equal to or better than they were at the beginning of the job.

--End of Section--

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SECTION 02542
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2.2.2 Gradation

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3.4 GROUTING

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3.4.1.1 Fly Ash and Air Entrainment

3.4.1.2 Aggregate

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3.4.1.4 Statement of Delivery Ticket for Each Batch of Grout Delivered

3.4.2 Grout Test Panel

3.4.3 Placement

3.4.4 Curing

3.4.5 Weep Holes

3.4.5.1 PVC Pipe

SECTION 02542

STONE PROTECTION

PART 1 GENERAL

1.1 SCOPE

The work provided for herein consists of furnishing all plant, labor, equipment and materials, and performing all operations in connection with the construction of the stone protection, including foundation preparation, placement of filter material, and placement of riprap, all in accordance with these specifications and the contract drawings.

1.2 QUALITY CONTROL

The Contractor shall establish and maintain quality control for the work specified in the section to assure compliance with contract requirements and maintain records of his quality control for all construction operations including but not limited to the following:

- (1) Foundation

Preparation (line and grade).

(2) Inspection

At the worksite to ensure use of specified materials.

(3) Filter

Gradation and placement.

(4) Riprap

Gradation and placement.

A copy of these records and tests, as well as the records of corrective action taken, shall be furnished the Government.

1.3 APPLICABLE PUBLICATION

The following publication of the issue listed below, but referred to thereafter by basic designation only, forms a part of this specification to the extent indicated by the reference thereto:

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

02542-2

C 138 Unit Weight, Yield, and Air Content (Gravimetric)
of Concrete

C 172 Sampling Freshly Mixed Concrete

U.S. ARMY CORPS OF ENGINEERS, HANDBOOK FOR CONCRETE AND
CEMENT (CRD)

CRD-C 106-93 Unit Weight and Voids in Aggregate

CRD-C 107-94 Specific Gravity and Absorption of Coarse
Aggregate

PART 2 PRODUCTS

2.1 STONE

2.1.1 General

All stone shall be durable material as approved by the Contracting Officer. The sources from which the Contractor proposes to obtain the material shall be selected well in advance of the time when the

material will be required. In case an undeveloped source is to be used, the Contractor will be required to show that an ample quantity of material is available before quality tests will be made. Stone for riprap shall be of a suitable quality to ensure permanence in the structure and in the climate in which it is to be used. It shall be free from cracks, seams and other defects that would tend unduly to increase its deterioration from natural causes. The inclusion of objectionable quantities of dirt, sand, clay and rock fines will not be permitted

2.1.2 Sources and Evaluation Testing

Riprap shall be obtained in accordance with the provisions in SECTION 00800, SP-13 STONE SOURCES. The Contractor shall submit suitable test reports and service records to show the acceptability of the riprap. If the Contractor proposes to furnish riprap from a source not currently listed, the Contractor will make such investigations as necessary to determine whether acceptable riprap can be produced from the proposed source. Satisfactory service records on work outside the Corps of Engineers will be acceptable. In order for riprap to be acceptable on the basis of service records, riprap of a similar size must have been placed in a similar thickness and exposed to weathering under similar conditions as is anticipated for this contract, and have satisfactorily withstood such weathering for a minimum of twenty years. If no such records are available, the Contractor will make tests to assure the acceptability of the riprap. The tests to which the riprap may be subjected will include petrographic analysis, specific gravity, abrasion, absorption, wetting and drying, freezing and thawing and such other tests as may be considered necessary by the Contracting Officer. The following guidance is provided for use by the Contractor in analyzing a

new source of riprap. Riprap that weighs less than 155 lbs/c.f. or has more than 2% absorption will not be accepted unless other tests and service records show that the riprap is satisfactory. The method of testing for unit weight will be CRD-C 106. The method of testing for absorption will be CRD-C 107. Samples shall be taken by the Contractor under the supervision of the Contracting Officer at least 60 days in advance of the time the placing of the riprap is expected to begin. The Contractor has the responsibility to assure the tests are performed in accordance with applicable Corps of Engineers' methods of testing given in the Handbook for Concrete and Cement, and will be performed at an independent, approved testing laboratory. The cost of testing will be borne by the Contractor.

2.1.3 Gradation

Gradation shall conform to the "R-400rev" RIPRAP GRADATION CURVE at the end of this section and format thereof shall be as shown. Neither the width nor the thickness of any piece shall be less than one-third of its length. The riprap shall contain no more than 3 percent of weight less than individual 55 lbs stones which includes up to 1 percent quarry spalls. Stone shall be reasonably well graded between the largest and smallest pieces. The gradation curve plot or graph from each gradation test performed on the "R-400rev" riprap shall fall within the upper and lower limit curves plotted thereon. The Contractor shall submit to the Contracting Officer a copy of the plot for each gradation test on the gradation graph.

2.1.4 Test Method

Gradation test method shall conform to the requirements of "MVD Standard Test method for Gradation", which is inserted at the end of this section as PLATE I. The test requirements shall be modified for the "R-400rev" riprap as follows: The gradation test for the "R-400rev" shall consist of separating riprap at the following sizes – 400 lbs, 300 lbs, 200 lbs, 140 lbs, 90 lbs, and 55 lbs. The Contractor may propose slight changes in the separation sizes with approval from the Contracting Officer. The following pages are also included at the end of this specification section: an Example Gradation and Worksheet, an Example Gradation, and an example Gradation Test Data Sheet as Plates II, III and IV.

2.1.5 Gradation Test

The Contractor shall perform a gradation test or tests on the riprap at the quarry. At least one gradation test shall be performed. The sample shall be taken by the Contractor under the supervision of the Contracting Officer, shall consist of not less than 25 tons of riprap and shall be collected in a random manner which will provide a sample which accurately reflects the actual gradation arriving at the jobsite. If collected by the truckload, each truckload shall be representative of the gradation requirements. The Contractor shall provide all necessary screens, scales and other equipment, and the operating personnel therefor, and shall grade the samples, all at no additional cost to the Government. For each sample, the Contractor shall record, plot, and submit the gradation data, using the form noted at the end of this section, to the Contracting Officer. The Contractor shall submit to the Contracting Officer a copy of the plot for each gradation test on the gradation graph.

