SECTION 32 31 00

FENCES AND GATES

Display hidden notes to specifier. (Don't know how? [Click Here](https://www.arcat.com/sd/display_hidden_notes.shtml))

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\*\* NOTE TO SPECIFIER \*\* Ameristar Fence Products; ornamental fences and gates, security fences and gates.
This section is based on the products of Ameristar Fence Products, which is located at:
1555 N. Mingo
Tulsa, OK 74116
Toll Free Tel: 888-333-3422
Email: [request info (mktg@ameristarfence.com)](https://admin.arcat.com/users.pl?action=UserEmail&company=Ameristar+Fence+Products&coid=30477&rep=&fax=&message=RE:%20Spec%20Question%20(02820afp):%20%20&mf=)
Web: <https://www.ameristarperimeter.com>
 [ [Click Here](https://www.arcat.com/arcatcos/cos30/arc30477.html) ] for additional information.
Ameristar was chartered two decades 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, promoting ease of installation, and enhancing aesthetic appearance. A new plant was designed and built to house state-of-the-art roll-forming, metal processing and powder coating equipment. The result has boosted Ameristar to its current position as the largest manufacturer of ornamental fencing in the world.

1. GENERAL
	1. SECTION INCLUDES

\*\* NOTE TO SPECIFIER \*\* Delete items below not required for project.

* + 1. Heavy industrial steel ornamental fence system - fusion welded.
		2. Heavy industrial steel ornamental fence system - internally secured.
		3. Heavy industrial aluminum ornamental fence system - internally secured.
		4. Commercial steel ornamental fence system - fusion welded.
		5. Commercial steel ornamental fence system - internally secured.
		6. High security steel fence system - ornamental pale.
	1. RELATED SECTIONS

\*\* NOTE TO SPECIFIER \*\* Delete any sections below not relevant to this project; add others as required.

* + 1. Section 31 20 00 - Earth Moving.
		2. Section 03 30 00 - Cast-in-Place Concrete.
		3. Section 32 31 11 - Gate Operators.
		4. Section 28 18 00 - Security Access Detection Equipment.
	1. REFERENCES

\*\* NOTE TO SPECIFIER \*\* The following ASTM Standards are applicable to Aegis Plus, Aegis II, Montage Plus and Montage II. Delete if not required.

* + 1. ASTM - American Society for Testing and Materials:
			1. ASTM A 653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
			2. ASTM B 117 - Practice for Operating Salt-Spray (Fog) Apparatus.
			3. ASTM D 523 - Test Method for Specular Gloss.
			4. ASTM D 714 - Test Method for Evaluating Degree of Blistering in Paint.
			5. ASTM D 822 - Practice for Conducting Tests on Paint and Related Coatings and Materials using Filtered Open-Flame Carbon-Arc Light and Water Exposure Apparatus.
			6. ASTM D 1654 - Test Method for Evaluation of Painted or Coated Specimens Subjected to Corrosive Environments.
			7. ASTM D 2244 - Test Method for Calculations of Color Differences from Instrumentally Measured Color Coordinates.
			8. ASTM D 2794 - Test Method for Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact). ASTM D3359 - Test Method for Measuring Adhesion by Tape Test.
			9. ASTM D 3359 - Test Method for Measuring Adhesion by Tape Test.
			10. ASTM F 2408 - Ornamental Fences Employing Galvanized Steel Tubular Pickets.

\*\* NOTE TO SPECIFIER \*\* The following ASTM Standards are applicable to Echelon Plus and Echelon II. Delete if not required.

* + 1. ASTM - American Society for Testing and Materials:
			1. ASTM B 117 - Practice for Operating Salt-Spray (Fog) Apparatus.
			2. ASTM B 221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles and Tubes.
			3. ASTM D 523 - Test Method for Specular Gloss.
			4. ASTM D 822 - Practice for Conducting Tests on Paint and Related Coatings and Materials using Filtered Open-Flame Carbon-Arc Light and Water Exposure Apparatus.
			5. ASTM D 1654 - Test Method for Evaluation of Painted or Coated Specimens Subjected to Corrosive Environments.
			6. ASTM D 2244 - Test Method for Calculations of Color Differences from Instrumentally Measured Color Coordinates.
			7. ASTM D 2794 - Test Method for Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact). ASTM D3359 - Test Method for Measuring Adhesion by Tape Test.
			8. ASTM D 3359 - Test Method for Measuring Adhesion by Tape Test.
		2. AAMA - American Architectural Manufactures Association:
			1. AAMA 2603 - Voluntary Specification, Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels.
	1. SUBMITTALS
		1. Submit under provisions of Section 01 30 00 - Administrative Requirements.
		2. [ Product Data ]: Manufacturer's data sheets on each product to be used, including:
			1. Preparation instructions and recommendations.
			2. Storage and handling requirements and recommendations.
			3. Installation methods.
		3. Shop Drawings: Indicate plan layout, spacing of components, post foundation dimensions, hardware anchorage, gates, and schedule of components.

\*\* NOTE TO SPECIFIER \*\* Delete selection samples if colors have already been selected.

* + 1. Selection Samples: For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns.
		2. Verification Samples: For each finish product specified, two samples, minimum size 6 inches (150 mm) square, representing actual product, color, and patterns.
	1. QUALITY ASSURANCE
		1. Manufacturer Qualifications: Company specializing in manufacturing Products specified in this section with minimum five years documented experience.
		2. Installer Qualifications: Installers experienced with type of construction involved and materials and techniques specified.
		3. Single Source: Entire fence system, and all associated accessories, fittings, and fasteners shall be obtained from a single source.
	2. DELIVERY, STORAGE, AND HANDLING
		1. Upon receipt at the job site, all materials shall be checked to ensure that no damage occurred during shipping or handling.
		2. Materials shall be stored in such a manner to ensure proper ventilation and drainage, and be protected against damage, weather, vandalism, and theft.
	3. PROJECT CONDITIONS
		1. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.
	4. WARRANTY

\*\* NOTE TO SPECIFIER \*\* Applicable to Aegis Plus and Aegis II only. Delete if not required.

* + 1. The powder coated surface on all components (pickets, rails, and posts) is warranted for 10 years. Refer to manufacturer for complete details regarding warranty.

\*\* NOTE TO SPECIFIER \*\* Applicable to Impasse only. Delete if not required.

* + 1. The powder coated surface on all components (pales, rails, and posts) is warranted for 15 years. Refer to manufacturer for complete details regarding warranty.

\*\* NOTE TO SPECIFIER \*\* Applicable to Montage II and Montage Plus only. Delete if not required.

* + 1. The electrocoated surface on all components (panels and posts) is warranted for 20 years. Refer to manufacturer for complete details regarding warranty.

\*\* NOTE TO SPECIFIER \*\* Applicable to Echelon Plus and Echelon II only. Delete if not required.

* + 1. The powder coated surface on all aluminum framework (pickets, rails and posts) is warranted for a limited lifetime. Refer to manufacturer for complete details regarding warranty.
1. PRODUCTS
	1. MANUFACTURERS
		1. Acceptable Manufacturer: Ameristar Fence Products, which is located at: 1555 N. Mingo; Tulsa, OK 74116; Toll Free Tel: 888-333-3422; Email: [request info (mktg@ameristarfence.com)](https://admin.arcat.com/users.pl?action=UserEmail&company=Ameristar+Fence+Products&coid=30477&rep=&fax=&message=RE:%20Spec%20Question%20(02820afp):%20%20&mf=); Web: <https://www.ameristarperimeter.com>

\*\* NOTE TO SPECIFIER \*\* Delete one of the following two paragraphs; coordinate with requirements of Division 1 section on product options and substitutions.

* + 1. Substitutions: Not permitted.
		2. Requests for substitutions will be considered in accordance with provisions of Section 01 60 00 - Product Requirements.

\*\* NOTE TO SPECIFIER \*\* The following paragraphs include several fence systems and accessories. Select one or more of the following paragraphs for the fence types required and delete those not required. If more than one type is required identify the location of each on the Drawings.

* 1. ORNAMENTAL FENCING

\*\* NOTE TO SPECIFIER \*\* Delete ornamental fencing not required.

* + 1. Heavy Industrial Steel Ornamental Fence System - Fusion Welded: System includes posts, panels, and mounting accessories.
			1. Acceptable Product: Montage II.
			2. Grade: Industrial.

\*\* NOTE TO SPECIFIER \*\* Montage fencing is available in various styles with 4 inch airspace and 3 inch airspace. Delete options not required for the Project. If rings are required, add "with rings" after the Style number.

* + - 1. Standard Style: 3-3/4 inch (101.6 mm) air space between pickets.
				1. Classic: Pressed pointed pickets extend above top rail.

Two Rail: Style Classic.

Two Rail Flush Bottom Treatment: Style Classic.

Three Rail: Style Classic.

Three Rail Flush Bottom Treatment: Style Classic.

Four Rail: Style Classic.

Four Rail Flush Bottom Treatment: Style Classic.

* + - * 1. Majestic: Flush top rail

Two Rail: Style Majestic.

Two Rail Flush Bottom Treatment: Style Majestic.

Three Rail: Style Majestic.

Three Rail Flush Bottom Treatment: Style Majestic.

Four Rail: Style Majestic.

Four Rail Flush Bottom Treatment: Style Majestic.

* + - * 1. Genesis: Flat top pickets extend above top rail.

Two Rail: Style Genesis.

Two Rail Flush Bottom Treatment: Style Genesis.

Three Rail: Style Genesis.

Three Rail Flush Bottom Treatment: Style Genesis.

Four Rail: Style Genesis.

Four Rail Flush Bottom Treatment: Style Genesis.

* + - * 1. Invincible: Pressed pointed pickets extend above the top rail, curving outward.

Two Rail: Style Invincible.

Two Rail Flush Bottom Treatment: Style Invincible.

Three Rail: Style Invincible.

Three Rail Flush Bottom Treatment: Style Invincible.

Four Rail: Style Invincible.

Four Rail Flush Bottom Treatment: Style Invincible.

* + - 1. Height:
				1. Height: 3 feet (914 mm).
				2. Height: 3 feet 6 inches (1067 mm).
				3. Height: 4 feet (1219 mm).
				4. Height: 5 feet (1524 mm).
				5. Height: 6 feet (1829 mm).
				6. Height: 7 feet (2133 mm).
				7. Height: 8 feet (2438 mm).
			2. Steel (ASTM A924/A924M): Steel for tubular pickets, rails and posts shall have minimum yield strength of 45,000 psi (310 MPa).
			3. Galvanizing (ASTM A653/A653M): Prior to forming, hot dip galvanized with minimum zinc coating weight of 0.90 oz/ft2 (276 g/m2), Coating Designation G-90.
			4. Rails:
				1. Steel channel, 1.75 inches (44 mm) x 1.75 inches (44 mm).
				2. Standard Picket Spacing: Picket holes shall be spaced at 4.715 inches (120 mm) o.c.
			5. Pickets: 1 inch (25.4 mm) square x 14 gauge tubing.

