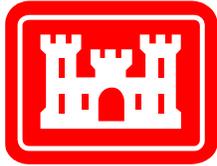


Memphis District

Invitation for Bid No. W912EQ-04-B-0015



**US Army Corps
of Engineers®**

Project Title:

**Revetment Repairs, Dike Repairs and Riprap Upper
Bank Paving**

Location:

**The Ohio and Mississippi Rivers Between Mound
City, Illinois (Ohio River Mile 972) and Mouth of
White River, Arkansas (Mississippi River Mile 599
AHP)**

Construction Solicitation and Specifications

**THIS PROJECT IS LIMITED TO 8(A) ELIGIBLES IN THE FOLLOWING
STATES: ARKANSAS, ILLINOIS, KENTUCKY, MISSISSIPPI,
MISSOURI, AND TENNESSEE**

Date: April 2004

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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 of Section 00010 and are 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. See Section 00700, DFARS Clause 252.236-7004 "PAYMENT FOR MOBILIZATION AND DEMOBILIZATION (DEC 1991)".

b. UNIT OF MEASUREMENT. The unit of measurement is the "lump sum" (LS).

1.2 UNIT PRICE PAYMENT ITEMS

1.2.1 GENERAL

(1) Payment items for the work of this contract on which the contract progress payments will be based are listed in the Bidding Schedule of Section 00010 and are 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.

(2) STONE DELIVERED BY BARGE.

a. MEASUREMENT. Measurement shall be by displacement.

b. BARGE TABLES. The Contractor shall furnish, not later than 5 days after receipt of notice to proceed, a list of barges, by name or number, which he anticipates using on this contract. Additional barge names or numbers shall be furnished during the progress of the work for any additional barges to be used. All barges to be used must have a Mississippi Valley Division (MVD) displacement table in order to be certified. In the event, that not all barges submitted for use are certified, the Contractor shall submit to the Contracting Officer or

designated representative drawings of such barges. The drawings shall show, as a minimum, the length, width, and depth of the barge and dimensions of the rake or rakes. A displacement table will be generated, provided to the Contractor, and incorporated into the MVD Standardized Barge Tables upon certification of the barge. Each table will contain the freeboard of the barge in feet and tenths from zero to the full depth of the barge, and the corresponding gross displacement to the nearest ton. No payment will be made for stone unloaded from uncertified barges until approval has been granted. Approval can be anticipated approximately 4 weeks after submission of the drawings to the Contracting Officer or designated representative.

c. **DISPLACEMENT GAGING LINES.** Each barge shall be suitably marked with two displacement gaging lines on each side of the barge. Each gaging line shall be painted perpendicular to the edge of the barge and be no less than 4 inches wide and 1 foot long on both the deck and side of the barge. Barges with rakes shall have the displacement gage lines placed at each corner of the box section between the rakes. If a barge has a box end or ends, the gaging lines shall be placed approximately four feet from the box end.

d. **DISPLACEMENT DETERMINATION.** The freeboard will be measured at the 4 gaging locations and the displacement determined by the use of the MVD Standardized Barge Tables from the average of these measurements. The displacement shall be determined before and after the barge is unloaded and the difference between these values shall be the quantity delivered. Prior to displacement measurements being taken on loaded or partially loaded barges, the below deck compartments shall be inspected for an excessive amount of water. If an excessive amount of water exists as determined by the Quality Assurance Representative, the barge must be pumped out before displacement measurements are taken. Prior to a partially loaded barge being moved from one task order location to a different task order location, displacement measurements shall be taken of the partially loaded barge to determine the quantity of product off-loaded at the initial site. Upon arrival of the partially loaded barge at the next site, displacement measurements shall be taken again to account for any lost product.

(3) **STONE DELIVERED BY TRUCK.** When stone, not handled by barge, is delivered by truck from a quarry or railroad siding, it shall be weighed on approved scales before being placed in the work. The scales shall be located as near the site of work as practicable and shall be tested as often as necessary to ensure accurate weights, as determined by the Contracting Officer. The Contractor shall furnish the scales and shall weigh the stone in the presence of a Government Quality Assurance Representative, who will certify the correctness thereof. Weight certificates furnished by a public weighmaster will be acceptable in lieu of such procedures when authorized by the Contracting Officer.

1.2.2 UNIT PRICE ITEMS

(1) 125 LB RIPRAP STONE

a. **MEASUREMENT.** See paragraph 1.2.1.(2) or 1.2.1.(3).

b. **PAYMENT.** Payment for 125 LB Riprap Stone satisfactorily placed in the work will be made at the unit price for "125 LB RIPRAP STONE", which price and payment shall constitute full compensation for delivering and placing of the stone and performing all work in accordance with these specifications except that additional compensation at the applicable contract unit price for "OVERBANK STONE PLACEMENT" will be made for stone placed landward of top bank or landward of an obstruction.

c. UNIT OF MEASUREMENT. The unit of measure for stone satisfactorily placed in the work will be the “ton” (TN) (2,000 pounds). Quantities will be computed to the nearest whole ton.

(2) 250 LB RIPRAP STONE

a. MEASUREMENT. See paragraph 1.2.1.(2) or 1.2.1.(3).

b. PAYMENT. Payment for 250 LB Riprap Stone satisfactorily placed in the work will be made at the unit price for “250 LB RIPRAP STONE”, which price and payment shall constitute full compensation for delivering and placing of the stone and performing all work in accordance with these specifications except that additional compensation at the applicable contract unit price for “OVERBANK STONE PLACEMENT” will be made for stone placed landward of top bank or landward of an obstruction.

c. UNIT OF MEASUREMENT. The unit of measure for stone satisfactorily placed in the work will be the “ton” (TN) (2,000 pounds). Quantities will be computed to the nearest whole ton.

(3) GRADED STONE A, SMALL REPAIRS

a. MEASUREMENT. See paragraph 1.2.1.(2) or 1.2.1.(3).

b. PAYMENT. Payment for Graded Stone A, Small Repairs satisfactorily placed in the work will be made at the unit price for “GRADED STONE A, SMALL REPAIRS”, which price and payment shall constitute full compensation for delivering and placing of the stone and performing all work in accordance with these specifications except that additional compensation at the applicable contract unit price for “OVERBANK STONE PLACEMENT” will be made for stone placed landward of top bank or landward of an obstruction.

c. UNIT OF MEASUREMENT. The unit of measure for stone satisfactorily placed in the work will be the “ton” (TN) (2,000 pounds). Quantities will be computed to the nearest whole ton.

(4) GRADED STONE A, LARGE REPAIRS

a. MEASUREMENT. See paragraph 1.2.1.(2) or 1.2.1.(3).

b. PAYMENT. Payment for Graded Stone A, Large Repairs satisfactorily placed in the work will be made at the unit price for “GRADED STONE A, LARGE REPAIRS”, which price and payment shall constitute full compensation for delivering and placing of the stone and performing all work in accordance with these specifications except that additional compensation at the applicable contract unit price for “OVERBANK STONE PLACEMENT” will be made for stone placed landward of top bank or landward of an obstruction.

c. UNIT OF MEASUREMENT. The unit of measure for stone satisfactorily placed in the work will be the “ton” (TN) (2,000 pounds). Quantities will be computed to the nearest whole ton.

(5) RIPRAP UPPER BANK PAVING

a. MEASUREMENT. See paragraphs 1.2.1(2) or 1.2.1(3) above.

b. PAYMENT. Payment for upper bank paving satisfactorily placed in the work will be made at the unit price for “RIPRAP UPPER BANK PAVING”, which price and payment shall constitute full compensation for delivering and placing of all Riprap Upper Bank Paving and performing all work in accordance with these specifications. No separate payment will be

made for preparation of the slope or other incidental work required; these costs shall be included in the contract unit price.

c. UNIT OF MEASUREMENT. The unit of measure for stone satisfactorily placed in the work will be the “ton” (TN)(2,000 pounds). Quantities will be computed to the nearest whole ton.

(6) CRUSHED STONE

a. MEASUREMENT. See paragraph 1.2.1.(2) or 1.2.1.(3).

b. PAYMENT. Payment for Crushed Stone satisfactorily placed in the work will be made at the unit price for “CRUSHED STONE”, which price and payment shall constitute full compensation for delivering and placing of the stone and performing all work in accordance with these specifications except that additional compensation at the applicable contract unit price for “OVERBANK STONE PLACEMENT” will be made for stone placed landward of top bank or landward of an obstruction.

c. UNIT OF MEASUREMENT. The unit of measure for stone satisfactorily placed in the work will be the “ton” (TN) (2,000 pounds). Quantities will be computed to the nearest whole ton.

(7) OVERBANK STONE PLACEMENT (TOP OF BANK TO 300')

a. MEASUREMENT. See paragraph 1.2.1.(2) or 1.2.1.(3).

b. PAYMENT. An additional payment for any type of stone that has to be transported and placed a distance no greater than 300 feet landward of top bank will be made at the unit price for “OVERBANK STONE PLACEMENT (TOP OF BANK to 300’)”, which price and payment shall constitute full compensation for all additional expenses incurred in transporting and placing the stone no more than 300 feet landward of the top of bank or landward of an obstruction whenever the stone cannot be placed by floating barge mounted stone placing equipment. This payment will be in addition to the unit price per ton for the type of stone that is specified to be placed landward of top bank.

c. UNIT OF MEASUREMENT. The unit of measure for stone satisfactorily transported and placed will be the “ton” (TN) (2,000 pounds). Quantities will be computed to the nearest whole ton.

(8) OVERBANK STONE PLACEMENT (300' TO 3,000')

a. MEASUREMENT. See paragraph 1.2.1.(2) or 1.2.1.(3).

b. PAYMENT. An additional payment for any type of stone that has to be transported and placed a distance between 300 feet and 3,000 feet landward of top bank will be made at the unit price for “OVERBANK STONE PLACEMENT (300' to 3,000’)”, which price and payment shall constitute full compensation for all additional expenses incurred in transporting and placing the stone between 300 feet and 3,000 feet landward of top of bank whenever the stone cannot be placed by floating barge mounted stone placing equipment. This payment will be in addition to the unit price per ton for the type of stone that is specified to be placed landward of top bank.

c. UNIT OF MEASUREMENT. The unit of measure for stone satisfactorily transported and placed will be the “ton” (TN) (2,000 pounds). Quantities will be computed to the nearest whole ton.

