SECTION 05 73 00

ORNAMENTAL HANDRAILS AND RAILINGS

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\*\* NOTE TO SPECIFIER \*\* Morse Architectural ; Glass railing systems, stainless steel railings.
This section is based on the products of Morse Architectural , which is located at:
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Kent, WA 98032
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Web: <https://www.morsearchitectural.com>
 [ [Click Here](https://www.arcat.com/arcatcos/cos39/arc39254.html) ] for additional information.
Morse Industries is delighted to relaunch under the M-D family umbrella as Morse Architectural. Morse Architectural will serve the commercial and residential glazing industry, ornamental metal fabricators, and the architectural design community with that same focus on customer delight that has been 40 years in the making. You can depend on the Morse Architectural team to deliver expert consultation, quality products, total project support, and to continue its signature customer centric culture for years to come.

1. GENERAL
	1. SECTION INCLUDES

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

* + 1. Structural glass railings.
		2. Adjustable glass railings.
		3. Stainless steel handrails.
	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 09 21 16.33 - Gypsum Board Area Separation Wall Assemblies.
	1. REFERENCES

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

* + 1. American National Standards Institute (ANSI):
			1. ANSI 1264.1 Safety Requirements for Workplace Floor and Wall Openings, Stairs, and Railing Systems
		2. American Welding Society (AWS):
			1. AWS D1.1 - Structural Welding Code- Steel
		3. ASTM International (ASTM):
			1. ASTM A 123 - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
			2. ASTM A 269 - Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service.
			3. ASTM A 307 - Standard Specification for Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength.
			4. ASTM A 492 - Standard Specification for Stainless Steel Wire Rope
			5. ASTM A 500 - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
			6. ASTM A 555 - Specifications for General Requirements for Stainless Steel Wire and Wire Rods.
			7. ASTM A 580 - Standards Specifications for Stainless Steel Wire.
			8. ASTM B117 - Salt Spray Corrosion Test.
			9. ASTM E 488 - Standard Test Method for Strength of Anchors in Concrete Elements.
			10. ASTM E 751 - Test Methods, Practices, and Terminology for Chemical Analysis of Steel Products.
			11. ASTM E 894 - Standard Test Method for Anchorage of Permanent Metal Railing Systems and Rails for Buildings.
			12. ASTM E 935 - Standard Test Methods for Performance of Permanent Metal Railing Systems and Rails for Buildings.
			13. ASTM E 1481 - Standard Terminology of Railing Systems and Rails for Buildings
			14. ASTM-F593 - Standard Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs
			15. ASTM F 606 - Test Methods for Determining the Mechanical Properties of Externally and Internally Threaded Fasteners, Washers, Direct Tension Indicators and Rivets
		4. International Code Council (ICC):
			1. ICC-ES AC174 - Acceptance Criteria for Deck Board Span Ratings and Guardrail Systems
				1. Section 4.2.2 - In-Fill Load Test.
				2. Section 4.2.3 - Uniform Load Test.
				3. Section 4.2.4 - Concentrated Load Test.
			2. ICC-ES AC273 - Acceptance Criteria for Handrails and Guards
			3. ICC-ES Evaluation Report: ESR-3950.
			4. California Building Code (CBC).
			5. International Building Code (IBC).
			6. International Residential Code (IRC).
		5. International Conference of Building Officials (ICBO): ICBO UBC - Uniform Building Code.
		6. Military Specification:
			1. MIL-P 53084: Primer, Cathodic Electrodeposition, Chemical Agent Resistant
	1. DEFINITIONS
		1. Railings: Guards, handrails, and similar devices used for protection of occupants at open-sided floor areas, pedestrian guidance and support, visual separation, or wall protection.
	2. PERFORMANCE REQUIREMENTS
		1. General: Railings shall be engineered to withstand structural loads indicated. Determine allowable design working stresses of railing materials.
			1. Determine Allowable design working stresses of stainless steel railing materials based on 60 percent of minimum yield strength
		2. Structural Performance: Provide railings capable of withstanding the effects of gravity loads and the following loads and stresses within limits and under conditions indicated.
			1. Structural Performance of Top Rails and Supports:
				1. Capable of withstanding a concentrated load of 200 pounds (90.6 kg), applied to top rail at any point and in any direction.
				2. Capable of withstanding a uniform load of 50 pounds per linear foot (74.3 kg/m) applied to the top rail horizontally with a simultaneous load of 100 pounds per linear foot (148.6 kg/m) applied vertically downward.
				3. Design need not provide for both concentrated and uniform loads to be applied concurrently.
			2. Structural Performance of Guardrail Infill:
				1. Capable of withstanding a horizontal concentrated load of 200 pounds (90.6 kg), applied to a 1 sq.ft. (0.1 sq.m.) area at any point on infill.
				2. Infill is defined to include panels, intermediate rails, balusters, and other elements.
				3. Design need not provide for infill loads to be applied concurrently with top rail loads.
		3. Thermal Movements: Provide exterior railings that allow 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.
			1. Temperature Change (Range): 120 degrees F (49 degrees C) ambient; 180 degrees F (82 degrees C) material surfaces.
		4. Control of Corrosion: Prevent galvanic action and other forms of corrosion by insulating metals and other materials from direct contact with incompatible materials.
	3. SUBMITTALS
		1. General: Submit under provisions of Section 01 30 00 - Administrative Requirements
		2. Product Data: Manufacturer's printed product information indicating material compliance and specified options are to be submitted prior to installation. Submit manufacturer's data sheets on each product to be used, including:
			1. Manufacturer's product lines of railings assembled from standard components.
			2. Grout, anchoring cement, and rail finish.
		3. Shop Drawings: Layout of railings components with dimensions, details, and finishes shall be submitted for approval and shall be approved prior to installation. Include plans, elevations, sections, details, and attachments to other work.

