



Illinois Department of Transportation

Office of Intermodal Project Implementation / Division of Aeronautics
1 Langhorne Bond Drive / Springfield, Illinois 62707-8415

July 24, 2019

SUBJECT: DuPage Airport
West Chicago, Illinois
DuPage County
Illinois Project Number: DPA-4652
SBG Project Number: 3-17-SBGP-TBD
Contract No. DU086
Item No. 07A, August 2, 2019 Letting
Addendum A

NOTICE TO PROSPECTIVE BIDDERS

Attached is an addendum to the plans or proposal. This addendum involves revised and/or added material.

Reason for Addendum:

Modification to Special Provision Item 162 Chain Link Fences

To All Plan Holders:

Revised Special Provision Item 162 Chain Link Fences, Section 162-2.4.B.3.B. regarding cantilever slide gate manufacturers

Special Provisions Changes:

Special Provision Item 162 Chain Link Fences, Section 162-2.4.B.3.B. regarding cantilever slide gate manufacturers is revised as follows:

“Approved substitution – All other systems must be submitted to the Resident Engineer for consideration in accordance with substitution requirements as set forth in the general provisions of the specification manual for review prior to approval of materials. Products submitted must meet performance criteria as per this specification. Approval of any substitution is at the discretion of the Owner and the Illinois Division of Aeronautics (IDA). Any approved substitutions will not be permitted to increase the overall cost of the associated pay item as bid. Any modifications to the existing gate, controllers and other elements to remain and be reused required due to approval of a substitution will be incidental to the associated pay item.”

Updated Item 162 Chain Link Fence Specification is attached with modified section highlighted.

Prime contractors must utilize the enclosed material when preparing their bid and must include any changes to the Schedule of Prices in their bid.

Questions on this addendum may be directed to Todd Merrihew of CH2M/Jacobs at 312.543.7102.

ITEM 162 CHAIN-LINK FENCES

DESCRIPTION

162-1.1 This item of work shall consist of furnishing and installing new chain link fence and gates at the locations shown on the construction plans and in accordance with this specification. The fence and gates shall be of the height and configuration as shown on the construction plans and comply with Federal specification RR-F-191, ASTM F668 Class 2b, ASTM F934 and AASHTO M181.

This work shall also include fence and gate replacement, relocations and removals at the locations shown on the plans.

The fence shall be the product of a manufacturer who has demonstrated by actual installation of a similar nature that its product is of the type required. The Contractor shall include all supplementary parts necessary or required for a complete and satisfactory installation within the true meaning and intent of the drawings. All runs of the fence shall present the same general appearance and the product of one manufacturer only will be accepted, except for items which do not influence the appearance of the completed fence. No used, rerolled, or open-seam steel shall be permitted in posts, gate frames, rails or braces.

MATERIALS

162-2.1 FABRIC. The chain-link fence fabric shall be fused/bonded vinyl clad coating over aluminized steel wire or galvanized steel wire, manufactured in accordance with ASTM F 668 Type 2b

A. Steel Core Wire Type

Steel core wire shall have an aluminum coating with a minimum coating weight of 0.40 oz. Per square foot. Or Steel core wire shall have a galvanized coating with a minimum coating weight of 1.2 oz. Per square foot.

B. Vinyl Clad Coating

The chain link fence fabric shall have a fuse/bonded vinyl clad coating.

C. Wire Size:

Steel core wire size is 9 gauge. The coated wire size is 8.

D. Height and Mesh Size:

Fabric height is 8 ft. high with a mesh size of 2 inches.

E. Selvage:

Top edge knuckled and bottom edge knuckled.

F. Color:

Color of vinyl coating shall be black. Refer to ASTM F934 for color selection.

The vinyl coating shall be self extinguishing and shall not support combustion when subject to the Horizontal Flame Test of ASTM D 470.

162-2.2 BARBED WIRE. All wires shall be spaced as shown on the plans. Barbed wire may be either galvanized steel barbed wire or aluminum coated steel barbed wire consisting of 2-strand of 12-1/2 gauge wire with 4-point barbs of 14-gage wire spaced 5 inches apart conforming to the following requirements:

A. Barbed Wire (Zinc-coated). Galvanized barbed wire shall conform to the Specifications for zinc-coated (galvanized) steel barbed wire, AASHTO M 280, Class 3 with a minimum coating of 0.80 ounce per square foot of wire surface.

