SECTION 05 73 00

ORNAMENTAL ALUMINUM RAILING

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\*\* NOTE TO SPECIFIER \*\* Key-Link; Ornamental aluminum railing products.
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This section is based on the products of Key-Link, which is located at:110 Peters Rd.New Holland, PA 17557Toll Free Tel: 888-704-7130Tel: 717-435-3196Fax: 717-355-7129Email: [request info (jsurovi@keylinkonline.com)](https://arcat.com/rfi?action=email&company=Key-Link&message=RE%253A%2520Spec%2520Question%2520(05720key)%253A%2520&coid=48043&spec=05720key&rep=&fax=717-355-7129)
Web: <https://keylinkonline.com>
 [ [Click Here](https://arcat.com/company/key-link-48043) ] for additional information.
Key-Link is a leading manufacturer of Aluminum Railing, Fencing and Chain Link Fence for both residential and commercial projects. With multiple product line styles to choose from in 8 stock colors, various baluster options plus horizontal and vertical Cable Rail systems, you'll see why Key-Link is the preferred choice for your aluminum fence and railing needs. Key-Link Fencing & Railing is an affiliate company of Superior Plastic Products located in picturesque Lancaster County PA. and has been in business since the early 1980's.
Experience outdoor living as you were meant to. Key-Link Fencing & Railing offers an array of options to surround you with a beautiful, lasting outdoor living space. Offering exceptional versatility and innovative solutions with a variety of baluster options, curved and glass panel railing and complete ADA handrail to enhance the enjoyment and safety of your outdoor living space.

1. GENERAL
	1. SECTION INCLUDES

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

* + 1. Ornamental Aluminum Railing.
		2. Outdoor LED Lighting.
	1. RELATED SECTIONS

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

* + 1. Section 03 30 00 - Cast-in-Place Concrete.
		2. Section 05 50 00 - Metal Fabrications.
		3. Section 05 51 33 - Metal Ladders.
		4. Section 05 52 13 - Pipe and Tube Railings
		5. Section 06 10 00 - Rough Carpentry.
		6. Division 16 - Electrical: Electrical service and disconnects, wire routing and connections.
	1. REFERENCES

\*\* NOTE TO SPECIFIER \*\* Delete references from the list below that are not actually required by the text of the edited section.

* + 1. AAMA 2604 - Performance Requirements and Test Procedures for High-Performance Organic Coatings on Aluminum Extrusions and Panels
		2. AAMA 609 and AAMA 610.02 - Cleaning and Maintenance Guide for Architecturally Finished Aluminum
		3. ASTM A 492 - Standard Specification for Stainless Steel Rope Wire
		4. ASTM B 26 - Standard Specification for Aluminum-Alloy Sand Castings.
		5. ASTM B 209 - Standard Specification for Aluminum and Aluminum-Alloy
		6. ASTM B 210 - Standard Specification for Aluminum and Aluminum-Alloy Drawn Seamless Tubes
		7. ASTM B 247 - Standard Specification for Aluminum and Aluminum Die Forgings, Hand Forgings and rolled Ring Forgings.
		8. ASTM B 429 - Standard Specification for Aluminum-Alloy Extruded Structural Pipe and Tube.
		9. NAHB ICC 700-2011 - Practice #601.7 No Site-Applied Finishing Materials
		10. NAHB ICC 700-2011 - Practice #604.1 Recycled Content.
		11. U.S. Green Building Council, LEED Building Design & Construction (BD+C) 2009 (Version 3.0) (LEED v2009).

\*\* NOTE TO SPECIFIER \*\* Edit the following paragraphs as required. Delete requirements not applicable to the Project.

* 1. DESIGN / PERFORMANCE REQUIREMENTS
		1. Comply with requirements of building authorities having jurisdiction in Project location and the following:
			1. Handrail Standard: ANSI A1264.1
			2. Occupational Safety and Health Administration - 29 CFR 1910.23 - Guarding floor and wall openings.
			3. Railings at stairs with more than 3 risers shall be designed with an ADA-compliant handrail.
		2. Design Loads: Design, fabricate, and install handrails, guardrails, and railing systems to the following requirements.

\*\* NOTE TO SPECIFIER \*\* Edit the following paragraphs as required. Superior railings are typically designed for ICBO loadings of 200 pound concentrated and 50 pound uniform, however railings can be fabricated to meet other code loading conditions. Codes vary in method of application and magnitude of load. Governing code should be checked for specific requirements. Horizontal and vertical concentrated load test of railing systems should be conducted in accordance with ASTM E 935.