\*\* NOTE TO SPECIFIER \*\* Delete if LEED submittals not required.

* + 1. LEED Submittals: Provide documentation to satisfy Credit requirement:
			1. List of 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. Design Data: Submit design data to verify compliance of design loads specified in Performance Requirements Article. Design data shall be signed and sealed by the qualified professional engineer responsible for their preparation.
		3. Samples: Submit Samples for verifications purposes. Samples shall be submitted prior to removal. Submit samples for the following:
			1. For each type of exposed finish required.
			2. Of each distinctly different linear railing member, including handrails, top rails, posts, and balusters.
				1. Fittings and brackets.
				2. Welded connections.
				3. Assembled Samples of railing systems, made from full-size components, including top rail, post, handrail, and infill. Show method of finishing members at intersections. Samples need not be full height.
		4. Certificates: Welding Certificates.
		5. Qualification Data: For Professional Engineer.
		6. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified inspecting and testing agency; according to ASTM E 894 and ASTM E 935.
		7. Closeout Submittals: Operation and Maintenance Data.
	1. QUALITY ASSURANCE
		1. Qualifications:
			1. Manufacturer Qualifications: Company engineering and fabrication of custom railing systems for a minimum of 10 years.
			2. Installer Qualifications: Company experienced in manufacturer's products for a minimum of 5 years. The Contractor shall provide trained laborers with prior experience in the type of construction involved as well as experience installing the materials and techniques specified.
			3. Qualified Professional Engineer: A professional engineer licensed in the state of the Project location and who is qualified to design the portion of the work described in this Section.
		2. Regulatory Requirements: Completed installations shall meet ICC standards, applicable requirements of ADA Accessibility Guidelines along with local amendments and/or modifications. Completed installations shall conform to state, regional, and local codes and regulations.
		3. Source Limitations: Obtain each type of railing through one source from a single manufacturer.
		4. Product Options:
			1. Information on the Drawings and in the specifications establishes requirements for system's aesthetic effects and performance characteristics. Aesthetic effects are indicated by dimensions, arrangements, alignment, and profiles of components and assemblies as they relate to sightlines, to one another, and adjoining construction. Performance characteristics are indicated by criteria subject to verification by one or more methods including structural analysis, preconstruction testing, field-testing, and in-service performance.
			2. The Drawings indicate size, profiles, and dimensional requirements of railings and are based on the specific system indicated. Refer to Section 01 60 00 - Product Requirements.
		5. Modifications: Do not modify intended aesthetic effects as judged solely by the Architect, except with the Architects' approval. If modifications are proposed, submit comprehensive explanatory data to the Architect for review.
		6. Welding: Qualify procedures and personnel according to AWS D1.1

\*\* 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.

* + 1. Mock-Ups: Build a freestanding mock-up to verify selections made under samples submittals and to demonstrate aesthetic effects and set quality standards for fabrication and installation. Build mock-ups for each form and finishes of railing consisting of two posts, top rail, infill area, and anchorage systems components that are full height and area not less than 24 inches (610 mm) in length.
	1. PRE-INSTALLATION MEETINGS
		1. Convene minimum two weeks prior to starting work of this Section.
	2. DELIVERY, STORAGE, AND HANDLING
		1. Deliver and store products in manufacturer's unopened packaging bearing the brand name and manufacturer's identification until ready for installation.
		2. Store components in a dry, sheltered location away from uncured concrete, masonry, mortar, and stucco; and a safe distance away from any sanding, blasting, welding or painting operations.
		3. Handle materials to avoid damage.
	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 recommended limits.
	4. SEQUENCING
		1. Schedule installation so wall attachments are made only to completed walls. Do not support railings temporarily by a means that do not satisfy structural performance requirements.
1. PRODUCTS
	1. MANUFACTURERS
		1. Acceptable Manufacturer: Morse Architectural , which is located at: 25811 74th Ave. S.; Kent, WA 98032; Toll Free Tel: 800-325-7513; Tel: 253-852-1399; Fax: 800-411-8226; Email: [request info (info@morse-arch.com)](https://admin.arcat.com/users.pl?action=UserEmail&company=Morse+Architectural+&coid=39254&rep=&fax=800-411-8226&message=RE:%20Spec%20Question%20(05730mor):%20%20&mf=); Web: <https://www.morsearchitectural.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 \*\* Morse Architectural offers a full line of glass railing components including base shoe (both wet and dry glaze), cladding, top rail, handrail brackets and more. Morse Architectural glass and metal handrail system components are designed for use with 1/2 inch (13 mm) - 13/16 inch (21 mm) tempered or laminated glass panels as structural balusters. Whether the job specifies a wet or dry system, Morse Architectural delivers the beauty you want for the finishing touch on your commercial and residential installations. Materials and Finishes: To ensure a superior product, we use only the highest-quality materials. Each finished component receives multiple runs on state-of-the-art polishing equipment to ensure a consistent, refined appearance. Aluminum handrail sections are extruded from alloy 6063-T5. Base sections are extruded from alloy 6005-T5 or 6063-T5. Both are available in mill or anodized finish. Stainless steel components are made from Type 304 stainless steel (or Type 316L upon request). Standard finishes are #8 polished and #4 brushed. Custom finishes are available for both aluminum and stainless steel components. These may include anodized and/or powder coating. Minimum runs and extended lead times may be required.

* 1. STRUCTURAL GLASS RAILINGS

\*\* NOTE TO SPECIFIER \*\* PanelGrip and Precision Lock facilitate the quick assembly of structural glass railing without messy fillers or special tools resulting in significant savings in labor and shipping costs. Reduce Labor Costs up to 80 percent - No setting blocks, no plumbing of glass, no multiple pours of cement, no waiting for cement to cure, no messy clean-up. Broadest Grip Range of any Dry Glaze System Made for range of 1/2 inch (13 mm) to 13/16 inch (21 mm) tempered and laminate glass. No Special Tools Required - All you need is an Allen wrench for installation or removal. No Mess - No mixing and pouring of expansion cement, no running of cement on incline. Delete Dry system style not required (Select PanelGrip, PanelGrip Narrow, Or Precision Lock). Delete all if Wet Glaze System is used.

* + 1. Dry Glaze System:
			1. Product: PanelGrip A42-0073 Dry Glaze System as manufactured by Morse Architectural.
				1. ICC-ES Evaluation Report: ESR-3950.

Compliance with IBC, and CBC.

* + - * 1. System: The system shall utilize a locking mechanism of high-strength aluminum and PVC isolators combined with a specially designed aluminum shoe moulding isolator assembly that is adjustable to accommodate a range of glass thicknesses.
				2. Base Shoe: Extruded from 6005-T5 in mill finish. 2-3/4 inches (70 mm) wide by 4-1/8 inches (105 mm) tall.
				3. Isolator and Panel Grip: Sized to accommodate glass thickness:

Black: A42-0028-1B .469 inch - .550 Inch (12 mm - 14 mm) glass thickness.

Dark Grey: A42-0028-1DG .569 Inch - .638" (15 mm - 16 mm)

Light Grey: A42-0028-1LG .642" - .726" (16 mm - 19 mm)

White: A42-0028-1W .719 inch - .781 inch (18.26 mm - 19.83 mm) glass thickness.

Red: A42-0028-1R .768 inch - .874 inch (20 mm - 22 mm) glass thickness.

* + - 1. Product: PanelGrip Narrow A42-0072 Dry Glaze System as manufactured by Morse Architectural for .5 inch (12.7 mm) to .625 inch (15.8 mm).
				1. System: The system shall utilize a locking mechanism of high-strength aluminum and PVC isolators combined with a specially designed aluminum shoe moulding isolator assembly that is adjustable to accommodate a range of glass thicknesses.
				2. Base Shoe: Extruded from 6005-T5 in mill finish. 2-1/2 inches (64 mm) wide by 4-1/8 inches (105 mm) tall.
				3. Isolator and Panel Grip: Sized to accommodate glass thickness:

A42-0027-1L .520 inch - .570 inch (12.7 mm - 14.3 mm) glass thickness.

* + - 1. Product: Precision Lock Adjustable Railing System as manufactured by Morse Architectural.
				1. System: The system allows the installer to quickly and easily adjust glass for plumb.
				2. Features:

Over 2 inches (51 mm) of adjustment.

Accommodates 1/2 to 1 inch (13 to 25 mm) glass.

Patented rotating pressure plate.

* + - * 1. Base Shoe:

\*\* NOTE TO SPECIFIER \*\* Delete models not required.

Model 68 Undrilled: For 1/2 to 11/16 inch (12.6 to 17.5 mm) monolithic or laminated tempered glass.

Model 68 Counterbored: For 1/2 to 11/16 inch (12.6 to 17.5 mm) monolithic or laminated tempered glass.

Model 80 Undrilled: For 11/16 to 1 inch (17.5 to 25.5 mm) monolithic or laminated tempered glass.

Model 80 Counterbored: For 11/16 to 1 inch (17.5 to 25.5 mm) monolithic or laminated tempered glass.

* + - * 1. Mechanism:

\*\* NOTE TO SPECIFIER \*\* Delete models not required.

Model M42-PL68B-4, Glass Thickness: 1/2 to 17/32 inches (12 to 13.5 mm).

Model M42-PL68D-4, Glass Thickness: 9/16 inches (14 to 15 mm).

Model M42-PL68E-4, Glass Thickness: 11/16 inches (16.8 to 17.5 mm).

Model M42-PL80D-4, Glass Thickness: 11/16 inches (16 to 17.5 mm).

Model M42-PL80E-4, Glass Thickness: 3/4 inches (19 mm).

Model M42-PL80F-4, Glass Thickness: 27/32 inches (21.5 mm).

Model M42-PL80G-4, Glass Thickness: 1 inch (24.7 to 25.5 mm).

\*\*NOTE TO SPECIFIER\*\* Delete models not required Each shoe requires gasket extrusion on each side to hold gasket in place. Choose between 10 ft (3048 mm) option and 20 ft (6096 mm) option.

* + - * 1. Gasket Extrusions: Snap on gasket extrusion.

A16-PL68SOMF10

A16-PL68SOMF20

* + - * 1. Compressible Closure Gasket:

\*\* NOTE TO SPECIFIER \*\* Each Base shoe requires (2) gaskets. Refer to gasket sizing charts for correct model selection. Indicate below which models are to be used according to base shoe and glass thickness combination.

