

SPECIFICATIONS FOR WORK

SPECIAL PROVISIONS

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1. PROJECT DESCRIPTION

The Project involves construction work associated with construction of approximately 3.3 miles of boundary fence at the Big Lake Wildlife Management Area, Fish, Wildlife & Parks (FWP) project # 7115342, located in Stillwater County, MT as identified in the project drawings.

2. PROJECT RELATED CONTACTS

Project contacts are designated as follows:

Owner:	Montana FWP 1420 E. Sixth Ave. PO Box 200701 Helena, MT 59620-0701	Project Representative:	Paul Valle FWP Project Manager 600 N. Park Ave. Helena, MT 59620-0701 406-841-4013 (wk) 406-431-3755 (cell) 406-841-4004 (fax)
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3. SITE INSPECTION

All Bidders should satisfy themselves as to the construction conditions by personal examination of the site described in this document. Bidders are encouraged to make any investigation necessary to assess the nature of the construction and the difficulties to be encountered.

4. SOILS INFORMATION

Geotechnical investigation work has not been done for this Project. It is the responsibility of the Contractor to conduct all investigations and determine the soil type and digging conditions that may be encountered with this Project prior to bid preparation.

5. PROJECT REPRESENTATIVE, INSPECTIONS, AND TESTING

The Contractor’s work will be periodically tested and observed to insure compliance with the Contract Documents. Complete payment will not be made until the Contractor has demonstrated that the work is complete and has been performed as required. If the Project Representative detects a discrepancy between the work and the requirements of the Contract Documents at any time, up to and including final inspection, such work will not be completely paid for until the Contractor has corrected the deficiency.

The Project Representative will periodically monitor the construction of work to determine if the work is being performed in accordance with the contract requirements. The Project Representative does not have the authority or means to control the Contractor's methods of construction. It is, therefore, the Contractor's responsibility to utilize all methods, equipment, manpower, and other means necessary to assure that the work is installed in compliance with the Drawings and Specifications, and laws and regulations applicable to the work. Any discrepancies noted shall be brought to the Contractor's attention, who shall immediately correct the discrepancy. Failure of the Project

Representative to detect a discrepancy will not relieve the Contractor of his ultimate responsibility to perform the work as required.

The Contractor shall inspect the work as it is being performed. Any deviation from the Contract requirements shall be immediately corrected. Prior to any scheduled observation by the Project Representative, the Contractor shall again inspect the work and certify to the Project Representative that he has inspected the work and it meets the requirements of the Contract Documents. All buried work items shall be inspected by the Project Representative prior to backfilling, or may not be considered for payment.

The work will be subject to review by the Project Representative. The results of all such observations shall be directed to the Contractor only through the Project Representative.

6. ENGINEERING INTERPRETATIONS

Timely Engineering decisions on construction activities or results have an important bearing on the Contractor's schedule. When engineering interpretation affects a plan design or specifications change, it should be realized that more than 24 hours may be required to gain the necessary Owner participation in the decision process including time for formal change order preparation as required.

7. REJECTED WORK

Any defective work or nonconforming materials or equipment that may be discovered at any time prior to the expiration of the warranty period, shall be removed and replaced with work or materials which shall conform to the provisions of the Contract Documents. Any material condemned or rejected shall be removed at once from the project site. Failure on the part of the Project Representative to condemn or reject bad or inferior work or to note nonconforming materials or equipment on the Contractor's submittals shall not be construed to imply acceptance of such work. The Owner shall reserve and retain all its rights and remedies at law against the Contractor and its Surety for correction of any and all latent defects discovered after the guarantee period.

The Project Representative will have the authority to reject work which does not conform to the Contract Documents and will provide the Owner with a list of defective work and nonconforming materials or equipment. The Owner will then promptly provide the Contractor with the list of defective work on nonconforming materials or equipment.

