

MAXSTOP

Welded Wire Security Fence

CORRECTIONAL FACILITIES
SECURITY FENCE SPECIFICATIONS
Section 040108CS

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**SECTION 040108CS
CORRECTIONAL SECURITY**

**WELDED WIRE MESH FENCING (GALVANIZED)
BARBED TAPE AND GATE SPECIFICATIONS**

PART 1 GENERAL

1.1 STIPULATIONS

- A. The specifications sections, "General Conditions", "Special Requirements" and "General Requirements" form a part of this Section by this reference thereto and shall have the same force and effect as if printed herewith in full.

1.2 SCOPE

- A. This specification covers fencing materials for a complete Polymer coated (green) over galvanized steel welded wire fence system, and accessories. All new gates shall be field painted to match fence system color.
- B. Sliding Gate Operator System with an Enclosed Drive Assembly: The work consists of furnishing all labor, materials, equipment, and appliances necessary to complete all motorized sliding gates required for this project in strict accordance with this section of specifications and drawings. Exposed chain drive or hydraulic friction drive gate systems will not be approved.
- C. Swing Gates: The work consists of furnishing all labor, materials, equipment and appliances necessary to complete all swing gates for this project in strict accordance with this section of specifications and drawings.

1.3 REFERENCE ASTM DOCUMENTS:

- A. B 117-07 Standard Practice for Operating Salt Spray (Fog) Apparatus
- B. A 121-07 Standard Specification for Metallic-Coated Carbon Steel Barbed Wire
- C. A 123/A123M-02 Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
- D. A 153/A153M-05 Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware
- E. A 307-07a Standard Specification for Carbon Steel Bolts and Studs, 60 000 PSI Tensile Strength
- F. A 780-00 Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings
- G. A 853-04 Standard Specification for Steel Wire, Carbon, for General Use
- H. C 94/C 94M-07 Standard Specification for Ready-Mixed Concrete
- I. F 567-07 Standard Practice for Installation of Chain-Link Fence
- J. F 626-96a Standard Specification for Fence Fittings
- K. F 900-05 Standard Specification for Industrial and Commercial Swing Gates

- L. F 1043-06 Standard Specification for Strength and Protective Coatings on Steel Industrial Chain Link Fence Framework
- M. F 1083-06 Standard Specification for Pipe, Steel, Hot-Dipped Zinc-Coated (Galvanized) Welded, for Fence Structures
- N. F 1910-98 Standard Specification for Long Barbed Tape Obstacles
- O. F 1911-05 Standard Practice for Installation of Barbed Tape
- P. F 1916-98 Standard Specifications for Selecting Chain Link Barrier Systems with Coated Chain Link Fence Fabric and Round Posts for Detention Applications (Grounding reference only)
- Q. F 2453/F2453M-05 Standard Specification for Welded Wire Mesh Fence Fabric (Metallic-Coated or Polymer Coated) for Meshes of 6 in.² [3871 mm²] or Less, in Panels or Rolls, with Uniform Meshes

1.4 SUBMITTALS

- A. Comply with pertinent provisions of General Conditions.
- B. Product Data:
 - 1. Provide manufacturer's catalog cuts with printed specifications and installation instructions.
 - 2. Furnish detailed sequence of operation (description of system).
 - 3. Deliver the required number of copies for operation and maintenance data covering the installed products, in accordance with the General Conditions. Include name, address and telephone number of the nearest fully equipped service organization.
- C. Shop Drawings:
 - 1. Supply Shop Drawings showing the relationship of system operating with other work. Include details of all major components. Include parts list showing manufacturer's names and part numbers for the complete installation.
 - 2. Include complete details of gate construction, gate height; post spacing dimensions and unit weights of track, supporting frame and concrete footing details.
- D. Samples: Provide the Professional with a representative sample of all fence components.

1.5 MATERIALS

- A. All accessories shall be hot-dipped galvanized in accordance with ASTM A 123 and ASTM F 2453 or as specified. Hardware coatings shall conform to ASTM A 153. Steel pipe and other framework shall be hot-dip galvanized in accordance with ASTM F 1083 and ASTM F 1043. Strength requirements for post shall conform to ASTM F 1043. The product of the yield strength and section modulus shall not be less than that for pipe conforming to ASTM F 1083.
- B. Products shall be new from recognized, reputable manufacturers. The manufacturers shall have a minimum of two (2) years experience. Used, re-rolled or re-galvanized material is not acceptable.
- C. Welded Wire Fabric shall be fabricated from low carbon steel wire and electronically control welded, forming a specified mesh size.