V11-PLG1BK20.

V11-PLG2BK20.

V11-PLG15BK20.

V11-PLG17BK20.

V11-PLG1BK20.

V11-PLG25BK20.

* + - * 1. Accessories:

\*\* NOTE TO SPECIFIER \*\* Delete accessory options not required.

Weld and Drain Blocks.

Perfect Aluminum Pins.

Cladding.

Top Rail.

\*\* NOTE TO SPECIFIER \*\* Delete Wet Glaze System if not required.

* + 1. Wet Glaze Systems:
			1. Base Shoe: Extruded 6005-T5 or 6063-T5 aluminum alloy.

\*\* NOTE TO SPECIFIER \*\* Delete base profiles not required.

* + - * 1. Provide "Heavy" base profile in size indicated for glass thickness scheduled.

\*\* NOTE TO SPECIFIER \*\* Delete glass thickness not required.

A42-0090 for 1/2 inch (12.7 mm) glass.

A42-0099 for 3/4 inch (19 mm) glass.

* + - * 1. Provide "Hollow" A42-0091 base profile (for 1/2 inch (12.7 mm) glass only).
				2. Provide "Low Profile" A42-0088 base (for 1/2 inch (12.7 mm) glass only).
				3. Provide "Tapered" A42-0076 base profile (for 1/2 inch (12.7 mm) glass only).
			1. Product: Wet Glaze System as manufactured by Morse Architectural.
			2. System: The system shall utilize wet cement combined with a specially designed aluminum shoe and setting block to accommodate a range of glass thicknesses.
			3. Setting Block: V50-0002BKA25 EPDM material in profile for 1/2 inch (12.7 mm) glass.

\*\* NOTE TO SPECIFIER \*\* Delete cladding style not required.

* + - 1. Cladding Style: Standard. One face exposed.
			2. Cladding Style: Side drilled. One face exposed and bottom exposed.

\*\* NOTE TO SPECIFIER \*\* Delete cladding materials not required.

* + - 1. Cladding Material: Stainless steel cladding in #4 finish.
			2. Cladding Material: Stainless steel cladding in #8 polished.
			3. Cladding Material: Aluminum Oil rubbed bronze effect.
			4. Cladding Material: Aluminum Clear satin.
			5. Cladding Material: Aluminum #4 brushed effect

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* + - 1. Spacer Block: Die cut, high density foam spacing and sealing pads with adhesive on one side to act as spacers. 1/4 inch thick x 3-7/16 inches (6.4 mm x 11.8 mm) tall. Sized for glass thickness.

\*\* NOTE TO SPECIFIER \*\* Delete type not required.

* + - * 1. V50-0010 for 1/2 inch (12 mm) glass.
				2. V50-0011 for 3/4 inch (19 mm) glass.
				3. Delete one of the following two paragraphs, or both if not required.
			1. Weld Block: S42-0023-10 Steel plate 2-1/2 inches x 2-3/4 inches x 1/2 inch (63.5 mm x 70 mm x 12.7 mm) with centered hole for attachment of base shoe.
			2. Base Drain Block: A42-0023-10: Aluminum block 2-1/2 inch x 2-3/4 inch x 1/2 inch (63.5 mm x 70 mm x 12.7 mm). Placed under exterior installed base shoes to provide drainage space. Install 12 inches (205 mm) on center.
		1. Top Rail Systems:
			1. Glass and metal handrail system components shall be designed for use with 1/2 inch (12.7 mm) through 3/4 inch (19 mm) tempered or laminated glass panels. Refer to Drawings.
			2. Materials and Finishes:

\*\* NOTE TO SPECIFIER \*\* Delete material and finish not required.

* + - * 1. Aluminum top rail sections shall be extruded from alloy 6063-T5. Base sections are extruded from alloy 6005-T5 or 6063-T5.

Finish: Mill finish.

Finish: Clear anodized finish.

\*\* NOTE TO SPECIFIER \*\* Custom finishes available for aluminum components. Minimum runs and extended lead times may be required.

Finish: Color anodizing.

Finish: Powder coating.

* + - * 1. Stainless steel top rail components shall be made from Type 304 stainless steel or Type 316L.

Finish: #8 polished.

Finish: #4 brushed.

\*\* NOTE TO SPECIFIER \*\* Delete round top rail if not required.

* + - 1. Round Top Rail: Rail, mitered custom corners, end caps and internal connector splices. Provide vinyl glass protector sleeve.

\*\* NOTE TO SPECIFIER \*\* Select diameter and finish. Delete steel top rail size and finish not required.

* + - * 1. Diameter: 1-1/2 inches (38 mm) stainless steel in #4 and #8 finish for 5/8 inch (15.9 mm) glass only.
				2. Diameter: 2 inches (50.8 mm) stainless steel in #4 and #8 finish for 3/4 inch (19 mm) glass only.
				3. Diameter: 2-1/2 inches (63.5 mm) stainless steel in #4 and #8 finish for 3/4 inch glass only.
				4. Diameter: 3 inches (76 mm) stainless steel in #4 and #8 finish for 3/4 inch (19 mm) glass only.
				5. Diameter: 3-1/2 (89 mm) inches stainless steel in #4 and #8 finish for 3/4 inch glass only.
				6. Diameter: 4 inches (101 mm) stainless steel in #4 and #8 finish for 3/4 inch (19 mm) glass only.
				7. Diameter: 1.7 inches (40.6 mm) stainless steel in #4 finish only for 1/2 inch (12.7 mm) and 3/4 inch (19 mm).
				8. Diameter: 1.9 inches (48.2 mm) stainless steel in #4 finish only for 1/2 inch (12.7 mm) and 3/4 inch (19 mm).

