32 31 00/AME
Buyline 5862

Ameristar Fence Products

Architectural Metal Fences & Gates

Ornamental Steel • Ornamental Welded
High Security Steel • Anti-Ram Barrier System • Ornamental Aluminum
Color Chain Link Framework • Galvanized Chain Link Framework
Swing & Slide Gates

PRODUCT SUMMARY

Ameristar® manufactures a wide variety of Architectural Metal Fence Systems to ensure a quality fence for every design need. Whether for high security, heavy industrial, or commercial business applications, Ameristar® has the answer.

DEFINING FEATURES

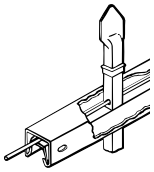
Any truly great product must have a defining feature that sets it apart from all others; Ameristar® fence systems have several features that make them superior to those of competing manufacturers.

DESIGN INNOVATION

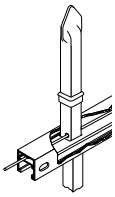
Ameristar® has developed unique (patented or patents pending) product designs that simultaneously expand structural capabilities and increase aesthetic value of its architectural fence systems.

ForeRunner™ Rail

The primary differentiating factor in Ameristar's Aegis II®, Aegis Plus®, and Echelon II® ornamental fence systems is the ForeRunner™ internal retaining rod picket-to-rail joining system. Panels employing this unique system present an attractive "good neighbor" look with no exposed fasteners.



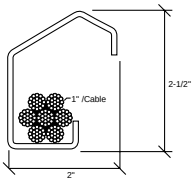
Aegis II® and Aegis Plus®
(Pages 6,7 and 12)



Echelon II®
(Pages 22 and 23)

Stalwart® Cables

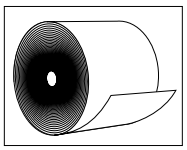
In Ameristar's high security Impasse® anti-ram fence barrier, the differentiating concept is the integrated Stalwart® cable system. The posts and horizontal rails are designed to double as conduits to carry high-strength anti-ram cables without compromising the excellent aesthetic appearance of the fence.



Stalwart® Cable and Rail
(Pages 20 and 21)

TOTAL PROCESS CONTROL

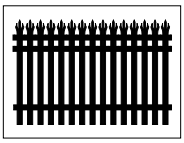
RAW MATERIAL



Coil Steel

Ameristar® is America's only architectural metal fence manufacturer who controls all manufacturing processes and all quality criteria from receipt of raw material to completion of finished product, totally inside the factory. This direct manufacturing throughput system coupled with the fast pace of Ameristar's Speed of Business™ ensures a very competitive initial cost, while Ameristar's superior structural design and premium PermaCoat® finish guarantee a significantly lower long-term cost.

FINISHED PRODUCT



Complete System

AMERISTAR FENCE PRODUCTS - TULSA, OKLAHOMA

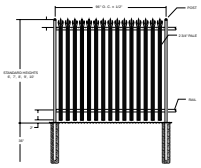
HIGH SPEED TUBE MILL	MULTI-PASS ROLL FORM	METAL PROCESSING, FITTINGS & GATE MFG.	PERMACOAT® ELECTROSTATIC POWDER COATING	FINISHED GOODS, PACKAGING & MARKING	READILY AVAILABLE INVENTORY	LOGISTICAL ROUTING, LOADING, & SHIPPING

QUALITY CONTROL

COMPREHENSIVE TECHNICAL SUPPORT

Architectural Binder

The shop drawing shown is one of several shop drawings contained in the Ameristar® Architectural Binder, which is available upon request. Ameristar's standard technical information in the form of drawings, specifications, photographic examples, and warranties, is provided in hard copy format. The binder addresses all Ameristar® high security, industrial, and commercial architectural metal fence and gate systems including Impasse®, Stalwart®, Aegis Plus® & Aeigs II®, Montage Plus® and Echelon Plus® & Echelon II®, as well as PermaCoat® and GalvOnAll™ chain link fence products.



Compact Disc

All Ameristar® high security, ornamental, and chain link fence system technical data is also available on CD format. On the new CD, architects will find digital photographs and electronic specifications and drawings pertaining to all of Ameristar's architectural metal fence and gate systems, as well as relevant data on the multi-stage electrostatic coating process for high security and industrial/commercial applications.

Internet Website

The Ameristar® architectural website (http://www.ameristarfence.com) enables the user to browse all of Ameristar's product lines. The site is complete with photos, drawings, specifications and installation procedures.

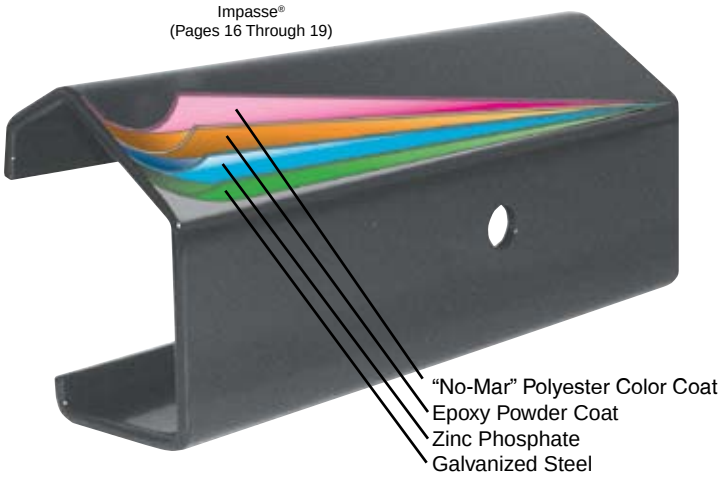
Ameristar's electronic media enable architects and specifiers to simply download specification information directly into the appropriate section of their CSI-formatted project specifications; they also enable the direct downloading of product drawings onto project blueprints.

DEFINING FEATURES

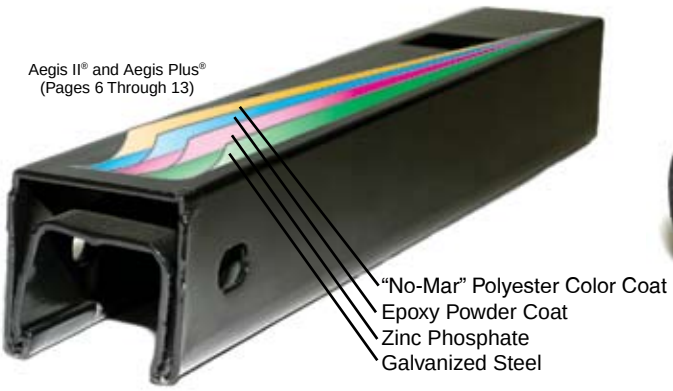
SUPERIOR COATING PROCESS

Impasse® High Security Fences, Aegis II® Industrial Ornamental Steel Fences, Aegis Plus® Commercial Ornamental Steel Fences, and PermaCoat® Industrial and Commercial Color Chain Link Framework are all protected with Ameristar's unique PermaCoat double coating process. The steel base material has a hot-dip galvanized coating, specially developed for subsequent application of powder coating. The galvanized substrate is subjected to the PermaCoat® process, a complete thermal stratification (multi-stage, high-temperature, multi-layer) electrostatic powder application system of both epoxy and polyester. The PermaCoat® powder coating system results in finished surfaces with unmatched performance. The base coat of epoxy powder far surpasses the corrosion resisting abilities of painted surfaces. The "no-mar" polyester powder top coat dramatically increases weathering resistance (color and gloss retention) and reduces scratches and burnishing marks normally encountered during shipping.

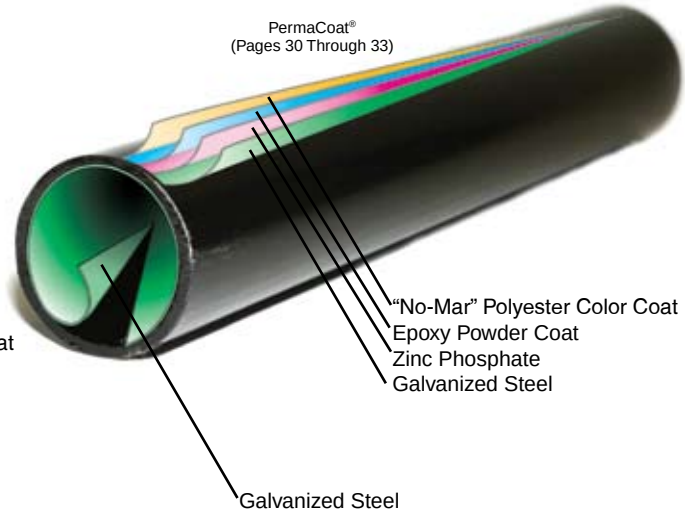
Impasse®
(Pages 16 Through 19)



Aegis II® and Aegis Plus®
(Pages 6 Through 13)



PermaCoat®
(Pages 30 Through 33)

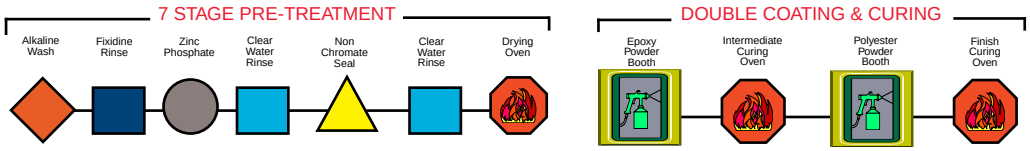


DEFINING FEATURES

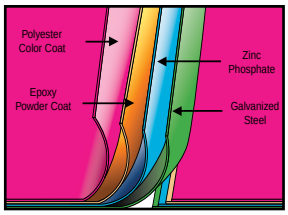
SUPERIOR PERMACOAT® PROCESS

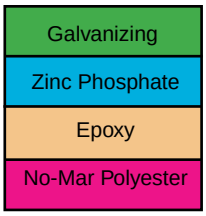
AMERISTAR® PERMACOAT® (DOUBLE COATED)

11 Stage PermaCoat® Double-Coating Process



All fence parts, gates and accessories are given complete PermaCoat® application.

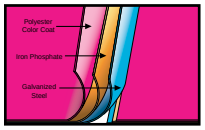


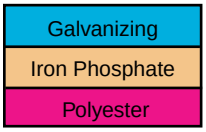


Zinc compounds are used in the phosphatizing process because they add a significant amount of sacrificial cathodic protection. The zinc is much more active than steel; therefore, the zinc must oxidize before the steel is free to corrode. Iron phosphate, by contrast, provides no sacrificial cathodic advantage when applied to steel.

TYPICAL COMPETITOR PROCESSES

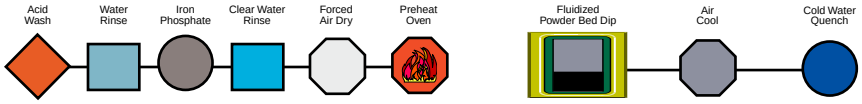
CONVENTIONAL POLYESTER (ONE COAT)

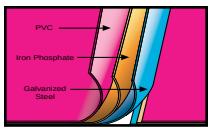


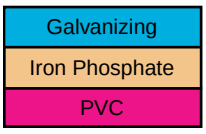


Simultaneous cleaning and phosphatizing significantly decreases the effectiveness of both treatments.

CONVENTIONAL PVC (ONE COAT)

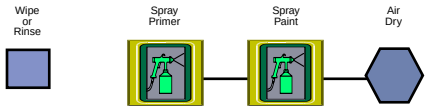


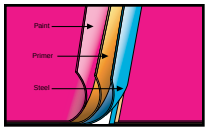


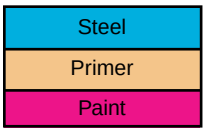


Curing is by a melt and quench process wherein the PVC material solidifies against the base metal surface. Adhesion is suspect and can vary greatly with small ambient changes.

PAINT SYSTEM





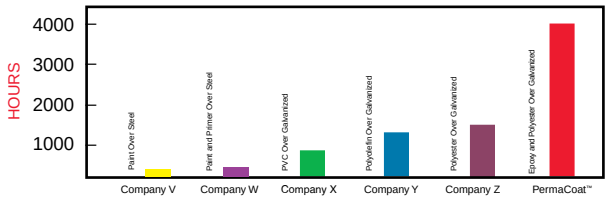


Welded steel fences are frequently painted or single-coated without pre-treatment. No transition protection between base material and paint with this process.

SUPERIOR CORROSION RESISTANCE

PermaCoat® significantly exceeds paint, polyolefin, PVC, and one coat polyester finishes in its ability to resist corrosion. ASTM B117 test results below show the dramatic difference.

ASTM B117 SALT SPRAY TESTING*
(Showing Relative Capability to Resist Corrosion)

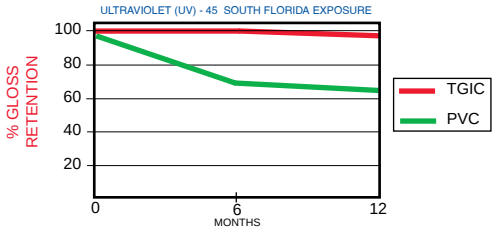


* Testing to ASTM B-117 with scribe to ASTM D1654 - Failure mode of 1/8-inch undercut or medium #8 blisters.

SUPERIOR UV RESISTANCE

PermaCoat®is far superior to PVC in resistance to the harmful effects of UV radiation, as shown below using South Florida exposure tests.

OUTDOOR ENVIRONMENT
Comparison of PVC and TGIC (Polyester)

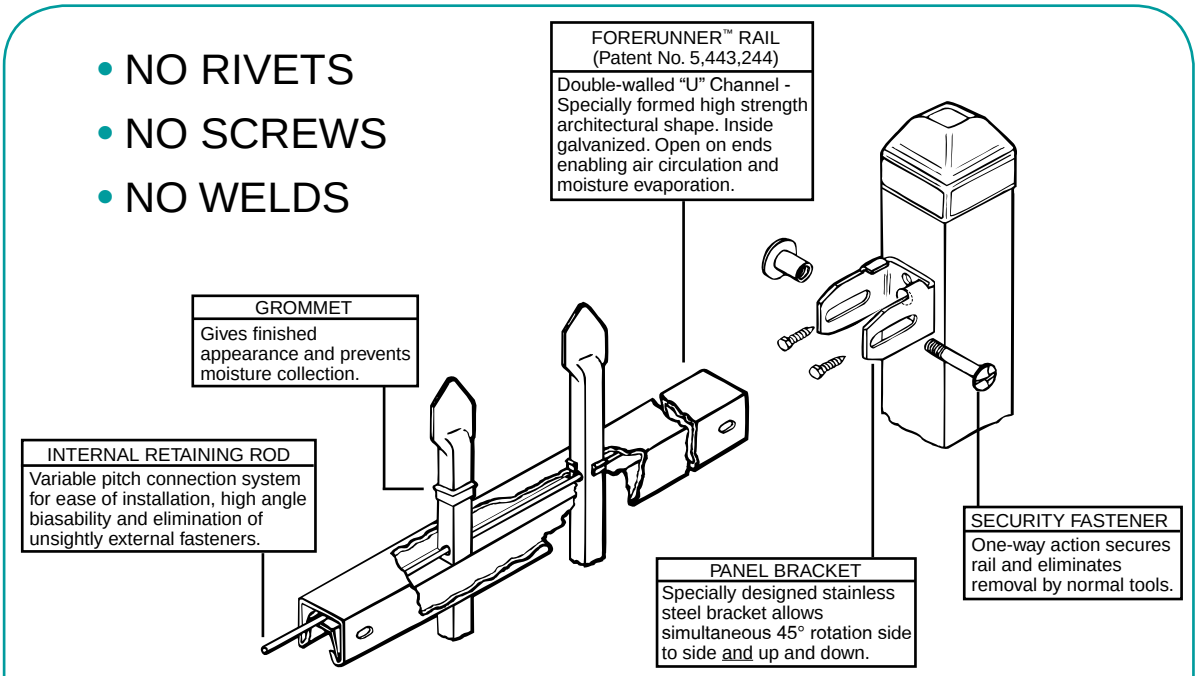


AEGIS II®

The Product Leader in Ornamental Fence

Aegis® - A revolutionary system of fence posts, framework and mounting accessories that are easily assembled to form an attractive "good neighbor" appearance with no exposed fasteners. Any truly great product must have a defining feature that sets it apart from all others; Ameristar's Aegis® fences, including Aegis II® Industrial and Aegis Plus® Commercial, has two such features:

- NO RIVETS
- NO SCREWS
- NO WELDS



AMERISTAR® AEGIS II®
WITH FORERUNNER™ RAIL & RETAINING ROD

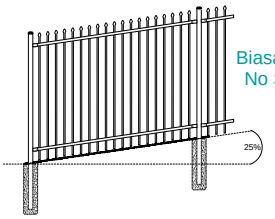
MOST PREVALENTLY SPECIFIED

8 out of 10 industrial ornamental fence specifications call for Aegis II® by Ameristar.

MOST PROFESSIONALLY INSTALLED

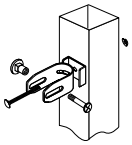
Ameristar ensures that only the best professional fence contractors install Aegis II®. Contractor experience is supplemented by special training presented at Ameristar's Tulsa training facility.

MOST FUNCTIONAL DESIGN



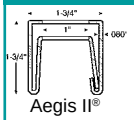
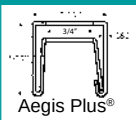
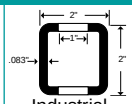
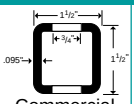
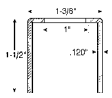
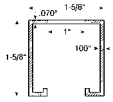
Biasability a minimum of 25%
No Stair Stepping Required

Industrial swivel bracket



Bracket allows simultaneous 45° rotation side to side and up and down.

RAIL STRENGTH

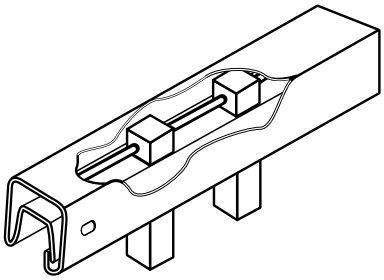
ForeRunner™ (Steel)	ForeRunner™ (Steel)	Structural Parameters			Square (Steel)	Square (Steel)	U-Channel (Steel)	U-Channel (Aluminum)
 Aegis II®	 Aegis Plus®	Profile of the Architectural Shape of the Rail *Vertical Design Loads are per rail; for capacity of fence panel, multiply by number of rails.			 Industrial	 Commercial		
.160	.160	T_{eff} = Effective Wall Thickness (IN)			.083	.095	.120	.100/.070
.1624	.1612	S_v = Section Modulus (IN) Vertical			.188	.115	.0938	.1350
.367	.254	S_h = Section Modulus (IN) Horizontal			.309	.147	.210	.260
2.55	2.13	W = Rail Weight (LBS/FT)			2.11	1.75	1.68	0.54
50,000	50,000	F_y = Yield Strength (PSI)			50,000	50,000	45,000	35,000
676#	652#	6' Span	Vertical Load Data PV_f = Ultimate Vertical	6' Span	523#	320#	- - - - -	262#
506#	492#	8' Span		8' Span	392#	239#	229#	- - - - -
1,020#	639#	6' Span	Horizontal Load Data PH_f = Ultimate Horizontal	6' Span	859#	409#	- - - - -	482#
765#	482#	8' Span		8' Span	644#	306#	438#	- - - - -
446#	430#	6' Span	* Vertical Load Data PV_d = Vertical Design Load @ .66 F_y	6' Span	345#	211#	- - - - -	173#
334#	325#	8' Span		8' Span	259#	158#	151#	- - - - -
673#	422#	6' Span	* Horizontal Load Data PH_d = Horizontal Design Load @ .66 F_y	6' Span	567#	270#	- - - - -	318#
505#	318#	8' Span		8' Span	425#	202#	289#	- - - - -

* RECOMMENDED LOAD VALUE FOR SAFE STRUCTURAL DESIGN (Allowable Strength = .66 F_y).

ATTACHMENT SECURITY

Picket To Rail

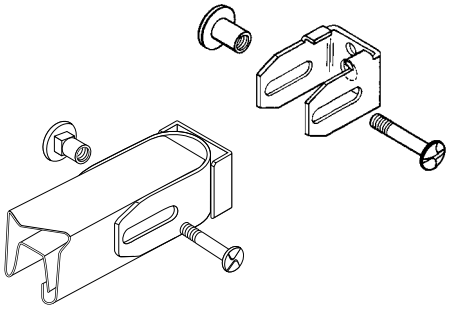
ForeRunner™ Rail
with Enclosed Retaining Rod



Rod is completely enclosed.
Attachment cannot be compromised.

Rail To Bracket

Security Fastener



One-way fastener cannot be loosened by
normally available tools.

PERMACOAT® FINISH

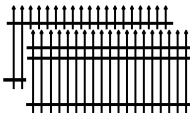
Ameristar's production facilities include a state-of-the-art polyester powder coating system providing Aegis II® fences with a finish that is far superior to other coatings in durability and scratch-resistance. Powder coating has become the fastest growing form of finishing technology. It does not emit hazardous volatile organic compounds as is the case with wet paints. Aegis II® fence components coated with PermaCoat® can endure over 3,500 hours of salt spray testing; proving the claim of long-lasting durability. With Aegis II® Industrial Steel, a maintenance-free, enviromentally-friendly fence is guaranteed. See Pages 4 and 5 for a detailed discussion of the PermaCoat® process and its comparative advantages over other coating systems.

COMPONENT SIZES

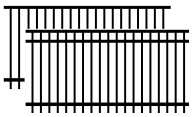
System	Pickets	Rails	Posts
Aegis II® Industrial	1" x 14 GA.	1-3/4" * x 14 GA. Double Wall	See Table To The Right

* Special Roll-Formed ForeRunner™ Shape

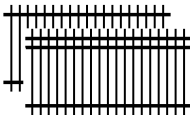
STYLES



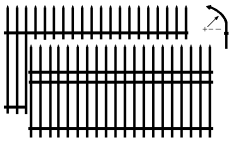
CLASSIC™
Style C2 (2-Rail)
Style C3 (3-Rail)



MAJESTIC™
Style M2 (2-Rail)
Style M3 (3-Rail)



GENESIS™
Style G2 (2-Rail)
Style G3 (3-Rail)



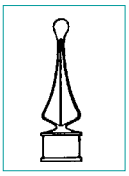
INVINCIBLE™
Style I2 (2-Rail)
Style I3 (3-Rail)

COLORS

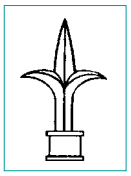
Request Color Chip samples for actual color

Black | Bronze | White | Desert Sand

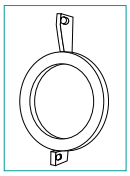
ADORNMENTS



Quad Flare



Triad



Ring

Ball Cap

GATES

Contact the Ameristar Architectural Department (800-321-8724) for detailed information and literature on gates.

WIND LOADING

Height (FT)	Rail Length	Post Size	Aegis II® Wind Load Capacity Factor (PSF)	Typical Wind Load Capacity (mph)
4	6	2-1/2" x 12 GA.	102.3	236
		3" x 12 GA.	122.8	259
	8	2-1/2" x 12 GA.	77.0	205
		3" x 12 GA.	92.2	224
5	6	2-1/2" x 12 GA.	65.5	189
		3" x 12 GA.	78.6	203
	8	2-1/2" x 12 GA.	49.3	164
		3" x 12 GA.	59.0	179
6	6	2-1/2" x 12 GA.	45.5	157
		3" x 12 GA.	54.6	172
	8	2-1/2" x 12 GA.	34.2	136
		3" x 12 GA.	41.0	149
7	6	2-1/2" x 12 GA.	33.4	135
		3" x 12 GA.	40.0	147
	8	2-1/2" x 12 GA.	25.0	116
		3" x 12 GA.	30.0	128
8	6	2-1/2" x 12 GA.	25.6	118
		3" x 12 GA.	30.7	129
	8	2-1/2" x 12 GA.	19.2	102
		3" x 12 GA.	23.0	112
		4" x 11 GA.	30.6	129
9	6	4" x 11 GA.	32.0	132
10	6	4" x 11 GA.	28.7	125

Note: Mph calculated using ANSI/ASCE 7-02, "American Society of Civil Engineers Minimum Design Loads for Buildings and Other Structures" Exposure Category C (open terrain with scattered obstructions having lengths generally less than 30 feet). For wind loading applicable to a particular specification, consult the appropriate Building Code.

AVAILABILITY

Shipping

Aegis II® Industrial Ornamental Fence components (e.g., pickets, rails, etc.) and TransPort™ Cantilever Gates are carefully packaged in heavy duty cardboard boxes to ensure the most economical damage-free shipping.

Ordering Information

To order, simply specify the fence or gate design series, color and height desired. Then figure and provide the quantities needed. Contact Ameristar® (888-333-3422) for the nearest distributor or if any other assistance is needed.

WARRANTY

A written 10 year limited warranty is extended on Ameristar's Aegis II® fence systems. Call Ameristar® for a copy.

MAINTENANCE

Little or no maintenance is required for the fence and gate systems supplied by Ameristar®. The PermaCoat® coated galvanized steel in Aegis II® and Aegis Plus® and the polyester coated aluminum in TransPort™ gates will remain corrosion free for years to come. If pickets or rails are damaged by accidental impact, the affected components can be easily replaced. Damages to coated surfaces can be readily covered with Ameristar's matching custom finishes (either spray or paint pen application).

Classic™

Ameristar's spear-pointed picket extends through the ForeRunner™ top rail to form the attractive traditional Classic™ design. The picket spear is formed with a 3/8" diameter rounded tip rather than a sharp point.

Majestic™

The Majestic™ design is formed to a configuration of contemporary simplicity that maintains a stately look of dignity.

Genesis™

The Genesis™ style offers extended pickets similar to the Classic™, but is differentiated by having a flat rather than spear-shaped picket top. Genesis™ is becoming increasingly popular as a perimeter for apartments and condominiums. Available in both 2 and 3-Rail styles.

Invincible™

Security and protection are combined with the beauty of ornamental fencing in the Invincible™ design. Each picket is spear-topped and extends 18" above the top rail, curving outward to make this fence very difficult to overcome, as the name implies.

CONSTRUCTION SPECIFICATION

SECTION 32 31 00 - ORNAMENTAL METAL FENCING SYSTEM

Aegis II® - Industrial Weight

(MEETS "BUY AMERICAN" DOMESTIC PROCUREMENTS)

PART 1 - GENERAL

1.01 WORK INCLUDED

The contractor shall provide all labor, materials and appurtenances necessary for installation of the industrial ornamental steel fence system defined herein at (specify project site).

1.02 RELATED WORK

Section 022 _ _ - Earthwork
Section 030 _ _ - Concrete

1.03 SYSTEM DESCRIPTION

The manufacturer shall supply a total industrial ornamental steel fence system of the Ameristar® Aegis II® (specify Classic™, Majestic™, Genesis™ or Invincible™) design. The system shall include all components (i.e., pickets, rails, posts, gates and hardware) required.

1.04 QUALITY ASSURANCE

The contractor shall provide laborers and supervisors who are thoroughly familiar with the type of construction involved and materials and techniques specified.

1.05 REFERENCES

ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy Coated (Galvannealed) by the Hot-Dip Process. ASTM B117 - Practice for Operating Salt-Spray (Fog) Apparatus. ASTM D523 - Test Method for Specular Gloss. ASTM D822 - Practice for Conducting Tests on Paint and Related Coatings and Materials using Filtered Open-Flame Carbon-Arc Light and Water Exposure Apparatus. ASTM D1654 - Test Method for Evaluation of Painted or Coated Specimens Subjected to Corrosive Environments. ASTM D2244 - Test Method for Calculations of Color Differences from Instrumentally Measured Color Coordinates. ASTM D2794 - Test Method for Resistance of Organic Coatings to The Effects of Rapid Deformation (Impact). ASTM D3359 - Test Method for Measuring Adhesion by Tape Test.

1.06 SUBMITTAL

The manufacturer's submittal package shall be provided prior to installation.

1.07 PRODUCT HANDLING AND STORAGE

Upon receipt at the job site, all materials shall be checked to ensure that no damage occurred during shipping or handling. Materials shall be stored in such a manner to ensure proper ventilation and drainage, and to protect against damage, weather, vandalism and theft.

PART 2 - MATERIALS

2.01 MANUFACTURER

The industrial ornamental steel fence system shall conform to Ameristar® AEGIS II®, (specify Classic™, Majestic™, Genesis™ or Invincible™) (specify 2-Rail, 3-Rail or 3-Rail with Rings) style manufactured by Ameristar® Fence Products, Inc., in Tulsa, Oklahoma.

2.02 MATERIAL

A. Steel material for fence framework (i.e., tubular pickets, rails and posts), when galvanized prior to forming, shall conform to the requirements of ASTM A924/A924M, with a minimum yield strength of 45,000 psi (344 MPa). The steel shall be hot-dip galvanized to meet the requirements of ASTM A653/A653M with a minimum zinc coating weight of 0.90 oz/ft^2 (276 g/m^2), Coating Designation G-90.

B. The manufactured galvanized framework shall be subjected to the PermaCoat® thermal stratification coating process (high-temperature, in-line, multi-stage, multi-layer) including, as a minimum, a six-stage pretreatment/wash (with zinc phosphate), an electrostatic spray application of an epoxy base, and a seperate electrostatic spray application of a polyester finish. The base coat shall be a thermosetting epoxy powder coating (gray in color) with a minimum thickness of 2 mils (0.0508mm). The topcoat shall be a "no-mar" TGIC polyester powder coat finish with a minimum thickness of 2 mils (0.0508mm). The color shall be (specify Black, Bronze, White or Desert Sand). The stratification-coated framework shall be capable of meeting the performance requirements for each quality characteristic shown in Table 1.

C. Material for fence pickets shall be 1" square x 14 Ga. tubing. The cross-sectional shape of the rails shall conform to the manufacturer's ForeRunner™ design with outside cross-section dimensions of 1.75" square and a minimum thickness of 14 Ga. Picket holes in the ForeRunner™ rail shall be spaced 4.715" o.c., except for Invincible™ style 6' long which shall be spaced 4.98" o.c. Picket retaining rods shall be 0.125" diameter galvanized steel. Posts shall be a minimum of 2-1/2" square x 12 Ga. High quality PVC grommets shall be supplied to seal all picket-to-rail intersections.

2.03 FABRICATION

A. Pickets, rails and posts shall be pre-cut to specified lengths. ForeRunner™ rails shall be pre-punched to accept pickets.

B. Grommets shall be inserted into the pre-punched holes in the rails and pickets shall be inserted through the grommets so that pre-drilled picket holes align with the internal upper raceway of the ForeRunner™ rails. (Note: This can best be accomplished by using an alignment template). Retaining rods shall be inserted into each ForeRunner™ rail so that they pass through the pre-drilled holes in each picket, thus completing the panel assembly.

C. Completed panels shall be capable of supporting a 600 lb. load (applied at midspan) without permanent deformation. Panels without rings shall be biasable to a 25% change in grade; panels with rings shall be biasable to a 12.5% change in grade.

D. Swing gates shall be fabricated using AEGIS II® panel material and gate ends having the same outside cross-section dimensions as the ForeRunner™ rail. All rail and upright intersections shall be joined by welding. All picket and rail intersections shall also be joined either by welding or by the same retaining rod process used for panel assembly.

PART 3 - EXECUTION

3.01 PREPARATION

All new installation shall be laid out by the contractor in accordance with the construction plans.

3.02 INSTALLATION

Fence posts shall be set in accordance with the spacings shown in Table 2, plus or minus 1/2", depending on the nominal span specified. Gate posts shall be spaced according to the gate openings specified in the construction plans. The "Earthwork" and "Concrete" sections of this specification shall govern post base material requirements. AEGIS II® panels shall be attached to posts using mechanically fastened panel brackets supplied by the manufacturer.

3.03 CLEANING

The contractor shall clean the jobsite of excess materials; post-hole excavations shall be scattered uniformly away from posts.

Table 1 - Coating Performance Requirements

Quality Characteristics	ASTM Test Method	Performance Requirments
Adhesion	D3359 - Method B	Adhesion (Retention of Coating) over 90% of test area (Tape and knife test).
Corrosion Resistance	B117 & D1654	Corrosion Resistance over 3,500 hours (Scribed per D1654; failure mode is accumulation of 1/8" coating loss from scribe or medium #8 blisters).
Impact Resistance	D2794	Impact Resistance over 60 inch lb. (Forward impact using 0.625" ball).
Weathering Resistance	D822, D2244, D523 (60° Method)	Weathering Resistance over 1,000 hours (Failure mode is 60% loss of gloss or color variance of more than 3 delta-E color units).

Table 2 - Post Spacing Requirements

Span	6' Nominal (67-3/4" Rail)				8' Nominal (92-5/8" Rail)			
Post Size	2-1/2"	3"	2-1/2"	3"	2-1/2"	3"	2-1/2"	3"
Bracket	Rigid		Swivel		Rigid		Swivel	
Straight Picket Post Settings +/- 1/2" O.C.	71-1/2"	72"	73"	73-1/2"	96"	96-1/2"	97-1/2"	98"
Curved Picket Post Settings +/- 1/2" O.C.	75"	75-1/2"	76-1/2"	77"	94-1/2"	95"	96"	96-1/2"

Aegis Plus®

Just the Right Size for Commercial Applications

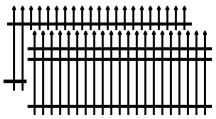
Commercial businesses finally have a high quality, competitively priced alternative to welded steel, aluminum and chain link. Painted steel that has been welded can rust soon after installation; ultra light aluminum fencing can be easily deformed by small climbing loads or impact loads. Aegis Plus® combines strength greater than most industrial steel fences with a surface finish that is essentially maintenance-free. The size also works well for residential users seeking greater strength and a more substantial look without the extremely high cost of heavy industrial fencing.

COMPONENT SIZES

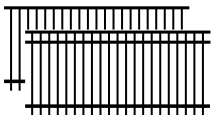
System	Pickets	Rails	Posts
Aegis Plus® Commercial	3/4" x 16 GA.	1-1/2" * x 14 GA.	See Table To The Right

* Special Roll-Formed ForeRunner™ Shape

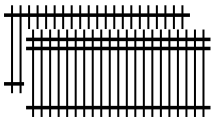
STYLES



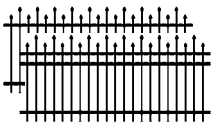
CLASSIC™
Style C2 (2-Rail)
Style C3 (3-Rail)



MAJESTIC™
Style M2 (2-Rail)
Style M3 (3-Rail)

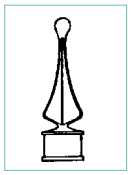


GENESIS™
Style G2 (2-Rail)
Style G3 (3-Rail)

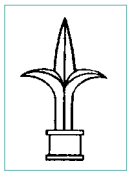


WARRIOR™
Style W2 (2-Rail)
Style W3 (3-Rail)

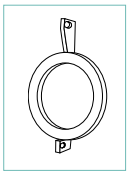
ADORNMENTS



Quad Flare



Triad



Ring

Ball Cap

GATES

Contact the Ameristar Architectural Department for detailed information and literature on gates.

WIND LOADING

Height (FT)	Rail Length	Post Size	Aegis Plus® Wind Load Capacity Factor (PSF)	Typical Wind Load Capacity (mph)
4	6	2-1/2" x 12 GA.	127.8	264
		3" x 12 GA.	152.6	288
	8	2-1/2" x 12 GA.	93.2	225
		3" x 12 GA.	111.2	246
5	6	2-1/2" x 12 GA.	82.1	211
		3" x 12 GA.	98.0	231
	8	2-1/2" x 12 GA.	59.8	180
		3" x 12 GA.	71.3	197
6	6	2-1/2" x 12 GA.	57.1	176
		3" x 12 GA.	68.2	193
	8	2-1/2" x 12 GA.	41.5	150
		3" x 12 GA.	49.6	164
7	6	2-1/2" x 12 GA.	42.0	151
		3" x 12 GA.	50.0	165
	8	2-1/2" x 12 GA.	30.4	128
		3" x 12 GA.	36.3	140
8	6	2-1/2" x 12 GA.	32.2	132
		3" x 12 GA.	38.4	144
	8	2-1/2" x 12 GA.	23.4	113
		3" x 12 GA.	27.9	123
		4" x 11 GA.	36.8	141
9	6	4" x 11 GA.	N/A	113
10	6	4" x 11 GA.	N/A	107

Note: Mph calculated using ANSI/ASCE 7-02, "American Society of Civil Engineers Minimum Design Loads for Buildings and Other Structures" Exposure Category C (open terrain with scattered obstructions having lengths generally less than 30 feet). For wind loading applicable to a particular specification, consult the appropriate Building Code.

COLORS, AVAILABILITY, WARRANTY & MAINTENANCE

Aegis Plus® color choices are the same as for Aegis II® (see Page 8). The availability, warranty and maintenance information of Aegis II® also applies to Aegis Plus® (see Page 8).

BIASABILITY

No Stair Stepping Required

Depending on style, some panels can be biased to follow a grade change of up to 25% (2 feet in 8 feet).

PERMACOAT® FINISH

See Pages 4 and 5 for a detailed discussion of the PermaCoat® process and its comparative advantages over other coating systems.

Aegis Plus® offers elegant style at an affordable price. Combined with a strength that exceeds typical industrial fences, Aegis Plus® is the best choice for the wide range of commercial and institutional projects that require perimeter fences.

CONSTRUCTION SPECIFICATION

SECTION 32 31 00 - ORNAMENTAL METAL FENCING SYSTEM

Aegis Plus® - Commercial Weight

(MEETS "BUY AMERICAN" DOMESTIC PROCUREMENTS)

PART 1 - GENERAL

1.01 WORK INCLUDED

The contractor shall provide all labor, materials and appurtenances necessary for installation of the commercial ornamental steel fence system defined herein at (specify project site).

1.02 RELATED WORK

Section 022 _ _ - Earthwork
Section 030 _ _ - Concrete

1.03 SYSTEM DESCRIPTION

The manufacturer shall supply a total commercial ornamental steel fence system of the Ameristar® Aegis Plus® (specify Classic™, Majestic™, Genesis™ or Warrior™) design. The system shall include all components (i.e., pickets, rails, posts, gates and hardware) required.

1.04 QUALITY ASSURANCE

The contractor shall provide laborers and supervisors who are thoroughly familiar with the type of construction involved and materials and techniques specified.

1.05 REFERENCES

ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy Coated (Galvannealed) by the Hot-Dip Process. ASTM B117 - Practice for Operating Salt-Spray (Fog) Apparatus. ASTM D523 - Test Method for Specular Gloss. ASTM D822 - Practice for Conducting Tests on Paint and Related Coatings and Materials using Filtered Open-Flame Carbon-Arc Light and Water Exposure Apparatus. ASTM D1654 - Test Method for Evaluation of Painted or Coated Specimens Subjected to Corrosive Environments. ASTM D2244 - Test Method for Calculation of Color Differences from Instrumentally Measured Color Coordinates. ASTM D2794 - Test Method for Resistance of Organic Coatings to The Effects of Rapid Deformation (Impact). ASTM D3359 - Test Method for Measuring Adhesion by Tape Test.

1.06 SUBMITTAL

The manufacturer's submittal package shall be provided prior to installation.

1.07 PRODUCT HANDLING AND STORAGE

Upon receipt at the job site, all materials shall be checked to ensure that no damage occurred during shipping or handling. Materials shall be stored in such a manner to ensure proper ventilation and drainage, and to protect against damage, weather, vandalism and theft.

PART 2 - MATERIALS

2.01 MANUFACTURER

The commercial ornamental steel fence system shall conform to Ameristar® AEGIS Plus®, (specify Classic™, Majestic™, Genesis™ or Warrior™) (specify 2-Rail, 3-Rail or 3-Rail with Rings) style manufactured by Ameristar® Fence Products, Inc., in Tulsa, Oklahoma.

2.02 MATERIAL

A. Steel material for fence framework (i.e., tubular pickets, rails and posts), when galvanized prior to forming, shall conform to the requirements of ASTM A924/A924M, with a minimum yield strength of 45,000 psi (344 MPa). The steel shall be hot-dip galvanized to meet the requirements of ASTM A653/A653M with a minimum zinc coating weight of 0.60 oz/ft^2 (184 g/m^2), Coating Designation G-60.

B. The manufactured galvanized framework shall be subjected to the PermaCoat® thermal stratification coating process (high-temperature, in-line, multi-stage, multi-layer) including, as a minimum, a six-stage pretreatment/wash (with zinc phosphate), an electrostatic spray application of an epoxy base, and a separate electrostatic spray application of a polyester finish. The base coat shall be a thermosetting epoxy powder coating (gray in color) with a minimum thickness of 2 mils (0.0508mm). The topcoat shall be a "no-mar" TGIC polyester powder coat finish with a minimum thickness of 2 mils (0.0508mm). The color shall be (specify Black, Bronze, White or Desert Sand). The stratification-coated framework shall be capable of meeting the performance requirements for each quality characteristic shown in Table 1.

C. Material for fence pickets shall be 3/4" square x 16 Ga. tubing. The cross-sectional shape of the rails shall conform to the manufacturer's ForeRunner™ design with outside cross-section dimensions of 1.50" square and a minimum thickness of 14 Ga. Picket holes in the ForeRunner™ rail shall be spaced 4.70" o.c. Picket retaining rods shall be 0.125" diameter galvanized steel. Posts shall be a minimum of 2-1/2" square x 12 Ga. High quality PVC grommets shall be supplied to seal all picket-to-rail intersections.

2.03 FABRICATION

A. Pickets, rails and posts shall be pre-cut to specified lengths. ForeRunner™ rails shall be pre-punched to accept pickets.

B. Grommets shall be inserted into the pre-punched holes in the rails and pickets shall be inserted through the grommets so that pre-drilled picket holes align with the internal upper raceway of the ForeRunner™ rails. (Note: This can best be accomplished by using an alignment template). Retaining rods shall be inserted into each ForeRunner™ rail so that they pass through the pre-drilled holes in each picket, thus completing the panel assembly.

C. Completed panels shall be capable of supporting a 400 lb. load (applied at midspan) without permanent deformation. Panels without rings shall be biasable to a 25% change in grade; panels with rings shall be biasable to a 12.5% change in grade.

D. Swing gates shall be fabricated using AEGIS Plus® panel material and gate ends having the same outside cross-section dimensions as the ForeRunner™ rail. All rail and upright intersections shall be joined by welding. All picket and rail intersections shall also be joined either by welding or by the same retaining rod process used for panel assembly.

PART 3 - EXECUTION

3.01 PREPARATION

All new installation shall be laid out by the contractor in accordance with the construction plans.

3.02 INSTALLATION

Fence posts shall be set in accordance with the spacings shown in Table 2, plus or minus 1/2", depending on the nominal span specified. Gate posts shall be spaced according to the gate openings specified in the construction plans. The "Earthwork" and "Concrete" sections of this specification shall govern post base material requirements. AEGIS Plus® panels shall be attached to posts using mechanically fastened panel brackets supplied by the manufacturer.

3.03 CLEANING

The contractor shall clean the jobsite of excess materials; post-hole excavations shall be scattered uniformly away from posts.

Table 1 - Coating Performance Requirements

Quality Characteristics	ASTM Test Method	Performance Requirments
Adhesion	D3359 - Method B	Adhesion (Retention of Coating) over 90% of test area (Tape and knife test).
Corrosion Resistance	B117 & D1654	Corrosion Resistance over 3,500 hours (Scribed per D1654; failure mode is accumulation of 1/8" coating loss from scribe or medium #8 blisters).
Impact Resistance	D2794	Impact Resistance over 60 inch lb. (Forward impact using 0.625" ball).
Weathering Resistance	D822, D2244, D523 (60° Method)	Weathering Resistance over 1,000 hours (Failure mode is 60% loss of gloss or color variance of more than 3 delta-E color units).

Table 2 - Post Spacing Requirements

Span	6' Nominal (73-1/4" Rail)		8' Nominal (92" Rail)	
Post Size	2-1/2"	3"	2-1/2"	3"
Post Settings +/- 1/2" O.C.	76-3/4"	77-1/4"	95-1/2"	96"

Montage II®

Welded Steel Ornamental Fence

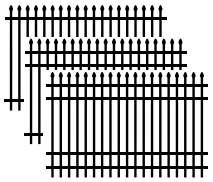
COMPONENT SIZES

System	Pickets	Rails	Posts
Montage II® Heavy Industrial	1" x 14 Ga.	1-3/4" x 1-3/4" x 0.105"	2-1/2" Sq. x 12 Ga. min. for fences up to & including 6' tall; 3" Sq. x 12 Ga. min. for 7' & 8' tall fences

20 YEAR WARRANTY

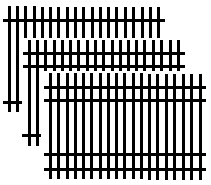
The E-Coat combination of galvanized steel, zinc phosphate pre-treatment, and epoxy and acrylic double coating provide the protection necessary to withstand adverse weathering effects and justify the 'best-in-the-business' 20 Year Warranty.

STYLES



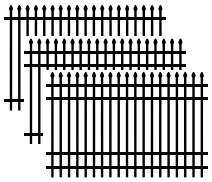
CLASSIC™
Style C2 (2-Rail)
Style C3 (3-Rail)
Style C4 (4-Rail)

The extended spear top of the Classic™ style gives the secure structure an added touch of elegance. Classic™ is available in 2-rail, 3-rail and 4-rail designs.



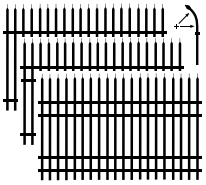
GENESIS™
Style G2 (2-Rail)
Style G3 (3-Rail)
Style G4 (4-Rail)

The Genesis™ acts as a foundation for creation of multiple custom looks by the addition of decorative finials. Genesis™ is available in 2-rail, 3-rail and 4-rail designs.



MAJESTIC™
Style M2 (2-Rail)
Style M3 (3-Rail)
Style M4 (4-Rail)

Majestic™ is a simple, yet elegant style with a smooth top rail, available in 2-rail, 3-rail and 4-rail designs. It is ideally suited for public pools, recreational areas, schools and other institutions.



INVINCIBLE®
Style I2 (2-Rail)
Style I3 (3-Rail)
Style I4 (4-Rail)

Invincible® means 'incapable of being overcome'. The gradual outward curve of the pickets makes this style a superior alternative to the chain link and barbed wire fences of the past. 2-rail, 3-rail and 4-rail profiles are available in 7' and 8' heights.

DESIGN ADVANTAGES

Maintenance-Free

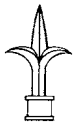
Montage II® panels are subjected to a thorough cleaning and zinc phosphate pretreatment and then, in Ameristar's state-of-the-art E-Coat system, are completely submerged twice, first in a moisture-resistant epoxy and secondly in a weather-resistant acrylic, to ensure protection over all exposed surfaces. Ameristar® uses the same cyclic testing technology, developed in the automotive industry, to ensure that Montage II® fences will endure harsh environments.

Fusion-Welded

Montage II® fence panels are fabricated using Ameristar's revolutionary ProFusion process that combines fusion and laser technology to automatically weld strong, virtually invisible, structural connections without unsightly or insecure fasteners. This rigid welded construction not only suits Montage II® for rigorous environments, but also makes it a popular choice for commercial applications like businesses, schools, and public parks and playgrounds.

ADORNMENTS

Quad Flare



Triad

Ball Cap

COLORS, AVAILABILITY & MAINTENANCE

Montage II® is available in black and bronze; color chip samples can be requested for actual color. Availability and maintenance information are the same as for the Aegis II® and Aegis Plus® steel fence systems.

- **All Terrain Flexibility (ATF)**

Unlike conventional welded panels that require stair-stepping along grades (leaving gaps and open areas below the fence), the all-terrain flexibility (ATF) of eight-foot long Montage II® Heavy Industrial panels allows racking up to 48" on Classic, Majestic and Genesis styles; up to 18" on Invincible® curved picket style.

- **Flush Bottom Rail Option**

For some applications, a flush bottom rail may be necessary to meet local building codes or simply to meet an aesthetic preference.

CONSTRUCTION SPECIFICATION

SECTION 32 31 00 - ORNAMENTAL WELDED FENCING SYSTEM

Montage II® - Heavy Industrial Weight

PART 1 - GENERAL
1.01 WORK INCLUDED
The contractor shall provide all labor, materials and appurtenances necessary for installation of the welded ornamental steel fence system defined herein at (specify project site).

1.02 RELATED WORK
Section __ __ __ - Earthwork
Section __ __ __ - Concrete

1.03 SYSTEM DESCRIPTION
The manufacturer shall supply a total fence system of Montage II ATF® Welded Ornamental Steel (specify Invincible®, Classic™, Majestic™, or Genesis™) design. The system shall include all components (i.e., panels, posts, gates and hardware) required.

1.04 QUALITY ASSURANCE
The contractor shall provide laborers and supervisors who are thoroughly familiar with the type of construction involved and materials and techniques specified.

1.05 REFERENCES
ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy Coated (Galvannealed) by the Hot-Dip Process. ASTM B117 - Practice for Operating Salt-Spray (Fog) Apparatus. ASTM D523 - Test Method for Specular Gloss. ASTM D714 - Test Method for Evaluating Degree of Blistering in Paint. ASTM D822 - Practice for Conducting Tests on Paint and Related Coatings and Materials using Filtered Open-Flame Carbon-Arc Light and Water Exposure Apparatus. ASTM D1654 - Test Method for Evaluation of Painted or Coated Specimens Subjected to Corrosive Environments. ASTM D2244 - Test Method for Calculation of Color Differences from Instrumentally Measured Color Coordinates. ASTM D2794 - Test Method for Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact). ASTM D3359 - Test Method for Measuring Adhesion by Tape Test.

1.06 SUBMITTAL
The manufacturer's literature shall be submitted prior to installation.

1.07 PRODUCT HANDLING AND STORAGE
Upon receipt at the job site, all materials shall be checked to ensure that no damage occurred during shipping or handling. Materials shall be stored in such a manner to ensure proper ventilation and drainage, and to protect against damage, weather, vandalism and theft.

PART 2 - MATERIALS
2.01 MANUFACTURER
The fence system shall conform to Montage II ATF® Welded Ornamental Steel, (specify Invincible®, Classic™, Majestic™, or Genesis™) design, (specify extended picket or flush) bottom rail treatment, (specify 2-Rail, 3-Rail or 4-Rail) style manufactured by Ameristar Fence Products, Inc., in Tulsa, Oklahoma.

2.02 MATERIAL
A. Steel material for fence panels and posts shall conform to the requirements of ASTM A653/A653M, with a minimum yield strength of 45,000 psi (344 MPa) and a minimum zinc (hot-dip galvanized) coating weight of 0.90 oz/ft2 (276 g/m2), Coating Designation G-90.

B. Material for pickets shall be 1" square x 14 Ga. tubing. The rails shall be steel channel, 1.75" x 1. 75" x .105". Picket holes in the rail shall be spaced 4.715" o.c. For fence systems up to and including 6 feet tall, posts shall be a minimum of 2-1/2" square x 12 Ga. For fence systems 7 feet tall and 8' tall, posts shall be a minimum of 3" square x 12 Ga. Gate posts shall meet the minimum requirements of Table 1.

2.03 FABRICATION
A. Pickets, rails and posts shall be pre-cut to specified lengths. Rails shall be pre-punched to accept pickets.

B. Pickets shall be inserted into the pre-punched holes in the rails and shall be aligned to standard spacing using a specially calibrated alignment fixture. The aligned pickets and rails shall be joined at each picket-to-rail intersection by Ameristar's proprietary fusion welding process, thus completing the rigid panel assembly (Note: The process produces a virtually seamless, spatter-free good-neighbor appearance, equally attractive from either side of the panel).

C. The manufactured panels shall be subjected to an inline electrodeposition coating (E-Coat) process consisting of a multi-stage pretreatment/wash (with zinc phosphate), followed by a duplex application of an epoxy primer and an acrylic topcoat. The minimum cumulative coating thickness of epoxy and acrylic shall be 2 mils (0.058 mm). The color shall be (specify Black or Bronze). The coated panels shall be capable of meeting the performance requirements for each quality characteristic shown in Table 2.

D. Gates shall be fabricated using welded ornamental panel material and gate ends having a 1-3/4" square cross-sectional size. All rail and upright intersections shall be joined by welding. All picket and rail intersections shall also be joined by welding.

PART 3 - EXECUTION
3.01 PREPARATION
All new installation shall be laid out by the contractor in accordance with the construction plans.

3.02 INSTALLATION
Fence posts shall be set according to Table 3, plus or minus ½". Fence panels shall be attached to posts with brackets supplied by the manufacturer. Gate posts shall be spaced according to the gate openings specified in the construction plans. The "Earthwork" and "Concrete" sections of this specification shall govern post base material requirements.

3.03 CLEANING
The contractor shall clean the jobsite of excess materials; post-hole excavations shall be scattered uniformly away from posts.

Table 1 – Minimum Sizes for Montage II Gate Posts

Gate Opening	Gate Height		
	Up To & Including 4'	Over 4', Up To & Including 6'	Over 6', Up To & Including 8'
Up To 4'	2-1/2" x 12 Ga.	3" x 12 Ga.	4" x 11 Ga.
4'-1" To 6'	3" x 12 Ga.	3" x 12 Ga.	4" x 11 Ga.
6'-1" To 8'	3" x 12 Ga.	4" x 11 Ga.	6" x 3/16"
8'-1" To 10'	3" x 12 Ga.	4" x 11 Ga.	6" x 3/16"
10'-1" To 12'	3" x 12 Ga.	4" x 11 Ga.	6" x 3/16"
12'-1" To 14'	3" x 12 Ga.	4" x 11 Ga.	6" x 3/16"
14'-1" To 16'	3" x 12 Ga.	4" x 11 Ga.	6" x 3/16"

Table 2 – Coating Performance Requirements

Quality Characteristics	ASTM Test Method	Performance Requirements
Adhesion	D3359 – Method B	Adhesion (Retention of Coating) over 90% of test area (Tape and knife test).
Corrosion Resistance	B117, D714 & D1654	Corrosion Resistance over 1,500 hours (Scribed per D1654; failure mode is accumulation of 1/8" coating loss from scribe or medium #8 blisters).
Impact Resistance	D2794	Impact Resistance over 60 inch lb. (Forward impact using 0.625" ball).
Weathering Resistance	D822, D2244, D523 (60° Method)	Weathering Resistance over 1,000 hours (Failure mode is 60% loss of gloss or color variance of more than 3 delta-E color units).

Table 3 – Montage II - Post Spacing By Bracket Type

Span	For INVINCIBLE® 8' Nominal (91-1/4" Rail)		For CLASSIC, GENESIS & MAJESTIC 8' Nominal (92-5/8" Rail)					
Post Size	2-1/2"	3"	2-1/2"	3"	2-1/2"	3"	2-1/2"	3"
Bracket Type	Industrial Flat Mount (BB301)		Industrial Universal (BB302)	Industrial Universal (BB303)	Industrial Flat Mount (BB301)		Industrial Swivel (BB304)*	
Post Settings ± ½" O.C.	94-1/2"	95"	96"	96-1/2"	96"	96-1/2"	* 96"	* 96-1/2"

* Note: When using BB304 swivel brackets on either or both ends of a panel installation, care must be taken to ensure the spacing between post and adjoining pickets meets applicable codes. This will require trimming one or both ends of the panel.

Fusion-Welded To Meet Any Application

Bedford City Schools

Otterbein College

El Segundo Park

Primrose School

Fanchawe College

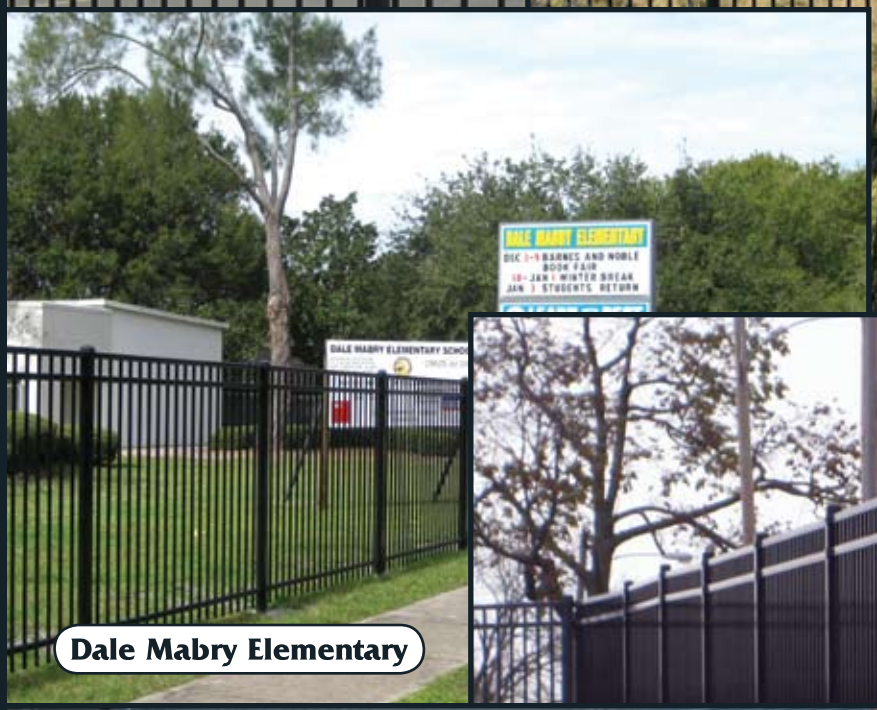
Greyhound Terminal

E-Coated To Withstand Any Climate

Styled To Add Value To Any Property

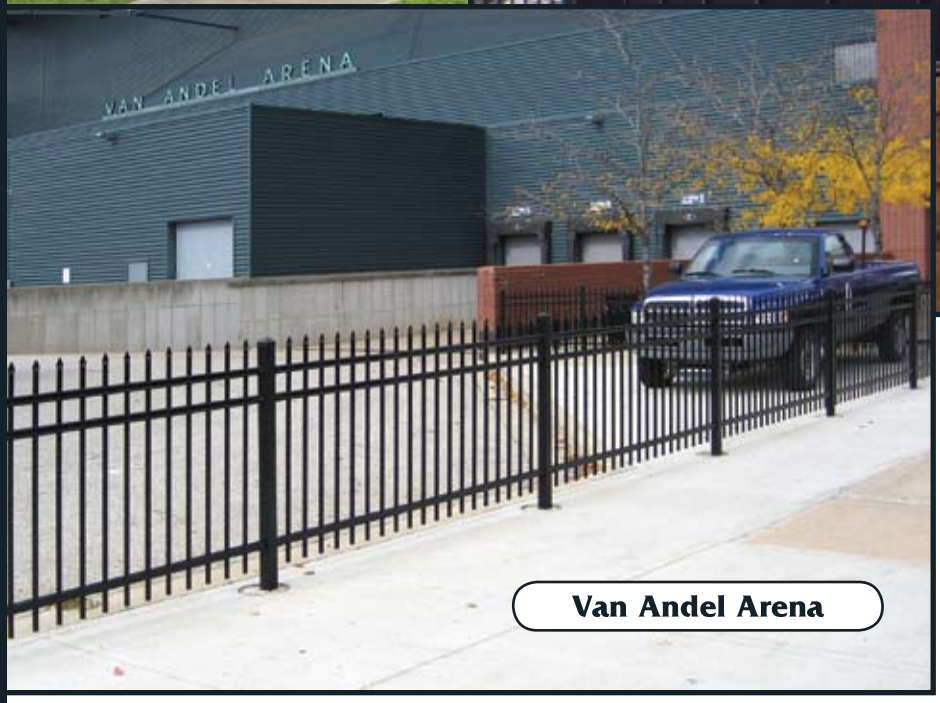
Heritage Investment

Gatorade Facility



Dale Mabry Elementary

Principal Insurance



Van Andel Arena

Backed By 20-Year Warranty

AMERISTAR®

Montage II® Heavy Industrial Ornamental Welded

www.ameristarfence.com

Montage Plus®

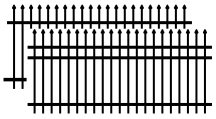
Fusion Welded Steel Construction

Montage Plus® is crafted with an inherent beauty that adds a decorative touch to any landscape. The fusion welded steel construction makes it applicable for all types of commercial installations such as retail businesses, storage facilities, schools, health care facilities and golf courses and recreational parks. The curved pickets of the Invincible® style provide a superior look to chain link and barbed wire. The maintenance-free electro-deposition coating (E-Coat) makes Montage Plus® suitable for any climate, hot or cold, wet or dry; Ameristar® uses the same cyclic testing technology used in the automotive industry to ensure that the coating will withstand repeated shifts in temperature and humidity.

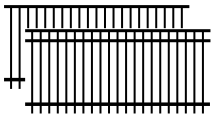
COMPONENT SIZES

System	Pickets	Rails	Posts
Montage Plus® Commercial	3/4" x 16 Ga. for fences up to & including 6' tall; 3/4" x 14 Ga. for 7' & 8' tall fences	1-7/16" x 0.072 Top 1-1/2" x 0.072" Sides	2-1/2" Sq. x 16 Ga. min. for fences up to & including 6' tall; 2-1/2" Sq. x 14 Ga. min. for 7' & 8' tall fences

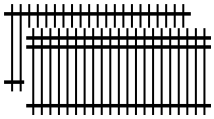
STYLES



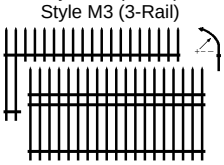
CLASSIC™
Style C2 (2-Rail)
Style C3 (3-Rail)



MAJESTIC™
Style M2 (2-Rail)
Style M3 (3-Rail)

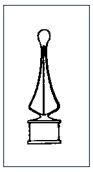


GENESIS™
Style G2 (2-Rail)
Style G3 (3-Rail)

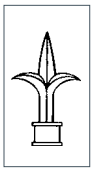


INVINCIBLE™
Style I2 (2-Rail)
Style I3 (3-Rail)

ADORNMENTS

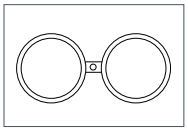


Quad Flare



Triad

Ball Cap



Ring

GATES

Gates are fabricated by welding Montage Plus® panel material to 1-3/4" square gate ends.

DESIGN ADVANTAGES

- **All Terrain Fence (ATF)™ Panel Design**
  Architectural design and construction technology have progressed to enable new facility construction on rough and uneven terrain that was previously considered unfeasible for permanent structures. Montage Plus® ATF maintains its rigid strength, while adapting to slopes as severe as a 30 inch rise in an 8 foot run.

- **Pool, Pet & Play (PPP)™ Picket Space Option**
  In many cases related to child care, public swimming pools, and containment, a narrower space may be desired or required for added safety or security. Montage Plus® offers the optional 3" space.

- **Flush Bottom Rail Option**
  For some applications, a flush bottom rail may be necessary to meet local building codes or simply to meet an aesthetic preference.

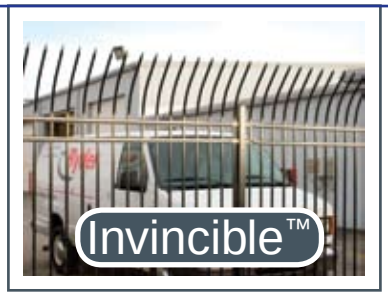
WARRANTY

The E-Coat combination of galvanized steel, zinc phosphate pre-treatment, and epoxy and acrylic double coating provide the protection necessary to withstand adverse weathering effects and justify the 'best-in-the-business' 20 Year Warranty.

COLORS, AVAILABILITY & MAINTENANCE

Montage Plus® color chip samples can be requested for actual color. Availability and maintenance information are the same as for the Aegis II® and Aegis Plus® steel fence systems.

Montage Plus® offers elegant style at an afford-able price. Montage Plus® is the best choice for commercial projects that require perimeter fences.



CONSTRUCTION SPECIFICATION

SECTION 32 31 00 - ORNAMENTAL WELDED FENCING SYSTEM

Montage Plus® - Commercial Weight

PART 1 - GENERAL

1.01 WORK INCLUDED

The contractor shall provide all labor, materials and appurtenances necessary for installation of the welded ornamental steel fence system defined herein at (specify project site).

1.02 RELATED WORK

Section ___ ___ - Earthwork
Section ___ ___ - Concrete

1.03 SYSTEM DESCRIPTION

The manufacturer shall supply a total fence system of (specify Montage Plus ATF® standard picket space or Montage Plus® Pool, Pet & Play® 3" air space) Welded Ornamental Steel (for standard picket space, specify Invincible®, Classic™, Majestic™, or Genesis™, for 3" air space, specify Classic™, Majestic™, or Genesis™) design. The system shall include all components (i.e., panels, posts, gates and hardware) required.

1.04 QUALITY ASSURANCE

The contractor shall provide laborers and supervisors who are thoroughly familiar with the type of construction involved and materials and techniques specified.

1.05 REFERENCES

ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy Coated (Galvannealed) by the Hot-Dip Process. ASTM B117 - Practice for Operating Salt-Spray (Fog) Apparatus. ASTM D523 - Test Method for Specular Gloss. ASTM D822 - Practice for Conducting Tests on Paint and Related Coatings and Materials using Filtered Open-Flame Carbon-Arc Light and Water Exposure Apparatus. ASTM D1654 - Test Method for Evaluation of Painted or Coated Specimens Subjected to Corrosive Environments. ASTM D2244 - Test Method for Calculation of Color Differences from Instrumentally Measured Color Coordinates. ASTM D2794 - Test Method for Resistance of Organic Coatings to The Effects of Rapid Deformation (Impact). ASTM D3359 - Test Method for Measuring Adhesion by Tape Test.

1.06 SUBMITTAL

The manufacturer's literature shall be submitted prior to installation.

1.07 PRODUCT HANDLING AND STORAGE

Upon receipt at the job site, all materials shall be checked to ensure that no damage occurred during shipping or handling. Materials shall be stored in such a manner to ensure proper ventilation and drainage, and to protect against damage, weather, vandalism and theft.

PART 2 - MATERIALS

2.01 MANUFACTURER

The fence system shall conform to (specify Montage Plus ATF® standard picket space or Montage Plus® Pool, Pet & Play® 3" air space) Welded Ornamental Steel, (for standard picket space, specify Invincible®, Classic™, Majestic™, or Genesis™, for 3" air space, specify Classic™, Majestic™, or Genesis™) design, (specify extended picket or flush) bottom rail treatment, (specify 2-Rail, 3-Rail or 4-Rail or 3-Rail or 4-Rail with Coronas) style manufactured by Ameristar Fence Products, Inc., in Tulsa, Oklahoma.

Table 1 - Minimum Sizes for Montage Plus Gate Posts

Gate Opening	Gate Height		
	Up To & Including 4'	Over 4', Up To & Including 6'	Over 6', Up To & Including 8'
Up to & Including 4'	2-1/2" x 14 Ga.	3" x 12 Ga.	3" x 12 Ga.
Over 4', Up To & Including 6'	3" x 12 Ga.	3" x 12 Ga.	4" x 12 Ga.
Over 6', Up To & Including 8'	3" x 12 Ga.	4" x 12 Ga.	6" x 12 Ga.

2.02 MATERIAL

A. Steel material for fence panels and posts shall conform to the requirements of ASTM A653/A653M, with a minimum yield strength of 45,000 psi (344 MPa) and a minimum zinc (hot-dip galvanized) coating weight of 0.60 oz/ft^2 (184 g/m^2), Coating Designation G-60.

B. For fence systems up to and including 6' tall, material for pickets shall be 3/4" square x 16 Ga. tubing. For fence systems 7' and 8' tall, material for pickets shall be 3/4" square x 14 Ga. tubing. The rails shall be steel channel, 1.5" x 1.4375" x 14 Ga. Picket holes in the rail shall be spaced (specify 4.675" o.c. for standard picket space or 3.500" o.c. for 3" air space). For fence systems up to and including 6' tall, posts shall be a minimum of 2-1/2" square x 16 Ga. For fence systems 7' and 8' tall, posts shall be a minimum of 2-1/2" square x 14 Ga. Gate posts shall meet the minimum requirements of Table 1.

2.03 FABRICATION

A. Pickets, rails and posts shall be pre-cut to specified lengths. Rails shall be pre-punched to accept pickets.

B. Pickets shall be inserted into the pre-punched holes in the rails and shall be aligned to standard spacing using a specially calibrated alignment fixture. The aligned pickets and rails shall be joined at each picket-to-rail intersection by Ameristar's proprietary fusion welding process, thus completing the rigid panel assembly (Note: The process produces a virtually seamless, spatter-free good-neighbor appearance, equally attractive from either side of the panel.).

C. The manufactured panels and posts shall be subjected to an inline electrodeposition coating (E-Coat) process consisting of a multi-stage pretreatment/wash (with zinc phosphate), followed by a duplex application of an epoxy primer and an acrylic topcoat. The minimum cumulative coating thickness of epoxy and acrylic shall be 2 mils (0.058 mm). The color shall be (specify Black or Bronze). The coated panels and posts shall be capable of meeting the performance requirements for each quality characteristic shown in Table 2.

D. Gates shall be fabricated using welded ornamental panel material and gate ends having a 1-3/4" square cross-sectional size. All rail and upright intersections shall be joined by welding. All picket and rail intersections shall also be joined by welding.

PART 3 - EXECUTION

3.01 PREPARATION

All new installation shall be laid out by the contractor in accordance with the construction plans.

3.02 INSTALLATION

Fence posts shall be set according to Table 3, plus or minus 1/2". Fence panels shall be attached to posts with brackets supplied by the manufacturer. Gate posts shall be spaced according to the gate openings specified in the construction plans. The "Earthwork" and "Concrete" sections of this specification shall govern post base material requirements.

3.03 CLEANING

The contractor shall clean the jobsite of excess materials; post-hole excavations shall be scattered uniformly away from posts.

Table 2 - Coating Performance Requirements

Quality Characteristics	ASTM Test Method	Performance Requirments
Adhesion	D3359 - Method B	Adhesion (Retention of Coating) over 90% of test area (Tape and knife test).
Corrosion Resistance	B117, D714 & D1654	Corrosion Resistance over 1,500 hours (Scribed per D1654; failure mode is accumulation of 1/8" coating loss from scribe or medium #8 blisters).
Impact Resistance	D2794	Impact Resistance over 60 inch lb. (Forward impact using 0.625" ball).
Weathering Resistance	D822, D2244, D523 (60˚ Method)	Weathering Resistance over 1,000 hours (Failure mode is 60% loss of gloss or color variance of more than 3 delta-E color units).

Detect

Deter

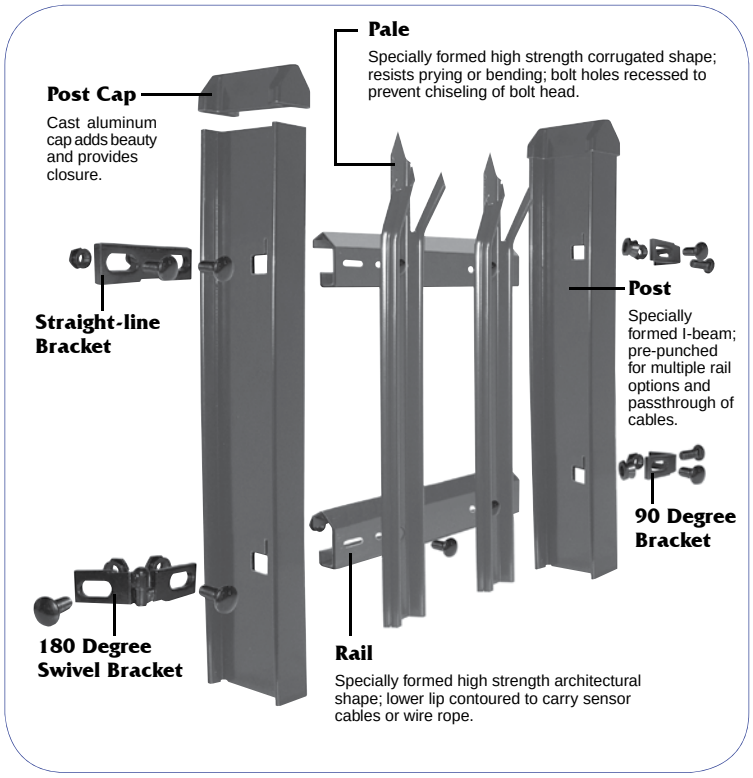
IMPASSE®

Ornamental Pale Security Fence

Delay

Deny

Traditional security fences of chain-link or wire mesh and barbed razor tape are no longer enough to meet today's increased security demands. They do not delay serious attacks or intrusion attempts for more than a few seconds. Ameristar's (Patent Pending) Impasse Security Fence offers the resistive strength of heavy-duty steel spears secured vertically to a framework of specially formed steel rails and I-beam posts. The stylish design of the Impasse, combined with its strength and security, provides a successful first line of defense. The structural configuration of the Impasse system not only delays aggressive attacks, but also allows for the seamless integration of additional security features such as anti-ram cables, sensors and alarm systems.



Standard security features of the Impasse® fence include the unique roll-formed Impasse® I-beam which acts as a strong barrier to support the entire fence system. The mounting bracket, a solid steel flat bar, fits through slotted holes pre-punched into the post. Heavy stainless steel tamperproof nuts and bolts attach adjacent rails to either end of the mounting bracket, ensuring a solid and secure connection. Tamperproof carriage bolts fit snugly into the recessed depression on the face of each pale, detering attempts to pry or chisel the bolt head.

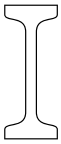
Break-Away Hex Nut

Stainless steel security nut prevents tampering or removal by normal tools.

The Impasse® Pale (picket) is designed with a special corrugated shape to ensure greater resistance to bending loads, particularly with attempts at pale separation.

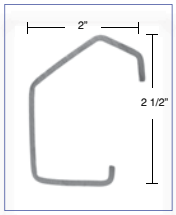
45 KSI Steel

Impasse® I-Beam

Structural Parameters	Impasse® I-Beam	Std RSJ H-Post	Square Post		Round Post	
Architectural Profile of Post			 2-1/2"	3"	 2-1/2"	3"
Bending Strength (lb/in)	93,700	68,875	36,950	54,520	24,400	43,900

NOTE: Materials roll-formed to achieve a double wall effective thickness of 0.200"

Impasse® Rail

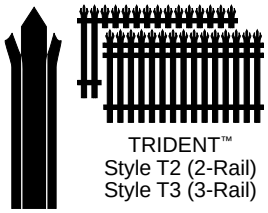


Structural Parameters		Impasse® Rail	Std RSA Rail	U-Channel Rail	Square Rail	Round Rail
Architectural Profile of Rail			 2" x 2-1/2"	 1-1/2" x 1-3/8"	 1-1/2" x 1-1/2"	 1-5/8" Dia
Design Load (Vert)	P_{vd} 6' Span	425	338	178	211	191
	P_{vd} 8' Span	319	253	134	158	143

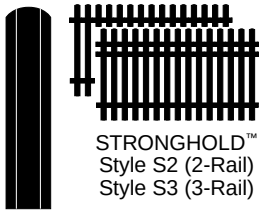
COMPONENT SIZES

System	Pales	Rails	Posts
Impasse® High Security	3/4" x 2-3/4"	2" x 2-1/2"	1-3/4" x 4"

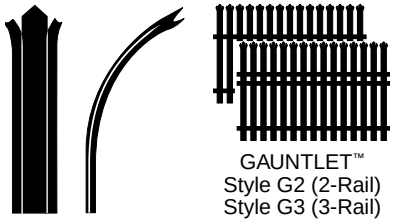
STYLES



TRIDENT™
Style T2 (2-Rail)
Style T3 (3-Rail)



STRONGHOLD™
Style S2 (2-Rail)
Style S3 (3-Rail)



GAUNTLET™
Style G2 (2-Rail)
Style G3 (3-Rail)

Also available 4-Rail and 5-Rail

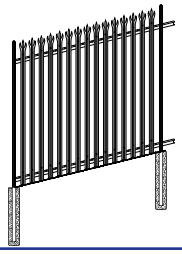
COLORS

Request Color Chip samples for actual color

Black | Bronze | White | Desert Sand

BIASABILITY

No Stair Stepping Required



Panel will rack over 30 degrees without special drilling or assembly operations.

GATES

Contact the Ameristar Architectural Department for detailed information and literature on gates.

WIND LOADING

Height (FT)	Rail Length	I-Post Size	Impasse® Wind Load Capacity Factor (PSF)	Wind Speed Capacity (3 Second Gust) (MPH)
6	6	1-3/4x4x12Ga	100.3	206.8
	8	1-3/4x4x12Ga	75.3	179.1
7	6	1-3/4x4x12Ga	73.8	177.4
	8	1-3/4x4x12Ga	55.3	153.5
8	6	1-3/4x4x12Ga	56.5	155.2
	8	1-3/4x4x12Ga	42.4	134.4
9	6	1-3/4x4x12Ga	44.6	137.9
	8	1-3/4x4x12Ga	33.5	119.5
10	6	1-3/4x4x12Ga	36.1	124.1
	8	1-3/4x4x12Ga	27.1	107.5

Note: Mph calculated using ANSI/ASCE 7-02, "American Society of Civil Engineers Minimum Design Loads for Buildings and Other Structures" Exposure Category C (open terrain with scattered obstructions having lengths generally less than 30 feet). For wind loading applicable to a particular specification, consult the appropriate Building Code.

PERMACOAT® FINISH

See Pages 4 and 5 for a detailed discussion of the PermaCoat® process and its comparative advantages over other coating systems.

AVAILABILITY

Shipping

Impasse® security fence components (e.g., pales, rails, posts, etc.) are carefully layered in bulk on special pallets to ensure the most economical damage-free shipping.

Ordering Information

To order, simply specify the fence or gate design series, color and height desired. Then figure and provide the quantities needed. Contact Ameristar® for the nearest distributor or if any other assistance is needed.

WARRANTY

A written 15 year limited warranty is extended on Ameristar's Impasse® fence systems. Call Ameristar® for a copy.

MAINTENANCE

Little or no maintenance is required for the fence and gate systems supplied by Ameristar®. The PermaCoat® epoxy and polyester coated steel in Impasse® will remain corrosion free for years to come. Damages to coated surfaces can be readily covered with Ameristar's matching custom finishes (either spray or paint pen application).

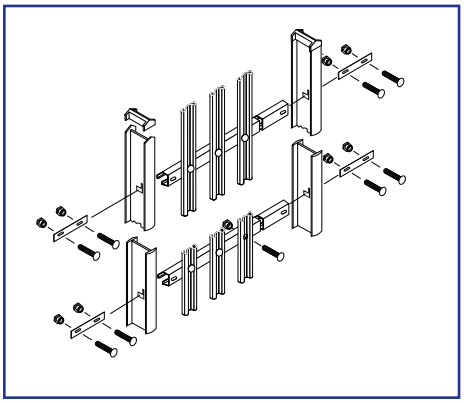
Trident™

The Impasse® Trident™ is designed for high-risk security applications. It is the most suited first line of defense to surround a military installation, a government complex, an airport or seaport, a nuclear or chemical plant, a munitions facility or armory, a reservoir, or any other facility in need of the utmost protection from the possibility of attack. High-tensile steel corrugated pales rise above the topmost rail and terminate with a menacing triple-pointed and splayed spear tip.

The Impasse Trident is made of high-tensile steel corrugated pales that rise above the topmost rail and terminate with a menacing triple-pointed and splayed spear tip.

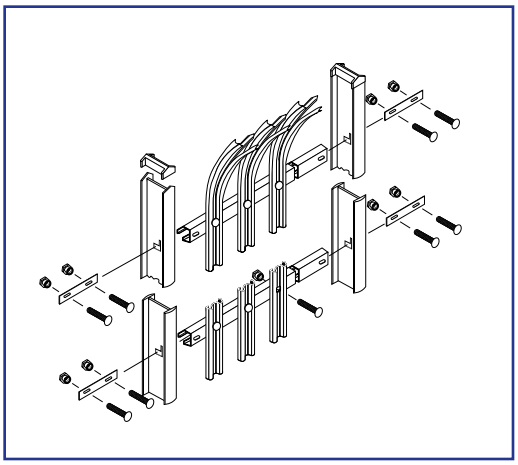
Stronghold™

The blunt slightly rounded tip of the Stronghold™ is ideal for facilities like schools, hospitals, sports complexes, racetracks and other public situations where strength is necessary, but safety of the general populace is also an important design consideration.



Gauntlet®

The Gauntlet® is the most serious Impasse® design as it couples the fearsome triple point with an outward curve that discourages attempts to gain entry by climbing. Barbed tape can be attached to make an even more difficult obstacle.



CONSTRUCTION SPECIFICATION

SECTION 32 31 00 - ARCHITECTURAL METAL FENCE

Impasse® - For High-Risk Security Assets and Facilities

(MEETS "BUY AMERICAN" DOMESTIC PROCUREMENTS)

PART 1 – GENERAL

1.01 WORK INCLUDED

The contractor shall provide all labor, materials and appurtenances necessary for installation of the steel corrugated pale fence system defined herein at (specify project site).

1.02 RELATED WORK

Section 022 _ _ - Earthwork
Section 030 _ _ - Concrete

1.03 SYSTEM DESCRIPTION

The manufacturer shall supply a total steel corrugated pale fence system of the Ameristar® Impasse® (specify Trident™, Stronghold™ or Gauntlet®) design. The system shall include all components (i.e., pales, rails, posts, gates and hardware) required.

1.04 QUALITY ASSURANCE

The contractor shall provide laborers and supervisors who are thoroughly familiar with the type of construction involved and materials and techniques specified.

1.05 REFERENCES

ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process. ASTM B117 - Practice for Operating Salt-Spray (Fog) Apparatus. ASTM D523 - Test Method for Specular Gloss. ASTM D822 - Practice for Conducting Tests on Paint and Related Coatings and Materials using Filtered Open-Flame Carbon-Arc Light and Water Exposure Apparatus. ASTM D1654 - Test Method for Evaluation of Painted or Coated Specimens Subjected to Corrosive Environments. ASTM D2244 - Test Method for Calculation of Color Differences from Instrumentally Measured Color Coordinates. ASTM D2794 - Test Method for Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact). ASTM D3359 - Test Method for Measuring Adhesion by Tape Test.

1.06 SUBMITTAL

The manufacturer's literature shall be submitted prior to installation.

1.07 PRODUCT HANDLING AND STORAGE

Upon receipt at the job site, all materials shall be checked to ensure that no damage occurred during shipping or handling. Materials shall be stored in such a manner to ensure proper ventilation and drainage, and to protect against damage, weather, vandalism and theft.

PART 2 – MATERIALS

2.01 MANUFACTURER

A. The steel corrugated pale fence system shall conform to Ameristar® Impasse® (specify Trident™, Stronghold™ or Gauntlet®) (specify number of rails) style manufactured by Ameristar Fence Products, Inc., in Tulsa, Oklahoma.

B. The entire fence system, and all associated gates, accessories, fittings, and fasteners shall be obtained from a single source.

2.02 MATERIAL

A. Steel material for fence framework (i.e., corrugated pales, rails and posts) when galvanized prior to forming, shall conform to the requirements of ASTM A924/A924M, with a minimum yield strength of 45,000 psi (344 MPa). The steel shall be hot-dip galvanized to meet the requirements of ASTM A653/A653M with a minimum zinc coating weight of 0.90 oz/ft ^{2} (276 g/m^2), Coating Designation G-90.

B. The manufactured galvanized framework shall be subjected to the PermaCoat® thermal stratification coating process (high-temperature, in-line, multi-stage, multi-layer) including, as a minimum, a six-stage pretreatment/wash (with zinc phosphate), an electrostatic spray application of an epoxy base, and a separate electrostatic spray application of a polyester finish. The base coat shall be a thermosetting epoxy powder coating (gray in color) with a minimum thickness of 2 mils (0.0508mm). The topcoat shall be a "no-mar" TGIC polyester powder coat finish with a minimum thickness of 2 mils (0.0508mm). The color shall be (specify Black, Bronze, White or Desert Sand). The stratification-coated framework shall be capable of meeting the performance requirements for each quality characteristic shown in Table 1.

C. Material for corrugated pales shall have a nominal material thickness of 0.075 inches. The cross-sectional shape of the rails shall conform to the manufacturer's Impasse® rail design with a nominal thickness of 0.100 inches. Pre-drilled holes in the Impasse® rail shall be spaced 6" o.c. Tamperproof fasteners shall be used to fasten each pale to each rail. Posts shall conform to the manufacturer's Impasse® double wall I-Beam design with a nominal membrane thickness of 0.100 inches (0.200" effective wall thickness).

2.03 FABRICATION

A. Pales, rails and posts shall be pre-cut to specified lengths. Impasse® rails shall be pre-punched to accept the tamperproof security fasteners.

B. Completed panels shall be capable of supporting a 400 lb. load (applied at midspan) without permanent deformation. Panels shall be biasable to a 30 degree change in grade.

C. Gates shall be fabricated using Impasse® pales. All rail and upright intersections shall be joined by welding. All picket and rail intersections shall also be joined by welding.

PART 3 - EXECUTION

3.01 PREPARATION

All new installation shall be laid out by the contractor in accordance with the construction plans.

3.02 INSTALLATION

Fence posts for 8' nominal spans shall be set 96" O.C., plus or minus 1/2". Fence posts for 6' nominal spans shall be set 72" O.C., plus or minus 1/2". Gate posts shall be spaced according to the gate openings specified in the construction plans. The "Earthwork" and "Concrete" sections of this specification shall govern post base material requirements. Impasse® panels shall be attached to posts using mounting brackets and tamperproof security fasteners supplied by the manufacturer.

3.03 CLEANING

The contractor shall clean the jobsite of excess materials; post-hole excavations shall be scattered uniformly away from posts.

Table 1

Quality Characteristics	ASTM Test Method	Performance Requirements
Adhesion	D3359 – Method B	Adhesion (retention of coating) over 90% of test area (tape and knife test).
Corrosion Resistance	B117 & D1654	Corrosion resistance over 3,500 hours (scribed per D1654; failure mode is accumulation of 1/8" coating loss from scribe or medium #8 blisters).
Impact Resistance	D2794	Impact resistance over 60 inch lb. (forward impact using 0.625" ball).
Weathering Resistance	D822, D2244,D523 (60° Method)	Weathering resistance over 1,000 hours (failure mode is 60% loss of gloss or color variance of more than 3 delta-E color units).

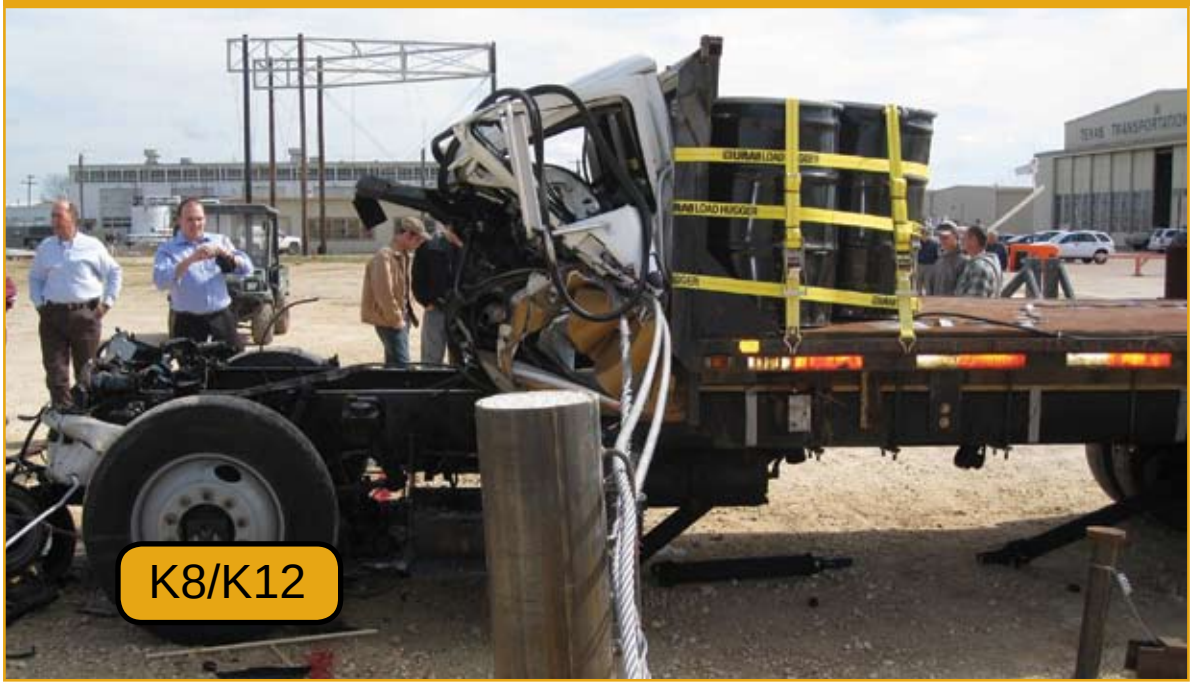
STALWART®

Security Upgrade Options

Ameristar's Stalwart® cabling system provides an anti-ram defense against forced entry or vehicular impact. The Impasse rail provides a concealing tray for the cables.

The Impasse™ posts and horizontal rails accept the Stalwart integrated cable system for added perimeter security. This system has successfully tested to the US Department of State K12 rating, stopping a 15,000 pound truck traveling at 50 mph. This system can be used with a variety of vertical materials such as Impasse pales, standard square ornamental pickets, welded wire, etc. to meet site aesthetic requirements. DOS K8 systems also available.

AMERISTAR® IMPASSE®
WITH STALWART® CABLE SYSTEM



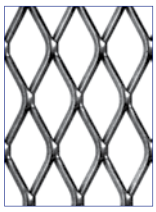
- Intrusion Detection System (IDS)

In several systems, the rails function as conduit trays that eliminate the need to trench for underground runs. This enables quicker installation and lowers the overall construction cost.

- CCTV and Lighting Systems

- Barbed Tape

- Anti-Scale Screening System



- Anti-Climb Fence System
  45mm (1-3/4") between pales

And More…

- Access Control
- Entrance Containment
- Bollards/Wedges/Planters
- Welded Wire Anti-Climb Inserts
- Biometrics/Card Readers
- Retina & Print Scans

CONSTRUCTION SPECIFICATION

SECTION 32 31 00 - STAND-ALONE ANTI-RAM BARRIER

K-12 Rated Stalwart™ Post & Rail Cable System

To Protect High-Risk Security Assets and Facilities Per DOS Requirements

(MEETS "BUY AMERICAN" DOMESTIC PROCUREMENTS)

PART 1 – GENERAL

1.01 WORK INCLUDED

The contractor shall provide all labor, materials and appurtenances necessary for installation of the anti-ram barrier system defined herein at (specify project site).

1.02 RELATED WORK

Section ___ ___ - Earthwork
Section ___ ___ - Concrete

1.03 SYSTEM DESCRIPTION

The manufacturer shall supply a total anti-ram cable barrier system of the Ameristar® Post & Rail Stalwart™ design. The system shall include all components (i.e., cables, supports, steel reinforcing, and hardware) required.

1.04 QUALITY ASSURANCE

The contractor shall provide laborers and supervisors who are thoroughly familiar with the type of construction involved and materials and techniques specified.

1.05 REFERENCES

ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy Coated (Galvannealed) by the Hot-Dip Process. ASTM B117 - Practice for Operating Salt-Spray (Fog) Apparatus. ASTM D523 - Test Method for Specular Gloss. ASTM D822 - Practice for Conducting Tests on Paint and Related Coatings and Materials using Filtered Open-Flame Carbon-Arc Light and Water Exposure Apparatus. ASTM D1654 - Test Method for Evaluation of Painted or Coated Specimens Subjected to Corrosive Environments. ASTM D2244 - Test Method for Calculation of Color Differences from Instrumentally Measured Color Coordinates. ASTM D2794 - Test Method for Resistance of Organic Coatings to The Effects of Rapid Deformation (Impact). ASTM D3359 - Test Method for Measuring Adhesion by Tape Test. Federal Specification RR-W-410E - Wire Rope and Strand. U.S. Department of State Test Standard SD-STD-02.01-A - Vehicle Crash Testing of Perimeter Barriers and Gates.

1.06 SUBMITTAL

The manufacturer's literature shall be submitted prior to installation.

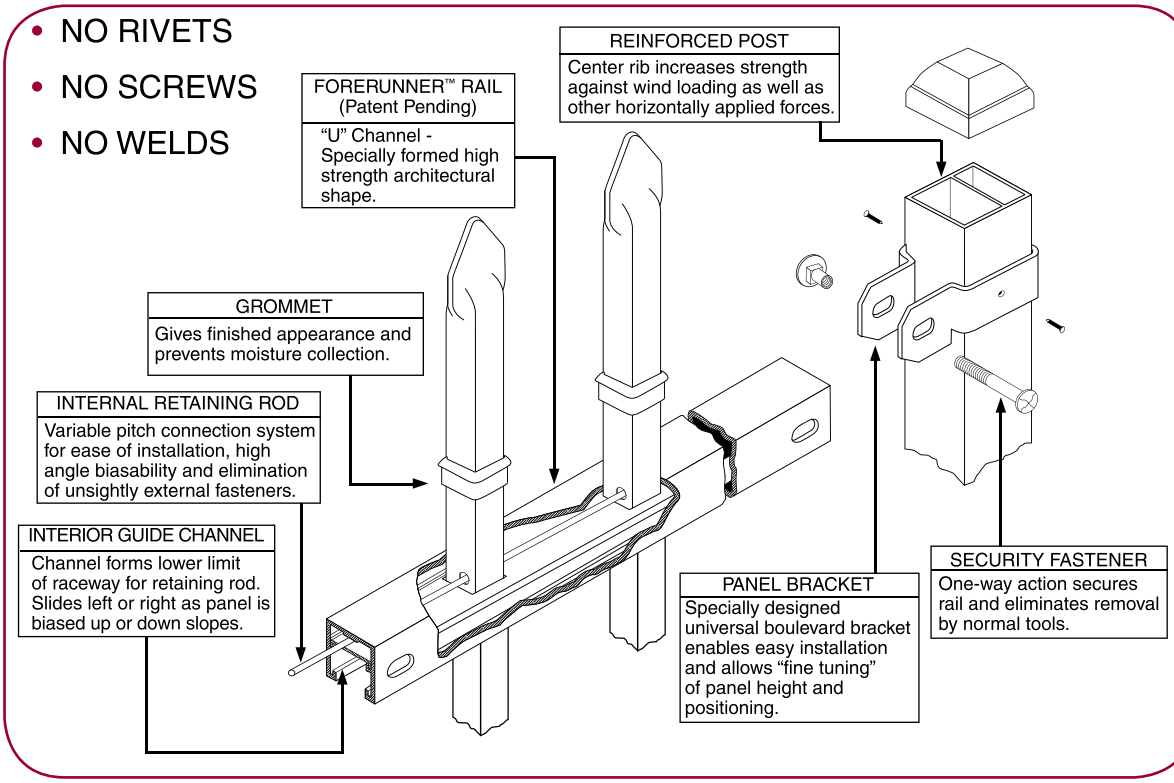
The Gauntlet® shown above uses two additional Impasse® rails placed between the top and bottom rails to accept the Stalwart® integrated cable system. The Stalwart® cable system combined with the Impasse® fence can be sized to meet various levels of anti-ram barrier capability from passenger cars to heavily loaded trucks. The system shown has been proven, in independent testing, to successfully stop 15,000 pound trucks traveling at 40/50 mph within 10 feet. This means a perimeter barrier can be easily designed to balance security and budget constraints.

Echelon II®

The Higher Level of Aluminum Fences

Echelon II® - A revolutionary fence system of aluminum posts, framework and mounting accessories that is easily assembled to form an attractive "good neighbor" appearance with no exposed fasteners. Any truly great product must have a defining feature that sets it apart from all others; Ameristar's Echelon II® fence has the revolutionary ForeRunner™ rail.

- NO RIVETS
- NO SCREWS
- NO WELDS



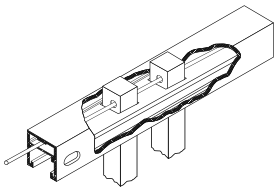
AMERISTAR® ECHELON II® WITH FORERUNNER™ RAIL & RETAINING ROD

SECURITY

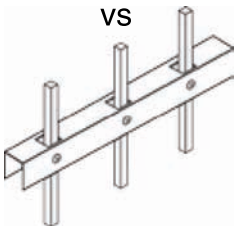
ForeRunner™ Rail
with Enclosed Retaining Rod

Attachment cannot be compromised.

(No Fasteners are Exposed)



VS



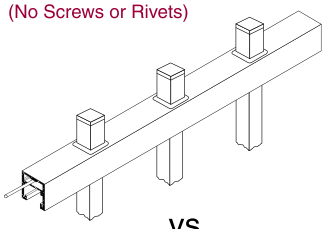
(Exposure Invites Tampering)

BEAUTY

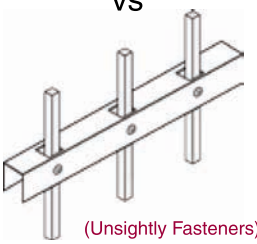
"Good Neighbor Design"
Rod Follows ForeRunner™ Centerline

Clean uninterrupted look.

(No Screws or Rivets)



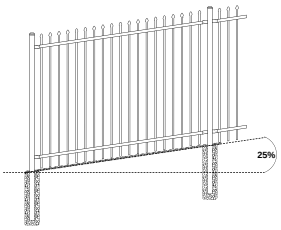
VS



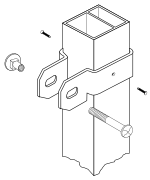
(Unsightly Fasteners)

FUNCTIONALITY

Biasability a minimum of 25%
No Stair Stepping Required

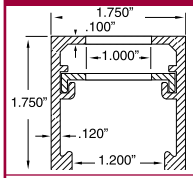
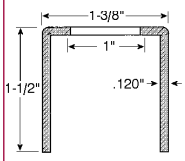
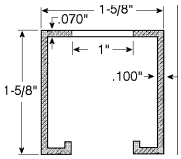


Universal mounting bracket



Enables accurate adjustment during installation

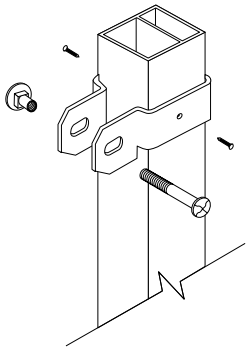
RAIL STRENGTH

ForeRunner™ (Aluminum) Echelon II®	Structural Parameters			U-Channel (Steel)	U-Channel (Aluminum)
	Profile of the Architectural Shape of the Rail *Vertical Design Loads are per rail; for capacity of fence panel, multiply by number of rails.				
.120/.100	T_{eff} = Effective Wall Thickness (IN)			.120	.100/.070
.2370	S_v = Section Modulus (IN) Vertical			.0938	.1350
.421	S_h = Section Modulus (IN) Horizontal			.210	.260
418#	6' Span	Vertical Load Data PV_f = Ultimate Vertical	6' Span	- - - - -	262#
314#	8' Span		8' Span	229#	- - - - -
742#	6' Span	Horizontal Load Data PH_f = Ultimate Horizontal	6' Span	- - - - -	482#
556#	8' Span		8' Span	438#	- - - - -
276#	6' Span	* Vertical Load Data PV_d = Vertical Design Load @ .66 F_y	6' Span	- - - - -	157#
207#	8' Span		8' Span	151#	- - - - -
490#	6' Span	* Horizontal Load Data PH_d = Horizontal Design Load @ .66 F_y	6' Span	- - - - -	303#
367#	8' Span		8' Span	289#	- - - - -

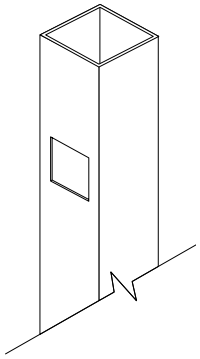
* RECOMMENDED LOAD VALUE FOR SAFE STRUCTURAL DESIGN (Allowable Strength = .66 F_y).

POST STRENGTH & SECURITY

A comparison of the Echelon II® reinforced post with standard punched posts used by other aluminum fence manufacturers shows several Echelon II® advantages.



- The Echelon II® post is made stronger by the reinforcing web; the conventional post is weakened by removing material from it's cross-section.
- Echelon II® requires only one non-punched post; the punched system requires four different posts (line, end, corner, and gate).



- Punched holes allow moisture build-up and potential freeze expansion.
- Echelon II® boulevard brackets allow for fine tuning of fence alignment.
- The wrap-around bracket, secured to the rail with Ameristar's tamperproof fastener, ensures far greater security than the single screw in punched posts.

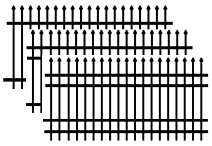
SUPERIOR FINISH

Ameristar's production facilities include a state-of-the-art polyester powder coating system providing Echelon II® fences with a finish that is far superior to other coatings in durability and scratch-resistance. Powder coating has become the fastest growing form of finishing technology. It does not emit hazardous volatile organic compounds as is the case with wet paints. The Echelon II® fence components can endure over 1,000 hours of salt spray testing; proving the claim of long-lasting durability. With Echelon II® Industrial Aluminum, a maintenance-free, enviromentally-friendly fence is guaranteed.

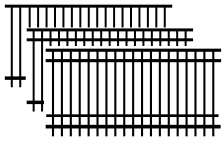
COMPONENT SIZES

System	Pickets	Rails	Posts
Echelon II® Industrial	1" x 1" x .065"	1-3/4" x 1-3/4" (.100" top wall / .120" side walls)	2-1/2" x 2-1/2"

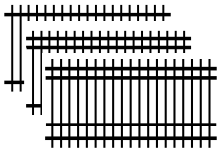
STYLES



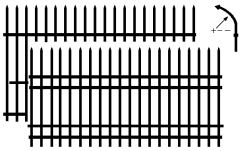
CLASSIC™
Style C2 (2-Rail)
Style C3 (3-Rail)
Style C4 (4-Rail)



MAJESTIC™
Style M2 (2-Rail)
Style M3 (3-Rail)
Style M4 (4-Rail)



GENESIS™
Style G2 (2-Rail)
Style G3 (3-Rail)
Style G4 (4-Rail)



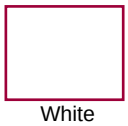
INVINCIBLE™
Style I3 (3-Rail)
Style I4 (4-Rail)

COLORS

Request Color Chip samples for actual color

Black

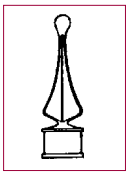
Bronze



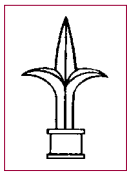
White

Desert Sand

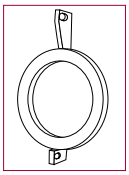
ADORNMENTS



Quad Flare



Triad



Ring

Ball Cap

GATES

Contact the Ameristar Architectural Department for detailed information and literature on gates.

WIND LOADING

Height (FT)	Rail Length	Post Size	Echelon II® Wind Load Capacity Factor (PSF)	Typical Wind Load Capacity (mph)
4	6	2-1/2" Square	112	206
		3" Square	213	285
	8	2-1/2" Square	84	178
		3" Square	160	246
5	6	2-1/2" Square	76	170
		3" Square	145	235
	8	2-1/2" Square	57	147
		3" x Square	109	203
6	6	2-1/2" Square	52	141
		3" Square	99	194
	8	2-1/2" Square	40	123
		3" Square	76	171
7	6	2-1/2" Square	38	120
		3" Square	73	166
	8	2-1/2" Square	28	104
		3" Square	55	144
8	6	2-1/2" Square	29	105
		3" x Square	56	145
	8	2-1/2" Square	22	91
		3" Square	42	126
		4" Square	78	172
9	6	4" Square	82	176
10	6	4" Square	66	159

Note: Mph calculated using ANSI/ASCE 7-02, "American Society of Civil Engineers Minimum Design Loads for Buildings and Other Structures" Exposure Category C (open terrain with scattered obstructions having lengths generally less than 30 feet). For wind loading applicable to a particular specification, consult the appropriate Building Code.

AVAILABILITY

Shipping

Echelon II® Industrial Ornamental Fence components (e.g., pickets, rails, etc.) and TransPort™ Cantilever Gates are carefully packaged in heavy duty cardboard boxes to ensure the most economical damage-free shipping.

Ordering Information

To order, simply specify the fence or gate design series, color and height desired. Then figure and provide the quantities needed. Contact Ameristar® for the nearest distributor or if any other assistance is needed.

WARRANTY

A written lifetime limited warranty is extended on Ameristar's Echelon II® fence systems. Call Ameristar® for a copy.

MAINTENANCE

Little or no maintenance is required for the fence and gate systems supplied by Ameristar®. The polyester coated aluminum in Echelon II® will remain corrosion free for years to come. If pickets or rails are damaged by accidental impact, the affected components can be easily replaced. Damages to coated surfaces can be readily covered with Ameristar's matching custom finishes (either spray or paint pen application).

Classic™

Echelon II® Classic™ style ornamental fences feature the traditional extended picket culminating with an arrow-shaped spear point that conveys a subtle warning message to would-be intruders.

Majestic™

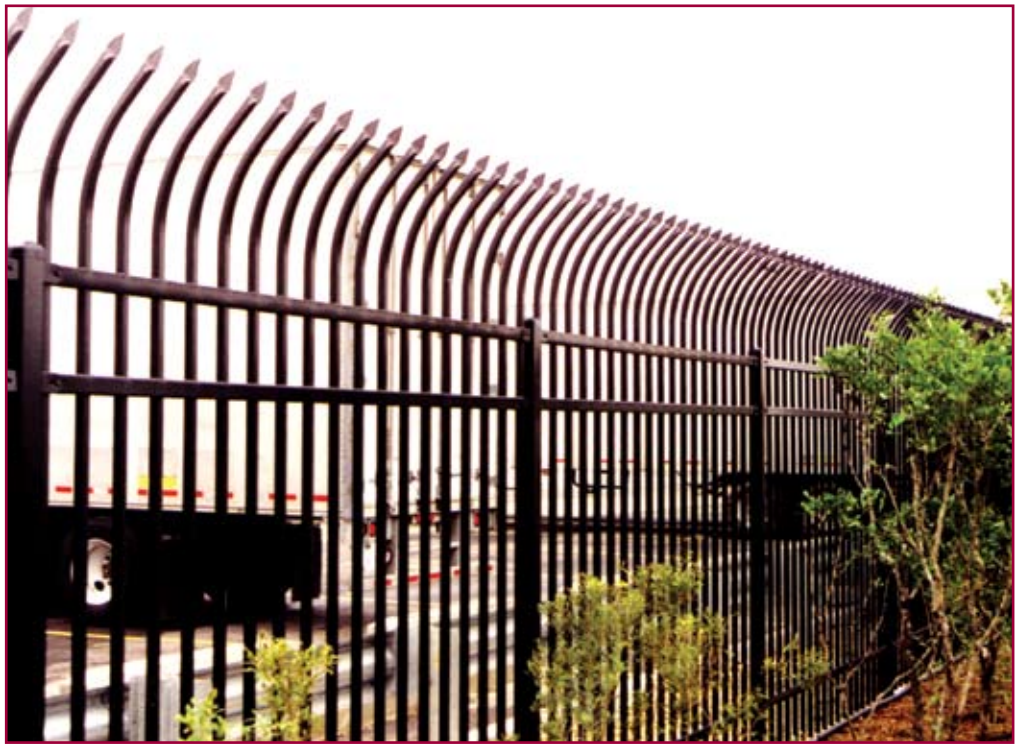
The contemporary Echelon II® Majestic™ style utilizes a flush top rail to produce the stately and streamlined look that blends well with flowers, shrubbery, and trees used in border landscapes.

Genesis™

The Echelon II® Genesis™ style highlights the sleek lines of unaltered square pickets reminiscent of solid vertical bar fences. The extended flat-topped tip does not detract from architecture or landscape.

Invincible™

The imposing Echelon II® Invincible™ style features an outwardly curving picket to warn potential intruders and make access by climbing virtually impossible.



CONSTRUCTION SPECIFICATION

SECTION 32 31 00 - ORNAMENTAL METAL FENCE SYSTEM

Echelon II® - Industrial Aluminum

PART 1 - GENERAL

1.01 WORK INCLUDED

The contractor shall provide all labor, materials and appurtenances necessary for installation of the industrial ornamental aluminum fence system defined herein at (specify project site).

1.02 RELATED WORK

Section 022 _ _ - Earthwork
Section 030 _ _ - Concrete

1.03 SYSTEM DESCRIPTION

The manufacturer shall supply a total industrial ornamental aluminum fence system of the Ameristar® Echelon II® (specify Classic™, Majestic™, Genesis™ or Invincible™) design. The system shall include all components (i.e., pickets, rails, posts, gates and hardware) required.

1.04 QUALITY ASSURANCE

The contractor shall provide laborers and supervisors who are thoroughly familiar with the type of construction involved and materials and techniques specified.

1.05 REFERENCES

ASTM B117 - Practice for Operating Salt-Spray (Fog) Apparatus. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles and Tubes. ASTM D523 - Test Method for Specular Gloss. ASTM D822 - Practice for Conducting Tests on Paint and Related Coatings and Materials using Filtered Open-Flame Carbon-Arc Light and Water Exposure Apparatus. ASTM D1654 - Test Method for Evaluation of Painted or Coated Specimens Subjected to Corrosive Environments. ASTM D2244 - Test Method for Calculation of Color Differences from Instrumentally Measured Color Coordinates. ASTM D2794 - Test Method for Resistance of Organic Coatings to The Effects of Rapid Deformation (Impact). ASTM D3359 - Test Method for Measuring Adhesion by Tape Test.

1.06 SUBMITTAL

The manufacturer's submittal package shall be provided prior to installation.

1.07 PRODUCT HANDLING AND STORAGE

Upon receipt at the job site, all materials shall be checked to ensure that no damage occurred during shipping or handling. Materials shall be stored in such a manner to ensure proper ventilation and drainage, and to protect against damage, weather, vandalism and theft.

PART 2 - MATERIALS

2.01 MANUFACTURER

The industrial ornamental aluminum fence system shall conform to Ameristar® Echelon II®, (specify Classic™, Majestic™, Genesis™ or Invincible™) (specify number of rails; add "with rings" if rings are included) style manufactured by Ameristar® Fence Products, Inc., in Tulsa, Oklahoma.

2.02 MATERIAL

A. Aluminum material for fence framework (i.e., tubular pickets, rails and posts) shall conform to the requirements of ASTM B221. The aluminum extrusions for posts and rails (outer channel) shall be Alloy and Temper Designation 6005-T5. The aluminum extrusions for pickets and rail inner slide channels shall be Alloy and Temper Designation 6063-T5.

B. The manufactured framework shall be subjected to the Ameristar® thermal stratification coating process (high-temperature, in-line, multi-stage, multi-layer) including, as a minimum, a six-stage pretreatment/ wash and an electrostatic spray application of a polyester finish. The topcoat shall be a "no-mar" TGIC polyester powder coat finish with a minimum thickness of 2 mils (0.0508mm). The color shall be (specify Black, Bronze, White or Desert Sand). The stratification-coated framework shall be capable of meeting the performance requirements for each quality characteristic shown in Table 1.

C. Material for fence pickets shall be 1" square x 0.065" thick extruded tubing. The cross-sectional shape of the rails shall conform to the manufacturer's ForeRunner™ design with outside cross-section dimensions of 1.75" square. The top wall of the outer channel of the rail shall be 0.100" thick; the side walls shall be 0.120" thick for superior vertical load strength. The inner slide channel of the rail shall be 0.080" thick. Picket holes in the ForeRunner™ rail shall be spaced 4.715" o.c., except for Invincible™ style 6' long which shall be spaced 4.98" o.c. Picket retaining rods shall be 0.125" diameter galvanized steel. Posts shall be a minimum of 2-1/2" square with a perimeter wall thickness of 0.080" and a interior reinforcing web thickness of 0.080". High quality PVC grommets shall be supplied to seal all picket-to-rail intersections.

D. All fasteners shall be stainless steel. Bracket to rail attachments shall be made using specially designed one-way tamperproof security bolts with inverted "t-nuts". Bracket to post connections shall be made using fasteners supplied by the manufacturer.

E. Aluminum castings shall be used for all rings, post caps, finials, and miscellaneous adornments.

2.03 FABRICATION

A. Pickets, rails and posts shall be pre-cut to specified lengths. ForeRunner™ rails shall be pre-punched to accept pickets.

B. Grommets shall be inserted into the pre-punched holes in the rails, and pickets shall be inserted through the grommets so that pre-drilled picket holes align with the internal raceway of the two-part ForeRunner™ rails. (Note: This can best be accomplished by using an alignment template). Retaining rods shall be inserted into each ForeRunner™ rail so that they pass through the pre-drilled holes in each picket, thus completing the panel assembly.

C. Completed panels shall be capable of supporting a 500 lb. load (applied at midspan) without permanent deformation. Panels shall be biasable to a 25% change in grade.

D. Gates shall be fabricated using ForeRunner™ rail material and gate ends having the same outside cross-section (1.75" Square) as the rail. Gate ends shall be 0.125" thick; gate pickets shall be 0.125" thick. All rail and upright intersections shall be joined by welding. All picket and rail intersections shall also be joined either by welding or by the same retaining rod process used for panel assembly.

PART 3 - EXECUTION

3.01 PREPARATION

All new installation shall be laid out by the contractor in accordance with the construction plans.

3.02 INSTALLATION

Fence posts shall be set in accordance with the spacings shown in Table 2, plus or minus 1/2", depending on the nominal span specified. Gate posts shall be spaced according to the gate openings specified in the construction plans. The "Earthwork" and "Concrete" sections of this specification shall govern post base material requirements. Echelon II® panels shall be attached to posts using mechanically fastened panel brackets supplied by the manufacturer.

3.03 CLEANING

The contractor shall clean the jobsite of excess materials; post-hole excavations shall be scattered uniformly away from posts.

Table 1 - Coating Performance Requirements

Quality Characteristics	ASTM Test Method	Performance Requirments
Adhesion	D3359 - Method B	Adhesion (Retention of Coating) over 90% of test area (Tape and knife test).
Corrosion Resistance	B117 & D1654	Corrosion Resistance over 1,000 hours (Scribed per D1654; failure mode is accumulation of 1/8" coating loss from scribe or medium #8 blisters).
Impact Resistance	D2794	Impact Resistance over 60 inch lb. (Forward impact using 0.625" ball).
Weathering Resistance	D822, D2244, D523 (60° Method)	Weathering Resistance over 1,000 hours (Failure mode is 60% loss of gloss or color variance of more than 3 delta-E color units).

Table 2 - Post Spacing Requirements

Span	6' Nominal (67-3/4" Rail)				8' Nominal (92-5/8" Rail)			
Post Size	2-1/2"	3"	2-1/2"	3"	2-1/2"	3"	2-1/2"	3"
Bracket	Rigid		Swivel		Rigid		Swivel	
Straight Picket Post Settings +/- 1/2"O.C.	71-1/2"	72"	73"	73-1/2"	96"	96-1/2"	97-1/2"	98"
Curved Picket Post Settings +/- 1/2" O.C.	75"	75-1/2"	76-1/2"	77"	94-1/2"	95"	96"	96-1/2"

Echelon Plus®

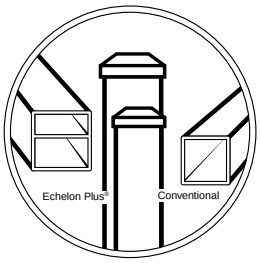
The Better Value

See why Echelon Plus® is considered the "better value" when compared to conventional aluminum products. The pickets, rails and posts provide a stronger structure. The all welded gate construction with thicker component walls ensures years of use with no sag. Echelon Plus® fences are polyester powder coated with a finish that is far superior to other coatings in durability and scratch-resistance. With Echelon Plus®, a maintenance-free, enviromentally-friendly fence is guaranteed.

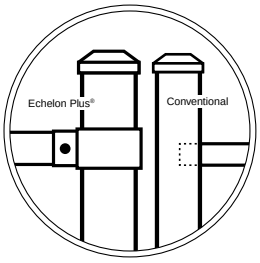
COMPONENT SIZES

Pickets	ForeRunner™ Rails	Posts	Heights
3/4" x .050"	1-1/4" x 1-7/16" TOP - .055 SIDES - .075	*2-1/2" x .060 3" x .125 4" x .250	36", 42", 48", 60", 72" (and 54" for Majestic & Conqueror pool panels)

*The Echelon Plus® post has an interior reinforcement web which adds tothe overall strength of the post.

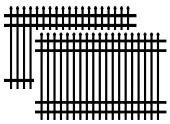


The Echelon Plus® post interior is reinforced

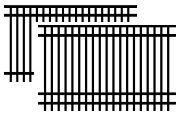


The Echelon Plus® rail is firmly attached to the post

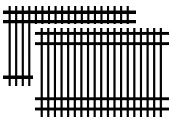
STYLES



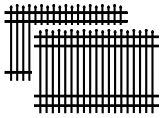
CLASSIC™
Style C3 (3-Rail)
*Style C4 (4-Rail)



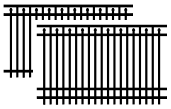
MAJESTIC™
Style M3 (3-Rail)
*Style M4 (4-Rail)



GENESIS™
Style G3 (3-Rail)
*Style G4 (4-Rail)

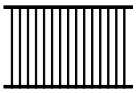


WARRIOR™
Style W3 (3-Rail)
*Style W4 (4-Rail)

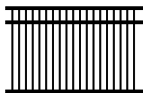


CONQUEROR™
Style R3 (3-Rail)
*Style R4 (4-Rail)

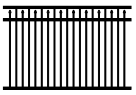
Pool Styles



MONARCH™
Style M2P (2-Rail)



MAJESTIC™
Style M3P (3-Rail)



CONQUEROR™
Style R3P (3-Rail)

* 6' HIGH ONLY

AVAILABILITY, WARRANTY & MAINTENANCE

The availability, warranty, and maintenance information of Echelon II® also applies to Echelon Plus® (see Page 24).

WIND LOADING

Height (FT)	Rail Length	Post Size	Echelon Plus® Wind Load Capacity Factor (PSF)	Typical Wind Load Capacity (mph)
4	6	2-1/2" x 2-1/2" Tube w/reinforced web	85	215
	8	2-1/2" x 2-1/2" Tube w/reinforced web	68	193
5	8	2-1/2" x 2-1/2" Tube w/reinforced web	47	159
6	8	2-1/2" x 2-1/2" Tube w/reinforced web	42	151

Note: Mph calculated using ANSI/ASCE 7-02, "American Society of Civil Engineers Minimum Design Loads for Buildings and Other Structures" Exposure Category C (open terrain with scattered obstructions having lengths generally less than 30 feet). For wind loading applicable to a particular specification, consult the appropriate Building Code.

COLORS

Request Color Chip samples for actual color

Black | Bronze | White

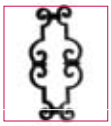
ADORNMENTS

Quad Flare

Triad

Ball Cap

Butterfly Scroll



Florentine Scroll

Rings

GATES

Contact the Ameristar Architectural Department for detailed information and literature on gates.

Echelon Plus® provides a wide selection of styles at an afordable price. The stronger posts and welded gates make Echelon Plus® an excellent fit for any commercial, institutional, and large estate perimeter fences projects.

CONSTRUCTION SPECIFICATION

SECTION 32 31 00 - ORNAMENTAL METAL FENCING SYSTEM

Echelon Plus® - Commercial Aluminum

PART 1 - GENERAL
1.01 WORK INCLUDED
The contractor shall provide all labor, materials and appurtenances necessary for installation of the ornamental aluminum fence system defined herein at (specify project site).

1.02 RELATED WORK
Section 022 _ _ - Earthwork
Section 030 _ _ - Concrete

1.03 SYSTEM DESCRIPTION
The manufacturer shall supply a total ornamental aluminum fence system of the Ameristar® Echelon Plus® (specify Classic™, Majestic™, Genesis™, Warrior™, or Conqueror™) design. The system shall include all components (i.e., pickets, rails, posts, gates and hardware) required.

1.04 QUALITY ASSURANCE
The contractor shall provide laborers and supervisors who are thoroughly familiar with the type of construction involved and materials and techniques specified.

1.05 REFERENCES
ASTM B117 - Practice for Operating Salt-Spray (Fog) Apparatus. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles and Tubes. ASTM D523 - Test Method for Specular Gloss. ASTM D822 - Practice for Conducting Tests on Paint and Related Coatings and Materials using Filtered Open-Flame Carbon-Arc Light and Water Exposure Apparatus. ASTM D1654 - Test Method for Evaluation of Painted or Coated Specimens Subjected to Corrosive Environments. ASTM D2244 - Test Method for Calculation of Color Differences from Instrumentally Measured Color Coordinates. ASTM D2794 - Test Method for Resistance of Organic Coatings to The Effects of Rapid Deformation (Impact). ASTM D3359 - Test Method for Measuring Adhesion by Tape Test.

1.06 SUBMITTAL
The manufacturer's literature shall be submitted prior to installation.

1.07 PRODUCT HANDLING AND STORAGE
Upon receipt at the job site, all materials shall be checked to ensure that no damage occurred during shipping or handling. Materials shall be stored in such a manner to ensure proper ventilation and drainage, and to protect against damage, weather, vandalism and theft.

PART 2 – MATERIALS
2.01 MANUFACTURER
The ornamental aluminum fence system shall conform to Ameristar® Echelon Plus®, (specify Classic™, Majestic™, Genesis™, Warrior™, or Conqueror™), (specify number of rails) - Rail style, (if ornamental rings are applicable, add 'with rings'), manufactured by Ameristar® Fence Products, Inc., in Tulsa, Oklahoma.

2.02 MATERIAL
A. Aluminum material for fence framework (i.e., tubular pickets, rails and posts) shall conform to the requirements of ASTM B221. The aluminum extrusions for posts and rails (outer channel) shall be Alloy and Temper Designation 6005-T5. The aluminum extrusions for pickets and rail inner slide channels shall be Alloy and Temper Designation 6063-T5.

B. The manufactured framework shall be subjected to the Ameristar® thermal stratification coating process (high-temperature, in-line, multi-stage) including, as a minimum, a six-stage pretreatment/wash and an electrostatic spray application of a polyester finish. The topcoat shall be a "no-mar" TGIC polyester powder coat finish with a minimum thickness of 2 mils (0.0508mm). The color shall be (specify Black, Bronze, or White). The stratification-coated framework shall be capable of meeting the performance requirements for each quality characteristic shown in Table 1.

C. Material for fence pickets shall be 3/4" square x 0.050" thick extruded tubing. The cross-sectional shape of the rails shall conform to the manufacturer's ForeRunner™ design with outside cross-section dimensions of 1.4375" x 1.250". The top wall of the outer channel of the rail shall be 0.055" thick; the side walls shall be 0.075" thick for superior vertical load strength. The inner slide channel of the rail shall be 0.070" thick. Picket holes in the ForeRunner™ rail shall be spaced 4.6875" o.c. Picket retaining rods shall be 0.125" diameter galvanized steel. Posts shall be a minimum of 2-1/2" square with a perimeter wall thickness of 0.060" and a an interior reinforcing web. Cast aluminum post caps shall be affixed to all posts. High quality PVC grommets shall be supplied to seal all picket-to-rail intersections.

D. All fasteners shall be stainless steel. Aluminum brackets shall be used to attach rails to posts.

E. Aluminum castings shall be used for all rings, post caps, finials, and miscellaneous adornments.

2.03 FABRICATION
A. Pickets, rails and posts shall be pre-cut to specified lengths. ForeRunner™ rails shall be pre-punched to accept pickets.

B. Grommets shall be inserted into the pre-punched holes in the rails, and pickets shall be inserted through the grommets so that pre-drilled picket holes align with the internal raceway of the two-part ForeRunner™ rails. (Note: This can best be accomplished by using an alignment template). Retaining rods shall be inserted into each ForeRunner™ rail so that they pass through the pre-drilled holes in each picket, thus completing the panel assembly.

C. Completed panels shall be capable of supporting a 200 lb. load (applied at midspan) without permanent deformation. Panels shall be biasable to a 25% change in grade.

D. Gates shall be fabricated using ForeRunner™ rail material and 1.75" square gate ends. Gate ends shall be 0.125" thick; gate pickets shall be 0.080" thick. All rail and upright intersections shall be joined by welding. All picket and rail intersections shall also be joined by welding.

PART 3 - EXECUTION
3.01 PREPARATION
All new installation shall be laid out by the contractor in accordance with the construction plans.

3.02 INSTALLATION
Fence posts (2-1/2" square) shall be set 95" on center, plus or minus 1/2". Gate posts shall be spaced according to the gate openings specified in the construction plans. The "Earthwork" and "Concrete" sections of this specification shall govern post base material requirements. Echelon Plus® panels shall be attached to posts using mechanically fastened panel brackets supplied by the manufacturer.

3.03 CLEANING
The contractor shall clean the jobsite of excess materials; post-hole excavations shall be scattered uniformly away from posts.

Quality Characteristics	ASTM Test Method	Performance Requirements
Adhesion	D3359 - Method B	Adhesion (Retention of Coating) over 90% of test area (Tape and knife test).
Corrosion Resistance	B117 & D1654	Corrosion Resistance over 1,000 hours (Scribed per D1654; failure mode is 1/8" coating loss from scribe or medium #8 blisters).
Impact Resistance	D2794	Impact Resistance over 60 inch lb. (Forward impact using 0.625" ball).
Weathering Resistance	D822, D2244, D523 (60° Method)	Weathering Resistance over 1,000 hours (Failure mode is 60% loss of gloss or color variance of more than 3 delta-E color units).

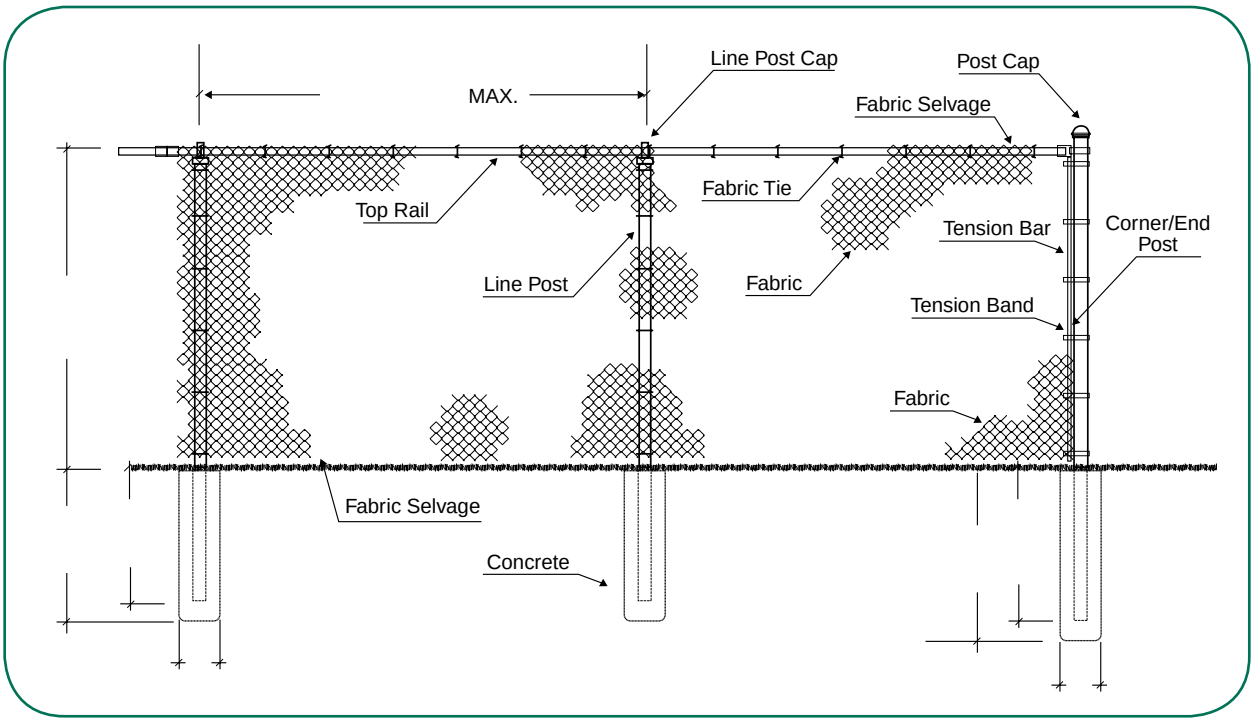
PERMACOAT®

Color Chain Link Fence Framework

Contemporary color fence systems from Ameristar® can be artfully blended into the natural environment to dramatically enhance any chain link fence installation, whether the application is commercial, recreational, industrial or high security. A PermaCoat® chain link fence adds the creative flair that reflects a well designed aesthetically pleasing project. The PermaCoat® system features a tough durable finish coat (see Pages 4 and 5) that resists severe weather conditions and maintains an attractive appearance year after year.

DETAILED PRODUCT DATA

Ameristar's electronic media enable architects and specifiers to simply download specification information directly into the appropriate section of their CSI-formatted project specifications; they also enable the direct downloading of product drawings onto project blueprints.



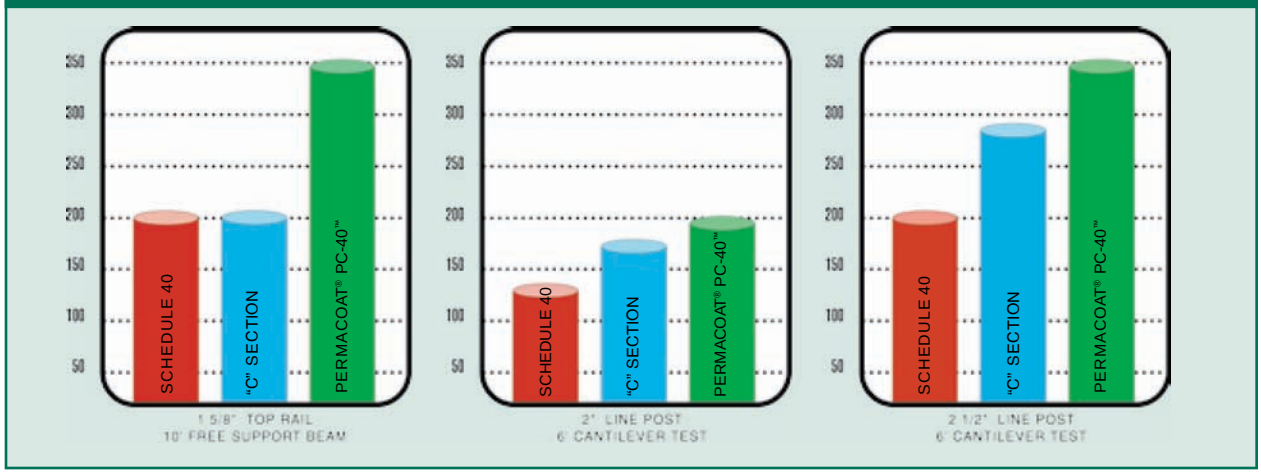
DEFINING FEATURES

The fence framework was designed and developed to answer the need for a more durable, attractive and affordable framing product. It is produced from high yield strength galvanized steel, using state-of-the-art mill forming and in-line welding techniques. It is coated with the PermaCoat® powder coating system, with its double layer of protection (actually powder coated twice). The base coat is a epoxy moisture barrier that is thermally fused to the galvanized substrate and is known for its outstanding corrosion resistance. The finish coat is a thermo-setting TGIC "no-mar" polyester with enhanced UV resistance to maintain a beautiful color finish for a lifetime of maintenance-free enjoyment.

DEFINING FEATURES

SUPERIOR STRENGTH

PERMACOAT® PC-40™ VS. SCHEDULE 40 & "C" SECTION
BENDING STRENGTH COMPARISON



SUPERIOR SYSTEM

APPLICATION		INDUSTRIAL ASTM F668/F1043 & ASTM F1712 Sports Complexes • Recreational Facilities • Industrial Plant Facilities Government Facilities • Department of Transportation • Prisons	COMMERCIAL ASTM F668/F1043 & F934 Nurseries • Mini-Storages • Golf Courses • Apartments • Office Complexes • Swimming Pools	TENNIS COURT ASTM F969
PERMACOAT® FRAMEWORK	PRODUCT	PERMACOAT® PC-40 FENCE PIPE	PERMACOAT® PC-20 FENCE PIPE	PERMACOAT® FENCE PIPE
15 Year Warranty	Terminal Posts up to 6'	2.375" O.D. x .130" Wall 3.12 lb./ft.	2.375" O.D. x .095" Wall 2.31 lb./ft.	N/A
Heights from 3' to 20'	Terminal Posts over 6'	2.875" O.D. x .160" Wall 4.64 lb./ft.	2.875" O.D. x .110" Wall 3.25 lb./ft.	2.875" O.D. x .160" Wall 4.64 lb./ft.
Black, Green or Brown PermaCoat® Epoxy & Polyester Powder Coating No-Mar Finish	Terminal Posts over 10'	4" O.D. x .160" Wall 6.56 lb./ft.	N/A	2.875" O.D. x .160" Wall 4.64 lb./ft.
	Line Posts up to 6'	1.900" O.D. x .120" Wall 2.28 lb./ft.	1.900" O.D. x .090" Wall 1.74 lb./ft.	N/A
	Line Posts over 6'	2.375" O.D. x .130" Wall 3.12 lb./ft.	2.375" O.D. x .095" Wall 2.31 lb./ft.	2.375" O.D. x .130" Wall 3.12 lb./ft.
Type B Tubular Steel Framework With Supplemental Color Coating As Per ASTM F1043	Line Posts over 10'	2.875" O.D. x .160" Wall 4.64 lb./ft.	N/A	2.875" O.D. x .160" Wall 4.64 lb./ft.
	Rails & Bracing	1.660" O.D. x .111" Wall 1.84 lb./ft.	1.660" O.D. x .090" Wall 1.43 lb./ft.	1.660" O.D. x .090" Wall 1.43 lb./ft.

COMPONENT SIZES

Structural component sizes are shown in Table 1 to the Construction Specification on Page 33.

STYLES

PermaCoat® PC-40™ and PC-20™ Color Chain Link fences are available with or without barbed wire.

COLORS

Request Color Chip samples for actual color

Black Brown Green

CANTILEVER GATES

Cantilever gate information is provided in the TransPort™ Cantilever Gate Section (Pages 46-47).

WIND LOADING

Consult the Chain Link Fence Manufacturers Institute Guide CLFMI-WLG 2445, "Guide for Selection of Line Post Spacings for Chain Link Fence".

AVAILABILITY

Shipping

PermaCoat® PC-40™ and PC-20™ Color Chain Link fence framework is carefully wrapped and bundled to ensure the most economical damage-free shipping.

Ordering Information

To order, simply specify the items and color desired. Then figure and provide the quantities needed. Contact Ameristar® for the nearest distributor or for any other assistance needed.

WARRANTY

A written 15 year limited warranty is extended on Ameristar's PermaCoat® PC-40™ and PC-20™ Color Chain Link framework. Call Ameristar® for a copy.

MAINTENANCE

Little or no maintenance is required for the fence and gate systems supplied by Ameristar®. The PermaCoat® coated galvanized metal in PC-40™ and PC-20™ framework and the polyester coated aluminum in TransPort™ gates will remain corrosion free for years to come. Damages to coated surfaces can be readily covered with Ameristar's matching custom finishes (either spray or paint pen application).

PermaCoat® PC-40™

Ameristar's PermaCoat® PC-40™ industrial color chain link fence not only controls access, as one would expect from an industrial fence; it also enchances the beauty of the facilities and properties it surrounds. Using Permacoated framework makes the PC-40™ Industrial Fence the most attractive and durable industrial chain link fence that can be installed anywhere.

PermaCoat® PC-20™

Security and protection are blended into an attractive appearance with the PermaCoat®PC-20™ commercial color chain link fence system.

Tennis Court Perimeters

The appropriate combination of framework materials from Ameristar's PermaCoat® PC-40™ and PC-20™ works best for tennis court perimeters (see Page 31).

CONSTRUCTION SPECIFICATION

SECTION 32 31 00 - COLOR CHAIN LINK FENCE SYSTEM

Utilizing PermaCoat® PC-40™ (Industrial) or PC-20™ (Commercial) Fence Pipe

(MEETS "BUY AMERICAN" DOMESTIC PROCUREMENTS)

PART 1 - GENERAL

1.01 WORK INCLUDED

The contractor shall provide all labor, materials and appurtenances necessary for installation of the color chain link fencing system defined herein at (specify project site).

1.02 RELATED WORK

Section 02500 – Paving and Surfacing
Section 03300 – Case-In-Place Concrete
Section 04200 – Unit Masonry

1.03 SYSTEM DESCRIPTION

The contractor shall supply a total color chain link fencing system of the design, style and strength defined herein. The system shall include all components (i.e., framework, chain link fabric, gates and fittings) required.

1.04 QUALITY ASSURANCE

The contractor shall provide laborers and supervisors who are thoroughly familiar with the type of construction involved and materials and techniques specified.

1.05 REFERENCES

A. American Society for Testing and Materials (ASTM) Standards: A90/A90M - Test Method for Weight (Mass) of Coating on Iron and Steel Articles with Zinc or Zinc-Alloy Coatings. A653/A653M - Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process. A924/A924M - Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process. B6 - Specification for Zinc. B117 - Practice for Operating Salt Spray (Fog) Apparatus. D1499 - Practice for Operating Light- and Water-Exposure Apparatus (Carbon-Arc Type) for Exposure of Plastics. D3359 - Test Methods for Measuring Adhesion by Tape Test. E8/E8M - Test Methods for Tension Testing of Metallic Materials. F567 - Practice for Installation of Chain-Link Fence. F668 - Specification for Poly (Vinyl Chloride) (PVC)-Coated Steel Chain-Link Fence Fabric. F900 - Specification for Industrial and Commercial Swing Gates. F934 - Specification for Standard Colors for Polymer-Coated Chain Link Fence Materials. F969 - Practice for Construction of Chain-Link Tennis Court Fence. F1043 - Specification for Strength and Protective Coatings on Metal Industrial Chain Link Fence Framework. F1184 - Specification for Industrial and Commercial Horizontal Slide Gates.

B. American Association of State Highway and Transportation Officials (AASHTO) Standards: M181 - Standard Specification for Chain-Link Fence.

C. United States Federal Supply Service General Services Administration Specifications: RR-F-191/3 - Federal Specification Sheet for Fencing, Wire and Post, Metal (Chain-Link Fence Posts, Top Rails and Braces) - Detail Specification.

1.06 SUBMITTAL

The manufacturer's submittal package shall be provided prior to installation.

1.07 PRODUCT HANDLING AND STORAGE

Upon receipt at the job site, all materials shall be checked to ensure that no damages occurred during shipping or handling. Materials shall be stored in such a manner to ensure proper ventilation and drainage and to protect against damage, weather, vandalism and theft.

PART 2 - MATERIALS

2.01 MANUFACTURER

Framework for color chain link fence systems shall conform to Ameristar® PermaCoat® (specify PC-40™ Industrial Weight or PC-20™ Commercial Weight) Fence Pipe, as manufactured by Ameristar® Fence Products in Tulsa, Oklahoma.

2.02 MATERIAL - STEEL FRAMEWORK

A. The steel material used to manufacture Ameristar® PermaCoat® (specify PC-40™ Industrial Weight or PC-20™ Commercial Weight) Fence Pipe shall be zinc-coated steel strip, galvanized by the hot-dip process conforming to the criteria of ASTM A653/A653M and the general requirements of ASTM A924/A924M.

B. The zinc used in the galvanizing process shall conform to ASTM B6. Weight of zinc shall be determined using the test method described in ASTM A90 and shall conform to the weight range allowance for ASTM A653, (specify Designation G-210 for PC-40™ Industrial Weight or Designation G-90 for PC-20™ Commercial Weight).

C. The framework shall be manufactured in accordance with commercial standards to meet the strength (50,000 psi minimum yield strength) and coating requirements of the following standards: 1.) ASTM F1043, Group IC, Electrical Resistance Welded Round Steel Pipe, (specify heavy industrial weight for PC-40™ or light industrial weight for PC-20™). 2.) M181, Type I, Grade 2, Electrical Resistance Welded Steel Pipe. 3.) RR-F-191/3, Class 1, Grade B, Electrical Resistance Welded Steel Pipe.

D. The exterior surface of the electrical resistance weld shall be recoated with the same type of material and thickness as the basic zinc coating.

E. The manufactured framework shall be subjected to the PermaCoat® process, a complete thermal stratification coating process (multi-stage, high-temperature, multi-layer) including, as a minimum, a six-stage pretreatment/wash (with zinc phosphate), an electrostatic spray application of an epoxy base, and a separate electrostatic spray application of a polyester finish.

F. The material used for the base coat shall be a zinc-rich (gray color) thermosetting epoxy; the minimum thickness of the base coat shall be two (2) mils. The material used for the finish coat shall be a thermosetting "no-mar" TGIC polyester powder; the minimum thickness of the finish coat shall be two (2) mils. The stratification coated pipe shall demonstrate the ability to endure a salt-spray resistance test in accordance with ASTM B117 without loss of adhesion for a minimum exposure time of 3,500 hours. Additionally, the coated pipe shall demonstrate the ability to withstand exposure in a weather-ometer apparatus for 1,000 hours without failure in accordance with ASTM D1499 and to show satisfactory adhesion when subjected to the cross-hatch test, Method B, in ASTM D3359. The polyester finish coat shall not crack, blister or split under normal use.

G. The color of all framework shall be (specify Black, Green or Brown) in accordance with ASTM F934.

H. The strength of Ameristar® PermaCoat® (specify PC-40™ Industrial Weight or PC-20™ Commercial Weight) Fence Pipe shall conform to the requirements of ASTM F1043; the minimum weight shall not be less than 90% of the nominal weight (see Table 1). The strength of line, end, corner and pull posts shall be determined by the use of 4' or 6' cantilevered beam test. The top rail shall be determined by a 10' free-supported beam test (see Table 1). An alternative method of determining pipe strength is by the calculation of bending moment (see Table 1). Conformance with this specification can be demonstrated by measuring the yield strength of a randomly selected piece of pipe from each lot and then calculating the section modulus. The yield strength shall then be determined according to the methods described in ASTM E8. For materials under this specification, the 0.2 offset method shall be used in determining yield strength. Terminal posts, line posts and top/bottom rails shall be precut to specified lengths.

2.03 MATERIAL - FENCE FABRIC

A. The material for chain link fence fabric shall be manufactured from galvanized steel wire. The weight of zinc shall meet the requirements of ASTM F668, Table 4. Galvanized wire shall be PVC-coated to meet the requirements of ASTM F668. The class of the fence fabric shall be (specify Class 1 - Extruded, Class 2A - Extruded and Bonded or Class 2B - Fused and Bonded).

B. Selvage: Top edge (specify knuckled or twisted) and bottom edge (specify knuckled or twisted).

C. Color: The coating color for the fence fabric shall be (specify Black, Green or Brown). Reference ASTM F668 and ASTM F934.

D. Wire Size: The size of the steel wire core shall be (specify gauge) gauge. (See Table 2); the finished size of the coated wire shall be (specify gauge) gauge (See Table 2).

E. Height and Mesh Size: The fabric height shall be (specify height) feet high with a mesh size of (specify mesh size) inches. (See Table 2).

2.04 MATERIAL - GATES

Swing gates shall be manufactured and coated to meet the requirements of ASTM F900. Slide gates shall be manufactured to meet the requirements of ASTM F1184. The color of all gates shall be (specify Black, Green or Brown) in accordance with ASTM F934.

PART 3 - EXECUTION

3.01 PREPARATION

All new installation shall be laid out by the contractor in accordance with the construction plan.

3.02 INSTALLATION

Install chain link fence in accordance with ASTM F567. For chain link tennis court fences, install in accordance with ASTM F969. Fence posts shall be set at spacings of a maximum of 10' o.c. Gate posts shall be spaced according to the gate openings specified in the construction plans. The "Paving and Surfacing," "Cast-In-Place Concrete" and "Unit Masonry" sections of this specification shall govern post base placement and material requirements. Install fabric on security side and attach with wire ties or clip to line posts at 15 inches o.c. and to rails, braces and tension wire at 24 inches o.c.

3.03 CLEANING

The contractor shall clean the jobsite of excess materials. Post hole excavations shall be scattered uniformly away from posts.

TABLE 1 - FRAMEWORK

Structural Application	Fence Industry O.D.	Decimal O.D. Equivalent		Pipe Wall Thickness		Weight		Section Modulus (inches)	x	Min. Yield Strength (psi)	=	Max. Bending Moment (lb. in.)	Calculated Load (lbs.)		
													10' Free Supported	Cantilever	
		inches	(mm)	inches	(mm)	lb./ft.	(kg/m)							4'	6'
PC-40™ (Industrial)	1-5/8"	1.660	42.16	.111	2.82	1.84	2.74	.1961	x	50,000	=	9,805	327	204	136
	2"	1.900	48.26	.120	3.05	2.28	3.39	.2810	x	50,000	=	14,050	468	293	195
	2-1/2"	2.375	60.33	.130	3.30	3.12	4.64	.4881	x	50,000	=	24,405	814	508	339
	3"	2.875	73.03	.160	4.06	4.64	6.90	.8778	x	50,000	=	43,890	1,463	914	610
	4"	4.000	101.60	.160	4.06	6.56	9.76	1.7819	x	50,000	=	89,095	2,970	1,856	1,237
PC-20™ (Commercial)	1-3/8"	1.315	33.40	.080	2.03	1.06	1.57	.0900	x	50,000	=	4,500	150	N/A	N/A
	1-5/8"	1.660	42.16	.085	2.16	1.43	2.13	.1574	x	50,000	=	7,870	262	164	109
	2"	1.900	48.26	.090	2.29	1.74	2.59	.2208	x	50,000	=	11,040	N/A	230	154
	2-1/2"	2.375	60.33	.095	2.41	2.32	3.45	.3734	x	50,000	=	18,670	N/A	389	259
	3"	2.875	73.03	.111	2.82	3.26	4.85	.6365	x	50,000	=	31,825	N/A	663	442

TABLE 2 - FABRIC

Structural Application	Finished Gauge	Finished OD (NOM)	Core Diameter (NOM)	PVC Coating Thickness	Mesh Sizes Available	Fabric Extrusion Type	Minimum Breaking Strength
PC-40™ (Industrial)	6	.192 (4.88 mm)	.148 (3.76 mm)	.015 - .025 (0.38 - 0.64 mm)	2 (50 mm); 1-3/4 (44 mm)	CLASS 2A	1290#
	8	.162 (4.11 mm)	.120 (3.05 mm)	.015 - .025 (0.38 - 0.64 mm)	2 (50 mm); 1-3/4 (44 mm); 1 (25 mm)	CLASS 1, 2A	850#
	9	.148 (3.76 mm)	.120 (3.05 mm)	.015 - .025 (0.38 - 0.64 mm)	2 (50 mm); 1-3/4 (44 mm); 1 (25 mm)	CLASS 1, 2A	850#
PC-20™ (Commercial)	8	.162 (4.11 mm)	.120 (3.05 mm)	.015 - .025 (0.38 - 0.64 mm)	2 (50 mm); 1-3/4 (44 mm); 1 (25 mm)	CLASS 1, 2A	850#
	9	.148 (3.76 mm)	.097 (2.46 mm)	.015 - .025 (0.38 - 0.64 mm)	2 (50 mm); 1-3/4 (44 mm); 1-1/4 (32 mm); 1 (25 mm)	CLASS 1, 2A	650#

GalvOnAll™

GBR-40™ Industrial and GBR-20™ Commercial Fence Pipe

SUPERIOR STRENGTH

Comparison of GalvOnAll™ GBR-40™ Fence Pipe against Schedule 40 Pipe & "C" Section Framework shows GBR-40™ to be far superior in strength (Note: The comparative strengths are identical to those shown for PC-40™ on Page 35).

COMPONENT SIZES

Structural component sizes are shown in Table 1 in the Construction Specification on Page 35.

STYLES

GalvOnAll™ GBR-40™ and GBR-20™ Chain Link fences are available with or without barbed wire.

CANTILEVER GATES

Cantilever gate information is provided in the Trans-Port™ Cantilever Gate Section (Pages 46-47).

WIND LOADING

Consult the Chain Link Fence Manufacturers Institute Guide CLFMI-WLG 2445, "Guide for Selection of Line Post Spacings for Chain Link Fence".

AVAILABILITY

GalvOnAll™ GBR-40™ and GBR-20™ Chain Link fence framework is carefully bundled to ensure the most economical damage-free shipping. To order, simply specify the items and lengths desired. Then figure and provide the quantities needed. Contact Ameristar® for the nearest distributor or for any other assistance needed.

MAINTENANCE

Little or no maintenance is required for chain link fence framework supplied by Ameristar®. The GalvOnAll™ GBR-40™ and GBR-20™ framework will remain corrosion free for years to come.

GalvOnAll™ GBR-40™

The high-tensile steel and advanced roll-forming process used to produce GalvOnAll™ GBR-40™ fence framework results in a strength superior to Schedule 40 pipe. Ameristar's GalvOnAll™ manufacturing process utilizes a full layer (0.90 oz. per sq. ft. nominal) of hot-dip galvanized on both the outside and inside surfaces. GalvOnAll's total protection process achieves much greater corrosion and exposure resistance than conventional galvanized framework employing a painted interior.

GalvOnAll™ GBR-20™

The high-tensile steel used in the manufacture of GalvOnAll™ GBR-20™ commercial fence pipe is designed to retain 80% of the strength of heavy industrial GalvOnAll™ GBR-40™ fence pipe. GalvOnAll™ GBR-20™ is a strong, yet economical alternative for endless applications such as tennis courts, baseball and softball fields, and sports complexes, and a host of institutional and business perimeter installations.

CONSTRUCTION SPECIFICATION

SECTION 32 31 00 - GALVANIZED CHAIN LINK FENCE SYSTEM

Utilizing GalvOnAll™ GBR-40™ (Industrial) or GBR-20™ (Commercial) Fence Pipe

(MEETS "BUY AMERICAN" DOMESTIC PROCUREMENTS)

PART 1 - GENERAL

1.01 WORK INCLUDED

The contractor shall provide all labor, materials and appurtenances necessary for installation of the galvanized chain link fence system defined herein at (specify project site).

1.02 RELATED WORK

Section 02500 - Paving and Surfacing
Section 03300 - Cast-In-Place Concrete
Section 04200 - Unit Masonry

1.03 SYSTEM DESCRIPTION

The contractor shall supply a total galvanized chain link fence system of the design, style and strength defined herein. The system shall include all components (i.e., framework, chain link fabric, gates and fittings) required.

1.04 QUALITY ASSURANCE

The contractor shall provide laborers and supervisors who are thoroughly familiar with the type of construction involved and materials and techniques specified.

1.05 REFERENCES

A. American Society for Testing and Materials (ASTM) Standards: A90/A90M - Test Method for Weight (Mass) of Coating on Iron and Steel Articles with Zinc or Zinc-Alloy Coatings. A392 - Specification for Zinc-Coated Steel Chain-Link Fence Fabric. A653/A653M - Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process. A924/A924M - Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process. B6 - Specification for Zinc. B117 - Practice for Operating Salt Spray (Fog) Apparatus. D1499 - Practice for Operating Light- and Water-Exposure Apparatus (Carbon-Arc Type) for Exposure of Plastics. E8/E8M - Test Methods for Tension Testing of Metallic Materials. E376 - Practice for Measuring Coating Thickness by Magnetic-Field or Eddy-Current (Electromagnetic) Test Methods. F567 - Practice for Installation of Chain-Link Fence. F626 - Specification for Fence Fittings. F668 - Specification for Poly (Vinyl Chloride) (PVC)-Coated Steel Chain-Link Fence Fabric. F900 - Specification for Industrial and Commercial Swing Gates. F969 - Practice for Construction of Chain-Link Tennis Court Fence. F1043 - Specification for Strength and Protective Coatings on Metal Industrial Chain Link Fence Framework. F1184 - Specification for Industrial and Commercial Horizontal Slide Gates.

B. American Association of State Highway and Transportation Officials (AASHTO) Standards: M181 - Standard Specification for Chain-Link Fence.

C. United States Federal Supply Service General Services Administration Specifications: RR-F-191/3 - Federal Specification Sheet for Fencing, Wire and Post, Metal (Chain-Link Fence Posts, Top Rails and Braces) - Detail Specification.

1.06 SUBMITTAL

The manufacturer's literature shall be submitted prior to installation.

1.07 PRODUCT HANDLING AND STORAGE

Upon receipt at the job site, all materials shall be checked to ensure that no damages occurred during shipping or handling. Materials shall be stored in such a manner to ensure proper ventilation and drainage and to protect against damage, weather, vandalism and theft.

PART 2 - MATERIALS

2.01 MANUFACTURER

Framework for galvanized chain link fence systems shall conform to Ameristar® GalvOnAll™ (specify GBR-40™ Industrial Weight or GBR-20™ Commercial Weight) Fence Pipe, as manufactured by Ameristar® Fence Products in Tulsa, Oklahoma.

2.02 MATERIAL - STEEL FRAMEWORK

A. The steel material used to manufacture Ameristar® GalvOnAll™ (specify GBR-40™ Industrial Weight or GBR-20™ Commercial Weight) Fence Pipe shall be zinc-coated steel strip, galvanized by the hot-dip process conforming to the criteria of ASTM A653/A653M and the general requirements of ASTM A924/A924M.

B. The zinc used in the galvanizing process shall conform to ASTM B6. Weight of zinc shall be determined using the test method described in ASTM A90 and shall conform to the weight range allowance for ASTM A653, (specify Designation G-210 for GBR-40™ Industrial Weight or Designation G-90 for GBR-20™ - Commercial Weight).

C. The framework shall be manufactured in accordance with commercial standards to meet the strength (50,000 psi minimum yield strength) and coating requirements of the following standards: 1.) ASTM F1043, Group IC, Electrical Resistance Welded Round Steel Pipe, (specify heavy industrial weight for GBR-40™ or light industrial weight for GBR-20™). 2.) M181, Type I, Grade 2, Electrical Resistance Welded Steel Pipe. 3.) RR-F-191/3, Class 1, Grade B, Electrical Resistance Welded Steel Pipe.

D. The exterior surface of the electrical resistance weld shall be recoated with the same type of material and thickness as the basic zinc coating.

E. A chromate conversion coating shall be applied to the external surface. The chromate shall be 30-micrograms/in^2 +/- 15 micrograms/in^2 and shall be verified by a strip and weigh method utilizing an atomic absorption spectrophotometer or x-ray fluorescence spectrograph.

F. A clear coat shall be applied over the chromate conversion coating. The thickness of the clear coating shall be a nominal 0.5 mils +/- 0.2 mils and shall be determined in accordance with ASTM E376 using a suitable magnetic or eddy current coating thickness tester. (Note: Thickness shall be determined by taking the difference between the thickness of zinc and the total thickness of clear coat and zinc.) The exterior clear-coated surface must demonstrate the ability to withstand exposure of 500 hours without failure at a black panel temperature of 145 F when tested in accordance with ASTM D1499. The clear coat shall also withstand 500 hours of exposure to 100% relative humidity per ASTM D2247 without blistering or peeling and 950 hours of exposure to salt spray per ASTM B117 with a maximum of 5% red rust.

G. The strength of Ameristar® GalvOnAll™ (specify GBR-40™ Industrial Weight or GBR-20™ Commercial Weight) Fence Pipe shall conform to the requirements of ASTM F1043; the minimum weight shall not be less than 90% of the nominal weight (see Table 1). The strength of line, end, corner and pull posts shall be determined by the use of 4' or 6' cantilevered beam test. The top rail shall be determined by a 10' free-supported beam test (see Table 1). An alternative method of determining pipe strength is by the calculation of bending moment (see Table 1). Conformance with this specification can be demonstrated by measuring the yield strength of a randomly selected piece of pipe from each lot and calculating the section modulus. The yield strength shall be determined according to the methods described in ASTM E8. For materials under this specification, the 0.2 offset method shall be used in determining yield strength. Terminal posts, line posts and top/bottom rails shall be precut to specified lengths.

2.03 MATERIAL - FENCE FABRIC

A. The fabric shall be hot dipped galvanized with a minimum zinc coating weight per ASTM A392 and specified as one of the following: (Class I - The weight of the zinc coating shall not be less than 1.2 oz./ft^2 [366 g/m^2], of uncoated wire surface) or (Class II - The weight of the zinc coating shall not be less than 2.0 oz./ft^2 [610 g/m^2] of uncoated wire surface, on wire of fabric coated before weaving; on fabric coated after weaving, the weight of zinc coating shall not be less than 2.0 oz./ft^2 [610 g/m^2] of uncoated wire surface as determined from the average of two or more specimens, and not less than 1.8 oz./ft^2 [500g/m^2] of uncoated wire surface for any individual specimen.).

B. Wire Size: The finished wire size shall be (specify gauge) gauge (See Table 2).

C. Height and Mesh Size: The fabric height shall be (specify height) feet high with a mesh size of (specify mesh size) inches (See Table 2).

D. Selvage: Top edge (specify knuckled or twisted) and bottom edge (specify knuckled or twisted).

2.04 MATERIAL - FENCE FITTINGS

The material for fence fittings shall be manufactured to meet the requirements of ASTM F626.

2.05 MATERIAL - GATES

Swing gates shall be manufactured and coated to meet the requirements of ASTM F900. Slide gates shall be manufactured to meet the requirements of ASTM F1184.

PART 3 - EXECUTION

3.01 PREPARATION

All new installation shall be laid out by the contractor in accordance with the construction plan.

3.02 INSTALLATION

Install chain link fence in accordance with ASTM F567. For chain link tennis court fences, install in accordance with ASTM F969. Fence posts shall be set at spacings of a maximum of 10' o.c. Gate posts shall be spaced according to the gate openings specified in the construction plans. The "Paving and Surfacing," "Cast-In-Place Concrete" and "Unit Masonry" sections of this specification shall govern post base placement and material requirements. Install fabric on security side and attach with wire ties or clip to line posts at 15 inches o.c. and to rails, braces and tension wire at 24 inches o.c.

3.03 CLEANING

The contractor shall clean the jobsite of excess materials. Post hole excavations shall be scattered uniformly away from posts.

TABLE 1 - FRAMEWORK

Structural Application	Fence Industry O.D.	Decimal O.D. Equivalent		Pipe Wall Thickness		Weight		Section Modulus (inches)	x	Min. Yield Strength (psi)	=	Max. Bending Moment (lb. in.)	Calculated Load (lbs.)		
													10' Free Supported	Cantilever	
		inches	(mm)	inches	(mm)	lb./ft.	(kg/m)							4'	6'
GBR-40 (Industrial)	1-5/8"	1.660	42.16	.111	2.82	1.84	2.74	.1961	x	50,000	=	9,805	327	204	136
	2"	1.900	48.26	.120	3.05	2.28	3.39	.2810	x	50,000	=	14,050	468	293	195
	2-1/2"	2.375	60.33	.130	3.30	3.12	4.64	.4881	x	50,000	=	24,405	814	508	339
	3"	2.875	73.03	.160	4.06	4.64	6.90	.8778	x	50,000	=	43,890	1,463	914	610
	4"	4.000	101.60	.160	4.06	6.56	9.76	1.7819	x	50,000	=	89,095	2,970	1,856	1,237
GBR-20 (Commercial)	1-3/8"	1.315	33.40	.080	2.03	1.06	1.57	.0900	x	50,000	=	4,500	150	N/A	N/A
	1-5/8"	1.660	42.16	.085	2.16	1.43	2.13	.1574	x	50,000	=	7,870	262	164	109
	2"	1.900	48.26	.090	2.29	1.74	2.59	.2208	x	50,000	=	11,040	N/A	230	154
	2-1/2"	2.375	60.33	.095	2.41	2.32	3.45	.3734	x	50,000	=	18,670	N/A	389	259
	3"	2.875	73.03	.111	2.82	3.26	4.85	.6365	x	50,000	=	31,825	N/A	663	442

TABLE 2 - FABRIC

Structural Application		Fabric Height and Diamond Count									Mesh Size	Wire Gauge	Nominal Wire Diameter	Minimum Breaking Strength
Industrial	Height	36" (910 mm)	42" (1070 mm)	48" (1220 mm)	60" (1520 mm)	72" (1830 mm)	84" (2130 mm)	96" (2440 mm)	120" (3050 mm)	144" (3660 mm)	2" (50.8 mm)	6	0.192" (4.88 mm)	2170#
	Count	10-1/2	12-1/2	13-1/2	17-1/2	20-1/2	24-1/2	27-1/2	34-1/2	41-1/2		9	0.148" (3.76 mm)	1290#
Industrial/ Security	Height	36" (910 mm)	42" (1070 mm)	48" (1220 mm)	60" (1520 mm)	72" (1830 mm)	84" (2130 mm)	96" (2440 mm)	120" (3050 mm)	144" (3660 mm)	1" (25.4 mm)	9	0.148" (3.76 mm)	1290#
	Count	20	23	27	33	39	45	53	67	79				
Tennis Court	Height								120" (3050 mm)	144" (3660 mm)	1-3/4" (44.5 mm)	9	0.148" (3.76 mm)	1290#
	Count								39-1/2	47-1/2		11	0.120" (3.05 mm)	850#
Commercial	Height	36" (910 mm)	42" (1070 mm)	48" (1220 mm)	60" (1520 mm)	72" (1830 mm)	84" (2130 mm)	96" (2440 mm)	120" (3050 mm)	144" (3660 mm)	2" (50.8 mm)	9	0.148" (3.76 mm)	1290#
	Count	10-1/2	12-1/2	13-1/2	17-1/2	20-1/2	24-1/2	27-1/2	34-1/2	41-1/2				

Delta Force®

Barbed Tape Obstacle Systems

Selection Guide

BTH

	Item Number	Diameter	Loops	Loop Spacing	Length per Roll	Weight per Roll
Whiplash® — Simple Helix, Unclipped	7555000020	18" (450 mm)	33	18" (450 mm)	50' (15 m)	11 lbs (5 kgs)
	7555000050	24" (600 mm)	33	18" (450 mm)	50' (15 m)	17 lbs (7.7 kgs)
	7555000080	30" (750 mm)	33	18" (450 mm)	50' (15 m)	22 lbs (10 kgs)

Tape Strip: AISI 430 Stainless Steel (ASTM A 653 Galvanized Steel Also Available) • 1" Wide Prior To Forming
Core Wire: AISI 301 Stainless Steel (ASTM A 764 Galvanized Steel Also Available) • .098" Diameter
Barb Clusters: Long Barbs • 2.4" (± .10") Tip-To-Tip • 4" On Center ■ **Loop Profile:** Circular

BTO

	Item Number	Diameter	Loops	Loop Spacing	Length per Roll	Weight per Roll
DefCon Alpha® — Concertina, 3 Clips Per Loop	7555100010	18" (450 mm)	31	12" (300 mm)	15' (4.5 m)	11 lbs (5 kgs)
	7555100040	24" (600 mm)	31	16" (400 mm)	20' (6 m)	17 lbs (7.7 kgs)
	7555100070	30" (750 mm)	31	16" (400 mm)	20' (6 m)	22 lbs (10 kgs)
	7555100100	36" (900 mm)	31	16" (400 mm)	20' (6 m)	25 lbs (11 kgs)
DefCon Bravo® — Double Concertina, 3 Clips Per Loop Per Coil	7555100130	24" (600 mm) AND 30" (750 mm)	31 AND 31	16" (400 mm) AND 16" (400 mm)	20' (6 m)	39 lbs (18 kgs)
DefCon Niko® — Concertina, 5 Clips Per Loop	7555100170	30" (750 mm)	51	12" (300 mm)	25' (7.5 m)	32 lbs (15 kgs)
	7555100190	30" (750 mm)	81	12" (300 mm)	40' (12 m)	52 lbs (24 kgs)
	7555100210	36" (450 mm)	51	12" (300 mm)	25' (7.5 m)	37 lbs (17 kgs)
	7555100230	36" (450 mm)	81	12" (300 mm)	40' (12 m)	59 lbs (27 kgs)
	7555100250	40" (1000 mm)	51	12" (300 mm)	25' (7.5 m)	44 lbs (20 kgs)
	7555100270	40" (1000 mm)	81	12" (300 mm)	40' (12 m)	68 lbs (31 kgs)
DefCon Victor® — Concertina, 7 Clips Per Loop	7555100290	40" (1000 mm)	51	12" (300 mm)	25' (7.5 m)	44 lbs (20 kgs)
	7555100310	40" (1000 mm)	81	12" (300 mm)	40' (12 m)	68 lbs (31 kgs)
DefCon Zulu® — Concertina, 9 Clips Per Loop	7555100320	60" (1500 mm)	51	12" (300 mm)	25' (7.5 m)	65 lbs (30 kgs)
	7555100340	60" (1500 mm)	101	12" (300 mm)	50' (15 m)	127 lbs (58 kgs)

Tape Strip: AISI 430 Stainless Steel (ASTM A 653 Galvanized Steel Also Available On Alpha® & Bravo®) • 1" Wide Prior To Forming
Core Wire: Galvanized Or Stainless (ASTM A 764 Galvanized Standard On Alpha® & Bravo® / AISI 301 Stainless Standard On Niko®, Victor® & Zulu®) • .098" Diameter
Barb Clusters: Long Barbs (Alternately Offset .15" - .45" Also Available) • 2.4" (± .10") Tip-To-Tip • 4" On Center ■ **Loop Profile:** Circular (Elliptical Also Available for Alpha® & Niko®)

BTC

	Item Number	Diameter	Loops	Loop Spacing	Length per Roll	Weight per Roll
ReCoil Alpha® — Concertina, 5 Clips Per Loop	7555400010	28" (710 mm)	56	21" (535 mm)	50' (15 m)	23 lbs (10.5 kgs)
	7555400020	38" (965 mm)	56	21" (535 mm)	50' (15 m)	34 lbs (15.5 kgs)
ReCoil Bravo® — Double Concertina, 5 Clips Per Loop Per Coil	7555400030	28" (710 mm) AND 38" (965 mm)	56 AND 56	21" (535 mm) AND 21" (535 mm)	50' (15 m)	57 lbs (26 kgs)

Tape Strip: ASTM A 653 Galvanized Steel • .68" Wide Prior To Forming
Core Wire: ASTM A 764 Galvanized Steel • .098" Diameter
Barb Clusters: Medium Barbs • .82" (± .10") Tip-To-Tip • 1.375" On Center ■ **Loop Profile:** Circular (Elliptical Also Available On ReCoil Alpha®)

NOTE: Upon request, selected Delta Force® products can be ordered with a larger or smaller quantity of loops per coil or with additional attachments per loop.

CONSTRUCTION SPECIFICATION

SECTION 32 31 00 - BARBED TAPE OBSTACLE & ENTANGLEMENT SYSTEMS

PART 1 - GENERAL
1.01 WORK INCLUDED
The contractor shall provide all labor, materials and appurtenances necessary for installation of the tactical barbed tape obstacle and entanglement system defined herein at **(specify project site)**.

1.02 SYSTEM DESCRIPTION
Section 022 _ _ - Earthwork
Section 030 _ _ - Concrete

1.03 SYSTEM DESCRIPTION
The manufacturer shall supply a total barbed tape obstacle and entanglement system of Ameristar® Delta Force® design. The system shall include all components (i.e., coils and related accessories) required.

1.04 QUALITY ASSURANCE
The contractor shall provide laborers and supervisors who are thoroughly familiar with the type of deployment involved and materials and techniques specified.

1.05 REFERENCES
· ASTM F 1910 - Standard Specification for Long Barbed Tape Obstacles.
· Military Commercial Item Description (CID) A-A-55522 - Barbed Tape, Concertina.

1.06 SUBMITTAL
The manufacturer's literature shall be submitted prior to installation.

1.07 PRODUCT HANDLING AND STORAGE
Upon receipt at the job site, all materials shall be checked to ensure that no damage occurred during shipping or handling. Materials shall be stored in such a manner to ensure proper ventilation and drainage, and to protect against damage, weather, vandalism and theft.

PART 2 - MATERIALS
2.01 MANUFACTURER
A. The tactical barbed tape entanglement system shall conform to Delta Force **(specify Whiplash® style barbed tape helix - BTH, reinforced tape with long barbs, simple helical configuration, DefCon® style barbed tape obstacle - BTO, reinforced tape with long barbs, concertina configuration or ReCoil Alpha® style barbed tape coil - BTC, flangeless tape with medium barbs, concertina configuration)** manufactured by Ameristar Fence Products, Inc., in Tulsa, Oklahoma.

B. The entire tactical entanglement system, and all associated accessories, shall be obtained from a single source.

2.02 MATERIALS
A. Barbed tape obstacle systems shall be designed to meet or exceed the requirements of **(specify ASTM F 1910 for BTH, BTO, or CID A-A-55522 for BTC systems)**.

B. Steel strip material for tape shall be **(specify applicable steel strip material criteria)**.

(For reinforced system including BTH, BTO, BTC, add following:)
C. Steel wire material for reinforcing core shall be **(specify applicable steel wire material criteria)**.

2.03 FABRICATION
A. Prior to fabrication, tape material shall be **(specify strip material width)** wide by **(specify strip material thickness)** thick. It shall be punched to produce clusters of 4 barbs spaced **(specify spacing of barb clusters)** on center. Barbs shall be **(specify flat or alternately offset .15" - .45")** in profile with a minimum length of **(specify barb length)**.
(For reinforced BTH and BTO systems, add following:)
After punching, the tape shall be reinforced by permanently cold clenching it around a stainless core wire with a 0.098" diameter and 130,000 psi minimum tensile strength. The barbed tape strip shall have a minimum wrap of 230 degrees about the core wire. The finished reinforced tape shall be a minimum of 0.325" wide in the throat area and shall exhibit two cut-resistant flanges. These flanges shall taper off in the immediate vicinity of the barb clusters to allow maximum barb penetration.
(For reinforced BTC systems, add following:)
After punching, the tape shall be reinforced by permanently cold clenching it around a galvanized core wire with a 0.098" diameter and 220,000 psi minimum tensile strength. The finished reinforced barbed tape shall be without flanges between barbs and shall not disengage when a force of 100 pounds is applied.

B. Barbed tape coil loops shall be shaped with a **(specify circular)** profile and contain **(specify the number of loops)** loops, **(specify diameter for circular coils)** ± 1". Each loop shall contain **(specify the number of barb clusters per loop)** barb clusters ± 1.
(Note: For double coil systems, it will be necessary to specify the quantity, size and cluster count for both the inner and outer coils).
(For concertina BTO systems, add following:)
Reinforced barbed tape shall be converted to concertina configuration by clipping alternate adjacent loops at **(specify number of attachment locations)** places about the circumference, continuous along the entire length of the coil. Clips shall be .375" by .065" and mechanically closed to withstand a minimum pull load of 200 pounds.
(For concertina BTC systems, add following:)
Flangeless reinforced coils shall be converted to concertina configuration by clipping alternate adjacent loops at 5 places about the circumference, continuous along the entire length of the coil. Clips shall be .375" by .065" and mechanically closed to withstand a minimum pull load of 200 pounds.

C. The barbed tape system shall be designed to be spread to a loop spacing of **(specify the spacing between loops)**, when fully deployed.
(For double coil BTO and BTC systems, add following:)
To ensure a uniform spacing for both inner and outer coils, they shall be fastened together by attaching a jacketed stainless steel wire rope, 7 by 7 strand, 3/64" by 5/64", at alternating loops throughout the double coil roll.

PART 3 - EXECUTION
3.01 PREPARATION
All new deployments shall be laid out by the contractor in accordance with the applicable project plans.

3.02 DEPLOYMENT
(For BTH and BTO systems, specify the following:)
The reinforced **(specify BTH helical or BTO concertina)** entanglement system is designed for use in a variety of permanent tactical deployment formations. Coils deployed in conjunction with standing fence systems or walls shall be firmly affixed using the fastening system specified in the manufacturer's instructions for the specific formation or combination of formations chosen. Each coil of barbed tape shall be extended a maximum of **(specify coil length in feet)** ± 1 foot. Adjacent coils shall be permanently spliced together by overlapping two barb clusters from each coil and splicing with steel tie wires placed around the shanks of the two coils between the barb clusters.
(For BTC systems, specify the following:)
The BTC flangeless reinforced concertina entanglement system is designed for use in a variety of permanent and temporary deployment tactical formations. Coils deployed in conjunction with standing fence systems or walls shall be firmly affixed using the fastening system specified in the manufacturer's instructions for the specific formation or combination of formations chosen. Coils running along ground surfaces shall have their free end pinned to the ground or tied to some other fixed point and then be spread until entirely deployed. Each coil of barbed tape shall be extended a maximum of 50' ± 1 foot. Adjacent coils shall be permanently spliced together by overlapping one cluster of each adjacent coil and splicing with two new steel tie wires placed around the shanks of the two coils between the barb clusters.

3.03 CLEANING
The contractor shall clear the deployment area of excess remnant materials upon completion of the deployment operation.

Architectural Metal Swing Gates

Better Gate Design and Rigid Welded Construction Means No Sag

All Impasse®, Aegis II®, Aegis Plus®, Montage Plus®, Echelon II®, and Echelon Plus® Single Swing and Double Swing Gates are welded at all joints to prevent sag and ensure proper fit and alignment. Electrostatic application of powder coating follows the welding operation. Aluminum gates are subjected to the full pre-treatment followed by polyester coating; galvanized steel gates are given both the full pre-treatment and full PermaCoat® epoxy and polyester coating (see Pages 4 and 5 for details).

OPENING SIZES

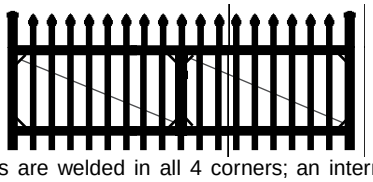
Impasse®, Aegis II®, Aegis Plus®, and Echelon II® Single and Double Gates are available in standard sizes up to openings of 16' and 32' respectively. Echelon Plus® Single and Double Gates are available in standard sizes up to openings of 7' and 14' respectively. For larger openings, special engineering may be needed or other options may be recommended.

REINFORCEMENT

For Gate Leaves 42" In Width Or Less:

Gusset plates are welded in all 4 corners of all gates (except Echelon Plus®) for added strength. Truss cables not included.

For Gate Leaves More Than 6 Feet In Width:



Gusset plates are welded in all 4 corners; an intermediate upright is added in center of leaf; and truss cables are attached for strength.

HINGE SELECTION CHART

Hinge Type	Size of Gate Leaf
Pin Hinge w/2-1/2" Male	Gate Leaves up to 4' long (under 90 lbs.)
Pin Hinge w/3" Male	Gate Leaves from 4' to 6' (under 90 lbs.)
Box Hinge	All Gate Leaves
180° Hinge	All Gate Leaves; fits 4" and 6" Sq. Posts

COLORS

Color choices are the same as for Estate™ gates on Page 44, except that Echelon Plus® gates are not available in desert sand.

WARRANTY

Warranties on Architectral Metal Swing Gates match the applicable warranty for the fence of the same type.

AVAILABILITY

Shipping

Architectural Metal Swing Gates are completely shrink-wrapped to ensure economical damage-free shipping.

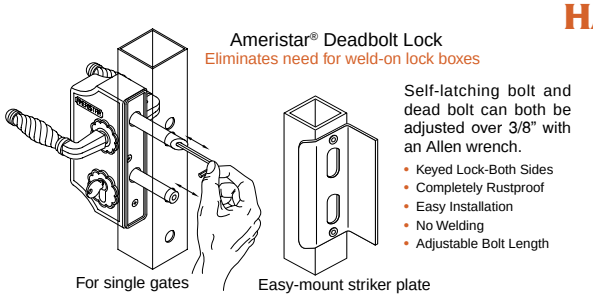
Ordering Information

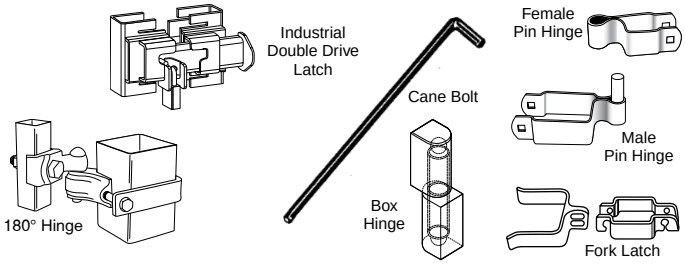
To order, simply specify the fence type for the gate to match along with the color and dimensions desired. The outside-to-outside width of the finished gate leaf must be specified. Then figure and provide the quantities needed. Contact Ameristar® for the standard leaf widths available or if any other assistance is needed.

MAINTENANCE

Little or no maintenance is required for Architectral Metal Swing Gates. supplied by Ameristar®. The coated finish will remain corrosion free for years to come. Damages to coated surfaces can be readily covered with Ameristar's matching custom finishes (either spray or paint pen application).

HARDWARE





CONSTRUCTION SPECIFICATION

SECTION 32 31 00 - GATE SYSTEMS

Architectural Metal Swing Gates

PART 1 - GENERAL

1.01 WORK INCLUDED

The contractor shall provide all labor, materials and appurtenances necessary for installation of the architectural metal swing gate system defined herein at (specify project site).

1.02 RELATED WORK

Section 022_ _ - Earthwork
Section 030_ _ - Concrete

1.03 SYSTEM DESCRIPTION

The manufacturer shall supply a total (specify material as aluminum or galvanized steel) swing gate system of Ameristar® (specify fence type as Impasse® Security, Aegis II® or Echelon II® Industrial Ornamental, or Aegis Plus®, Montage Plus® or Echelon Plus® Commercial Ornamental) design and (specify the style from those listed in the manufacturer's literature for the applicable fence type) style defined herein. The system shall include all components (i.e., pickets or pales, rails, gate uprights and hardware) required.

1.04 QUALITY ASSURANCE

The contractor shall provide laborers and supervisors who are thoroughly familiar with the type of construction involved and the materials and techniques specified.

1.05 QUALITY ASSURANCE

ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy Coated (Galvannealed) by the Hot-Dip Process. ASTM A924/A924M - Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process. ASTM A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength and High-Strength Low-Alloy with Improved Formability.
ASTM B117 - Practice for Operating Salt-Spray (Fog) Apparatus. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles and Tubes. ASTM D523 - Test Method for Specular Gloss. ASTM D822 - Practice for Conducting Tests on Paint and Related Coatings and Materials using Filtered Open-Flame Carbon-Arc Light and Water Exposure Apparatus. ASTM D1654 - Test Method for Evaluation of Painted or Coated Specimens Subjected to Corrosive Environments. ASTM D2244 - Test Method for Calculations of Color Differences from Instrumentally Measured Color Coordinates. ASTM D2794 - Test Method for Resistance of Organic Coatings to The Effects of Rapid Deformation (Impact). ASTM D3359 - Test Method for Measuring Adhesion by Tape Test.

1.06 SUBMITTAL

The manufacturer's submittal package shall be provided prior to installation.

1.07 PRODUCT HANDLING AND STORAGE

Upon receipt at the job site, all materials shall be checked to ensure that no damages occurred during shipping or handling. Materials shall be stored in such a manner as to ensure proper ventilation and drainage and to protect against damage, weather, vandalism and theft.

PART 2 - MATERIALS

2.01 MANUFACTURER

The architectural metal swing gate system shall conform to the Ameristar® (specify material as aluminum or galvanized steel), (specify fence type as Impasse® Security, Aegis II® or Echelon II® Industrial Ornamental, or Aegis Plus®, Montage Plus® or Echelon Plus® Commercial Ornamental) design, (specify the style from those listed in the manufacturer's literature for the applicable fence type) style.

2.02 MATERIAL REQUIREMENTS

A. If material for gate framework (i.e. tubular pickets, rails and gate ends) is steel that is galvanized prior to forming, it shall conform to the requirments of ASTM A924, with a minimum yield strength of 45,000 psi (344 MPa). The steel shall be hot-dip galvanized to meet the requirements of ASTM A653 with a minimum zinc coating weight of 0.90 oz/ft^2 (276 g/m^2), Coating Designation G-90.

B. If material for gate framework (i.e. tubular pickets, rails and gate ends) is steel that is galvanized after forming, it shall conform to the requirments of ASTM A1011/A1011M, with a minimum yield strength of 45,000 psi (344 MPa). The exterior shall be hot-dip galvanized with a 0.45 oz/ft^2 (138 g/m^2) minimum zinc weight. The interior surface shall be coated with a minimum of 81% nominal zinc pigmented coating, 0.3 mils (0.0076 mm) minimum thickness.

C. If material for gate framework (i.e. tubular pickets, rails and gate ends) is aluminum, it shall conform to the requirements of ASTM B221. The aluminum extrusions for posts and rails shall be Alloy and Temper Designation 6005-T5. The aluminum extrusions for pickets and rail inner slide channels shall be Alloy and Temper Designation 6063-T5.

D. Material, dimensions and spacings for gate pales or pickets and for gate rails shall be the same as that used for fence panels of the (specify fence type as Impasse® Security, Aegis II® or Echelon II® Industrial Ornamental, or Aegis Plus®, Montage Plus® or Echelon Plus® Commercial Ornamental) type and (specify the style from those listed in the manufacturer's literature for the applicable fence type) style. Gate uprights shall be (specify 2" square x 16 ga. galvanized steel for Impasse™ Security, 1.75" square x 16 ga. galvanized steel for Aegis II® and Aegis Plus® Ornamental Steel, 2" square x 0.250" aluminum for Echelon II® Ornamental Aluminum, or 1-1/4" square x 0.125" aluminum for Echelon Plus®).

2.03 FABRICATION

A. Pickets or pales, rails and uprights shall be precut to specified lengths and prepunched or predrilled as necessary to accept inserted components, rods or fasteners.

B. Gates shall be fabricated in a manner that ensures each upright and rail intersection is joined by welding. Each pale or picket and rail intersection shall be joined by welding or by the same process used for fence panel assembly.

C. Completed gates shall be capable of supporting a (specify 600 lb. for Impasse®, Aegis II® or Echelon II® gates or 200 lb. for Aegis Plus®, Montage Plus® or Echelon Plus®) load applied at midspan without permanent deformation (prior to mounting gates to posts).

D. Galvanized steel gates shall be subjected to a six-stage pretreatment/wash (with zinc phosphate) followed by an electrostatic spray application of a two coat powder system. The base coat is a thermosetting epoxy powder coating (gray in color) with a minimum thickness of 2-4 mils. The top coat is a "no-mar" TGIC polyester powder coat finish with a minimum thickness of 2-4 mils. The color shall be (specify Black, Bronze, White or Desert Sand for Impasse®, Aegis Plus® and Aegis II® or Black, Bronze or Desert Sand for Montage Plus). Coated galvanized framework shall be capable of salt spray resistance for 3,500 hours without loss of adhesion on parts scribed per ASTM D1654 and tested in accordance with ASTM Test Method B117. Failure is considered to have occurred when there is either 1/8" coating loss from the scribed mark or an accumulation of medium #8 blisters. Coated galvanized framework shall also be capable of meeting the performance requirements for each quality characteristic shown in Table 1.

E. Aluminum gates shall be subjected to a six-stage pretreatment/wash (with zinc phosphate) followed by an electrostatic spray application of a polyester finish. The finish coat shall be a "no-mar" TGIC polyester powder coat finish with a minimum thickness of 2 mils (0.0508mm). The color shall be (specify Black, Bronze, White or Desert Sand for Echelon II® or Black, Bronze or White for Echelon Plus®). Coated aluminum framework shall be capable of salt spray resistance for 1,000 hours without loss of adhesion on parts scribed per ASTM D1654 and tested in accordance with ASTM Test Method B117. Failure is considered to have occurred when there is either 1/8" coating loss from the scribed mark or an accumulation of medium #8 blisters. Coated aluminum framework shall also be capable of meeting the performance requirements for each quality characteristic shown in Table 1.

PART 3 - EXECUTION

3.01 PREPARATION

All new installation shall be laid out by the Contractor in accordance with the construction plans.

3.02 INSTALLATION

Gate post(s) shall be spaced according to the gate openings specified in the construction plans. The "Earthwork" and "Concrete" sections of this specification shall govern post base placement and material requirements.

3.03 CLEANING

The Contractor shall clean the jobsite of excess materials. Post hole excavations shall be scattered uniformly away from post(s).

Table 1 - Coating Performance Requirements

Quality Characteristics	ASTM Test Method	Performance Requirments
Adhesion	D3359 - Method B	Adhesion (Retention of Coating) over 90% of test area (Tape and knife test).
Impact Resistance	D2794	Impact Resistance over 60 inch lb. (Forward impact using 0.625" ball).
Weathering Resistance	D822, D2244, D523 (60° Method)	Weathering Resistance over 1,000 hours (Failure mode is 60% loss of gloss or color variance of more than 3 delta-E color units).

ESTATE™

Beautiful, Strong and Maintenance-Free Aluminum Entry Gates

The Estate™ design is a statement in itself. It adds value and aesthetics to complete the look of elegance. Private businesses, large estates and condominium complexes are ideal properties for the prestigious appeal of the Estate™ Entry Gate. All framework is 1/4" thick and all intersections are welded. Standard Entry Gates are available either with single leaves (as shown to the right) for openings up to 14', or with double leaves for openings up to 28'.

Single Swing Estate™ Entry Gate

Special gates with the same arched top rails can be made in either walk gate or drive gate forms to match the spacings and top designs of all the Ameristar® ornamental fence types (i.e., Aegis II® or Echelon II® Industrial Ornamental, or Aegis Plus®, Montage Plus® or Echelon Plus® Commercial Ornamental) that have straight picket extensions or flush top rails.

COMPONENT SIZES

Pickets	Rails	Uprights
3/4" Square x .125" Wall or 1" Square x .125" Wall	1" x 2" Channel x .250" Wall	2" Square x .250" Wall

STYLES

CLASSIC™

MAJESTIC™

GENESIS™

Warrior™ and Conqueror™ (not shown) are also available.

COLORS

Request Color Chip samples for actual color

Black

Bronze

White
Not Available in Montage Plus®

Desert Sand
Not Available in Montage Plus®

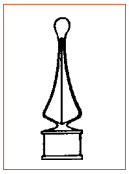
HARDWARE

A variety of hinging and latching hardware is available for Estate™ Entry Gates (see Page 37).

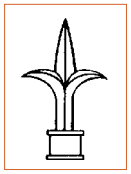
WARRANTY

A written lifetime limited warranty is extended on Ameristar's Estate™ gates. Call Ameristar® for a copy.

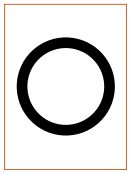
ADORNMENTS



Quad Flare

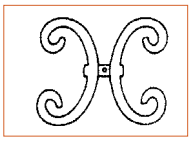


Triad

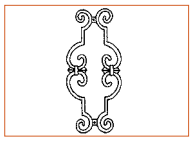


Ring

Ball Cap



Butterfly



Florentine

Letters

AVAILABILITY

Shipping

Estate™ Entry Gates are completely shrink-wrapped to ensure the most economical damage-free shipping.

Ordering Information

To order, simply specify the gate design series, color and dimensions desired. Then the quantities needed. Contact Ameristar® for the nearest distributor or if any other assistance is needed.

MAINTENANCE

Little or no maintenance is required for Estate™ Entry Gates. Damages to coated surfaces can be readily covered with Ameristar's matching custom finishes (either spray or paint pen application).

CONSTRUCTION SPECIFICATION

SECTION 32 31 00 - GATE SYSTEMS

Estate™ Arched Aluminum Entry Gates

PART 1 - GENERAL

1.01 WORK INCLUDED

The contractor shall provide all labor, materials and appurtenances necessary for installation of the architectural metal swing gate system defined herein at (specify project site).

1.02 RELATED WORK

Section 022_ _ - Earthwork
Section 030_ _ - Concrete

1.03 SYSTEM DESCRIPTION

The manufacturer shall supply an aluminum Estate™ entry gate of (specify Classic™, Majestic™, Genesis™, Warrior™, or Conqueror™) style. The system shall include all components (i.e., pickets, rails, gate uprights and hardware) required.

1.04 QUALITY ASSURANCE

The contractor shall provide laborers and supervisors who are thoroughly familiar with the type of construction involved and the materials and techniques specified.

1.05 REFERENCES

ASTM B117 - Practice for Operating Salt-Spray (Fog) Apparatus.
ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles and Tubes.
ASTM D523 - Test Method for Specular Gloss.
ASTM D822 - Practice for Conducting Tests on Paint and Related Coatings and Materials using Filtered Open-Flame Carbon-Arc Light and Water Exposure Apparatus. ASTM D1654 - Test Method for Evaluation of Painted or Coated Specimens Subjected to Corrosive Environments.
ASTM D2244 - Test Method for Calculations of Color Differences from Instrumentally Measured Color Coordinates.
ASTM D2794 - Test Method for Resistance of Organic Coatings to The Effects of Rapid Deformation (Impact).
ASTM D3359 - Test Method for Measuring Adhesion by Tape Test.

1.06 SUBMITTAL

The manufacturer's submittal package shall be provided prior to installation.

1.07 PRODUCT HANDLING AND STORAGE

Upon receipt at the job site, all materials shall be checked to ensure that no damages occurred during shipping or handling. Materials shall be stored in such a manner as to ensure proper ventilation and drainage and to protect against damage, weather, vandalism and theft.

PART 2 - MATERIALS

2.01 MANUFACTURER

The entry gate system shall conform to the Ameristar® Estate™ Entry Gate (specify Classic™, Majestic™, Genesis™, Warrior™, or Conqueror™) style, (specify single or double), with (specify total opening in feet) opening, (specify height in feet at post) to (specify height in feet at center of opening) tall, hinged to (specify cross-sectional size and gauge of posts) posts.

2.01 MATERIAL REQUIREMENTS

A. Aluminum material for gate framework (i.e. tubular pickets,rails and gate ends) shall conform to the requirements of ASTM B221. The aluminum extrusions for uprights and rails shall be Alloy and Temper Designation 6005-T5. The aluminum extrusions for pickets shall be Alloy and Temper Designation 6063-T5.

B. Rails and gate uprights shall have a minimum wall thickness of 1/4". Rails shall be 1" x 2"channel. Ends shall be 2" square. Pickets shall be (specify 3/4" square or 1" square) by 1/8" wall thickness.

2.03 FABRICATION

A. Pickets, rails and uprights shall be precut to specified lengths and rails shall be prepunched to accept inserted pickets.

B. Gates shall be fabricated in a manner that ensures each upright and rail intersection is joined by welding. Each pale or picket and rail intersection shall be joined by welding or by the same process used for fence panel assembly.

C. Completed gates shall be capable of supporting a 400 pound load applied at midspan without permanent deformation (prior to mounting gates to posts).

D. Estate™ Entry Gates shall be subjected to a six-stage pretreatment/wash (with zinc phosphate) followed by an electrostatic spray application of a polyester finish. The finish coat shall be a "no-mar" TGIC polyester powder coat finish with a minimum thickness of 2 mils (0.0508mm). The color shall be (specify Black, Bronze, White or Desert Sand). Coated aluminum gates shall be capable of salt spray resistance for 1,000 hours without loss of adhesion on parts scribed per ASTM D1654 and tested in accordance with ASTM Test Method B117. Failure is considered to have occurred when there is either 1/8" coating loss from the scribed mark or an accumulation of medium #8 blisters. Coated aluminum gates shall also be capable of meeting the performance requirements for each quality characteristic shown in Table 1.

PART 3 - EXECUTION

3.01 PREPARATION

All new installation shall be laid out by the Contractor in accordance with the construction plans.

3.02 INSTALLATION

Gate post(s) shall be spaced according to the gate Openings specified in the construction plans. The Earthwork" and "Concrete" sections of this specification shall govern post base placement and material requirements.

3.03 CLEANING

The Contractor shall clean the jobsite of excess materials. Post hole excavations shall be scattered uniformly away from post(s).

Table 1 - Coating Performance Requirements

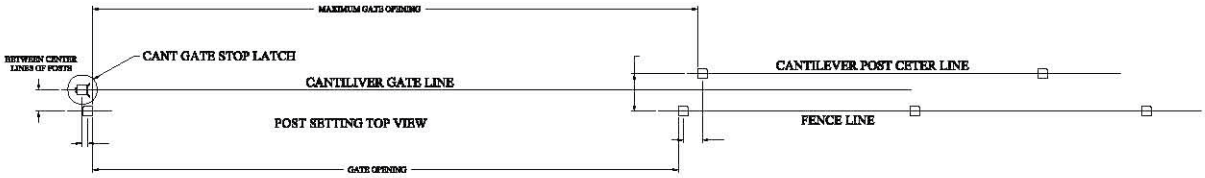
Quality Characteristics	ASTM Test Method	Performance Requirments
Adhesion	D3359 - Method B	Adhesion (Retention of Coating) over 90% of test area (Tape and knife test).
Impact Resistance	D2794	Impact Resistance over 60 inch lb. (Forward impact using 0.625" ball).
Weathering Resistance	D822, D2244, D523 (60° Method)	Weathering Resistance over 1,000 hours (Failure mode is 60% loss of gloss or color variance of more than 3 delta-E color units).

TransPort™

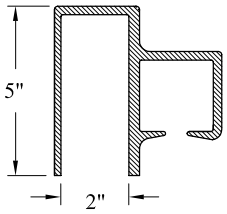
Aluminum Cantilever Gates

U.S.A. Patent No. 5,136,813

TransPort™ Cantilever Gate Systems are available for Impasse® Security; Aegis II®, Echelon II® and Estate™ Ornamental; and PermaCoat® and GalvOnAll™ Chain Link applications.



The TransPort™ is an all weather cantilever gate and aluminum track extrusion with internal roller assemblies. This results in the gate and track system sliding as a single unit.



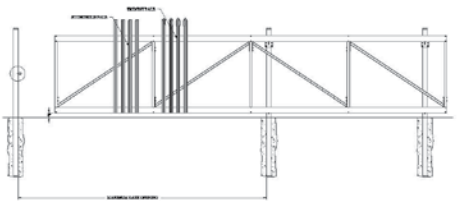
SINGLE FAST-TRAK™ TOP RAIL
WEIGHT = 5.85 LBS./FT.

STRENGTH

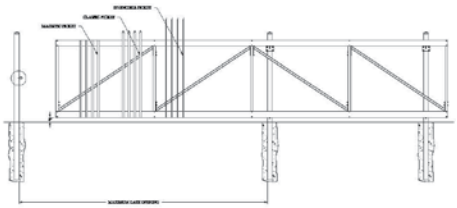
TransPort™ Cantilever Gates offer superior strength as the track is 60% heavier (by weight) than competitor extrusions.

TYPES AND STYLES

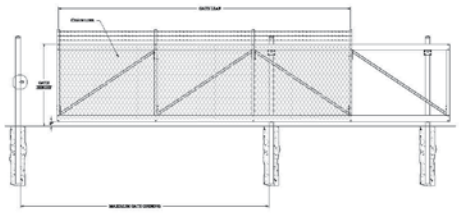
TransPort™ Impasse® Security
Cantilever Gates



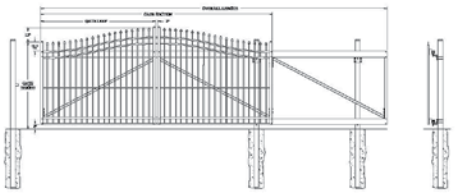
TransPort™ Aegis II® and Echelon II®
Ornamental Cantilever Gates

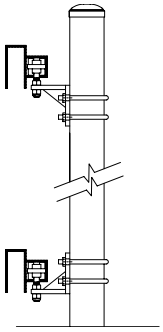


TransPort™ PermaCoat® and GalvOnAll™
Chain Link Cantilever Gates



TransPort™ Estate™
Ornamental Cantilever Gates





END VIEW
(INSTALLED GATE)

Smooth roll parallels fence

GATE OPENING SIZES

Gate Type	Opening	Security	Ornamental	Chain Link
Double Track	Single	6' Through 36'	6' Through 36'	6' Through 36'
	Bi Parting	12' Through 72'	12' Through 72'	12' Through 72'

All gates to be installed in an off-line configuration.

COLORS

Request Color Chip samples for actual color

For TransPort™ Impasse® Security and Aegis II® or Echelon II® OrnamentalCantilever Gate Systems

Black | Bronze | White | Desert Sand

For TransPort™ PermaCoat® Chain Link Cantilever Gate Systems

Black | Brown | Green

WARRANTY

Ameristar Fence Products hereby certifies that its TransPort™ gates are free from defects in material or workmanship. (Note: Accidental damages, defects resulting from improper installation techniques, and damage from abuse or vandalism are not included herein).

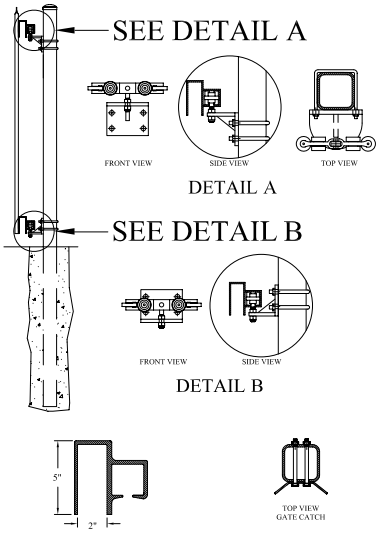
MAINTENANCE

Little or no maintenance is required for the TransPort™ Cantilever Gates supplied by Ameristar®. The polyester coated aluminum will remain corrosion free for years to come. Damages to coated surfaces can be readily covered with Ameristar's matching custom finishes (either spray or paint pen application).

HARDWARE

Features

- Hot-Dip Galvanized
- Extra Heavy-Duty
- U-Bolts for either Round or Square Posts



AVAILABILITY

TransPort™ Cantilever Gate components are carefully banded to specially constructed pallets and hardware and fasteners are packaged in heavy duty cardboard boxes to ensure the most economical damage-free shipping.

CONSTRUCTION SPECIFICATION

SECTION 32 31 00 - TRANSPORT® ORNAMENTAL CANTILEVER GATES

ORNAMENTAL CANTILEVER GATES, INDUSTRIAL
TRANS PORT® – ALUMINUM CANTILEVER GATES, ALL STYLES

PART 1 - GENERAL
1.01 WORK INCLUDED
The contractor shall provide all labor, materials, and appurtenances necessary for installation of the industrial cantilever gate system defined herein at (specify project site).
1.02 RELATED WORK
Section _____ _____ - Earthwork
Section _____ _____ - Concrete
1.03 SYSTEM DESCRIPTION
The manufacturer shall supply a total industrial ornamental aluminum cantilever gate system of the Ameristar® TransPort® design, (specify style name) style, picket interspace, and height defined herein. The system shall include all components (i.e., tracks, uprights, pickets, hardware, fittings and fasteners) required.
1.04 QUALITY ASSURANCE
The contractor shall provide laborers and supervisors who are thoroughly familiar with the type of construction involved and materials and techniques specified.
1.05 REFERENCES
ASTM B117 - Practice for Operating Salt Spray (Fog) Apparatus. ASTM B221 - Aluminum and Aluminum Alloy Extruded Bars, Shapes and Tubes.
1.06 SUBMITTAL
The manufacturer's literature shall be submitted prior to installation.
1.07 PRODUCT HANDLING AND STORAGE
Upon receipt at the job site, all materials shall be checked to ensure that no damage occurred during shipping or handling. Materials shall be stored in such a manner to ensure proper ventilation and drainage, and to protect against damage, weather, vandalism, and theft.

PART 2 - MATERIALS
2.01 MANUFACTURER
All industrial ornamental aluminum cantilever gates shall conform to the Ameristar® TransPort® gate system, (specify style name) design, manufactured by Ameristar Fence Products, Inc., in Tulsa, Oklahoma. The project gate schedule shall include the following additional information for each cantilever gate included in the project scope: (specify nominal opening size range in feet) opening, and (specify size and shape of posts) gate posts.

2.02 MATERIAL
A. The materials used for cantilever gate framing (i.e., uprights,diagonal braces and pickets or pales) shall be manufactured from ASTM B221 aluminum (designation 6063-T-6) with a yield strength of 25,000 PSI, a tensile strength of 30,000 PSI and a standard mill finish. The TransPort® FastTrak™ rails shall be manufactured from ASTM B221 aluminum (designation 6063-T-6) with a yield strength of 25,000 PSI, a tensile strength of 30,000 PSI and a standard mill finish.
B. Four Suspension Roller Assemblies shall be included with each gate.
C. The coating material used for the finished gate shall be a thermoset glycidal-polyester supplied as a homogeneous free-flowing powder. The cured coating shall be capable of withstanding 500 hours of salt spray testing to ASTM B117 without creep.

2.03 FABRICATION
A. Components shall be precut to specified lengths.
B. Top and bottom rail extrusions shall be mechanically fastened to vertical uprights and reinforced with diagonal braces, as required by drawing.

PART 3 - EXECUTION
3.01 PREPARATION
All new gate installations shall be laid out by the contractor in accordance with the construction plans.
3.02 INSTALLATION
A. Set gate posts in accordance with the gate elevation drawing.
B. Attach Suspension Rollers to gate posts per end view (cross-section) in construction drawings; slide TransPort™ rails onto rollers.
C. Install gate stops.

3.03 CLEANING
Contractor shall clean jobsite of excess materials; post hole excavations shall be scattered uniformly away from gate posts.

PassPort™

Steel Roll Gates

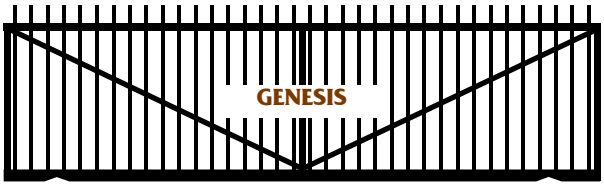
TYPES AND STYLES

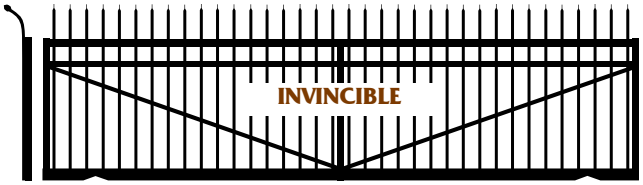
PassPort Commercial Ornamental Roll Gates

Ornamental Pickets: 3/4" Square
(Available in Profiles of 2-Rail, 3-Rail & 3-Rail w/Rings)

PassPort II Industrial Ornamental Roll Gates

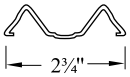
Ornamental Pickets: 1" Square
(Available in Profiles of 2-Rail, 3-Rail & 3-Rail w/Rings)



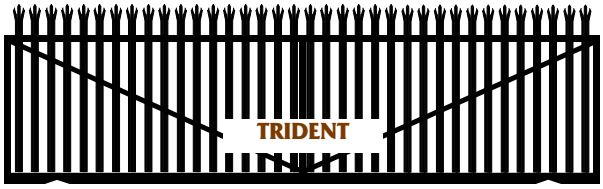


PassPort IS (Impasse Security) Roll Gates

Security Pales: Proprietary Corrugated Impasse® Shape x 1/8" Thick



(Available in Profiles of 2-Rail & 3-Rail)



COMPONENT SIZES

Top Rail(s), Uprights and Diagonal Braces: 2" Square x 11 Ga.
Bottom Rail: 2" x 4" x 11 Ga. (Notched & Plated for V-Track Wheels)
Gate Lengths: Up To 36'

HARDWARE

Roll Gate Hardware Kit includes:

- 2 ea - 6 inch Wheel Kits (including wheels, bearings, spacer bushings, washers, bolts & lock nuts)

- 2 ea - 6 inch Guide Rollers

- 1 ea - Gate Latch

COLORS

Request Color Chip samples
for actual color

For PassPort™ Ornamental and Impasse® Security Gate Systems

Black | Bronze | White | Desert Sand

AVAILABILITY

PassPort™ Roll Gate components are carefully wrapped and corner-reinforced to ensure the most economical damage-free shipping.

WARRANTY

A 1 year limited warranty is extended on Ameristar's PassPort™ roll gates. (Note: Accidential damages, defects resulting from improper installation techniques, and damage from abuse or vandalism are not included herein).

MAINTENANCE

Only minimal maintenance is required for PassPort™ Gates supplied by Ameristar®. The epoxy and polyester PermaCoat® finish protects the steel substrate. Damages to coated surfaces can be readily covered with Ameristar's matching custom finishes (either spray or paint pen application).

CONSTRUCTION SPECIFICATION

SECTION 32 31 00 - PassPort®, PassPort II® and PassPort IS® - Steel Roll Gates

PART 1 - GENERAL
1.01 WORK INCLUDED
The contractor shall provide all labor, materials and appurtenances necessary for installation of the steel roll gate system defined herein at (specify project site).
1.02 RELATED WORK
Section 022_ _ - Earthwork
Section 030_ _ - Concrete
1.03 SYSTEM DESCRIPTION
The manufacturer shall supply a total roll gate system of Ameristar® (specify product line as PassPort® Commercial Ornamental, PassPort II® Industrial Ornamental or PassPort® IS Security Pale) design series and (specify the style as Classic, Majestic, Genesis, or Invincible for PassPort® or PassPort II® ornamental roll gates or Trident, Stronghold, or Gauntlet for PassPort IS® security roll gates) style. The system shall include all components (i.e., pickets or pales, rails, gate uprights, wheels and hardware) required.
1.04 QUALITY ASSURANCE
The contractor shall provide laborers and supervisors who are thoroughly familiar with the type of construction involved and materials and techniques specified.
1.05 REFERENCES
ASTM D523 - Test Method for Specular Glass. ASTM D822 - Practive for Conducting Tests on Paint and Related Coatings and Materials using Filtered Open-Flame Carbon-Arc Light and Water Exposure Apparatus. ASTM D1654 - Test Method for Evaluation of Painted or Coated Specimens Subjected to Corrosive Environments. ASTM D2244 - Test Method for Calculations of Color Differences from Instrumentally Measured Color Coordinates. ASTM D2794 - Test Method for Resistance of Organic Coatings to The Effects of Rapid Deformation (Impact). ASTM D3359 - Test Method for Measuring Adhesion by Tape Test.
1.06 SUBMITTAL
The manufacturer's submittal package shall be provided prior to installation.
1.07 PRODUCT HANDLING AND STORAGE
Upon receipt at the job site, all materials shall be checked to ensure that no damages occurred during shipping or handling. Materials shall be stored in such a manner to ensure proper ventilation and drainage and to protect against damage, weather, vandalism and theft.

PART 2 - MATERIALS
2.01 MANUFACTURER
The steel roll gate system shall conform to Ameristar® (specify product line as PassPort® Commercial Ornamental, PassPort II® Industrial Ornamental or PassPort® IS Security Pale) design series, (specify the style as Classic, Majestic, Genesis, or Invincible for PassPort® or PassPort II® ornamental roll gates or Trident, Stronghold, or Gauntlet for PassPort IS® security roll gates) style and (specify frame configuration as 2-rail or 3-rail) frame configuration manufactured by Ameristar Fence Products, Inc. in Tulsa, Oklahoma.
2.02 MATERIAL
A. Steel material for roll gate components (i.e. pickets or pales, rails, diagonals and uprights), shall be commercial steel with a minimum yield strength of 45,000 psi (344 MPa).
B. Ornamental picket/pale material shall be (specify 3/4" square x 14 Ga. tubing for PassPort® Commercial Ornamental gate pickets, 1" square x 14 Ga. tubing for PassPort® II Industrial Ornamental gate pickets, or 2-3/4" wide x 0.075" thick corrugated pales for PassPort IS® security roll gates). Picket/pale spacing shall be (specify 4-5/8" for PassPort® Commercial Ornamental gate pickets, 4-3/4" for PassPort® II Industrial Ornamental gate pickets, or 6" for PassPort IS® security pales). Material for toprails, uprights and diagonals rails shall be 2" square x 11 Ga. Material for the bottom rail shall be 2" x 4" x 11 Ga. Posts shall be 4" square x 11 Ga.
2.03 FABRICATION
A. Pickets/pales, rails, uprights and posts shall be precut to specified lengths. Diagonals shall be precut to specified lengths and angles. Frame materials shall be joined by welding. Pickets/pales shall be face welded to roll gate frame, except for Invincible or Gauntlet style gates over 18' long. Invincible or Gauntlet style gates over 18' long shall have pickets face-welded to 2" x 2" angle iron to form panels equal in length to the gate frame bay width.
B. The manufactured roll gates and bolt-on panels (if applicable) shall be subjected to the PermaCoat® thermal stratification coating process (high-temperature, in-line, multi-stage, multi-layer) including, as a minimum, a six-stage pre-treatment/wash (with zinc phosphate), an electrostatic spray application of an epoxy base, and a separate electrostatic sprayapplication of a polyester finish. The base coat shall be a thermosetting epoxy powder coating (gray in color) with a minimum thickness of of 2 mils (0.0508mm). The topcoat shall be a "no-mar" TGIC polyester powder coat finish with a minimum thickness of 2 mils (0.0508mm). The color shall be (specify Black, Bronze, White, or Desert Sand). The stratification-coated framework shall be capable of meeting the performance requirements for each quality characteristic shown in Table 1.
C. Completed gates shall be capable of supporting a 200 lb. load applied at midspan without permanent deformation.

PART 3 - EXECUTION
3.01 PREPARATION
All new installation shall be layed out by the contractor in accordance with the construction plans.
3.02 INSTALLATION
Gate posts shall be set in accordance with the spacings shown in the construction plans. The "Earthwork" and "Concrete" sections of this specification shall govern post base material requirements. 6" wheels shall be bolted to the gate (between the wheel plates welded near the ends of the gate bottom rail). The gate shall be set upright with the V-grooved wheels positioned over the pre-installed steel V-track that traverses the gate opening. Roller guides shall be affixed to the gate posts at a height even with the gate toprail to hold the gate in a vertical position. Gate stops shall be welded to the end of the gate or track so gate cannot pass rollers in either direction.
3.03 CLEANING
The contractor shall clean the jobsite of excess materials; post hole excavations shall be scattered uniformly away from posts.

AMERISTAR®

World's Largest Architectural Metal Fence Manufacturer

Ameristar® was chartered a quarter-century ago to provide specialty fence products that were more affordable, but did not compromise the quality level demanded by specifiers and consumers. This could be accomplished only by complete reformation of the way fence products were being manufactured. Product design was approached from many new perspectives; maximizing high-volume productivity; increasing strength and durability; designing the ultimate level of system security; promoting ease of installation; enhancing aesthetic appearance; and maintaining an environmentally friendly workplace. A new plant was designed and built to house state-of-the-art roll-forming, metal processing and powder coating equipment. The result (see photo above) has boosted Ameristar® to its current position as the largest manufacturer of architectural metal fence systems in the world.

Decades ago, Europe and the Middle East, threatened constantly by terrorism, abandoned chain link fence as a security defense when they found that wire fences could be breached in seconds. The United State felt safe and continued to believe the chain link security myth. We know different now! The first line of perimeter defense must remain impassable to intrusion attempts for several minutes. Using severely sharpened high-strength steel spears, called pales, fastened securely to rigid framework of specially formed rails and posts, Ameristar® has raised the bar of perimeter security with Impasse®.

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