1. Manufacturer:
 - a. **C. E. Shepherd Co., Houston, TX, 800-324-9473**
 - b. Tymetal Corporation, Inc., Greenwich, NY, 800-328-4283
- D. The wire shall conform to ASTM F 2453. After welding, the fabric is hot-dipped, galvanized with a minimum 1.2 oz zinc/ft², followed by 10 mil minimum polymer coating (green).
 1. Polymer coating shall be thermally fused and adhered to a primer, which is thermally cured onto the galvanized steel core wire.
 2. Polymer coating shall be applied in a continuous process.
 3. All cut ends shall be coated with vinyl at the factory before shipping.
- E. Fabric Heights:
 1. Exercise Yard Fence (14 ft.):
 - a. Upper welded mesh fabric, 1/2 in. x 3 in. x 10.5 gauge shall extend 7 ft. from the mid fence connection to the top of the fence.
 - b. Lower welded mesh fabric 2 in. x 2 in. x 6 gauge shall extend from the mid fence connection to 18 in. below grade. Bottom panel height is 8 ft. – 10 in. for interior fence around exercise yard, including a 4 in. overlap at mid fence connection.
 2. Division fences (14 ft.):
 - a. Welded mesh fabric, 2 in. x 2 in. x 8 gauge shall extend from 14 ft. to grade level.
 3. No climb corners: 1/2 in. x 3 in. x 10.5 gauge welded mesh panels shall extend from mid fence connection to top of fence. (3 in. mesh is vertical for this application.)
- F. Framework: Framework strength and coating shall be in accordance with ASTM F 1043.
 1. SS30 Pipe, hot-dipped galvanized and Polymer coated conforming to standard specification ASTM F 1043, Group IV. No Group IV posts shall be used for Motorized Gates or swing gates exceeding 5 ft. in width.
 2. Pipe shall have minimum yield strength of 50,000 PSI (344.0 MPa). Exterior and interior coatings shall be in accordance with ASTM F 1043, Types B and D.
 3. Polymer coating shall be 10 mils minimum in accordance with ASTM F 1043, color conforming to ASTM F 934 (green).
 4. Performance: All framework shall meet the following performance in accordance with test method ASTM B 117 (Salt Spray Test).
 5. Wind Loads: Post shall withstand 70 mph minimum wind load.
 6. Manufacturers:
 - a. Wheatland Pipe Co., Collingswood, NJ, 800-257-8182

- b. Allied Tube & Conduit, Harvey, IL, 800-882-5543
 - c. Gregory Galvanizing, Canton, OH 330-477-4800
 - d. Or approved equal
7. Post Sizes, determined in accordance with previous approved practices Line, terminal and gate post shall not be less than 95 % of the nominal weight conforming to (ASTM F 1043 Group 1A, IC, II and IV).
- a. Exercise Yard and Division Fences (14 ft.) or (16 ft.):
 - 1) Tubular line and terminal posts shall be 4 in. diameter.
 - 2) Every other post to be 16 ft. high, including all new corner and end posts.
8. Rail Size:
- a. 1-5/8 in. diameter rails located at the top and middle of the exercise yard fence.
 - b. 1-5/8 in. diameter rails located at the top, middle and bottom of the division fence.
 - c. The 4 in. overlap at mid-fence shall be secured by using 2-hole connecting bars and 5/16 in. carriage bolts, as recommended by manufacturer. Peen threaded end of bolt or tack weld nut to bolt.
 - d. Use 9 gauge tie wires to secure welded mesh to tubular rail as per Section 2.1G 5, 6 and 7.
- G. Fittings and Accessories:
- 1. Post Tops: Pressed steel or malleable iron, designed as a weather tight enclosure for tubular post. Provide one cap for each exposed tubular post end.
 - 2. Pre-shaped Power Twisted Ties: Fabric attachment to rails, 9 gauge ties for fabric sizes 10.5 gauge and larger. Fabric attachment to line post shall be made with 9 gauge ties for fabric sizes 10.5 gauge and larger. Ties shall be vinyl-coated, galvanized steel of proper size. Ties shall be manufactured by L.C. Enterprises or approved equal.
 - 3. Tie spacings for top rails are at intervals not exceeding 24 in. Bottom rail tie spacing intervals not to exceed 12 in.
 - 4. Tie and bracket combinations: Spacing for line and terminal posts are at intervals not exceeding 15 in. See drawings for tie wire and bracket locations.
 - 5. Tie and bracket combinations: Spacing for mid rail splice not to exceed 12 in.
 - 6. No-climb corners: Shall be secured using 5/16 in. carriage bolts washers and nuts, attachment spacing shall correspond with corner connections.
- H. Barbed Tape: Shall conform to ASTM F 1910 Item 21 and as specified herein.