\*\* NOTE TO SPECIFIER \*\* Delete aluminum top rail if not required.

* + - * 1. Diameter: 2 inches (1-29/32 inches (48.4 mm)) aluminum for 3/4 inch (19 mm) glass.
			1. Wall Flange: Match diameter and finish of rail.

\*\* NOTE TO SPECIFIER \*\*Delete rectangular top rail not required. Available for 1/2 inch (13 mm) and 3/4 inch (19 mm) glass.

* + - 1. Stainless Steel Rectangular Top Rail: 2.36 inches wide by 1.57 inches high (60 mm by 40 mm). #4 brushed finish. Provide vinyl insert for glass thickness scheduled.

\*\* NOTE TO SPECIFIER \*\*Delete U-Channel top rail not required. Available for 1/2 inch (13 mm) glass.

* + - 1. Stainless Steel U-Channel Top Rail: 0.874 inches wide by 1.75 inches high (22 mm by 44.5 mm). Provide vinyl insert for 1/2 inch (12.7 mm) glass.

\*\* NOTE TO SPECIFIER \*\* Delete material and finish not required.

* + - * 1. Material: 304 alloy.
				2. Material: 316 alloy.

\*\* NOTE TO SPECIFIER \*\* Delete finish not required.

* + - * 1. Finish: #8 polished.
				2. Finish: #4 brushed.

\*\* NOTE TO SPECIFIER \*\*Delete U-Channel top rail not required. Available for 1/2 inch (12.7 mm) glass.

* + - 1. Aluminum U-Channel Top Rail: 1 inch wide by 1 inch high (25 mm by 25 mm). Provide vinyl insert for 1/2 inch (12.7 mm) glass.

\*\* NOTE TO SPECIFIER \*\*Delete finishes not required.

* + - * 1. Finish: Black Anodized
				2. Finish: Clear Satin Anodized
				3. Finish: Brushed Stainless Anodized
			1. Aluminum U-Channel Top Rail: 1 inch wide by 1-1/2 inches high (25 mm by 38 mm). Provide vinyl insert for 1/2 inch (12.7 mm) glass.

\*\* NOTE TO SPECIFIER \*\*Delete finishes not required.

* + - * 1. Finish: Black Anodized
				2. Finish: Clear Satin Anodized
				3. Finish: Brushed Stainless Anodized
			1. Aluminum U-Channel Top Rail: 1 inch wide by 2 inches high (25 mm by 51 mm). Provide vinyl insert for 1/2 inch (12.7 mm) glass.

\*\* NOTE TO SPECIFIER \*\*Delete finishes not required.

* + - * 1. Finish: Black Anodized
				2. Finish: Clear Satin Anodized
				3. Finish: Brushed Stainless Anodized
			1. Provide end caps and connectors in material and finish to match rail.

\*\* NOTE TO SPECIFIER \*\* Our glass clamps are very versatile part of our railing systems. Available in both flat and concave back, they can be used with either round or square balusters to mount glass or other architectural panels. Safety First! When it comes to our glass solutions, one thing is perfectly clear: style and safety go hand in hand. All glass clamps are certified and grip the glass with immense strength. Our glass clamps have been successfully tested with both tempered and laminated glass, and can be used with glass up to a width of 5.3 feet (1600 mm). Delete if not required.

* + 1. Glass Clamp Systems:
			1. Provide glass clamps in profile scheduled for post systems indicated

\*\* NOTE TO SPECIFIER \*\* Delete profile not required.

* + - 1. Profile: Round.
			2. Profile: Square.

\*\* NOTE TO SPECIFIER \*\* Delete mounting not required.

* + - 1. Mounting Type: Flat.
			2. Mounting Type: Tube.

\*\* NOTE TO SPECIFIER \*\* Delete material not required.

* + - 1. Material: 304 alloy.
			2. Material: 316 alloy.

\*\* NOTE TO SPECIFIER \*\* Modern, minimalistic and sleek that's our stainless steel cable railing system. Our cable components are designed to be compatible with other systems allowing you versatility and the ability to create a myriad of designs. Primarily used as infill, cable is available in 1/8 inch (3 mm) diameter in three lengths. A variety of adapters and fittings allow you customize the system for use with our round or square design balusters to meet your specific design needs.

* + 1. Stainless Steel Cable Systems:
			1. Provide cable, receivers for end conditions, cover caps and stair washers as scheduled or required to provide infill guardrail system.
			2. Material: Stainless steel 304 alloy.
			3. Material: Stainless steel 316 alloy.

\*\* NOTE TO SPECIFIER \*\* Delete diameter not required.

* + - 1. Diameter: 1/8 inches (3.2 mm).
			2. Diameter: 5/32 inches (4 mm).

\*\* NOTE TO SPECIFIER \*\* Sleek, modern and clean that's our stainless steel rod railing system. Our rod components are designed to be compatible with other systems allowing you versatility and the ability to create a myriad of designs. Primarily used as infill, rod is available in 1/2 inch (12.7 mm) diameter in two lengths. A variety of crossbar holders and fittings allow you customize the system for use with our round or square design balusters to meet your specific design needs. Select Post/Bracket/Handrail diameters and options from Stainless Steel Handrails, Brackets, and Posts section below.