2.2 FILTER MATERIALS

2.2.1 General

Filter material shall consist of gravel or crushed stone. The material shall be composed of tough, durable particles, shall be reasonably free from thin, flat and elongated pieces, and shall contain no organic matter nor soft, friable particles in quantities considered objectionable by the Contracting Officer.

2.2.2 Gradation

U.S. Standard	Permissible Limits
<u>Sieve No.</u>	<u>Percent by Weight, Passing</u>
3-inch	100
1 1/2-inch	85-100
3/4-inch	35-70
3/8-inch	5-40
No. 4	0-10

The material shall be well-graded between the limits shown. The Contractor shall furnish a certified test report which certifies that the supplied filter material meets the above gradation and also furnish a representative sample of this same material to the Government.

PART 3 EXECUTION

3.1 BASE PREPARATION

Areas on which the filter material and riprap are to be placed shall be dressed to conform to cross sections shown on the contract drawings. Humps and depressions within the slope lines shall be dressed to provide relatively smooth and uniform surfaces. Immediately prior to placing the filter material, the prepared base will be inspected by the Contracting Officer and no material shall be placed thereon until that area has been approved.

3.2 PLACEMENT OF FILTER MATERIAL

Filter material for riprap bedding shall be spread uniformly on the prepared base to the lines and grades as indicated on the contract drawings and in such manner as to avoid damage to the prepared base. Any damage to the surface of the prepared base during placing of the material shall be repaired before proceeding with the work. Compaction of material placed on the prepared base will not be required, but each layer shall be finished to present a reasonably even surface, free from mounds or windrows. The allowable deviation from the prescribed thickness shall be plus 4 inches.

The maximum depth of water in which filter material placement will be permitted is five feet.

3.3 RIPRAP

3.3.1 General

Riprap shall be placed on the prepared base and/or filter material within the limits shown on the contract drawings. Riprap shall be as specified in 2.1 above.

3.3.2 Placement

Placement of the riprap shall begin at the downstream end of the weir, which is to be constructed, and progress upstream to the end of the weir. The maximum depth of water in which riprap placement will be permitted is five feet.

Riprap shall be placed in a manner which will produce a reasonably well-graded mass of rock with the minimum practicable percentage of voids, and shall be constructed, within the specified tolerance, to the lines and grades indicated on the contract drawings. A tolerance of plus 6 inches and minus 3 inches from the required finished surface of the riprap will be allowed provided these extremes do not occur adjacent to each other, and that neither extreme exists over more than 10 percent of the total area. Riprap shall be placed to its full course thickness in one operation and in such manner as to avoid displacing the filter material. The riprap shall be placed in the channel

bottom first and then proceed up the slope. The larger stones shall be well distributed and the entire mass of stones in their final position shall be graded to conform to the gradation specified in 2.1.3 above. The finished riprap shall be free from objectionable pockets of small stones and clusters of larger stones. Placing riprap in layers will not be permitted. Placing riprap by dumping it at the top of the slope and pushing it down the slope will not be permitted. The desired distribution of the various sizes of stones throughout the mass shall be obtained by selective loading of the material at the quarry or other source; by controlled dumping of successive loads during final placing; or by other methods of placement which will produce the specified results. The Contractor shall use procedures to insure that the indicated distribution of the various sizes of riprap is maintained throughout placement in the completed structure.

3.4 GROUTING

3.4.1 Grout

Portions of installed riprap as indicated on the drawings shall be grouted. No grout shall be placed under water. The grout mix shall have the following proportions:

- a. minimum cementitious material 550 lb/cy (cement + fly ash)
- b. fine aggregate 1600 lb/cy (approx.)
- c. coarse aggregate 1300 lb/cy (approx.)
- d. maximum water-cement ratio 0.70

3.4.1.1 Fly Ash and Air Entrainment

Fly ash may be substituted for cement up to 20% of the cementitious material content. Grout shall be air-entrained with an air content between 4.5 and 7.5 percent. The grout may contain a water-reducing admixture.

3.4.1.2 Aggregate

Fine aggregates shall conform to the requirements of ASTM C33 and the coarse aggregate shall meet the requirements for Size No. 8 in ASTM C33. The water content shall be such that the grout has a consistency which will permit gravity flow into the interstices of the riprap with the help of pumping, barring, spading, vibrating and brooming.

3.4.1.3 Grout Testing

The contractor shall test grout during the course of the work. Sampling of fresh grout will be performed by the methods prescribed in ASTM Designation C 172. The yield of the design mix will be checked by the methods prescribed in ASTM Designation C 138. The government or site representative will determine when a random sample will be taken ; but, it will be no more frequently than 10 tests.

3.4.1.4 Statement of Delivery Ticket for Each Batch of Grout Delivered

The Contractor shall furnish a statement-of-delivery ticket for each batch of grout delivered to the job site. As a minimum the ticket shall show date, time of loading, time of arrival on site, time of completed unloading, total weights in pounds of cement, water, and fine and coarse aggregates, amount of air-entraining agent, and the revolution counter reading at the time of batching.

3.4.2 Grout Test Panel

The test panel shall be at a noncritical area of the weir as determined by the Contracting Officer. The test panel at a minimum shall be at least a 10 foot x 10 foot square. The 12" filter material shall be placed as specified in paragraph 3.2 above and the 36" layer of riprap shall be placed as specified in paragraph 3.3.2 above. The grout shall be placed as specified in paragraph 3.4.3 below. The side walls of the test panel shall be reinforced and stabilized as needed to prevent movement. The Contracting Officer and the Contractor shall both be present when the filter material, riprap, and the grout are being placed. The grout shall be allowed to set for 24 hours at which point the Contracting Officer and the Contractor shall both be present when the test panel is investigated to determine the depth of penetration of the grout. The side walls will be removed to determine if the penetration reaches 18". If the penetration does not meet the 18" requirement, a new grout mix will be designed, and a new test panel shall be constructed and investigated as described above until the design meets

the specification requirement.

3.4.3 Placement

The grout shall be placed in the dry: a construction plan indicating how the Contractor plans to accomplish placing the grout in the dry, shall be submitted to the Contracting Officer. The grout shall be placed in the work within 90 minutes after mixing. Retempering of grout will not be permitted. Riprap shall not be grouted when the ambient temperature is below 40 degrees F or above 85 degrees F unless approved by the Contracting Officer in writing, nor when the grout, without special protection, is likely to be subjected to freezing temperatures before final set has occurred. Prior to grouting, the riprap shall be flushed with water to remove the fines from the rock. The rock shall be kept moist just ahead of the actual placing, but the grout shall not be placed in standing or flowing water. Grout placed on inverts or other nearly level areas may be placed in one course. On slopes, the riprap shall be grouted in successive strips, approximately 10 feet in width, commencing at the lowest strip and working up the slope. Each batch of grout shall be placed on the upper portion of the ungrouted part of the strip and worked into the voids between the stones and down the slopes. Immediately after placing a batch of grout, it shall be distributed over the surface of the strip by the use of brooms and the grout worked into place between stones with suitable bars, spades, and trowels. Adequate precautions shall be taken to prevent grout from penetrating the prepared base. The flow of grout shall be directed with brooms, spades or baffles to prevent it from flowing excessively along the same path and to assure that voids are filled. Tight pockets of rock shall be

pried apart to aid the penetration of grout so that voids shall be filled and that the grout penetrates the rock blanket. All brooming on slopes shall be uphill. Grout shall be placed to within 6 inches of the riprap grade/slope as shown on the drawings. The rough surface of the riprap grade/slope shall be maintained and excess grout within the top 6 inches shall be removed. After completion of any strip as specified, no workman, nor any load, shall be permitted on the grouted surface for a period of at least 24 hours. The surface of all grouted riprap shall be protected from rain, flowing water and mechanical injury for a period of at least 7 days.

3.4.4 Curing

The surface of all grouted riprap shall be cured by keeping the surface continuously wet for a period of not less than 7 days or by application of an approved curing compound in lieu of continued application of moisture. The compound shall be sprayed on the moist grout surfaces as soon as free water has disappeared, but shall not be applied to any surface until finishing of that surface is completed. The curing compound shall be applied as recommended by the manufacturer. If the membrane is damaged during the curing period, the damaged area shall be resprayed as recommended by the manufacturer.

3.4.5 Weep Holes

Weep holes shall be placed at 10 foot centers in the grouted riprap slopes in accordance with the details shown on the drawings.

3.4.5.1 PVC Pipe

PVC pipe, 3 inches in diameter shall be placed at the locations as shown on the drawings and at the intervals as specified in 3.4.4 above. The pipe and the coupler shall conform to the requirements of ASTM D 3034. The joints shall be joint solvent welded. The PVC pipe shall be hand filled with filter material as indicated on the drawings. The PVC pipe shall be imbedded 6 inches into the filter material, as shown on the drawings.

-- End of Section --

LMVD STANDARD TEST METHOD FOR GRADATION

- A. Select a representative sample (Note #1), weigh and dump on hard stand.
- B. Select four specific size stones to use as reference stones (a1, b1, c1, and d1) while performing the "individual weight larger than" test (see example & Note #2). Selected stone sizes should represent an evenly distributed cross section of the various size stones contained within the sample. Reference stone "a1" is typically the largest stone in the sample. Procedure is similar to the standard aggregate gradation test for "individual weight retained".
- C. Determine the largest size stone in the sample. (100% size)
- D. Separate the sample into piles starting with the stones that are larger than reference stone "b1" and proceeding to the smallest stones. The first pile should contain all stones larger than reference stone "b1" and smaller than "a1", the largest stone. Pile two should contain all stones larger than "c1" and smaller than "b1". Pile 3 should contain all stones larger than "d1" and smaller than "c1". The remaining pile should contain all stones smaller than "d1". Use reference stones for visual comparison in separating the obviously "larger than" stones. Stones that appear close to a specific size reference stone must be individually weighed. If a stone is heavier than the specific size reference stone, it should be placed in the pile containing the stones larger than the reference stone. Weigh each pile as a whole or cumulatively adding each stone in the individual piles.
- E. Paragraph D above will result in "individual weight retained" figures. Calculate individual percent retained (heavier than) and cumulative percent retained and cumulative percent passing (lighter than). Record test results, as shown on Plate II, on the "Gradation Test Data Sheet" (Plate IV). Plot percent finer by weight, along with the specification curves on ENG Form 4055.
- F. See plate IV and a RIPRAP GRADATION CURVES plate for a blank "Gradation Test Data Sheet" and a blank ENG FORM 4055.

