

SECTION 323100

FENCING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

- A. All of the Contract Documents, including General and Supplementary Conditions and Division 1 apply to the work of this Section.

1.02 DESCRIPTION OF WORK

- A. The work of this Section includes, but is not limited to the following:
  - 1. Grading and Compaction of Sub-base
  - 2. Concrete Footings for Fencing
  - 3. Black Vinyl Coated Chain Link Fence and Gates
  - 4. Cleaning, Repair and Protection.

1.03 RELATED WORK

- A. Carefully examine all of the Contract Documents for requirements that affect the work of this Section. Other specification sections that directly relate to the work of this Section include, but are not limited to, the following:
  - 1. Section 311000 – Site Preparation
  - 2. Section 312000 - Earth Moving
  - 3. Section 321200 - Asphalt Paving
  - 4. Section 323000 – Site Improvements
  - 5. Section 321313 – Exterior Concrete

1.04 SUBMITTALS

- A. Refer to individual site improvements for additional submittal requirements.
- B. Provide manufacturer's product material information and system performance data along with material and system samples for each item specified in this Section for the Landscape Architect's review and approval prior to ordering materials.
- C. The General Contractor shall verify by field inspection that all items within this section conform to the specified requirements and approved submittals prior to installation.

1.05 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials and products adequately protected against damage. Handle in strict compliance with manufacturer's instructions and recommendations and store off the ground. Protect from all possible damage including, but not limited to, chipping, staining, cracking and other damage. Cracked, chipped, or stained units will be rejected and shall not be utilized in this work. Sequence deliveries to avoid delays, but minimize on-site storage.

1.06 COORDINATION

- A. The work of this Section shall be coordinated with that of other trades affecting, or affected by, this work as necessary to assure the steady progress of the work of this Contract.
- B. Substrates: Proceed with work only when substrate construction and penetrating work is complete.

1.07 REFERENCE STANDARDS

- A. Chain Link Fence Manufacturers Institute (CLFMI).
- B. American Society of Testing and Materials (ASTM).
- C. ASTM F1184 Specification for Industrial and Commercial Horizontal Slide Gates

1.08 GUARANTEE

- A. In addition to the specific guarantee requirements of the GENERAL CONDITIONS and SUPPLEMENTARY GENERAL CONDITIONS, the Contractor shall provide the manufacturers' standard written warranty for each product within this specification. All of these guarantees shall be in addition to, and not in lieu of, other liabilities that the Contractor may have by law or other provisions of the Contract Documents.

PART 2 - PRODUCTS & EXECUTION (Combined)

2.01 GRADING AND COMPACTION OF SUB-BASE

- A. Do all necessary grading in addition to that specified under Section 312000 – Earth Moving to bring subgrade or foundation after final compaction to required grades and sections to obtain a foundation of uniform bearing surface. In absence of specific requirements, compact foundation by such means as will provide firm base and insurance against settlement of superimposed work.
- B. Sub-base preparation, including material, shall be of properly approved quality as specified under Section 312000 - EARTH MOVING. Start of work under this Section shall constitute acceptance of the foundation conditions to which this work is to be applied. Any defects in work resulting from such conditions shall be corrected under this Section, at no additional cost to the Owner.

2.02 CONCRETE FOOTINGS FOR FENCING ITEMS

- A. Construct concrete footings where shown on the Drawings.
- B. Concrete for footings shall be 4,000 lb. concrete as specified in Section 03 30 00 –CAST-IN-PLACE CONCRETE.
- C. Place concrete on moist subgrade or against prepared footings in continuous operation between transverse joints or individual sections. Vibrate all concrete. Do not place concrete in freezing temperatures or on frozen base.

2.03 VINYL COATED CHAIN LINK FENCE AND GATES

- A. Submittals:
  - 1. Shop Drawings: Supply shop drawings at an approved scale for location, installation and erection of all components of the chain link fence and gates.
  - 2. Product information: Provide manufacturer's product data showing installation and limitations in use. Supply Certificates of Compliance for all materials required for fabrication and installation.
  - 3. Material Selection and Samples: Submit samples showing the material size, gauge and finish for all components required for construction, including but not limited to:
    - a) A 12"x12" sample of fence fabric.
    - b) A 12" section of each type of fence pipe required.
    - c) Provide 1 of each type of fitting required.
    - d) Provide a 6" sample of fabric tie material.
    - e) Provide 1 gate latch and 1 gate hinge (to be returned to the fence contractor)

upon completion of the installation).