* + 1. Stainless Steel Rod Systems:
			1. Provide rods, crossbar holders and bar stands as scheduled or required to provide infill guardrail system.
			2. Rods: 0.47 inch (12 mm) diameter.

\*\* NOTE TO SPECIFIER \*\* Delete material not required.

* + - 1. Material: Stainless steel 304 alloy.
			2. Material: Stainless steel 316 alloy.
			3. Rod: 0.47 inch (12 mm) diameter.

\*\* NOTE TO SPECIFIER \*\* The look of floating glass is the ultimate in minimalist design. Create glass railing that appears to float above the ground or in front of the base. Our full line of mounts and adapters allow you to do just that, showcasing the beauty of the glass and the view. Delete if not required.

* + 1. Glass Spider Adaptors: Size as scheduled or required. Refer to Drawings.

\*\* NOTE TO SPECIFIER \*\* Delete adaptor not required.

* + - 1. Spider Adaptor: Double, round.
			2. Spider Adaptor: Single, round.
			3. Spider Adaptor: Double, square.
			4. Spider Adaptor: Single, square

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* + 1. Stand-Offs: Size as scheduled or required. Refer to Drawings.

\*\* NOTE TO SPECIFIER \*\* Delete profiles not required.

* + - 1. Profile: Adjustable round profile, S10-5045BS
			2. Profile: Large round profile, R13-0760-000-12.
			3. Profile: Small round profile, R13-0762-000-12.
			4. Profile: Narrow square profile, R13-4762-000-12.
			5. Profile: Wide back square profile, S21-2048.

\*\* NOTE TO SPECIFIER \*\* Delete article if not required.

* 1. ADJUSTABLE GLASS RAILINGS
		1. Product: Precision Lock Adjustable Railing System as manufactured by Morse Architectural. Allows installer to adjust glass for plumb quickly and easily with no specialized tools.
			1. Extruded from 6063 T6 Aluminum.
			2. Over 2 inch (51 mm) of adjustment to plumb glass; 1 inch (25 mm) either direction at 42 inch (1067 mm) glass height.
			3. Accommodates 1/2 to 1 inch (12.7 to 25.4 mm) glass.
			4. Patented rotating pressure plate.
			5. Components:
				1. Precision Lock Dry Glazed Shoes: For both laminated and monolithic glass.

Glass Thickness: 1/2 to 1 inch (12.7 to 25.4 mm).

* + - * 1. Precision Lock Model 68 Base Shoes (WxH): 2-3/4 x 4-1/8 inch (70 x 105 mm). For 1/2 to 11/16 inch (12.6 to 17.52 mm) monolithic or laminated tempered glass.

\*\* NOTE TO SPECIFIER \*\* Delete length options not required.

Length: Undrilled 10 ft (3048 mm)

Length: Undrilled 20 ft (6096 mm)

Length: Counterbored 10 ft (3048 mm)

Length: Counterbored 20 ft (6096 mm)

* + - * 1. Precision Lock Model 68 Mechanisms: For use with model 68 base shoes. Configured to fit glass thicknesses from 1/2 to 11/16 inch (12.6 to 17.52 mm).

\*\* NOTE TO SPECIFIER \*\* Delete glazing thickness options not required.

Glazing Thickness: 1/2 to 17/32 inch (12 to 12.76 and 13.52 mm).

Glazing Thickness: 9/16 inch (14.28 to 15 mm).

Glazing Thickness: 11/16 inch (16.76 to 17.52 mm).

* + - * 1. Precision Lock Model 80 Base Shoes (WxH): 3-5/32 x 4-1/8 (80 x 105 mm). For 11/16 to 1 inch (17.52 to 25.4 mm) monolithic or laminated tempered glass.

\*\* NOTE TO SPECIFIER \*\* Delete length options not required.

Length: Undrilled 10 ft (3048 mm).

Length: Undrilled 20 ft (6096 mm).

Length: Counterbored 10 ft (3048 mm).

Length: Counterbored 20 ft (6096 mm).

* + - * 1. Precision Lock Model 80 Mechanisms: For use with model 80 base shoes. Configured to fit glass thicknesses from 11/16 to 1 inch (17.52 to 25.4 mm).

\*\* NOTE TO SPECIFIER \*\* Delete glazing thickness options not required.

Glazing Thickness: For 11/16 inch (16 to 17.52 mm).

Glazing Thickness: For 3/4 inch (19 mm).

Glazing Thickness: For 27/32 inch (21.52 mm).

Glazing Thickness: For 1 inch (25.52 mm).

* + - * 1. Snap on Gasket Extrusions: For tight seal between glass and shoe. Works with model 68 and 80 base shoes.

Cladding: Fits over top for a perfect finished look.

\*\* NOTE TO SPECIFIER \*\* Delete length option not required.

Length: 10 ft (3048 mm).

Length: 20 ft (6096 mm).

* + - * 1. Compressible Closure Gaskets: Works in tandem with gasket extrusion to seal between the glass and shoe. For sealing glass thicknesses between 1/2 and 1 inch (12.7 to 25.4 mm).

\*\* NOTE TO SPECIFIER \*\* Delete length option not required.

Length: 10 ft (3048 mm).

Length: 20 ft (6096 mm).

* + - 1. Accessories:
				1. Alignment Pins: Tobe used at each base shoe joint.
				2. Ratcheting Wrench, 3/4 inch (19 mm): For locking mechanisms in place.
				3. Top Infill Dividers: Available in 4 and 8 inch (101 and 203 mm).

