

SECTION 057300 DECORATIVE METAL RAILINGS WITH 3/16" WIRE MESH INFILL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:
 - Mechanically Fastened Aluminum Infill System for Pipe and Component Railing System

1.3 PERFORMANCE REQUIREMENTS

- A. All railings shall be supplied to conform to applicable sections of the following codes:
 - International Building Code
 - ADAAG
- B. 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. Handrails:
 - a. Uniform load of 50 lbf/ft. applied in any direction.
 - b. Concentrated load of 200 lbf. applied in any direction.
 - c. Uniform and concentrated loads need not be assumed to act concurrently.
 - 2. Top Rails of Guards:
 - a. Uniform load of 50 lbf/ft. applied in any direction.
 - b. Concentrated load of 200 lbf. applied in any direction.
 - c. Uniform and concentrated loads need not be assumed to act concurrently.
 - 3. Infill Area of Guards:
 - a. Horizontal concentrated load of 50 lbf. applied to 1 sq. ft. at any point in system, including panels, intermediate rails, balusters, or other elements composing infill area.
 - b. Load on infill area need not be assumed to act concurrently with loads on top rails.
- C. 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. Temperature Change (Range): 120°F, ambient; 180°F, material surfaces.
- D. Control of Corrosion: Prevent galvanic action and other forms of corrosion by insulating metals and other materials from direct contact with incompatible materials.

1.4 SUBMITTALS

- A. Product Data: For the following:
 - Manufacturer's product lines of mechanically connected railings.
 - and finish products.
- B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.
 - For installed products indicated to comply with design loads, include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
- C. Samples for Initial Selection: For products involving selection of color, texture, or design.
- D. Mill Certificates: Signed by manufacturers of stainless steel and aluminum products certifying that products furnished comply with requirements.
- E. Qualification Data: For professional engineer.

- F. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, according to ASTM E 935.

1.5 QUALITY ASSURANCE

- A. Source Limitations: Obtain each type of railing through one source from a single manufacturer.
- B. Mock-up Panel: One section of each type of railing system for verification.
 1. Approximate Size: ¼ to ½ of full size, using full size components.
 2. Approved mockups may become part of the completed work if undamaged at time of Substantial Completion.
 3. Approval of mockups does not constitute approval of deviations from the Contract Documents unless such deviations are specifically approved by Architect in writing.

1.6 PROJECT CONDITIONS

- A. Field Measurements: Verify actual locations of walls and other construction contiguous with railings by field measurements before fabrication and indicate measurements on Shop Drawings.

1.7 COORDINATION AND SCHEDULING

- A. Coordinate installation of anchorages for railings. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.
- B. Schedule installation so wall attachments are made only to completed walls. Do not support railings temporarily by any means that do not satisfy structural performance requirements.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Basis-of-Design Railing Product: Subject to compliance with requirements, provide, Hollaender® Speed-Rail® Quik Connect™ 2-Line design with Aluminum Mesh Infill as engineered, manufactured and assembled by Hollaender® Manufacturing or an approved equivalent.

2.2 METALS, GENERAL

- A. Metal Surfaces, General: Provide materials with smooth surfaces, without seam marks, roller marks, rolled trade names, stains, discolorations, or blemishes.
- B. Brackets, Flanges, and Anchors: Cast or formed metal of same type of material and finish as supported rails, unless otherwise indicated.

2.3 ALUMINUM

- A. Aluminum, General: Provide alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated, and with not less than the strength and durability properties of alloy and temper designated below for each aluminum form required.
- B. Extruded Bars and Tubing: ASTM B 221, Alloy 6063-T6, 6005-T5
- C. Extruded Structural Pipe and Round Tubing: ASTM B 429, Alloy 6063-T6, 6005-T5. Provide 1 ½ in IPS, (1.90 in OD) Schedule 40 Alloy 6063-T6 pipe for Horizontal Rails (Top and Bottom), Schedule 80 Alloy 6005-T5 for Vertical Posts
- D. Drawn Seamless Tubing: ASTM B 210, Alloy 6063-T832
- E. Plate and Sheet: ASTM B 209, Alloy 6061-T6
- F. Die and Hand Forgings: ASTM B 247, Alloy 6061-T6

- G. Base Flange Castings: ASTM B 26/B 26M, Alloy Almag 535 or Alloy 6063-T6
- H. External Structural Fitting Castings: ASTM B 26/B 26M, Alloy Almag 535
- I. External Structural Panel Retention Clip Castings: Alloy Almag 535
- J. Infill Panel Mesh: .1875 Diameter Interlock Crimped Wire, A1350-H9
- K. Infill Panel Border: 1/8" thick 1.00" x .61" U-Channel Hem Border with .308 Radius, 11GA, Alloy 6063-T6