(9) EARTHWORK

a. MEASUREMENT. Earthwork will be measured for payment using quantities computed from before and after grading surveys. Earthwork quantities will be measured from the ground surface, as determined by a before grading survey and the grade lines as established in the field by the Government Quality Assurance Representative.

b. PAYMENT. Payment for grading or excavation on revetments (bank grading, overbank slope grading) and grading or excavation in a dike field (bankhead excavation, root dike excavation, or key trench excavation) will be made at the applicable unit price for "EARTHWORK", which price and payment shall constitute full compensation for furnishing all labor, equipment, materials, supplies, and performing all grading or excavation as specified by the task orders. The unit price for "EARTHWORK" shall also include the necessary cost of clearing, drift removal, and disposal of debris therefrom for the areas to be graded or excavated.

c. UNIT OF MEASUREMENT. The unit of measurement will be the "cubic yard" (CY). Quantities will be computed to the nearest whole cubic yard.

(10) BREAKING OUT PAVEMENT

a. MEASUREMENT. The unit of measurement for breaking out pavement will be the square (100 square feet).

b. PAYMENT. Payment for breaking out asphalt and/or concrete pavement will be made at the applicable contract unit price for "BREAKING OUT PAVEMENT," but in no case will payment be made for breakout in those areas where only restoration or dressing of subgrade is necessary. The unit price shall constitute full compensation for furnishing all material, equipment and labor for breaking out pavement, breaking concrete or asphalt into the required sizes and using the broken pavement as fill where required, disposing of any excess material, and performing all work incidental thereto.

c. UNIT OF MEASUREMENT. The unit of measurement is the "square" (SQ). Quantities shall be computed to the nearest 1/100 square for payment purposes.

(11) RANGE MARKER

a. MEASUREMENT. The unit of measurement for a range marker satisfactorily placed and painted will be each marker so placed.

b. PAYMENT. Payment for range markers will be made at the applicable contract unit price for "RANGE MARKER," which price shall constitute full compensation for furnishing all materials, equipment and labor; hauling, handling and storage of materials; manufacturing; placing; dressing and finishing the concrete to the required shape; painting the face of the range marker yellow; painting the range number thereon; and performing all operations incidental thereto. Precast range markers which are broken, badly chipped, or otherwise seriously damaged by the Contractor's operations before final acceptance shall be replaced by the Contractor at his expense.

c. UNIT OF MEASUREMENT. The unit of measurement is "each" (EA).

(12) PAINTING RANGE MARKER

a. MEASUREMENT. The unit of measurement for painting a rangemarker will be each existing range marker satisfactorily painted with the proper number.

b. PAYMENT. Payment for painting the range number on a previously placed range marker will be made at the applicable contract unit price for "PAINTING RANGE MARKER" which price shall constitute full compensation for furnishing all equipment, labor, and materials, and for performing the painting. No separate payment will be made for painting range numbers on a range marker constructed and placed under this contract.

c. UNIT OF MEASUREMENT. The unit of measurement is "each" (EA).

(13) RANGE CLEARING

a. MEASUREMENT. The unit of measurement for range clearing will be the square (100 square feet).

b. PAYMENT. Payment for range clearing will be made at the applicable contract unit price for "RANGE CLEARING", which price shall constitute full compensation for furnishing all equipment, labor, and materials, performing all range clearing and disposal of resultant debris and any other work incidental thereto.

c. UNIT OF MEASUREMENT. The unit of measurement is the "square" (SQ). Quantities shall be computed to the nearest whole square.

(14) ISLAND 15 NECK DIKE STONE

a. MEASUREMENT. See paragraph 1.2.1.(2) or 1.2.1.(3).

b. PAYMENT. Payment for repairs to the Island 15 Neck Dike will be made at the applicable contract unit price for "ISLAND 15 NECK DIKE STONE", which price shall constitute full compensation for furnishing all equipment, labor, and materials, performing debris clearing and disposal, transportation of the stone from the river to the dike, and any other work incidental thereto.

c. UNIT OF MEASUREMENT. The unit of measurement is the "ton" (TN)(2,000 pounds). Quantities shall be measured to the nearest whole ton.

(15) DIKE STONE REMOVAL

a. MEASUREMENT. Time will be measured to the nearest tenth of an hour. Time will start when the Contractors floating plant exits the channel to access the dike where stone is to be removed from the dike. Time will continue as long as constructive effort is being made to remove stone from the dike. No time will be charged if any of the equipment necessary to remove stone or construct the apron is inoperative due to equipment failure or lack of personnel. Time will continue until the floating plant returns to the channel.

b. PAYMENT. Payment for dike stone removal will be made at the applicable unit price for "DIKE STONE REMOVAL", which price and payment shall constitute full compensation for furnishing all labor, equipment, supplies, and performing all stone removal as specified by the task order. The unit price for "DIKE STONE REMOVAL" shall also include all the costs of constructing the apron from the stone removed from the dike.

c. UNIT OF MEASUREMENT. The unit of measurement will be the "hour" (HR). Quantities will be computed to the nearest tenth of an hour.

(16) UPSTREAM TOWING

a. MEASUREMENT. Miles will be measured to the nearest whole mile using the "Flood Control and Navigation Maps of the Mississippi River" in effect at the time of the directed move.

b. PAYMENT. Payment for “UPSTREAM TOWING” will be made when the Contracting Officer directs the Contractor to proceed to a jobsite location that is different from the normal downstream movement between locations of work and this directed move causes an increase in miles over what would have been required in the normal progress of the work and as specified in Section 00800. Payment for “UPSTREAM TOWING” will be made at the applicable contract unit price per mile and which price and payment shall include all costs of towing the equipment and materials necessary to perform the work specified at the out of sequence jobsite location of work.

c. UNIT OF MEASUREMENT. The unit of measurement is the “mile” (MI). Quantities shall be computed to the nearest whole mile.

(17) DOWNSTREAM TOWING

a. MEASUREMENT. Miles will be measured to the nearest whole mile using the “Flood Control and Navigation Maps of the Mississippi River” in effect at the time of the directed move.

b. PAYMENT. Payment for “DOWNSTREAM TOWING” will be made when the Contracting Officer directs the Contractor to proceed to a jobsite location that is different from the normal downstream movement between locations of work and this directed move causes an increase in miles over what would have been required in the normal progress of the work and as specified in Section 00800. Payment for “DOWNSTREAM TOWING” will be made at the applicable contract unit price per mile and which price and payment shall include all costs of towing the equipment and materials necessary to perform the work specified at the out of sequence jobsite location of work.

c. UNIT OF MEASUREMENT. The unit of measurement is the “mile” (MI). Quantities shall be computed to the nearest whole mile.

PART 2 PRODUCTS (NOT USED)

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--- End of Section ---

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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 21 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. Anytime barge mounted hydraulic machinery requiring large storage capacities of hydraulic fluid,(i.e. Liebherr Trackhoe, Demag Trackhoe, etc.) is utilized, a plan to prevent discharge of fluids into the river in the event of a broken hydraulic line will be submitted to the Contracting Officer's Representative for approval.

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.

1.2.1.9 PLAN OF BORROW AREA(S)

The Contractor shall include a plan of borrow area(s) for the job site.

1.3 SUBCONTRACTORS

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

1.4 PERMITS OBTAINED BY CORPS OF ENGINEERS

The Corps of Engineers will not obtain any permits for this project. See Contract Clause entitled "PERMITS AND RESPONSIBILITIES".

1.5 REGULATORY REQUIREMENTS

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

1.6 PAYMENT

No separate payment or direct payment will be made for the cost or the work covered under this section, and such work will be considered as a subsidiary obligation of the contractor.

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 developed 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 operative.

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 designated on the contract drawings and 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 BORROW AREAS ON GOVERNMENT PROPERTY

Borrow areas on Government property shall be managed to minimize erosion and to prevent sediment from entering nearby water courses or lakes.

3.1.1.8 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.

3.1.1.9 TEMPORARY EXCAVATION AND EMBANKMENTS

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

3.1.1.10 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.

3.1.1.11 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.

3.1.1.12 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 provide movement of materials or equipment which do 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 along with measures for their protection shall be listed by the Contractor prior to beginning of construction operations. All work or other activities that could affect the Interior Least Tern, Pallid Sturgeon, or other listed species must be specifically approved by the Contracting Officer.

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 applicable state air pollution regulations 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 competent 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). The Contractor shall comply with any instructions from the responding agency concerning containment and/or cleanup of the spill.

-- End of Section --

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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 (1994a) 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 (1993b) 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 Applicable)

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 21 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 who 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.

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 signed by an authorized official of the firm which describes the responsibilities and delegates sufficient authorities to adequately perform the functions of the CQC System Manager, including authority to stop work which is not in compliance with the contract. The 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.

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 shall complete the course entitled "Construction Quality Management for Contractors". This requirement must be met not later than 60 days after award of the contract unless the CQC Systems Manager(s) produces a valid certificate from prior course. This course is periodically offered by the Memphis District as well as other Corps Districts.

3.5 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 is 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 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 costs associated with the validation of the 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 paragraph 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 workmanship 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--

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SECTION 02544 STONE

PART 1 GENERAL

1.1 SCOPE

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, it is the Contractor's responsibility to determine that the new stone source(s) is capable of supplying the quantities and gradation needed and at the rate needed to maintain the scheduled progress of the work. Stone 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.