B. Barbed Wire (Aluminum-coated). Aluminum-coated steel barbed wire shall conform to the Specifications for galvanized steel barbed wire, except the wire shall be aluminum coated. The wire shall have not less than 0.25 ounce coating of aluminum alloy per square foot of uncoated surface. The weight of the aluminum alloy coating shall be determined in accordance with AASHTO T 213.

Three strands of barbed wire shall be used above the top rail on arms as shown on the construction plans. Barbed wire shall have 4 point barbs spaced a maximum of 5" apart. The barbs shall be sharp and tightly wrapped about a uniformly twisted 12-1/2 (.0985") gauge line wires, galvanized or aluminized.

162-2.3 FENCE POSTS, POST TOPS AND EXTENSIONS, RAILS, GATES, BRACES, STRETCHER BARS, AND CLIPS. ColorBond fence system shall have fence posts and rails vinyl coated manufactured of high strength steel pipe triple coated per Standard specification ASTM F1043 - Group IC (external coating per F1043 paragraph 7.1.2; internal coating per F1043 paragraph 7.2.4.). The framework for fence system shall have a 10 to 14 mil. coating.

<u>Pipe Size</u> <u>Outside Diameter</u>	<u>Group IC</u> <u>Weights Lbs./Ft.</u>
1 5/8"	1.84
2"	2.28
2 1/2"	3.12
3"	4.64
4"	6.56

A. Fence Posts:

	<u>Fabric Height</u>	<u>Line Post OD</u>	<u>Terminal Post OD</u>
	8' high	2 1/2 "	3"
B.	<u>Gate Posts</u>		
	<u>Single Gate Width</u>	<u>Double Gate Width</u>	<u>Post OD Group 1A or 1C</u>
	Up to 6'	Up to 12'	3"
	7' to 12'	13' to 25'	4"
C.	<u>Fence Rails:</u>		
	<u>8' high</u>		
	Top	1 5/8"	
	Brace	1 5/8" plus truss	
	Bottom	tension wire	

162-2.4 GATES Gates shall be of the type and size shown on the plans and shall conform to the details shown on the plans.

A. Pedestrian and Drive Gates:

Pedestrian and Drive gates shall be swing gates placed to span the required opening as shown on the plans. In certain instances, two swing gates placed side by side will be required to span the openings. Gate frames shall be constructed of 2" O.D. galvanized pipe. Gate frame shall be welded at all corners to form a rigid panel, and filled with fabric, and topped with three strand barbed wire when specified for the fence. The hinges shall allow the gate to swing 180 degrees. The latches shall be heavy duty and have a provision for a pad lock.

B. Slide Gates:

Slide gates shall be cantilever gates conforming to the dimensions and details shown on the plans. Gate Operators, card readers, and electric power and control shall be re-used and reconnected from existing gate to the new gate. The work in this section shall include furnishing all labor, materials, equipment and appliances necessary to complete all Fortress Heavy Duty Cantilever Slide Gate(s) required for this project in strict accordance with this specification section and drawings.

- 1 REFERENCES:
 - A. Underwriters Laboratory Gate Operator Requirements (UL 325). See 3.02 C.
 1. Automated/operated vehicular gates are not to be used for pedestrian traffic. Separate pedestrian gates must always be provided if pedestrian traffic is expected.
 - B. ASTM F 2200 - Standard Specification for Automated Vehicular Gate Construction. See 2.01 C.
 - C. ASTM F 1184 - Standard Specification for Industrial and Commercial Horizontal Slide Gates, Type II, Class 2. See 3.02 B.
 - D. American Welding Society AWS D1.2 Structural Welding Code. See 2.01 D and 2.03 D.
- 2 SUBMITTAL:
 - A. Product Data:
 1. Provide manufacturer's catalog cuts with printed specifications and installation instructions.
 - B. Shop Drawings:
 1. Supply shop drawings showing the gate system, including details of all major components.
 2. Include details of gate construction, gate height, and post spacing dimensions.
 - C. Certification of Performance Criteria:
 1. Manufacturer of gate system shall provide certification stating the gate system includes the following material components that provide superior performance and longevity. Alternate designs built to minimum standards that do not include these additional structural features shall not be accepted.
 - a. Gate track system shall be keyed to interlock into gate frame member (providing 200% additional strength when compared to weld only keyless systems). When interlocked with and welded to the "keyed" frame top member, gate track forms a composite structure.
 - b. Gate shall have a minimum counterbalance length of 50% opening width which provides a 36% increase in lateral resistance (when compared to ASTM minimum of 40% counterbalance). If gate is ever to be automated, counterbalance section shall be filled with fabric or other specified material.
 - c. To provide superior structural integrity, intermediate vertical members shall be used - with spacing between verticals to be less than 50% of the gate frame height.
 - d. Entire gate frame (including counterbalance section) shall include 2 adjustable stainless or galvanized steel cables (minimum 3/16") per bay to allow complete

gate frame adjustment (maintaining strongest structural square and level orientation).

- e. Gate truck assemblies shall be tested for continuous duty and shall have precision ground and hardened components. Bearings shall be pre-lubricated and contain shock resistant outer races and captured seals.
- f. Gate truck assemblies shall be supported by a minimum 5/8" plated steel bolt with self aligning capability, rated to support a 2,000 # reaction load.
- g. Hanger brackets shall be hot dipped galvanized steel with a minimum 3/8" thickness that is also gusseted for additional strength.
- h. Gate top track and supporting hangar bracket assemblies shall be certified by a licensed professional engineer to withstand a 2,000 lb. vertical reaction load without exceeding allowable stresses.

D. Certifications:

- 1. Gate in compliance with ASTM F 2200, Standard Specification for Automated Vehicular Gate Construction per section 2.01 C.
- 2. The aluminum welders and welding process must be certified per section 2.03 D.
- 3. Manufacturer shall supply gate design performance certification as per section 1.03 C.

3 CANTILEVER SLIDE GATE MANUFACTURERS:

- A. The cantilever sliding gate system shall be manufactured by Tymetal Corp., 678 Wilbur Avenue, Greenwich, NY 12834 (800) 328 4283.
- B. Approved substitution - All other systems must be submitted to the Resident Engineer for consideration in accordance with substitution requirements as set forth in the general provisions of the specification manual for review prior to approval of materials. Products submitted must meet performance criteria as per this specification. Approval of any substitution is at the discretion of the Owner and the Illinois Division of Aeronautics (IDA). Any approved substitutions will not be permitted to increase the overall cost of the associated pay item as bid. Any modifications to the existing gate, controllers and other elements to remain and be reused required due to approval of a substitution will be incidental to the associated pay item.
- C. Gate manufacturer shall certify gate is manufactured in compliance with ASTM F 2200, Standard Specification for Automated Vehicular Gate Construction. See 1.03 D.1.
- D. Gate manufacturer shall provide independent certification as to the use of a documented Welding Procedure Specification and Procedure Qualification Record to insure conformance to the AWS D1.2 welding code. Upon request, Individual Certificates of Welder Qualification

documenting successful completion of the requirements of the AWS D1.2 code shall also be provided. See 1.03 D.3.

4 GATE DIMENSIONS:

A. Fortress Heavy Duty Cantilever Slide Gate dimensions shall be as shown on the detail drawings.

5 GATE CONSTRUCTION DETAILS:

A. Gate Frame:

1. The gate frame shall be fabricated from 6063-T6 aluminum alloy extrusions. The top member shall be a 3" x 5" (76mm x 127mm) aluminum structural channel/tube extrusion weighing not less than 3.0 lb/lf (4.4kg/m). To maintain structural integrity this frame member shall be "keyed" to interlock with the "keyed" track member. If fabricated as a single horizontal piece, the bottom member shall be a 2" x 5" (51mm x 127mm) aluminum structural tube weighing not less than 2.0 lb/lf (2.9kg/m). If fabricated in two horizontal pieces, the bottom member shall be a 5" (127mm) aluminum structural channel weighing not less than 2.6 lb/lf (3.8kg/m). When the gate frame is manufactured in two horizontal pieces or sections, they shall be spliced in the field (the gate frame shall be fabricated in one or multiple sections depending on size requirements or project constraints).

B. Vertical Members (Chain Link):

1. The vertical members at the ends of the gate frame shall be "P" shaped in cross section with a nominal base dimension of no less than 2" x 2" (51mm x 51mm) and weighing not less than 1.6 lb/lf (2.3kg/m). Major 2" x 2" (51mm x 51mm) vertical members weighing not less than 1.1 lb/lf shall separate each bay and shall be spaced at less than gate height intervals.

2. Intermediate 1" x 2" (25mm x 51mm) vertical members weighing not less than .82 lb/lf shall alternate between 2" x 2" major members.

C. Gate Track:

1. The gate frame shall have a separate semi-enclosed "keyed" track, extruded from 6005A-T61 or 6105-T5 aluminum alloy, weighing not less than 2.9 lb/lf (4.2kg/m). The track member is to be located on only one side of the top primary. Welds to be placed alternately along the top and side of the track at 9" (229mm) centers with welds being a minimum of 2" (51mm).

D. All welds on the gate frame shall conform to Welding Procedure Specification and Procedure Qualification Record to insure conformance to the AWS D1.2 Structural Welding Code. All individual welders shall be certified to AWS D1.2 welding code. See 1.02 D.

- E. Gate Mounting:
 1. The gate frame is to be supported from the track by two (2) swivel type, self-aligning, 4 wheeled, sealed lubricant, ball-bearing truck assemblies.
 2. The bottom of each support post shall have a bracket equipped with a pair of 3" (76mm) UHMW guide wheels. Wheel cover protectors shall be included with bottom guides to comply with UL325.
 3. Gap protectors shall be provided and installed, compliant with ASTM F 2200-05.
 - F. Diagonal Bracing:
 1. Diagonal "X" bracing of 3/16" or 1/4" diameter stainless or galvanized steel cable shall be installed throughout the entire gate frame.
 - G. The gate shall be completed by installation of approved filler as specified.
 1. Chain Link: 2" x 2" x 9 gauge aluminized steel chain link fabric shall extend the entire length of the gate (if operated gate, counterbalance must also have fabric to prevent reach through and comply with ASTM F2200, see 1.03 C.1) Fabric shall be attached at each end of the gate frame by standard fence industry tension bars and tied at each 2" x 2" (51mm x 51mm) vertical member with standard fence industry ties. ASTM F2200 requires attachment method that leaves no leading or bottom edge protrusions (cannot exceed 0.5 inch).
- 6 POSTS:
- A. A single set of support posts shall be minimum 4" O.D. (102mm) round SS40 or 4" x 4" x 3/16" wall square steel tubing, grade 500. Gate posts shall be galvanized or coated and supported in concrete footings as specified by the design team.
- 7 FINISH:
- A. Gate to black color coated with polyester powder as specified. The gate (including any new track member) and all new accessories shall be pretreated chemically by sand blasting or other acceptable method to ensure proper coating adherence.
- 8 WARRANTY:
- A. The truck assembly shall be warranted against manufacturing defects by the manufacturer for a period of (5) five years from date of sale.
- 9 INSTALLATION:
- A. Final grades and installation conditions shall be examined. Installation shall not begin until all unsatisfactory conditions are corrected. Equipment in this section shall be installed in strict accordance with the company's printed instructions unless otherwise shown on the contract drawings.

- B. The gate and installation shall conform to ASTM F 1184 standards for aluminum cantilever slide gates, Type II, Class 2. See 1.02 C.
 - C. If the gate system is to be automated, the gate and installation shall also comply with ASTM F 2200 and UL 325. See 1.02 A and 1.02 B. For automated gates the existing power/control system will be utilized and reconnected to the new gate.
- 10 SYSTEM VALIDATION:
- A. The complete system shall be adjusted to assure it is performing properly.
 - B. The system shall be operated for a sufficient period of time to determine that the system is in proper working order.
 - C. For operated gate systems - test and verify safety features:
 1. Each system feature and device is a separate component of the gate system.
 2. Read and follow all instructions for each component.
 4. The warning signs on the existing gate must be removed, stored and reinstalled in prominent position on both sides of the gate.

162-2.5 RESERVED

162-2.6 MISCELLANEOUS FITTINGS AND HARDWARE. All fittings and accessories shall be vinyl coated and manufactured in accordance with Federal specification RR-F191/4D. Color to be selected by Resident Engineer.

A. Terminal Post Cap:
Pressed steel.

B. Line Post Cap:
Pressed steel.

C. Tension Bars:
3/16" X 3/4" steel - Provide one tension bar for each gate and end post, and two for each corner and pull post.

D. Tension Bands:
Fabricated from 12 gauge pressed steel. Spaced not over 14" O.C. to secure tension bars to terminal posts. Bands shall have beveled edges.

E. Brace Bands:
Fabricated from 12 gauge pressed steel. Bands are to secure rail ends and truss rods to terminal posts. Bands shall have beveled edges.

F. Fabric Ties:

PVC coated 9 gauge (0.148") OD Aluminum.

G. Rail Ends:

SIEVE SIZE PERCENT PASSING		Steel.
Sieve Size	(IDOT CA-6)	H.
1-1/2"	100	
1"	95 + 5	
1/2"	75 + 15	
No. 4	43 + 13	
No. 16	25 + 15	
No. 200	8 + 4	

Sleeves:
PVC coated steel.

I. Boulevard Clamps:

Pressed steel, with 5/16" diameter carriage bolts.

J. Bolts and Nuts:

ASTM A 307, Grade A, coated to match color of fence fabric.

162-2.7 CONCRETE. Concrete shall be produced and placed in accordance with Item 610.

A high early strength concrete may be used. The concrete mix design shall be approved for use by the Illinois Division of Aeronautics prior to using it on the project.

162-2.8 RESERVED

162-2.9 WELDING. Structural members of gates which are in contact shall be fully welded by a method that will procure a continuous weld on all sides and faces of joints at exposed edges. Surplus welding material shall be removed.

162-2.10 SIGNS. The Contractor shall provide and install Restricted Area signage as shown on the plans. Existing signage on fence to be removed, stored and reinstalled on the new fence.

162-2.11 CRUSHED AGGREGATE BASE COURSE - 6" (CA-6). Crushed aggregate shall be constructed and compacted prior to the placement of the fence barrier for the entire length of the fence. The granular aggregate material shall consist of crushed stone meeting the material requirements set forth in IDOT Standard Specifications for Road and Bridge Construction, latest edition, Section 351. The material gradation shall be as follows: All granular cradles shall be compacted to 90% of the maximum density.

The work shall include the handling and disposal of all material cleared, excavated, or removed, regardless of the type, character, composition, or condition of such material encountered. All excess spoils associated with the installation of the CA-6 will be hauled off site.

CONSTRUCTION METHODS

162-3.1 CLEARING FENCE LINE & TOPSOIL REMOVAL. The site of the fence shall be sufficiently cleared of obstructions, and surface irregularities shall be graded so that the fence will conform to the general contour of the ground. The fence line shall be cleared to a minimum width of 2 feet on each side of the centerline of the fence and additionally as necessary for installation of the wildlife deterrent barrier. This clearing shall consist of the removal of all stumps, brush, rocks, trees, or other obstructions which will interfere with proper construction of the same fence. Stumps within the cleared area of the fence line shall be grubbed or excavated. All brush, stumps, and other debris which would interfere with the proper construction of the underground wildlife deterrent fence barriers in the required location must be removed. The material removed and disposed of will not constitute a pay item and will be considered included in the fence construction. All holes remaining after post and stump removal shall be refilled with suitable soil, gravel, or other material acceptable to the Resident Engineer and shall be compacted properly with tampers.

The work shall include the handling and disposal of all material cleared, excavated, or removed, regardless of the type, character, composition, or condition of such material encountered.

After clearing the fence line additional soil/material removal is required as identified in the Plans to a width of 2 feet wide on each side of the centerline of the fence to a depth of 6 inches for placement of CA-6 material. The removal of this soil/material for the CA-6 placement will be paid under item AR152460 Topsoil Stripping.

162-3.2 INSTALLING POSTS. All posts shall be spaced not more than 10 feet apart as shown on the plans. Terminal (end, corner, pull, and brace) and gate posts shall be set 42 inches in concrete bases as shown on the plans. All line posts shall be set 42 inches in concrete bases as shown on the plans. The top of the concrete bases shall be 6 inches below the ground/CA-6 aggregate, trowel finished, and sloped to drain away from the posts. Holes of full depth and size for the concrete bases for posts shall be dug to the size and depth as shown on the plans. The removal of the materials for the concrete and post installation will be paid separately as unclassified excavation under Pay Item AR152410.

Blasting of rock or other obstructions shall be done if necessary. All post settings shall be done carefully so that all posts shall be vertical and in true alignment and rigidly secured in position.

On terminal (end, corner, pull, and brace) and gate posts, the post tops and brace rail clamps around the posts shall be placed before setting the posts in concrete bases. In setting the gate posts, great care must be taken to make sure that gate posts are set the exact distance apart as shown on the plans. For example, posts for a 6-foot gate must be set so as to leave an opening exactly 6 feet wide. A line drawn across from the top of one gate post to the other must be level, regardless of the grade at the ground line.