\*\* NOTE TO SPECIFIER \*\* Delete article if not required.

* 1. STAINLESS STEEL HANDRAIL, BRACKETS AND POSTS

\*\* NOTE TO SPECIFIER \*\* Our round design is clean, sleek and showcases the beauty of stainless steel. Compatible with our other systems, the round design accommodates glass, cable or rod components providing you with endless design possibilities. Our system installs on site with no welding required - simply glue, drill and tap the pieces into place. The pre-fabricated, pre-finished tubing is designed to fit perfectly with other components. Available in type 304 and 316 stainless steel for either interior or exterior installation.

* + 1. Stainless Steel Handrail Brackets and Tubing:

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* + - 1. Handrail Brackets - Wall Mount: Refer to drawings for design.

\*\* NOTE TO SPECIFIER \*\* Delete profiles not required.

* + - * 1. Profile: Round handrail and round support system.
				2. Profile: Round handrail and square support system.
				3. Profile: Square handrail and square support system.
				4. Profile: Square handrail and round support system.

\*\* NOTE TO SPECIFIER \*\* Delete material not required.

* + - * 1. Material: Stainless steel 304 alloy.
				2. Material: Stainless steel 316 alloy.

\*\* NOTE TO SPECIFIER \*\* Delete rail not required.

* + - * 1. Rail Diameter: 1-1/2 inches (38 mm).
				2. Rail Diameter: 2 inches (51 mm).
				3. Post Diameter: Square 1.57 inches (40 mm).

\*\* NOTE TO SPECIFIER \*\* Delete wall mount type not required.

* + - * 1. Mount: Wall mount with concealed fastener, no saddle.
				2. Mount: Wall mount with concealed fastener, flat saddle.
				3. Mount: Wall mount with concealed fastener, curved saddle.
				4. Mount: Wall mount with exposed fastener, curved saddle.
				5. Mount: Wall mount with concealed fastener, adjustable flat saddle.
				6. Mount: Wall tube mount with concealed fastener, flat saddle.
				7. Mount: Wall mount with concealed fastener, adjustable curved saddle.
				8. Mount: Wall tube mount with concealed fastener, curved saddle.

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* + - 1. Handrail Brackets - Glass Mount: Refer to drawings for design.

\*\* NOTE TO SPECIFIER \*\* Delete profiles not required.

* + - * 1. Profile: Round handrail and round support system.
				2. Profile: Round handrail and square support system.
				3. Profile: Square handrail and square support system.
				4. Profile: Square handrail and round support system.

\*\* NOTE TO SPECIFIER \*\* Delete material not required.

* + - * 1. Material: Stainless steel 304 alloy.
				2. Material: Stainless steel 316 alloy.

\*\* NOTE TO SPECIFIER \*\* Delete diameter not required.

* + - * 1. Rail Diameter: 1-1/2 inches (38 mm).
				2. Rail Diameter: 2 inches (51 mm).
				3. Rail Diameter: Square 1.57 inches (40 mm).

\*\* NOTE TO SPECIFIER \*\* Delete mount not required.

* + - * 1. Glass Mount: Flat saddle.
				2. Glass Mount: Curved saddle.
				3. Glass Mount: Adjustable flat saddle.
				4. Glass Mount: Adjustable curved saddle.

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* + - 1. Handrail Brackets - Round Post Mount: Refer to drawings for design.

\*\* NOTE TO SPECIFIER \*\* Delete profiles not required.

* + - * 1. Profile: Round handrail and round support system.
				2. Profile: Round handrail and square support system.
				3. Profile: Square handrail and square support system.
				4. Profile: Square handrail and round support system.

\*\* NOTE TO SPECIFIER \*\* Delete material not required.

* + - * 1. Material: Stainless steel 304 alloy.
				2. Material: Stainless steel 316 alloy.

\*\* NOTE TO SPECIFIER \*\* Delete post not required.

* + - * 1. Post Diameter: 1-1/2 inches (38 mm).
				2. Post Diameter: 2 inches (51 mm).
				3. Post Diameter: Square 1.57 inches (40 mm).

\*\* NOTE TO SPECIFIER \*\* Delete rail not required.

* + - * 1. Rail Diameter: 1-1/2 inches (38 mm).
				2. Rail Diameter: 2 inches (51 mm).
				3. Rail Diameter: Square 1.57 inches (40 mm).

\*\* NOTE TO SPECIFIER \*\* Delete mount not required.

* + - * 1. Post Mount: Flat saddle.
				2. Post Mount: Curved saddle.
				3. Post Mount: Adjustable flat saddle.
				4. Post Mount: Adjustable curved saddle.
				5. Post Mount: 135 degree curved saddle.
				6. Post Mount: 90 degree curved saddle.
				7. Flush Fittings: Material and finish to match rail in configurations as required.
				8. Baluster Posts and Brackets: Sized to accommodate round railing diameter and application. Posts, covers and floor flanges as indicated or required.
				9. Fascia Mount Baluster Brackets: Sized to accommodate round railing diameter and application.

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* + - 1. Handrail Brackets - Square Post Mount: Refer to drawings for design.

\*\* NOTE TO SPECIFIER \*\* Delete profiles not required.

* + - * 1. Profile: Round handrail and round support system.
				2. Profile: Round handrail and square support system.
				3. Profile: Square handrail and square support system.
				4. Profile: Square handrail and round support system.

\*\* NOTE TO SPECIFIER \*\* Delete material not required.