* + - 1. Handrail and Top Rails: Concentrated and uniform loading need not be applied simultaneously.
				1. Uniform load: 50 pounds per foot (74.3 kg/m) applied at the top in any direction..
				2. Concentrated load: 200 pounds (90.6 kg) applied at the top in any direction.
			2. Infill: Infill load and other loads need not be applied simultaneously.
				1. Concentrated load: 50 pounds (90.6 kg) applied horizontally on any area of 1 sf (0.093 sm).
		1. Thermal Movement: Provide for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures by preventing buckling, opening of joints, overstressing of components, failure of connections, and other detrimental effects. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime sky heat loss.
		2. Corrosion Control: Prevent electrolytic reaction between dissimilar metals and other forms of corrosion by insulating metals and other materials from direct contact with incompatible materials.
		3. Provide ADA-compliant handrail, including mounting brackets, elbows, transitions, wall brackets and other appurtenances necessary for a complete installation complying with requirements of authorities having jurisdiction.
	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. Details of material and construction.
			3. Storage and handling requirements and recommendations.
			4. Installation methods and requirements.
		3. Shop Drawings: Submit shop drawings for fabrication and installation of ornamental metalwork. Include plans, elevations and detail sections. Indicate materials, methods, finishes and types of joinery, fasteners, anchorages and accessory items.
		4. Provide structural calculations prepared and certified by a qualified structural engineer licensed to practice in the project jurisdiction.

\*\* NOTE TO SPECIFIER \*\* Delete the following paragraphs if LEED is not applicable.

* + 1. LEED Submittals: Provide documentation of how the requirements of Credit will be met:
			1. List of proposed materials with recycled content. Indicate post-consumer recycled content and pre-consumer recycled content for each product having recycled content.
			2. Product data and certification letter indicating percentages by weight of post-consumer and pre-consumer recycled content for products having recycled content.
		2. NAHB ICC 700-2011:
			1. Practice #601.7 No Site-Applied Finishing Materials.
			2. Practice #604.1 Recycled Content.

\*\* 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), representing actual product, color, and patterns.
		3. Manufacturer's Certificates: Certify products meet or exceed specified requirements.
		4. Closeout Submittals: Provide manufacturer's maintenance instructions that include recommendations for periodic cleaning and maintenance of all components.
	1. QUALITY ASSURANCE
		1. Manufacturer Qualifications: Minimum 10 years documented experience manufacturing products specified in this section.
		2. Installers Qualifications: Minimum 3 years documented experience installing systems specified in this section.

\*\* NOTE TO SPECIFIER \*\* Include a mock-up if the project size and/or quality warrant taking such a precaution. The following is one example of how a mock-up on a large project might be specified. When deciding on the extent of the mock-up, consider all the major different types of work on the project. Note that a mockup will represent an additional cost for the project. Delete if not required.

* + 1. Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.
			1. Finish areas designated by Architect.
			2. Do not proceed with remaining work until workmanship, color, and sheen are approved by Architect.
			3. Refinish mock-up area as required to produce acceptable work.
			4. Accepted mock-ups shall be comparison standard for remaining Work

\*\* NOTE TO SPECIFIER \*\* Include a Pre-Installation Meeting if the project size and/or quality warrant taking such a precaution. Delete if not required.

* + 1. Pre-Installation Meeting: Convene a meeting at the project site prior to scheduled commencement of the Work of this Section. Attendees to include the Architect the Manufacturer's representative, the Contractor, the Installer, and related trades. Review the following.
			1. Project conditions.
			2. Status of other trades.
			3. Project duration.
			4. Field-constructed mock-ups.
	1. DELIVERY, STORAGE, AND HANDLING
		1. Handle and store materials in accordance with manufacturers instructions and to prevent damage.
		2. Store products in manufacturer's unopened, properly labeled, original packaging until ready for installation.
		3. Store components to avoid damage from moisture, abrasion, and other construction activities.
	2. SEQUENCING
		1. Ensure that products of this section are supplied to affected trades in time to prevent interruption of construction progress.
	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.
		2. Field Measurements: Take measurements of actual dimensions where necessary for fit without gaps. Indicate measurements on shop drawings.
	4. WARRANTY
		1. Provide with manufacturer's limited lifetime warranty.
1. PRODUCTS
	1. MANUFACTURERS
		1. Acceptable Manufacturer: Key-Link, which is located at:110 Peters Rd.New Holland, PA 17557Toll Free Tel: 888-704-7130Tel: 717-435-3196Fax: 717-355-7129Email: [request info (jsurovi@keylinkonline.com)](https://arcat.com/rfi?action=email&company=Key-Link&message=RE%253A%2520Spec%2520Question%2520(05720key)%253A%2520&coid=48043&spec=05720key&rep=&fax=717-355-7129);Web: <https://keylinkonline.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.
	1. RAILING MATERIALS
		1. Aluminum: Alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated, and with not less than strength and durability properties of alloy and temper designated below for each aluminum form required.
			1. Extruded Bar and Tube: ASTM B 221 (ASTM B 221 M), alloy 6063T5/ T52.
			2. Extruded Structural Pipe and Tube: ASTM B 429, alloy 6063T832.
			3. Drawn Seamless Tube: ASTM B 210 (ASTM B 210M), alloy 6063T832.
			4. Plate and Sheet: ASTM B 209 (ASTM B 209M), alloy 6061T6.
			5. Die and Hand Forgings: ASTM 8247 (ASTM B 247 M), alloy 6061T6.
			6. Castings: ASTM B 26/B 26M, alloy A 356T6.
		2. Tempered Glass: ASTM C 1048, Kind FT (fully tempered), Condition A (uncoated), Type 1 (transparent glass, flat). Quality q3 (glazing select) Provide products complying with requirements indicate below for class, thickness, and manufacturing process that have been tested for surface and edge compression according to ASTM C 1048 and for impact strength according to 16 CFR, Part 1201 for Category lI materials.
			1. Clear Glass: Class 1 (clear)
			2. Thickness: 5/16" unless otherwise noted.
			3. Glass with visual distortions shall not be used and will not be accepted.
			4. Provide safety glass permanently marked with certification label of Safety Glazing Certification Council or another certification agency, acceptable to authorities having jurisdiction.
	2. DECORATIVE ALUMINUM RAILING
		1. Series: Arabian with ball post caps and contoured top rail.
			1. Rails:
				1. Contoured Top rail: 1-3/4 inches by 1-7/8 inches
				2. Bottom rail: 1-1/4 inches by 1-1/2 inches
			2. Railing Section Length: Provide straight sections unless indicated to be curved.

\*\* NOTE TO SPECIFIER \*\* Select one of the following paragraphs and delete the one not required.

* + - * 1. 6 feet.
				2. 8 feet.
			1. Railing Height:

\*\* NOTE TO SPECIFIER \*\* Select one of the following paragraphs and delete those not required.

* + - * 1. 36 inches.
				2. 42 inches.
			1. Picket (Baluster) Style:

\*\* NOTE TO SPECIFIER \*\* Select one of the following paragraphs and delete those not required.

* + - * 1. Somerset: 3/4 inch by 3/4 inch square
				2. Richmond: 3/4 inch diameter round
				3. Trenton: 3/4 inch by 3/4 inch square, twisted
				4. Hampton: 3/4 inch by 3/4 inch square, hammered
				5. Dayton: 3/4 inch diameter round, turned.
				6. Easton: 3/4 inch by 3/4 inch square, hammered and twisted
				7. Buffalo: 1/4 inch by 3/4 inch square, with 6 inch belly
				8. Potomac: 3/4 inch by 3/4 inch square, hammered with belly
				9. Medford: 3/4 inch by 3/4 inch square with 4 inch belly
				10. Altoona: 3/4 inch by 3/4" square, hammered with 4 inch belly
				11. Glass panel: 5/16 inch by 4 feet.
			1. Picket Spacing: 3.5 inches to 3.7 inches
			2. Posts: 2.5 inches square with a wall thickness of 0.125 inch.
			3. Third Rail and Trim:

\*\* NOTE TO SPECIFIER \*\* Select one of the following optional third rail and trim paragraphs as required. Delete entirely if not required.

* + - * 1. Plain.
				2. With Rings.
				3. With Butterfly Centerpiece.

\*\* NOTE TO SPECIFIER \*\* Select the following optional secondary handrail and fitting paragraphs as required. Delete entirely if not required.

* + - 1. Secondary Handrail: 1-1/2 inch Schedule 40 (3.81 cm) aluminum pipe with 1.9 inch outside diameter.
				1. End Cap
				2. "P" Loop Return
				3. 6 inch Corner Mounting Bracket
				4. Outside Elbow
				5. Connector
				6. 0 To 90 degree Universal Elbow
				7. 104 inch Straight Handrail
				8. 34 degree Radius Elbow
				9. 90 degree Elbow Return Bracket
				10. Straight Wall Bracket
				11. 3 inch Mounting Bracket
				12. 90 degree Radius Elbow
		1. Series: Keystone with flat post caps and flat top rail.
			1. Rails:
				1. Flat Top rail: 1-3/4 inches by 1-7/8 inches
				2. Bottom rail: 1-1/4 inches by 1-1/2 inches
			2. Railing Section Length: Provide straight sections unless indicated to be curved.

\*\* NOTE TO SPECIFIER \*\* Select one of the following paragraphs and delete the one not required.

* + - * 1. 6 feet.
				2. 8 feet.
			1. Railing Height:

\*\* NOTE TO SPECIFIER \*\* Select one of the following paragraphs and delete those not required.

* + - * 1. 36 inches.
				2. 42 inches.
			1. Picket (Baluster) Style:

\*\* NOTE TO SPECIFIER \*\* Select one of the following paragraphs and delete those not required.

* + - * 1. Somerset: 3/4 inch by 3/4 inch square
				2. Richmond: 3/4 inch diameter round
				3. Trenton: 3/4 inch by 3/4 inch square, twisted
				4. Hampton: 3/4 inch by 3/4 inch square, hammered
				5. Dayton: 3/4 inch diameter round, turned.
				6. Easton: 3/4 inch by 3/4 inch square, hammered and twisted
				7. Buffalo: 1/4 inch by 3/4 inch square, with 6 inch belly
				8. Potomac: 3/4 inch by 3/4 inch square, hammered with belly
				9. Medford: 3/4 inch by 3/4 inch square with 4 inch belly
				10. Altoona: 3/4 inch by 3/4" square, hammered with 4 inch belly
				11. Glass panel: 5/16 inch by 4 feet.
			1. Picket Spacing: 3.5 inches to 3.7 inches
			2. Posts: 2.5 inches square with a wall thickness of 0.125 inch.
			3. Third Rail and Trim:

\*\* NOTE TO SPECIFIER \*\* Select one of the following optional third rail and trim paragraphs as required. Delete entirely if not required.

* + - * 1. Plain.
				2. With Rings.
				3. With Butterfly Centerpiece.

\*\* NOTE TO SPECIFIER \*\* Select the following optional secondary handrail and fitting paragraphs as required. Delete entirely if not required.

* + - 1. Secondary Handrail: 1-1/2 inch Schedule 40 (3.81 cm) aluminum pipe with 1.9 inch outside diameter.
				1. End Cap
				2. "P" Loop Return
				3. 6 inch Corner Mounting Bracket
				4. Outside Elbow
				5. Connector
				6. 0 To 90 degree Universal Elbow
				7. 104 inch Straight Handrail
				8. 34 degree Radius Elbow
				9. 90 degree Elbow Return Bracket
				10. Straight Wall Bracket
				11. 3 inch Mounting Bracket
				12. 90 degree Radius Elbow
		1. Series: American with ball post caps and flat top rail.
			1. Rails:
				1. Flat Top rail: 1-3/4 inches by 1-7/8 inches
				2. Bottom rail: 1-1/4 inches by 1-1/2 inches
			2. Railing Section Length: Provide straight sections unless indicated to be curved.

\*\* NOTE TO SPECIFIER \*\* Select one of the following paragraphs and delete the one not required.

* + - * 1. 6 feet.
				2. 8 feet.
			1. Railing Height:

\*\* NOTE TO SPECIFIER \*\* Select one of the following paragraphs and delete those not required.

* + - * 1. 36 inches.
				2. 42 inches.
			1. Picket (Baluster) Style:

\*\* NOTE TO SPECIFIER \*\* Select one of the following paragraphs and delete those not required.

* + - * 1. Somerset: 3/4 inch by 3/4 inch square
				2. Richmond: 3/4 inch diameter round
				3. Trenton: 3/4 inch by 3/4 inch square, twisted
				4. Hampton: 3/4 inch by 3/4 inch square, hammered
				5. Dayton: 3/4 inch diameter round, turned.
				6. Easton: 3/4 inch by 3/4 inch square, hammered and twisted
				7. Buffalo: 1/4 inch by 3/4 inch square, with 6 inch belly
				8. Potomac: 3/4 inch by 3/4 inch square, hammered with belly
				9. Medford: 3/4 inch by 3/4 inch square with 4 inch belly
				10. Altoona: 3/4 inch by 3/4" square, hammered with 4 inch belly
				11. Glass panel: 5/16 inch by 4 feet.
			1. Picket Spacing: 3.5 inches to 3.7 inches
			2. Posts: 4 inch square hollow, recessed aluminum extrusion with 0.135 in wall thickness.
			3. Third Rail and Trim:

\*\* NOTE TO SPECIFIER \*\* Select one of the following optional third rail and trim paragraphs as required. Delete entirely if not required.

* + - * 1. Plain.
				2. With Rings.
				3. With Butterfly Centerpiece.

\*\* NOTE TO SPECIFIER \*\* Select the following optional secondary handrail and fitting paragraphs as required. Delete entirely if not required.

* + - 1. Secondary Handrail: 1-1/2 inch Schedule 40 (3.81 cm) aluminum pipe with 1.9 inch outside diameter.
				1. End Cap
				2. "P" Loop Return
				3. 6 inch Corner Mounting Bracket
				4. Outside Elbow
				5. Connector
				6. 0 To 90 degree Universal Elbow
				7. 104 inch Straight Handrail
				8. 34 degree Radius Elbow
				9. 90 degree Elbow Return Bracket
				10. Straight Wall Bracket
				11. 3 inch Mounting Bracket
				12. 90 degree Radius Elbow
		1. Series: American with vertical cable rail. Railings run between posts that contain openings for cables. Both end and crossover posts are single posts manufactured utilizing aluminum and capable of withstanding maximum tension levels.
			1. Rails:
				1. Flat Top rail: 1-3/4 inches by 1-7/8 inches
				2. Bottom rail: 1-1/4 inches by 1-1/2 inches
			2. Railing Section Length: Provide straight sections unless indicated to be curved.

\*\* NOTE TO SPECIFIER \*\* Select one of the following paragraphs and delete the one not required.

* + - * 1. 6 feet.
				2. 8 feet.
			1. Railing Height:

\*\* NOTE TO SPECIFIER \*\* Select one of the following paragraphs and delete those not required.

* + - * 1. 36 inches.
				2. 42 inches.
			1. Brackets: A360 die cast aluminum socket brackets.
			2. Cable: High strength stainless steel cables spaced at 3.25 inch centers and tensioned between end posts.
				1. Infill: 1/8 in diameter, 7x7, T-316 stainless steel cable attached to the rail.
				2. Intermediate Support Balusters: 1/2 inch diameter solid stainless steel rod (three per 96 in rail, equally spaced).
				3. Support Block: 3-1/2 inch high by 1-7/16 inch wide "Y"-shaped die cast aluminum.
			3. Posts: 3-1/4 inch square by 0.12 inch wall 6105-T6 hollow aluminum extrusions with 1-5/8 inch wide grooves on all four sides.
		1. Series: American with horizonal cable rail. Railings run between posts that contain openings for cables. Both end and crossover posts are single posts manufactured utilizing aluminum and capable of withstanding maximum tension levels.
			1. Rails:
				1. Flat Top rail: 1-3/4 inches by 1-7/8 inches
				2. Bottom rail: 1-1/4 inches by 1-1/2 inches
			2. Railing Section Length: Provide straight sections unless indicated to be curved.

\*\* NOTE TO SPECIFIER \*\* Select one of the following paragraphs and delete the one not required.

* + - * 1. 6 feet.
				2. 8 feet.
			1. Railing Height:

\*\* NOTE TO SPECIFIER \*\* Select one of the following paragraphs and delete those not required.

* + - * 1. 36 inches.
				2. 42 inches.
			1. Brackets: A360 die cast aluminum socket brackets.
			2. Cable: High strength stainless steel cables spaced at 3.25 inch centers and tensioned between end posts.
				1. Infill: 1/8 in diameter, 7x7, T-316 stainless steel cable attached to the rail.
				2. Intermediate Support Balusters: 1/2 inch diameter solid stainless steel rod (three per 96 in rail, equally spaced).
				3. Support Block: 3-1/2 inch high by 1-7/16 inch wide "Y"-shaped die cast aluminum.
			3. Posts: 3-1/4 inch square by 0.12 inch wall 6105-T6 hollow aluminum extrusions with 1-5/8 inch wide grooves on all four sides.
		1. Series: Lancaster with flat post caps and contoured top rail.
			1. Rails:
				1. Contoured Top rail: 2.8 inches by 3-1/4 inches
				2. Bottom rail: 1-1/2 inches by 3-1/4 inches
			2. Railing Section Length: Provide straight sections unless indicated to be curved.

\*\* NOTE TO SPECIFIER \*\* Select one of the following paragraphs and delete the one not required.

* + - * 1. 6 feet.
				2. 8 feet.
			1. Railing Height:

\*\* NOTE TO SPECIFIER \*\* Select one of the following paragraphs and delete those not required.

* + - * 1. 36 inches.
				2. 42 inches.
			1. Picket (Baluster) Style:

\*\* NOTE TO SPECIFIER \*\* Select one of the following paragraphs and delete those not required.

* + - * 1. Strasburg: 1 inch square
				2. Topeka: 1 inch square, twisted
				3. Harrisburg: 1 inch square, hammered
				4. 1 inch square, with 4 inch belly
				5. Albany: 1 inch square. hammered, with 4 inch belly
			1. Picket Spacing: 3.5 inches to 3.7 inches
			2. Posts: 3-1/4 inch square by 0.12 inch wall 6105-T6 hollow aluminum extrusions with 1-9/16 inch wide grooves on all four sides.
			3. Third Rail and Trim:

\*\* NOTE TO SPECIFIER \*\* Select one of the following optional third rail and trim paragraphs as required. Delete entirely if not required.

* + - * 1. Plain.
				2. With Rings.
				3. With Butterfly Centerpiece.

\*\* NOTE TO SPECIFIER \*\* Select the following optional secondary handrail and fitting paragraphs as required. Delete entirely if not required.

* + - 1. Secondary Handrail: 1-1/2 inch Schedule 40 (3.81 cm) aluminum pipe with 1.9 inch outside diameter.
				1. End Cap
				2. "P" Loop Return
				3. 6 inch Corner Mounting Bracket
				4. Outside Elbow
				5. Connector
				6. 0 To 90 degree Universal Elbow
				7. 104 inch Straight Handrail
				8. 34 degree Radius Elbow
				9. 90 degree Elbow Return Bracket
				10. Straight Wall Bracket
				11. 3 inch Mounting Bracket
				12. 90 degree Radius Elbow
		1. Series: Outlook with flat post caps and flat top rail.
			1. Rails:
				1. Flat Top rail: 1-1/2 inches by 1.530 inches
				2. Bottom rail: 1-1/8 inches by 1 inch
			2. Railing Section Length: Provide straight sections unless indicated to be curved.

\*\* NOTE TO SPECIFIER \*\* Select one of the following paragraphs and delete the one not required.

* + - * 1. 5 feet.
				2. 6 feet.
				3. 7 feet.
				4. 8 feet.
			1. Railing Height:

\*\* NOTE TO SPECIFIER \*\* Select one of the following paragraphs and delete those not required.

* + - * 1. 36 inches.
				2. 42 inches.
			1. Picket (Baluster) Style: 5/8 inch

\*\* NOTE TO SPECIFIER \*\* Select one of the following paragraphs and delete those not required.

* + - * 1. Strasburg: 5/8 inch square
				2. Topeka: 5/8 inch square, twisted
				3. Harrisburg: 5/8 inch square, hammered
				4. 5/8 inch square, with 4 inch belly
				5. Albany: 5/8 inch square. hammered, with 4 inch belly
			1. Picket Spacing: 3.5 inches to 3.7 inches
			2. Posts: 3-1/4 inch square by 0.12 inch wall 6105-T6 hollow aluminum extrusions with 1-9/16 inch wide grooves on all four sides.
			3. Third Rail and Trim:

\*\* NOTE TO SPECIFIER \*\* Select one of the following optional third rail and trim paragraphs as required. Delete entirely if not required.

* + - * 1. Plain.
				2. With Rings.
				3. With Butterfly Centerpiece.

\*\* NOTE TO SPECIFIER \*\* Select the following optional secondary handrail and fitting paragraphs as required. Delete entirely if not required.

* + - 1. Secondary Handrail: 1-1/2 inch Schedule 40 (3.81 cm) aluminum pipe with 1.9 inch outside diameter.
				1. End Cap
				2. "P" Loop Return
				3. 6 inch Corner Mounting Bracket
				4. Outside Elbow
				5. Connector
				6. 0 To 90 degree Universal Elbow
				7. 104 inch Straight Handrail
				8. 34 degree Radius Elbow
				9. 90 degree Elbow Return Bracket
				10. Straight Wall Bracket
				11. 3 inch Mounting Bracket
				12. 90 degree Radius Elbow
		1. Structural Porch Posts: Hollow aluminum extrusion with structural aluminum pipe insert

\*\* NOTE TO SPECIFIER \*\* Select one of the following optional paragraphs as required. Delete entirely if not required.

* + - 1. 3-1/4 inches by 3-1/4 inches, 7500 lbs maximum load, 1170 lbs uplift resistance.
			2. 4 inches by 4 inches 26000 lbs maximum load, 1400 lbs uplift resistance.
		1. Standard Porch Posts: Hollow aluminum extrusion

\*\* NOTE TO SPECIFIER \*\* Select one of the following optional paragraphs as required. Delete entirely if not required.

* + - 1. 3-1/4 inches by 3-1/4 inches, 5000 lbs maximum load, 1365 lbs uplift resistance.
			2. 4 inches by 4 inches 21000 lbs maximum load, 1400 lbs uplift resistance.

\*\* NOTE TO SPECIFIER \*\* Select the following paragraph as required. Delete entirely if not required.

* + 1. Round Porch Posts: Aluminum tubing, 6 inch diameter.
		2. Newel Posts: Hollow aluminum extrusion

\*\* NOTE TO SPECIFIER \*\* Select one of the following optional paragraphs as required. Delete entirely if not required.

* + - 1. 2-1/2 inches by 2-1/2 inches.
			2. 3-1/4 inches by 3-1/4 inches.
			3. 4 inches by 4 inches
		1. Accessories:
			1. Post Caps and Trim: Cap all hollow extrusions with aluminum caps and trim as selected by the Architect from the manufacturer's available selections. Provide colors and textures matching railing types selected.
			2. Fasteners, Inserts, and Sleeves: Provide non-corrosive fasteners as provided by the manufacturer for applications indicated.
			3. Brackets and Wedges: Provide brackets and wedges as recommended by the manufacturer for each type of condition indicated.
		2. Finish: Finish railing system components after fabrication as follows:

\*\* NOTE TO SPECIFIER \*\* Select Standard or Special colors from the following paragraphs and delete the one not required. Note that additional lead times may apply for Special colors.

* + - 1. Standard Colors complying with AAMA 2604 powder coatings formulated with super durable or modified polyester resins with colors as selected by the Architect.
			2. Special Colors complying with AAMA 2605 high-performance exterior specifications that are resistant to moisture, weathering, ozone and UV radiation with colors as selected by the Architect.

\*\* NOTE TO SPECIFIER \*\* Select the Outdoor LED Lighting required from following paragraphs and delete those not required.

* 1. OUTDOOR LED LIGHTING
		1. Construction:
			1. Die-Cast and Powder-Coated Aluminum Housing
			2. Acrylic Lens.
			3. High output 3000K LED bulbs. Rated at over 50,000 hours.
			4. LED light board coated with an Optical Conformal Coating to protect circuitry from normal environmental conditions.
			5. Mizu-P25 2.50mm Pitch Waterproof connections.
			6. UL / CSA approved.

\*\* NOTE TO SPECIFIER \*\* Select the fixture Style(s) required from following paragraphs and delete those not required.

* + 1. Fixture Style:
			1. Pyramid Style Post Cap Light: Light shines outward on all sides.
				1. Size: Fits post size:

\*\* NOTE TO SPECIFIER \*\* Select the size required from following paragraphs and delete those not required.

2-1/2 inch

3-1/4 inch

4 inch

* + - * 1. Low Power Draw: 0.4 Watts per Cap.

\*\* NOTE TO SPECIFIER \*\* Select the following optional paragraph if required and delete if not required.

* + - * 1. Matching Post Caps: Provide none lighted caps where indicated.
			1. Decorative Style Post Cap Light: Light shines outward on all sides.
				1. Size: Fits post size:

\*\* NOTE TO SPECIFIER \*\* Select the size required from following paragraphs and delete those not required.

2-1/2 inch

3-1/4 inch

4 inch

* + - * 1. Low Power Draw: 0.4 Watts per Cap.

\*\* NOTE TO SPECIFIER \*\* Select the following optional paragraph if required and delete if not required.

* + - * 1. Matching Post Caps: Provide none lighted caps where indicated.
			1. Pyramid Style Post Cap Downlight: Light shines downward on all sides.
				1. Size: Fits post size:

\*\* NOTE TO SPECIFIER \*\* Select the size required from following paragraphs and delete those not required.

2-1/2 inch

3-1/4 inch

4 inch

* + - * 1. Low Power Draw: 1.6 Watts per Cap.

\*\* NOTE TO SPECIFIER \*\* Select the following optional paragraph if required and delete if not required.

* + - * 1. Matching Post Caps: Provide none lighted caps where indicated.
			1. Decorative Style Post Cap Downlight: Light shines downward on all sides.
				1. Size: Fits post size:

\*\* NOTE TO SPECIFIER \*\* Select the size required from following paragraphs and delete those not required.

2-1/2 inch

3-1/4 inch

4 inch

* + - * 1. Low Power Draw: 1.6 Watts per Cap.
			1. Post and Stair Accent Light: Mounts to posts, stair risers or deck fascia. Low profile light shines downward.
				1. Size: 2 inches W by 1 inch H.

\*\* NOTE TO SPECIFIER \*\* Select the fixture Color(s) required from following paragraphs and delete those not required.

* + 1. Fixture Color:

\*\* NOTE TO SPECIFIER \*\* The following colors are color matched for aluminum railing.

* + - 1. Gloss White
			2. Textured White
			3. Silver
			4. Gloss Bronze
			5. Textured Bronze
			6. Kona
			7. Gloss Black
			8. Textured Black

\*\* NOTE TO SPECIFIER \*\* The following colors are color matched for special order color match.

* + - 1. Gloss Beige
			2. Brownstone
			3. Speckled Walnut
			4. Redwood
			5. Hunter Green

\*\* NOTE TO SPECIFIER \*\* The following colors are color matched for vinyl railing.

* + - 1. White
			2. Almond
			3. Clay
			4. Black
		1. Accessories: Provide with the following accessories as required for the installation indicated on the Drawings.

\*\* NOTE TO SPECIFIER \*\* Available in: 2 foot, 5 foot, or 9 foot Lengths

* + - * 1. Wire Extension

\*\* NOTE TO SPECIFIER \*\* Includes: 2-Way Splitter, 5 foot and 9 foot Wire Extensions

* + - * 1. Post Light Wire Kit
				2. 2-Way Wire Splitter

\*\* NOTE TO SPECIFIER \*\* Comes with 1 Plug Cover

* + - * 1. 4-Way Wire Splitter

\*\* NOTE TO SPECIFIER \*\* Available in 3 Per Pack

* + - * 1. Plug Cover

\*\* NOTE TO SPECIFIER \*\* The following accessories are optional select those required from the following paragraphs and delete those not required.

* + - * 1. Remote Dimmer: Control the brightness of lights remotely.
				2. Photoelectric Timer: Set a timer for lights.

\*\* NOTE TO SPECIFIER \*\* Power supply is suitable for up to 40 fixtures. Verify quantity required for installation as required

* + - * 1. Power Supply: Mean Well NPF-40-12 UL8750 constant voltage and constant current LED power supply.

Input Voltage: 90~305Vac

C.V. Output Voltage: 12.0 Volts

C.V. Max Current: 3.340 Amps

Max Output Power: 40 Watts

Constant Current: 3.340 Amps

C.C. Voltage Min: 7.20 VDC

C.C. Voltage Max: 12.00 VDC

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.

\*\* NOTE TO SPECIFIER \*\* Include the following paragraph and coordinate installation as applicable. Delete if not required.

* + 1. Coordinate railing installation with installation of waterproof membrane or coating Specified in Section 07xxx.
		2. Ensure that adjacent surfaces, structures, and finishes are protected from damage by construction activities of this section.
		3. Use wood blocks and padding to prevent damage to railing members and fittings during erection.
		4. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
	1. INSTALLATION
		1. Install in accordance with manufacturer's instructions.
		2. Keep perimeter lines straight, plumb, and level.
		3. Provide grounds, clips, backing materials, adhesives, brackets, anchors, and accessories necessary for a complete installation.
			1. Expansion Bolt Mounting: Anchor through base plates to concrete substrate.
			2. Sleeve Mounting:
				1. Arrange for casting of sleeves or core drill insitu concrete to provide holes for railing uprights.
				2. After setting, fill holes with hydraulic grout; brace members until grout is cured.
			3. Connect railing components in accordance with manufacturer's instructions applicable to the specified system. Tighten all fasteners so that completed railing is rigid and free of play at joints and component attachments.

\*\* NOTE TO SPECIFIER \*\* Include the following two paragraphs for cable rail. Delete if not required.

* + - 1. Do not tension the cables completely until all the cables have been installed between the end posts.
			2. Provide intermediate support posts between end posts and tension cables to maintain a 3 inch (7.62 cm) maximum center to center spacing between cables.

\*\* NOTE TO SPECIFIER \*\* Include the following paragraphs for rail. Delete if not required.

* + - 1. Expansion Joints: Provide expansion joints for continuous spans in excess of 40 feet (12.0 m). Construct joints by deleting structural adhesive from one end of the spliced joint so that it is free to move in or out of the pipe. If a joint is provided every 30 feet (9.0 m), the width of the gap should allow 1/8 inch (3.0 m) expansion for each 40 degrees F (22 degrees C) of expected temperature rise.

\*\* NOTE TO SPECIFIER \*\* Include the following paragraphs for LED lighting if required. Delete if not required.

* + 1. Install LED lighting in accordance with the manufacturer's recommendations. Coordinate with Division 16 - Electrical: Electrical service and disconnects, wire routing and connections.
	1. ERECTION TOLERANCES
		1. Install railings plumb and level, securely fastened, with vertical members plumb.
			1. Maximum variation from plumb: 1/4 inch (6.0 mm).
			2. Maximum misalignment from true position: 1/4 inch (6.0 mm).
			3. Maximum misalignment between adjacent separated members: 1/8 inch (3.0 mm).
	2. CLEANING
		1. Remove dust or other foreign matter from component surfaces; clean finishes in accordance with AAMA 609 and AAMA 610.
	3. PROTECTION
		1. Protect installed products until completion of project.
		2. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION