

CONSTRUCTION SPECIFICATIONS

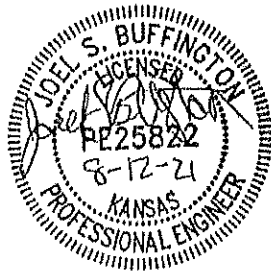
DELAWARE WATERSHED
JOINT DISTRICT NO. 10

JACKSON COUNTY, KANSAS

REHABILITATION OF GRADE STABILIZATION
DETENTION DAM SITE A-99

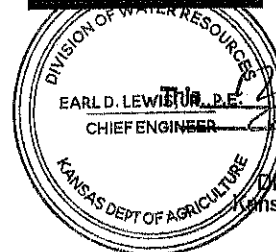
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APPROVED
day of January 2022
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SUPPLEMENTARY CONDITIONS

As required by the Permit to Construct issued by the Division of Water Resources the following specified conditions will apply.

The Division of Water Resources will be notified when:

1. Proposed construction of project is to commence.
2. The dam foundation has been prepared for placement of fill. No material shall be placed on any portion of the foundation until such portion of the foundation has been approved by a representative of the Division of Water Resources.
3. Installation of the principal spillway pipe or any other conduit that extends through the embankment and appurtenances is to be accomplished. A representative of the Division of Water Resources will be present to approve fill material and observe installation.

THEREFORE, these conditions shall become a part of the approved construction specifications and a required provision of the Permit to Construct. The CONTRACTOR will notify the ENGINEER in charge of the project several days in advance regarding the timing of the above stated works of improvement in order to allow the ENGINEER a sufficient time to give notification to the Division of Water Resources. This being defined as no less than 48 hours.

IN ADDITION, these considerations require that the designing ENGINEER and/or a representative shall provide continuous, on site inspection during construction.

Failure by the CONTRACTOR to comply with the above conditions could result in loss of construction time allotment and will be solely the responsibility of the CONTRACTOR.

CONSTRUCTION SPECIFICATION

1. SAFETY PLAN

1. SCOPE

This work shall consist of maintaining the construction site and operations in a safe condition.

2. ITEMS OF WORK

It shall be the responsibility of the Contractor to maintain the construction site and operations in a safe condition. Workers, the general public, and any public utility on the site must be protected from accidental damage. The Contractor must contact Kansas One Call at least one week prior to initiation of soil disturbing activities to have utilities identified and marked. The Contractor shall also contact the rural water districts or any other utility not typically members of Kansas One Call. (800-344-7233) The designer makes no representation as to the existence or non-existence of utilities on the construction site. The absence of utilities on drawings is no assurance that they are not present.

The Contractor must follow all applicable rules and regulations of the Occupational Safety and Health Administration (OSHA). Warning signs and protective fencing shall be installed as needed to provide public safety.

CONSTRUCTION SPECIFICATION

2. CLEARING AND GRUBBING

1. SCOPE

The work shall consist of the clearing and grubbing of designated areas by removal and disposal of trees, snags, logs, stumps, shrubs and rubbish.

2. MARKING

The limits of the areas to be cleared and grubbed will be marked by means of stakes, flags, tree markings or other suitable methods. Trees to be left standing and uninjured will be designated by special markings placed on the trunks at a height of about six feet above the ground surface.

3. REMOVAL

All trees not marked for preservation and all snags, logs, brush, stumps, shrubs and rubbish shall be removed from within the limits of the marked areas. Unless otherwise specified, all stumps, roots and root clusters having a diameter of one inch or larger shall be grubbed out to a depth of at least two feet below subgrade elevation for concrete structures and one foot below the ground surface at embankment sites and other designated areas.

4. DISPOSAL

All trees and brush and other materials removed from the clearing will be the property of the contractor unless.

Materials removed from the cleared and grubbed areas shall be burned or buried.

5. SALVAGE

Structures that are designated to be salvaged shall be carefully removed and neatly placed in the specified storage areas. Materials from fences designated to be salvaged shall be placed outside the work area on the property from which they were removed. Wire shall be

rolled into uniform rolls of convenient size and posts and rails shall be neatly piled. Trees that are designated to be salvaged will be carefully removed and placed in a specified area. Materials to be disposed of by burying shall be covered with earth to a depth of at least 2 feet. On areas not covered with water, at least the top 6 inches shall be topsoil. These areas shall be graded and finished in a workmanlike manner to prevent ponding of water.

6. ITEMS OF WORK AND CONSTRUCTION

Items of work to be performed in conformance with this specification and construction detailed therefore are:

a. Bid Item Clearing and Grubbing

(1) This item shall consist of clearing and grubbing of the dam site and borrow area to the limits as shown on the drawings or as directed by the engineer.

(2) Blasting will not be permitted in the vicinity of the principal spillway after the work has begun on the appurtenances, conduit, or inlet structure except as approved by the engineer.

(3) Measurement and payment shall be at the lump sum prices established in the contract. Such payment shall constitute full compensation for all labor, materials, equipment, and all other items necessary and incidental to the completion of the work.

b. Subsidiary Item Structure Removal

(1) This item shall consist of removing the fences in the construction area as shown on the drawings.

(2) No separate payment will be made for this item. Compensation for this item shall be included in the payment for Clearing and Grubbing.

CONSTRUCTION SPECIFICATION

3. STRUCTURE REMOVAL

1. SCOPE

The work shall consist of the removal, salvage and disposal of structures (including fences) from the designated areas.

2. MARKING

Method 1. Each structure unit to be removed will be marked by means of stakes, flags, painted markers or other suitable methods.

Method 2. The limits of the areas from which structures must be removed will be marked by means of stakes, flags, or other suitable methods. Structures to be preserved in place or salvaged will be designated by special markings.

3. REMOVAL

Method 1. All structures designated in the contract for removal shall be removed to specified extent and depth.

Method 2. Within the areas so marked all visible structures located and identified by survey stakes shall be removed to the specified extent and depth.

4. SALVAGE

Structures that are designated to be salvaged shall be carefully removed and neatly placed in the specified storage areas. Salvaged structures that are capable of being disassembled shall be dismantled into individual members or sections. Such structures shall be neatly match marked with paint prior to disassembly. All pins, nuts, bolts, washers, plates and other loose parts shall be marked or tagged to indicate their proper locations in the structure and shall be fastened to the appropriate structural member or packed in suitable containers. Materials from fences designated to be salvaged shall be placed outside the work area on the property from which they were

removed. Wire shall be rolled into uniform rolls of convenient size. Post and rails shall be neatly piled.

5. DISPOSAL OF REFUSE MATERIAL

Refuse materials resulting from structure removal shall be burned or buried at locations shown on the drawings or as specified in Section 7 of the specifications.

6. MEASURE AND PAYMENT

Method 1 For items of work for which specific unit prices are established in the contract, payment for the removal of each structure unit, except fences, will be made at the contract unit price. Fences removed or removed and salvaged will be measured to the nearest linear foot. Payment for fence removal or removal and salvage will be made at the contract unit prices appropriate to each type and size of fence.

Such payment will constitute full compensation for all labor, equipment, tools, and all other items necessary and incidental to the completion of the work.

Method 2 For item of work for which specific lump sum prices are established in the contract, payment for structure removal will be made at the contract lump sum price.

Such payment will constitute full compensation for all labor, equipment, tools, and all other items necessary and incidental to the completion of the work.

All Methods The following provisions apply to all methods of measurement and payment. Compensation for any item of work described in the contract but not listed in the bid schedule will be included in the payment for the item of work to which it is made subsidiary. Such items and the items to which they are made subsidiary are identified in Section 7 of this specification.

7. ITEMS OF WORK AND CONSTRUCTION

Items of work to be performed in conformance with this

specification and construction detailed therefore are:

a. Bid Item-Structure Removal

- (1) This item shall consist of removing the existing principal spillway pipeline, and drawdown pipeline. Marking of the work will be by Method 1. Removal of structures will be by Method 1. Measurement and payment shall be by method 2.
- (2) Materials to be disposed of by burying shall be covered with earth to a depth of at least 2 feet.
- (3) On areas not covered by permanent water, at least the top 6 inches of the 2 feet of cover shall be topsoil. These areas shall be graded and finished in a workmanlike manner to prevent the ponding of water

b. Subsidiary Item Structure Removal

- (1) This item shall consist of removing the fences in the construction area as shown on the drawings.
- (2) No separate payment will be made for this item. Compensation for this item shall be included in the payment for Clearing and Grubbing.

CONSTRUCTION SPECIFICATION

4. INSPECTION PLAN

1. SCOPE

The work conducted under this contract shall have continuous on-site inspection during construction to assure that all items of work are completed in conformance with the approved plans and specifications. The inspector must possess the knowledge, skills and experience necessary to conduct timely and effective inspection. The inspector must be acceptable to the Engineer and regulatory agencies with purview over the project.

2. ITEMS OF WORK

A. Pre-Construction Conference

A pre-construction conference shall be held at which the inspector, the engineer, the contractor and the owner shall have a representative. State and Federal agencies with interest in the project shall be informed of the conference and given the opportunity to attend. The Contractor shall notify the interested parties of the time and place of the meeting at least two weeks in advance. At the conference, the following items (at a minimum) shall be addressed:

1. Any questions regarding interpretation of the plans and specifications shall be answered.
2. Work hours and schedules shall be established.
3. Ingress and egress routes shall be established.
4. Construction staging areas and parking areas shall be defined.
5. Security precautions of the contractor and land owner shall be discussed.
6. Quality assurance testing and inspection needs shall be discussed.

7. A list of contact phone numbers for all interested parties shall be established.
8. Contractor notification requirements for regulatory agencies, the engineer and the inspector shall be delineated.
9. Any other items the attendees deem appropriate.

B. Job Diary During On Site Inspection

The quality assurance inspector shall maintain a job diary in which all inspection reports and data are recorded. A written report of each inspection shall be documented in the diary. Photographs shall also be taken of work in progress, as necessary, and kept with the job diary. The inspector shall also maintain a set of construction plans on which all as-built modifications are documented.

C. On Site Inspection Requirements

Each low-impact dam shall be inspected by an engineer qualified in the design of dams, or that engineer's authorized representative, whenever any of the following conditions is met:

1. Backfill is being place in the cutoff trench of a dam.
2. Conduits and their appurtenances are being placed.
3. Backfill is being placed around a conduit.
4. Drain material and outlets are being installed.
5. Concrete forms and reinforcing steel are being placed.
6. Concrete is being placed.
7. Any other stage of construction required by the permit, approved plans, or approved specifications to be inspected occurs.

D. Material Inspection Requirements

1. All materials used in construction must be inspected before they are installed in the works of improvement.
2. Most materials should be inspected upon delivery to the job site. In some cases, inspection and approval is appropriate before the materials are delivered, such as: rock rip-rap, drainfill, bedding materials, aggregates and similar items.
3. Materials delivered to the job site shall be inspected to verify that sizes, quantity, dimensions, materials quality and manufacturing standards conform to the project plans and specifications. All materials shall be carefully inspected to identify any defects or damage during handling or installation at the job site. All inspection findings shall be documented in the job diary including photographic evidence, as needed.
4. Materials found to be damaged or not in conformance with the plans and specifications shall be rejected.

E. Final Inspection Requirements

A final inspection and certification shall be conducted by the project engineer or his/her representative.

CONSTRUCTION SPECIFICATION

5. STORM WATER POLLUTION PREVENTION

1

1. SCOPE

The work shall consist of installing measures or performing work to control erosion and minimize the production of sediment and other pollutants to water during construction operations in accordance with these specifications. The excavation and moving of soil materials shall be scheduled so the smallest possible areas will be unprotected from erosion for the shortest time feasible.

2. MATERIALS

- A. Seed for Temporary Seeding - All seed shall conform to the current state rules and regulations governing quality and purity and shall be labeled in conformance with state regulations in effect on the date of invitation for bids. Bag label values will be evidence of purity and germination. The percent noxious weed seed allowable shall be as defined in the current state law for agricultural seed. No seed will be accepted with a date of test of more than 9 months prior to the date of delivery to the site.

Seed that has become wet, moldy, or otherwise damaged in transit or storage will not be accepted. Each type of seed shall be delivered in a separate sealed container and fully tagged unless the Contracting Officer or Engineer grants an exception.

- B. Mulch for Temporary Mulching - All mulch shall consist of wheat, oat, or rye straw, hay, grass cut from native grasses or other plants approved by the Contracting Officer or Engineer. The mulch material shall be air dry, reasonably light in color, and shall not be musty, moldy, caked, or otherwise of low quality. The use of mulch that contains noxious weeds will not be permitted. The Contractor shall provide a method satisfactory to the Contracting Officer for determining weight of mulch furnished.

- C. Other Mulch Materials - Mulching materials, such as

wood cellulose fiber mulch, mulch tackifiers, synthetic fiber mulch, netting, and mesh are other mulching materials that may be required for specialized locations and conditions. These materials, when specified, must be accompanied by the manufacturers' recommendations for methods of application.

D. Silt Fence - Filter fabric shall be standard strength or extra strength. Synthetic filter fabric should be a pervious sheet of polypropylene, nylon, polyester, or polyethylene yarn conforming to the following requirements:

- Filtering Efficiency: 75% - 85% (minimum)
- Tensile Strength at 20% Elongation:
Standard Strength - 30 lb/linear inch (minimum); Extra Strength - 50 lb/linear inch (minimum)
- Slurry Flow Rate: 0.3 gallon ft²/minute (minimum)

Synthetic filter fabric shall contain ultraviolet ray inhibitors and stabilizers to provide a minimum of 6 months of expected usable construction life at a temperature range of 0 to 120 F. The filter fabric shall be purchased in a continuous roll to avoid joints. Filter fabric shall be at least 26 inches wide (18 inches above ground and 8 inches below ground). Standard strength filter fabric must be supported by a wire mesh. The wire fence (14 gauge minimum), should be at least 22 inches wide and should have a maximum mesh spacing of 6 inches. Extra strength filter fabric does not require a wire mesh support fence.

