CITY OF BILOXI

**SPECIAL PROVISION NO. 907-607-1 CODE: (SP)**

**DATE: 06/27/2017**

**SECTION 607 - FENCES AND CATTLEGUARDS**

Delete all of the subsections of Section 607 in their entirety and insert the following:

**607.01 - Description.** The work under this section shall consist of removing and reconstructing an existing fence using existing materials; removing an existing fence and constructing a new fence using all new materials; or constructing a new fence (no existing fence removal) using all new materials. Where a new fence is specified, the fence along with gates where indicated shall be constructed of the type or types indicated by the Contract Documents unless specifically excluded. The Contractor shall secure and pay for all permits required on work required under this section of the specifications.

**607.02 - Materials.**

**607.02.1 – General.** When the contract contains a pay item for removal and reconstruction of an existing fence, the Contractor shall use the existing materials for the reconstruction of the fence. The Contractor shall be responsible for replacing all damaged fence items with new materials, which can be attributed to the Contractor’s negligence during the removal or the reconstruction process. All new fence materials shall meet or exceed the minimum requirements specified in the following subsections.

Unless stated otherwise, metal materials for chain link fences and wooden fences as applicable shall be as follows: posts, gate frames, braces, rails, stretcher bars, truss rods, and tension wire shall be of steel. Gate hinges, post caps, stretcher bar bands, and other parts shall be of steel, malleable iron, ductile iron or equal except that post tops, rail ends, ties and clips may be of aluminum, except ties for six foot (6’) fences shall be steel.

* + 1. **- Chain Link Fences – Six Foot and Under.**

**607.02.2.1 - Fabric.** Chain link fabric shall consist of a fencing material from steel wire helically wound and interwoven in such a manner as to provide a continuous mesh without knots or ties except in the form of knuckling the ends of wires to form the selvage of the fabric.

Chain link fabric shall be galvanized commercial quality nine (9) gauge steel woven in a two-inch diamond mesh. Top and bottom selvage shall be knuckled. Basic steel wire shall be a medium high carbon quality. The permissible variation from the specified size of mesh shall be plus or minus one-eighth of one inch (1/8”). The tolerance in the diameter of the coated wire shall be plus or minus 0.005 inch.

The height of the fabric shall be the overall dimension from ends of knuckles. The tolerance of the nominal height shall be plus or minus one inch.

The weight of zinc coating shall Class 2, not be less than two ounces per square foot (2.0 oz./ft.2) of uncoated wire surface as determined from the average of results of two or more specimens, and not less than 1.8 oz./ft.2 of uncoated wire surface for any individual specimen.

**607.02.2.2 – End, Corner and Pull Posts.** End, corner and pull posts shall be two and three-eighths inch (2 3/8”) nominal outside diameter (O.D.) Type I (schedule 40) round posts weighing 3.65 pounds per foot (lb/ft). All posts shall be equipped with post tops.

Posts shall be hot dipped galvanized (zinc Grade E) with a minimum average zinc coating of 1.8 oz./ft.2 meeting ASTM F-1083.

**607.02.2.3 – Intermediate (line) Posts.** Intermediate posts shall be one and seven-eighths inch (1 7/8”) nominal outside diameter (OD) Type I (schedule 40) round posts weighing 3.65 pounds per foot (lb/ft). All posts shall be equipped with tops. All posts shall be equipped with post tops.

Posts shall be hot dipped galvanized (zinc Grade E) with a minimum average zinc coating of 1.8 oz./ft.2 meeting ASTM F-1083.

**607.02.2.4 – Gate Posts.** Gateposts shall be Type I (schedule 40) with a nominal outside diameter (O.D.) as shown below:

Swing Gates:

|  |  |  |
| --- | --- | --- |
| GATE LEAF WIDTH | O.D. OF PIPE | PIPE WEIGHT |
| Up to and including 4 ft wide | 2 3/8 inches | 3.65 lb/ft |
| Over 4 ft and up to 10 ft wide | 2 7/8 inches | 5.79 lb/ft |
| Over 10 ft and up to 18 ft wide | 4 inches | 9.11 lb/ft |

Rolling Gates:

Gateposts for rolling gates shall be a minimum of three and one-half inch outside diameter (O.D.) pipe weighing 7.58 pounds per foot (lb/ft).

Posts shall be hot dipped galvanized (zinc Grade E) with a minimum average zinc coating of 1.8 oz./ft.2 meeting ASTM F-1083.

**607.02.2.5 – Post Braces.** Post braces shall be provided for each gate, corner, pull, and end post for use with 6-foot (6’) fences. Post braces shall be one and eleven-sixteenths inch (1 11/16”) nominal outside diameter (O.D.), round Type I pipe weighing 2.27 pounds per foot (lb/ft).

The brace shall consist of a round tubular brace extending to each adjacent line post at approximately midheight of the fabric and a truss consisting of a rod not less than five-sixteenth inch (5/16”) nominal diameter and a turnbuckle for adjustment. The truss rod shall extend from the line post back to the gate, corner, pull, or end post as shown on the standard details.

**607.02.2.6 - Top Rail.** Top rails shall be one and eleven-sixteenths inch (1 11/16”) nominal outside diameter (O.D.) round Type I (schedule 40) pipe weighing 2.27 pounds per foot (lb/ft). The rails shall be in lengths not less than eighteen feet (18’), and shall be fitted with couplings or swedged for connecting the lengths into a continuous run. The couplings shall be not less than six inches (6”) long, with seven-hundredths inch (0.070”) minimum wall thickness, and shall allow for expansion and contraction of the rail. Open seam outside sleeves shall be permitted only with a minimum wall thickness of one-tenth inch (0.100”).

Suitable ties or clips shall be provided in sufficient number for attaching the fabric securely to the top rail at intervals not exceeding twenty-four inches (24”).

Top rail shall be fastened to each gate, terminal, corner, pull and end post with heavy pressed steel connections or by other approved means.

Top rails shall be hot dipped galvanized (zinc Grade E) with a minimum average zinc coating of 1.8 oz./ft.2 meeting ASTM F-1083.

**607.02.2.7 - Gates**

**607.02.2.7.1 – General.** The base materials of the gate frame shall be shall be a minimum of one and eleven-sixteenths inch (1 11/16”) nominal outside diameter (O.D.) round Type I (schedule 40) pipe weighing 2.27 pounds per foot (lb/ft). The members shall be welded at all corners or assembled with corner fittings. Gates assembled with corner fittings shall have adjustable truss rods on panels five foot (5’) wide or wider. Truss rods shall be the same base metal and finish as the gate frames.

Gate frames shall be zinc-coated in accordance with ASTM Specifications F 1043 or f 1083, or a combination thereof, and shall match that selected for any adjoining fence framework. Welded joints shall be coated in accordance with Practice A780, employing a zinc-rich paint.

Gate fabric shall be the same type as used in fence construction. The fabric shall be securely attached to the gate frame at intervals not exceeding fifteen inches (15”).

Gate opening size shall be as shown on the drawings or as directed by the City Engineer or his authorized representative in the field. Opening size shall be the clear opening measured from the inside face to the inside face of the gate posts.

Gate posts shall be in accordance with the subsection entitled “Gate Posts” of this section of the specifications.

All gate accessories shall be of the materials as specified for the fence unless specified otherwise.

**607.02.2.7.2 – Swing Gates.** Swing gates shall conform to ASTM F 900. Gate leaves shall have vertical interior bracing at maximum intervals of eight feet (8’). Interior bracing shall be a minimum of one and eleven-sixteenths inch (1 11/16”) nominal outside diameter (O.D.) round Type I (schedule 40) pipe weighing 2.27 pounds per foot (lb/ft).

**607.02.2.7.3 - Roller Gates.** Wheels shall be eight-inch (8”) truck wheels with hard rubber tires and metal hub. Rear track wheels shall be pressed steel and sized properly for the size of track specified. The track shall be one and eleven-sixteenths inch (1 11/16”) nominal outside diameter (O.D.) round Type I (schedule 40) pipe weighing 2.27 pounds per foot (lb/ft).

**607.02.2.7.4 – Gate Hardware**

**607.02.4.7.4.1 – Hinges.** Hinges shall be structurally capable of supporting the size of gate leaf specified and allowing the gate to open and close without binding. The hinges shall be so designed to permit the gate to swing a full one hundred eighty degrees (180°). Bottom hinges shall be ball and socket types designed to support the weight of the gate on the post footing. The upper hinges shall be wrap-around adjustable type.

**607.02.2.7.4.2 – Gate Latches.** Gate latches for single swing gates shall be capable of retaining the gate in a closed position and shall have a provision for padlock.