* + - * 1. Material: Stainless steel 304 alloy.
				2. Material: Stainless steel 316 alloy.

\*\* NOTE TO SPECIFIER \*\* Delete post diameters not required.

* + - * 1. Post Diameter: 1-1/2 inches (38 mm).
				2. Post Diameter: 2 inches (51 mm).
				3. Post Diameter: Square 1.57 inches (40 mm).

\*\* NOTE TO SPECIFIER \*\* Delete rail diameters not required.

* + - * 1. Rail Diameter: 1-1/2 inches (38 mm).
				2. Rail Diameter: 2 inches (51 mm).
				3. Rail Diameter: Square 1.57 inches (40 mm).

\*\* NOTE TO SPECIFIER \*\* Delete mount not required.

* + - * 1. Post mount - flat saddle.
				2. Post mount - curved saddle.
				3. Post mount - adjustable flat saddle.
				4. Post mount - adjustable curved saddle.
				5. Post mount - 135 degree curved saddle.
				6. Post mount - 90 degree curved saddle.
				7. Flush Fittings: Material and finish to match rail in configurations as required.
				8. Baluster Posts and Brackets: Sized to accommodate round railing diameter and application. Posts, covers and floor flanges as indicated or required.
				9. Fascia Mount Baluster Brackets: Sized to accommodate round railing diameter and application.
			1. End Caps, Flanges and Wall Returns: Sized to accommodate railing shape, diameter and application.
1. EXECUTION
	1. EXAMINATION
		1. Verification of Conditions: Examine areas and conditions under which the work is to be installed, and notify the Contractor in writing, with a copy to the Owner and the Architect, of any conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected.
			1. Examine gypsum board assemblies, where in forced to receive anchors, to verify that locations of concealed reinforcements have been clearly marked for installer. Locate reinforcements and mark locations if not already done.
			2. Verify areas to receive railings are completed to previously established conditions as detailed in other sections.
			3. Coordinate post setting diagrams, plans, templates, and drawings and verify the proper installation of any necessary anchorages as detailed in the Drawings.
			4. Coordinate with appropriate entity to correct unsatisfactory conditions, if any exist.
			5. Beginning of the work shall indicate acceptance of the areas and conditions as satisfactory by the Installer.
	2. PREPARATION
		1. Clean surfaces thoroughly prior to installation.
		2. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
	3. INSTALLATION
		1. Install in accordance with manufacturer's instructions.

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* + 1. Dry Glaze Glass Guardrail System Installation:
			1. Base Shoe Moulding: The inside channel of the shoe shall be plumb to +/- 1/8 inch (3 mm) at an extended height of 42 inches (1067 mm) to assure glass panel top edge will align with adjoining panels.
			2. Place the Isolators into the Base Shoe Molding. Space Isolators a maximum of 14 inches (305 mm) on center with a maximum of 4 inches (76 mm) in from the left and right edges of each panel - 4 isolators per 4 foot panel.
			3. Place the glass atop the Isolators in the Base Shoe Molding. Overlap glass panels with butt joints of the base Shoe Moulding.
			4. Insert the aluminum Pane/Grip mechanism.
			5. Using a hex head Allen wrench, tighten the cap screw on the Pane/Grip mechanism. While tightening the plastic pad will break away from the aluminum as the unit expands. Confirm alignment and make snug-tight, then continue tightening to 10 ft/lbs of torque. Repeat on all Pane/Grip mechanisms to secure the panel in position.
			6. Insert Spacing Pads: Insert Spacing Pads between glass panels to prevent glass-to-glass contact. Trim as required.
			7. Seal Top of Shoe with cladding style.

\*\* NOTE TO SPECIFIER \*\* Delete if not required.

* + 1. Wet Glaze Glass Guardrail System Installation:
			1. Attach aluminum shoe molding to substrate with 1/2 inch (13 mm) stainless steel cap screws or bolts on 12 inches (305 mm) centers.
				1. Aluminum shall not be placed in direct contact with concrete or dissimilar metals. Isolate aluminum from substrate.
			2. Insert resilient setting blocks to provide support and cushion for glass panels as the 1/2 inch (12.7 mm) tempered float glass is inserted into the base section. Setting blocks shall be placed at points 1/4 and 3/4 of the length of the panel from the end. Insert vinyl spacer between adjoining glass panels to prevent glass to glass contact. Align and plumb glass panels. Fill base with expansive cement or non-shrinking, non-metallic grout.
			3. Insert rigid protective insert to the top edge of the glass panel between glass and handrail. Internal splice connectors shall be used for end-to-end connection of railing sections and corners. Install end caps and weld or fasten with adhesive or screws.
			4. Cover exposed base with cladding material to match top rail. Silicone or two-way tape shall be used to adhere cladding.
	1. CLEANING
		1. Repair scratches and other installation-incurred damage on rails and posts. If damage is visible from a distance of 5 feet (1524 mm), component shall be replaced.
		2. Clean up debris and unused material, and remove from site.
		3. Clean glass immediately after installation. Scratched, chipped, or cracked glass shall be replaced.
	2. PROTECTION
		1. Protect finishes of railings from damage during construction period with temporary protective coverings approved by railing manufacturer. Remove protective coverings at time of Substantial Completion.
		2. Restore finishes damaged during installation and construction period so no evidence remains of correction work. Return items that cannot be refinished in field to shop; make required alterations and refinish entire unit, or provide new units.

END OF SECTION