2.4 FINISHES, GENERAL

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- C. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

2.5 ALUMINUM FINISHES

- A. Finish designations prefixed by AA comply with the system established by the Aluminum Association for designating aluminum finishes.
- B. Standard Quik Connect™ aluminum finish for as designated:
 1. Clear Anodized Finish for Pipe Extrusion: Clear Anodized AA-M10C22A41 (Architectural class, .7 mil thickness or greater) where designated
 2. Finish for Cast Fittings: Alloy Aluminum Magnesium 535 Ground, Polished & Mill where designated
 3. Powder Coat Finish for Aluminum components comprising Infill Panels: AAMA-2604 compliance with designated Tiger-Drylac® RAL Color #138/91021 – Anodized Silver or an approved equivalent to match Clear Anodized Pipe and Fittings.
- C. Additional Quik Connect™ aluminum finish options Black:
 1. Black Anodized Finish for Pipe Extrusion: Black Anodized AA-M10C22A42 (Architectural class, .7 mil thickness or greater) where designated
 2. Powder Coat Finish for Fittings/Components/Infill: AAMA-2604 compliance with designated Tiger-Drylac® RAL Color #061/80079 – Black Anodized Effect or an approved equivalent to match Black Anodized Pipe.
- D. Additional Quik Connect™ aluminum finish options Dark Bronze:
 1. Dark Bronze Anodized Finish for Pipe Extrusion: Dark Bronze Anodized AA-M10C22A42 (Architectural class, .7 mil thickness or greater) where designated
 2. Powder Coat Finish for Fittings/Components/Infill: AAMA-2604 compliance with designated Tiger-Drylac® RAL Color #061/868001 – Dark Bronze Anodized Effect or an approved equivalent to match Dark Bronze Anodized Pipe.
- E. Additional Quik Connect™ aluminum finish options Safety Yellow:
 1. Powder Coat Finish for Pipe Extrusion: AAMA-2604 compliance with designated PPG® RAL 1018 Super Durable Zinc Yellow

2. Powder Coat Finish for Fittings/Components/Infill: AAMA-2604 compliance with designated PPG® RAL 1018 Super Durable Zinc Yellow

2.6 FASTENERS

- A. General: Provide the following:
 1. Cast Speed-Rail® Structural Pipe Fittings: Reverse-knurl cup point set screws JS 600 Zinc Plated 3/8 – 16 x 7/16"
- B. Fasteners for Anchoring Hollaender® #45SBC-8 Square Floor Flange
 1. Select fasteners of type, grade, and class required to produce connections suitable for anchoring railings to other types of construction indicated and capable of withstanding design loads.
- C. Fasteners for Speed-Rail® Quik Connect™ Railing with Wire Mesh Infill:
 1. Rails and Posts shall be connected utilizing Hollaender® Speed-Rail® structural slip-on fittings for interconnecting railing components and for attaching them to other work, unless exposed fasteners are unavoidable or are the standard fastening method for railings indicated.
 2. Hollaender® Speed-Rail® structural slip-on fittings with internal/external, reverse knurl, cup point, hex head set screws. Hardware material to be JS 600 Zinc Plated 3/8 – 16 x 7/16".
 3. Infill panels to be secured to Rail & Post structure with four (4) Alloy Almag 535 Hollaender® Speed-Rail® model #97-8 cast retention Speed-Rail® fittings. Hardware material to be JS 600 Zinc Plated 3/8"–16 x 7/16".
 4. Secure the infill panels in the panel clips with reverse knurl cup-point set screws JS 600 Zinc Plated 3/8"-16 x 7/16".
- D. Systems using pop rivets, welds, self-tapping screws or adhesives will not be accepted.

2.7 WIRE MESH INFILL FOR RAILINGS

- A. Aluminum Mesh Infill Panel:
 1. Material: Woven Interlock Crimped Aluminum Wire Mesh infill panel: minimum .1875 in diameter, aluminum alloy A1350-H9.
 2. Pattern: 2" square on center
 3. Retention to Frame: Welded Wire to U-Channel
 4. Frame: 1/8" thick 1.00" x .61" U-Channel Hem Border with .308 Radius, 11GA, Alloy 6063-T6 aluminum
 - a. Corner & joints welded, ground and polished
 - b. Consistent clearance/reveal around panel of 1.25" to 1.50"
 - c. To assure minimum maintenance and maximum corrosion protection, bottom channel of frame shall have a minimum of two (2) drainage holes to evacuate water.
 5. Retention to Railing System:
 - a. Infill panels to be secured to Rail & