

BASIC FENCE SPECIFICATIONS

A-1 Fence Company

Revised 2014

Our selected highlights and notes from popular standard specifications. These standards are subject to change without notice. Consult the complete, current version and local jurisdictions before taking action. Arranged in numerical order, by product class:

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1.0 CHAIN LINK FENCING

ASTM A 53 SCHEDULE 40 AND SCHEDULE 80 PIPE.

Covers black pipe, hot-dipped, zinc coated, welded and seamless varieties.

Caution: A53 schedule 40 pipe can be considered equal to F1083-13 schedule 40 pipe however, depending upon the architect's wording in the specification section, F1083-13 may or may not be substituted.

ASTM A 90/A90M-13 TESTING ZINC COATING ON STEEL ARTICLES

ASTM A 116-11 METALLIC COATED STEEL-WOVEN WIRE FENCE FABRIC

ASTM A 121-13 METALIC COATED STEEL BARBED WIRE

Design Number 12-4-5-14R is "twisted 12 gage, four point, 5" on-center.

Design Number 12-4-3-14R is "twisted 12 gage, four point, 3" on-center.

Coatings:

Type A – Aluminum coated, .3 oz/sq.ft.

Type Z – Class 3- Galvanized coated, .80 oz/sq.ft.

Type ZA – Zinc-5% aluminum-mischmetal alloy.

ASTM A 123 ZINC (HOT DIP GALVANIZED) COATED IRON AND STEEL

The minimum coating is 2.3 oz. per sq. ft.

ASTM A 392-11a ZINC COATED CHAIN LINK FABRIC

11.1.1 Class 1. 1.2 oz zinc coating.

11.1.2 Class 2. 2.0 oz zinc coating.

It can be GBW (galvanized before weaving) or GAW (galvanized after weaving) fabric.

Standard chain link fabric dimensions from Table 4:

12 ½ GA .099" diameter wire.

11 ½ GA .113"

11 GA .120"

9 GA .148"

6 GA .192"

Fabric sizes now include: 3/8", ½", 5/8", ¾", 1", 1 ¼", 1 1/2", 1 ¾", and 2" mesh.

ASTM A 491-11 ALUMINUM COATED CHAIN LINK FABRIC

11.1 Aluminum coating "aluminized", per table 3.

6 – 9 Gage .40-oz/sq. ft.

11 Gage .35

11 ½ Gage .30

ASTM B 429 ALUMINUM ALLOY PIPE AND TUBING

Covers schedule 40, aluminum pipe.

ASTM A 500 COLD FORMED STEEL (WELDED AND SEAMLESS)

Tensile strength varies by grade.

ASTM A 501 HOT-FORMED STEEL (WELDED AND SEAMLESS)

ASTM F 552 TERMINOLOGY, CHAIN LINK FENCING

ASTM F 567-14 INSTALLATION OF CHAIN LINK FENCE

4.1 Post spacing – 10' o.c.

5.1 Fence Post footings for:

Posts 4" O.D. or less – 4 x post diameter and 24" deep + 3" per foot of height over 4'.

4 ½" O.D. and larger – 3 x post diameter and 24" deep + 3" per foot of height over 4'.

Limited to a maximum of 60" deep, and a maximum post height of 20'.

5.11.1 Residential Swing Gate Posts. (Each leaf).

Width	Height	Post Size	Hole Size (Diameter x Depth)	Spec
<=4'	6'	1 7/8"	8" x 30"	F 654
>4' - <=6'	6'	2 3/8"	10" x 30"	"

5.12.1 Commercial and Industrial Swing Gate Posts. (Each leaf).

Width	Height	Post Size	Hole Size (Diameter x Depth)	Spec
<=4'	6'	2 3/8"	10" x 30"	F 900
>4' - <=10'	6'	2 7/8"	12" x 36"	"
>10'	6'	4"	12" x 36"	"
<=6'	>6'	2 7/8"	12" x 36"	"

>6' - <=12'	>6'	4"	12" x 36"
>12' - <=18'	>6'	6 5/8"	<u>20"</u> x 42"
>18' - 24'	>6'	8 5/8"	<u>26"</u> x 48"

- 6. Bracing and mid-rails.
 - 6.1 With top-rail: no bracing for <=6' h.
 - >6' high – mid brace.
 - >12' high – mid rail required.
 - Without top-rail.
 - Brace required – 2/3's up.
 - 7.2 Tension wire in lieu of top rail.
 - Bottom tension wire is optional.
- 8. Chain Link Fabric
 - 8.4 Fabric to line posts (tie wire) 15" spaces.
 - Fabric to tension wire (hog rings) 24" spaces.

ASTM F 626-14 FENCE FITTINGS

- 3. Post Caps and Eye-tops. Pressed steel or cast iron, 1.2 oz galvanized coating.
- 4. Rail Ends and Brace Type Rail Ends. Pressed steel or cast iron, 1.2 oz galvanized coating.
- 5. Top Rail Sleeves. Pressed steel or round steel tubing, 1.2 oz galvanized coating.
- 6. Tie Wires and Clips
 - 6.1.1 Standard Round Ties
 - 6.1.1.1 Twelve Gage Steel. 0.8 oz galvanized coating.
 - 6.1.1.2 Nine Gage Steel. 0.9 oz galvanized coating.
 - 6.1.1.3 Nine Gage Aluminum
 - 6.1.2 High Security Round Ties. More....
- 7.1 Tension Bands and Brace Bands. Steel, 1.2 oz galvanized coating.
- 7.2 Tension Bands – minimum 14 gage, x 3/4" wide.
- 7.3 Brace Bands – minimum 12 gage, x 3/4" wide.
- 8. Tension Bars
 - 8.1 Steel tension bars. 1.2 oz galvanized coating.
 - 8.2 Fiberglass tension bars.
 - 8.4 Tension bars for 1 3/4" and 2" chain link up to 5' high – 3/16" x 5/8".
 - Over 5' high – 3/16" x 3/4".
 - For 1" chain link mesh, - 1/4" x 3/8".
- 9. Truss Rod Assembly
 - 9.1 Steel truss rods, 5/16" diameter rod with 1.2 oz galvanized coating.
 - 9.3 Truss rod tightener shall hold 2000#.
- 10. Barb Wire Arms
 - 10.1 Arms are pressed steel or cast iron with 1.2 oz galvanized coating.
 - 10.2.1 Type I – single slant arm for 3 strands wire.
 - 10.2.2 Type II – single vertical arm.
 - 10.2.3 Type III – “V” arm for 6 strands.
 - 10.2.4 Type IV – “A” shaped, for 5 strands of barb wire.
 - 11.2 Color Coated Fittings – polymer coated

ASTM A 653 ZINC COATING OF STEEL SHEET OR ALLOY COATED

Defines various zinc coating standards. G 90 is a coating of .9 oz. per sq. ft. (.45 oz. per side), .75 mills per side. Specifies acceptable test ranges for samples. E.g.: for G90, the Triple-Spot Test must read .32 oz per side. A Single Spot test must read .80 oz total, both sides.

ASTM F 654-07 RESIDENTIAL CHAIN LINK GATES

3.2 Any gate leaf wider than 6’ or taller than 6’ is not classified as a residential gate.
See ASTM F 900.

ASTM F 668-11 PVC AND OTHER COATED CHAIN LINK FABRICS

Note: The steel core wire is the specified wire gage, not the outside of the coating.
Organic polymer coating is also standard. Fused polyolefin is also quoted by vendors to comply.

- 6.1 Class 1 – Extruded coating.
- 6.2 Class 2a – Extruded and adhered.
- 6.3 Class 2b – Fused and adhered.
- 15. Thickness -Minimum: Class 2a - .015 inches. Class 2b - .006 inches.

ASTM F 669 LIGHT INDUSTRIAL AND COMMERCIAL PIPE AND TUBING

This spec has been obsoleted and is replaced by ASTM F 1043, see below.

ASTM A 787/A787M WELDED STEEL PIPE AND TUBING SPECIFICATIONS

Defines the sizes, shapes and thicknesses for steel pipe and tube. Frequently used in conjunction with ASTM A653 to define galvanized coatings, including hot-dipped and G-90 standards.

ASTM A 817 METALIC COATED STEEL WIRE.

Note: It has been reported that “Galvan” has recently been approved as well – a formulation of zinc, aluminum + Cerium/Lanthanum. 6/08. Commonly called “Mischmetal Alloy”.

ASTM A 824-01 (07) COATED STEEL MARCELLED TENSION WIRE

- 1.1.2 Type II is zinc coated steel wire (galvanized) per ASTM A 817.
- 5.2 Wire is 0.177” diameter, “7 gage” only. Nothing covers “6 gage”.
- 5.3.1 Type I – Aluminum coated.
- 5.3.2 Type II –Zinc Coated.
- 5.3.3 Type III – 5% Zinc coating.

Note: It has been reported that “Galvan” has recently been approved as well – a formulation of zinc, aluminum + Cerium/Lanthanum. 6/08. Commonly called “Mischmetal Alloy”.

ASTM F 900-11 COMMERCIAL AND INDUSTRIAL SWING GATES

Post footing – see ASTM F 567.

Automated Vehicle Gates – see ASTM F 2200.

- 4.2.4 Barb wire on gates must be supported every 8’ or less.
- 4.2.5 Barbed Tape installed on automated gates must be at a minimum of 8’ height.
- 5.2 Gate Frames.

Height	Gate Frame Size	Weight	Class
<=6’	1 5/8”	1.83 #/Ft.	Structural
> 6’	1 7/8”	2.28 #/Ft.	Structural

5.2.2 Gate Posts. Width is for each gate leaf. Post size is O.D.

Width	Height	Post Size	Hole Size	Weight (Min.)
<=4'	6'	2 3/8"	10" x 30"	3.11 #/Ft.
>4' - <=10'	6'	2 7/8"	12" x 36"	4.64 #/Ft.
>10'	6'	4"	14" x 36"	8.65 #/Ft.
<=6'	>6'	2 7/8"	10" x 36"	4.64 #/Ft.
>6' - <=12'	>6'	4"	12" x 36"	8.65 #/Ft.
>12' - <=18'	>6'	6 5/8"	16" x 42"	18.02 #/Ft.
>18' - 24'	>6'	8 5/8"	18" x 48"	27.12 #/Ft.

Vertical stiffeners every 8' or more. Horizontal stiffeners if greater than 8' high.

6.5 Gate stops are required for all double gates.

6.6 Gate keepers are required for all gate leafs greater than 5 feet.

ASTM F 934-96 (08) COLORS FOR POLYMER-COATED CHAIN LINK MATERIALS

ASTM F 969-11 CHAIN LINK TENNIS COURT FENCING

5.3 Fences with windscreen should use stronger framework, with posts closer together.

6.1.2 Type II classification for chain link fabric is a Class 1 galvanized, per ASTM A 392.

6.1.4 Type IV classification is for PVC coated chain link fabric of any grade.

8.1.4 Chain link mesh shall be 1 3/4".

New: Gates must swing outward.

New: CLFMI Wind Load Guide (WLG2445) is now called out if wind screen is added to the tennis court. Withdrawn and republished in 2012, and does not go below 105 miles per hour.

ASTM F 1043-13 STRENGTH AND COATINGS (GALVANIZED POSTS AND RAILS) FOR CHAIN LINK FRAMEWORK

Note: CLFMI Wind Load Guide (WLG2445) is now called out and cautioned.

Fused polyolefin is also quoted by vendors to comply.

5.0 Strength Requirements.

5.1 Industrial – acceptable materials are either schedule 40 or “high strength” – having 50,000 psi minimum yield strength.

Group IA is Schedule 40.

Group IC is the manufacturer’s “high strength” grade.

Light Industrial – is a thinner wall section version (lighter weight).

See Table 3.

Table 3A shows the impact of wind loading on post size and height of the fence.

6.0 Strength Calculations for alternate designs (not shown in this specification) could be presented whereby imported, “Structural Grade” would comply with the “Light Industrial/Commercial” classification.

7.0 Coating Requirements.

7.1 External coatings now identified separately.

7.1.1 Type A – Zinc, 1.8 oz/ft².

7.1.2 Type B – Zinc, 0.9 oz/ft², with organic overcoat of a verifiable polymer film, using:

7.1.3 Type C – Zinc, 5%.

7.2 Internal Coatings same as above.

8.1 PVC, polyester polymer or polyolefin elastomer coating.

ASTM F 1083-13 GALVANIZED FENCE STRUCTURES (GALVANIZED PIPE)

6.1.1.1 Regular grade tensile strength is 48,000 psi, minimum.

6.1.1.2 High Strength Grade Sch 40 tensile strength is 60,000 psi, minimum.

6.1.2.1 Regular grade yield strength is 30,000 psi, minimum.

6.1.2.2 High Strength Grade yield strength is 50,000 psi, minimum.

7.1 Weight of galvanized coating – 1.8 oz/ ft².

12.1 By this specification, pipe may be schedule 40 or schedule 80.

Note: Schedule 80 is called “Extra Strong”, not “High Strength”.