8. UTILITIES

The exact locations of existing underground utilities that may conflict with the work are not precisely known. It shall be the Contractor's responsibility to contact the owners of the respective utilities and arrange for field location services. **One Call Locators, 1-800-424-5555**

- 8.1 Notification. The Contractor shall contact, in writing, all public and private utility companies that may have utilities that may be encountered during excavation. The

notification includes the following information:

- a. The nature of the work that the Contractor will be performing.
- b. The time, date and location that the Contractor will be performing work that may conflict with the utility.
- c. The nature of work that the utility will be required to perform such as moving a power pole, supporting a pole or underground cable, etc.
- d. Requests for field location and identification of utilities.

A copy of the letter of notification shall be provided to the Project Representative. During the course of construction, the Contractor shall keep the utility companies notified of any change in schedule or nature of work that differs from the original notification.

- 8.2 Identification. All utilities that may conflict with the work shall be the Contractor's responsibility to locate before any excavation is performed. Field markings provided by the utilities shall be preserved by the Contractor until actual excavation commences. All utility locations on the Drawings should be considered approximate and should be verified in the field by the Contractor. The Contractor shall also be responsible for locating all utilities that are not located on the Drawings.
- 8.3 Removal or Relocation of Utilities. All electric power, street lighting, gas, telephone, and television utilities that require relocation will be the responsibility of the utility owner. A request for extending the specified contract time will be considered if utility owners cause delays.
- 8.4 Public Utilities. Water, sewer, storm drainage, and other utilities owned and operated by the public entities shall, unless otherwise specifically requested by the utility owner, be removed, relocated, supported or adjusted as required by the Contractor at the Contractor's expense. All such work shall be in accordance with these Specifications, or the Owner's Standard Specifications or written instructions when the work involved is not covered by these Specifications.
- 8.5 Other Utilities. Utilities owned and operated by private individuals, railroads, school districts, associations, or other entities not covered in these Special Provisions shall, unless otherwise specifically requested by the utility owner, be removed, relocated, supported or adjusted as required by the Contractor at the Contractor's expense. All work shall be in accordance with the utility owner's directions, or by methods recognized as being the standard of the industry when directions are not given by the owner of the utility.
- 8.6 Damage to Utilities and Private Property. The Contractor shall protect all utilities and private property and shall be solely responsible for any damage resulting from his construction activities. The Contractor shall hold the Owner and Project Representative harmless from all actions resulting from his failure to properly protect

utilities and private property. All damage to utilities shall be repaired at the Contractor's expense to the full satisfaction of the owner of the damaged utility or property. The Contractor shall provide the Owner with a letter from the owner of the damaged utility or property stating that it has been repaired to the utility owner's full satisfaction.

- 8.7 Structures. The Contractor shall exercise every precaution to prevent damage to existing buildings or structures in the vicinity of his work. In the event of such damages, he shall repair them to the satisfaction of the owner of the damaged structure at no cost to the Owner.
- 8.8 Overhead Utilities. The Contractor shall use extreme caution to avoid a conflict, contact, or damage to overhead utilities, such as power lines, streetlights, telephone lines, television lines, poles, or other appurtenances during the course of construction of this project.
- 8.9 Buried Gas Lines. The Contractor shall provide some means of overhead support for buried gas lines exposed during trenching to prevent rupture in case of trench caving.
- 8.10 Survey Markers and Monuments. The Contractor shall use every care and precaution to protect and not disturb any survey marker or monuments, such as those that might be located at lot or block corners, property pins, intersection of street monuments or addition line demarcation. Such protection includes markings with flagged high lath and close supervision. No monuments shall be disturbed without prior approval of the Project Representative. Any survey marker or monument disturbed by the Contractor during the construction of the project shall be replaced at no cost to the Owner by a licensed land surveyor.

The Contract Plans may show utility locations based on limited field observation and information provided to the Project Representative by others. **The Project Representative cannot guarantee their accuracy.** The Contractor shall immediately notify the Project Representative of any discrepancies with utility locations as shown on the Contract Drawings and/or their bury depths that may in any way affect the intent of construction as scoped in these specifications.

There will be no separate payment for exploratory excavation required to locate underground utilities.