1.2 SOURCES AND EVALUATION TESTING.

Stone shall be obtained in accordance with the provisions of Paragraph 1.14, Section 00800. The Contractor shall submit suitable test reports and service records to show the acceptability of the stone. If the Contractor proposes to furnish stone from a source not currently posted, the Contractor will make such investigations as necessary to determine whether acceptable stone can be produced from the proposed source. Satisfactory service records on work outside the Corps of Engineers will be acceptable. If no such records are available, the Contractor will make tests to assure the acceptability of the stone. The tests to which the stone 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 stone. Stone that weighs less than 155 lbs/cf. or has more than 2% absorption will not be accepted unless other tests and service records show that the stone 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 stone 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 a Waterways Experiment Station approved testing laboratory. The cost of testing will be borne by the Contractor.

1.3 STONE TESTING 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 reference thereto:

U.S. Army, Corps of Engineers Handbook for Concrete and Cement (CRD).

CRD-C 103-94 Standard Test Method for
Sieve Analysis of Fine

and Coarse Aggregates

CRD-C 106-93	Standard Test Method for Unit Weight and Voids in Aggregate
CRD-C 107-94	Standard Test Method for Specific Gravity and Absorption of Coarse Aggregate

1.4 QUALITY CONTROL.

The Contractor shall inspect all stone before it is incorporated into the work for compliance with contract requirements and any stone found to be out of compliance will be rejected. All information pertaining to the inspection shall be recorded and included in quality control reports furnished the Contracting Officer. The original and two copies of these records, as well as the records of corrective action taken, shall be furnished the Government daily.

The inspections shall include, but will not be limited to, the following:

(1) Submission of stone samples for quality testing, if from other than approved sources.

(2) Cleanliness of stone.

(3) Quantity of stone delivered and placed each day.

(4) Gradation of Stone. Gradation tests of stone shall be accomplished at the quarry. Tests by weight shall be made by the Contractor in the presence of the Contracting Officer's Representative. The Contractor shall notify the Contracting Officer not less than 3 days in advance of each test. If the Government representative is unavailable, the Contractor shall perform the tests and certify to the Contracting Officer that the stone shipped complies with the specifications. A minimum of one test shall be performed for each 50,000 tons of Graded Stone A supplied to the Government from each source. A minimum of one test shall be performed for each 25,000 tons of 125 LB Riprap Stone and for each 25,000 tons of 250 LB Riprap Stone supplied to the Government from each source. A minimum of one test shall be performed for each 5,000 tons of Crushed Stone supplied to the Government from each source. Each test sample shall be representative of the stone being shipped and shall consist of not less than 50 tons for Graded Stone A and not less than 15 tons each for 125 LB Riprap Stone, 250 LB Riprap Stone, and Crushed Stone. Percentage determinations shall be made for each stone weight specified in paragraphs 2.1, 2.2, 2.3, and 2.4 of this section. Gradation test data shall be recorded on LMV Form 602-R, "Gradation Test Data Sheet," a copy of which is shown at the end of this section. Failure of the test on the initial sample and on an additional sample will be considered cause for rejection of the quarry and/or quarry process, and all stone represented by the failed tests shall be set aside and not incorporated into the work. Any additional tests required because of the failure of an initial test sample will not be considered as one of the other required tests. Certification and test results will represent stone shipped from the quarry and must be received by the Government representative before the stone is used in the work. The Contractor shall designate on the test form that portion (in tons) of the lot tested which is

applicable to this contract. Any deviation from the reported tonnage shall be corrected on a revised gradation test form. The Contracting Officer may direct, under the Contract Clause "Inspection of Construction", additional testing of stone furnished to the worksite if the stone appears, by visual inspection, to be of questionable gradation or quality. Refer to the following standard gradation test methods.

1.5 MVD STANDARD TEST METHOD FOR GRADATION OF RIPRAP

- A. Select a representative sample (See Note), weigh and dump on hard stand.
- B. Select specific sizes (see example) on which to run "individual weight larger than" test. 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 by "size larger than" the selected weights, starting with the larger sizes. Use reference stones, with identified weights, for visual comparison in separating the obviously "larger than" stones. Stones that appear close to the specific weight must be individually weighed to determine size grouping. Weigh each size group, either individually or cumulatively.
- E. Paragraph D above will result in "individual weight retained" figures. Calculate individual percent retained (heavier than) and compare this with the specifications.

Note

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.

Example Gradation Specifications

<u>Stone Weight in Lbs</u>	<u>Individual Percent Retained</u>
75-125	10 Max
25-75	40-60
6-25	20-40
0-6	15 Max

Example Worksheet

<u>Stone Size</u> <u>Lbs</u>	<u>Individual</u> <u>Wt. Retained</u>	<u>Individual</u> <u>Percent Retained</u>	<u>Specifications</u>
---------------------------------	--	--	-----------------------

>125	0	0	0
75-125	2,600	8	10 Max
25-75	16,200	50	40-60
6-25	10,000	32	20-40
0-6	<u>3,200</u>	10	15 Max
Total	32,000 lbs.		

NOTE: Largest stone 120 lbs.

1.6 MVD STANDARD TEST METHOD FOR GRADATION OF GRADED STONE A

- A. Select a representative sample (Note #1), weigh and dump on hard stand.
- B. Select specific sizes (see example) on which to run "individual weight larger than" test. (See Note #2.) 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 by "size larger than" the selected weights, starting with the larger sizes. Use reference stones, with identified weights, for visual comparison in separating the obviously "larger than" stones. Stones that appear close to the specific weight must be individually weighed to determine size grouping. Weigh each size group, either individually or cumulatively.
- 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). Plot percent passing, along with the specification curve on ENG Form 4055, a copy of which is shown at the end of this section.

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; large 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. After the test is plotted on a curve, then the gradation limits may be plotted. Overlapping gradations with this method are no problem. It is usually more convenient, however, to select points from the gradation limits, such as the minimum 50% size, the minimum 15% size, and one or two others, as separation points.

Example Gradation Specifications

<u>Stone Weight</u> <u>in Lbs</u>	<u>Cumulative Percent</u> <u>Finer by Weight</u>
--------------------------------------	---

5,000	100
2,500	70 - 100
500	40 - 65
100	20 - 45
5	0 - 15
1	0 - 5

Example Worksheet

<u>Stone Size</u> <u>Lbs.</u>	<u>Individual</u> <u>Wt. Retained</u>	<u>Individual</u> <u>Percent Retained</u>	<u>Cumulative</u> <u>% Retained</u>	<u>% Passing</u>
5,000	0	0	0	100
2,500	15,000	15	15	85
500	35,000	35	50	50
100	25,000	25	75	25
5	24,000	24	99	1
1	<u>1,000</u>	1	100	0
	Total 100,000			

NOTE: Largest stone 3,725 lbs.

PART 2 PRODUCTS

2.1 125 LB RIPRAP STONE.

Except as indicated by the following tolerances, 125 lb. riprap stone shall be in pieces weighing not less than 6 pounds each nor more than 125 pounds each, and no dimensions shall be over 20 inches. Each shipment shall be graded as follows:

<u>Weight of Pieces in Pounds</u>	<u>Percent of Total Weight</u>
75 to 125	10 maximum
25 to 75	40 to 60
6 to 25	20 to 40
0 to 6	0 to 15

Note: Not more than 5 percent shall pass a one-inch sieve.

2.2 250 LB RIPRAP STONE.

Except as indicated by the following tolerances, 250 lb. riprap stone shall be in pieces weighing not less than 6 pounds each nor more than 250 pounds each, and no dimensions shall be over 24 inches. The least dimension of any piece shall be not less than one-third the length. Each shipment shall be reasonably well graded approximately as follows:

<u>Weight of Pieces in Pounds</u>	<u>Percent of Total Weight</u>
200 - 250	5 maximum
75 - 200	10 - 50
25 - 75	20 - 60
6 - 25	10 - 40
0 - 6	15 maximum

Note: Not more than 5 percent shall pass a one-inch sieve.

2.3 CRUSHED STONE.

Crushed stone shall be free from dirt and fines and shall be graded from fine to coarse and fall within the following gradation limits:

<u>Sieve Size</u> U.S. Standard <u>Square Mesh</u>	<u>Cumulative</u> <u>Percent Passing</u> <u>by Weight</u>
4-Inch	100
1-Inch	0-75
No. 4	0-5

2.4 GRADED STONE A.

Each shipment of Graded Stone A used in the work shall conform to the gradation curve at the end of this section. The gradation of the stone furnished shall lie within the band between the two heavy lines indicated on the chart. Material smaller than 1-pound size may include dirt and foreign materials accumulated from interledge layers or from blasting or loading operations.

PART 3 EXECUTION (NOT APPLICABLE)

- - End of Section - -

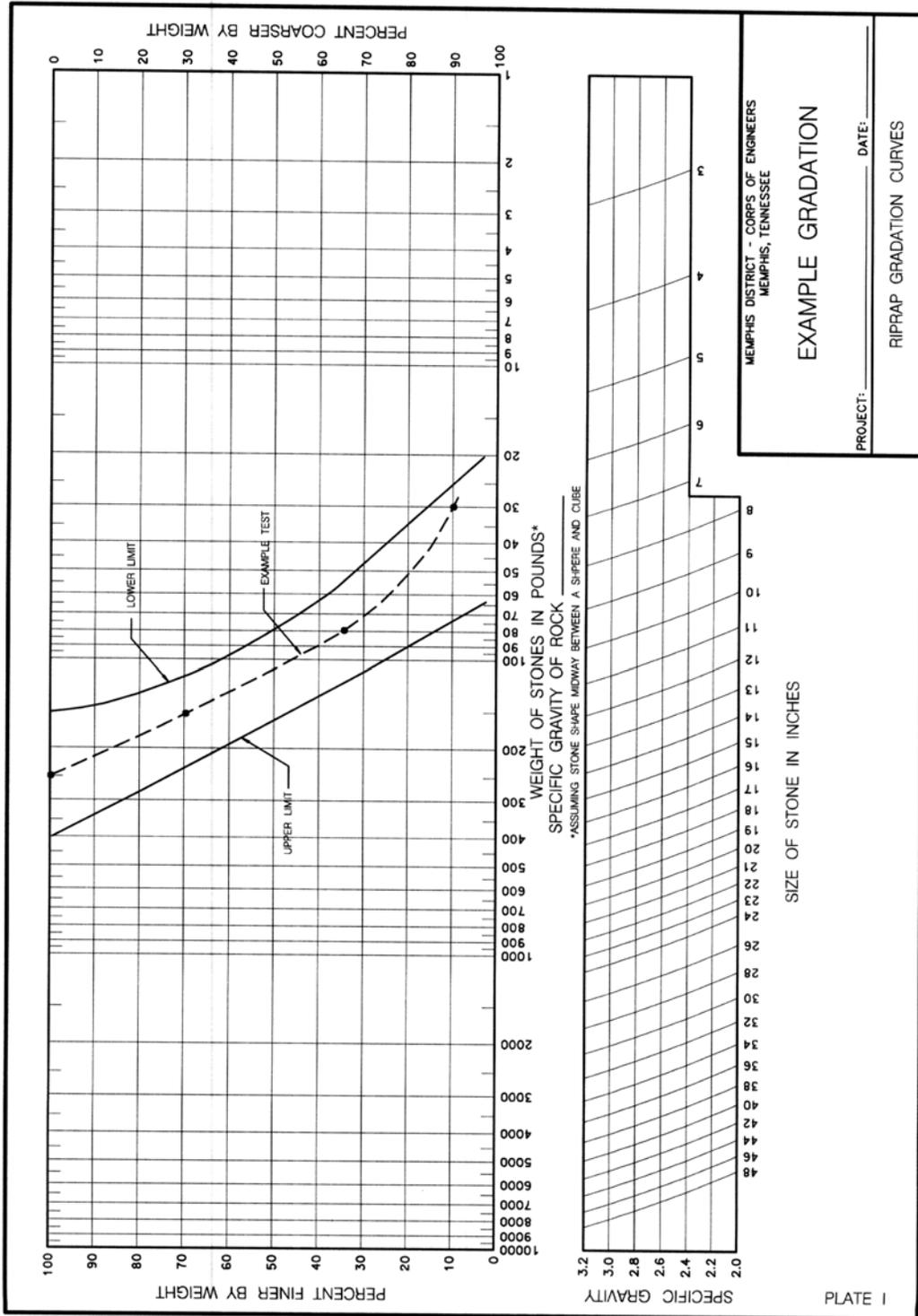


PLATE I

GRADATION TEST DATA SHEET

Quarry _____ Stone Tested _____

Date of Test _____ Testing Rate _____

TEST REPRESENTS

Contract No.	District	Tons
TOTAL		

GRADATION

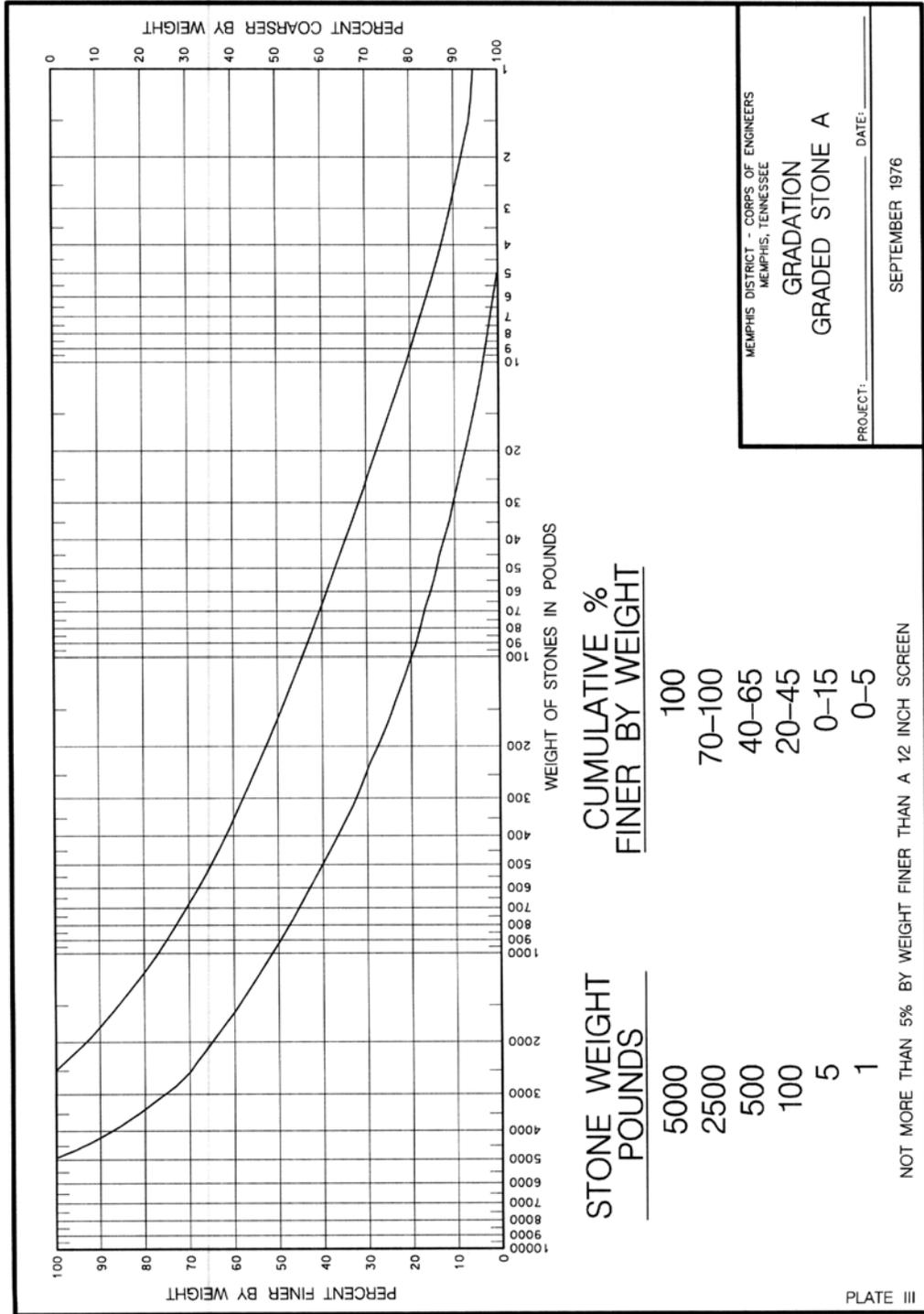
Stone Size (lbs)	Individual Weight Retained	Individual % Retained	Cumulative		Specification
			%Coarser	%Finer	% Finer by wt
Total Weight					

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
**GRADATION
 GRADED STONE A**
 PROJECT: _____ DATE: _____
 SEPTEMBER 1976

III PLATE

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SECTION 02545 REVETMENT REPAIRS

PART 1 GENERAL

1.1 SCOPE

The work provided for herein consists of furnishing all materials, equipment, and labor; performing grading, excavation, and breaking out pavement; and placing earth fill, crushed stone, riprap stone, and graded stone A required by the task orders for revetment repairs.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.1 EARTHWORK

3.1.1 GRADING

The work consists of shaping and sloping of bluff banks where failures have occurred in the bank paving. It may also include reshaping of damaged drains and constructing new drains; reshaping of overbank areas within 3,000 feet of top bank; and any incidental work as may be required by the task order. Material resulting from the grading operations, including broken pavement, if any, shall be used for making fills where required, including the restoration of deficient slopes. All grading and filling shall be done to the lines and grades as staked in the field or as specified. Material used in making fills or restoring the subgrade shall be free from roots, brush or other debris; and shall be placed in layers not to exceed one foot in thickness. Each layer shall be thoroughly compacted to a density at least equal to that of the adjacent undisturbed earth. Excess material may be wasted in the river or spread on the slope adjacent to the area of repair.

3.2 BREAKING OUT PAVEMENT

3.2.1 GENERAL

The work consists of the breaking out of concrete or asphalt pavement in damaged or undermined areas of pavement. The concrete pavement is approximately 4 inches in thickness, and the asphalt pavement is approximately 5 inches in thickness. The Quality Assurance Representative, prior to the start of work, will mark the area of pavement to be broken out. Any additional areas to be broken out adjacent thereto will be marked as required as the work progresses. Any pavement that is damaged by the Contractor's operations, outside the limits to be broken out shall be repaired by the Contractor at his expense. The breaking out may be done by any method which will accomplish the results desired and will not damage paving outside the limits marked.

3.2.2 CONCRETE BREAKOUT

Damaged or undermined monolithic, articulated or slab concrete shall be broken into pieces not exceeding 18 inches in any dimension. The pieces shall be left on the subgrade where broken.

In areas where grading may be required, the concrete shall be broken out to the extent necessary to permit grading the bank to slopes suitable for paving and the broken concrete used in making fills adjacent to the breakout.

3.2.3 ASPHALT BREAKOUT

Generally, asphalt breakout will be limited to areas requiring grading of the bank to slopes suitable for paving. The broken asphalt shall be used to the extent possible in making fills adjacent to the breakout. When broken asphalt is used in making fills, the pieces shall not exceed 18 inches in any dimension. The broken asphalt that is not used for fill shall be spread out sufficiently to avoid abrupt humps on the adjacent paving. In areas where asphalt is damaged and grading of bank is not required, stone may be placed on top of the broken or damaged asphalt to the extent necessary to cover the damaged area.

3.2.4 REMOVAL OF DRIFT AND CLEARING

Accumulations of drift shall be removed from the areas to be repaired. Clearing will not generally be necessary; however, any trees, stumps or brush in the areas where repair work is prescribed shall be cut off flush with the ground or to an elevation 1 foot below the top of the fill, and removed from the area. The debris shall be disposed of as specified in Section 02546.