Gate latches for double swing gates shall be the same as single swing. In addition, double swing gates shall be equipped with a drop rod or plunger bar arranged to engage the gate stop. Locking devices shall be constructed so that the center drop rod or plunger bar cannot be raised when the gate is locked.

**607.02.2.7.4.3 – Gate Stops and Keepers.** Gate stops shall be provided for all double gates.

Keepers shall be provided for each gate leaf over five-foot (5’). Keepers shall consist of a mechanical device for securing the free end of the gate when in full open position.

**607.02.2.8 - Tension Wire.** Tension wire shall be spiraled, Number Seven (#7) gauge plus or minus five-thousandths inch (0.005") in diameter, conforming to ASTM A-824.

Tension wire coating shall conform to ASTM A-824 Type II Zinc-coated Class 2, 1.20 ounces per square foot (oz/ft2) and as per manufacturer's specifications. The fabric shall be attached securely to the tension wire at intervals not exceeding twenty-four inches (24”).

**607.02.2.9 - Tension Bars.** Tension bars shall be not less than three-sixteenths inch (3/16”) by three-fourths inch (3/4”) and shall be not less than two inches (2”) shorter than the nominal height of the fabric with which they are to be used. One tension bar shall be provided for each end and gatepost and two for each corner and pull post.

**607.02.2.10 - Ties or Clips.** Ties or clips of adequate strength shall be provided in sufficient number for attaching the fabric to all line posts at intervals not exceeding fifteen inches (15”); and not exceeding twenty four inch (24”) when attaching fabric to top rails or tension wire.

**607.02.2.11 - Bands or Clips.** Bands or clips of galvanized steel or aluminum alloy per ASTM F-626 shall be provided in sufficient number for attaching the fabric and stretcher bars to all terminal posts at intervals not exceeding fifteen inches (15”). Tension bands shall be formed from flat or beveled steel and shall have a minimum thickness after galvanizing of seventy-eight thousandths inch (0.078”); and minimum width of three-quarters inch (3/4”) for posts four inch (4”) outside diameter (O.D.) or less and one hundred eight thousandths inch (0.108”) thickness by 7/8 inch for posts larger than four inch (4”) O.D. Brace bands shall be formed from flat or beveled steel and shall have a minimum thickness of one hundred eight thousandths inch (0.108”) after galvanizing; and a minimum width of three-quarters inch (3/4”) for four inch (4”) outside diameter posts. Standard mill tolerances of ± 0.005 inch on thickness and one-hundredth inch (0.010”) on width shall apply. Attachment bolts shall be five-sixteenth inch by one and one-quarter inch (5/16” x 1-1/4”) galvanized carriage bolts with nuts.

**607.02.2.12 - Post Tops.** Post tops shall consist of ornamental tops. The top shall be provided with a hole suitable for the through passage of the top rail. The post tops shall fit over the outside of posts and shall exclude moisture from posts.

**607.02.2.13 – Zinc Coating.** All Type I and Type II steel framework and other iron parts shall be zinc coated by the hot-dipped method, using zinc Grade E. Zinc weight shall be as listed throughout this specification section and shall be determined in accordance with ASTM A-90.

**607.02.3 - Wooden Fences.** If metal posts, rails, or bracing is specified for wood fence, metal materials shall be in accordance with the specification for chainlink fences above.

**607.02.3.1 - Fence Boards.** The new fence boards shall be of the same size and type of material as the existing fence boards. The fence style and board tops shall be as indicated on the drawings or shall match the pattern of the existing fence boards that were removed (example: dog eared).

Boards for the fence shall be 5/8” x 6” x 6’-0, unless otherwise specified, cedar, redwood, cypress or pressure treated southern pine and shall be No. 2 grade or better.

**607.02.3.2 - Posts.** All wood posts shall be southern pine and shall be treated in accordance with AWPA C14. Posts shall be 4” x 4” x 8’-0, unless otherwise specified. Posts shall have been pressure treated with pentachlorophenol or chromated copper arsenate (CCA) preservative.

**607.02.3.3 - Horizontal Rails.** All wood rails shall be southern pine and shall be treated in accordance with AWPA C14. Rails shall be No. 2 selected grade two by four inch (2”x4”) nominal size by sixteen feet (16’-0) long and cut to required length. Rails shall have been pressure treated with pentachlorophenol or chromated copper arsenate preservative.

**607.02.3.4 - Braces.** All wood braces shall be southern pine and shall be treated in accordance with AWPA C14. Braces shall be two by four inch (2” x 4”) nominal size. Braces shall have been pressure treated with pentachlorophenol or chromated copper arsenate preservative.