1. Barbed Tape: Double coil concertina barbed tape product shall consist of 24 in. diameter coil placed inside a 30 in. diameter coil. Both coils are fabricated from AISI 430 stainless steel hardened to Rockwell (30N).
 - a. The tape shall be 0.025 (or barb stiffness equal to 0.025) thick x 1 in. wide prior to forming.
 - b. Each barb shall be 1.25 in. in length to center and 2.5 in. tip/tip in groups of 4 spaced on 4 in. centers.
 - c. The 24 in. diameter coil shall contain 19 groups of barbs and the 30 in. diameter coil shall contain 23 groups of bars.
 - d. All spiral turns of the tapes shall be permanently cold clenched to a minimum of 230 degrees around their respective hot-dipped zinc galvanized steel core wires having a diameter of 0.098 in. The minimum tensile strength of the core wire shall be 220,000 PSI (1517 MPa.) in accordance with ASTM A 764, Finish 2, Class II, Type 3.
2. Adjoining loops on each coil shall be clipped together at three (3) locations per loop throughout the entire coil resulting in a concertina affect when deployed.
 - a. The clips shall be 0.065 in. thick x 0.375 in. wide minimum; fabricated from stainless steel, and capable of withstanding a minimum 200 lb. pull load.
3. The two (2) coils shall be attached at each end with 7 x 7 strand 1/16 in. stainless steel wire rope, Type 304 with a breaking strength of 480 lbs., or other suitable means, to secure the inner and outer coils together during deployment. The wire ropes shall be crimped with two (2) aluminum compression sleeves. When deployed, the 24 in. / 30 in. double coil shall cover 20 ft. with inner and outer coil spacing not to exceed 16 in. on centers.
4. All ties required to fasten tape to fence shall be furnished and installed by this Contractor.

I. Exercise Yard Swing Gates

1. Exercise yards gates shall be 14 ft. double leaf swing gate type, complete with latches, stops, keepers and hinges.
2. Gate Frame:
 - a. SS40 Steel Pipe: 2.375 in. O.D., 2.78 lbs/ft.
 - b. Support Posts shall be 4 in. Diameter, SS40 Pipe, 6.56 lbs/ft.
3. Gate Construction Conforming to ASTM F 900: Assemble gate frames by welding. Install mid height horizontal rails and install mid distance vertical pipe of the same size and weight as frame members. Where bracing is required in only one direction (horizontal or vertical), provide truss rods as cross bracing to prevent sagging or twisting. All connections shall be welded and painted with two (2) coats of zinc rich paint.
4. Gate Fabric: Shall be the type as indicated on the drawings. The fabric shall be attached securely to the gate frame at intervals not exceeding 12 in. Secure fabric to frame with tension bars, tension bands and 9 gauge galvanized coated steel wire ties.
5. Gate Hinges:

- a. Gate hinges shall be hot dip galvanized with zinc coating of no less than 2 oz. of zinc/ft.² (610 g/m²).
 - b. Hinges shall be provided as appropriate for all gates.
 - 1) Hinges shall be adequate for gate size specified, with large bearing surfaces for clamping in position. The hinges shall not twist or turn under the action of the gate. The gates shall be capable of being opened and closed easily by one person.
 - 2) All hinges will be malleable iron, ball-and-socket type. Hinges shall be non-lift-off-type, offset to permit 180 degrees of swing, and of suitable size and weight to support gate. Provide three (3) hinges for each leaf over 7 ft. (2.1m) high.
6. Gate Latches:
- a. Latches shall have a plunger bar or center drop rod of full gate height arranged to engage the center stop.
 - b. Latches shall be arranged for locking with specified locking hardware.
 - c. Center stops shall consist of a device arranged to be set in concrete and to engage a plunger bar of the latch for double gates.
7. Locking Devices shall be constructed so that the center drop rod or plunger bar cannot be raised when locked.
- a. Provide gate stops consisting of mushroom type or flush plate with anchors. **Set in concrete to engage the center drop rod or plunger bar.**
 - b. Provide locking device and padlock eyes as an integral part of the latch, requiring one (1) padlock for locking both gate leaves where padlocks are called for.
8. Provide keeper for all manually operated vehicle gates, which automatically engages the gate leaf, holding it in the OPEN position until manually released.
9. Gates and Posts shall be modified as required to receive hardware, including locking and operating mechanisms as herein specified.

PART 2 EXECUTION

2.1 INSTALLATION

- A. Installation of the Framework Components shall be in accordance with ASTM F 567, when applicable and as specified herein. Larger corner posts not required for welded mesh installations.
- B. Installation of Welded Wire Fabric components: Follow the manufacturer's recommendations.
 1. Tolerances: Top to bottom of panel 1 in. post to panel misalignment tolerance. This tolerance covers those areas where minor grade change can be accommodated; panels are out of square; the occasional workmen's oversight; or posts that are out of plumb.