3.2.5 PREPARATION OF SUBGRADE

In areas where grading or excavation is required, the subgrade shall be dressed to a uniform surface suitable for paving. In other areas where crushed stone or riprap is specified, the subgrade shall be dressed as necessary to provide an even surface for paving or to provide for a suitable tie to the existing paving.

3.3 STONE WORK

3.3.1 GENERAL

Crushed stone, riprap stone, and/or Graded Stone A may be used to repair failure areas in existing paving or to protect the upstream, downstream, and landward areas adjacent to an existing revetment (no work will be required more than 3,000 feet landward of top bank). Where stone placement is specified within 3,000 feet landward of top bank and cannot be placed solely by a barge-mounted dragline, the applicable contract unit price for "OVERBANK STONE PLACEMENT" will be added in accordance with Section 01025. Stone shall be placed on the bank or overbank area by crane or dragline equipped with skip, grapple, clamshell, or rock bucket; by front-end loader or bulldozer; or by trucks or other methods approved by the Contracting Officer. Unless otherwise approved by the Contracting Officer, the maximum capacity of dragline buckets used to place riprap paving stone on the bank will be limited to 3 cubic yards.

3.3.2 CRUSHED STONE

Crushed stone may be required for use under riprap paving as a filter blanket. Crushed stone filter blanket is normally placed 4 inches in thickness above the water surface, 6 inches in thickness in drains and in the amount of two (2) tons per square (100 sq. ft.) when placed below the water surface. Placement above the water shall be to the lines and grades specified or as

staked in the field; below the water surface, in the amount specified or as directed at the time of placing.

3.3.3 RIPRAP STONE

Riprap stone, either the 125 LB or the 250 LB gradation may be required for use in constructing paving, scour hole repair, stone fill, stone spurs, stone landward of an obstruction and making other repairs to a revetment slope or within 3,000 feet of top of bank of the revetment. It is contemplated that, when 250 LB riprap is specified, the quantities will be in increments of a barge load of approximately 1,000 tons for placement at one or more nearby locations.

3.3.4 GRADED STONE A

Graded Stone A may be required for use in constructing paving, scour hole repair, stone fill, stone spurs, stone landward of an obstruction and making other repairs to revetment slope or within 3,000 feet of top of bank of the revetment. It is contemplated that the quantities required will be in increments of a barge load of approximately 1,000 tons for placement at a single revetment. When less than 10,000 tons of Graded Stone A is specified in the task order at a single revetment, the stone shall be considered "GRADED STONE A, SMALL REPAIRS" for payment purposes. When 10,000 tons or more of Graded Stone A is specified in the task order at a single revetment, the stone shall be considered "GRADED STONE A, LARGE REPAIRS" for payment purposes. A task order may be amended for more or less than 10,000 tons to change the quantity and thus the pay item before commencement of work on that task order.

3.3.5 PAVING

Paving shall be placed in the areas specified by the task order. Rearrangement by hand may be necessary to provide complete coverage of the specified area with an average thickness of 10 inches for 125 LB riprap and 12 inches for 250 LB riprap. A tolerance of 2 inches above or below the average thickness will be allowed. Openings between stones exposing more than 4 square inches of the graded bank will not be allowed. Spalls and quarry chips may be used as a base but not as a filler. In underwater placement, the stone shall be uniformly distributed at the rate of 8 tons per square unless another rate is specified by the task orders.

3.3.6 SCOUR HOLE REPAIR LANDWARD OF TOP BANK

Scour Hole Repair Landward Of Top Bank is defined as the placement of riprap stone, either the 125 LB or 250 LB size, no more than 30 feet down the graded banks of the scour hole and at the rate specified by the task order. No scour hole repair will be required more than 3,000 feet landward of top bank. Where placement of the riprap stone cannot be placed by a barge-mounted dragline, the applicable contract unit price for "OVERBANK STONE PLACEMENT" will be added to the contract unit price of the stone size specified by the task order.

3.3.7 STONE FILL

Stone fill is defined as the placement of riprap stone, either of the 125 LB size, 250 LB size, or Graded Stone A, in holes or depressions whenever a uniform rate of placement cannot be specified. A stone fill area, as specified by a task order, may be required to be constructed above the water surface, below the water surface, or landward of top bank. No stone fill will be required more than 3,000 feet landward of top bank. Where stone fill, landward of top bank, cannot be placed by a barge mounted dragline, the applicable contract unit price for

“OVERBANK STONE PLACEMENT” will be added to the contract unit price of the type stone specified by the task order.

3.3.8 STONE SPURS

In the repair or prevention of overbank scour, riprap stone of the 125 LB or 250 LB gradation, or Graded Stone A, may be required to construct or repair spurs landward of top bank. A spur is a stone structure with a crown width, a top elevation, and side slopes. It usually ties into the revetment paving and extends landward at varying angles with top bank. Extensions of existing overbank spurs may also be required. The height of stone spurs will usually be from 3 to 6 feet. Work will not extend beyond 3,000 feet landward of the top of the bank. The location, alignment, and dimensions of the overbank spurs shall be as described in the task order. Where overbank stone spurs are specified and cannot be placed solely by a barge-mounted dragline, the applicable “OVERBANK STONE PLACEMENT” pay item will be added to the contract unit price of the type stone specified.

3.3.9 STONE PLACEMENT LANDWARD OF AN OBSTRUCTION

Stone Placement Landward of an Obstruction is defined as the placement of stone, accomplished by hauling equipment or other means approved by the Contracting Officer, in a location on a revetment slope which cannot be reached by a barge-mounted dragline due to an obstruction. An example of an obstruction would be a grain elevator loading dock. Whenever placement of stone landward of an obstruction is specified by the task order, the applicable “OVERBANK STONE PLACEMENT” pay item will be added to the contract unit price of the type stone specified.

3.4 RANGE MARKER AND RANGE CLEARING

See Section 02546.

3.5 QUALITY CONTROL

During performance and after completion, the Contractor shall inspect the revetment stone repairs for compliance with the contract requirements and record the inspection of all operations including, but not limited to, the following:

- (1) Bank grading, excavating or reshaping damaged drains through the paving, placing graded material into fill areas, and disposing of waste material.
- (2) Breaking out pavement within specified limits.
- (3) Disposition of cleared material, drift, and other debris.
- (4) Preparation of subgrade for paving.
- (5) Size and weight of stone.
- (6) Placement of crushed stone, riprap stone, and Graded Stone A including rearrangement and completion of work.

The Contractor shall furnish the Government a copy of these records and tests, as well as the records of corrective action taken.

-- End of Section --

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SECTION 02546
RANGE MARKERS AND RANGE CLEARING

PART 1 GENERAL.

1.1 SCOPE.

The work provided for herein consists of furnishing all materials, equipment, and labor, and performing all work necessary for the manufacture and placing of concrete range markers; for painting range numbers on new and existing range markers; and for range clearing.

PART 2 PRODUCTS. (NOT USED)

PART 3 EXECUTION.

3.1 LOCATION OF MARKERS.

Concrete range markers shall be established where indicated in the task orders. One marker per range shall be placed at approximately mid-bank, (+15 LWRP).

3.2 DISPOSAL OF CLEARED MATERIAL AND OTHER DEBRIS.

3.2.1 GENERAL.

All debris resulting from construction operations on this contract shall, at the Contractor's option, be disposed of by windrowing adjacent to the repair limits or removing from the site.

3.2.2 DISPOSAL.

Small growth and brush from range clearing may be trimmed and left flat on the slope of the cleared area. Trees and debris from range clearing may be windrowed along the downstream edge of the clearing. Debris from other repair areas may be placed in windrows or small piles adjacent to the limits of the work. Tree limbs shall be trimmed sufficiently to make the windrows or piles as small as practicable. The Contractor may elect to remove all debris resulting from contract operations from the site of the work. 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 these specifications.

3.3 RANGE MARKERS.

3.3.1 CAST-IN-PLACE MARKERS.

In establishing cast-in-place range markers, the concrete shall be placed on top of and worked into the voids of the undisturbed riprap paving. The marker shall be not less than 12 inches in thickness above the stone on the landward side and taper to about 6 inches in thickness above the stone on the river side. The marker shall be of sufficient size to provide an even surface not less

than 3 feet long and 2 feet wide. The exposed face of the marker shall be finished to a surface suitable for painting.

3.3.2 PRECAST MARKER.

Precast concrete markers will be acceptable, and may be formed with hooks or eyes to facilitate the handling operations. The size of the marker shall be not less than 3 feet by 2 feet and not less than 14 inches in thickness along one side of the 3-foot dimension and taper to 10 inches on the other side. The exposed face of the marker shall be finished to a surface suitable for painting. When placing precast markers, the existing stone shall be removed from the site and the subgrade dressed to a smooth surface. The thick side of the marker shall be placed landward. The stone which was removed from the site shall be placed around the edges of the marker in such a way as not to obscure the exposed face.

3.3.3 CONCRETE FOR MARKERS.

3.3.3.1 COMPOSITION.

The concrete mixture used shall be composed of one part Portland cement, two parts fine aggregate and three parts coarse aggregate by volume, or a commercially available dry concrete mixture known as "Sakrete" or equal, will be acceptable.

3.3.3.2 STORAGE.

Cement or prepared dry mix concrete shall be stored at the site of the work in an approved manner to prevent the absorption of moisture.

3.3.3.3 WATER.

Water used in mixing concrete shall be fresh and free from injurious amounts of sewage, oil, acid, alkali, salts, or organic matter. River water will normally meet these requirements.

3.3.3.4 WATER CONTENT.

The water content of all concrete mixtures shall be the minimum necessary to properly place the mixture being used.

3.3.3.5 MEASUREMENTS.

The proportions of all material quantities entering into the concrete shall be determined by volumetric measurements.

3.3.3.6 CONTROL.

The Contractor shall provide all necessary equipment and plant to determine and control the amounts of materials entering each batch unless a commercially prepared premixed, premeasured product is used.