9. CONSTRUCTION SAFETY

The Contractor shall be solely and completely responsible for conditions of the jobsite, including safety of all persons (including employees) and property during performance of the work. This requirement shall apply continuously and not be limited to normal working hours. Safety provisions shall conform to U.S. Department of Labor (OSHA), and all other applicable federal, state, county,

and local laws, ordinances, codes, and regulations. Where any of these are in conflict, the more stringent requirement shall be followed. The Contractor's failure to thoroughly familiarize himself with the aforementioned safety provisions shall not relieve him from compliance with the obligations and penalties set forth therein.

10. CONSTRUCTION LIMITS AND AREAS OF DISTURBANCE

10.1 Construction Limits. Where construction easements or property lines, are not specifically called out on the Plan Drawings, limit the construction disturbance to 10 feet when measured from the edge of the slope stake grading, or to the adjacent property line, whichever is less. Disturbance and equipment access beyond this limit is not allowed without the written approval of both the Project Representative and the owner of the affected property. If so approved, disturbance beyond construction limits shall meet all requirements imposed by the landowner; this includes existing roads used and/or improved as well as the construction of new access roads. Special construction, reclamation, or post-construction road ripping or other closure provisions required by the landowner on access roads beyond the construction limits shall be performed by the Contractor at no additional cost to the Owner.

10.2 Areas of Disturbances. Approved areas of disturbance are those areas disturbed by construction activities within the construction limits and along designated or approved access routes. Such areas may require reclamation and revegetation operations, including grading to the original contours, top soiling with salvaged or imported topsoil, seeding, fertilizing, and mulching as specified herein. Other areas that are disturbed by the Contractor's activities outside of the limits noted above will be considered as site damage or unapproved areas of disturbance subject to Repair and Replacement Quality as specified in the General Conditions. This includes areas selected by the Contractor outside the defined construction limits for mobilization, offices, equipment, or material storage.

11. PROTECTION OF ADJACENT IMPROVEMENTS

Retain and protect all adjacent improvements not called for removal on the drawings. Restore all damaged items to pre-existing condition.

12. TREE PROTECTION AND PRESERVATION

The Contractor and the Owner shall individually inspect all trees within the project construction limits prior to construction. The Owner shall determine which trees are to be removed and which trees are to be preserved. Construction of the grading, utilities and various roadway facilities must not, in the opinion of the Project Representative, significantly damage the trees root system or hinder it's chances for survival. Reasonable variations from the plans, as determined by the Project Representative, may be employed to ensure the survival of trees.

13. CONSTRUCTION SURVEYS

Contractor shall be aware of property pins and survey monuments. Damage to these pins will

require replacement of such by a registered land surveyor at no cost to the owner.

14. MATERIALS SALVAGE AND DISPOSAL

If the Owner requests to salvage material removed from the project, notify the Owner within 24 hours prior to delivery at a specific location approved by the Owner.

Haul and waste all excavated material to a legal site and obey all state, county, and local disposal restrictions and regulations.

15. STORED MATERIALS

Contractor shall use an approved storage area for materials. Materials and/or equipment purchased by the Contractor may be paid for on a monthly basis providing invoices for said materials and equipment are presented to the Project Representative, and such materials have been approved through the submittal process are stored and insured.

16. STAGING AND STOCKPILING AREA

Contractor shall use staging and stockpiling sites for temporary traffic control devices and equipment as approved by the Owner. Contract drawings may show approved staging and stockpiling locations. Notify Owner within 24 hours for approval of staging and stockpiling sites not shown on the contract drawings.

17. SECURITY

The Contractor shall provide all security measures necessary to assure the protection of equipment, materials in storage, completed work and the project in general.

18. CLEANUP

Cleanup for each item of work shall be fully completed and accepted before the item is considered final. If the Contractor fails to perform cleanup within a timely manner the Owner reserves the right to shut down construction activities.

19. ACCESS DURING CONSTRUCTION

Provide access to all public and private roadways and approaches along the project throughout the construction period.

20. CONSTRUCTION TRAFFIC CONTROL

The contractor is responsible for providing safe construction and work zones within the project limits by implementing the rules, regulations, and practices of the Manual on Uniform Traffic Control

Devices, current edition.

21. SANITARY FACILITIES

On-site toilet facilities for employees of Contractor and Subcontractors shall be provided and maintained in a sanitary condition.

22. PROPOSAL ITEM DESCRIPTIONS AND ESTIMATED QUANTITIES

1. Mobilization/Demobilization:
 - A. * Description: This bid item shall consist of the preparation work and operations necessary performed by the Contractor for the movement of personnel, equipment, supplies, and incidentals to and from the work site. The work includes those actions necessary for obtaining necessary permits required for mobilization; for the establishment of all offices and facilities necessary to work on the project; for premiums on contract bonds; for insurance for the contract; and for other work on the various items on the project site. Mobilization costs for subcontracted work shall be considered to be included.
 - * Estimated Quantity:
 - 1 lump sum
2. Fence:
 - * Description: This bid item includes all equipment, labor, materials and associated work for the installation of a barb and smooth wire fence to the line noted in the specifications and drawings.
 - * Estimated Quantity:
 - 17,448 linear feet
3. Gates
 - * Description: This bid item includes all equipment, labor, materials and associated work for the installation of barb wire gates as noted in the specifications and drawings. Gate locations will be staked in the field.
 - * Estimated Quantity:
 - 6
4. Two post panels
 - * Description: This bid item includes all equipment, labor, materials and associated work for the installation of two post fence panels as defined in the specifications and drawings.
 - * Estimated Quantity:
 - 30
5. Three post panels
 - * Description: This bid item includes all equipment, labor, materials and

associated work for the installation of three post fence panels as defined in the specifications and drawings.

* Estimated Quantity:

- 5

6. Five post panels

* Description: This bid item includes all equipment, labor, materials and associated work for the installation of five post fence panels as noted in the specifications and drawings.

* Estimated Quantity:

- 2

7. Fence removal

* Description: This bid item includes all equipment, labor, and associated work for the removal of existing wood and wire fence as noted in the specifications and drawings.

* Estimated Quantity:

- 19,060 linear feet

8. Stream crossing repair

* Description: This bid item includes all equipment, labor, and associated work for the repair of approximately 200 lf of existing wire fence at the water inlet stream crossing as noted in the specifications and drawings.

* Estimated Quantity:

- 1 lump sum

SPECIFICATIONS FOR WORK

TECHNICAL PROVISIONS

Incorporation of Montana Public Works Technical Specifications.

The Technical Specifications as found in Montana Public Works Standard Specifications (MPWSS), Sixth Edition, April 2010, are hereby incorporated by reference and made a part of this Contract:

Incorporation of Montana Fish, Wildlife & Parks Technical Specifications and Modifications to MPW Technical Specifications.

In addition to the MPWSS Technical Specifications are the following Montana Fish, Wildlife & Parks Technical Specifications (modifications to MPWSS Technical Specifications).

- SECTION 01010 - Summary of Work
- SECTION 01450 - Mobilization/Demobilization
- SECTION 01750 - Final Cleanup
- SECTION 02112 - Removal of Existing Pavement, Concrete Curb, Sidewalk, Driveway and/or Structures
- SECTION 02810 - Fencing

SECTION 01010
SUMMARY OF WORK

All applicable portions of this specification section in the MPWSS shall apply with the following additions, deletions and/or modifications.

PART 1 GENERAL

1.3 WORK SEQUENCE

Add the following:

- E. Complete all work **on, or before, October 31, 2013.**

- F. Install new fence prior to removing existing fence to accommodate potential livestock pasture on adjacent landowner parcels. At the end of each work day, assure existing fence and/or new fence is secure to maintain livestock pasture on adjacent landowner parcels.

END OF SECTION 01010

SECTION 01450

MOBILIZATION/DEMOBILIZATION

Added Section.