\*\* NOTE TO SPECIFIER \*\* Delete if racking/biasability (ability of panels to follow grades) is not required.

* + - 1. Racking/Biasability (Ability of Panels to Follow Grades): able to follow varying grade changes to a maximum of 48 inch (762 mm) rise in an 8 foot (2438 mm) run.

\*\* NOTE TO SPECIFIER \*\* Select the post size(s) required from the following paragraphs and delete those not required. Refer to manufacturer's literature for determining post sizes according to wind loads.

* + - 1. Posts:
				1. Size: 2.5 inches by 2.5 inches by 12 gauge w/ standard post cap.
				2. Size: 3 inches by 3 inches by 12 gauge w/ standard post cap.
				3. Size: 4 inches by 4 inches by 11 gauge w/standard post cap.

\*\* NOTE TO SPECIFIER \*\* Select accessories required from the following paragraphs and delete those not required. Finals are only applicable to the Genesis style.

* + - 1. Accessories: Aluminum castings.
				1. Finial: Quad Flair.
				2. Finial: Triad.
				3. Post Cap: Ball Cap.

\*\* NOTE TO SPECIFIER \*\* Delete ornamental fencing not required.

* + 1. Heavy Industrial Steel Ornamental Fence System - Internally Secured: System includes fence posts, framework, and mounting accessories.
			1. Acceptable Product: Aegis II.
			2. Grade: Industrial.
			3. Style:

\*\* NOTE TO SPECIFIER \*\* Aegis II fencing is available in four styles. Delete options not required for the Project. If rings are required, add "with rings" after the Style number.

* + - * 1. Invincible: Pressed pointed pickets extend above top rail, curving outward.

Two Rail: Style Invincible.

Three Rail: Style Invincible.

* + - * 1. Classic: Pressed pointed pickets extend above top rail.

Two Rail: Style Classic.

Three Rail: Style Classic.

* + - * 1. Majestic: Flush top rail

Two Rail: Style Majestic.

Three Rail: Style Majestic.

* + - * 1. Genesis: Flat top pickets extend above top rail.

Two Rail: Style Genesis.

Three Rail: Style Genesis.

* + - 1. Height:
				1. Height: 4 feet (1219 mm).
				2. Height: 5 feet (1524 mm).
				3. Height: 6 feet (1829 mm).
				4. Height: 7 feet (2134 mm).
				5. Height: 8 feet (2438 mm).
				6. Height: 9 feet (2743 mm).
				7. Height: 10 feet (3048 mm).
			2. Steel (ASTM A924/A924M): Steel for tubular pickets, rails and posts shall have minimum yield strength of 45,000 psi (310 MPa).
				1. Galvanizing (ASTM A653/A653M): Prior to forming hot dip galvanized with minimum zinc coating weight of 0.90 oz/sq ft (276 g/sq meter), Coating Designation G-90.
			3. Rails:
				1. Acceptable Product: Ameristar ForeRunner Rails.
				2. Double-walled U channel; outside cross-section dimensions of 1-3/4 inch (44.5 mm) square; minimum thickness of 14 gauge; inside galvanized; open ends for air circulation and moisture evaporation.

\*\* NOTE TO SPECIFIER \*\* Retain one of the following two paragraphs.

* + - * 1. Panel Length: 6 foot (1829 mm) typical.
				2. Panel Length: 8 foot (2438 mm) typical.
				3. Rail Strength:

Effective Wall Thickness: 0.160 inch.

Rail Weight: 2.55 lbs/ft.

* + - * 1. Enclosed Retaining Rod: Retaining rods shall be 0.125 inch (3.2 mm) diameter galvanized steel. Variable pitch connection system for, high angle racking and elimination of external fasteners
				2. PVC Grommets: Provide grommets to seal all picket-to-rail intersections.

\*\* NOTE TO SPECIFIER \*\* Retain one of the following two paragraphs.

* + - * 1. Picket holes in the ForeRunner rail for Classic, Majestic and Genesis shall be spaced at 4.715 inches (120 mm) o.c.
				2. Picket holes in ForeRunner rail for 6 foot long Invincible style fencing shall be spaced at 4.98 inches (126.5 mm) o.c.
			1. Pickets: 1 inch (25.4 mm) square x 14 gauge steel tubing.
			2. Fasteners: All fasteners shall be 302 stainless steel; match finish of fence.
				1. Security Fastener: one-way tamperproof security bolts with inverted t-nuts.
				2. Bracket to Post Connections: Self-drilling hex-head screws.
			3. Panels: Completed panels shall be capable of supporting a 600 pound load applied at midspan without permanent deformation.

\*\* NOTE TO SPECIFIER \*\* Delete if racking/biasability (ability of panels to follow grades) is not required.

* + - 1. Racking/Biasability (Ability of Panels to Follow Grades): Minimum of 25 percent slope.

\*\* NOTE TO SPECIFIER \*\* Select the post size(s) required from the following paragraphs and delete those not required. Refer to manufacturer's literature for determining post sizes according to wind loads.

* + - 1. Posts:
				1. Size: 2-1/2 inches by 2-1/2 inches by 12 gauge w/ standard post cap.
				2. Size: 3 inches by 3 inches by 12 gauge w/ standard post cap.
				3. Size: 4 inches by 4 inches by 11 gauge w/ standard post cap.