3.3.3.7 BATCHING AND MIXING EQUIPMENT.

Adequate facilities shall be provided for accurate measurement and control of the materials entering the concrete. Mixing by hand in a waterproof container will be acceptable.

3.3.3.8 MIXING.

The concrete shall be mixed until the consistency and composition is such that it can be worked readily with a shovel or other suitable tool.

3.3.3.9 TIME INTERVALS BETWEEN MIXING AND PLACING.

Concrete shall be placed before initial set has occurred and within 10 minutes after mixing. The area where the marker is to be placed shall be wetted prior to placing concrete.

3.3.3.10 CONVEYING.

Concrete shall be conveyed from the mixer to the locations at which it is to be used as rapidly as practicable by methods which will prevent segregation or loss of ingredients. There shall be no vertical drop greater than three feet.

3.3.3.11 CURING.

The range markers shall be cured with a commercially available liquid membrane-forming compound. The compound shall be applied in accordance with the manufacturer's directions not later than 1 hour after finishing the marker surface.

3.3.3.12 COVERING AND PROTECTING.

The Contractor shall take steps as may be necessary to protect green concrete during freezing or rainy weather. Freshly poured concrete shall be covered with a tarpaulin or some other approved means of protection with air space between concrete and the cover. Concrete which is damaged due to lack of proper protection from freezing or rain will be rejected, and shall be replaced by the Contractor at his expense.

3.4 PAINTING RANGE MARKERS.

The range number shall be painted on all range markers placed under this contract. Where specified in the task orders or directed by the Quality Assurance Representative, range numbers shall be painted on previously placed range markers. All paint used on the range markers shall be durable, weather resistant, and suitable for use on concrete. The face of the range marker shall be cleaned as necessary prior to painting to assure proper adherence of the paint. The riverside face of the range marker shall first be painted yellow and allowed to dry. Numerals (and letter, where applicable) shall be painted black. They shall be as large as practical and still permit placing the full range number on the yellow, riverward face of the marker. As an example, a marker to be painted at range 150+00 shall be painted "150" only; or at range 150+00U painted "150U." The width of the painted line shall be approximately one inch. Lettering may be made freehand with a paint brush or may be stenciled with a spray can, or may be accomplished by any method approved by the Contracting Officer which will produce a neat, legible number.

3.5 RANGE CLEARING.

Range clearing shall consist of removing drift, if any, and cutting vegetation and any trees (generally not over 4 inches in diameter) which obscure the 1,000-foot spaced range markers. The trees and vegetation shall be cut off at a height not greater than 6 inches above the paving from the top range marker down the slope to the end of the obstruction. The width of clearing

shall be 20 feet or as directed. Debris resulting from range clearing shall be disposed of as specified in 3.2 above.

3.6 QUALITY CONTROL.

The Contractor shall inspect all range markers and range clearing for compliance with the contract requirements and record the inspection of all operations including, but not limited to the following:

- (1) Storage of cement or dry mix concrete.
- (2) Storage of fine and coarse aggregate.
- (3) Batching and mixing.
- (4) Conveying, placing, and finishing.
- (5) Protection.
- (6) Location and placement of range markers.
- (7) Cleaning as necessary and painting range numbers on range markers.
- (8) Width and completeness of range clearing.
- (9) Disposition of clearing debris.

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

-- End of Section --

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SECTION 02547 DIKE REPAIRS

PART 1 GENERAL

1.1 SCOPE.

The work provided for herein consists of furnishing all materials, equipment, and labor for making stone repairs to dike fields in the Mississippi River and the construction of dike hard points. The work consists of grading and paving areas of damaged dike bankheads, placing stone fill in areas of dikes where damage has occurred, the razing or removal of stone from a dike and performing overbank grading and paving necessary to maintain the integrity of the dike field. A dike field is defined as an area extending from the thalweg to 3,000 feet landward of top of bank and extending from 1,000 feet upstream of the most upstream dike of that dike system to 1,000 feet downstream of the most downstream dike of that system. Work will be required only on portions of dike fields which are accessible by floating plant. Task orders will be issued for each dike field where work is required, setting forth the details and limits of work.

PART 2 PRODUCTS. (NOT USED)

PART 3 EXECUTION.

3.1 EARTHWORK

3.1.1 GRADING.

Grading shall consist of the sloping of bluff banks where failures have occurred in the bankhead paving. It may also include the preparation of the subgrade for the placement of new paving; construction of new bankheads; reshaping of overbank areas within 3,000 feet of top bank and any incidental work within the dike field as may be required by the task order. Material resulting from the grading operations shall be used for making fills where required, including the restoration of deficient slopes. All grading and filling shall be done to the lines and grades as staked in the field or as specified. Material used in making fills or restoring the subgrade shall be free from roots, brush or other debris; and shall be placed in layers not to exceed one foot in thickness. Each layer shall be thoroughly compacted to a density at least equal to that of the adjacent undisturbed earth. Excess material may be wasted in the river or spread on the slope adjacent to the area of repair.

3.1.2 KEY TRENCH.

A key trench may be required along the downstream limit of the riprap paving or at other locations on the bankhead. Unless otherwise specified or directed, the key trench shall extend from top bank to waters edge, have a bottom width of 10 feet and side slopes of 1V on 1H. The bottom grade shall be 5 feet below the prescribed grade of riprap paving.

3.1.3 ROOT DIKE.

A root dike may be required when making bankhead repairs. Unless otherwise specified or directed, the root dike shall be constructed along the centerline of the dike. The root dike shall extend from 30 feet landward of top of bank far enough down the slope to have a minimum of a 5 feet thickness of stone below the intersection of the dike and the slope of the bankhead. The bottom width shall be 10 feet with side slopes of 1V on 1H. The grade of the root dike shall be 5 feet below the prescribed grade of riprap paving.

3.1.4 REMOVAL OF DRIFT AND CLEARING.

All trees, stumps, brush and other debris shall be removed from the area to be repaired and disposed of as specified in Section 02546. Any trees, stumps and brush within the repair area shall be cut off flush with the ground.

3.2 STONE WORK.

3.2.1 GENERAL.

Crushed stone, riprap stone, and/or Graded Stone A may be used to repair failure areas in existing dikes, dike bankheads, or other areas within the dike field (no work will be required more than 3,000 feet landward of top bank). Where stone placement is specified within 3,000 feet landward of top bank and cannot be placed solely by a barge-mounted dragline, the applicable contract unit price for "OVERBANK STONE PLACEMENT" will be added in accordance with section 01025. Stone shall be placed in the dike, or in overbank areas by crane or dragline equipped with skip, grapple, clamshell, or rock bucket; by front end loader or bulldozer; or by trucks or other methods approved by the Contracting Officer. Unless otherwise approved by the Contracting Officer, the maximum capacity of dragline buckets used to place riprap paving stone on the bank will be limited to 3 cubic yards.

3.2.2 CRUSHED STONE.

Crushed stone may be required for use under riprap paving as a filter blanket. Crushed stone filter blanket is normally placed 4 inches in thickness above the water surface, 6 inches in thickness in drains and in the amount of two (2) tons per square (100 sq.ft.) when placed below the water surface. Placement above the water shall be to the lines and grades specified or as staked in the field; below the water surface, in the amount specified or as directed at the time of placing.

3.2.3 RIPRAP STONE.

Riprap stone of the specified maximum size (125 LB or 250 LB) may be required for use in constructing paving, scour hole repair, stone fill, stone spurs, stone landward of an obstruction and making other repairs within a dike field. It is contemplated that, when 250 LB Riprap is specified, the quantities will be in increments of a barge load of approximately 1,000 tons for placement at one or more nearby locations.

3.2.4 GRADED STONE A.

Graded Stone A may be required for use in constructing paving, scour hole repair, stone fill, stone spurs, stone landward of an obstruction and making other repairs to dikes. It is contemplated that the quantities required will be in increments of a barge load of approximately 1,000 tons for placement at one or more nearby dike fields. When less than 10,000 tons of Graded

Stone A is specified in the task order at a single dike field, the stone shall be considered "GRADED STONE A, SMALL REPAIRS" for payment purposes. When 10,000 tons or more of Graded Stone A is specified in the task order at a single dike field, the stone shall be considered "GRADED STONE A, LARGE REPAIRS" for payment purposes. A task order may be amended for more or less than 10,000 tons to change the quantity and thus the pay item before commencement of work on that task order.

3.2.5 PAVING.

Paving shall be placed in the areas specified by the task order. Rearrangement by hand may be necessary to provide complete coverage of the specified area with an average thickness of 10 inches for 125 LB riprap and 12 inches for 250 LB riprap. A tolerance of 2 inches above or below the average thickness will be allowed. Openings between stones exposing more than 4 square inches of the graded bank will not be allowed. Spalls and quarry chips may be used as a base but not as a filler. In underwater placement, the stone shall be uniformly distributed at the rate of 8 tons per square unless another rate is specified by the task orders.

3.2.6 SCOUR HOLE REPAIR LANDWARD OF TOP BANK.

Scour Hole Repair Landward Of Top Bank is defined as the placement of riprap stone, either the 125 LB or 250 LB size, no more than 30 feet down the graded banks of the scour hole and at the rate specified by the task order. No scour hole repair will be required more than 3,000 feet landward of top bank. Where placement of the riprap stone cannot be placed by a barge-mounted dragline, the applicable contract unit price for "OVER BANK STONE PLACEMENT" will be added to the contract unit price of the stone size specified by the task order.

3.2.7 STONE FILL.

Stone fill is defined as the placement of riprap stone, either of the 125 LB size, 250 LB size, or Graded Stone A, in holes or depressions whenever a uniform rate of placement can not be specified. A stone fill area, as specified by a task order, may be required to be constructed above the water surface, below the water surface, or landward of top bank. No stone fill will be required more than 3,000 feet landward of top bank. Where stone fill, landward of top bank, cannot be placed by a barge mounted dragline, the applicable contract unit price for "OVER BANK STONE PLACEMENT" will be added to the contract unit price of the type stone specified by the task order.

3.2.8 STONE SPURS.

In the repair or prevention of overbank scour, riprap stone of the 125 LB or 250 LB gradation, or Graded Stone A, may be required to construct or repair spurs landward of top bank. A spur is a stone structure with a crown width, a top elevation, and side slopes. It usually ties into the revetment paving and extends landward at varying angles with top bank. Extensions of existing overbank spurs may also be required. The height of stone spurs will usually be from 3 to 6 feet, with maximum heights depending upon the depth of overbank scour. Work will not extend beyond 3,000 feet landward of the top of the bank. The location, alignment, and dimensions of the overbank spurs shall be as described in the task order. Where overbank stone spurs are specified and cannot be placed solely by a barge-mounted dragline, the applicable "OVER BANK STONE PLACEMENT" pay item will be added to the contract unit price of the type stone specified.

3.2.9 STONE PLACEMENT LANDWARD OF AN OBSTRUCTION.

Stone Placement Landward of a Obstruction is defined as the placement of stone, accomplished by hauling equipment or other means approved by the Contracting Officer, in a location on a revetment slope which cannot be reached by a barge-mounted dragline because the area to be paved is landward of an obstruction. An example of an obstruction would be a grain elevator loading dock. Whenever placement of stone landward of an obstruction is specified by the task order, the applicable "OVERBANK STONE PLACEMENT" pay item will be added to the contract unit price of the type stone specified.

3.2.10 DIKE STONE FILL.

Eroded areas of dikes shall be restored and gaps filled with riprap stone or Graded Stone A. The stone fill shall be placed to the elevations and sections of adjacent portions of the dike or in accordance with the task orders or as directed by the Contracting Officer. The underwater portion of the repairs shall be accomplished in uniform horizontal layers of about 5-foot thickness. Each lift shall be carried the entire length of the dike repairs. Generally a 6-foot crown width with slopes of angle of repose (approximately 1V on 1 1/4H) will be required. A tolerance of plus or minus one foot will be allowed in the specified elevation and crown width. The stone shall be placed by a crane or dragline equipped with a skip, grapple, clamshell, or rock bucket; by front-end loader or bulldozer; or by trucks or other equipment approved by the Contracting Officer. Placing of stone fill in the dike will not be permitted when river stages are above the top of dike without prior approval of the Contracting Officer or at any river stages when site and current conditions prevail which, in the opinion of the Contracting Officer, make operations impracticable or uneconomical.

3.3 ISLAND 15 NECK DIKE.

3.3.1 SCOPE.

The Island 15 Neck stone dike is an overland structure beginning about 1,500 feet from the old Caruthersville ferry landing and extending 19,500 feet eastward. Most of the dike crown width is also a portion of Tennessee State Highway 79. The highway in this area is either sand, dirt, or gravel. The dike is functional only during overbank stages. The likelihood of this dike being overtopped in any particular year is estimated to be about 50 percent. Any damage to the dike would depend upon the extent and duration of overbank flows across the dike. If a task order is issued for this location, 125 LB Riprap Stone will be used and it is anticipated that the quantity of stone specified will range from a minimum of 500 tons to about 8,000 tons.

3.3.2 DESCRIPTION OF WORK.

Damages to this dike may consist of degraded areas, loss of crown width on the south or downstream side, and damages to the downstream apron. Riprap stone shall be placed in specified areas in a manner to produce a reasonably well-graded mass of stone with the minimum practicable percentage of voids. The new stone to be placed shall be smoothly transitioned into the existing stone.

3.3.3 OPTIONAL WORK

The Contractor will be given the option to decline any work specified at this location, if the specified quantity of stone is less than a minimum of 500 tons. Damages which interrupt public use of the state highway will be high-priority items and such specified repairs shall be accomplished as soon as practicable after receipt of the task order.

3.3.4 ACCESS.

The area of greatest current attack and of greatest potential damage is near the mid-length of the dike, or the area directly south of Hathaway Dike No. 5. It is anticipated that the most feasible access will be from a river landing on Fritz Landing Revetment opposite about mile 856 AHP, across private property to a county road, then south to Highway 79 and west to the location of work. Load limit restrictions for the county road and Highway 79 may be imposed by Lake County Highway Department or Tennessee Department of Transportation. Right-of-way for access from a river landing to the county road will be furnished by and at the expense of the Government. Upon completion of work at this location, any such access roadway and right-of-way furnished by the Government shall be left in a condition satisfactory to the Contracting Officer. See Section 00800, "RIGHT-OF-WAY", for other right-of-way information.

3.3.5 TOLERANCES.

The following tolerances will be allowed in the specified repairs, provided the extremes do not occur adjacent to each other.

- (1) Surface elevations.
 - (a) Upstream 31 feet of dike crown - 0 to minus 1 foot.
 - (b) Downstream 9 feet of dike crown and apron – plus or minus 6 inches.
- (2) Crown line (each side) - 6 inches inside to 1 foot outside.
- (3) Slopes - Plus or minus 1 foot.

3.4 DIKE STONE REMOVAL.

3.4.1 SCOPE.

Work to degrade certain areas of selected dikes may be ordered to enhance the performance of some dike fields.

3.4.2 DESCRIPTION OF WORK.

Stone will be removed from specified locations in a dike by displacing stone from the area downstream so as to create an apron adjacent to the dike. Openings may vary from 50 feet to 200 feet in length at a specified bottom elevation, with side slopes of 1V on 2H to 1V on 5H. The bottom elevation of the area where the stone is to be removed may be required to be as low as the Low Water Reference Plane. The apron shall be approximately 5 foot thick and it shall extend downstream far enough to exhaust the stone removed from the dike. When a dike with a 6 foot crown width is degraded 10 feet, the apron would extend about 40 feet downstream of the dike. When the same dike is degraded 15 feet, the apron would extend 80 feet downstream of the dike.

3.4.3 ORDER OF WORK.

Stone removal will be performed during the normal downstream progression of work in a parcel and, if the Contractor cannot access the location of the work because there is not enough water to float his equipment, he will not be required to do the work.

3.4.4 TOLERANCES.

When the bottom elevation of the stone removal is above the water surface, a tolerance of plus or minus one foot in elevation will be allowed, with an additional tolerance of plus three feet for large individual stones, which may be encountered. When work is completed underwater a tolerance of plus or minus two feet will be allowed, with an additional tolerance of plus three feet for large individual stones, which may be encountered.

3.5 QUALITY CONTROL.

The Contractor shall inspect all dike stone repair operations for compliance with contract requirements and record the inspection of all operations including, but not limited to the following:

- (1) Grading of slopes to design grade within tolerance.
- (2) Disposition of material from grading and excavation.
- (3) Dressing of slope before placement of paving.
- (4) Placement of slope and underwater paving.
- (5) Thickness and coverage of paving.
- (6) Weight and size of stone.
- (7) Placement of stone within tolerances and alignment.
- (8) Grade and section of stone fill.
- (9) Stone removal and apron construction.

The Contractor shall furnish to the Contracting Officer a copy of these records and tests, as well as the records of corrective action taken.

3.6 PLACEMENT CONTROL.

3.6.1 GENERAL.

The Contractor shall be responsible for control of the stone placement. All necessary equipment, materials, and supplies for placement control shall be furnished by and at the expense of the Contractor. At all times when stone placement from floating plant is underway, the means by which the Contractor positions his plant, equipment, and stone supply barges must function accurately and consistently. Whatever the method employed, it must permit the Contractor and the Government Quality Assurance Representative to readily determine the exact position of the stone being placed. If the Quality Assurance Representative determines that it is necessary to insure that stone is being properly placed, then the Contractor will be required to obtain a survey and to plot cross sections of the area where stone is being placed. These cross sections shall be obtained as often as and on the intervals prescribed by the Government Quality Assurance Representative. Prior approval of the Contracting Officer will be required in each instance before placing any stone subaqueously without the aid of any of the equipment listed below.

3.6.2 ALIGNMENT CONTROL.

Acceptable methods of alignment control for floating plant engaged in the placement of subaqueous stone include the use of a manned transit, laser, colored or polarized light beams, or other methods that demonstrate them to be practicable, sufficiently precise and reliable.

3.6.3 DISTANCE CONTROL.

Acceptable methods of distance control for floating plant engaged in subaqueous placement of stone include the use of electronic distance surveying instruments or other methods that demonstrate them to be practicable and sufficiently precise and reliable.

3.6.4 DEPTH FINDER.

A suitable recording electronic depth finder shall be provided at each location of work under this contract. The depth finder shall have a recording scroll not less than 4 inches wide with a scale of not more than 10 feet of depth to the inch. The depth finder shall be capable of obtaining accurate soundings and shall be used as an aid in the control of subaqueous stone placement. The Contractor shall insure that the depth finder is in proper working order at all times and shall furnish and maintain an adequate stock of recording paper for the depth finder. The Contractor shall submit to the Contracting Officer for approval the manufacturer's name, model number, and/or model name of the electronic depth finder proposed for use prior to the unit being placed in service.

3.6.5 TARGETS.

The use of bank targets for alignment control will not be permitted for a working distance greater than 400 feet from the bank without prior approval of the Contracting Officer. The use of buoys as placement control devices will not be permitted.

3.6.6 RECORD MAP SURVEYS

The Contractor shall be required to make a "Record Map Survey" if so noted on the task order. The survey shall include: the elevation of the top of the dike repairs at the centerline and at the upstream and downstream crown limit at 20 foot intervals, the centerline location of the repairs relative to the existing dike on either side of the repairs, elevations on the side slopes at waters edge, and the "ahead of stone profile". The "ahead of stone profile" is the elevation of the bottom of the river along the centerline of the dike repairs immediately before stone is placed in the first lift of the repairs; these elevations shall be taken at 20 foot intervals. This survey data shall be recorded on cross section paper and shall include a top view and a profile view and be plotted to a scale of one inch equals 20 feet. The top view shall include the crown width and the location of the repairs relative to the existing dike and shall include 100 feet of the existing dike on either side of the repairs. The profile view shall include the elevation of the top of the dike from 100 feet landward of the repairs to 100 feet riverward of the repairs and the "ahead of stone profile" where the dike was repaired. Surveys shall be conducted in the presence of the Government Quality Assurance Representative. All survey data shall be provided to the Government upon completion of the task order. No separate payment will be made to the Contractor for this survey.