Posts shall be at least 4 feet long, and should be composed of either 4-inch diameter pine (or equivalent) or 1.00 to 1.33 lb/linear ft steel. Steel posts should have projections for fastening wire and fabric to them.

E. Straw / Hay Bales for Barriers - Rectangular bales of hay or straw shall be used. The bales shall be in sound condition. Bales shall not contain noxious weeds.

3. SEEDING AND MULCHING METHODS

All seeding and mulching operations shall be performed in such manner that the seed or mulch is applied uniformly to the designated areas at the specified application rate.

4. MEASUREMENT AND PAYMENT

- A. Method 1 - For items of work for which specific unit prices are established in the contract each item will be measured to the nearest unit applicable. Payment for each item will be made at the contract unit price for that item. Such payment will constitute full compensation for all labor, equipment, tools, and all other items necessary and incidental to the completion of the work.
- B. Method 2 - For items or work for which specific lump sum prices are established in the contract, payment for pollution control will be made at the contract lump sum price. Such payment will constitute full compensation for all labor, equipment, tools, and all other items necessary and incidental to the completion of the work.
- C. All Methods - The following provisions apply to all methods of measurement and payment. Compensation for any item of work described in the contract but not listed in the bid schedule will be included in the payment for the item or work to which it is made subsidiary. Such items, and the items to which they are made subsidiary, are identified in Section 5.

5. ITEMS OF WORK AND CONSTRUCTION DETAILS

Items of work to be performed in conformance with this specification and the construction details are as follows:

A. Bid Item - Temporary Seeding For Protective Cover

- (1) This item shall consist of seeding to reduce erosion and sedimentation on disturbed areas that will not be permanently seeded. The disturbed areas will be seeded to a temporary cover as follows:

- a. Between February 15 to May 15 and September 1 to December 1, wheat shall be seeded at the rate of 60 pounds per acres. The seed shall be clean seed wheat of a variety common to the area, or,

b. Between May 15 and September 1, Sudan shall be seeded at the rate of 10 pounds per acre.

(2) If the plants do not grow quickly or thick enough to prevent erosion within 21 days of seeding, temporary mulching shall be applied.

(3) All accessible areas shall be seeded with a drill equipped with coulter openers spaced not more than 12 inches apart. Seed shall be placed $\frac{1}{2}$ to $1\frac{1}{2}$ inches deep. Small inaccessible or wet areas that cannot be seeded with a drill may be hand broadcast. All broadcast seeding shall be harrowed or hand-raked the same day the seed is spread.

(4) Measurement and Payment shall be by Method 1.

B. Bid Item - Temporary Mulching

(1) This item shall consist of applying mulch for soil stabilization or erosion control on disturbed areas when conditions are not favorable for establishment of a temporary vegetative cover because of time, temperature, soil and/or moisture conditions. Temporary mulching shall be applied at the rate of 2 tons per acre. It shall be tacked into place by a disk with straight, serrated blades, weighted to press the mulch into the soil a minimum of two (2) inches. The mulch shall be tacked the same day it is applied.

(2) If necessary, seeded areas should be covered with mulch to provide protection from the weather. Seeding on slopes or 2:1 or steeper, in adverse soil conditions, during excessively hot or dry weather, or where heavy rain is expected, shall be followed by spreading mulch.

(3) Measurement and payment shall be by Method 1.

C. Bid Item - Straw or Hay Bale Barriers or Silt Fences

(1) This item shall consist of the installation of straw or hay bale barriers or silt fences as shown in the plans, or as directed by the field engineer, to settle and trap sediment from overland flow immediately upstream of an area before flow becomes concentrated, or below disturbed areas where runoff may occur in the

form of overland flow. Installation of hay bales can be used at the toe of steep slopes, such as the back slope of the dam, to trap sediment, as temporary drop structures to stabilize channel flow lines or as a perimeter filter barrier.

(2) Straw or hay bales shall be installed as follows:

- a. The bales will be installed in a trench, 4 inches minimum depth, the width of the bale.
- b. They are to be tightly abutting with no gaps.
- c. They are to be staked at least 6 inches into the ground using two (2) 1" X 2" stakes per bale.
- d. Back filled and compacted with the excavated soil.

(3) Silt fences shall be installed as follows:

- a. The maximum height of the silt fence should range between 18 and 36 inches above the ground surface (depending on the amount of upslope ponding expected).
- b. Posts should be spaced 8 to 10 feet apart when a wire mesh support fence is used and no more than 6 feet apart when extra strength filter fabric (with no wire fence) is used. The posts should extend at least 18 inches into the ground.
- c. A trench should be excavated 4 to 8 inches wide and 4 to 12 inches deep along the upslope side of the line of posts.
- d. If standard strength filter fabric is to be used, the wire mesh support fence may be fasted to the upslope side of the posts using 1 inch heavy duty wire staples, tie wires, or hog rings. Extend the wire mesh support to the bottom of the trench. The filter fabric should then be stapled or wired to the fence, and 8 to 20 inches of the fabric should extend into the trench (see drawing on the plans).
- e. Extra strength filter fabric does not require a wire mesh support fence. Staple or wire the filter fabric directly to the posts and extend 8 to 20 inches of the fabric into the trench.
- f. Where joints in the fabric are required, the filter cloth should be spliced together only at a support post, with a minimum 6-inch overlap, and securely sealed.
- g. Do not attach filter fabric to trees.
- h. Backfill the trench with compacted soil or 0.75 inch

minimum diameter gravel placed over the filter fabric.

(4) Measurement and Payment shall be by Method 1.

D. Bid Item - Diversions

(1) This item shall consist of using diversions to divert water away from work areas and/or to collect runoff from work areas for treatment and safe disposition. Diversions shall be used in accordance with the Stormwater Pollution Prevention Plan and Drawings, or as directed by the field engineer.

(2) Method of payment shall be by Method 1. The length of diversions will be determined to the nearest linear foot by measurement of the diversion along the centerline of the channel.

E. Subsidiary Item - Stream Crossings

(1) This item shall consist of using stream crossings where fording of streams by equipment is necessary. Materials used in stream or channel crossings shall be selected to permit placement, operation, and removal of the crossings with a minimum deposition of sediment into the stream.

(2) No separate payment will be made for this item. Compensation for this item shall be included in the payment for Excavation, Common (Specification 21, Section 12.e.) and Earthfill, Embankment (Specification 23, Section 10.a.).

F. Subsidiary Item - Sediment Basins

(1) This item shall consist of using sediment basins to settle and filter out sediment from eroding areas to protect properties and streams below the construction site. The borrow pits will be used for sediment basins in accordance with the Stormwater Pollution Prevention Plan or as directed by the field engineer.

(2) No separate payment will be made for this item. Compensation for this item shall be included in the payment for Excavation, Common (Specification 21, Section 12.e.) and Earthfill, Embankment (Specification 23, Section 10.a.).

CONSTRUCTION SPECIFICATION

6. SEEDING AND MULCHING FOR PROTECTIVE COVER

1. SCOPE

The work shall consist of preparing the area for treatment, furnishing and placing seed in the designated areas as specified.

2. MATERIALS

Seed - All seed shall conform to the current rules and regulations of the state where it is being used and from the latest crop available. Seed shall be labeled in accordance with the state laws in effect on the date of invitations for bids and shall meet or exceed the standards for purity and germination listed in Project Documents.

Seed that has become wet, moldy, or otherwise damaged in transit or storage will not be accepted. The percent of noxious weed seed allowable shall be as defined in the current state laws relating to agricultural seeds. Each type of seed shall be delivered in separate sealed containers and fully tagged unless exception is granted in writing by the Engineer or Contracting Officer.

3. SEEDING MIXTURES AND DATES OF PLANTING

The per acre rate for seed mixture and date of seeding shall be as shown on the vegetative plan or as specified in Project Documents.

4. SEED BED PREPARATION AND TREATMENT

Areas to be treated shall be dressed to a smooth, firm surface. On sites where equipment can safely operate, (generally slopes 2:1 or flatter), the seedbed shall be adequately loosened (4 to 6 inches deep) and smoothed. Disking or cultipacking or both may be necessary. On areas where equipment cannot operate, the seedbed shall be prepared by hand by scarifying to provide a roughened surface so that broadcast seed will stay in place. If seeding is to be done immediately following construction, seedbed preparation may not be required except on

compacted, polished, or freshly cut area.

Rocks larger than 6 inches in diameter, trash, weeds, and other debris that will interfere with seeding or maintenance shall be removed or disposed of as directed by the Engineer or Contracting Officer.

Seedbed preparation shall be discontinued when soil moisture conditions are not suitable for the preparation of a satisfactory seedbed as determined by the Engineer or Contracting Officer.

5. SEEDING

All seeding or sprigging operations shall be performed in such a manner that the seed or sprigs are applied in the specified quantities uniformly on the designated areas. The method and rate of seed application shall be as specified in Section 8. Unless otherwise specified, seeding or sprigging shall be done within 2 days after final grading is complete.

6. MEASUREMENT AND PAYMENT

For items of work for which specific unit prices are established in the contract, each area will be measured to the nearest 0.1 acre. Payment will be made at the contract unit price for the designated treatment which shall constitute full compensation for all materials, labor, equipment, tools, and other items necessary and incidental to the completion of the work.

7. MULCHING

Mulch materials shall consist of good quality smooth brome grass, no older than the previous year's cutting. The mulch shall be applied at a rate of 2 tons per acre. The mulch will be anchored by using a straight, serrated disc weighted to press the mulch into the soil a minimum of two inches. Spacing between discs will not exceed 12 inches. No area will be mulched that cannot be anchored in the same day's operation.

8. ITEMS OF WORK AND CONSTRUCTION DETAILS

Items of work to be performed in conformance with this

specification and the construction details therefore are:

Bid Item - Seeding and Mulching

- (1) This item shall consist of preparing the seedbed and placing seed and mulch on the area shown on the drawings or as directed by the engineer.
- (2) The seeding operation shall be done after final grading is completed. Seeding of Mixture #1 may be done from August 15 to October 1 and from December 1 to April 15. Seeding of Mixture #2 may only be done from December 1 to May 15.
- (3) All equipment used on the slopes will be operated on or near the level contour of the slopes. If necessary, a cable or other means will be used to prevent rutting of the slopes during all seeding and mulching operations.
- (4) Weeds will be removed from the seeding area if they will interfere with any operation in the seeding process.
- (5) All accessible areas will be sown with a grass drill. Seed shall be placed 1/4 to 3/4 inch deep. The drill shall be equipped with coulter openers and depth bands spaced not more than 12 inches apart. Small inaccessible or wet areas that cannot be seeded with a grass drill, may be hand broadcast. All broadcast seeding shall be lightly harrowed or hand raked the same day the seed is spread.
- (6) Seed mixtures shall be as follows:

Mixture #1

(Disturbed Area Above Permanent Water)

acre		Pounds per
<u>Species</u>	<u>in "Pure Live Seed" (PLS)</u>	
Kaw big bluestem, <u>Andropogon gerardi</u>		1.2
Osage indiangrass, <u>Sorghastrum nutans</u>		1.2
El Reno sideoats grama, <u>Bouteloua curtipendula</u>		0.6
Barton western wheatgrass, <u>Agropyron smithii</u>		3.0
Blackwell switchgrass, <u>Panicum virgatum</u>		1.2
Texoka or Improved buffalograss, <u>Buchloe dactyloides</u>		2.5
Achenbach smooth brome, <u>Bromus inermis</u>		<u>2.4</u>

Total Rate 12.1

Mixture #2
(Overseeding Front Slope Berm)

<u>Species</u>	<u>Pounds per Acre_</u> <u>in "Pure Live Seed" (PLS)</u>
Kanlow Switchgrass, <u>Panicum virgatum</u>	2.5
Praire Cordgrass, <u>Spartina pectinata</u>	<u>2.5</u>
Total Rate	5.0

Mixture #3
(Seeding area adjacent to the wetland area)
(Native grass filter area)

<u>Species</u>	<u>Pounds per acre in</u> <u>"Pure Live Seed" PLS</u>
Aldous little bluestem, <u>Schizachyrium scoparium</u>	1.6
Kaw big bluestem, <u>Andropogon gerargi</u>	2.4
Osage indiagrass, <u>Sorghastrum nutans</u>	2.4
El Reno sideoats grama, <u>Bouteloua curtipendula</u>	2.4
Blackwell switchgrass, <u>Panicum virgatum</u>	0.6
Western Wheatgrass, <u>Agropyron smithii</u>	2.0
Showy Partridge Pea, <u>Chamaecrista fasciculata</u>	0.1
Illinois Bundleflower, <u>Desmanthus Illinoensis</u>	0.2
Purple Prairie Clover, <u>Dalea Purpurea</u>	0.1
Maximillian Sunflower, <u>Helianthus Maximiliani</u>	<u>0.1</u>
Total Rate	11.9

(7) Fertilizer shall be applied either by a broadcast spreader or through a separate attachment on the grass drill (seed and fertilizer cannot be mixed in drill box).

Fertilizer shall be applied at the rate of 50 lb nitrogen per acre and 30 lb phosphate per acre.

CONSTRUCTION SPECIFICATION

10. WATER FOR CONSTRUCTION

1. SCOPE

The work shall consist of furnishing, transporting, and using water for construction purposes in accord with the applicable specifications.

2. FACILITIES AND EQUIPMENT

The Contractor shall build and maintain such access and haul roads as are needed, and shall furnish, operate, and maintain all pumps, piping, tanks, and other facilities needed to load, transport, and use the water as specified.

These facilities shall be equipped with meters, tanks, or other devices by which the volume of water supplied can be measured.

3. DUST ABATEMENT AND HAUL ROAD MAINTENANCE

Water for dust abatement and haul road maintenance shall be applied to haul roads and other dust-producing areas as needed to prevent excessive dust and to maintain the roads in good condition for efficient operation while they are in use.

4. EARTHFILL, DRAINFILL, ROCKFILL

Water for earthfill, drainfill, or rockfill shall be used in the fill materials as specified in the applicable construction specifications.

5. CONCRETE, MORTAR, GROUT

Water used in mixing or curing concrete, pneumatically applied mortar, or other Portland cement mortar or grout shall meet the requirements of the applicable

construction specifications and shall be used in conformance with those specifications. Payment for water used in these items is covered by the applicable concrete, mortar, or grout specification.

6. MEASUREMENT AND PAYMENT

For water items for which specific unit prices are established in the contract, the volume of water furnished and used in accordance with the specifications will be measured to the nearest 1000 gallons.

Except as otherwise specified, the measurement for payment will include all water needed at the construction site, except as noted in Section 5, to perform the work required under the contract in accordance with the specifications but will not include water wasted or used in excess of the amount needed. It will not include water used in concrete which is mixed elsewhere and transported to the site.

Payment for water will be made at the contract unit price. Such payment will constitute full compensation for all labor, materials, equipment, and all other items necessary and incidental to furnishing, transporting, and using the water.

7. ITEMS OF WORK AND CONSTRUCTION DETAILS

Items of work to be performed in conformance with this specification and the construction details therefore are:

Bid Item - Water

(1) This item shall consist of furnishing, transporting, measuring, and applying water to the drainfill, foundation and earthfill surface as necessary to bring them to the specified moisture content and for dust abatement and haul road maintenance. The source and water rights for the quantity of water needed will be the responsibility of the contractor.

(2) Water shall not be added to the foundation or earthfill materials without approval of the engineer. The amount of water added shall be only that amount that will provide a moisture content in the foundation or earthfill material to be within the required range plus a reasonable amount to compensate for evaporation and other unavoidable losses.

(3) Borrow operations will not start until the applied water has been absorbed uniformly by the soil. The length of absorption time shall be approved by the engineer. The surface of the borrow area shall be maintained in a manner that will prevent undue loss of moisture.

(4) Sources of earthfill materials which contain excessive moisture because of the addition of water under this specification shall not be abandoned in favor of other materials. Steps shall be taken by the contractor to reduce the moisture content of such materials.

(5) Water shall not be used for dust abatement or haul road maintenance without the approval of the engineer. Water used for haul road maintenance or dust control shall be properly applied to prevent slippery, muddy, or other hazardous conditions. Water shall be applied to other dust-producing areas as directed.

(6) Water shall be measured in units of gallons.

Water delivered by pipeline shall be measured by a water meter placed in the pipeline as close as possible to the point of delivery.

Water delivered in tanks during regular working hours shall be measured at the point of delivery by water meters in the outlet works or by calibrated tanks. These methods of measurement shall not be used interchangeably; however, the engineer may authorize the change from one system to the other.

Water delivered in tanks outside regular working hours shall be measured at the point of delivery by water meters in the outlet works.

Means shall be provided by the contractor to check the accuracy of the water meters or the calibration of the tanks when requested by the engineer. Water meters shall have an accuracy of + or - 3 percent of the true quantity.

CONSTRUCTION SPECIFICATION

11. REMOVAL OF WATER

1. SCOPE

The work shall consist of the removal of surface water and ground water as needed to perform the required construction in accordance with the specifications. It shall include (1) building and maintaining all necessary temporary impounding works, channels, and diversions, (2) furnishing, installing and operating all necessary pumps, piping and other facilities and equipment, and (3) removing all such temporary works and equipment after they have served their purposes.

2. DIVERTING SURFACE WATER

The Contractor shall build, maintain and operate all cofferdams, channels, flumes, sumps, and other temporary diversion and protective works needed to divert stream flow and other surface water through or around the construction site and away from the construction work while construction is in progress. Unless otherwise specified, a diversion must discharge into the same natural drainage in which its head works are located.

Unless otherwise specified, the Contractor shall furnish to the Contracting Officer in writing, their plan for diverting surface water before beginning the construction work for which the diversion is required. Acceptance of this plan will not relieve the Contractor of responsibility for completing the work as specified.

3. DEWATERING THE CONSTRUCTION SITE

Foundations, cutoff trenches and other parts of the construction site shall be dewatered and kept free of standing water or excessively muddy conditions as needed for proper execution of the construction work. The Contractor shall furnish, install, operate and maintain all drains, sumps, pumps, casings, wellpoints, and other equipment needed to perform the

dewatering as specified. Dewatering methods that cause a loss of fines from foundation areas will not be permitted.

Unless otherwise specified, the Contractor shall furnish to the Contracting Officer, in writing, their plan for dewatering before beginning the construction work for which the dewatering is required. Acceptance of this plan will not relieve the Contractor of responsibility for completing the work as specified.

4. DEWATERING BORROW AREAS

Unless otherwise specified in Section 8, the Contractor shall maintain the borrow areas in drainable condition or otherwise provide for timely and effective removal of surface and ground waters that accumulate within the borrow areas from any source.

Borrow material shall be processed as necessary to achieve proper and uniform moisture content for placement.

If pumping to dewater borrow areas is included as an item of work in the bid schedule, each pump used for this purpose shall be equipped with a water meter in the discharge line. Accuracy of the meters shall be such that the measured quantity of water is within 3 percent, plus or minus, of the true quantity. Means shall be provided by the Contractor to check the accuracy of the water meters when requested by the Contracting Officer.

5. EROSION AND POLLUTION CONTROL

Removal of water from the construction site, including the borrow areas shall be accomplished in such a manner that erosion and the transmission of sediment and other pollutants are minimized.

6. REMOVAL OF TEMPORARY WORKS

After the temporary works have served their purposes, the Contractor shall remove them or level and grade them to the extent required to present a sightly appearance and to prevent any obstruction of the flow of water or any other interference with the operation of or access to the permanent works.

Except as otherwise specified, pipes and casings shall be removed from temporary wells and the wells shall be filled to ground level with gravel or other suitable material approved by the Contracting Officer.

7. MEASUREMENT AND PAYMENT

Method 1 Items of work listed in the bid schedule for removal of water, diverting surface water, dewatering construction sites, and dewatering borrow areas will be paid for at the contract lump sum prices. Such payment will constitute full compensation for all labor, equipment, tools, and all other items necessary and incidental to the completion of the work.

Method 2 Items of work listed in the bid schedule for removal of water, diverting surface water, dewatering construction sites, and dewatering borrow areas will be paid for at the contract lump sum prices. Such payment will constitute full compensation for furnishing, installing, operating, and maintaining the necessary trenches, drains, sumps, pumps, and piping, and for all labor, equipment, tools, and all other items necessary and incidental to the completion of the work, except that additional payment for pumping to dewater borrow areas will be made as described in the following paragraph.

If pumping to dewater borrow areas is listed as an item of work in the bid schedule, payment will be made at the contract unit price which shall be the price per 1,000 gallons shown in the bid schedule. Such payment will constitute full compensation for pumping only. Compensation for equipment and preparation and for other costs associated with pumping will be included in the lump sum payment for removal of water or the lump sum payment for dewatering borrow areas.

Payment will be made only for pumping that is necessary to dewater borrow areas that cannot be effectively drained by gravity or that must have the water table lowered to be usable. Pumping for other purposes will not be included for payment in this item.

All Methods The following provisions apply to all methods of measurement and payment. Compensation for any item of work described in the contract but not listed in the bid schedule will be included in the payment for the item of work to which it is made subsidiary. Such items and the items to which they are made subsidiary are identified in Section 8 of this specification.

8. ITEMS OF WORK AND CONSTRUCTION DETAILS

Items of work to be performed in conformance with this specification and the construction details therefore are:

Subsidiary Item - Removal of Water

- (1) This item shall consist of the removal of water from the work site during construction.
- (2) Surface and groundwater in the borrow area shall be effectively and timely removed as necessary to provide good trafficability and full utilization of the borrow materials.
- (3) Materials used in stream or channel crossings shall be selected to permit placement, operation, and removal of the crossing with a minimum deposition of sediment into the stream.
- (4) No separate payment will be made for this item. Compensation for this item shall be included in the payment for Excavation, Common; Reinforced Concrete, Appurtenances, Class 4000; Drain fill; Plastic Drainage Pipe, 4-inch Diameter; and 10 inch Diameter, as appropriate.