**607.02.3.5 - Gates.** The gate frame shall be made from the bracing material as described above and the wood screen shall be of the same material and configuration as the fence boards.

**607.02.3.6 - Hardware and Fasteners.**  Gate hardware such as bolts, nuts washers, latches, pulls, hinges and hardware sets shall conform to ASTM Designation A 307. Hardware shall be hot dipped galvanizing. Nails for attaching boards to framing shall be galvanized screw nails for use with a nail gun or galvanized ring-shank nails set recessed from the board surface.

**607.02.4 - Concrete.** Concrete for footings shall be a 1:2:4 mix capable of 2,500 psi in 28 days. Concrete shall cure three (3) days prior to installation of fence fabric or boards.

**607.03 - Construction Requirements.**

**607.03.1 – General.** When the contract contains a pay item for removal and reconstruction of an existing fence, the Contractor shall carefully measure and record the existing fences location, condition and height where removal is required for construction. Also location and size of gate shall be noted. The Contractor shall store the existing fence materials at a location safe from burglary, vandalism, etc. until the reconstruction process is initiated. The Contractor shall reconstruct the existing fence in its prior location, of its proper size, utilizing existing material, and at the prior grade. The fence shall be acceptable to the property owner and the Engineer before payment will be authorized. All work shall be done in a neat and orderly manner and shall not inconvenience the property owner or tenant. The reconstruction of existing fences and the installation of new fences shall meet the construction requirements stated in the following subsections.

**607.03.2 - Chain Link Fence.** Installation of chainlink fencing and gates shall meet the requirements of ASTM F 567.

**607.03.2.1- Posts.** All posts shall be spaced so as to assure proper support of the fence, but shall have a maximum spacing of ten-foot (10’). End posts shall be set at the beginning and end of each continuous length of fence. Corner posts shall be set at abrupt changes in vertical and horizontal alignments. Gateposts shall be placed on each side of gate openings.

Post shall be set in concrete as shown on the drawings in a vertical, plumb position. The concrete post foundation dimensions shall be as shown on the drawings. The minimum diameter of the hole dug for the concrete placement shall be ten-inches (10”), but shall not be less than four times the largest cross section of the post, unless otherwise specified. The minimum depth of the hole shall be twenty-four inches (24”) plus three-inches (3”) for each additional one-foot (1’) fence height over four-foot (4’). The top of the concrete foundation shall extend above grade two-inches; however the top of the concrete foundation shall be two-inches below grade if a cover of sod or other material is provided. The top of the concrete bases shall be trowel finished and sloped to drain away from the posts. All post settings shall be performed carefully so that all posts will be vertical and in true alignment.

When setting gateposts, caution must be exercised to insure that the gateposts are set the exact distance apart so that gates and accessories will fit the opening. The tops of the gateposts shall be set level, one with another.

The diagonal braces shall be securely fastened to the terminal post and the adjacent line post or its footing or a footing of equal size. There should be no more than a fifty-degree (50°) angle between the brace and the ground. The horizontal braces (if used in place of diagonal braces) shall be securely fastened with truss rods from the bottom of the terminal post to the adjacent line post where the brace rail terminates. The brace shall be attached halfway point of the terminal post above grade.

**607.03.2.2 – Top Rail.** The top rail must be supported at each post so that a continuous brace from end to end of each stretch of fence is formed. The top rail shall be securely fastened to the terminal post. The top rail shall be installed continuous with sleeves or couplings at the joints to allow for expansion and contraction.

**607.03.2.3 - Fabric.** The wire fabric shall be placed on the outside of the fence line. Where

splices are necessary, they shall be made by bringing the ends close together and weaving a picket in such a way that it will catch with each twist each separate mesh of the end pickets of both rolls of fabric.

The fabric shall be installed two-inches (2”) above finished grade.

Standard chain link stretching equipment shall be used for stretching the fabric before tying it to the posts. The fabric shall be tightened so that the fabric has a smooth uniform surface, free from sag.

Stretcher bars with tension bands or other suitable devices shall be installed at a maximum of fifteen-inch (15”) intervals. The fabric shall be fastened to the line posts at intervals not exceeding fifteen-inches (15”). The fabric shall be attached to top rail and tension wire at intervals not exceeding twenty-four (24”) intervals.