B. Scope:

1. This specification covers colored chain link fence and gates, including chain link fabric, framework, and fittings. Fence heights / gate heights and widths shall be shown on the drawings.
- C. PVC Coating: Fence fabric and framework shall be thermally-fused vinyl coating over galvanized steel. "A Bonded or extruded and glued" fabric will not be accepted.
- D. Color: All fence material including fabric, framework, fittings and hardware shall be black.
- E. Fabric: Fabric for all fences shall be a 2" diamond mesh unless otherwise noted. Fabric shall be #6 gauge core wire unless otherwise noted (0.192" nominal wire diameter) with a minimum breaking strength of 2170 pounds, thermally fused in accordance with ASTM F668-2b. The weight of the zinc coating on the steel wire shall be 0.3 oz. per square foot minimum. Chain link fabric shall be color matched with framework materials. Fabric shall be knuckled at both selvages.
- F. Framework: Shall consist of terminal posts, line posts, top rail, bottom rail, mid rail, truss rods at end and corner posts and gate frames.
- G. Posts and rails shall be steel pipe, Type 1: ASTM F 1083, standard weight, schedule 40, minimum yield strength of 25,000 psi, sizes as indicated below. Before color is applied, all materials shall be given a minimum 1.8 ounce per s.f. coating of zinc. PVC-coated finish shall be applied in accordance with ASTM F 1234, apply supplemental color coating of 12 mils (0.254-0.356 mm) of thermally fused PVC.

1. Sizes of Framework:

a) Fences less than 5' Height

Post or Rail	Outside Diameter	Pounds/Foot
End Corner & Pull Post	2.375"	3.65
Line Post	1.900"	2.72
Top and Bottom Rail	1.660"	2.27

2. Fences greater than 5' Height but less than 8' Height

- 1) Provide mid rail braces\* between all end/corner posts and adjacent line posts at all fences 5' – 8' in height.

Post or Rail	Outside Diameter	Pounds/Foot
End Corner & Pull Post	2.875"	3.65
Line Post	2.375"	2.72
Top and Bottom Rail	1.660"	2.27

Mid Rail Braces*	1.660"	2.27
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3. Fences equal to or greater than 8' Height:

- 1) Provide continuous mid rails\* for all fences 8'-12' in height.

Post or Rail	Outside Diameter	Pounds/Foot
End Corner & Pull Post	4.0"	9.10
Line Post	2.875"	5.79
Top and Bottom Rail	1.660"	2.27
Mid Rail Braces*	1.660"	2.27

\* Mid rails and mid rail braces at fences in front of players benches at baseball and softball dugouts shall be set at 3-feet above grade so as not to obstruct line of sight when seated on players benches.

- H. Top rail couplings 6-inch minimum in length shall be spaced at maximum 20-foot centers and 9 gauge minimum fabric tie wires shall be spaced at 18-inch maximum centers.
- I. Swing Gates: Gate openings shall be as indicated on the drawings. Gate height shall conform to the height of the fence unless otherwise indicated. Gate frames shall be fabricated with welded corners and braces. Frames shall be filled with chain link fabric of the same gauge and size as the fence. Gate post hinges shall be heavy-duty offset type furnished of adequate size and strength for the gate size specified and to allow a minimum 180-degree swing. Braces and trusses shall be furnished as specified as indicated below.. Gate shall include a heavy duty galvanized and vinyl coated positive latching device that will accommodate a padlock and secure the gate in a closed position. Gate post sizes shall be as described below:
1. Swing gate post sizes: (per ASTM F900)

Gate height up to and including 6 ft. (1.2m)	
Gate leaf width	Post Outside Diameter
up to 4 ft.	2.375 in
over 4 ft. to 10 ft.	2.875 in

Gate height over 6 ft. to 12 ft. (1.2 to 2.4m)	
Gate leaf width	Post Outside Diameter

up to 6 ft.	4.000 in
over 6 ft. to 12 ft.	4.000 in
over 12 ft. to 18 ft.	6.625 in

2. Braces and truss rods at gates
  - a) Include midrail brace in welded gate frame if gate is 5' height or greater.
  - b) Include truss rods for all gate leaves that are 7' width or wider.

