

**SPECIFICATION  
FOR  
FENCE, CHAIN LINK, STEEL**

(This specification is released for procurement purposes until revised or rescinded.)

**SCOPE**

This specification is intended to cover the requirements for galvanized (zinc-coated) and aluminum coated steel chain link fencing, including all specified accessories, posts, fittings, and hardware required to make a complete installation. Specific sizes, lengths, and arrangement shall be as stated in the Invitations For Bids and the accompanying layout drawings. It is not intended to cover all types of commercially available chain link fencing.

**I. CLASSIFICATION**

<b>TYPE</b>	<b>USE</b>	<b>HEIGHT ± 1" (INCHES)</b>	<b>MESH SIZE ± 1/8" (INCHES)</b>	<b>*GAUGE NUMBER</b>	<b>DIAMETER COATED (IN.) ± .005</b>
I	Heavy Industrial	36, 42, 48, 60, 72, 84, 96, 108, 120, 144	2.0000	6.0000	0.1920
II	Standard Industrial	36, 42, 48, 60, 72, 84, 96, 108, 120, 144	2.0000	9.0000	0.1480
III	Light	36, 42, 48, 60, 72, 84	2.0000	11.0000	0.1200
IV	Tennis Court	96, 108, 120, 144	1-3/4	11.0000	0.1200

\* Coated wire. All wire sizes used are U.S. Steel Wire Gauge.

**A. FABRIC CLASSES:**

Class 1 - Fabric coating to be minimum of 1.2 oz./sq.ft. of zinc or 0.35 oz./sq.ft. of aluminum.

For the majority of installations, such as urban and rural atmosphere where the rate of corrosion is moderate.

Class 2 - Fabric coating to be minimum of 2.0 oz./sq. ft. of zinc or 0.40 oz./sq. ft. of aluminum.

For highly corrosive atmospheres.

**II. APPLICABLE STANDARDS**

The following documents of issue in effect on the date of the Invitation for Bids shall form a part of this specification:

TT-P-641G - Primer Coating: Zinc Dust-Zinc Oxide (For Galvanized Surfaces)  
General Services Administration

Specifications Distribution Branch  
Washington Navy Road, Bldg. 197  
Washington, DC 20407

Selected ASTM STANDARDS for Fence Materials and Products  
American Society for Testing and Materials (ASTM)  
1916 Race Street  
Philadelphia, PA 19103

### III. REQUIREMENTS

#### A. MATERIALS

1. Fence Fabric

Fabric shall be chain link wire woven. The base metal of the fabric shall be a good commercial quality steel wire capable of meeting the requirements specified in Table I.

The steel wire shall be either zinc-coated (galvanized) by the hot-dip process after weaving, or aluminum coated, hot-dipped before fabrication.

Selvage shall be twisted and barbed or knuckled as specified in the Invitation for Bids.

Fences that are used for recreational areas shall be knuckled selvage at both top and bottom.

2. Posts

Posts shall conform to all structural, coating and use requirements as shown in Tables I and III.

3. Post Caps

Post tops shall be fitted with either aluminum or heavy malleable caps. These caps shall fit snugly on the posts, shall have suitable means for being attached securely, and shall prevent water from entering the tubular posts. This shall include keeper stakes and other tubular vertical components.

Line Caps shall have appropriate provision for top rails (when used) to pass through the line caps.

4. Top Rail

Top rails shall be as shown in Tables II and III in lengths of not less than 18' unless otherwise specified, and shall be fitted with couplings for connecting lengths into a continuous run.

The couplings shall be not less than 6" long, with 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 0.100". Top rail is to pass through the line post tops, and suitable ties or clips shall be provided in sufficient number for attaching the fabric securely to the top rail at intervals not exceeding 2'. Top rail shall

be securely fastened to terminal posts by either pressed steel or malleable steel galvanized connections.

5. Brace Rails

Brace rails shall be as shown in Tables II and III. Brace rails shall be securely fastened to posts by brace bands and rail ends or other pressed steel or malleable steel galvanized connectors.

6. Extension Arms For Barbed Wire

When specified, barbed wire extension arms shall be of an angle of approximately 45° or vertical as required, and shall be fitted with clips or other means for attaching three strands of barbed wire. With 45° arms, the top wire shall be approximately 12" horizontally from the fence line and the other wires spaced uniformly between the top of the fence fabric and the outside strand. Barbed wire arms shall be of sufficient strength to withstand a weight of 200 pounds applied at the outer strand of barbed wire. Six line barbed wire V-arms shall be supplied, if specified.