NOTES

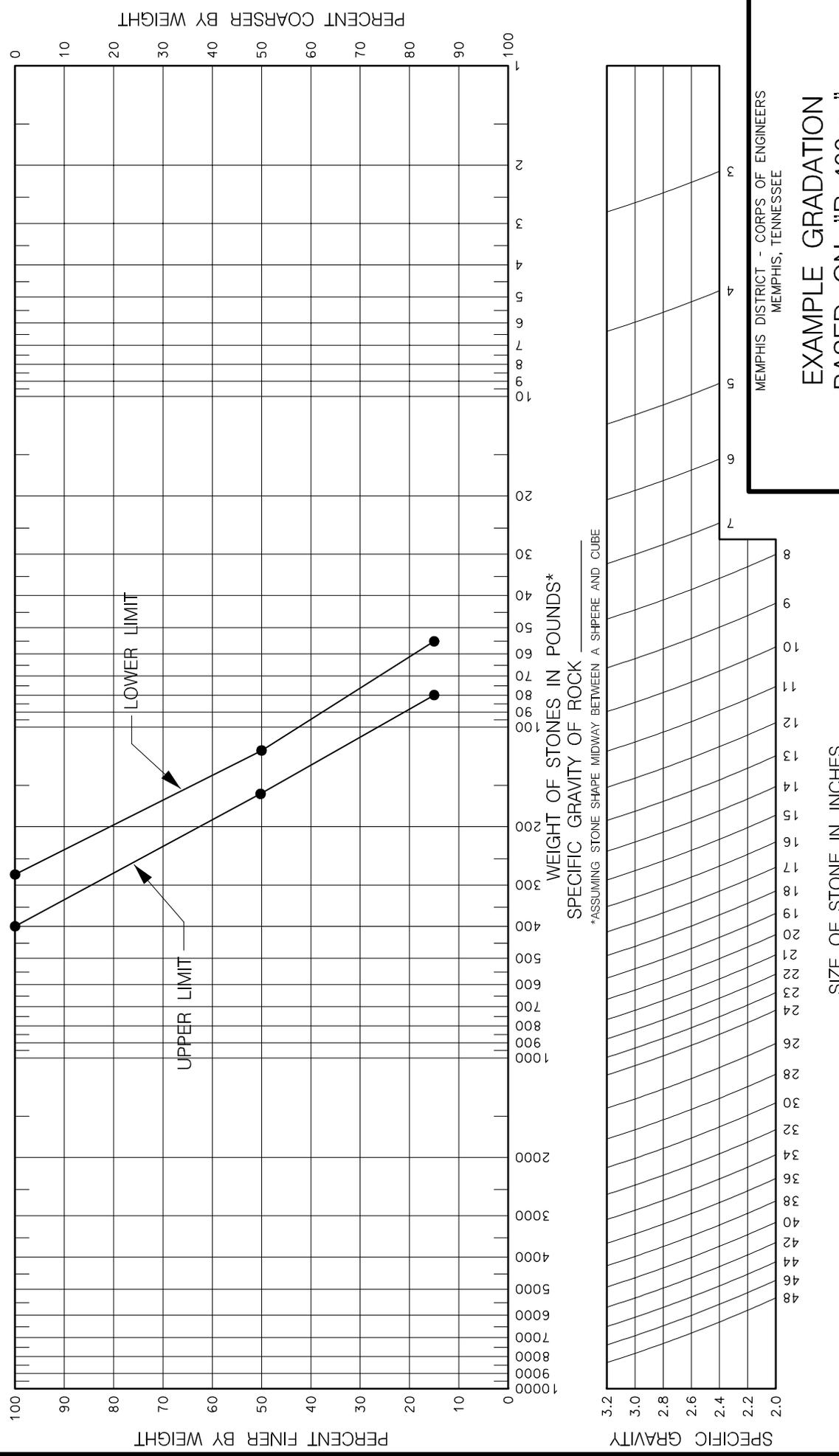
1. Sample Selection. The most important part of the test and the least precise is the selection of a representative sample. No "standard" can be devised; larger quarry run stone is best sampled at the shot or muck pile by given direction to the loader; small graded riprap is best sampled by random selection from the transporting vehicles. If possible, all parties should take part in the sample selection and agree before the sample is run that the sample is representative.
2. Selection of Size for Separation. It is quite possible and accurate to run a gradation using any convenient sizes for the separation, without reference to the specifications. However, it is usually more convenient to select weights from the gradation limits, such as the 90 lbs., 40 lbs., 20 lbs., and 5 lbs. as shown in the following "R-90" example. After the test is plotted on ENG 4055 and a curve drawn, the gradation limits from the specifications shall be plotted.

**EXAMPLE GRADATION - SPECIFICATIONS
BASED ON "R - 400 rev"**

Stone Weight in Lbs.	Percent Finer by Weight
400 - 280	100
160 - 120	50
80 - 55	15

**EXAMPLE GRADATION - WORKSHEET
BASED ON "R - 90"**

Stone Size (lbs)	Weight Retained	Individual % Retained	Cumulative % Ret.	% Pass	
400	0	0	-	100	
300	7500	10	10	90	
200	15000	20	30	70	
140	11250	15	45	55	
90	18750	25	70	30	
	20250	27	97	3	
	2250	3	100	-	
Total Weight	75000lbs				