J. Accessories:

1. Chain link fence accessories: ASTM F 626, Provide items required to complete fence system. Galvanize each ferrous metal item in accordance with ASTM A 153 and finish to match framing (Black Vinyl Coating).
2. Post Caps: Formed steel, weather tight dome-shape closure cap. Provide one cap for each post. Caps shall be affixed to the post securely so as to prevent removal.
3. Stretcher Bars: One piece lengths equal to 2-inches less than full height of fabric with a minimum cross section of 3/16 inch x 3/4-inch. Provide stretcher bars where chain link fabric meets terminal posts.
4. Tie Wire: 9 gauge vinyl coated galvanized steel wire for attachment of fabric to line posts.

- K. General: Certain components not adaptable to the here in specified coating process may be color coated by other means. All fittings shall be pressed steel or malleable iron. Tie wires shall be minimum 9 gauge PVC coated steel or 6 gauge aluminum. Line and terminal posts to be of sufficient length to be set to the full depth of concrete footing indicated on the Drawings. Maximum spacing of line posts shall be 10-feet.

1. Each fence panel shall be constructed such that it will pass the following test. Deflection of the fence fabric shall be no greater than 2 inches when a force of 30 pounds is applied in the center of a framed panel, perpendicular to the plane of the fence fabric. Fabric shall return to original position true to the plane of the fence when force is released.

PART 3 - EXECUTION

3.01 CHAIN LINK FENCE INSTALLATION

- A. Erect chain link fencing only after final grading is complete. Install fence fabric and bolt heads on one side of fence and bolt nuts on the other side.
1. Level: Install all fence work, including fences over irregular terrain, with posts plumb and top of fence fabric and rails level, except as indicated otherwise and except at regular slopes and hills, install top of fence fabric and rails to follow slope.
  2. Posts Set in Ground: Accurately space posts at approximately (8) feet on center, unless otherwise indicated or required, and excavate neat, circular holes at least four times the diameter of the post and at least 6 inches below post. For all other posts set posts at least (3) feet below finish grade or as shown on the details and center align posts in hole with 6

inches of concrete beneath posts. Fill holes with concrete and vibrate and consolidate around posts. Maintain true vertical and top alignment and alignment along the fence line. Extend concrete footings to (2) inches below finish grades and slope to shed water away from posts. Align posts and fence fabric to permit paving to continue around fence posts so that concrete fence post footing does not show.

3. Rails: Provide top and bottom rails continuously with expansion couplings as recommended by fence manufacturer. Install intermediate rails, where used, flush with face fabric using offset fittings if necessary. Provide intermediate rails for all fences over (6) feet high.
4. Fabric: Thread tension bars through fabric and clamp to fabric at 4 inches on center. Band stretcher bars to end posts at (12) inches on center. Stretch fabric tightly and securely anchor fabric to framing and tension wires leaving about (1) inch clearance above grade. Anchor and tie so that fabric remains in tension after pulling force is released. Form joints of splices in fabric only at posts. Tie fabric to line posts at (12) inches on center, to rails and braces at (24) inches on center, and to tension wires at (24) inches on center with U-shaped tie wires double turned with ends bent into fence for safety.
5. PVC Coated Work: Generally comply with requirements for galvanized work. Take extreme care to prevent removal of or damage to PVC coatings. Touch-up all cut and abraded surfaces with PVC tough-up paint to prevent corrosion and to make tough-up invisible.

### 3.02 CLEANING, REPAIR AND PROTECTION

- A. Repair minor damage to eliminate all evidence of repair. Remove and replace work that cannot be satisfactorily repaired.
- B. Provide temporary protection to ensure that the work will be without dirt, stains, damage or deterioration at time of final acceptance. Clean up stains and spills as they occur. Remove protections and clean as necessary immediately before final acceptance.
- C. Upon completion of the work and before acceptance, the Contractor shall remove and dispose of in an approved manner all surplus materials, rubbish, etc. which the Contractor may have accumulated during the course of the work and shall leave the site in a clean and orderly condition. The Contractor shall not abandon any material at or near the site regardless of whether or not it has any value.

END OF SECTION