2. Install the smooth face of the fence fabric on the secure side of the fence. Install the upper and lower fence fabric sections in a manner so as not to create a hand or toe hold at the horizontal joint between the panels. Vertical wires are installed on the inmate side of the fence.
- C. Site Preparation: Prior to the installation, all necessary grading and cleaning on both sides of fence shall be performed by this Contractor.
1. Grading shall be done in such a manner as to provide a straight flat and level surface; soil fill shall be thoroughly compacted.
 2. All excavation shall be coordinated with respect to electrical component installations. All existing utilities shall be located prior to starting excavation.
- D. Framework: Erect the fencing in straight lines between angle points. Erect framework in accordance with ASTM F 567 and as approved by shop drawings. All fencing shall be grounded as specified herein (3.1 M). NOTE: Grounding in Section 3.1 M shall be completed by this contractor.
1. Post Holes:
 - a. Minimum Post Hole Diameters for 2.375 in. are 10.0 in.; 2.875 in. are 12.0 in.; 4.0 in. are 16 in.; 6.625 in. are 24.0 in.; and 8.625 in. are 32.0 in. (Table 1 for Post Hole Depth).

Table 1 Post Hole Depth in Soil							
Exposed Height of Fabric		Line Post		Corner/End Pull Post		Setting Depth	
6 ft.	1.8 m	2.375 in.	60 mm	2.375 in.	73 mm	30 in.	762 mm
7 ft.	2.1 m	2.375 in.	60 mm	2.375 in.	73 mm	33 in.	838 mm
8 ft.	2.4 m	2.375 in.	60 mm	2.375 in.	73 mm	36 in.	914 mm
9 ft.	2.7 m	2.875 in.	73 mm	2.875 in.	73 mm	39 in.	990 mm
10 ft.	3.0 m	2.875 in.	73 mm	2.875 in.	73 mm	42 in.	1066 mm
11 ft.	3.4 m	2.875 in.	73 mm	2.875 in.	73 mm	45 in.	1143 mm
12 ft.	3.7 m	2.875 in.	73 mm	2.875 in.	73 mm	48 in.	1219 mm
13 ft.	4.0 m	2.875 in.	73 mm	2.875 in.	73 mm	51 in.	1295 mm
14 ft.	4.3 m	4.000 in.	102 mm	4.000 in.	102 mm	54 in.	1372 mm
15 ft.	4.6 m	4.000 in.	102 mm	4.000 in.	102 mm	57 in.	1447 mm
16 ft.	4.9 m	4.000 in.	102 mm	6.525 in.	102 mm	60 in.	1524 mm

Note: The depth shall be a minimum of 24 in. (610 mm) plus 3 in. (76 mm) for each 1 ft. (.305 m) increase in the fence height over 4 ft. (1.2 m) per ASTM A 567.

- b. Post Holes in Solid Rock or Concrete:
 - 1) Drill holes into solid rock or concrete 1/2 in. wider than pipe diameter, and 18 in. deep for end, corner and gate posts and 12 in. deep for line post.
 - 2) Half-fill the void with non-shrinkable grout and force the post to the bottom of the hole, leaving no voids. Crown the grout to shed water. The use of sleeves in new concrete is recommended.

- E. Concrete Mix: Shall be in accordance with ASTM C 94 with maximum 3/4 in. aggregate, and having minimum compression strength of 3,300 PSI at 28 days. Concrete shall be thoroughly worked into the post holes leaving no voids.
- F. Allow concrete to cure a minimum of seven (7) days before installing fence fabric or fittings. The top surface of the post footing shall have a crown water shed finish.
- G. Post Spacing: Space post equal distance in the fence line to a maximum of 7 ft. on center. No terminal posts larger than line post required, except for gate post.
- H. To prevent digging or tunneling under the fence: Extend the new interior exercise yard fence 18 in. below grade. Top of post footings shall begin at the fence panel's sub-grade for all buried fabric locations.
- I. Rails:
 - 1. Install rails as called for on the drawings and in these specifications. All rails shall be installed on the side of the fence least accessible for climbing from the inmate side. No corner bracing required for welded wire fabric installations.
 - 2. Top rails, with the use of 7 in. sleeve, shall run continuously through the top caps or extension arms. Intermediate and bottom rails shall be connected to the line and terminal post using boulevards or bands and rail ends. Attachment bolts for bands shall be 5/16 in. x 1-1/2 in. carriage bolts with nuts.
 - 3. Boulevard bolts shall be 3/8 in. minimum in diameter. Middle and bottom rails locations shall correspond with this specification and drawings. Where fence fabric is buried, no bottom rail is needed.
 - a. 2-way brace bands and rail ends may be used in place of boulevards.
 - b. To eliminate material build-up over boulevards, remove a section of mesh (2 in. x 4 in.) from the lower panel, at the post, such that upper panel covers the area of removed material, permitting neither a gap nor overlap.
- J. Welded Wire Fabric General:
 - 1. Welded wire panels are fabricated to correspond with the widths and heights specified.
 - 2. Upper and lower panels on the interior and exterior fences shall overlap the mid fence connection 4 in.
 - 3. Welded mesh panels are attached with a combination of brackets and tie wire in accordance with the drawing.
 - a. Preformed 1 in. x 10 gauge thick two (2) piece brackets, zinc and polymer coated are secured to the line post and rails with 5/16 in. carriage bolts.
 - b. Terminal post connections are comprised of tension bands. Band spacing is not to exceed 15 in. for terminal post. See corner connection detail for securing tension bands.
 - 4. Panels overlap the line post 2 in. minimum. Preformed Power Twisted ties for line post and rails are acceptable.

K. Barbed Tape Installation:

1. Follow installation instruction in accordance with ASTM F 1911 Paragraph 6.5 wire reinforced (Double Coil Concertina) and as shown on the drawings.

L. Grounding to the Earth: Grounding and bonding of the perimeter security systems shall be in accordance with the N.E.C. (National Electric Code), N.E.S.C. (National Electric Safety Code), ASTM F 1916 and as specified herein. No grounding required when the framework and fabric are polymer coated.

1. Fences crossing power lines of 600 volts or more shall be grounded at or near the point of crossing and at distances not exceeding 150 feet on each side of crossing.
2. Grounding electrodes shall be installed at 200 ft. intervals along the new and existing interior and exterior fence lines.
3. The grounding electrodes shall be a minimum 3/4 in. diameter x 10' long copper clad rod, driven into the earth until the top is 12 in. below grade. Attach a No. 2 AWG bare stranded copper conductor by exothermically welding to the ground rods and extend underground in the immediate vicinity of the fence post.
4. Secure the grounding conductor to the post with 5/16 in. self-tapping galvanized or stainless steel bolts and approved copper compression terminal ends or clamps.
5. After grounding connections have been completed, perform a ground resistance test in the presence of the Using Agency's Representative. The ground resistance shall not exceed 25 OHMS under normal dry conditions.
6. Where resistance requirements cannot be attained, install additional rods no closer than 6 ft. on center. Install no more than two (2) additional rods at each location.
7. All grounding to earth shall be performed by this contractor.

2.2 CLEANING

- A. Clean-up: Upon completion of the installation, clean up all waste material resulting from the fence construction.

PART 3 GENERAL: GATE SPECIFICATIONS

3.1 SECTION INCLUDES

- A. Vehicle Sliding Gate Operator System with an Enclosed Drive Assembly: The work in this section consists of furnishing all labor, materials, equipment and appliances necessary to complete all motorized sliding gate(s) and pedestrian gate(s) required for this project in strict accordance with this section of specifications and drawings. Exposed chain drive or hydraulic friction drive gate systems will not be approved.

3.2 REFERENCES

- A. Underwriters Laboratory Gate Operator Requirements (UL 325)
- B. American Welding Society AWS D1.1/D1.1M Structural Welding Code

- C. A 123/A123M-02 Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
- D. F 1083-06 Standard Specification for Pipe, Steel, Hot-Dipped Zinc-Coated (Galvanized) Welded, for Fence Structures

3.3 DEFINITIONS

- A. Technical Advisor(s): An employee of the company producing the system who is certified in writing by the manufacturer to be technically qualified in design, installation, and servicing of the required gate systems. Personnel involved solely in sales do not qualify.
- B. Gate Control Console: The interior enclosure that houses the gate controls, typically desk or counter mounted.

3.4 SUBMITTALS

- A. Submittal Packages: Manufacturer shall submit the Quality Assurance and Gate Systems Submittal Packages at the same time.
- B. Quality Assurance Submittal Package:
 - 1. Manufacturer's Qualifications Data:
 - a. Names, addresses and facility contacts of four (4) similar projects where manufacturer's equipment and hardware has been in operation for not less than three (3) years
 - 2. Installation Company Qualification Data: (Completed by the Manufacturer)
 - a. Name, business address and telephone numbers of the installation company
 - b. Name of person supervising installation and completion of work in this section
 - 1) Names, address and facility contacts of four (4) similar projects this person has supervised in the past three (3) years.
 - 2) Include written verification from the manufacturer the person supervising the work is trained and qualified in the installation of the accepted gate and related detention hardware.
 - 3) If person supervising the work is not trained by the manufacturer or does not meet the minimum requirements as stated above, then the Contractor must obtain a list of certified equipment representatives from the manufacturer and select one to be on site during equipment installation.
 - 3. Technical Advisor's Qualification Data:
 - a. Name, business address and telephone numbers of technical advisor(s)
 - b. Written certification from gate systems equipment manufacturer that advisor is technically qualified in design, installation and servicing of products.

3.5 GATE SYSTEMS PACKAGE

- A. Written certification from the Technical Advisor for each gate system stating that the gate system submittal package has been reviewed for accuracy and completeness and all materials and installation methods are approved.
- B. Shop Drawings:
 - 1. Complete detail drawings for each height and style of gate required. List materials required, and technical data including size, weight, and finish to ensure conformance to specifications. Show relationship of gates with other work. Include details of all major components. Include parts list showing manufacturer's names and part numbers for the complete installation.
 - 2. Complete detail drawings for console and cabinet required. Include technical data, including size and finishes and parts list showing manufacturer's names and part numbers for the complete installation.
 - 3. Wiring Diagrams must show switches, controls, motors, and other electrical components. Include wiring diagrams of the complete system as proposed to be installed.
 - 4. Product Data: Manufacturers catalog sheets, specification and installation instructions for accessories, hardware and each type of switch, control and motor.
 - 5. Provide name, business address, and telephone numbers of nearest fully equipped service organization.

3.6 CONTRACT CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data for Each Gate Type: Deliver three (3) copies of instructions for operation, maintenance, recommendations, and parts manuals covering the installed products to the Owners representative. Include name, address and telephone number of nearest fully equipped service organization.
- B. Certification: Deliver to the Owners representative written certification from the manufacturer's technical advisor that the gate systems and accessories are installed and operating properly. Include system acceptance test report as per specifications.

3.7 QUALITY ASSURANCE

- A. Manufacturers Qualifications: The manufacturer of the gates shall be regularly engaged in the production of such products, shall have furnished such products for five (5) similar projects that have been in operation for not less than three (3) years, and shall be subject to the approval of the Pennsylvania Department of Corrections.
- B. Installation Company Qualifications: The company installing the work of this section and the person supervising the work shall be experienced in gate system work, and shall have been engaged in the assembly and installation of the specified gates for a minimum of three (3) years.
- C. Warranty: Manufacturer of gate system shall warranty all components furnished as part of the gate system.
- D. Technical Advisor: In addition to reviewing and approving the gate systems submittals package, the technical advisor (for each type of gate system) shall provide the following on site services:

1. Render advice regarding installation and final adjustment of the gate system(s).
2. Witness final system test and then certify with an affidavit that the gate system(s) is installed in accordance with the contract documents and is operating properly.
3. Train facility personnel on the operation and maintenance of the gate system(s) a minimum of two (2) 1-hour sessions.
4. Answer questions that might arise.

3.8 MAINTENANCE

- A. Spare Parts: Furnish the following and store at the site where directed:
1. Sliding Gate – Mechanical: One (1) reduction gear assembly, one (1) full length chain and repair links and one (1) crank handle.
 2. Sliding Gate – Electrical: One (1) motor, two (2) limit switches, four (4) limit nuts, one (1) relay overload, two (2) relay motor OPEN/CLOSE solid state, one (1) transformer, one (1) circuit board-VS, one (1) disconnect switch 30 amp, thermostat, one (1) status/limit switch and one (1) heater gearbox immersion.
- B. Supply the required amounts of recommended lubricants for three (3) years of service.

3.9 CERTIFICATIONS

- A. The steel factory welders must be certified per section 2.01-A/2.

PART 4 PRODUCTS

4.1 VEHICLE SALLYPORT LOCKING SYSTEM

- A. Manufacturers:
1. The vehicle Sallyport locking system shall be manufactured by one of the following:
 - a. The Tymetal Corporation – Model PLUSS – (1-800) 328-4283
 - b. Southern Folger Division – Model 9100- “A” or “J”
 - c. No substitutions
 - d. The following specifications are based on the Tymetal PLUSS Design. However, the component composition of the Southern Folger Model 9100-“A” or “J” may differ. The three (3) models listed are approved for this project.
 2. Gate manufacturer shall provide independent certification as to the use of a documented welding procedure specification and procedure qualification record to insure conformance with the AWS D1.1 Welding Code. Individual certificates of welder qualification documenting successful completion of the requirements of the AWS D1.1M Code shall also be provided.
- B. System Dimensions: Each overhead locking system shall have a clear opening height and clear opening width as shown on the detail drawings.

- C. Operation: When device is in the closed position, it shall be impossible to move the gate to the open position except by electrical or mechanical operations provided.
- D. Locking: Keyless locking is to be accomplished by means of a 3-point mechanically activated locking column.
- E. Rate of Travel: Gate shall move from the completely opened position to the completely closed and locked position at a rate of 30 ft. per minute. System shall have an electro-mechanical (non solid state) wiring package.

4.2 VEHICLE SALLYPORT GATE SYSTEM – MOTOR

- A. Motors: Motors shall be 1 HP, 208 Volt, 3-Phase, as produced by a nationally recognized manufacturer.
- B. Overload Protection: Motors shall be protected against overload, either by thermal or a current sensing overload device.
- C. Gear (Box) Reducer: (Component differs between the three (3) manufacturers specified.) The self enclosed gear head gearbox shall be manufactured as a single unit, and shall consist of a hardened steel machine cut worm and mating bronze gear running in oil bath. Oil shall be #634 specialty oil with a fluid pour point of -44oF.
 - 1. The gearbox shall perform the following functions:
 - a. Adjustable Clutching Device
 - b. Manual Disconnect by Crank Handle
- D. Gearbox Heater: A 110 Volt electrical service shall provide power to the thermostat controlling the internal gearbox heater.
- E. Controller: (Component differs between the three (3) manufacturers specified.) The controller houses all of the required gate logic components including; relays, limit switches and motor starters with overloads all within a NEMA 4 enclosure. Controls are specified in detail in specifications.
- F. Main Power Disconnect Switch and Wiring Compartment: When this switch is in the off position, the main power is disconnected from the control unit.
- G. Speed: Minimum of 30 ft. per minute.
- H. Manual Operation: (Component differs between the three (3) manufacturers specified.) Crank handle located in the motor box shall provide a 2-step engagement procedure for manual operation. Open motor box, fold out handle located at ground level and crank gate opened or closed.
- I. Control Circuit: 24 VAC control power
 - 1. Provide a long distance module.
- J. Limits: The operator shall be equipped with an integral limit system that provides accurate settings to control the open and close positions of the gate and shall not be affected by manual operation or motor removal.

- K. Audio Alarm: When a command is recognized by the motor controller this alarm is activated 3-seconds before the motor is energized and the gate starts to move. This is continuously activated while the gate is in motion.
- L. Motor Housing: Water Resistant Motor Box: The motor box shall be constructed of 10 gauge sheet steel, hot dip galvanized per ASTM 123, gasketed, and located at ground level for easy maintenance.
 - 1. Security Hinges and Tamper Resistant Security Screws: Security hinges and screws shall be furnished to secure operator enclosure components.
 - 2. Motor Box Lock: Motor box shall be locked with a prison dead bolt. Three (3) paracentric keys shall be provided per key code. Dead bolt lock shall be Southern Steel Model #1080 with Folger Adams #38VZ2 key code. This will match existing keying system of the institution.
- M. System Components:
 - 1. Track:
 - a. Four (4) openings up to 24 ft., overhead track shall consist of two (2) 8 in. (203mm) structural steel channels joined together as shown on the drawings, weighing a minimum of 33 lbs/lf.
 - b. Four (4) openings 25 ft – 30 ft. overhead track shall consist of two (2) 10 in. structural steel channels joined together as shown on the drawings, weighing a minimum of 37 lbs/lf.
 - c. All individual welders shall be tested to conform to AWS D1.1/D1.1M structural Welding Code – Steel. The manufacturer shall provide individual qualification test records.
 - 2. Trolley: Heavy duty wheels shall be milled from a single block of hardened stainless steel and use two (2) sealed ball bearings per wheel, six (6) wheels per trolley.
 - 3. Bottom Guides:
 - a. The project detail drawings shall show the bottom guide selection required for the project.
 - b. Bottom Guides on Plates: Bottom guides shall be constructed of 3/8 in. x 2-1/2 in. flat steel, welded to a 1/4 in. x 5 in. x 10-1/2 in. steel plate, shall be lagged to the concrete footing.
 - 4. Locking Column: The locking column is constructed of a W-4 “h” beam at 13 lbs/lb with a removable steel cover, secured with security screws.
 - 5. Locking Tangs: Three (3) locking tangs are to be affixed to the leading edge of the gate panel to provide positive locking into the locking column.
 - 6. Posts: Double set of support posts shall be minimum 4 in. O.D. SS40 or SCH. 40 galvanized steel with concrete footings as specified by the design team.
 - 7. Drive Chain: Drive chain shall be #60 roller chain.

8. Gate Guide Angle: Gate guide angle shall consist of 2-1/2 in. x 1-1/2 in. x 1/4 in. steel angle attached to the bottom of the gate panel running its full length.

N. Gate Panel:

1. Gate panel shall be manufactured with galvanized steel pipe meeting the manufacturers requirements. Gate frame shall be welded to form a rigid panel. Gate operator manufacturer must supply the gate panel equipment with truss rods.
2. Outer Support Members shall be SS30 hot dip galvanized steel pipe 2.375 in. O.D. weighing 2.78 lbs/ft.
3. Inner Support Members: SS30 hot dip galvanized steel pipe 2.375 in. O.D. weighing 2.78 lbs/ft.
4. Gate panel shall be trussed in accordance with manufacturer's specifications.
5. Gate Panel Filler: Mesh shall be used as shown on the detail drawings.

O. Controls:

1. UL Class IV Installation (Supervised Application – Constant Pressure):
 - a. For Class IV installations, constant pressure on the pushbutton control, with the gate in site, is required as a primary entrapment protection device to keep the gate in motion. When the pushbutton is released, the gate will stop. The secondary entrapment device shall be the inherent audio alarm. An auto-close timer shall not be used in Class IV installations.
 - 1) Control Function: Control console will operate one (1) gate.
 - 2) Console Type: Console shall be for interior use, and shall be of the wall mounted type. Mount 40 in. A.F.F. Console shall be key operated
 - (i) Gate opening is initiated by pressing and holding the OPEN pushbutton.
 - (ii) Gate closing is initiated by pressing and holding the CLOSE pushbutton.
 - (a) Indication Lights: A green indication light illuminates when the gate is completely closed and locked. A red indication light illuminates under all other conditions.
 - 3) A STOP pushbutton allows the gate to be stopped in any position.
 - (i) Resuming Movement:
 - (a) Gate movement may be resumed in either direction by pushing the appropriate pushbutton.
 - 4) All wiring shall be concealed in proper conduit.

- 5) Provide emergency manual control mechanism to permit the unlocking and manual operation of the sliding gates by means of crank as specified in specification in the event of power failure.
 - 6) Coordinate all control wiring and conduit needs. This Contractor is responsible for all exterior electrical components.
- P. The Installing Contractor shall be responsible to ensure that appropriate external primary entrapment safety devices be installed for the specific site conditions to protect all potential entrapment zones.

4.3 PEDESTRIAN SWING GATES

A. Manufacturers:

1. The pedestrian swing gate systems shall be manufactured by Tymetal Corporation, 2549 State Route 40, Greenwich, NY 12834 (1-800) 328-4283. Pedestrian swing gate systems shall be fully assembled at the factory and shipped to the project site ready for installation.
2. All individual welders shall be tested to conform to AWS D1.1/D1.1M structural Welding Code – Steel. The manufacturer shall provide individual qualification test records.
3. All other pedestrian swing gate systems must be submitted to the design team in accordance with substitution requirements as set forth in the general provisions of the project manual for approval prior to the bid date.
4. Store gate frames on building site, in an upright position, under cover, on wood sills or floors, and in a manner that prevents rust or damage. Ventilate canvas or plastic covers to prevent moisture traps.

B. System Dimensions: Each gate shall have a clear gate opening width of 3 ft.-6 in. or 5 ft.-0 in. and a gate height of 7 ft.-0 in. See project drawings for gate size and location.

C. System Function:

1. General Description: Pedestrian swing gate system shall be designed as an exterior security swing gate.
2. Operation: When the gate is in the closed position, it shall be impossible for the gate to be opened except by mechanical means.
3. Pedestrian Swing Gate Lock: Gate shall be furnished with a mechanical lock.

D. System Components:

1. Security Gate Panel Filler: Gate panel filler shall be 2 in. x 2 in. x 6 gauge polymer coated weld mesh in exercise yard gates and 2 in. x 2 in. x 8 gauge in the division fence gates.
2. Coating: The entire gate frame and door assembly shall be hot dip galvanized after welding.
3. Hinges: Two (2) needle bearing hinges per gate shall be furnished and shall have a thrust capacity (door weight) of 600 lbs. per pair.

4. Mechanical Lock: Mechanical swing gate lock shall be keyed both sides. Supply three (3) keys per key code of Institution. Dead bolt lock shall be Southern Steel Model #1080 with Folger Adams #38VZ2 key code.
- E. Fabrication:
1. General:
 - a. Steel members shall be straight, true and free from dents, buckle, twist or rough edges. All joints shall be tight metal-to-metal welded finish. All welds shall show uniform section and deep penetration. Clean weld spatter off so that surfaces are easily cleaned.
 - b. All welds on the gate frame shall conform to welding procedure specifications and procedure qualifications record to insure conformance with AWS D1.1/D1.1M structural Welding Code. All individual welders shall be certified to AWS D1.1/D1.1M welding code.
 2. Frames, Stiles and Rails: Steel members shall be tubular in cross section with a minimum wall thickness of 3/16 in. Members shall be mitered and welded at the corners.
- F. Finish:
1. Galvanizing: All exposed system parts shall be zinc galvanized or as otherwise specified.

PART 5 EXECUTION

5.1 SITE INSPECTION

- A. Final grades and installation conditions shall be examined. Installation shall not begin until all unsatisfactory conditions are corrected.

5.2 INSTALLATION

- A. Equipment in this section shall be installed in strict accordance with the company's printed instructions unless otherwise shown on the contract drawings.

5.3 FIELD QUALITY CONTROL

- A. Preliminary System Test:
 1. Preparation: Have the technical advisor adjust the complete system and then operate it long enough to assure that it is performing properly.
 2. Run a preliminary test for each system.
 - a. Determine whether the system is in a suitable condition to conduct the acceptance test.
 - b. Check and adjust equipment.
 - c. Train facility personnel.

B. System Acceptance Test:

1. Preparation: Notify the Owner's representative at least three (3) working days prior to the test so arrangements can be made to have a facility representative witness the test.
2. Test system function step-by-step.
3. Supply all equipment necessary for system adjustment and testing.
4. Test and Explain Safety Features:
 - a. Each system feature and device is a separate component of the gate system.
 - b. Ensure that all instructions for mechanical components, safety devices and the gate operator are available for everyone who will be using the gate system.
 - c. The warning signs shipped with the gate operator must be installed in prominent position on both sides of the gate.
5. Ensure the Owner is clear with regard to the safety points concerning the basic operational guidelines of the safety features of the gate operator system. These safety points are listed in the operator manual and must be read prior to system use.
6. Submit written report of test results signed by technical advisor and the Owner's representative.

END OF SECTION