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P.O. Box 53465 Oklahoma City, OK 73152 PH. (405) 521-3851

Attention Vendors

****AMENDMENT #1****

April 16, 2019

Solicitation #117P

**Description: Removal & Replacement of 4 Water Control Structures –
Hackberry Flat WMA**

Due Date: 04/24/19

Please note that updated project specs have been released by the engineer and have been attached here, including:

- 1) Method of measurement changed to lump sum
- 2) Information provided on augured & concreted pilings
- 3) Trench safety specs added

These changes should better align with what was discussed by project managers during the mandatory pre-bid meeting on April 12, 2019.

This does not change any other aspect of the solicitation.

Please review and contact me if you have any questions or concerns. Thank you.

Respectfully,

Paul Proctor

Certified Procurement Officer
Oklahoma Department of Wildlife Conservation
2145 NE 36TH St
Oklahoma City, OK 73111
Phone: (405) 522-5762
Website: wildlifedepartment.com



Proctor, Paul <paul.proctor@odwc.ok.gov>

Fwd: Fw: Hackberry Flat Technical Specs and other info

Richardson, Josh <josh.richardson@odwc.ok.gov>
To: "Proctor, Paul" <paul.proctor@odwc.ok.gov>

Mon, Apr 15, 2019 at 11:26 AM

----- Forwarded message -----

From: **Alan Stacey** <astacey02@sbcglobal.net>
Date: Mon, Apr 15, 2019 at 11:25 AM
Subject: Fw: Hackberry Flat Technical Specs and other info
To: Josh Richardson <josh.richardson@odwc.ok.gov>
CC: Kelvin Schoonover <kelvin.schoonover@odwc.ok.gov>

Josh: see Carter's revisions to the HF contract. Please keep Carter/myself posted on the bid closing.....thanks!

--- On Mon, 4/15/19, Carter Coleman <ccoleman@ducks.org> wrote:> From: Carter Coleman <ccoleman@ducks.org>

> Subject: Hackberry Flat Technical Specs and other info
> To: "Alan Stacey" <astacey02@sbcglobal.net>
> Date: Monday, April 15, 2019, 11:04 AM
>
>
>
>
>
>
>
> Alan,
>
> Attached are the revised
> technical specs. Method of measurement has been changed to
> Lump Sum for all items. Method of payment has been removed.
> Please let me know if there are any questions or comments on
> the specs.
>
>
> As it relates to setting
> the timbers with an auger and concrete – if the
> contractor wants to go this route, we would ask them to run
> a 10" auger to 15' of depth and to backfill
> around the piles with concrete. If you want a concrete spec
> I can send it but this may be unnecessary.
>
> For trench safety I have
> attached two PDF's for your reference. The first is the
> sloping and benching requirements of Subpart P, the second
> is the soils classification information referenced in the
> first attachment. Its safe to be conservative
> and assume we are in type C soils – in that scenario
> the contractor just needs to cut the trench that 1.5/1 (max
> slope) to be in compliance. The 2:1 to 2.5:1 you referenced
> during our phone call would be more than adequate. As long
> as the contractor knows
> this and is willing to cut the trench in this manner, I

> would not require him to submit a sealed trench safety plan,
> this will just unnecessarily drive up cost. The trench is
> not deep enough to require a benched excavation.

>

>

> I am working on a plan
> sheet with horizontal layout information.

>

> When is the bid
> opening?

>

> Thanks,

>

>

> Carter A. Coleman,
> P.E.
> Regional Engineer (TX, OK, NM)

>

> Ph: 832-595-0663 Ext.
> 2281

> Cell: 832-535-9178
> ccoleman@ducks.org

>

> 915 Front Street
> Richmond, TX 77469

>

>

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>

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Josh Richardson
OK Department of Wildlife
Office: 405-396-2503
Fax: 405-396-8035

4 attachments



image001.jpg
2K

1926 Subpart P App B - Sloping and Benching _ Occupational Safety and Health Administration.pdf
226K

Soil Classification - 1926 Subpart P App A _ OSHA.pdf
167K

Hackberry Structure Technical Specifications.pdf
441K

By Standard Number / 1926 Subpart P App B - Sloping and Benching

- **Part Number:** 1926
 - **Part Number Title:** Safety and Health Regulations for Construction
 - **Subpart:** 1926 Subpart P
 - **Subpart Title:** Excavations
 - **Standard Number:** 1926 Subpart P App B
 - **Title:** Sloping and Benching
 - **GPO Source:** e-CFR
-

(a) **Scope and application.** This appendix contains specifications for sloping and benching when used as methods of protecting employees working in excavations from cave-ins. The requirements of this appendix apply when the design of sloping and benching protective systems is to be performed in accordance with the requirements set forth in § 1926.652(b)(2).

(b) **Definitions.**

Actual slope means the slope to which an excavation face is excavated.

Distress means that the soil is in a condition where a cave-in is imminent or is likely to occur. Distress is evidenced by such phenomena as the development of fissures in the face of or adjacent to an open excavation; the subsidence of the edge of an excavation; the slumping of material from the face or the bulging or heaving of material from the bottom of an excavation; the spalling of material from the face of an excavation; and ravelling, i.e., small amounts of material such as pebbles or little clumps of material suddenly separating from the face of an excavation and trickling or rolling down into the excavation.

Maximum allowable slope means the steepest incline of an excavation face that is acceptable for the most favorable site conditions as protection against cave-ins, and is expressed as the ratio of horizontal distance to vertical rise (H:V).

Short term exposure means a period of time less than or equal to 24 hours that an excavation is open.

(c) **Requirements -- (1) Soil classification.** Soil and rock deposits shall be classified in accordance with appendix A to subpart P of part 1926.

(2) **Maximum allowable slope.** The maximum allowable slope for a soil or rock deposit shall be determined from Table B-1 of this appendix.

(3) **Actual slope.** (i) The actual slope shall not be steeper than the maximum allowable slope.

(ii) The actual slope shall be less steep than the maximum allowable slope, when there are signs of distress. If that situation occurs, the slope shall be cut back to an actual slope which is at least $\frac{1}{2}$ horizontal to one vertical ($\frac{1}{2}$ H:1V) less steep than the maximum allowable slope.

(iii) When surcharge loads from stored material or equipment, operating equipment, or traffic are present, a competent person shall determine the degree to which the actual slope must be reduced below the maximum

allowable slope, and shall assure that such reduction is achieved. Surcharge loads from adjacent structures shall be evaluated in accordance with § 1926.651(i).

(4) **Configurations.** Configurations of sloping and benching systems shall be in accordance with Figure B-1.

TABLE B-1
MAXIMUM ALLOWABLE SLOPES

SOIL OR ROCK TYPE	MAXIMUM ALLOWABLE SLOPES (H:V)(1) FOR EXCAVATIONS LESS THAN 20 FEET DEEP(3)
STABLE ROCK	VERTICAL (90°)
TYPE A (2)	3/4:1 (53°)
TYPE B	1:1 (45°)
TYPE C	1 1/2:1 (34°)

Footnote(1) Numbers shown in parentheses next to maximum allowable slopes are angles expressed in degrees from the horizontal. Angles have been rounded off.

Footnote(2) A short-term maximum allowable slope of 1/2H:1V (63°) is allowed in excavations in Type A soil that are 12 feet (3.67 m) or less in depth. Short-term maximum allowable slopes for excavations greater than 12 feet (3.67 m) in depth shall be 3/4H:1V (53°).

Footnote(3) Sloping or benching for excavations greater than 20 feet deep shall be designed by a registered professional engineer.

Figure B-1

Slope Configurations

(All slopes stated below are in the horizontal to vertical ratio)

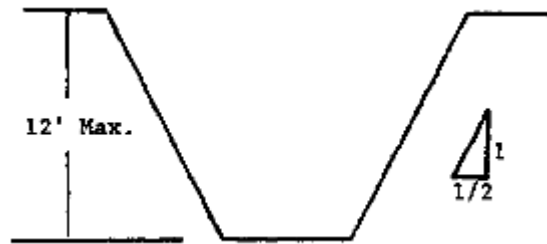
B-1.1 Excavations made in Type A soil.

1. All simple slope excavation 20 feet or less in depth shall have a maximum allowable slope of 3/4:1.



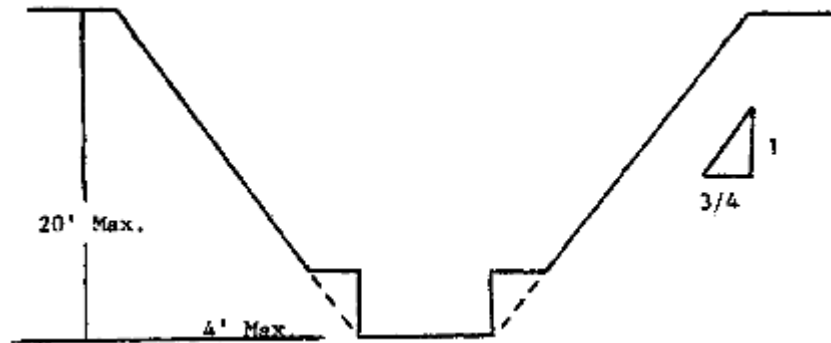
SIMPLE SLOPE -- GENERAL

Exception: Simple slope excavations which are open 24 hours or less (short term) and which are 12 feet or less in depth shall have a maximum allowable slope of 1/2:1.

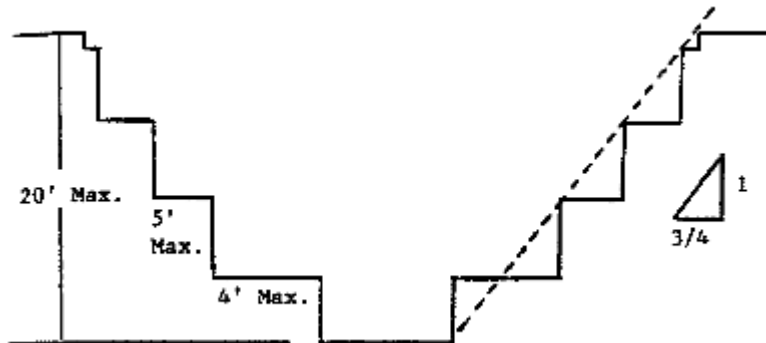


SIMPLE SLOPE -- SHORT TERM

2. All benched excavations 20 feet or less in depth shall have a maximum allowable slope of 3/4 to 1 and maximum bench dimensions as follows:

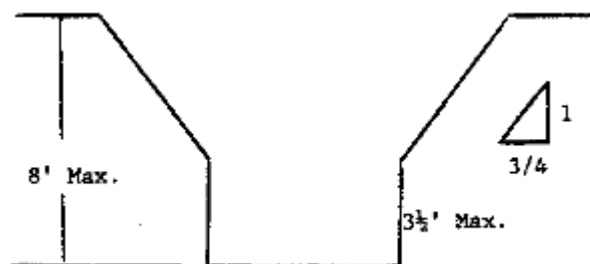


SIMPLE BENCH



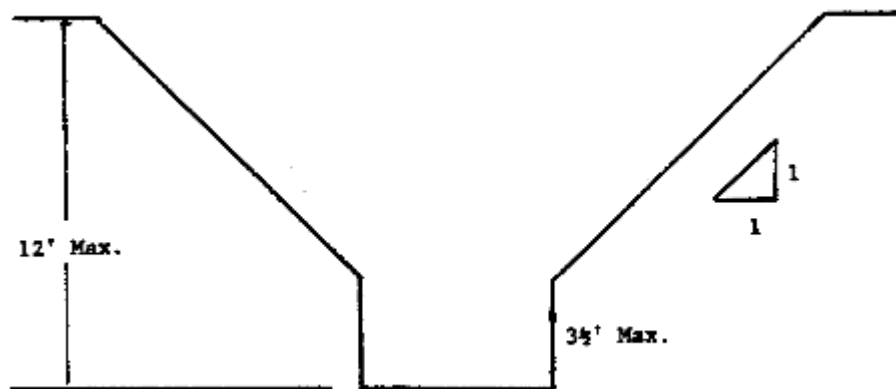
MULTIPLE BENCH

3. All excavations 8 feet or less in depth which have unsupported vertically sided lower portions shall have a maximum vertical side of 3½ feet.



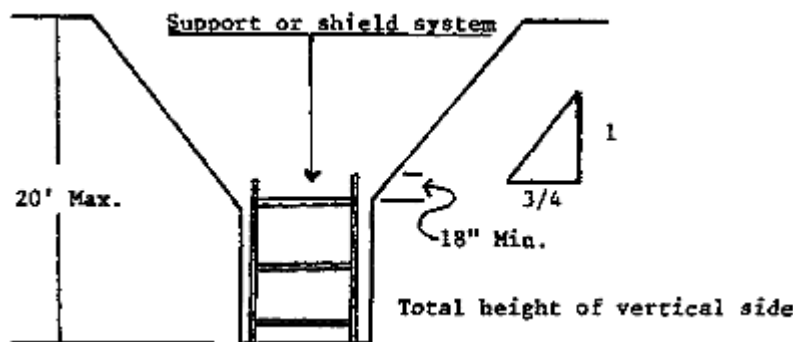
UNSUPPORTED VERTICALLY SIDED LOWER PORTION -- MAXIMUM 8 FEET IN DEPTH)

All excavations more than 8 feet but not more than 12 feet in depth with unsupported vertically sided lower portions shall have a maximum allowable slope of 1:1 and a maximum vertical side of 3½ feet.



UNSUPPORTED VERTICALLY SIDED LOWER PORTION -- MAXIMUM 12 FEET IN DEPTH)

All excavations 20 feet or less in depth which have vertically sided lower portions that are supported or shielded shall have a maximum allowable slope of ¾:1. The support or shield system must extend at least 18 inches above the top of the vertical side.

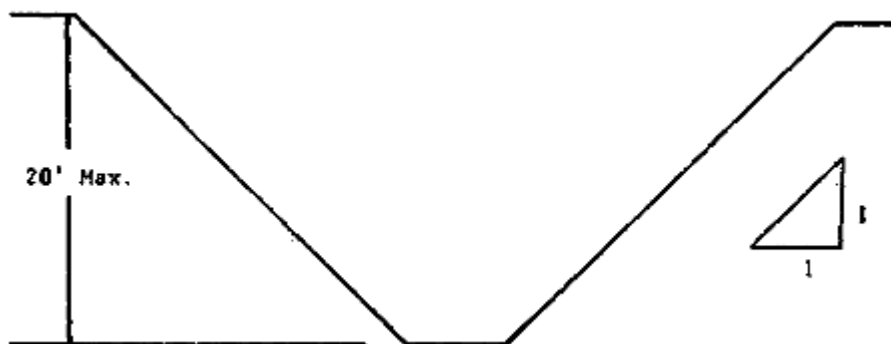


SUPPORTED OR SHIELDED VERTICALLY SIDED LOWER PORTION

4. All other simple slope, compound slope, and vertically sided lower portion excavations shall be in accordance with the other options permitted under § 1926.652(b).