\*\* NOTE TO SPECIFIER \*\* Select accessories required from the following paragraphs and delete those not required. Finals are only applicable to the Genesis style.

* + - 1. Accessories: Aluminum castings.
				1. Finial: Quad Flair.
				2. Finial: Triad.
				3. Post Cap: Ball Cap.
				4. Rings.
		1. Heavy Industrial Aluminum Ornamental Fence System - Internally Secured: System includes fence posts, framework, and mounting accessories.
			1. Acceptable Product: Echelon II.
			2. Grade: Industrial.
			3. Style:

\*\* NOTE TO SPECIFIER \*\* Echelon II fencing is available in four styles. Delete options not required for the Project. If rings are required, add "with rings" after the Style number.

* + - * 1. Invincible: Pressed pointed pickets extend above top rail, curving outward.

Two Rail: Style Invincible.

Three Rail: Style Invincible.

Four Rail: Style Invincible.

* + - * 1. Classic: Pressed pointed pickets extend above top rail.

Two Rail: Style Classic.

Three Rail: Style Classic.

Four Rail: Style Classic.

* + - * 1. Majestic: Flush top rail

Two Rail: Style Majestic.

Three Rail: Style Majestic.

Four Rail: Style Majestic.

* + - * 1. Genesis: Flat top pickets extend above top rail.

Two Rail: Style Genesis.

Three Rail: Style Genesis.

Four Rail: Style Genesis.

* + - 1. Height:
				1. Height: 4 feet (1219 mm).
				2. Height: 5 feet (1524 mm).
				3. Height: 6 feet (1829 mm).
				4. Height: 7 feet (2134 mm).
				5. Height: 8 feet (2438 mm).
				6. Height: 9 feet (2743 mm).
				7. Height: 10 feet (3048 mm).
			2. Aluminum:
				1. Tubular Pickets, Rails and Posts: Shall conform to ASTM B221.
				2. Extrusions for Posts and Rails (Outer Channel): 6005-T5.
				3. Extrusions for Pickets and Rail (Inner Slide Channels): 6063-T5.
			3. Rails:
				1. Acceptable Product: Ameristar ForeRunner Rails.
				2. Double-walled U channel; outside cross-section dimensions of 1-3/4 inch (44.5 mm) square; interior guide channel shall form lower limit of raceway for retaining rod.

\*\* NOTE TO SPECIFIER \*\* Retain one of the following two paragraphs.

* + - * 1. Panel Length: 6 foot (1829 mm) typical.
				2. Panel Length: 8 foot (2438 mm) typical.
				3. Rail Strength: Effective Wall Thickness: top wall of outer channel of the rail shall be 0.100 inch (2.54 mm) thick; side walls shall be 0.120 inch (3.05 mm) thick.
				4. Enclosed Retaining Rod: Retaining rods shall be 0.125 inch (3.2 mm) diameter galvanized steel. Variable pitch connection system for, high angle racking and elimination of external fasteners.
				5. PVC Grommets: Provide grommets to seal all picket-to-rail intersections.

\*\* NOTE TO SPECIFIER \*\* Retain one of the following two paragraphs.

* + - * 1. Picket holes in the ForeRunner rail for Classic, Majestic and Genesis shall be spaced at 4.715 inches (120 mm) o.c.
				2. Picket holes in ForeRunner rail for 6 foot long Invincible style fencing shall be spaced at 4.98 inches (126.5 mm) o.c.
			1. Pickets: 1 inch (25.4 mm) square x 0.065 inch (1.65 mm) thick extruded aluminum tubing.
			2. Fasteners: All fasteners shall be 302 stainless steel; match finish of fence.
				1. Security Fastener: one-way tamperproof security bolts with inverted t-nuts.
				2. Bracket to Post Connections: Self-drilling hex-head screws.
			3. Panels: Completed panels shall be capable of supporting a 300 pound load applied at midspan without permanent deformation.
			4. Racking/Biasability (Ability of Panels to Follow Grades): Minimum of 25 percent slope.
			5. Posts:

\*\* NOTE TO SPECIFIER \*\* Select the post size(s) required from the following paragraphs and delete those not required. Refer to manufacturer's literature for determining post sizes according to wind loads.

* + - * 1. Size: 2-1/2 inches by 2-1/2 inches with perimeter wall thickness of 0.080 inch (2.03 mm) and interior reinforcing web thickness of 0.080 inch (2.03 mm) w/ std. post cap.
				2. Size: 3 inches by 3 inches with perimeter wall thickness of 0.120 inch w/ std. post cap.
				3. Size: 4 inches by 4 inches with perimeter wall thickness of 0.250 inch w/ std. post cap.
			1. Accessories: Aluminum Castings.

\*\* NOTE TO SPECIFIER \*\* Select accessories required from the following paragraphs and delete those not required. Finals are only applicable to the Genesis style.

* + - * 1. Finial: Quad Flair.
				2. Finial: Triad.
				3. Post Cap: Ball Cap.
				4. Rings.
		1. Commercial Steel Ornamental Fence System - Fusion Welded: System includes posts, panels, and mounting accessories.
			1. Acceptable Product: Montage Plus or Montage Commercial.
			2. Grade: Commercial.

\*\* NOTE TO SPECIFIER \*\* Montage fencing is available in various styles with 4 inch airspace and 3 inch airspace. Delete options not required for the Project. If rings are required, add "with rings" after the Style number.