MEMPHIS DISTRICT - CORPS OF ENGINEERS
MEMPHIS, TENNESSEE

**EXAMPLE GRADATION
BASED ON "R-400rev"**

PROJECT: _____ DATE: _____

RIPRAP GRADATION CURVES

G R A D A T I O N T E S T D A T A S H E E T

Quarry _____ Stone Tested _____

Date of Test _____ Testing Rate _____

T E S T R E P R E S E N T S

Contract No.	District	Tons
TOTAL		

G R A D A T I O N

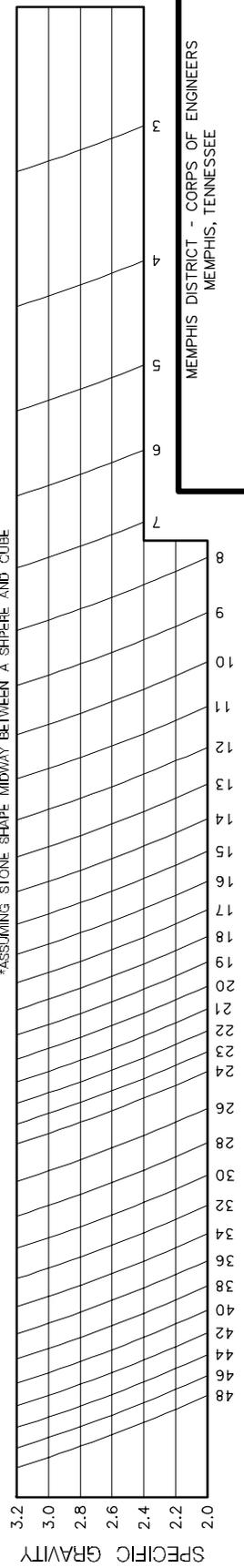
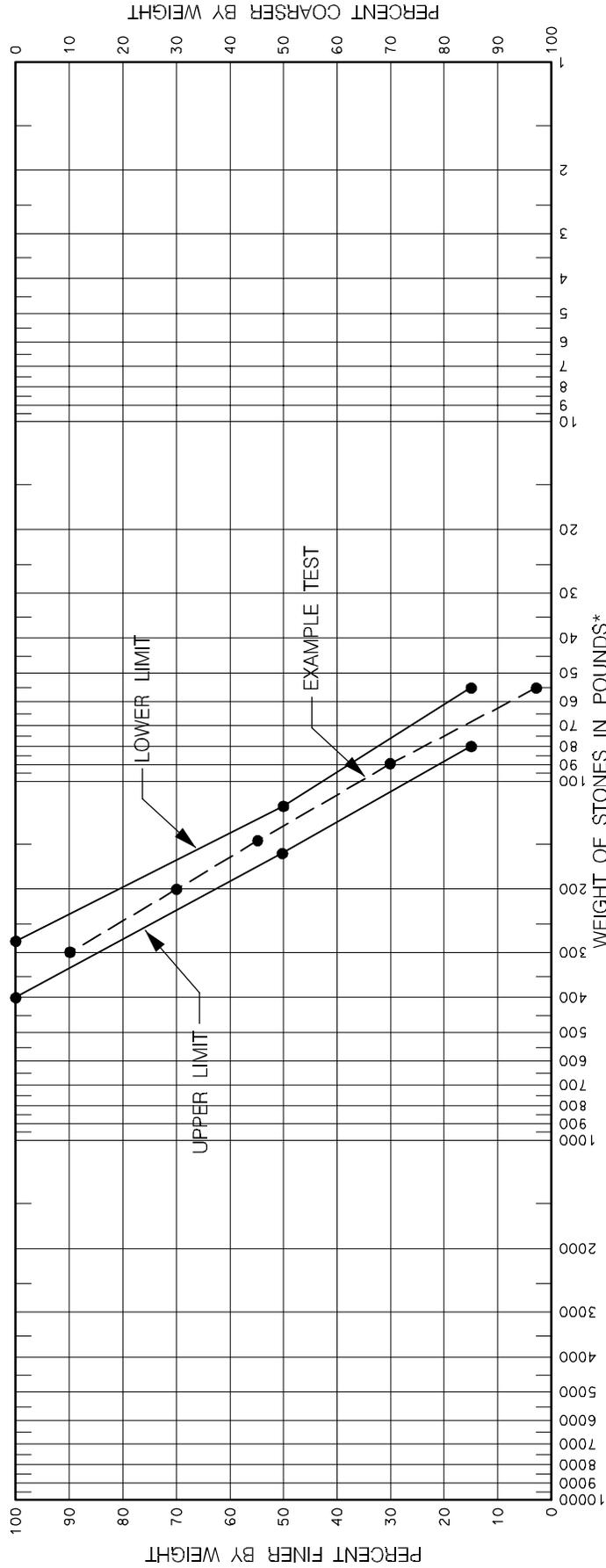
Stone Size (lbs)	Weight Retained	Individual % Retained	Cumulative % Ret.	% Pass	Specification % Finer by wt
Total Weight					

Remarks: _____

I Certify that the above stone sample is representative of the total tonnage covered by this test report.

Contractor Representative _____

Government Representative _____

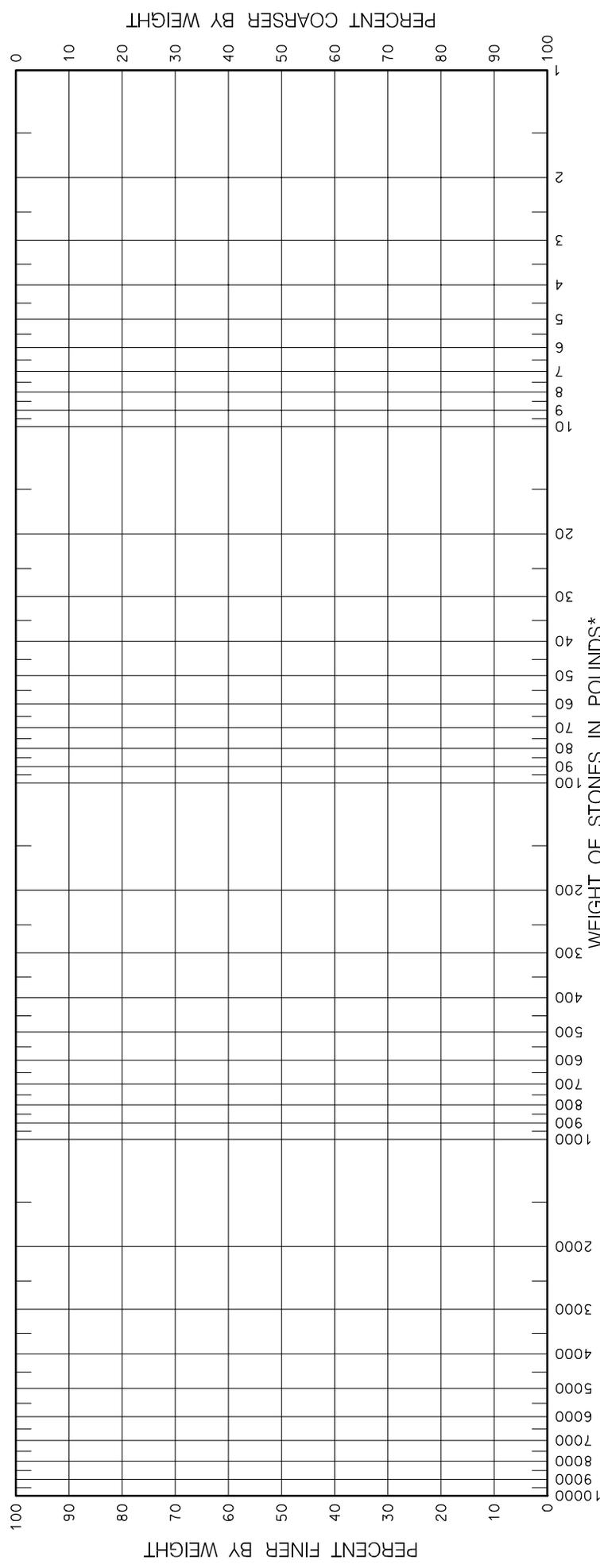


MEMPHIS DISTRICT - CORPS OF ENGINEERS
MEMPHIS, TENNESSEE

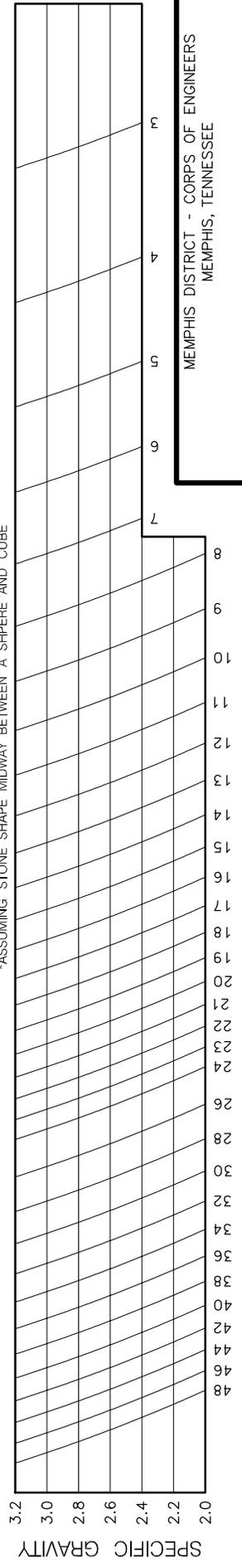
"R-400rev"

PROJECT: _____ DATE: _____

RIPRAP GRADATION CURVES



WEIGHT OF STONES IN POUNDS*
 SPECIFIC GRAVITY OF ROCK _____
 *ASSUMING STONE SHAPE MIDWAY BETWEEN A SPHERE AND CUBE



MEMPHIS DISTRICT - CORPUS OF ENGINEERS
 MEMPHIS, TENNESSEE

PROJECT: _____ DATE: _____

RIPRAP GRADATION CURVES

INSTRUCTIONS

- Section 1 will be initiated by the Contractor in the required number of copies.
- Each transmittal shall be numbered consecutively in the space provided for "Transmittal No.". This number, in addition to the contract number, will form a serial number for identifying each submittal. For new submittals or resubmits mark the appropriate box; on resubmittals, insert transmittal number of last submission as well as the new submittal number.
 - The "Item No." will be the same "Item No." as indicated on ENG FORM 4288 for each entry on this form.
 - Submittals requiring expeditious handling will be submitted on a separate form.
 - Separate transmittal form will be used for submittals under separate sections of the specifications.
 - A check shall be placed in the "Variation" column when a submittal is not in accordance with the plans and specifications--also, a written statement to that effect shall be included in the space provided for "Remarks".
 - Form is self-transmittal, letter of transmittal is not required.
 - When a sample of material or Manufacturer's Certificate of Compliance is transmitted, indicate "Sample" or "Certificate" in column c, Section I.
 - U.S. Army Corps of Engineers approving authority will assign action codes as indicated below in space provided in Section I, column i to each item submitted. In addition they will ensure enclosures are indicated and attached to the form prior to return to the contractor. The Contractor will assign action codes as indicated below in Section I, column g, to each item submitted.
- THE FOLLOWING ACTION CODES ARE GIVEN TO ITEMS SUBMITTED
- | | | | | | |
|---|----|---|----|----|---|
| A | -- | Approved as submitted. | E | -- | Disapproved (See attached). |
| B | -- | Approved, except as noted on drawings. | F | -- | Receipt acknowledge. |
| C | -- | Approved, except as noted on drawings.
Refer to attached sheet resubmission required | FX | -- | Receipt acknowledged, does not comply
as noted with contract requirements. |
| D | -- | Will be returned by separate correspondence. | G | -- | Other (Specify) |
- Approval of items does not relieve the contractor from complying with all the requirements of the contract plans and specifications.

TRANSMITTAL OF SHOP DRAWINGS, EQUIPMENT DATA, MATERIAL SAMPLES, OR DATE
MANUFACTURER'S CERTIFICATES OF COMPLIANCE
(Read instruction on the reverse side prior to initiating this form)

TRANSMITTAL NO.

SECTION I - REQUEST FOR APPROVAL OF THE FOLLOWING ITEMS (This section will be initiated by the contractor)

TO: _____ **FROM:** _____ **CONTRACT NO.** _____

CHECK ONE:
 THIS IS A NEW TRANSMITTAL
 THIS IS A RESUBMITTAL OF TRANSMITTAL _____

SPECIFICATION SEC. NO. (Cover only one section with each transmittal) _____ **PROJECT TITLE AND LOCATION** _____

CHECK ONE: THIS TRANSMITTAL IS FOR FIO GOVT. APPROVAL

ITEM NO.	DESCRIPTION OF ITEM SUBMITTED (Type size, model number/etc.)	MFG OR CONTR. CAT., CURVE DRAWING OR BROCHURE NO. (See instruction no. 8)	NO. OF COPIES	CONTRACT REFERENCE DOCUMENT		CONTRACTOR USE CODE	VARIATION FOR CE USE CODE (See instruction No. 6)	
				SPEC. PARA. NO.	DRAWING SHEET NO.			
a.	b.	c.	d.	e.	f.	g.	h.	i.

REMARKS

I certify that the above submitted items have been reviewed in detail and are correct and in strict conformance with the contract drawings and specifications except as otherwise stated.

NAME AND SIGNATURE OF CONTRACTOR

SECTION II - APPROVAL ACTION

ENCLOSURES RETURNED (List by Item No.) _____ **NAME, TITLE AND SIGNATURE OF APPROVING AUTHORITY** _____ **DATE** _____

ENG FORM 4025-R, OCT 99 (ER 415-1-10) EDITION OF SEP 93 IS OBSOLETE SHEET ____ OF ____ (Proponent: CEMP-CE)

DIVISION 2 - SITE WORK

SECTION 02935

ESTABLISHMENT OF TURF

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SECTION 02935

ESTABLISHMENT OF TURF

PART 1 GENERAL

1.1 SCOPE

The work provided for herein consists of furnishing all plant, labor, equipment, and materials, and performing all operations necessary for dressing, fertilizing, and turfing areas as specified herein and as indicated on the drawings. Fertilizing and/or seeding may be accomplished by aircraft or ground equipment at the option of the Contractor.

1.2 QUALITY CONTROL

The Contractor shall establish and maintain quality control for the work specified in this section to assure compliance with contract requirements and maintain records of his quality control for all construction operations including but not limited to the following:

(1) Preparation of Ground Surface. Location and quality of dressing, including necessary clearing, filling, or dressing out of washes, smoothness and uniformity of surfaces, and time of year.

(2) Fertilizing. Quality of materials, areas fertilized, quantity applied, and method of application.

(3) Seeding. Quality and type of seed, area covered, rate of application, quantity of seed used, and method of distribution.

A copy of these records and tests, as well as the records of corrective action taken, shall be furnished the Government.

1.3 AREAS TO BE TREATED

From approximate Stations 99+60 to 104+40, the combination of dressing, fertilizing, and seeding shall be performed on all surfaces of the excavated material embankment placed in the disposal area, upon surfaces of berm areas between the embankment and the top bank of the improved channel,

and any areas denuded of grass by construction and/or clearing operations.

1.4 MATERIALS

1.4.1 Fertilizer

Fertilizer shall consist of a mixture containing nitrogen, phosphorous, and potash, and shall be uniform in composition and free-flowing. The fertilizer may be delivered to the site in bags or other convenient containers or delivered in bulk. If delivered in bags or containers, the fertilizer shall be fully labeled in accordance with the applicable fertilizer laws of the State of Missouri and shall bear the name, tradename or trademark, and warranty of the producer. The fertilizer shall meet the requirements of the State of Missouri for commercial fertilizer. Should the commercial fertilizer be furnished in bulk, the Contractor shall furnish certified weight tickets and a certified quantitative analysis report, in triplicate, from a recognized testing laboratory certifying the nutrient ratio of the materials. In the event the commercial mixture is delivered to the job site in the original containers, unopened, the analysis report will not be required.

1.4.2 Seed

Seed labeled in accordance with U.S. Department of Agriculture Rules and Regulations under the Federal Seed Act shall be furnished by the Contractor. Seed shall be furnished in sealed, standard containers unless written exception is granted. Seed that is wet or moldy or that has been otherwise damaged in transit or storage will not be acceptable. The specifications for seeds shall conform to the following, unless otherwise approved by the Contracting Office

<u>Kind of Seed</u>	<u>Minimum Purity</u> <u>Percent</u>	<u>Minimum Germination</u> <u>Percent</u>
Switchgrass	95	80
Perennial Rye	95	80
Red Top	95	80
Bermuda Grass	95	80

1.4.3 Soil for Repairs

For fill of areas to be repaired, soil shall be of a quality at least equal to that which exists in areas adjacent to the area to be repaired. Soil used shall be free from roots, stones, and other materials that hinder grading, planting, and maintenance operations and shall be free from objectionable weed seeds and toxic substances.

1.5 CERTIFICATES AND SAMPLES

1.5.1 Fertilizer

Duplicate signed copies of invoices from suppliers shall be furnished. Invoices shall show quantities and percentage of nitrogen, phosphorous, and potash. Upon completion of the project, a final check of the total quantity of fertilizer used will be made against total area treated, and if minimum rates of application have not been met, an additional quantity of material sufficient to make up the minimum application rate shall be distributed as directed.

1.5.2 Seed

The Contracting Officer shall be furnished duplicate signed copies of statements certifying that each container of seed delivered is labeled in accordance with the Federal Seed Act and is at least equal to the requirements specified in 1.4.2 above. This certification shall be obtained from the supplier and shall be furnished on or with all copies of seed invoices.

PART 2 PRODUCTS (Not Applicable)

PART 3 EXECUTION

3.1 COMMENCEMENT, PROSECUTION, AND COMPLETION

3.1.1 General

Preparation of the ground surface, fertilizing, and turfing operations shall be accomplished during the season between 1 March and 31 May, inclusive, and 1 September and 15 November, inclusive, unless otherwise authorized by the Contracting Officer.

3.1.2 Sequence of Work

The sequence of operations for work prescribed in this section shall be as follows:

- (1) Preparation of ground surface.
- (2) Fertilizing.
- (3) Seeding.
- (4) Compacting,.

3.2 PREPARATION OF GROUND SURFACE

3.2.1 General

Equipment, in good condition, shall be provided for the proper preparation of the ground and for

handling and placing all materials.

3.2.2 Clearing

Prior to grading and dressing, vegetation that may interfere with turfing operations shall be removed and shall be disposed of as specified in SECTION 02114, Paragraph 3.2. The surface shall be cleared of roots, cable, wire, and other materials that might hinder the work or subsequent maintenance.

3.2.3 Dressing

Surfaces where the combination of dressing, fertilizing, and seeding is required as specified in 1.3 above shall be prepared for fertilizing and seeding by dressing so as to produce smooth profiles, crown widths, and end slopes. The Contractor shall loosen, except on channel slopes, the soil 4-6 inches deep, by disking, prior to placing the seed.

3.3 APPLICATION OF FERTILIZER

Fertilizer shall be distributed uniformly over the areas to be seeded at a rate which will supply not less than 40 pounds of available nitrogen, 40 pounds of available phosphorous, and 40 pounds of potash per acre. Fertilizer distributed over the surfaces where the combination of dressing, fertilizing, and seeding is required as specified in 1.3 above shall be incorporated into the soil by light disking, harrowing, or other acceptable methods immediately following the application.

3.4 SEEDING

3.4.1 General

Seed sown during the season between 1 March and 31 May, inclusive, shall consist of 20 pounds of Switchgrass, 20 pounds of Perennial Rye, 20 pounds of Red Top, and 20 pounds of hulled Bermuda grass seed, per acre. Seed sown during the season between 1 September and 15 November, inclusive, shall consist 20 pounds of Switchgrass, 20 pounds of Perennial Rye, 20 pounds of Red Top, and 20 pounds of unhulled Bermuda grass seed, per acre. A satisfactory method of sowing shall be employed, using approved mechanical power-drawn seeders, mechanical hand-seeders, broadcast-seeders, or other approved methods. When conditions are such by reason of drought, high winds, excessive moisture, or other factors that satisfactory results are not likely to be obtained, work shall be halted as directed and resumed only when conditions are favorable or when approved alternative or corrective measures and procedures have been effected. If inspection either during seeding operations or after there is a show of green indicates that areas have been left unplanted, additional seed shall be sown if so directed.