7. Tension Bars

Tension bars shall be as shown in Table III, the length shall be 1" less than the fabric height. One tension bar shall be provided for each gate and end post and two for each corner and pull post.

8. Tension Wire

Top and bottom tension wires shall be as shown in Table I. Bottom tension wire shall be used unless otherwise specified. When top rail is not specified, top tension wire shall be used.

9. Barbed Wire

When specified in the Invitation for Bids, barbed wire shall be double strand as shown in Table I with 4-point barbs spaced approximately 5" apart. 15 1/2 gauge shall be high strength steel wire and may use 16 1/2 gauge barbs.

10. Gates

Gate frames shall be fabricated from materials shown in Tables II and III using welded construction, or riveted with heavy pressed steel or malleable corner fittings. All welds done after galvanizing shall be ground smooth and painted with zinc paint with minimum 78% by weight of pigment consisting of minimum 79% zinc dust and 19% zinc oxide by weight (FED TT-P-641G).

Gate fabric shall be the same as that used for the fence.

Gate assembly shall be complete with hinges, catch, stops and locking device. Gates shall be reinforced as necessary with brace rails and/or truss rods to provide rigid construction free from sag and twist. Barbed wire, when specified, shall be as shown in Table I.

Double gate latches shall be a combination fulcrum-type latch with center drop rod or of the plunger-bar type of full gate height and arranged to engage the gate stop.

Single gate openings may be furnished with a fulcrum-type of latch or other suitable latch. Gate stops shall consist of a flush plate with anchor arranged to be set in concrete and to engage the plunger of the bar latch. Single gates may be provided with other approved types of stops. Keepers shall consist of a substantial mechanical device for securing and supporting the free end of the gate when in the full open position. All latches, stops, and keepers shall be hot-dip galvanized malleable iron or pressed steel. Keepers are not required on gates 4' wide or less unless specified in the IFB.

11. Hinges

Hinges shall be galvanized malleable iron or pressed steel of sufficient size and strength to support the weight of the gate without sagging. Hinges shall be designed not to twist or turn under gate action and shall allow gate to swing approximately 180° (along and parallel to fenceline).

12. Miscellaneous Items

Tension bands, clips, ties, bolts, nuts and post caps may be of aluminum alloy construction. These items, when made of steel, shall be hot-dipped galvanized as specified in Table III. Items under 1/8" thickness shall have minimum 1.50 oz/sq.ft. zinc coating and items 1/8" thickness and over shall have minimum 1.80 oz/sq.ft. zinc coating.

**TABLE I  
REQUIREMENTS FOR WIRE COMPONENTS**

<u>COMPONENT</u>	WIRE	DIAMETER OF	BREAKING	COATING, OZ. PER		SQ. FT.
	GAUGE	COATED WIRE ± .005	STRENGTH, MIN. 1BF	(A817) ZINC CLASS 1	CLASS 2	ALUM.
FABRIC	6	.192	2170	1.2	2.0	.40
(A392) Zinc	9	.148	1290	1.2	2.0	.40
(A491) Alum.	11	.120	850	1.2	2.0	.35
TENSION WIRE	7.0000	0.1770	--	0.6000		0.4000
BARBED WIRE	12 1/2	0.0990	950.0000	0.5000		0.3000
BARBS (A121)	14.0000	0.0800	650.0000	0.4500		0.2500
BARBED WIRE, HIGH STRENGTH	15 1/2	.067	950	.50		.21
BARBS, HIGH STRENGTH	16 1/2	.058	--	.45		.18

**TABLE II \*\*  
USE APPLICATIONS FOR STRUCTURAL MEMBERS**

COMPONENTS	NOMINAL SIZE	LINE	POST	END, PULL CORNER	AND POST		GATE	POST		GATE	FRAME	RAIL
		UNDER 6' HIGH	6' AND OVER	UNDER 6' HIGH	6' AND OVER	UP TO 6' LEAF	6' TO 12' LEAF	13' TO 17' LEAF	18' AND OVER	UNDER 6' HIGH 8' WIDE	OVER 6' HIGH OR 8' WIDE	TOP AND BRACE
SCHEDULE 40 STEEL PIPE	1 ¼											X
	1 ½	X								X	X	
	2.0000		X	X								
	2 ½				X	X						
	3 ½						X					
	6.0000							X				
	8.0000								X			
*STEEL PIPE	1 ¼											X
YIELD STRENGTH 50,000 P.S.I.	1 ½	X										
TRIPLE COATED	2.0000		X	X								
(SEE TOP OF PAGE 8)	2 ½				X							
STEEL PIPE	1 ¼									X		X
YIELD STRENGTH 50,000 P.S.I.	1 ½	X									X	
HOT DIPPED GALVANIZED	2.0000		X	X								
ROLL FORMED C SECTION	2 ½				X							
STEEL (A123)	1-5/8 X 1-¼											X
H SECTION	2¼ X 1.70	X	X									
	3½ X 3½					X						
	2½ X 3½	X	X									

\* See statement below Table III

\*\* All sizes given in Table II are minimums for the application

**TABLE III  
REQUIREMENTS FOR STRUCTURAL MEMBERS  
AND ACCESSORIES**

**COMPONENTS	NOM. PIPE SIZE	OUTSIDE DIAMETER OR SIZE ± 1%	WALL THICKNESS	WEIGHT PER LIN. FT.	COATING PER SQ. FT.	
					ZINC	ALUM.
SCHEDULE 40 STEEL PIPE	1¼	1.660"	.140	2.27	1.80	
	1½	1.900"	.145	2.72	1.80	
	2	2.375"	.154	3.65	1.80	
	2½	2.875"	.203	5.79	1.80	
	3½	4.000"	.226	9.10	1.80	
	6	6.625"	.280	18.97	1.80	
	8	8.625"	.365	24.70	1.80	
*STEEL PIPE YIELD STRENGTH 50,000 P.S.I., TRIPLE COATED	1¼	1.660"	.111	1.83	1.00	
	1½	1.900"	.120	2.28	1.00	
	2	2.375"	.130	3.12	1.00	
	2½	2.875"	.160	4.64	1.00	
STEEL PIPE YIELD STRENGTH 50,000 P.S.I., HOT DIPPED GALVANIZED	1¼	1.660"	.111	1.83	1.80	
	1½	1.900"	.120	2.28	1.80	
	2	2.375"	.130	3.12	1.80	
	2½	2.875"	.160	4.64	1.80	
ROLL FORMED C SECTION, STEEL		1.625 X 1.25"	.0747	1.35	2.00	
		2.25 X 1.70"	.125	3.26	2.00	
		3.5 X 3.5"	.135	5.14	2.00	
H SECTION		2.25 X 1.95"		4.1000	2.0000	
POST CAP					1.8000	ALLOY
TOP RAIL SLEEVE		0.51 X 6"			1.5000	ALLOY
TOP RAIL END					1.5000	ALLOY
BRACE END					1.5000	ALLOY
TENSION BAND		14 GA. X 3/4			1.5000	ALLOY
BRACE		12 GA. X 3/4			1.5000	ALLOY
TRUSS ROD		3/8 DIA.			1.8000	ALLOY
TENSION BAR		3/16 X 3/4 ± 1/32			1.8000	ALLOY
EXTENSION ARM		14 GA.			1.5000	ALLOY
HINGES, LATCHES					1.8000	ALLOY
TIES & CLIPS		12 GA. -1.06			1.2500	9 GAUGE
BOLTS & NUTS OVER	3/8 DIA.	WASHERS OVER	3/16 THICK		1.2500	ALLOY
BOLTS & NUTS UNDER	3/8 DIA.,	WASHERS	UNDER 3/16	THICK	1.0000	ALLOY

\*See next page for explanation.

\* Pipe shall be triple coated with min. .9 oz. zinc per sq. ft., chromate conversion coating min. 15 micrograms per sq. in. and an outside coating of min. .0003 inches thick of clear polyurethane. Inside coating shall be minimum 85% by weight of zinc powder with a dry thickness of 1 mil.

\*\* Hydrostatic testing is not required for pipe to be used for fence posts.

## **B. INSTALLATION**

When purchased on an installed basis, all installation work shall be performed by experienced, skilled workmen in accord with good construction practices. The fence shall be erected accurately to the lines shown on the layout drawings.

### 1. Posts

The location and setting of all posts shall be in compliance with ASTM specification F567, Standard practice for Installation of Chain-Link Fence.

### 2. Top Rail

Top rail as shown in Tables II and III shall be run through openings in line post caps and connected into a continuous rail by the use of rail connectors of swedged rail joints. Continuous rail shall run between all terminal posts. It shall be fastened at the ends to the post with rail ends and brace bands.

### 3. Brace Rail

Horizontal brace rails shall be installed at all end, corner, pull and gate posts, except fence 6' high or less which has a top rail. Brace rails shall be securely fastened between terminal posts and adjacent line post with rail ends and brace bands or other acceptable hardware. On fence with top rail, the brace rail shall be installed halfway between ground level and the top rail. On fence without top rail, they shall be at the two thirds point above ground level.

### 4. Tension Wire

Top tension wire when used shall be installed in the top 1' of the fabric. Bottom tension wire shall be installed in the bottom 6" of the fabric. Tension wires shall be securely fastened to the fabric with suitable ties or clips at not more than 2' intervals. Wires shall be taut and securely fastened to terminal posts.

### 5. Fabric

The fabric shall be installed on the outside of the enclosed area (outside line posts) unless otherwise specified. Fabric shall be tightened to present a uniform appearance free from sag.

Fabric fastening to terminal posts shall be by tension bars and bands with band spacing intervals not exceeding 15". Fasten fabric to rails and tension wire with ties or clips at intervals not exceeding 24". Fasten fabric to line posts with ties or clips at intervals not exceeding 15".

When ground contour is not to be graded to the bottom of the fence fabric, the fence shall be erected so that the bottom of the fabric does not exceed 2" from the ground surface. When surface depressions between posts cause exceeding of the above tolerance, barbed wire strands shall be installed on 2" intervals to close the gap.

6. Gates

Gates shall be installed true to opening and plumb when closed. They shall operate easily and keepers shall be installed on gates with leaves over 4' wide. Stops shall be provided to insure proper alignment when gate is closed.

7. Barbed Wire

Barbed wire, when specified, shall be taut and securely fastened to extension arms in slots provided with clips or ties.

8. Workmanship

The installed fence shall have all clips, ties, bolts, nuts, etc. securely attached or tightened. The fence shall have a uniform neat appearance and all debris caused by the fence installation removed. All necessary hardware to make a complete job shall be installed.

**IV. WARRANTY**

The contractor warrants to the owner that all chain link fence furnished under this specification will be new, of good material and workmanship, and agrees to replace promptly any part or parts which reason of defective material or workmanship shall fail under normal use, free of negligence or accident, for a minimum period of 12 months from date of acceptance. Such replacement shall be free of any charge to the owner or his representative.

**V. SERVICE, PARTS, AND MANUALS**

This section is not applicable.

**VI. ACCEPTANCE EVALUATION AND QUALITY ASSURANCE**

**A. PRODUCTION INSPECTION AND TESTING**

The manufacturer shall be responsible for all testing necessary to assure that the quality of the product shall meet the requirements of the standards cited. These tests shall be performed as necessary during the manufacturing process.

**B. FIELD INSPECTION**

1. Scheduling the Inspection

The contractor is required to report promptly the completion of installation (or delivery) to the quality assurance representative who will then coordinate and schedule the acceptance inspection with the contractor and owner.

2. Sampling

The contractor shall notify this Division as instructed in the Invitation for Bids, where and when the materials may be sampled by the quality assurance representative (or other authorized representative of the agency). The contractor should allow a reasonable time interval for sampling, testing, and reporting.

3. Sampling and Field Inspection

Sampling and field inspection shall be in accordance with the Inspection Procedure For Fence, Chain-Link (5660-CLF-IP). Copies of 5660-CLF-IP may be obtained from the N.C. Department of Administration, Division of Purchase and Contract 116 West Jones Street, Raleigh, N.C. 27603-8002.

**VII. ORDERING DATA**

Purchasers should exercise any desired option offered herein and should specify the following in the Requisition and the Invitation for Bids:

1. Title, number, and date of this specification.
2. Type and class of fence desired.
3. Fabric height desired.
4. A list of equipment by item name and number to be used by the purchaser as a reference guide to the specification.
5. Top rail required.
6. Bottom tension wire excluded.
7. Barbed wire - 3 or 6 strands.
8. Type selvage at top and bottom

\*\*\*\*\***End of Document**\*\*\*\*\*