* + - 1. Standard Style: 3 15/16 inch (101.6 mm) air space between pickets.
				1. Classic: Pressed pointed pickets extend above top rail.

Two Rail: Style Classic.

Two Rail Flush Bottom Treatment: Style Classic.

Three Rail: Style Classic.

Three Rail Flush Bottom Treatment: Style Classic.

Four Rail: Style Classic.

* + - * 1. Majestic: Flush top rail

Two Rail: Style Majestic.

Two Rail Flush Bottom Treatment: Style Majestic.

Three Rail: Style Majestic.

Three Rail Flush Bottom Treatment: Style Majestic.

Four Rail: Style Majestic.

* + - * 1. Genesis: Flat top pickets extend above top rail.

Two Rail: Style Genesis.

Two Rail Flush Bottom Treatment: Style Genesis.

Three Rail: Style Genesis.

Three Rail Flush Bottom Treatment: Style Genesis.

Four Rail: Style Genesis.

* + - * 1. Warrior: Pressed pointed pickets extend above top rail, alternately 7.5 inches (152mm) and 4.5 inches (305mm).

Two Rail: Style Warrior.

Two Rail Flush Bottom Treatment: Style Warrior.

Three Rail: Style Warrior.

Three Rail Flush Bottom Treatment: Style Warrior.

Four Rail: Style Warrior.

* + - * 1. Invincible: Pressed pointed pickets extended above top rail, curved outward.

Three Rail: Style Invincible.

Four Rail: Style Invincible.

* + - 1. Pool, Pet and Play Style: 3 inch (76.2 mm) air space between pickets.
				1. Classic: Pressed pointed pickets extend above top rail.

Two Rail: Style Classic.

Two Rail Flush Bottom Treatment: Style Classic.

Three Rail: Style Classic.

Three Rail Flush Bottom Treatment: Style Classic.

Four Rail: Style Classic.

* + - * 1. Majestic:

Two Rail: Style Majestic.

Two Rail Flush Bottom Treatment: Style Majestic.

Three Rail: Style Majestic.

Three Rail Flush Bottom Treatment: Style Majestic.

Four Rail: Style Majestic.

* + - * 1. Genesis: Flat top pickets extend above top rail.

Two Rail: Style Genesis.

Two Rail Flush Bottom Treatment: Style Genesis.

Three Rail: Style Genesis.

Three Rail Flush Bottom Treatment: Style Genesis.

Four Rail: Style Genesis.

* + - 1. Height:
				1. Height: 3 feet (914 mm).
				2. Height: 3 feet 6 inches (1067 mm).
				3. Height: 4 feet (1219 mm).
				4. Height: 5 feet (1524 mm).
				5. Height: 6 feet (1829 mm).
				6. Height: 7 feet (1829 mm).
				7. Height: 8 feet (1829 mm).
			2. Steel (ASTM A924/A924M): Steel for tubular pickets, rails and posts shall have minimum yield strength of 45,000 psi (310 MPa).
			3. Galvanizing (ASTM A653/A653M): Prior to forming, hot dip galvanized with minimum zinc coating weight of 0.60 oz/ft2 (184 g/m2), Coating Designation G-60.
			4. Rails:
				1. Steel channel, 1.4375 inches (36.5 mm) x 1.5 inches (38 mm).

\*\* NOTE TO SPECIFIER \*\* Retain one of the following two paragraphs.

* + - * 1. Standard Picket Spacing: Picket holes shall be spaced at 4.675 inches (118.75 mm) o.c.
				2. Pool, Pet and Play Picket Spacing: Picket holes shall be spaced at 3.5 inches (88.9 mm) o.c.
			1. Pickets: 3/4 inches (19 mm) square x 17 gauge tubing for heights up to 6 feet, and 14 gauge tubing for 7 and 8 foot heights.
			2. Racking/Biasability (Ability of Panels to Follow Grades): able to follow varying grade changes to a maximum of 48 inch (762 mm) rise in an 8 foot (2438 mm) run.

\*\* NOTE TO SPECIFIER \*\* Select the post size(s) required from the following paragraphs and delete those not required. Refer to manufacturer's literature for determining post sizes according to wind loads.

* + - 1. Posts:
				1. Size: 2.5 inches by 2.5 inches by 16 gauge w/ standard post cap.
				2. Size: 2.5 inches by 2.5 inches by 14 gauge w/ standard post cap, required for 7 foot and 8 foot heights.
				3. Size: 3 inches by 3 inches by 12 gauge w/ standard post cap.

\*\* NOTE TO SPECIFIER \*\* Select accessories required from the following paragraphs and delete those not required. Finals are only applicable to the Genesis style.

* + - 1. Accessories: Aluminum castings.
				1. Finial: Quad Flair.
				2. Finial: Triad.
				3. Post Cap: Ball Cap.
				4. Double Rings.
				5. Butterfly Scroll.

\*\* NOTE TO SPECIFIER \*\* Retain the first paragraph below for Classic, Majestic, or Genesis style fencing. Delete first paragraph and retain second paragraph for Invincible style fencing.

* + 1. Commercial Steel Ornamental Fence System - Internally Secured: System includes posts, framework, and mounting accessories.
			1. Acceptable Product: Aegis Plus.
			2. Grade: Commercial.
			3. Style:

\*\* NOTE TO SPECIFIER \*\* Aegis Plus fencing is available in four styles. Delete options not required for the Project. If rings are required, add "with rings" after the Style number.

* + - * 1. Warrior: Pressed pointed pickets extend above top rail, alternately 7.5 inches (152 mm) and 4.5 inches (305 mm).

Two Rail: Style Warrior.

Three Rail: Style Warrior.

* + - * 1. Classic: Pressed pointed pickets extended above top rail.

Two Rail: Style Classic.

Three Rail: Style Classic.

* + - * 1. Majestic: Flush top rail

Two Rail: Style Majestic.

Three Rail: Style Majestic.

* + - * 1. Genesis: Flat top pickets extend above top rail.

Two Rail: Style Genesis.

Three Rail: Style Genesis.

* + - 1. Height:
				1. 1.Height: 4 feet (1219 mm).
				2. Height: 5 feet (1524 mm).
				3. Height: 6 feet (1829 mm).
				4. Height: 7 feet (2134 mm).
				5. Height: 8 feet (2438 mm).
			2. Steel (ASTM A924/A924M): Steel for tubular pickets, rails and posts shall have minimum yield strength of 45,000 psi (310 MPa).
				1. Galvanizing (ASTM A653/A653M): Prior to forming, hot dip galvanized with minimum zinc coating weight of 0.90 oz/sq ft (276 g/m2), Coating Designation G-90.
			3. Rails:
				1. Acceptable Product: Ameristar ForeRunner Rails.
				2. Double-walled U channel; outside cross-section dimensions of 1-1/2 inch (38 mm) square; minimum thickness of 14 gauge; inside galvanized; open ends for air circulation and moisture evaporation.

\*\* NOTE TO SPECIFIER \*\* Retain one of the following two paragraphs.

* + - * 1. Panel Length: 6 foot (1829 mm) typical.
				2. Panel Length: 8 foot (2438 mm) typical.
				3. Rail Strength:

Effective Wall Thickness: 0.160 inch.

Rail Weight: 2.13 lbs/ft.

* + - * 1. Enclosed Retaining Rod: Retaining rods shall be 0.125 inch (3.2 mm) diameter galvanized steel. Variable pitch connection system for, high angle racking and elimination of external fasteners
				2. PVC Grommets: Provide grommets to seal all picket-to-rail intersections.
				3. Picket holes in the ForeRunner rail shall be spaced at 4.70 inches (119 mm) o.c.
			1. Pickets: 3/4 inch (25.4 mm) square x 17 gauge steel tubing.
			2. Fasteners: All fasteners shall be 302 stainless steel; match finish of fence.
				1. Security Fastener: one-way tamperproof security bolts with inverted t-nuts.
				2. Bracket to Post Connections: Self-drilling hex-head screws.
			3. Panels: Completed panels shall be capable of supporting a 400 pound load applied at midspan without permanent deformation.
			4. Racking/Biasability (Ability of Panels to Follow Grades): Minimum of 25 percent slope.

\*\* NOTE TO SPECIFIER \*\* Select the post size(s) required from the following paragraphs and delete those not required. Refer to manufacturer's literature for determining post sizes according to wind loads.

* + - 1. Posts:
				1. Size: 2-1/2 inches by 2-1/2 inches by 12 gauge w/ standard post cap.
				2. Size: 3 inches by 3 inches by 12 gauge w/ standard post cap.
				3. Size: 4 inches by 4 inches by 12 gauge w/ standard post cap.

\*\* NOTE TO SPECIFIER \*\* Select accessories required from the following paragraphs and delete those not required. Finals are only applicable to the Genesis style.

* + - 1. Accessories: Aluminum castings.
				1. Finial: Quad Flair.
				2. Finial: Triad.
				3. Post Cover: Ball Cap.
				4. Rings.
		1. High Security Steel Fence System - Ornamental Pale: Steel corrugated pale security fence including pales, rails, posts, and hardware required for a complete system.
			1. Acceptable Product: Impasse.
			2. Grade: High Security.

\*\* NOTE TO SPECIFIER \*\* Impasse fencing is available in three styles. Delete styles and rail options not required for Project.

* + - 1. Style:
				1. Trident: System consists of high-tensile steel corrugated pales that extend above topmost rail and terminate with a triple-pointed and splayed spear tip.

Two Rail: Style Trident.

Three Rail: Style Trident.

Four Rail: Style Trident.

Five Rail: Style Trident.

* + - * 1. Stronghold: System consists of high-tensile steel corrugated pales with blunt, slightly rounded tip.

Two Rail: Style Stronghold.

Three Rail: Style Stronghold.

Four Rail: Style Stronghold.

Five Rail: Style Stronghold.

* + - * 1. Gauntlet: System consists of high-tensile steel outward curving corrugated pales that extend above topmost rail and terminate with triple pointed and splayed spear tips.

Two Rail: Style Gauntlet.

Three Rail: Style Gauntlet.

Four Rail: Style Gauntlet.

Five Rail: Style Gauntlet.

* + - 1. Height:
				1. 1.Height: 6 feet (1829 mm).
				2. Height: 7 feet (2134 mm).
				3. Height: 8 feet (2438 mm).
				4. Height: 9 feet (2743 mm).
				5. Height: 10 feet (3048 mm).
			2. Steel (ASTM A924/A924M): Steel for corrugated pales, rails and posts shall have minimum yield strength of 45,000 psi (310 MPa).
				1. Galvanizing (ASTM A653/A653M): Prior to forming, hot dip galvanized with minimum zinc coating weight of 0.90 oz/sq ft (276 g/sq meter), Coating Designation G-90.
			3. Rails: High strength steel; lower lip contoured to carry optional anti-ram cables, sensor cables, and alarm systems.
				1. Acceptable Product: Impasse Rail.
				2. Dimensions: 2 inches (50.8 mm) wide by 2-1/2 inches (63.5 mm) high by 0.100 inch (2.54 mm) nominal thickness.

\*\* NOTE TO SPECIFIER \*\* Retain one of the following two paragraphs.

* + - * 1. Panel Length: 6 foot (1829 mm) typical.
				2. Panel Length: 8 foot (2438 mm) typical.
				3. Pale Holes: Spaced at 6 inches (152.4 mm) o.c.
			1. Pales: Corrugated shape; resists prying or bending; nominal 2.75" wide x 0.075 inch (1.9 mm).
			2. Fasteners: All fasteners shall be 302 stainless steel; match finish of fence.
				1. Tamperproof Carriage Bolts: Bolts fit snugly into recessed depression on the face of each pale, for connection of pales to rails.
				2. Break-Away Hex Nut: Stainless steel security nut prevents tampering or removal by normal tools.
				3. Panel Brackets: Provide fishplate brackets to attach panels to slotted holes in post.
				4. Tamperproof Nuts and Bolts: Attach adjacent rails to either end of the fishplate bracket.
			3. Panels: Completed panels shall be capable of supporting a 400 lb. load (applied at midspan) without permanent deformation.
			4. Racking/Biasability (Ability of Panels to Follow Grades): Panels shall be biasable to a 30 degree change in grade.
			5. Posts: Double wall I-beam; pre-punched for multiple rail options and pass through of cables.
				1. Acceptable Product: Impasse I-Beam.
				2. Bending Strength: 93,700 psi.
				3. Size: 1-3/4 inches (44.5 mm) by 4 inches (101.6 mm).
				4. Thickness: Nominal membrane thickness of 0.100 inch (2.54 mm); effective wall thickness of 0.200 inch (5.08 mm).
				5. Post Cap: Cast aluminum.

\*\* NOTE TO SPECIFIER \*\* Include other Sections in the Project Manual to specify security systems and accessories listed below. This paragraph only requires coordination of systems and accessories, not for providing the systems and accessories.

* + - 1. Security Systems and Accessories: Coordinate with other Sections for integration of the following security systems and accessories:
				1. The Stalwart Anti-Ram Cable System.
				2. The Xspan Anti-Climb Screen System.
				3. Vehicle Access Control Systems.
				4. Barbed Tape Helical Coil Toppings.
				5. IDS (Intrusion Detection Sensors).
				6. Lighting Systems.
				7. Closed Circuit TV Systems.
				8. Access Control.
				9. Biometrics/Card Readers/ Retina & Print Scans.
				10. Entrance Containment.
	1. FINISH

\*\* NOTE TO SPECIFIER \*\* Applicable to Aegis Plus, Aegis II and Impasse. Delete if not required.

* + 1. PermaCoat: Thermal stratification coating process (high-temperature, in-line, multi-stage, multi-layer) including six-stage pretreatment/wash with zinc phosphate, an electrostatic spray application of epoxy base, and a separate electrostatic spray application of a polyester top coat finish.
			1. Base Coat Coating Thickness: Thermosetting epoxy powder coating with minimum thickness of 2 to 4 mils (0.0508 to 0.1016 mm).
			2. Top Coat Coating Thickness: No-mar TGIC polyester powder finish with minimum thickness of 2 to 4 mils (0.0508 to 0.1016 mm).
			3. Coating Performance Requirements: Coating meets or exceeds the following.
				1. Adhesion (ASTM D 3359, Method B): Adhesion over 90 percent of test area (tape and knife test).
				2. Corrosion Resistance (ASTM B 117, ASTM D 1654): Coated galvanized steel 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 inch (3.18 mm) coating loss from the scribed mark or an accumulation of medium #8 blisters.
				3. Impact Resistance (ASTM D 2794): 60 inch pounds, minimum (impact using 0.625 inch ball).
				4. Weathering Resistance (ASTM D 822, D 2244, D 523 - 60 Degree Method): 1,000 hours, minimum (failure mode is 60 percent loss of gloss or color variance of more than 3 delta-E color units.)

\*\* NOTE TO SPECIFIER \*\* Applicable to Montage Plus and Montage II. Delete if not required.

* + 1. E-Coat: Electrode position coating process consisting of multi-stage pretreatment/wash (with zinc phosphate), followed by duplex application of epoxy primer and acrylic topcoat; for interior and exterior of steel posts, rail and pickets.
			1. Coating Thickness: Minimum cumulative coating thickness of epoxy and acrylic shall be 2 mils (0.058 mm).
			2. Coating Performance Requirements: Coating meets or exceeds the following:
				1. Adhesion (ASTM D 3359, Method B): Adhesion over 90 percent of test area (tape and knife test).
				2. Corrosion Resistance (ASTM B 117, ASTM D 714, ASTM D 1654): Coated galvanized steel shall be capable of salt spray resistance for 1,500 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 inch (3.18 mm) coating loss from the scribed mark or an accumulation of medium #8 blisters.
				3. Impact Resistance (ASTM D 2794): 60 inch pounds, minimum (impact using 0.625 inch ball).
				4. Weathering Resistance (ASTM D 822, D 2244, D 523 - 60 Degree Method): 1,000 hours, minimum (failure mode is 60 percent loss of gloss or color variance of more than 3 delta-E color units.)

\*\* NOTE TO SPECIFIER \*\* Applicable to Echelon Plus and Echelon II. Delete if not required.