If the ground is not level, the upgrade gate post shall be set first to get the proper height for the downgrade gate post. The concrete bases for end, corner, pull, brace, and gate posts shall be placed first and allowed to cure for 14 days. The concrete bases for line posts shall be allowed to cure for 7 days. Stretcher bar bands and truss bands as specified on the plans shall be spread and slipped on end, corner, pull, brace, and gate posts as the next operation. Post tops are then inserted on all other posts. No extra compensation shall be made for rock excavation. Rock excavation shall not be grounds for extension of time.

All posts shall be set to a minimum depth of 48 inches below the existing ground line. The fence shall not be erected until the concrete encasement around the post has cured 7 days or reached a compressive strength of 2,500 psi. If a high-early strength concrete is used the fence may be erected once the concrete has reached a compressive strength of 2,500 psi. The Contractor will be responsible for concrete testing other than at 28 days for final concrete acceptance.

All excess spoils associated with the installation of the fencing will be hauled off site.

162-3.3 INSTALLING TOP RAILS. To start the installation, a length of top rail shall be run through the first couple of post tops; a rail clamp shall be assembled on the end, corner, or gate post, as the case may be. The end of the rail already placed shall be butted into the clamp and fastened. The top rail shall be installed along the run of the fence and the various sections joined with sleeve couplings. At no more than every 100 feet an expansion coupling shall be placed to take care of expansion and contraction of the rail. The rail shall be clamped in the end, corner, or gate post at the end of the run of the installation of top rail.

162-3.4 INSTALLING BRACES. All horizontal braces shall be attached together with truss rods at all terminal (end, corner, and pull) and gate posts to the brace posts as shown on the plans.

162-3.5 INSTALLING FABRIC. The fabric shall be unrolled on the outside of the fence line with the bottom edge of the fabric against the posts. The various rolls shall be spliced by bringing the ends close together and weaving in a picket in such a way that it will engage both of the roll ends and catch with each twist each separate mesh of the end pickets of both rolls of fabric. The fabric shall be raised and tied loosely to the top rail with a temporary tie wire at intervals of about 20 feet. The fabric shall be installed by a method approved by the Engineer. One method used is given below.

A. At end, corner, or gate posts, the stretcher bar shall be slipped through the end picket of the fabric and the stretcher bar bands at the same time. Then the bolts in the stretcher bar band shall be tightened. Additional rolls of fabric shall be spliced and placed as the erection progresses along the fence.

B. In long sections, the fence shall be stretched at intervals of about 100 feet. After the stretching is complete, the fabric shall be tied to the top rails with No. 6 gauge galvanized wire clips securely clinched at the back of the rail. The fastenings shall be spaced not more than 24 inches on centers for the top rail.

C. The fabric shall be attached to the line posts with No. 6 gauge galvanized wire clips securely clinched to the back of the line posts. The fastenings shall be spaced more than 14 inches on centers for line posts. The topmost clip shall be placed on the line post as near the top of the fabric as possible and the lowest clip as near the bottom of the fabric as possible.

D. At terminal (end, corner, and pull) and gate posts the fabric shall be fastened with stretcher bars and bands. The fastenings shall be spaced not more than 14 inches on centers for terminal (end, corner, and pull) and gate posts. The topmost band shall be placed on these posts as near the top of the fabric as possible and the lowest band as near the bottom of the fabric as possible.

Standard chain-link fence stretching equipment shall be provided for stretching the fabric before tying it to the rails and posts. The stretching and tying operations shall be repeated about every 100 feet until the run of fence is completed. Equipment of one type for performing the stretching operation may be composed of four pieces of lumber (2 x 4's or larger) cut into a slightly shorter length than the width of the fabric. The pieces shall be bored for six bolts of about 1/2 or 5/8-inch diameter and shall be assembled as shown on the plans. One pair shall be used for stretching the fabric and both pairs shall be used for making a closure of a run of the fence.

Before making a closure, the other end of the run shall be fastened to the end, corner, or gate post as described previously. The operation of making a closure of a run shall be as follows. The stretching equipment as described above shall be clamped on the ends of the fabric parallel to each other and about 5 feet apart when the tension is first applied. The stretching shall continue until the slack has been removed from both sections of the fabric. If the ends overlap, the fabric shall be cut to match. The ends shall be joined by the insertion of a picket similar to the method of connecting two rolls of fabric.

162-3.6 ELECTRICAL GROUNDS. Continuous fence shall be grounded at intervals not exceeding 500 ft. There shall be a ground within 100 ft. of gates in each section of the fence adjacent to the gate.

Fence under a power line shall be grounded by three grounds, one directly under the crossing and one on each side 25 to 50 ft away. A single ground shall be located directly

under each telephone wire or cable crossing.

The ground shall be accomplished with a copper clad rod 8 feet long and a minimum of 5/8 inch in diameter driven vertically until the top is 6 inches below the ground surface. A No. 6 solid copper conductor shall be clamped to the rod and to the fence in such a manner that each element of the fence is grounded. Installation of ground rods shall not constitute a pay item and shall be considered incidental to fence construction.

162-3.7 GENERAL. The fence shall be constructed in accordance with the details on the plans and as specified herein using new materials, and all work shall be performed in a workmanlike manner satisfactory to the Engineer. Prior to the beginning of the work or upon the request of the Contractor, the Resident Engineer shall locate the position of the work by establishing and marking the property line or fence line. When directed, the Contractor shall span the opening below the fence with barbed wire fastened to stakes of the required length at locations of small natural or drainage ditches where it is not practical to conform the fences to the general contour of the ground surface, as required. The new fence shall be permanently tied to the terminals of existing fences whenever required by the Resident Engineer. The finished fence shall be plumb, taut, true to line and ground contour, and complete in every detail. When directed, the Contractor shall be required to stake down the chain-link fence at several points between posts.

When directed, in order to keep stock on adjoining property enclosed at all times, the Contractor shall arrange the work so that construction of the new fence will immediately follow the removal of existing fences. The length of unfenced section at any time shall not exceed 300 feet or it shall be of such length that the stock can be kept in the proper field. The work shall progress in this manner and at the close of the working day the newly constructed fence shall be tied to the existing fence. Openings in the fence shall be guarded when stock is using the adjoining property.

162-3.8 INSTALLING GATES. The gates shall be hung on gate fittings as shown on the plans. The lower hinge (ball and socket type) shall be placed on top of the concrete footing in which the gate post is set; the concrete in the footings shall extend up to the bottom of the lower hinge. The sockets for the cane or foot bolts shall be set in concrete so that the plunger pin will fit perfectly in the socket when the gate is in a closed position. Gates shall be erected to swing in the direction indicated and shall be provided with gate stops as specified or as shown on the plans. All hardware shall be thoroughly secured, properly adjusted, and left in perfect working order. Hinges and diagonal bracing in gates shall be adjusted so that the gates will hang level. Electric gates will be installed and connected to the existing gate power/control system including all work needed to provide integration into the existing gate power/control system to provide a fully functional gate.

162-3.9 EXISTING FENCE CONNECTIONS. Wherever the new fence joins an existing fence, either at a corner or at the intersection of straight fence lines, a corner post with a brace post shall be set at the junction and braced the same as herein described for corner

posts or as shown on the plans.

If the connection is made at other than the corner of the new fence, the last span of the old fence shall contain a brace span.

162-3.10 CLEANING UP. The Contractor shall remove from the vicinity of the completed work all tools, buildings, equipment, etc., used during construction.

162-3.11 FENCE AND GATE REMOVAL. These items shall consist of complete removal of existing fence and gates (fabric, posts, signs and other hardware) as shown on the plans. The Airport Management shall have the option of keeping the removed fence and gates. If the Airport Management chooses, the removed fence material shall become the property of the Contractor, and shall be removed from the airport property.

METHOD OF MEASUREMENT

162-4.1 Class E Fence - 8' shall be measured in place from outside to outside of end posts or corner posts and shall be the length of fence actually constructed, except the space occupied by the gates.

162-4.2 Gates. cantilevered (electric and manual), combination (electric and manual), and/or swing gates shall be measured in units for each gate installed and accepted.

162-4.3 Fence and Gate Removals. Fence removal to be paid for shall be the actual length of fence (including post widths) removed, except for the space occupied by the gates. Gate removals shall be measured in units for each gate removed.

162-4.4 Barbed Wire 3 Strands. Barbed Wire 3 Strands to be paid for shall be the actual length of fence existing or new measured in linear feet in accordance with the Contract Documents.

162-4.5 Vinyl Fence Upgrade. Vinyl Fence Upgrade to be paid for shall be the actual length of new fence including the non-sliding gate lengths measured in linear feet in accordance with the Contract Documents. Sliding gates are not included which are powder coated, incidental to the gate. This item is an additive alternate and will be awarded at the discretion of the Illinois Department of Transportation.

BASIS OF PAYMENT

162-5.1 Class E Fence - 8' payment will be made at the contract unit price per linear foot for chain-link fence. This price shall be full compensation for furnishing all materials and for all preparation, erection, and installation of these materials, and for all labor, equipment, tools, and incidentals necessary to complete the item. *Incidental work and materials necessary to*

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complete the item shall include, but is not limited to: installation of protective electrical grounds; temporary security measures for the AOA. Installation of wildlife deterrent barrier will be measured and paid as indicated in Special Provision – Item 163 – Wildlife Deterrent Barrier. The removal of the materials for the concrete and post installation will be paid separately as unclassified excavation under Pay Item AR152410. Barbed Wire 3 Strand will be paid for separately under pay Item AR801762. Vinyl coating of the fence will be paid for separately under Item AS162401.

162-5.2 Gates. Payment will be made at the contract unit price per each for cantilevered (electric and manual), combination (electric and manual), and/or swing gates. This price shall be full compensation for furnishing all materials, for all preparation, erection, and installation of these materials, and for all labor, equipment, tools, and incidentals necessary to complete the item. Incidental work and materials necessary to complete the item shall include, but are not limited to: installation of protective electrical grounds; temporary security measures for the AOA. Installation of wildlife deterrent concrete pads will be measured and paid as indicated in Special Provision – Item 163 – Wildlife Deterrent Barrier.

162-5.3 Fence and Gate Removals. Fence removal payment shall be made at the contract unit price per linear foot for fence removal. This price shall be full compensation for furnishing all materials and for all removals, restoration, including grading, backfilling, seeding and mulching, and disposal, and for all labor, equipment, tools, and incidentals necessary to complete this item.

Gate removal payment will be paid at the contract unit price per each for cantilevered (electric and manual), combination (electric and manual), and/or swing gate removal. This price shall be full compensation for furnishing all materials and for all removals, restoration, including grading, backfilling, seeding and mulching, and disposal, and for all labor, equipment, tools, and incidentals necessary to complete this item.

162-5.4 Barbed Wire 3 Strands payment will be made at the contract unit price per linear foot for Barbed Wire 3 Strands. This price shall be full compensation for furnishing all materials and for all preparation, modifications needed to existing fence, and installation of these materials, and for all labor, equipment, tools, and incidentals necessary to complete the item. Incidental work and materials necessary to complete the item shall include but is not limited to: modifications to existing fencing to allow for the installation of barbed wire and associated appurtenances, including angle arms, post extensions, welding, wire installation, and any other items or activities required to install the 3 strand barbed wire on the existing or new fence.

162-5.5 Vinyl Fence Upgrade to be paid at the contract unit price per linear foot for Vinyl Fence Upgrade. Vinyl coating will be applied at the same time as manufacture of the fencing materials and is inclusive of all efforts required to coat the fencing with the vinyl coating inclusive of any repairs required in the field. This item is an additive alternate and will be awarded at the discretion of the Illinois Department of Transportation.

Payment will be made under:

Item AR162220	Class E Manual Slide Gate - 20' - per Each (EA)
Item AR162508	Class E Fence - 8' - per Linear Foot (LF)
Item AR162531	Walkway Gates, Class E - per Each (EA)
Item AR162610	Class E Gate - 10' - per Each (EA)
Item AR162614	Class E Gate - 14' - per Each (EA)
Item AR162616	Class E Gate - 16' - per Each (EA)
Item AR162716	Electric Gate - 16' - per Each (EA)
Item AR162720	Electric Gate - 20' - per Each (EA)
Item AR162722	Electric Gate - 22' - per Each (EA)
Item AR162725	Electric Gate - 25' - per Each (EA)
Item AR162730	Electric Gate - 30' - per Each (EA)
Item AR162900	Remove Class E Fence - per Linear Foot (LF)
Item AR162905	Remove Gate - per Each (EA)
Item AR162908	Remove Electric Gate - per Each (EA)
Item AR162910	Remove Class E Gate - per Each (EA)
Item AR162920	Remove Manual Slide Gate - per Each (EA)
Item AR162948	Adjust Electric Gate - per Each (EA)
Item AR801762	Barbed Wire 3 Strands - per Linear Foot (LF)
Item AS162401	Vinyl Fence Upgrade - per Linear Foot (LF)

END OF ITEM 162