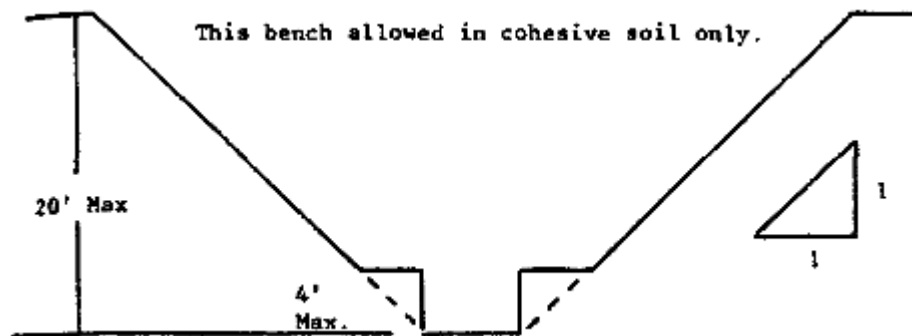
B-1.2 Excavations Made in Type B Soil

1. All simple slope excavations 20 feet or less in depth shall have a maximum allowable slope of 1:1.

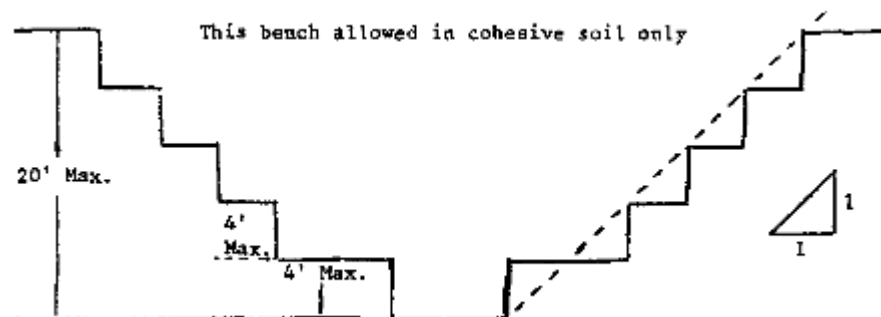


SIMPLE SLOPE

2. All benched excavations 20 feet or less in depth shall have a maximum allowable slope of 1:1 and maximum bench dimensions as follows:

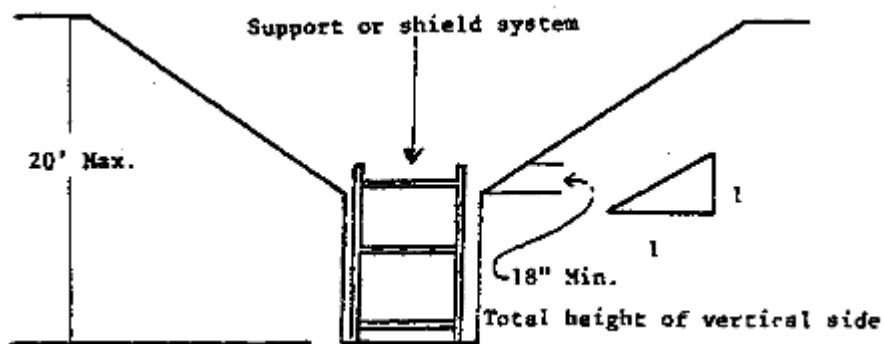


SINGLE BENCH



MULTIPLE BENCH

3. All excavations 20 feet or less in depth which have vertically sided lower portions shall be shielded or supported to a height at least 18 inches above the top of the vertical side. All such excavations shall have a maximum allowable slope of 1:1.

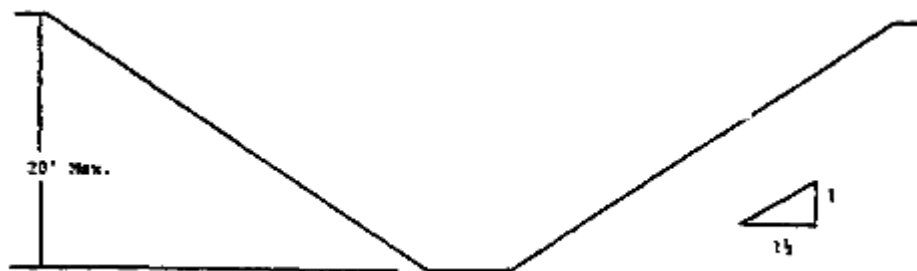


VERTICALLY SIDED LOWER PORTION

4. All other sloped excavations shall be in accordance with the other options permitted in § 1926.652(b).

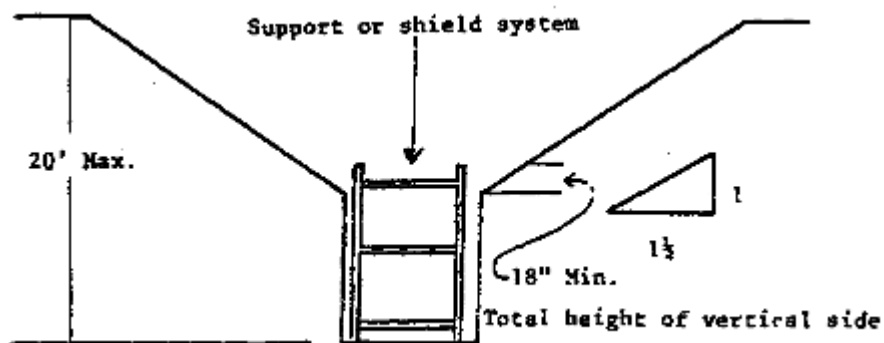
B-1.3 Excavations Made in Type C Soil

1. All simple slope excavations 20 feet or less in depth shall have a maximum allowable slope of 1½:1.



SIMPLE SLOPE

2. All excavations 20 feet or less in depth which have vertically sided lower portions shall be shielded or supported to a height at least 18 inches above the top of the vertical side. All such excavations shall have a maximum allowable slope of 1½:1.

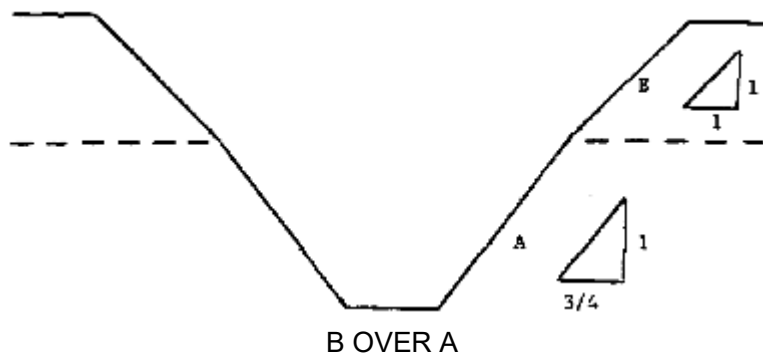


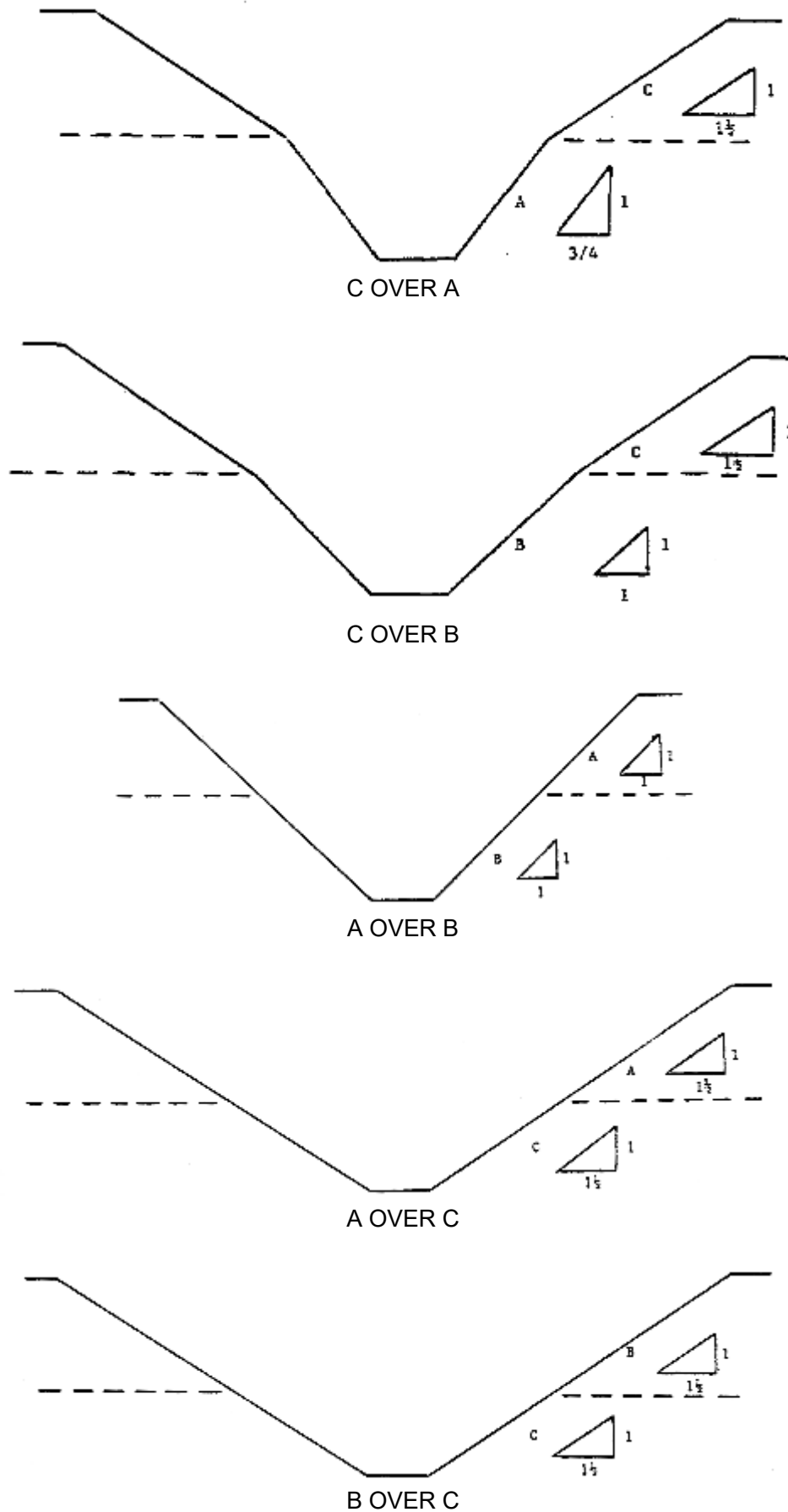
VERTICAL SIDED LOWER PORTION

3. All other sloped excavations shall be in accordance with the other options permitted in § 1926.652(b).

B-1.4 Excavations Made in Layered Soils

1. All excavations 20 feet or less in depth made in layered soils shall have a maximum allowable slope for each layer as set forth below.





2. All other sloped excavations shall be in accordance with the other options permitted in § 1926.652(b).

UNITED STATES DEPARTMENT OF LABOR

Occupational Safety & Health Administration
200 Constitution Ave NW
Washington, DC 20210
800-321-6742 (OSHA)
TTY
www.OSHA.gov

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Disaster Recovery Assistance
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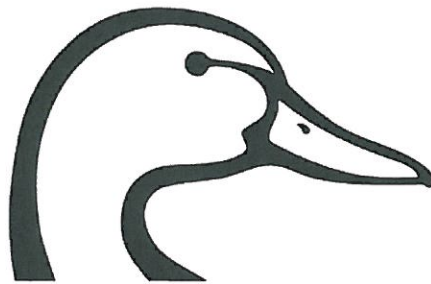
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TECHNICAL SPECIFICATIONS
FOR
**HACKBERRY FLAT WMA
STRUCTURE REMEDIATION**

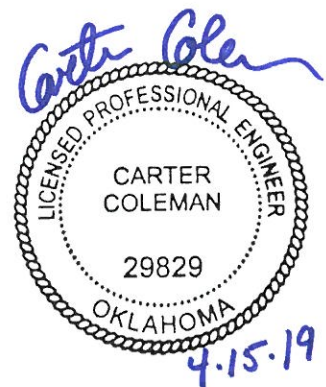
TILLMAN COUNTY, OK

DU PROJECT NUMBER
DU-OK-6-5



DUCKS UNLIMITED, INC.
TEXAS FIELD OFFICE
915 FRONT ST.
RICHMOND, TEXAS 77469
CERTIFICATE OF AUTHORIZATION NO. F-001112

IN COOPERATION WITH
OKLAHOMA DEPARTMENT OF WILDLIFE CONSERVATION



CONSTRUCTION SPECIFICATION

201 - MOBILIZATION

201.1 SCOPE

The work shall include the supply of all labor, material and equipment to transport all needed labor, material and equipment to and from a project site which is required to successfully complete the project as shown on the plans or described by the Engineer. When work on a project site consists of constructing a number of water control structures, levees or other items of work, mobilization shall also include the supply of all labor, material and equipment needed to transport required labor, material and equipment between the various work locations.

Mobilization shall include all activities and costs for transportation of personnel, equipment, and operating supplies to the site; establishment of offices, buildings, and other necessary facilities for the Contractor's operations at the site; premiums paid for performance and payment bonds, including coinsurance and reinsurance agreements as applicable.

Demobilization shall include all activities and costs for transportation of personnel, equipment, and supplies not included in the contract from the site; including the disassembly, removal and site clean up, of offices, buildings, and other facilities assembled on the site for this contract.

201.2 METHOD

The Contractor shall conduct all mobilization and demobilization operations in a timely and orderly manner. Unless otherwise approved by the Engineer, mobilization operations shall commence no later than one (1) week after the pre-construction meeting.

Demobilization shall commence no later than one (1) week after project completion and be finished within two (2) weeks of project completion. The contractor shall be fully mobilized on the project site and ready to begin work on September 1, 2018.

201.3 INGRESS AND EGRESS

201.31 ROADS AND FENCES

The Contractor shall limit the construction traffic to public roadways and access roads shown on plans. Surface alterations to access roads, fences and or gates resulting from operations of the contractor shall be repaired at the Contractor's expense.

The Contractor shall repair or replace any fences, roads, bridges, boat launches, paths, or other facilities which may be damaged or destroyed by the Contractors operations.

201.4 METHOD OF MEASUREMENT

Mobilization shall be measured on a unit basis. The unit shall be shown in the Unit Price Table of the Standard Bid Form for the "MOBILIZATION" bid item. Mobilization shall be measured in the following manner:

Lump Sum (LS): Mobilization will be measured on a project percent complete basis of the lump sum bid during the project.

CONSTRUCTION SPECIFICATION

204 – EMBANKMENT

204.1 SCOPE

The work shall include the supply of all labor, material and equipment required to complete the construction of the water control structure as shown on the plans and as staked in the field. The work shall include:

- construction of earthen dikes, embankments, or levees with associated cores and keyways.
- leveling and trimming of earthen dikes, embankments, or levees.
- placement of backfill around water control structure(s) and pipes or culverts.

Fill material required for compacted backfill as outlined on the construction plans or directed by the Engineer shall be suitable onsite material, generated during the ditch maintenance portion of the project, free of organic matter. Fill material shall be clean clay or sandy clay.

204.3 CONSTRUCTION METHODS

Unless otherwise specified or directed by the Engineer, all suitable fill material shall be placed in lifts of not more than six (6) inches and shall be compacted by routing the hauling and spreading equipment (minimum ground pressure 7.0 psi) over the fill in such a manner that every point on the surface of each layer of fill will be traversed by not less than 1 tread track of the spreading and hauling equipment or by other methods approved by the Engineer. The moisture content of the fill materials shall be suitable to achieve proper compaction of these materials utilizing the tamping equipment. Fill material that is too wet (i.e. pumping under the weight of the construction equipment) when deposited in the fill areas shall be removed and dried to the optimum moisture content prior to compaction. If fill materials are too dry to achieve proper compaction, the contractor shall evenly mix water with the fill material to yield moisture content suitable for compaction of the fill materials. No extra payment will be made for hauling or applying water.

All dikes, embankments or levees shall be construction staked to final grade elevations shown on the drawings. Dikes, embankments, and levees shall be brought to these specified elevations by the contractor using suitable compacted fill material graded to a tolerance of 0.1 feet.

Backfilling must be as continuous as possible and the fill maintained such that drainage is assured at all times. Should fill settlement occur during the construction of the water control structure within seven (7) days of substantial completion, and prior to acceptance of the work, additional material shall be placed and trimmed to achieve final grade by the

Contractor at their own expense. After backfilling has been constructed to final grade, the area shall be leveled and trimmed to conform with the lines and grades and cross sections as shown on the plans and/or as staked.

204.4 CONTROL OF SURFACE AND SUBSURFACE WATER

The Contractor is responsible for control of surface/sub-surface water and drainage during the construction period. All temporary fills and/or crossings necessary to promote construction will be installed and removed at the Contractor's expense prior to acceptance of the work. Control of surface and subsurface water shall be maintained in accordance with construction Specification **205 – WATER CONTROL**.

204.5 SETTLEMENT

Should fill settlement occur during the construction of embankment and/or prior to acceptance of the work, additional material shall be placed and trimmed to achieve final grade by the Contractor.

204.5 METHOD OF MEASUREMENT

Embankment shall be measured on a unit basis.

The unit shall be shown in the Unit Price Table of the Standard Bid Form for the "Embankment" bid item and measured in the following manner:

Lump Sum - (LS): Embankment will be measured on a lump sum basis as shown on the plans.

CONSTRUCTION SPECIFICATION

205 – WATER CONTROL

205.1 DESCRIPTION

The work shall consist of the removal of surface water and ground water as necessary to perform the construction required by the contract in accordance with the specifications. It shall include: (1) constructing, installing, building, and maintaining all necessary temporary water containment facilities, 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 their intended function is no longer required.

205.2 DIVERTING SURFACE WATER

The Contractor shall install, maintain and operate all cofferdams, channels, flumes, sumps, and all other temporary diversion and protective works needed to divert stream flow and other surface water through or around the construction site. Control of surface water shall be continuous during the period that damage to construction work could occur. Unless otherwise specified and/or approved, the diversion outlet shall be into the same drainage-way that the water would have reached before being diverted.

The Contractor shall furnish the Engineer in writing, a proposed plan for diverting surface water before beginning any construction activities for which a diversion is required, unless waived by the Engineer. Acceptance of this plan, or the waiving of the plan requirement, will not relieve the Contractor of the responsibilities related to this activity during the process of completing the work as specified.

205.3 DEWATERING THE CONSTRUCTION SITE

The Contractor is responsible for control of surface water, subsurface water and drainage during the construction period. All temporary fills, crossings, and culverts necessary to promote drainage will be installed and removed at the Contractor's expense prior to acceptance of the work. Any claims arising from upstream or downstream damages as a result of the construction or failure of these temporary works will be the Contractors responsibility.

Cofferdams will be required for all excavations in active watercourse channels and in areas of ground water seepage. Cofferdams must be built to withstand all the forces to which they may be subjected and shall be located such as to give sufficient clearance for the construction of cutoff trenches and/or sump pits for dewatering unless otherwise provided. Cofferdam placement, maintenance and removal shall be the responsibility of the Contractor.

Foundations, cutoff trenches, and all other parts of the construction site shall be dewatered and kept free of standing water and muddy conditions as necessary for the proper execution of the work. The Contractor shall furnish, install, operate, and maintain all drains, sumps, pumps, casings, well points, and all other equipment required to properly dewater the site as specified. Dewatering systems that cause a loss of soil fines from the foundation areas will not be permitted.

The Contractor shall furnish the Engineer in writing, a proposed plan for dewatering before commencing with any construction activity that dewatering may be required, unless waived by the Engineer. Acceptance of this plan, or the waiving of the plan requirement, will not relieve the Contractor of responsibilities for completing the specified work.

205.4 EROSION AND POLLUTION CONTROL

Removal of water from the construction site, including the borrow areas, shall be accomplished in a manner that erosion and the transporting of sediment and other pollutants are minimized. Dewatering activities shall be accomplished in a manner that the groundwater quality is not altered. Pollution control activities shall not conflict with the requirements of Construction Specification **211 – POLLUTION CONTROL**, if it is a part of this contract.

205.5 REMOVAL OF TEMPORARY WORKS

When temporary works are no longer needed, the Contractor shall remove and return the area to a similar condition that existed prior to construction. Areas where temporary works were located shall be graded for sightly appearance with no obstruction to natural surface water flows or the proper functioning and access to the works of improvement installed. The Contractor shall exercise extreme care during the removal stages to minimize the loss of soil sediments and debris that was trapped during construction.

Pipes, casings, and any other material used to dewater the site shall be removed from temporary wells. The wells shall be filled to ground level with clean gravel or other suitable material approved by the Engineer. The Contractor shall exercise extreme care to prevent pollution of the ground water by these actions.

205.6 METHOD OF MEASUREMENT

No separate measurement will be made for Water Control. Water Control shall be considered incidental to the water control structure installation required for the construction outlined in the construction plans and specifications.

CONSTRUCTION SPECIFICATION

206 – WATER CONTROL STRUCTURES

206.1 SCOPE

The work of this section shall include the supply of all labor, materials, and equipment required to complete the fabrication and installation of the water control structures with appurtenances as called for on the drawings and/or specified herein. The work shall include:

- Fabrication of aluminum water control structures.
- Bed preparation and installation of lumber and timber supports where required or as detailed in the plans.
- Field assembly, if required, of: pipe to structure; installation of water control gates on structures; installation of stop logs; and any other associated hardware as shown on the plans.
- Installation of Cathodic Protection.
- Placement of backfill and compaction of material around pipe and structures.

206.2 MATERIALS

All materials shall be handled and stored in careful and workmanlike manner to the satisfaction of the Engineer. The Contractor shall be responsible for any damages to the pipe or water control structure caused by the Contractors operations. Repairs to or replacement of damaged materials shall be at the Contractors expense. Methods of repairs or decision to replace damaged materials shall be at the discretion of the Engineer.

206.21 CORRUGATED ALUMINUM PIPE (CAP)

Corrugated aluminum pipe and fittings shall conform to the requirements of ASTM B744, ASTM B745, or ASTM B790 for the specified pipe sheet thickness, shape type, fabrication methods.

Fittings shall be fabricated from sheet aluminum meeting the requirements contained in ASTM B744 and ASTM B745. The coating for fittings shall be the same as that specified for the corrugated aluminum pipe.

Fabricated, welded fittings shall result in a continuous smooth surface finish. Aluminum welding electrodes used shall conform to the requirements of American Welding Society (AWS) specification AWS A5.10, "Specification for Aluminum and Aluminum Alloy Welding Rods and Bare Electrodes." Welded surfaces and adjacent surfaces damaged during welding shall be treated by removing all weld splatter. The affected surface shall be cleaned to bright metal by sand blasting, power disk sanding, or wire brushing. The cleaned area shall extend at least 0.5 inch into the undamaged section of coated area. Within 24 hours of completion of surface, preparation all treated surfaces shall be painted with two

coats of a chromate rich primer and allowed to fully dry before exposure to weathering conditions.

Aluminum pipe or fabricated aluminum fittings that will have contact with steel, iron, other metals, or chemically treated wood products shall be isolated from direct contact by coating potential contact surfaces with a zinc-chromate primer and allowed to fully dry before final installation.

Aluminum pipe or fittings embedded or attached to concrete or masonry structures shall be coated with a bituminous paint or other approved methods to prevent contact between the concrete and aluminum surfaces.

206.23 RISER STRUCTURES- ALUMINUM

Riser structures shall be fabricated to the dimensions shown in the plan drawings to provide the clear width openings required for weir flow. Frames for the riser shall be fabricated from 6061-T6 aluminum alloy channel sections of the sizes shown. Plate aluminum shall be 5086 H116 alloy of the thickness shown in the plan details. Stop logs shall be extruded from 6061-T6 aluminum alloy with a tongue and groove profile as detailed in the plans. Bar grating shall be manufactured from 6063-T6 aluminum alloy with swaged bars spaced on 4" centers and bearing bars spaced on 1 3/16" centers. Bar grating shall be supplied with serrated or other non-slip surfacing.

The corrugated aluminum pipe shall be shop welded to the riser structure or if requested, the contractor may field weld the pipe to the riser structure. Lifting lugs shall be provided as required for safe loading and installation and to prevent damage to the structure during handling.

Shop drawings for the riser fabrication shall be submitted to the Engineer for review and approval prior to fabrication.

206.24 MAGNESIUM ANODE AND CATHODIC PROTECTION MATERIAL

Anodes shall be 50lb Magnesium Anodes (ASTM AZ63) with wire and terminations per anode manufacturer recommendations. Contractor to submit product data sheets on selected anode for engineer approval prior to construction.

Bolted terminations shall consist of one 1/4" stainless steel bolt per each magnesium anode.

Anode connection wire shall be #6 AWG Copper Lead Wire/THWN.

206.3 CONSTRUCTION METHODS

206.31 SUPPORT STRUCTURE

Installation of timber pilings, lumber and timber support structures shall be in accordance

with specification section 411- TIMBER STRUCTURES.

206.32 BACKFILL

Backfill for structures shall be in accordance with specification section 204- EMBANKMENT.

206.33 CONTROL OF SURFACE/SUBSURFACE WATER

The Contractor is responsible for control of surface water, subsurface water and drainage during the construction period. All temporary fills and culverts necessary to promote or divert drainage will be installed and removed at the Contractor's expense prior to acceptance of the work. Any claims arising from upstream or downstream damages as a result of the construction or failure of these temporary works will be the Contractors responsibility.

206.4 METHOD OF MEASUREMENT

Water Control Structures shall be measured in the following manner:

Lump Sum (LS): Water Control Structures shall be measured on a lump sum basis. Measurement shall be made for each Water Control Structure consisting of a pipe, sluice gate, riser structure with stoplogs and associated parts supplied and installed as detailed or specified in the plans. Where multiple riser structures are installed in the same location, each individual structure will be measured for payment.

Magnesium Anodes shall be measured in the following manner:

Lump Sum (LS): Magnesium anodes shall be measured on a lump sum basis. Measurement shall be made for each anode/wire/termination fastener supplied and installed as detailed or specified in the plans. Where multiple anodes are installed on a single water control structure, each individual anode/wire/termination fastener will be measured for payment.

No separate measurement shall be made for the installation or removal of cofferdams, dewatering, excavation, backfill, compaction, or other incidental items necessary to complete the water control structure installation.

CONSTRUCTION SPECIFICATION

211 - POLLUTION CONTROL

211.1 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 and air during construction operations.

211.2 EROSION AND SEDIMENT CONTROL MEASURES AND WORKS

The measures and works shall include, but are not limited to, the following:

Staging of Earthwork Activities The excavation and moving of soil materials shall be scheduled so that the smallest possible areas will be unprotected from erosion for the shortest time feasible.

Seeding Seeding to protect disturbed areas.

Diversions Diversions to divert water away from work areas and to collect runoff from work areas for treatment and safe disposition. These works are temporary and shall be removed and the area restored to its original state when they are no longer needed or permanent measures are installed.

Stream Crossings Culverts or bridges where equipment must cross streams. These works are temporary and shall be removed and the area restored to its original state when they are no longer needed or permanent measures are installed.

Sediment Basins Sediment basins to settle and filter out sediment from eroding areas to protect properties and streams below the construction site. These works are temporary and shall be removed and the area restored to its original state when they are no longer needed or permanent measures are installed.

Sediment Filters Silt fence to trap sediment from areas of limited runoff. Sediment filters shall be properly anchored to prevent erosion under them. These works are temporary and shall be removed and the area restored to its original state when they are no longer needed or permanent measures are installed.

Turbidity Curtains Floating sediment fences used to prevent the flow and or washing of disturbed debris and sediment in a water source: stream, river, pool, lake reservoir, etc. Turbidity curtains shall be properly anchored to prevent erosion under them. These works are temporary and shall be removed and the area restored to its original state when they are

no longer needed or permanent measures are installed.

Waterways Waterways for the safe disposal of runoff from fields, diversions and other structures or measures. These works are temporary and shall be removed and the area restored to its original state when they are no longer needed or permanent measures are installed.

Other Additional work as specified by the Engineer or required by the Federal, State, or Local Government.

211.3 CHEMICAL POLLUTION

The Contractor shall provide watertight tanks or barrels or construct a sump sealed with plastic sheets to be used to dispose of chemical pollutants, such as drained lubricating or transmission oils, greases, soaps, concrete mixer wash water, asphalt, etc., produced as a by-product of the construction work. At the completion of the construction work, sumps shall be voided without causing pollution.

Sanitary facilities such as chemical toilets or septic tanks shall not be placed adjacent to live streams, wells, or springs. They shall be located at a distance sufficient to prevent contamination of any water sources. At the completion of construction work, facilities shall be disposed of without causing pollution.

211.4 AIR POLLUTION

The burning of brush or slash or disposal of other materials shall adhere to local and state regulations.

Fire prevention measures shall be taken to prevent the start or the spreading of wild fires which result from project work. Firebreaks or guards shall be constructed at locations shown on the drawings.

All public access or haul roads used by the contractor during construction of the project shall be sprinkled or otherwise treated to fully suppress dust. All dust control methods shall insure safe operations at all times. If chemical dust suppressants are used, the material shall be a commercially available product specifically designed for dust suppression and the application shall follow manufacturer's requirements and recommendations. A copy of the product data sheet and manufacturer's recommended application procedures shall be provided to the Engineer five working days before use.

211.5 MAINTENANCE, REMOVAL, AND RESTORATION

All pollution control measures and works shall be adequately maintained in a functional condition as long as needed during the construction operation. All temporary measures

shall be removed and the site restored to as nearly original conditions as practicable.

211.6 PERMITS

The Contractor shall comply with all the conditions set forth in the acquired permits. The Contractor shall ensure that off-site adverse impacts and water quality degradation does not occur during construction. If violations do occur, it will be the Contractor's responsibility to correct the matters and comply with any additional measures requested by any regulatory agency at no additional expense to Ducks Unlimited, Inc. If violations result in monetary fines, it shall be the contractor's responsibility to pay the fines and implement necessary corrective action as soon as possible at no additional cost to Ducks Unlimited, Inc. The quality control person determined by the Contractor shall be responsible for the various inspections and making sure conditions of the various permits are being met.

211.7 METHOD OF MEASUREMENT

No separate measurement will be made for Pollution Control. Pollution Control shall be considered as incidental to all operations related to this project.

CONSTRUCTION SPECIFICATION

411 –TIMBER STRUCTURES

411.1 DESCRIPTION

Work under this section shall consist of furnishing all labor, materials, tools, equipment and supplies to install piling and lumber as indicated on the drawings and as specified herein. This subdivision includes furnishing and installing materials and items of timber piling, lumber and fasteners associated with this construction.

411.2 QUALITY ASSURANCE

Driven piles shall be installed by a contractor that is thoroughly experienced in setting and driving piles.

Timber Piles shall conform to ASTM D25.

Lumber shall conform to the American Softwood Lumber Standards PS 20-70. All lumber shall be grade marked in accordance with the Southern Pine Inspection Bureau (SPIB) grading rules or Western Wood Products Association (WWPA) grading rules.

Wood preservative shall comply with the American Wood Preservers Association (AWPA) Standard C18, treated with waterborne salts for marine (saltwater) use.

Treated lumber shall bear the mark of the American Wood Preservers Bureau (AWPB).

Nailing Standards: Table 1705.1 – “Fastening Schedule” of (Southern) Standard Building Code.

411.3 SUBMITTALS

The Contractor shall submit certification that all timber piling meets ASTM D25 specifications and have been pressure treated in accordance with American Wood Preservers’ Association (AWPA) Standard C18 with the preservative retention as required in these specifications. The Contractor shall submit certification by treating plant, stating type of preservative solution and pressure process used, net amount of preservative retained and conformance with applicable standards. The Contractor shall submit certification by treatment plant that moisture content of treated materials was reduced to levels indicated prior to shipment to project site.

The Contractor shall submit copies of driving record of each pile including project name and number, name of Contractor, pile location and number.

For driven piles: Type and size of hammer used, type of pile, rate of operation of pile

driving equipment, pile dimensions, elevation of pile tip, elevation of butt before cut-off, ground elevation, record of number of blows for each foot of penetration, computed pile capacity (if applicable), pile deviation, and any unusual occurrences identified during pile driving.

For jetted or excavated piles: Pile dimensions, elevation of pile tip, elevation of butt before cut-off, ground elevation, computed pile capacity (if applicable), pile deviation, and any unusual occurrences identified during pile driving.

411.4 PRODUCT STORAGE AND HANDLING

The Contractor shall store material above ground and protect with waterproof covering. The Contractor shall provide air circulation within and around stacks of material.

411.5 PROJECT CONDITIONS

Piles may be driven, jetted, or excavated at the Contractor's option.

Piles shall not be installed until all excavation has been completed. Minimum pile depth shall be measured from finished grade at the pile.

The Contractor shall fit carpentry work to other work; the Contractor shall scribe and cope as required for accurate fit. The Contractor shall coordinate location of timber piles, posts, nailers, blocking, grounds and similar supports to allow attachment of other work.

411.6 MATERIALS

411.61 LUMBER

Lumber and timbers are specified in nominal dimensions. The Contractor shall provide actual sizes as required by American Lumber Standards Committee (ALSC) Standard PS-20.

Grade Stamps: The Contractor shall factory-mark each piece of lumber with grade stamp of inspection agency evidencing compliance with grading rule requirements and identifying grading agency, grade, species, moisture content at time of surfacing, and mill. For exposed lumber apply grade stamps to ends or back of each piece, or omit grade stamps entirely and issue certification of grade compliance from inspection agency in lieu of grade stamp.

Treated pilings, timbers and lumber shall be in conformance with applicable AWWA treatment standards and identified by label, stamp or certification the type of preservative treatment used and the retention levels stated in pounds preservative per cubic foot of wood.

Moisture Content: 19% maximum at time of dressing and shipment for sizes 2" to 4" in

nominal thickness, kiln dried 20% or less for timbers 5"x5" and larger, round piles kiln dried 25% or less.

411.62 TIMBER STRUCTURE COMPONENT SPECIFICATION

Piling, lumber and timbers shall be provided as specified in the table below:

COMPONENT	NOMINAL DIMENSION	GRADE	SURFACING	PRESERVATIVE TREATMENT Retention min. lbs/cu ft
Square Piles	8" X 8"	No. 1 SYP Marine Grade	S4S	2.5 pcf Chromated Copper Arsenate (CCA)
Round Piles	12" Dia.	ASTM D25	N/A	2.5 pcf CCA
Walers	4" x 12"	No. 1 SYP Marine Grade	Rough	2.5 pcf CCA
Bulkhead Wall Cap	2" x 12"	No. 1 SYP Marine Grade	Rough	2.5 pcf CCA
Wakefield Piling	2" x 12" or 3" x 12"	No. 1 SYP Seawall Grade	Rough	2.5 pcf CCA
Walkway Lumber	2" x 6" 2" x 10" 3"x12"	No. 1 SYP Marine Grade	Rough	2.5 pcf CCA

411.63 FASTNERS AND ANCHORAGES

The Contractor shall provide size, type, material and finish as indicated on the drawings and as recommended by applicable standards and building codes, complying with applicable Federal Specifications for nails, staples, screws, bolts, nuts, washers, and anchoring devices.

All fasteners, bolts, nuts, washers, hangars and deck screws shall be Grade 304 or 316 stainless steel. Ogee washers and plate washers shall be hot-dipped galvanized per ASTM A153 at the rate of 20 ounces of zinc per square foot of surface area. Neoprene washers shall be provided at all locations where aluminum is exposed to steel.

Ogee washers shall be coated with a generous amount of heavy grease to deter corrosion.

411.64 GEOTEXTILE FABRIC

The geotextile fabric shall be placed as detailed on the plans or as directed by the Engineer. It shall be a Class 1, nonwoven fabric placed at the locations indicated on the plans. Test data from the identified production run of the geotextile fabric shall be required for each

of the tests shown below.

<u>Property</u>	<u>Test Method</u>	<u>Class I</u>
Tensile Strength- lbs. 1/	ASTM-D4632 Grab Test Method	200 min.
Tensile Strength- Psi 1/	ASTM-D4595 Wide Strip Method	400 min.
Bursting Strength- psi 1/	ASTM-D3786 Diaphragm Tester	320 min.
Elongation-% 1/	ASTM-D4632	<50
Puncture - lbs. 1/	ASTM-D3787	90 minimum
Ultraviolet Light Resistance	ASTM-D4355 150 hrs. exposure	70 % tensile strength retained
Apparent Opening Size (AOS) 2/	ASTM-D4751	Size < or = #70 max.
Permittivity - sec ⁻¹	ASTM-D4491	0.10

1/ Minimum average roll value (weakest principal direction)

2/ U.S. Standard Sieve

The Contractor shall supply all items necessary to fasten the geotextile to the bulkhead so it will not slide or form gaps when placing backfill behind the bulkhead. Geotextile fabric shall be nailed to the soil side of the bulkhead with galvanized square head cap nails or other suitable fastener. Adjacent ends of geotextile fabric shall be overlapped a minimum of 12". Geotextile fabric is to extend from the top waler to a point at least 2' below the finished grade located on the water side or as detailed in the plans.

Prior to use, the geotextile shall be stored in a clean dry place, out of direct sunlight, not subject to extremes of either hot or cold, and with the manufacturer's protective cover in place.

411.65 FIBERGLASS REINFORCED PLASTIC GRATING

Grating for fishing pier structures shall be a molded fiberglass reinforced plastic grating (FRP) manufactured with a vinyl ester resin and have nominal grid dimensions of 1.5"x1.5"x1.5", length, width and depth respectively. FRP grating shall be gray in color and supplied with stainless steel mounting clips as recommended by the manufacturer. Fiberglass grating shall be manufactured by Seasafe, Inc. model GG-1515, North American Grating model MG1515, AMD, Inc. fiberglass grating or an approved equal.

411.66 DRIVING EQUIPMENT

Contractor shall use pile driving equipment of type generally used in standard pile driving practice, operated at manufacturer's specified rate, to develop required rated energy per blow or driving frequency.

411.7 CONSTRUCTION METHODS

Verify site conditions and determine if any situations exist which would have an adverse effect on the work.

Use driving method, which will not cause damage to vegetation, water quality or nearby structures.

411.71 DRIVING PILES

The Contractor shall notify the Engineer 48 hours in advance of beginning pile driving operations.

The Contractor shall layout pile location using a template or by any other method necessary to assure that piling will be in proper alignment.

The Contractor shall continuously drive piling to the minimum depth indicated on the drawings. Should refusal be reached or should some other reason occur that prevents setting piles at this minimum depth, the Contractor shall notify the Engineer immediately. The Engineer should also be notified if driven piles fail to set firm and meet required load capacity.

The Contractor shall ensure that there is adequate pile length to obtain full embedment plus required top elevation after any damage to driving end has been removed. Contractor is responsible for protecting piles by providing pile caps and/or driving shoes which may be required to ease driving and to assure proper embedment and pile alignment.

The Contractor shall drive piles with tip end down and butt end up. All piles shall be driven plumb, maintaining center of gravity for each pile to conform to locations shown on the drawings.

The Contractor shall carefully plumb leads and pile before driving. The Contractor shall take care during driving to prevent and to correct any tendency of piles to twist or rotate. Piles shall be driven within 2 inches of plan location and be plumb within 1" in 10' from the vertical.

Damaged piles and piles driven outside required driving tolerances will not be accepted. Rejected piles shall be withdrawn and replace with new piles. The Engineer may approve the abandonment and cut-off of rejected piles. Additional piles shall be driven to replace rejected units at designated locations.

The Contractor shall solidly fill spaces left by withdrawn piles using cohesion less soil material such as gravel, broken stone, and gravel-sand mixtures. The Contractor shall place and compact throughout length of space.

The Contractor shall cut-off tops of driven piles, square with pile axis and at elevations indicated. The Contractor shall dispose of excess materials off site in an acceptable manner.

411.72 CUTTING AND DRILLING

All cuts, notches and drilled holes in lumber, timbers and piling shall be coated with a waterborne copper based solution in accordance with AWWA Standard M4.

411.73 GENERAL CARPENTRY

The Contractor shall discard units of material with defects, which might impair the quality of work, and units, which are too small to fabricate the work with minimum joints or the optimum joint arrangement.

The Contractor shall set carpentry work accurately to required levels and lines, with members plumb and true and accurately cut and fitted.

The Contractor shall securely attach carpentry work to substrates by anchoring and fastening as shown and as required by recognized standards. The Contractor shall use hot-dipped galvanized common wire nails and finishing nails, except as otherwise indicated. The Contractor shall use finishing nails for finish work.

The Contractor shall select fasteners of the size that will not penetrate members where opposite side will be exposed to view or will receive finish materials. The Contractor shall make tight connections between members. The Contractor shall install fasteners without splitting of wood and predrill as required. Anchors and nails shall comply with the "Fastening Schedule" of the (Southern) Standard Building Code.

The Contractor shall install preservative-treated wood products using non-corrosive fasteners.

No splicing of wood framing members between bearing piles will be permitted unless specifically detailed.

Blocking:

- a. Install as required.
- b. Wedge, align, and anchor blocking with nails and other fasteners as required.
- c. Locate blocking to facilitate installation of finishing materials, fixtures, specialty items, and trim as required

411.8 METHOD OF MEASUREMENT

Bid items under the Timber Structure heading shall be measured as specified below and as shown in the Unit Price Table of the Standard Bid Form.

Timber Piling shall be measured as follows:

Lump Sum - Plan Quantity (LS): Timber piling shall be measured on a plan quantity basis. This quantity shall be the length of piling installed and accepted as calculated from the construction plans for each size and type of pile specified. Piles furnished and driven at the option of the contractor will not be measured for payment. No measurement will be made for piles furnished or driven to replace piles lost or damaged before the completion of the contract while in stockpile or during handling and driving.

No separate measurement will be made for walers, lumber, cross bracing, timber supports, fasteners, or incidental items required for a complete installation.

Wakefield Piling shall be measured as follows:

Lump Sum - Plan Quantity (LS): Wakefield Piling shall be measured on a plan quantity basis. This quantity shall be the square footage of piling installed and accepted as calculated from the construction plans. Piles furnished and driven at the option of the contractor will not be measured for payment. No measurement will be made for piles furnished or driven to replace piles lost or damaged before the completion of the contract while in stockpile or during handling and driving.

No separate measurement will be made for walers, lumber, timber supports, fasteners, or incidental items required for a complete installation.

FRP Grating shall be measured as follows:

Lump Sum - Plan Quantity (LS): FRP Grating shall be measured on a plan quantity basis. This quantity shall be the square footage of FRP Grating installed and accepted as calculated from the construction plans.

No separate measurement will be made for lumber, cross bracing, timber supports, fasteners, or incidental items required for a complete installation.

411.9 METHOD OF PAYMENT

Bid items under the Timber Structure heading shall be paid for at the unit price bid and measured as specified herein. The unit prices bid shall be payment in full for the supply of all equipment, materials, labor, appurtenances, and any other incidental items needed for a complete installation as described in this specification or as shown on the plans.