3.4.2 Broadcast Seeding

Seed shall be broadcast with approved sowing equipment and distributed uniformly over the areas. Seed shall be covered lightly by brush harrow, spike-tooth harrow, chain harrow, cultipacker, or other approved device. Seed shall not be broadcast during windy weather.

3.4.3 Damage to Seeding

The Contractor shall be fully responsible for any damage to the seeded areas caused by his operations. Areas that become damaged as a result of poor workmanship or failure to meet the requirements of the specifications may be ordered to be repaired and reseeded to specification requirements, without additional cost to the Government

3.5 COMPACTING

Immediately after seeding operations have been completed upon the surfaces where the combination of dressing, fertilizing, and seeding is required as specified in 1.3 above, such surfaces shall be compacted by one pass of a cultipacker, corrugated roller, or other approved equipment weighing 100 to 160 pounds per linear foot of roller. The roller shall be operated parallel to the centerline of the channel.

3.6 HYDRAULIC SLURRY METHOD

In lieu of spreading fertilizer, sowing seed, and compacting as specified hereinabove, the hydraulic slurry method of fertilizing, and seeding or any combination thereof, may be used by the Contractor

3.7 INSPECTION AND ACCEPTANCE.

3.7.1 General

Acceptance of the turfed areas will be determined by visual inspection. Existence of rainwash damage or dead and dying turf will not be acceptable.

3.7.2 Areas Requiring Returfing.

Areas being inspected for completion that do not meet the requirements for completion as specified hereinabove shall be returfed at no additional cost to the Government.

--End of Section--

TRANSMITTAL OF SHOP DRAWINGS, EQUIPMENT DATA, MATERIAL SAMPLES, OR DATE
MANUFACTURER'S CERTIFICATES OF COMPLIANCE
(Read instruction on the reverse side prior to initiating this form)

TRANSMITTAL NO.

SECTION I - REQUEST FOR APPROVAL OF THE FOLLOWING ITEMS (This section will be initiated by the contractor)

TO: _____ **FROM:** _____ **CONTRACT NO.** _____

CHECK ONE:
 THIS IS A NEW TRANSMITTAL
 THIS IS A RESUBMITTAL OF TRANSMITTAL _____

SPECIFICATION SEC. NO. (Cover only one section with each transmittal) _____ **PROJECT TITLE AND LOCATION** _____

CHECK ONE: THIS TRANSMITTAL IS FOR FIO GOVT. APPROVAL

ITEM NO.	DESCRIPTION OF ITEM SUBMITTED (Type size, model number/etc.)	MFG OR CONTR. CAT., CURVE DRAWING OR BROCHURE NO. (See instruction no. 8)	NO. OF COPIES	CONTRACT REFERENCE DOCUMENT		CONTRACTOR USE CODE	VARIATION FOR CE USE CODE (See instruction No. 6)	
				SPEC. PARA. NO.	DRAWING SHEET NO.			
a.	b.	c.	d.	e.	f.	g.	h.	i.

REMARKS

I certify that the above submitted items have been reviewed in detail and are correct and in strict conformance with the contract drawings and specifications except as otherwise stated.

NAME AND SIGNATURE OF CONTRACTOR

SECTION II - APPROVAL ACTION

ENCLOSURES RETURNED (List by Item No.) _____ **NAME, TITLE AND SIGNATURE OF APPROVING AUTHORITY** _____ **DATE** _____

ENG FORM 4025-R, OCT 99 (ER 415-1-10) EDITION OF SEP 93 IS OBSOLETE SHEET ____ OF ____ (Proponent: CEMP-CE)

INSTRUCTIONS

- Section 1 will be initiated by the Contractor in the required number of copies.
- Each transmittal shall be numbered consecutively in the space provided for "Transmittal No.". This number, in addition to the contract number, will form a serial number for identifying each submittal. For new submittals or resubmits mark the appropriate box; on resubmittals, insert transmittal number of last submission as well as the new submittal number.
 - The "Item No." will be the same "Item No." as indicated on ENG FORM 4288 for each entry on this form.
 - Submittals requiring expeditious handling will be submitted on a separate form.
 - Separate transmittal form will be used for submittals under separate sections of the specifications.
 - A check shall be placed in the "Variation" column when a submittal is not in accordance with the plans and specifications--also, a written statement to that effect shall be included in the space provided for "Remarks".
 - Form is self-transmittal, letter of transmittal is not required.
 - When a sample of material or Manufacturer's Certificate of Compliance is transmitted, indicate "Sample" or "Certificate" in column c, Section I.
 - U.S. Army Corps of Engineers approving authority will assign action codes as indicated below in space provided in Section I, column i to each item submitted. In addition they will ensure enclosures are indicated and attached to the form prior to return to the contractor. The Contractor will assign action codes as indicated below in Section I, column g, to each item submitted.
- THE FOLLOWING ACTION CODES ARE GIVEN TO ITEMS SUBMITTED
- | | | | | | |
|---|----|---|----|----|---|
| A | -- | Approved as submitted. | E | -- | Disapproved (See attached). |
| B | -- | Approved, except as noted on drawings. | F | -- | Receipt acknowledge. |
| C | -- | Approved, except as noted on drawings.
Refer to attached sheet resubmission required | FX | -- | Receipt acknowledged, does not comply
as noted with contract requirements. |
| D | -- | Will be returned by separate correspondence. | G | -- | Other (Specify) |
- Approval of items does not relieve the contractor from complying with all the requirements of the contract plans and specifications.

Invitation No. W912EQ-04-B-0001

DIVISION 3 - CONCRETE

THRU

DIVISION 16 - ELECTRICAL

(NOT USED)

D3-TOC-1