-- End of Section --

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SECTION 02548
RIPRAP UPPER BANK PAVING

PART 1. GENERAL.

1.1. SCOPE.

The work consists of the placing of Riprap Upper Bank Paving on the banks of the Ohio and Mississippi Rivers between Mile 975 Ohio River and the Mouth of White River, Arkansas (Mississippi River Mile 599 AHP).

1.2. PROSECUTION.

The Contractor shall place bank paving at a rate of not less than 16,800 tons per week. Because sudden rises in river stages may erode the unpaved upper bank, it is imperative that upper bank paving operations performed under this contract follow bank grading/mattress sinking operations as closely as working conditions will permit. In order to protect the unpaved bank from erosion/wave wash, the Contractor may be directed to strip pave a lower portion of the bank slope as specified in subparagraph 3.4.2, Strip Paving, or may be directed to proceed to a higher priority location. If the Contractor falls behind the required progress called for, he shall take such steps as may be necessary to improve his progress. If effective steps are not taken by the Contractor, the Contracting Officer may require him to increase the number of shifts, and/or overtime operations, days of work, and/or the amount of construction plant in order to maintain the required progress, all without additional cost to the Government.

PART 2 PRODUCTS. (NOT USED)

PART 3 EXECUTION.

3.1. GENERAL.

The work consists of furnishing all plant, labor and materials, and performing all work in strict accordance with these specifications, schedules and drawings for construction of Riprap Upper Bank Paving. The work may be performed at several localities which will be selected after the award of the contract and will be designated by the task orders and "Before Construction" drawings which will be issued pursuant to paragraph 1.4, Section 00800. The Contractor shall perform the work regardless of the number of localities involved. Work may not be required under these specifications at all localities at which mattress sinking operations will be performed; however, work may be required at locations where articulated concrete mattress is not required. The work to be performed normally includes the final preparation of the slopes and procuring and placing the riprap on the graded bank. At some locations, underwater and/or overbank paving may be required. Such locations will be specified by the task order and indicated on the Before Construction drawings. The Government reserves the right to accomplish all or any portion of the work at any location by other means.

3.2 QUALITY CONTROL.

3.2.1 GENERAL.

The Contractor shall establish and maintain quality control for slope dressing and riprap paving to assure compliance with contract requirements, and shall maintain records of his quality control for all construction operations, including but not limited to the following:

(a) Dressing the slope to eliminate any irregularities, including irregularities in the gravel blanket placed by others, due to rain or wave wash or operations of the Contractor's equipment.

(b) Grading and dressing necessary to secure a suitable connection with the riprap paving in place.

(c) Underwater paving to assure proper connection with concrete mattress and complete coverage.

(d) Above-water connection between riprap paving and concrete mattress.

(e) Connection between riprap paving and asphalt paving.

(f) Placement of riprap on gravel blanket, upper bank slope, and if applicable, overbank areas for thickness and proper coverage.

(g) Placement of riprap in ditch outlets.

3.2.2 REPORTING.

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

3.3 SLOPE DRESSING.

3.3.1 GENERAL.

The bank will be graded, including finish grading, by others. However, the Contractor shall, preparatory to placing the paving, dress the slope to eliminate any irregularities, including irregularities in the bedding material placed by others, due to rain or wave wash or operations of the Contractor's equipment. Irregularities in the ungraded slope shall be filled with layers of earth not greater than one foot in uncompacted thickness and firmly compacted into place. If directed by the Contracting Officer, irregularities in graded areas shall be filled with stone, and payment will be made at the applicable contract unit price for "RIPRAP UPPER BANK PAVING" for stone so placed. Earth fill material shall be acquired from adjacent areas within the limits of the right of way. The Contractor shall redress and/or clean out any landside drainage ditch damaged by his operations.

3.3.2 REGRADING.

Any regrading necessitated by slides in the bank occurring before or during construction of the bank paving may be repaired by the Contractor under the direction of the Contracting Officer. No paving shall be placed on such a disturbed area until the slide has been graded out or otherwise corrected. Compensation for any regrading by the Contractor will be made under the Unit Price Payment Item for "EARTHWORK".

3.3.3 REPAIRS.

The Contractor shall repair at his expense any damage to the graded bank or strip paving caused by his failure to place paving at the rate required by paragraph 1.1.b of Section 00800. If strip paving is ordered by the Contracting Officer due to reasons beyond the control of the Contractor and the graded bank or the strip paving is damaged by rain wash or overtopping, the Contractor shall make the repairs as ordered by the Contracting Officer and an adjustment in the contract price for that portion of the work will be made in accordance with the Contract Clause entitled "Changes".

3.4 RIPRAP UPPER BANK PAVING.

3.4.1 GENERAL.

Riprap Upper Bank Paving shall consist of a course of 125 LB Riprap Stone with an average thickness of 10 inches, measured normal to the slope, except where other thickness is specified or indicated on the drawing. The paving shall cover the surface of the bank between the limits of work as shown on the jobsite plans or as determined by the Quality Assurance Representative in the field. The landward limit of riprap paving may include an overbank strip not exceeding a distance of fifty feet landward of the top of the bank. The bank to be paved will have been graded by others to a slope that will vary from approximately 1V on 3H to 1V on 5H and any overbank area to be paved will have been dressed by others to a surface suitable for paving. In general, the width of the paving will vary between approximately 50 feet and 200 feet as measured along the slope of the graded bank.

3.4.2 STRIP PAVING.

When directed by the Contracting Officer's Representative, the Contractor shall pave the bank in strips parallel to the water's edge. It is anticipated that strip paving will be required whenever there is more than 2,000 linear feet of unpaved bank available to the Contractor for paving or whenever rising river stages threaten overtopping of the inshore limit of mattress within that area. In areas where articulated concrete mattress has been placed, strip paving will consist of placing riprap paving in a strip along and parallel to the inshore edge of mattress. Unless otherwise authorized or directed, the strip shall be 30 feet wide, except it will include complete paving of drains within the area. At locations requiring only stone paving, the underwater paving shall be placed along a strip 30 feet wide above and parallel to the water's edge and shall include paving of drains. Once strip paving operations are directed, this method of paving shall continue as long as required by the Contracting Officer's Representative, and shall be conducted at such locations and in such order of precedence as he requires in order to protect the interest of the Government. If strip paving operations and moving, as required by the Contracting Officer's Representative to perform the most essential work, prevent the Contractor from maintaining the required production rate, an equitable adjustment in contract time will be allowed upon written request and justification. Additional towing required to move between jobs as authorized by the Administrative Contracting Officer and to return to unfinished jobs to complete them will be paid for as provided in Section 00800, Paragraph 1.2, ORDER OF WORK.

3.4.3 UNDERWATER PAVING.

Where specified by the task order with its applicable "Before Construction" drawings, underwater riprap paving shall be placed on subaqueous areas not covered by articulated concrete mattress. The underwater riprap paving shall be uniformly distributed over the area to be paved in the amount of 8 tons per square (100 sq. ft.) or such other amount as indicated by the task order.

3.4.4 PLACEMENT.

The stone shall be placed on the graded slopes by crane or dragline equipped with skip, grapple, clamshell, or rock bucket or by other method approved by the Contracting Officer and rearranged by use of a trackhoe or by hand as necessary to provide complete coverage of the banks to the specified average thickness. If the entire upper bank cannot be paved from floating plant and stone is windrowed on the upper slope, the windrowed stone shall be spread to the prescribed thickness by pulling the stone up the slope with a trackhoe or by other approved methods. In no case shall the stone be pulled or bulldozed down the slope. A tolerance of 2 inches above or below the specified average thickness will be allowed. Openings between stones exposing more than 4 square inches of the graded slope or gravel blanket will not be permitted. In underwater placement, the stone shall be uniformly distributed in the amount specified. Riprap placed underwater shall be controlled to the extent necessary to provide coverage as indicated on the "Before Construction" drawings and/or to assure a connection between articulated concrete mattress and riprap paving placed above water.

3.4.5 CONNECTIONS.

Connections between Riprap Upper Bank Paving and concrete mattress or paving shall be made as detailed on the "RIPRAP UPPER BANK PAVING - STANDARD DETAILS" drawing, located at the end of Section 00800. Any stone placed or spilled onto the concrete mattress shall be removed by the Contractor and placed by hand into the paving and mattress connection area. The thickness of stone in the connection shall be not less than 18 inches at a point 4 feet from the concrete mattress or paving, and shall taper to an average thickness of 10 inches at the edge of the mattress and at a point 6 feet from the mattress or paving, unless other thickness is specified. At the connection between riprap paving and existing asphalt paving, the thickness of the riprap paving shall be increased to 18 inches in a strip approximately 4 feet in width along the connection of the riprap and existing asphalt paving.

3.4.6 BEDDING MATERIAL.

Bedding material approximately 4 inches thick will have been placed by others at most locations from approximately the -5 LWRP contour to the +15 LWRP contour. The Contractor shall exercise reasonable care in placing riprap so that the bedding material will not be damaged.

3.4.7 EXPOSED FLANKS.

When the bank paving ends with a flank or flanks not connected with existing work, the Contracting Officer may direct that the last 60 linear feet be paved with riprap averaging 20 inches in thickness from a point 4 feet landward of the articulated concrete mattress to the landward limit of the paving.

3.4.8 DITCH OUTLETS.

The bottom and side slopes of drainage ditches shall be paved for a distance of 10 to 25 feet landward of the top bank as specified in the task order.

-- End of Section --

DIVISION 03 (CONCRETE)
THRU
DIVISION 16 (ELECTRICAL)
NOT USED