PART 1 GENERAL

1.1 DESCRIPTION

- A. This item shall consist of the preparatory work and operations necessary performed by the Contractor for the movement of personnel, equipment, supplies, and incidentals to and from the work site. The work includes those actions necessary for obtaining necessary permits required for mobilization; for the establishment of all offices and facilities necessary to work on the project; for premiums on contract bonds; for insurance for the contract; and for other work on the various items on the project site. Mobilization costs for subcontracted work shall be considered to be included.
- B. Contractor's cost for administration, bonding, insurance, and site documents shall be included in mobilization and shall not be paid as a separate item.
- C. All equipment moved to the project sites shall be in good mechanical condition and free of fuel, oil, lubrication, or other fuel leaks. The Contractor shall immediately remove any equipment potentially or actually discharging environmentally damaging fluids.
- D. All equipment moved to the project sites shall be thoroughly cleaned before it is brought to the sites to prevent the introduction of weed seeds. Equipment removed from the sites may not be returned to the sites again until it is thoroughly cleaned again.

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION – NOT USED

PART 4 MEASUREMENT AND PAYMENT

4.1 MEASUREMENT

- A. There will be no direct measurement of this item.

4.2 PAYMENT

- B. Partial payments for mobilization/demobilization will be made based on the lump sum bid price as follows:

- 50% of the amount bid for mobilization/demobilization when the Contractor has moved on-site and begun construction activities.
- 100% of the amount bid for mobilization/demobilization when 100% of the contract amount (exclusive mobilization/demobilization) has been completed.

END OF SECTION 01450

SECTION 01750
FINAL CLEANUP

Added Section.

PART 1 GENERAL

1.1 DESCRIPTION

- A. This work consists of final cleanup of the project site prior to final acceptance.

PART 2 PRODUCTS – NOT USED

PART 3 EXECUTION

3.1 CONTRACTOR RESPONSIBILITIES

The contractor shall be responsible for final clean up at the end of the project to a level satisfactory to the owner. All construction debris, no matter how small, shall be collected and removed from the site. All wheel ruts shall be filled in and be leveled to match the adjacent grade and material. Re-seeding or re-sodding, or other re-surfacing may be necessary to repair any construction related impacts or damage.

All survey markings, stakes, temporary paint marks, flagging and other devices shall be removed regardless of who installed them. All excess pavement, concrete, gravel, soil, or other construction materials not intended for permanent use shall be removed.

For boundary fencing projects, do not disturb line-of-sight t-posts. Leave all line-of-sight t-posts in their original location.

All final slopes shall be dressed manually to remove woody debris, accumulated trash and oversized material. Any new slope or topsoil surfaces shall be hand raked to provide a uniform appearance. The contractor shall dress all gravel, pavement and concrete edges to eliminate abrupt edges and provide a smooth transition. All construction related temporary sediment control devices shall be removed as soon as practical.

PART 4 MEASUREMENT AND PAYMENT

4.1 PAYMENT

Unless specifically noted otherwise, all final cleanup work shall be incidental to other work items in the contract and no separate payment shall be made.

END OF SECTION 01750

SECTION 02112

REMOVAL OF EXISTING PAVEMENT, CONCRETE CURB, SIDEWALK, DRIVEWAY AND/OR STRUCTURES

All applicable portions of this specification section in the MPWSS shall apply with the following additions, deletions and/or modifications.

PART 1 GENERAL

1.1 DESCRIPTION

A. Add the following:

The work also consists of the removal, salvage, stockpile, and/or disposal of existing fence materials on private property and within, or near, the FWP WMA property boundary.

PART 3 EXECUTION

Add the following:

3.2 EXISTING FENCE WIRE REMOVAL

- A. Remove and dispose all existing boundary fence wire at locations shown in the project drawings, or as directed by the Project Representative. All removed fence wire material becomes property of the Contractor. Dispose all removed fence wire material off the project site and obey all state, county, and local disposal restrictions and regulations.

3.3 EXISTING FENCE T-POST REMOVAL AND/OR SALVAGE

- A. Remove and/or salvage all existing boundary fence metal T-posts at locations shown in the project drawings, or as directed by the Project Representative. Salvage metal T-posts, per FWP's salvage criteria. T-post salvage criteria includes:
- Same dimensional characteristics for new T-posts specified
 - Straight and true, not bent or out of alignment (measured over entire length)
 - Less than 25% rusted surface area

Non-salvaged T-posts become property of the Contractor. Dispose all non-salvageable T-posts off the project site and obey all state, county, and local disposal restrictions and regulations. Non-salvageable T-posts may be used in deadman applications.

3.4 EXISTING FENCE WOOD POST REMOVAL

A. For existing boundary fence wood posts, remove wood posts and dispose of off the project site and obey all state, county, and local disposal restrictions and regulations.

B. All posts removed north of the existing railroad grade shall be stockpiled neatly on the adjacent property East of the new fence line.

PART 4 MEASUREMENT AND PAYMENT

Add the following:

4.3A FENCE REMOVAL

A. Fence removal will be measured and paid for by the linear foot (LNFT).

END OF SECTION 02112

SECTION 02810

FENCING

Added Section.

PART 1 GENERAL

1.1 DESCRIPTION

- A. This work consists of furnishing, erection, and placement of new fencing per the drawings and specifications.

PART 2 PRODUCTS

2.1 GENERAL

- A. Barbed wire shall be zinc-coated, steel barbed wire meeting the requirements of ASTM A-121. Breaking strength of strand wire shall be not less than 950 pounds. Barbs shall be uniformly spaced from 4 to 5 inches apart. Minimum weight of zinc coating shall be Class I. Wire shall consist of two twisted strands of 12 1/2 gage strands. "Red Brand" and "OK Brand Premium" are examples of wire that meet ASTM A-121. **Wire breaking strength and coating certification shall be provided to the Project Manager.**
- B. Barbless wire shall be two smooth twisted strands of 12 1/2 gage wire: zinc coated steel meeting requirements of ASTM A-121 or equal. Breaking strength of a strand of wire shall be not less than 950 pounds, minimum weight of zinc coating shall be Class I.
- C. Brace panel wire shall be barbless, smooth 9 gage **soft** wire meeting requirements of ASTM A-641. It will be used for constructing braces and panels, tying to anchors, etc.
- D. Staples. Wire staples of the barbed U-shaped type shall be used to fasten the wire fencing to the wooden posts. They shall be not less than 9 gage galvanized, 1-3/4 inches long.
- E. Nails. Shall be 40 d common galvanized.
- F. Fence clips shall be not lighter than 12 1/2 gage, galvanized. They shall be used to fasten the wire to metal posts and shall be bent all the way around fence wire.
- G. Metal Posts. Metal posts shall meet the requirements of ASTM A-702 and be American manufactured. Painting shall be in accordance with good manufacturing practice. Same paint pattern shall be used throughout project site requiring installation of new metal

posts. Posts shall be 6 feet long. The metal shall be good commercial quality steel with maximum carbon content of 0.82%. Posts shall be Tee, H, channel, or U-bar section and shall have corrugations, knobs, notches, holes, or studs so placed and constructed as to engage a substantial number of fence line wires in proper position.

Each line post shall have a steel anchor plate weighing not less than 0.67 pounds, tapered to facilitate driving and securely fastened in such a position that its top edge will be two to three inches below ground when the post is driven to the prescribed depth. Post shall weigh 1.33 lbs. per L.F. of post.

H. Wood Posts and Brace Rail. Posts and brace rail shall be made from western larch, lodge pole pine, ponderosa pine, or Douglas-fir. They shall have the bark removed, be well seasoned, sound, and straight-grained. They shall be finished round. **Posts** shall be 5 inch minimum diameter and 7 feet in length or as specified in the project drawings. All posts shall be treated with a solution conforming to AWPAs standards. Penetration shall be at least 1/2 inch. Post shall be fully treated. Posts that are to be driven shall be tapered and treated. **Brace rail** shall be a minimum 4-inch diameter by 8 feet long, or as specified in the project drawings. All brace rail shall be fully treated conforming to AWPAs standards. **Certification of AWPAs treatment shall be provided to the Project Manager.**

I. Wood Rails. Wooden rails shall be made from western larch, lodgepole pine, ponderosa pine, or douglas-fir. They shall have the bark removed, be well seasoned, sound, and straight-grained. They shall be finished half round. **Wood rails** shall be 4 inch minimum diameter and 8 feet in length. All rails shall be treated with a solution conforming to AWPAs standards. Penetration shall be at least 1/2 inch. All wood rail shall be fully treated conforming to AWPAs standards. **Certification of AWPAs treatment shall be provided to the Project Manager.** Fasten rails to posts with 5" *Ledgerlock* screws, or approved equal.

J. Brace Panels. Shall be placed at corners, endpoints and when run exceeds **30 rods**. Brace panels shall be constructed as depicted in drawings and shall provide for strong anchorage points and shall aligned with fence line within a tolerance of 2 degrees.

K. Gates and Single Panels. Gates shall by 16'-18' wide, and shall be located in the field by the Engineer. Post and brace rail shall be the same as specified for line fence panels and corners.

Where designated, wire gates shall have 4 strands of barbwire with 2 wood stays. Stays shall be minimum 2" diameter wood. Each gate shall have a new single panel on each side and a mechanical over-center gate closer.

L. Deadmen anchors shall be used at grade depressions. They shall consist of 10 gage mild steel of 12-inch diameter. A No. 5 rebar shall be welded in the center and a loop formed in the other end to accept the tie wire. Rebar length shall be 30 inches after the loop is

formed. Other anchor types may be accepted upon approval of the Engineer. Duckbill anchors are also approved.

PART 3 EXECUTION

3.1 CLEARING AND GRUBBING

- A. "Clearing" shall consist of the falling of trees greater than 3 inches diameter breast height (dwb), delimiting them, and cutting into six-foot sections. Clearing shall also include the disposal of stumps, brush, windfalls, limbs, sticks, piles of sawdust, rubbish, debris, vegetation, and other objectionable material occurring within the clearing limits or which interfere with excavation or embankment.
- B. "Grubbing" shall consist of the removal from the ground and the disposal of roots, stumps, together with duff, matter, roots, and debris from the grubbing limits.
- C. Construction methods for clearing and grubbing operations are as follows:
 - (1) No stumps or roots shall remain more than 4 inches above the ground along the fence line.
 - (2) Low hanging branches and unsound or unsightly branches on trees or shrubs designated to remain shall be removed as directed. Branches of trees extending over the fence line shall be trimmed to give a clear height of 8 feet above the ground along the fence line. Width of clearing for fence line shall be 4 feet.

3.2 FENCE INSTALLATION

- A. Post holes and excavations for footings and anchors shall be excavated on the lines established by the Engineer to the depths and cross-sections shown on the standard drawings. Wooden posts may be driven when so prepared and any damaged posts shall be repaired or rejected. Post shall be plumb when set. **All fence post hole excavations shall be on FWP property or easement, 12" from the surveyed property line, marker, or monument.** Do not disturb any survey property corner monument or marker during fence installation. Leave all line-of-sight marker t-posts in place.
- B. All posthole filling and backfilling work shall be in six-inch layers and each layer shall be solidly tamped and compacted as it is placed.
- C. Posts that are cut or trimmed for any valid reason shall be given two coats of preservative material approved by the Engineer. Braces shall be securely nailed to terminal and brace posts. Brace to post joint shall be coped or notched. No square to round joint accepted.
- D. Deadmen or anchors will be used at grade depressions or other places where the vertical space from the ground to the bottom fence wire has exceeded the design value within a one rod distance.

- E. Brace panels shall be installed at angle points, corners, gates, or wherever a break in the terrain occurs. However, in no case shall brace panels be more than **30 rods apart**. See Table 1 for brace panel installation requirements. One strand of brace wire will be used in accordance to standard drawing. Brace wire shall be tight when twisted. Barbwire fence wire shall be tied off at each brace.

Table 1. Brace Panel Installation Requirements

Panel Type	No. of Panels	Location Applications	
		Horizontal	Vertical
Single (two post panel)	1	In Line, Each side of gates	Constant Grade
Double (three post panel)	2	Angle points < 90°	Grade Breaks < 45°
Corner (five post panel)	4	90° Corners	Grade Breaks > 45°

- F. All posts shall be plumb and solidly set in place after backfilling or driving has been completed.
- G. Stretching by a motor vehicle will not be permitted; the power must be by or through a mechanical stretcher or device designed for such use.
- H. Fence line shall be straight and square between corner points.
- I. Fence clips shall be bent all the way around fence wire.
- J. Tension shall be applied in accordance with wire manufacturer's recommendations.
- K. Fence wire shall be wrapped around terminal posts and fastened to itself with at least four turns. Fence wire, in general, shall be placed on the side of the post opposite the site but on curves shall be placed so the force is against the post. At grade depressions and alignment angles, where stresses tending to pull posts from the ground are created, the wire fence shall be snubbed or guyed at the critical points by brace wire attached to each horizontal line of fence wire and the end of the combined strands being firmly attached to a "deadman" buried not less than two feet in the ground, or to an approved "anchor" at a point which will serve best to resist the pull of the wire fence. "Deadmen" also may be fastened to posts. Fence wire and brace wire shall be installed without nicks or significant abrasions. Nicks or abrasions that may lead to pre-mature wire breaks shall be rejected by the Project Manager and replaced at no cost by the Contractor.
- L. U-shaped staples shall be driven diagonally across the wood grain so that both points do not enter between the same grain. In depressions where wire up-lift occurs, staples shall be sloped slightly upward, against the pull of the wire. On level ground and over knolls, staples shall be sloped slightly downward. Wire shall be stapled tightly

at corner, end, and pull posts. In no case shall staples be driven so tight as to damage the wire.

- M. A cross-fence, not the property of the Owner, shall not be fastened to the Owner's fence but shall be terminated, in a workmanlike manner, adjacent thereto.
- N. Upon completion, the fence shall be true to line and grade; all posts shall be vertical and firm and all wire shall be taut and the completed fence shall be completely acceptable in all respects; no openings shall be left that will permit stock or other large animals to pass through the fence.
- O. Weed Control: All equipment used during construction shall be thoroughly washed both inside, outside, underneath, pickup boxes, trailer's, trucks, etc. before entrance to the project area. Vehicles used to commute to and from job site shall be kept clean as not to transport weed seed to project area. This cost shall be subsidiary to the project and considered incidental thereto and no payment shall be made for it.
- P. Exterior boundary fences shall have owner-supplied 4" x 12" boundary signs attached no more than 500 feet apart and 2 at every corner panel. Signs shall be securely fastened to posts, rails or between fence wires as determined by the project Manager. Additional owner-supplied 12" x 18" aluminum signs shall be installed at all exterior gates and corners where designated by the Project Manager. The cost of installing such signs shall be subsidiary to the project and shall not constitute a pay item and shall be considered incidental thereto and no payment shall be made for it.
- Q. Fence removal, remove and dispose of existing jackleg fence including all wood Jacks and rails, posts, wire, braces, gates, and hardware as shown in the project drawings or as directed by the project manager. All removed fence material becomes the property of the contractor. Dispose of all removed fence material off the project site and obey all state, county, and local disposal restrictions and regulations.

PART 4 MEASUREMENT AND PAYMENT

4.1 BASIS OF MEASUREMENT

- A. All types of fence will be measured by the linear foot complete in place, on its actual alignment, inclusive of brace panels and corners and excluding gates. The measurement will be made on the fence line along the ground, from end post to end post, including wing fences to structures, the intent being to measure the actual length of fence in place. If it is necessary, in crossing depressions, to install a double section of fence, vertically, this extra section will be measured for payment.
- B. Gates will be measured on a per each basis.
- C. Deadmen anchors, tree anchor, and any line clearing required shall be subsidiary to the fence and considered incidental thereto.

D. Brace panels will be measured on a per each basis.

E. Fence removal will be measured by the linear foot basis.

4.2 BASIS OF PAYMENT

A. All types of fence shall be paid for per foot basis, measured as specified above.

B. Gates will be paid for on a unit price per each basis.

C. Brace panels will be paid on a unit price per each basis.

D. Fence removal will be paid for on a per foot basis.

END OF SECTION 02810