ASTM F 1183-96 (11) ALUMINUM ALLOY CHAIN LINK FABRIC

ASTM F 1184-10 COMMERCIAL AND INDUSTRIAL HORIZONTAL SLIDE GATES

For “Cantilever Roll Gates”.

This is not applicable for standard chain link roll gates with ground wheels and pipe track.

These gates are more popular where snow is an issue or gravel driveways preclude gate wheels or ground track. Their cost tends to be higher.

ASTM F 1345-10a GALFAN/GAVINAL FABRIC

Aluminum coated fabric. Commonly called “Mischmetal Alloy”.

ASTM F 1379-95 (13) BARBED TAPE (RAZOR RIBBON) TERMINOLOGY

ASTM F 1553-11 GUIDELINE FOR SPECIFYING CHAIN LINK FENCE

ASTM F 1664-08 POLYMER COATED TENSION WIRE.

The gage is always the “core wire” gage.

ASTM F 1665-08 POLYMER COATED BARBED WIRE.

The gage is always the “core wire” gage.

ASTM F 1712-11 CHAIN LINK MATERIALS FOR HIGH SECURITY APPLICATIONS

4.2 Fabric meshes larger than 1” shall be 6 gage or 9 gage. 1” mesh shall be 9 gage. Smaller than 1” mesh shall be 11 gage.

4.3.2 Tie wires shall be 9 gage.

ASTM F 1908-08 RESIDENTIAL OUTDOOR SWIMMING POOL FENCES

This standard is adopted from the U.S. Consumer Product Safety Commission Standard. Local city standards take precedence over these general guidelines, but these should be considered as the minimum.

6.1 Minimum height above grade (as measured from the outside) - 48”.

6.2 Visibility – at least 65% open area as viewed from the outside supervising area.

6.3 Ground clearance – 4” or less.

6.4 Solid barriers – masonry walls shall have no indentation or protrusion greater than 3/8”.

6.5 Horizontal and vertical members (wood, vinyl and iron fences):

If the distance between the tops of the horizontal members is <45” then the vertical space are <= 1 3/4”.

If the distance between the tops of horizontal members is >= 45” then the vertical spaces are <4” with no horizontal cutout (decoration) > 1 3/4”.

6.6 Chain link fences – 1 1/4” mesh. (1 3/4” across the diagonal measurement).

- 6.7 Diagonal members (lattice) maximum spaces of 1 3/4"
- 6.8 Access gates.
- 6.8.1 Double leaf gates must be (key) locked when not in use. Key type padlock is acceptable.
- 6.8.2 Single leaf gates must open away from the pool and be a self-closing and self-latching. If the latching device is <54" above grade, use 1/2" mesh within 18"
- 6.9.1 Building doors are not part of any fence project.
- 6.9.1.2 Self-latching devices must be 54" above the floor or properly screened and protected.
- 7.2 Clear zone – the fence shall be at least 48" away from any climbable structure.

Additional references have been added in this specification for:

- ASTM F 1346 – SAFETY COVERS.
- ASTM F 2286 - REMOVABLE MESH FENCE.
- ASTM F 2518 – SAFETY AUDITS.

ASTM F 1910-98 (13) LONG BARBED OBSTACLE TAPE (RAZOR RIBBON)

7.1 Material Standards are:

Item #	Description
1.	18" Single Coil, Stainless Steel
2.	18" Single Coil, Galvanized Steel
5.	24" Single Coil, Stainless Steel
13.	30" Single Coil, Stainless Steel
21.	24"/30" Double Coil, Stainless Steel
23.	24"/30" GPBTO, Type II.
24.	24" Single Coil, 300 Series Stainless Steel.
25.	30" Single Coil, 300 Series Stainless Steel.

ASTM F 1911-05 INSTALLATION OF BARBED TAPE (RAZOR RIBBON) Much more to read.....

7.1 Concertina Security Coils (Table 1) 18" diameter:

Coil Loops/Roll	Spacing	Yield, l.f.
31 - 18" Diameter	12"	15'

7.2 Helical Security Coils

Coil Loops/Roll	Spacing	Yield, l.f.
33 - 18" Diameter	18"	50'

7.3 **Minimum Height (Warning). 7' to the bottom of the coil.**

ASTM F 2000-10 FENCES FOR BALLFIELDS AND OTHER SPORTS FACILITIES

- 6.1 Permanent Outfield Fence.
 - 6.1.1 Minimum height is 8'.
 - 6.1.2 Bottom ground clearance shall be no more than 1".
 - 6.1.6 Minimum of 2" mesh, 9 gage chain link, knuckle-knuckle.
- 6.7 Backstop Fencing.
 - 6.7.3 Center panel no less than 25' behind home plate. Side panels no less than 25' from the foul lines.
 - 6.7.4 Minimum height 16'.
- 6.8.2 Single leaf access gates shall swing away from the field and be self-closing and self-latching.
- 7.2 Foul line fence – minimum of 25' from the foul line.

Layout drawings are provided for:

Junior Baseball – 200' to minimum outfield fence.

Baseball Field – 350' to minimum outfield fence.

Softball Field – 200' to minimum outfield fence.

7.3 Spectator protective fence – minimum of 8' high.

7.4 Player protective fence – minimum of 8' high.

FIELD LAYOUT DRAWINGS

Junior Baseball Field – 200' minimum to outfield fence.

Baseball Field – 350' recommended to outfield fence.

Softball Field – 200' minimum to outfield fence.

ASTM F 2049-11 FENCES FOR COMMERCIAL, PUBLIC AND MULTI-FAMILY PLAY AREAS

7.1 If classified as “Continuous Barrier”, fence must withstand a 10,000 lb point load.

7.4 Fences

7.4.1 Height – minimum of 4' high.

7.4.2 Visibility – must maintain visibility for supervised surveillance.

7.4.3 Ground Clearance – maximum of 4”.

7.4.4 Solid barriers (block walls etc.) no protrusion greater than 3/8”.

7.5 Fence types.

7.5.1 Horizontal and vertical members.

If the distance between the tops of the horizontal rails is less than 45”, they shall be on the outside of the play area, and the vertical members (pickets) spaces shall be no greater than 1 3/4”.

If the tops of the rails are greater than 45” apart, then the spaces between the vertical members shall be no greater than 4”.

7.5.2 Chain link mesh – 1 1/4”.

7.5.3 Lattice – no greater than 1 3/4” in the greatest dimension.

7.6 Access Gates.

7.6.1 Double drive gates shall be padlocked.

7.6.2 Pedestrian gates shall swing outward, with self-closing and self-latching devices. The release mechanism shall be 48” above grade with 1/2” mesh within 18” of the latch.

7.8 Wall – 4' high minimum. If fence is above, the bottom gap < 2”

7.9 Picket or Ornamental Fence – same as above.

Note: Latch height is also specified.

8.2 Clear Zone – There must be at least 72” between the fence and any structure that could be used for climbing.

8.3 Vulnerable Play Zone. Consideration for placement of fences to limit hazards. Potential hazards are: RR tracks, bodies of water, streets, parking lots, electrical equipment et. al.

Level I (top priority) where the hazard is less than 30' from the play equipment.

Level II from 30' – 100'.

Level III from 100' – 200'.

9.1 Responsibility of property owner, occupant or tenant to maintain the fences and gates, including lock operation.

ASTM F 2611-11 DESIGN AND CONSTRUCTION OF CHAIN LINK SECURITY FENCING

- 6.1 Chain Link Fabric.
- 6.1.1 Security Chain Link Mesh Configurations

CONSIDERATION

MESH / GAGE

Standard Commercial Industrial	2", 9 ga
Bolt Cutters Required to Breach	2", 6 ga
More Difficult to Climb, More Time to Cut	1 3/4", 9 ga
More Difficult to " ", Bolt Cutters	1 3/4", 6 ga
Increasingly More Difficult to Climb, Cut	1", 11 ga
Increasingly " ", Longer to Cut	1", 9 ga
Eliminates Finger Holes to Climb	5/8", 11 ga
Requires Special Equipment to Cut	1/2", 11 ga
More Time to Cut Through	3/8", 11 ga

- 6.2.1 Line post selection with wind load considerations per CLMFI – WLG 2445.
- 6.2.1.1 Terminal posts usually one size larger than line post, except for 6" and 8" line posts.
- 7.9 Bottom rails can be further secured byread more.
- 7.12 Anti-Ram Systems.....read more.

Note: Wind Loading is also referenced in CLFMI – WLG 2445.

ASTM F 2630-07 GUIDE FOR SELF-CLOSING, SELF-LATCHING GATES.

- 5.1 Self-closing – must close from 12" away and 90 degrees.
- 5.2 Self-latching – must latch from 12" away and 90 degrees.

ASTM F 2631-07 STANDARD PRACTICE FOR INSTALLING CHAIN LINK FENCE FOR OUTDOOR SPORTS FIELDS, COURTS AND RECREATIONAL FACILITIES.

Specs are quite detailed for materials, sizes, heights, field sizes.
Sports included are: soccer, 6 & 8 man football, field hockey, lacrosse, rugby, handball, basketball, racquetball, badminton, volleyball, paddle tennis.

ASTM F 2656 07 STANDARD TEST METHOD FOR VEHICLE CRASH TESTING OF PERIMETER BARRIERS

ANTI-RAM SECURITY FENCE CRASH RATINGS:

- K-4 MP30 - 15,000# vehicle, 30 mph, < 36" penetration.
- K-8 MP40 - 15,000# vehicle, 40 mph, < 36" penetration.
- K-12 MP50/P1 – 15,000# vehicle, 50 mph, < 36" penetration.

ASTM F 2698-08 FENCES FOR SKATE PARKS

- 6.1 72" minimum height.
- 6.2 At least 50% visibility required.
- 6.3 2" ground clearance maximum.
- 6.4 Chain link – 2" mesh, 9 gage.
- 6.5 Welded wire mesh 2" X 2"
- 6.6 Ornamental and pick fences.
- 6.10 Access gates.
- 6.11 Grounding.
- 8. Safety and danger warning signs are required.

ASTM F 2699-08 FENCES FOR PUBLIC WATER SPRAY/PLAY AREAS

ASTM F 2780-09 EXPANDED METAL SECURITY FENCES AND BARRIERS

Detailed specifications are referenced, including:

Crash Testing per ASTM F 2548.

U.S. Department of Defense – UFC 4-010 Antiterrorism and UFC 4-020 Security Engineering Facilities.

G.S.A. Site Security Design.

ASCE – Design Loads – wind.

ASTM F 2781-10 TESTING FORCED ENTRY RESISTANCE FOR SECURITY FENCES

Provides standard methods to test a list of entry tools and time-to-breach various security fences. The treat levels are defined as:

1.1.1 Low Threat Level (L)

1.1.2 Medium Threat Level (M)

1.1.3 Aggressive Threat Level (A)

New report published by CLFMI (9/9/2010) followed this procedure and produced the following summarized results.

1. Mesh sizes smaller than 1" significantly increase penetration resistance times.
2. 1/2" mesh x 9 GA provides greater penetration resistance than 3/8" mesh x 11 GA.
3. 3/8" mesh x 11 GA and 1/2" mesh x 9 GA provide more penetration resistance than expanded metal panel fencing at Low Threat Levels.
4. 1/2" mesh x 9 GA provides more penetration resistance at a Low and Medium Threat Level than expanded metal panel fencing.
5. Unraveling of security grade chain link wire pickets with the fence under tension was deemed "not a practical means of penetration" during testing due to the excessive time required to pull and pry a wire for 2" x 6 GA fabric and 1" x 9 GA fabric. Unraveling was considered "not doable" for wire sizes of at least 11 GA with mesh sizes less than 1 inch.
6. Tunneling resistance increases significantly (11 minutes to 26 minutes) when burying security grade chain link fabric below ground and backfilling with stone and soil.

These findings are conclusive and can be used in the specification of security fencing based on anticipated threat levels and security personnel response times. For more information about security grade chain link fence, visit chainlinkinfo.org and see Security Fencing Guidelines.

PENITRATION TEST 4' SQ. (Hole)	3/8" Mesh x 11 Ga	1/2" Mesh x 9 Ga
Low: 1 man, hand tools	L 12.5 minutes.	L 10.9 minutes.
Medium: 2 man, battery operated power tools	M 1.8 minutes.	M 10.9 minutes.
Aggressive: 2 men, gas powered tools	A 7.0 minutes.	A 1.2 minutes.

TEST	2" Mesh x 6 Ga	1" Mesh x 9 Ga	3/8" Mesh x 11 Ga.
Time to unravel	10 minutes	8 minutes	Not breached

TEST	No Buried Fence	Buried Fence
Time to tunnel below grade	11.1 minutes	25.8 minutes

2.0 REPAIR OF WELDED CHAIN LINK FABRICATIONS – Repair of pre-galvanized materials after welding.

ASTM A 780 Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings. Uses zinc rich (65% zinc) paint, zinc solder or metalizing.

MIL P-15145 Repair of damaged coatings (galvanized) using a spray-on, zinc oxide dust paint. See the mfr.: “LPS brand Cold Galv.” conforms to MIL P-46105, 26915A, and T-26433.

MIL P-21035 Repair of damaged coatings (galvanized). Two coats, same as above.

APWA 206-6.8 Repair of damaged coatings (galvanized) using the “Galv-a-loy” solder process.

S.C. EDISON Repair of damaged coatings (galvanized) using “Galvanox, Type 1”, manufactured by Subox, Inc., Koppers Organic Zinc, or SCE approved equal.

LAUSD – Gal-Viz or Galvabar.

2.0 SECURITY FENCING GUIDELINES

CLMFI This guideline, in its entirety can be found at:

<http://codewriters.com/asites/page.cfm?usr=clfma&pageid=887>

To summarize: The various mesh sizes available in the three previously discussed gauges are listed in the order of their penetration resistance/security:

- | | |
|--------------------------------|----------------------|
| A. Extremely high security | 3/8" mesh 11 gauge |
| B. Very high security | 1" mesh 9 gauge |
| C. High security | 1" mesh 11 gauge |
| D. Greater Industrial security | 2" mesh 6 gauge |
| E. Industrial security | 2" mesh 9 gauge |
| F. Commercial grade security | 2" mesh 11 gauge |
| G. Residential grade | 2 ¼" mesh 11 ½ gauge |

See **ASTM F 2781-09** above, for additional details.

4.0 RELATED SPECIFICATIONS

AASHTO M 181 –95 FEDERAL STATE HIGHWAY FENCE SPECIFICATION.

Note: Grade 2 is for SS-40.

APWA – 600 AMERICAN PUBLIC WORKS SPECIFICATION for chain link fences.

Cal-Trans M-80 CALIFORNIA DEPARTMENT OF TRANSPORTATION SPECIFICATION
FOR FENCES.

CLFMI Chain Link Fence Manufacturers Institute – generally uses ASTM standards.

CLFMI – WLG 2445 Selection of Post Spacings with Wind Loading.

I.C.B.O. INL. CONFERENCE OF BUILDING OFFICIALS. Specifications for fasteners among other things.

U.B.C. Uniform Building Code and the CA edition – C.B.C.

F – 162 F.A.A. Specification for chain link fences.
Note that 162-1 is for SS-40.

AFH 32-1084 U.S. Air Force Specification for chain link fences.

U.F.C. 4-022-01 Security Engr. Entry Control Facilities/Access Control Points
-02 Selection and Application of Vehicle Barriers
-03 Fences, Gates and Guard Facilities
4-026-01 Design to Resist Forced Entry

TSA Pub. A-001 U.S. Dept. of Homeland Security, Security Guidelines for General Aviation Airports. May 2004. Very ambiguous, no details.

DOD 0-2000.12H Directive for AT/FP Program.

OPNAVINST 5530.14C. Navy Physical Security.

U.F.G.S. High-Security Fence and Gates, section: 32 31 15.53.

MUTCD – Manual on Uniform Traffic Control Devices, Section 2B.68 Gates.

Paragraph 2:

A gate typically features a gate arm that is moved from a vertical to a horizontal position or is rotated in a horizontal plane from parallel to traffic to perpendicular to traffic. Traffic is obstructed and required to stop when the gate arm is placed in a horizontal position perpendicular to traffic. Another type of gate consists of a segment of fence (usually on rollers) that swings open and closed, or that is retracted to open and then extended to close.

Paragraph 3:

Gates are sometimes used to enforce a required stop. Some examples of such uses are the following:

A. Parking facility entrances and exits,

B. Private community entrances and exits,

C. Military base entrances and exits,

D. Toll plaza lanes,

E. Movable bridges (see Chapter 4J),

F. Automated Flagger Assistance Devices (see Chapter 6E), and

G. Grade crossings (see Part 8).

Paragraph 15:

Except as provided in Paragraph 16, rolling sections of fence, if used, shall include either a horizontal strip of retroreflectorized sheeting on both sides of the fence with vertical stripes alternately red and white at 16-inch intervals measured horizontally to simulate the appearance of a gate arm in the horizontal position, or one or more Type 4 object markers (see Section 2C.66), or both. If a horizontal strip of retroreflectorized sheeting is used, the bottom of the sheeting shall be located 3.5 to 4.5 feet above the roadway surface.

5.0 APWA – STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION **“GREEN BOOK” 2009 Edition**

Drawing – Standard Plan 600 –2 or 600-0 (Southern California Chapter)

Section 201 – Concrete For fence and guardrail post foundations.

Concrete: 201-1.1.2(A) Specifies Class 500-C-2500.

201-1.4.1 Allows hand mixing where machine mixing is impractical.

201-1.4.4 Hand Mixing is permitted for less than 1 cubic yard. Each batch not to exceed 1/3 cu. yd.

Section 206 – Miscellaneous Metal Items

206-6 Chain Link Fence

206-6.1 Materials – Class 1 or 1A for pipe and references ASTM F 1083

206-6.2 Posts, rails, braces and gates.

Fences < 6’ high

Terminal and gate posts 2 3/8”

Line posts 1 7/8”

Fences >= 6’ high

Terminal and gate posts 2 7/8”

Line posts 2 3/8”

Gate Posts

Single swing gates or double gates (two leaves)

<= 6’ wide leaf x 5’ h 2 3/8”

<= 6’ wide leaf x 6’ h 2 7/8”

<= 13’ wide leaf 4” schedule 40 or 3 1/2” High Strength (Class 1A)

>13’, <= 18’ leaf 6 5/8”

> 18’ leaf 8 5/8”

Slide gates >6’ wide 4” “

Top Rail and Braces 1 5/8”

Gates

Frames 1 7/8”

Interior Braces 1 5/8”

206-6.3 Chain Link Fabric

206-6.3.1 Galvanized - ASTM A 392

5’ high – 11 gage

>= 6’ high 9 gage

206-6.3.2 PVC Coated

ASTM F668, Class 1 or Class 2.

206-6.4 Tension and Tie Wires.

7 gage Marcellled tension wire.

11 gage galvanized steel or 6 gage aluminum tie wires.

Tension bars 3/16" x 3/4".

206-6.5 Truss or Tension Rods – 3/8" diameter galvanized steel.

206-6.6 Fittings – galvanized steel.

206-6.7 Barb Wire – 4 point galvanized steel, 5" spacing.

206-6.8 Repair of Damaged Coatings – Galvabar or Zinc Dust Paint per below:

Section 210 Paint and Protective Coatings

210-3.5 Repair of Damaged Zinc Coatings

210-3.5.3 Zinc Dust Paint per ASTM A780 – 90% minimum zinc by weight.

210-3.5.4 Zinc Based Solders per ASTM A 780 – minimum 5 mils thickness.

Section 304 Metal Fabrication and Construction

304-3.2 Chain Link Fence

Footings

5' high fence

Line posts 30" deep x 8" diameter

>= 6' high fence

Line posts 36" deep x 8" diameter

All others per plans or

36" deep x 12" diameter, minimum.

6.0 FEDERAL SPECS: RR-F-191, AMMEMDED 2008

General – All military specifications include the "By America Act", requiring all domestic materials. Where schedule 40 pipe is shown, you can substitute SS-40, if available, unless noted otherwise.

RR-F-191/1E CHAIN LINK FENCE FABRIC

1.2 Classifications

Type I – Zinc coated steel. 1.2 oz

Type II – Aluminum coated steel

Type III – Aluminum alloy

Type IV – PVC coated over zinc or aluminum

Only ASTM F 668, Class 2b qualifies.

Mesh Sizes

1", 9 and 11 gage.

1 3/4", all gages.

2", all gages.

2 1/8", all gages.

Wire Gages

11 gage - .120"

9 gage - .148"

6 gage - .192"

Fabric Height

36", 42", 48", 60", 72", 84", 96", 120", and 144".

3.10 Selvage

- (a) ≤ 60" high, 2" mesh, K-K (knuckle-knuckle)
- (b) > 60" high, 2' mesh, T-K (twisted top)
- (c) All 1" and 1 3/4" mesh, K-K

Unless specified otherwise.

3.3 Wire diameter is always "core" diameter.

3.7 Type IV. PVC coated. Minimum is .0007".

6.2 Zinc –coated, 1.2 oz per sq. ft., or 2.0 mils.

RR-F-191/2E CHAIN LINK GATES

1.2 Classifications

Type I – Single swing.

Type II – Double swing.

Type III – Single cantilever sliding or wheel sliding. (Verify gate frame sizes).

Type IV – Double cantilvever or wheel sliding. “

Type V – Single overhead sliding.

Type VI – Double overhead sliding.

Type VII – Vertical lift.

Type VIII – Special.

3.2.1 Frames can be pregalv with shop cold zinc touchup unless noted otherwise.

3.2.2 Colored gate frames can be shop welded and touch-up with matching spray paint.

3.4 Barb wire top. Extend frames 1', use 3 strands.

RR-F-191/3E CHAIN LINK POSTS, RAILS, FRAMES

1.2 Classifications

Class 1 – steel pipe

Grade A – hot dipped, 1.8 oz.

Grade B – hot dipped or sprayed, .9 oz. Per (3.4.1), it also must be over-coated with clear acrylic or polyester and the inside must also be protected.

Sizes – the wall thickness shown is for "SS-40". Check plans to verify if "only full-weight" is shown.

SP1 – 1 5/8" x 0.111" wall thickness ("SS 40" or full weight)

SP2 – 1 7/8" x 0.12"

SP3 – 2 3/8" x 0.13"

SP4 - 2 7/8" x 0.16"

SP5 – 4" x 0.226"

SP6 – 6 5/8" x 0.28"

SP7 – 8 5/8" x 0.322"

Other classes are not listed here. They cover square, aluminum, “C” and “H” section posts.

3.0 Requirements

3.1 Zinc coating, unless otherwise noted, all steel material shall be (Grade A) 1.8 oz of zinc, inside and out.

3.4.1 Class 1 steel pipe, grades A and B.

Schedule 40 must conform to ASTM F 1083.

“SS-40” must be 50,000 psi – minimum yield strength (this is standard).

3.5 Posts (Table I)

<u>Post Type</u>	<u>Fabric Heights</u>	<u>Size</u>
Terminal	<= 6 ft	2 3/8”
	> 6 ft	2 7/8”
Line	<= 6 ft	1 7/8”
	>6, <= 8 ft	2 3/8”
	>8 ft	2 7/8”
Gate	<u>Leaf Width</u>	
	<=6 ft	2 7/8”
	<=13 ft	4”
	<=18 ft	6 5/8”
	<=23 ft	8 5/8”

3.6 Top rails – see drawings or ordering info.

3.6.2 Braces

If no top rail – must brace gates and terminals.

If >= 6 ft high, braces must be included. 5/16” truss rod and tightener.

If >9 ft high, double braces must be included.

RR-F-191/4E CHAIN LINK FENCE ACCESSORIES

3.2 Zinc coating. All steel items, minimum of 1.2 oz.

3.3 Color. If specified, see previous.

3.4 Pressed steel is allowed.

3.4.4 Wire ties – 15” spacing for line posts. 24” spacing for top rail or for hog-rings. If hog-rings, size => fabric size and material.

3.4.5 Brace and tension bands – 3/4” wide by .1” thk, 15” spacing.

3.4.6 Tension bars

For 1 3/4” and 2” fabric – 3/4” x 3/16”.

For 1” mesh, 3/8” x 3/16” or equal cross section (>=.0703 sq. in).

3.4.7 Tension wire must be used if no top rail. Marcellled. Bottom always. 7 gage .177” core dia. 1.2 oz.

4.4.3 Barb arms – must withstand a vertical load on the end of 250#.

7.0 GATES

Section 142.3 California Labor Code, 11-22-2007. General Industrial Safety Orders/Horizontal Sliding Gates.

S3324 Horizontal Sliding Gates.

- (a) Must be equipped with positive stops or devices that limit the gate travel to the designed fully open and closed positions.
- (b) These stops shall be constructed, installed and maintained by a qualified person to resist impact loads in order to safely contain sliding gate components within the designed stop limits.
- (c) Employees responsible for operating or inspecting the gates shall be instructed in the safe operation of such gates.
- (d) Repairs to gate hardware shall only be performed by a qualified person.

8.0 ORNAMENTAL METAL

ASTM A 702-13 SPECIFICATION FOR WROUGHT IRON

ASTM F 900-11 COMMERCIAL AND INDUSTRIAL SWING GATES

See additional details on page 4 above.

Post footing – see ASTM F 567.

Automated Vehicle Gates – see ASTM F 2200.

Fabrication:

Gates $\leq 6'$ high – 1 1/2" sq TS frame, 1.84 #/ft, minimum (11 gage).

Gates $> 6'$ high – 2" sq TS frame, 2.52 #/ft, minimum (11 gage).

ASTM F 1908-98 RESIDENTIAL OUTDOOR SWIMMING POOL FENCES –See details, above.

ASTM F 2049-09b FENCES FOR COMMERCIAL, PUBLIC AND MULTI-FAMILY PLAY AREAS – See details above in Chain Link.

ASTM F 2408-11 ORNAMENTAL FENCES USING GALVANIZED STEEL PICKETS

5.1 Tubular picket fences shall be galvanized before or after forming by the hot-dip process.

5.1.1 Galvanized after forming – minimum .3 oz/sq. ft. outside, and .3 mils interior.

5.1.2 Materials.

G-90 coating is also acceptable - .9 oz/ft².

Sizes:

<u>Application</u>	<u>Component</u>	<u>Cross Section</u>	<u>Wall thkness.</u>
Residential	Picket	5/8" x 5/8 "	18 ga.
	Rail	1" x 1"	18 ga.
	Post	2" x 2 "	16 ga.
Light Ind. (Comm.)	Picket	3/4" x 3/4 "	16 ga.
	Rail	1 3/8" x 1 1/2"	14 ga.
	Or	1 1/2" x 1 1/2"	
	Post	2 1/2" x 2 1/2 "	14 ga.
Industrial	Picket	1" x 1 "	16 ga.

Rail	1 3/8" x 1 1/2"	14 ga.
Or	1 1/2" x 1 1/2"	
Post	3" x 3"	12 ga.

Material Coatings

Industrial or Commercial, hot-dip coating minimum .9 oz/sq.ft or G-90.

Residential - minimum .6oz./sq.ft or G-60.

5.2.1 Polyester or epoxy – minimum 3 mils. Polyolefin – 7 mils. PVC – 10 mils.

8.1 Structural testing is also identified. Expensive.

ASTM F 2453/F2453M – 14 (NEW) WELDED WIRE MESH FABRIC ≤ 6 in². IN PANELS OR ROLLS. UNIFORM MESHES.

4.1.1 Type 1 – pregalvanized wire, welded wire mesh.

4.1.2 Type 2 – galvanized after weaving and welding.

4.1.3 Type 3 – 5% zinc aluminum-mischmetal.

4.1.4 Type 4 – uses zinc coated wire.

4.1.5 Polymer coated Type 1 or Type 2.

For mesh made in panels – see Table 1 and for mesh made in rolls – see Table 2.

Table 1 – Mesh in panels.

Vertical Spacing – 1/2" and 2" using 6 1/2 - 11 gage wire.

Horizontal Spacing – 2" and 3".

Table 2 – Mesh in rolls.

Vertical Spacing – 1" through 3" using 6 1/2 - 12 gage wire.

Horizontal Spacing – 1/2" though 2.4".

12. Also specifies testing. Expensive.

ASTM F 2548-12 (NEW) EXPANDED METAL FENCE SYSTEMS FOR SECURITY PURPOSES.

4.1 Materials must meet ASTM F 1267

4.2.1 Type 1 – Expanded metal mesh.

4.2.2 Type 2 – Expanded and flattened metal mesh.

4.3.1 Class 1 – uncoated.

4.3.2 Class 2 – hot dip zinc coated.

4.3.3 Class 3 – corrosion resisting steel.

Specs include: diamond orientation, gage, panel size, framework, gates, fittings, anti-climb and below grade tunneling prevention and wind load caution.

ASTM F 2598-11 ORNAMENTAL FENCES USING STEEL PICKETS

4.1 Tubular picket fences shall be made from ASTM A 500 or A501 steel with a minimum yield strength of 45,000 psi.

4.2 Organic Coating Materials.

4.2.1 Powder coatings, any of the following:

Polyester or polyester and epoxy – minimum 3 mils.

Polyolefin elastomer – minimum 7 mils.

PVC – minimum 10 mils.

4.2.2 Wet coatings (painted), any of the following, in a two-coat process:

One coat epoxy, polyester or polyurethane primer and,

One coat polyester, polyurethane or acrylic finish, to a minimum combined thickness of 2 mils.

5.1.1 Material Sizes:

<u>Application</u>	<u>Component</u>	<u>Cross Section</u>	<u>Wall thkness.</u>
Residential	Picket	5/8" x 5/8 "	18 ga.
	Rail	1" x 1"	18 ga.
	Post	2" x 2 "	16 ga.
Light Ind. (Comm.)	Picket	3/4" x 3/4 "	16 ga.
	Rail	1 3/8" x 1 1/2"	14 ga.
	Or	1 1/2" x 1 1/2"	
	Post	2 1/2" x 2 1/2 "	14 ga.
Industrial	Picket	1" x 1 "	16 ga.
	Rail	1 3/8" x 1 1/2"	14 ga.
	Or	1 1/2" x 1 1/2"	
	Post	3" x 3 "	12 ga.

7. Structural testing is required – expensive.

ASTM F 2656-07 STANDARD TEST METHOD FOR VEHICLE CRASH TESTING OF PERIMETER BARRIERS

ANTI-RAM SECURITY FENCE CRASH RATINGS:

K-4 MP30 - 15,000# vehicle, 30 mph, < 36" penetration.

K-8 MP40 - 15,000# vehicle, 40 mph, < 36" penetration.

K-12 MP50/P1 – 15,000# vehicle, 50 mph, < 36" penetration.

ADDITIONAL SPECIFICATIONS

Preparation of steel surfaces prior to painting or coating.

SSPC-SP 1 SOLVENT CLEANING OF STEEL SURFACES – Standard shop practice.

SSPC-CP 2 CLEANING WITH HAND TOOLS – additional shop labor required.

SSPC-CP 3 CLEANING WITH POWER TOOLS – additional, greater shop labor required.

SSPC-CP 5 and beyond – outside subcontract cleaning and coating.

FENCE CRASH RATINGS

SD-STD-02.01 U.S. Department of State, Federal Crash Ratings.

K 4 – 30 mph, 15,000 # vehicle, penetration < 1 meter.

K 8 – 40 mph.

K 12 – 50 mph.

9.0 WOOD AND RELATED MATERIALS

ASTM F 537-01 (2007) DESIGN, FABRICATION AND INSTALLATION OF WOOD FENCES

4. Fence Types.

4.2 Type I – Rail fences.

4.3 Type II – Board fences.

4.4 Type III – Picket fences.

- 4.5 Type IV – Solid panel fences.
- 5. See Standard Tables 1-8 for materials by species, specifications, grading, classifications.
- 8. Species of Wood. See Tables 9-11 for general properties comparisons for softwoods and hardwoods.
- 11.5 Post footings – see Table 14 for hole sizes.
- 11.6 Metal Posts.
- 11.7 Fasteners. See Table 15 for type and length.
- 12. Finishes on wood fences.

ASTM F 1908-98 RESIDENTIAL OUTDOOR SWIMMING POOL FENCES-See above.

10.0 PVC FENCES (RIGID POLY VINYL CHLORIDE)

ASTM F 964-13 RIGID POLY (PVC) EXTERIOR PROFILES FOR FENCES AND RAILS
Dimensional, physical, structural and other performance requirements.

ASTM F 1999-00 (06) INSTALLING PVC FENCES

7.1.1 Post holes. Diameter - 4” greater than largest cross-section of the post.

Depth – 24” minimum plus 3” per foot of height over 4’.

7.1.2 Add 6” to depth in frost/freeze zones.

11.0 WELDED AND EXPANDED WIRE MESH

ASTM F 2453 & 2453 M-14 WELDED WIRE MESH AND COATED MESHES,

For 6” square or less, uniform panels.

4.1.1 Type 1 is zinc coated GBW (galvanized before welding).

4.1.2 Type 2 is GAW.

4.1.3 Type 3 is Zinc-5% coated aluminum mischmetal alloy.

4.1.4 Type 4 is zinc coated is GBW, polymer coated.

ASTM F 2548-12 EXPANDED METAL MESH SYSTEM FOR SECURITY PURPOSES.

4.2 Type.

4.2.1 Type 1 – expanded.

4.2.2 Type 2 – expanded and flattened.

4.3 Class.

4.3.1 Class 1 – uncoated.

4.3.2 Class 2 – hot dip coated.

4.3.3 Class 3 – corrosion resistant steel.

12. AUTOMATION SYSTEMS

ASTM F 2200-13 CONSTRUCTION OF AUTOMATED VEHICLE GATES

3.3 Class I Gate – residential automated gate for 1- 4 single family dwellings.

3.4 Class II Gate – for commercial and multi-family housing (5 or more).

3.5 Class III Gate – for industrial buildings, not intended for the general public.

3.6 Class IV Gate – for guard controlled gates, (visible, manual control only – pushbuttons).

- Unauthorized access is prevented via supervised security personnel.
- 4.2 Gates shall be designed and constructed to not fall over more than 45 degrees when detached from the supporting hardware. (Design assumptions – roll gate with ground wheel and roller guide wheels are “gone”. Gate safety post and/or gate hook framework prevents “fall-over” and gate stops prevent gate from going beyond the welded gate stops. “Worst-case scenario” is: gate tries to pivot and fall over in the closed position.
 - 4.3 Gates shall have smooth bottom edges.
 - 4.4 Minimum height for barbed tape is 8’. Per ASTM F 1911-05, the bottom of the coil shall be, at minimum 7’.
 - 4.5 Minimum height for barbed wire is 6’ above grade.
 - 4.7 No gate latches on automated gates.
 - 4.8.6 Bottom gate retainers shall be allowed on Class IV applications.
 - 4.9 Gate movement shall not be initiated by gravity when the automatic gate operator is disconnected.
 - 4.10 Pedestrian gates shall not be incorporated into a vehicular gate. A separate pedestrian gate shall be provided.
 - 5.0 Any non-automated gate shall comply with these standards when automated.
 - 6. **Vehicle Horizontal Slide Gates.**
 - 6.1 For Class I through III
 - 6.1.1 All weight bearing, exposed rollers shall be guarded or covered up to 8’ above grade.
 - 6.1.2 All exposed openings shall be limited to 2 ¼” up to 72” above grade.
 - 6.1.3 All exposed openings shall be limited to 4” above 72” above grade.
 - 6.1.4 Positive gate stops shall be required for both open and closed positions.
 - 6.1.5 Gates shall enter a receiver stop.
 - 6.1.5.1 Gates shall be recessed behind the leading edge of the receiver post.
 - 7. **Vehicle Swing Gates.**
 - 7.1 For Class I through III
 - 7.1.1 No entrapment area allowed between the gate and supporting structure.
 - 7.1.1.1 Gaps shall not exceed 4” unless...
 - 7.1.1.2 they exceed 16”.

UL-325 MIMIMUM REQUIREMENTS FOR AUTOMATED VEHICLE GATES
 Swing gates: see A-1 Standard Drawing UL-325SW.
 Roll gates: see A-1 Standard Drawing UL-325RL.

13.0 POST FOOTINGS

ASTM C 33 ROCK (In concrete mix) As standard, we use rock that meets this specification.

ASTM C 150 CEMENT As standard, we use Type II / V Cement for post footings. 2500 psi.

ASTM C1107 M - 08 STANDARD SPECIFICATION FOR PACKAGED DRY, HYDRAULIC-CEMENT GROUT (NONSHRINK)

ASTM C 1600 RAPID HARDENING HYDRAULIC CEMENT

If needed, the mix design for this is ASTM C 928.

“Por Rok” is one of many brand named rapid hardening hydraulic cements.

ASTM F 567-07 FOOTING SIZE For size of post footings, see above details.

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Concrete: 201-1.1.2(A) Specifies Class 500-C-2500.

201-1.4.1 Allows hand mixing where machine mixing is impractical.

201-1.4.4 Hand Mixing is permitted for less than 1 cubic yard. Each batch not to exceed 1/3 cu. yd.

DISCLAIMER

These specifications are commonly referenced in the fence industry. Selected paragraphs from these specs are also shown, along with a brief, edited summary of the included information. They are offered without consideration, for the exclusive benefit of our customers. This summary is not comprehensive and is not to be reprinted, copied or used by any other entity, for any other reason.

These specifications do not necessarily agree with any design/build or “standard methods and practices” used in the industry or, specifically any of those used by A-1 Fence Company.

The specific, detailed information (not the specification) must be shown on the contract and the crew’s work order if a specific requirement is to be met.

ASTM (American Society of Testing and Materials) nomenclature generally shows the specification number followed by the year (“-“ two digit year) that the spec was modified. If no new modification date is shown, the most recent year it has been reviewed will be shown in parentheses. In general, ASTM will review each specification every four years, or before.