**607.03.2.4 – Tension Wire.** Tension wire should be stretched from end to end of each stretch of fabric within the bottom six inches (6”) of fabric. The tension wire should be taut and free from sag. The fabric shall be attached securely to the tension wire at intervals not exceeding twenty-four inches (24”).

**607.03.2.5 - Gates.** The gates shall be hung on gate fittings as approved (per submittal) by

the City Engineer or his authorized representative. Sockets shall be set in concrete in the center of the double gates so that the plunger pin will fit perfectly in the socket when the gates are in a closed position. If replacing an existing gate, the gate shall be placed back at the original location of the existing gate in the field. All hardware shall be secured, properly adjusted and left in perfect working order.

**607.03.3 - Wood Board Fence.**

**607.03.3.1 - Boards.** The fence boards shall be installed with a maximum of three-eighths inch (3/8”) space between boards with a nail gun or hammer. Recess nail heads approximately one sixteenth inch (1/16”) in the boards. The top of fence boards shall be level from end to end of fence. Hold the bottom of the fence approximately three inches (3”) above uniform grade line. Boards shall be placed with the rails and braces toward the private property and the flush boards toward the public property, unless otherwise stated.

**607.03.3.2 - Posts.** All posts shall be spaced so as to assure proper support of the fence but shall not exceed eight foot (8’) maximum spacing. The posts shall be set in a concrete footing. The top of the concrete footing shall be flush with or slightly above ground, trowel finished and sloped to drain away from the posts. Holes for the posts shall be dug twelve inch (12”) in diameter to assure proper support of the fence. All post settings shall be performed carefully so that all posts will be vertical and in true alignment. When setting gateposts, caution must be exercised to insure that the gateposts are set the exact distance apart so that gates and accessories will fit the opening. The tops of the gateposts shall be set level, one with another.

**607.03.3.3 - Horizontal Rails.** Install rails horizontally at the top, center and bottom of posts. Stagger splices using galvanized rail connectors. Space splices a maximum of six inches (6”) past posts so that no more than one splice occurs in each bay.

**607.03.3.4 - Braces.** Install braces diagonally between rails in the gate frame

**607.03.3.5 - Gates.** The gates shall be hung on gate fittings as approved (per submittal) by the Engineer. The gates shall be placed back at the original location of the existing gate in the field. All hardware shall be secured, properly adjusted and left in perfect working order.

**607.04 - Method of Measurement.** All new fencing will be measured by the linear foot of completed fence. Measurements will be made along the bottom of the fence and openings will be excluded, except openings for gates unless otherwise specified herein.

Where a separate pay item for swing gates is included in the schedule of bid items, the pay item shall apply only to new gates, which are not replacing an existing gate. The gates shall be measured for payment per each gate in place. Where a separate pay item for a swing gate is not included in the schedule of bid items or where a new swing gate is replacing an existing swing gate, the gate shall be measured by the linear foot of completed fence containing the gate.

Roller gates will be measured per each completed in place.

The price bid for swing gates or roller gates (if there is a separate pay item on the schedule of bid items) shall include gate posts, frame, fabric, clips, bands, ties, bracing, hardware, wheels, rollers, tracks, concrete and all other accessories associated with the gate.

The removal and replacement of existing fence completed and accepted will be measured for payment by the linear foot.

Contractor is responsible for staking the proper alignment of all fence line(s). No separate payment will be made for this staking. Posts, rails, concrete, anchors, expansion sleeves, gates, hardware, and all other accessories necessary for the construction will not be measured for separate payment, unless stated otherwise in this subsection. The cost thereof shall be included in the unit prices bid for other items.

**607.05 - Basis of Payment.** Fencing items will be paid for at the contract unit prices for the respective items, which shall be full compensation for completing the work.

Payment will be made under:

907-607-A: Remove Existing and Install New Chain Link Fence - per linear foot

907-607-B: Remove Existing and Install New Wood Privacy Fence - per linear foot

907-607-C: Remove and Reconstruct Existing Fence (All Types) - per linear foot

907-607-D Remove Existing Fence (All Types) - per linear foot

907-607-E: Install New Chain Link Fence - per linear foot

907-607-F: Install New Wood Privacy Fence - per linear foot

907-607-G Remove Existing Gate (All Types) - per each

907-607-H: Install New Chain Link Roller Gate - per each

907-607-J: Install New Chain Link Swing Gate - per each

907-607-M: Install New Wood Swing Gate - per each