* + 1. Polyester Coating: Thermal stratification coating process (high-temperature, in-line, multi-stage, multi-layer) including six-stage pretreatment/wash with zinc phosphate and a separate electrostatic spray application of a polyester top coat finish.
			1. Top Coat Coating Thickness: No-mar TGIC polyester powder finish with minimum thickness of 2 to 4 mils (0.0508 to 0.1016 mm).
			2. Coating Performance Requirements: Coating meets or exceeds the following:
				1. Adhesion (ASTM D 3359, Method B): Adhesion over 90 percent of test area (tape and knife test).
				2. Corrosion Resistance (ASTM B 117, ASTM D 1654): Coated galvanized steel 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 inch (3.18 mm) coating loss from the scribed mark or an accumulation of medium #8 blisters.
				3. Impact Resistance (ASTM D 2794): 60 inch pounds, minimum (impact using 0.625 inch ball).
				4. Weathering Resistance (ASTM D 822, D 2244, D 523 - 60 Degree Method): 1,000 hours, minimum (failure mode is 60 percent loss of gloss or color variance of more than 3 delta-E color units.)
	1. FABRlCATlON

\*\* NOTE TO SPECIFIER \*\* Retain the following paragraph for ForeRunner systems including Aegis II, Aegis Plus, Echelon II and Echelon Plus.

* + 1. ForeRunner Railing System:
			1. Pickets, rails and posts shall be precut to specified lengths.
			2. ForeRunner rails shall be prepunched to accept pickets.
			3. Pickets shall be predrilled to accept retaining rods.
			4. Provide PVC grommets to seal all picket-to-rail intersections. Grommets shall be inserted into the prepunched holes in the rails and pickets shall be inserted through the grommets so that predrilled picket holes align with the internal upper raceway of the ForeRunner.
			5. Retaining rods shall be inserted into each ForeRunner rail so that they pass through the predrilled holes in each picket.

\*\* NOTE TO SPECIFIER \*\* Retain the following paragraph for ProFusion welded Montage and Montage Plus Fencing systems.

* + 1. ProFusion Welding System:
			1. Rails shall be pre-punched to accept pickets.
			2. 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.
			3. The aligned pickets and rails shall be joined at each picket-to-rail intersection by Ameristar's proprietary fusion welding process, (ProFusion Welding) thus completing the rigid panel assembly.

\*\* NOTE TO SPECIFIER \*\* Retain the following paragraph for Impasse security fence systems.

* + 1. Impasse Fabrication
			1. Pales, rails and posts shall be pre-cut to specified lengths.
			2. Impasse rails shall be pre-punched to accept the tamperproof security fasteners.
1. EXECUTION
	1. EXAMINATION
		1. Do not begin installation until substrates have been properly prepared.
		2. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
	2. PREPARATION
		1. Clean surfaces thoroughly prior to installation.
		2. Prepare the grade and remove surface irregularities, if any, which may cause interference with the installation of fencing.
		3. If preparation and condition is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
	3. INSTALLATION
		1. Install in accordance with manufacturer's instructions.
		2. Use of non-Ameristar parts/components are will negate manufacturer's warranty.
		3. Fence posts shall be set in accordance with the manufacturer recommended spacing.
		4. Division 2 and Division 3 Sections shall govern post base material requirements.

\*\* NOTE TO SPECIFIER \*\* Retain one of the following two paragraphs. The first paragraph is for Aegis II, Aegis Plus, Echelon II, Echelon Plus and Montage Plus. The second paragraph is for Impasse security fences and gates.

* + 1. Panels shall be attached to posts using mechanically fastened panel brackets supplied by the manufacturer.
		2. Impasse panels shall be attached to posts using mounting brackets and tamperproof security fasteners supplied by the manufacturer.
		3. When cutting rails immediately seal the exposed surfaces by:
			1. Removing all metal shavings from cut area.
			2. Apply zinc-rich primer to thoroughly cover cut edge and drilled hole; allow to dry.
			3. Apply 2 coats of custom finish spray paint matching fence color.
			4. Failure to seal exposed surfaces in accordance with manufacturer's instructions will negate manufacturer's warranty.
		4. Gate posts shall be spaced according to the manufacturers' gate drawings, dependent on standard out-to-out gate leaf dimensions and gate hardware selected.
			1. Type and quantity of gate hinges shall be based on the application; weight, height, and number of gate cycles.
			2. The manufacturer's gate drawings shall identify the necessary gate hardware required for the application.
			3. Gate hardware shall be provided by the manufacture of the gate and shall be installed per manufacturer's recommendations

\*\* NOTE TO SPECIFIER \*\* Erection tolerances are included for consideration. Edit if required or delete if not required.

* 1. ERECTION TOLERANCES
		1. Maximum Variation From Plumb: 1/4 inch.
		2. Maximum Offset From Indicated Position: 1 inch.
		3. Minimum distance from property line: 6 inches.
	2. CLEANING
		1. Leave immediate work area neat at end of each work day.
		2. Clean jobsite of excess materials; scatter excess material from post hole excavations uniformly away from posts. Remove excess material if required.
		3. Clean fence with mild household detergent and clean water rinse well. Mortar should be removed from exposed posts and other fencing material using a 10% solution of muriatic acid followed immediately by several rinses with clean water.
		4. Touch up scratched surfaces using materials recommended by manufacturer. Match touchup paint color to fence finish.
	3. PROTECTION
		1. Protect installed products until completion of project.
		2. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION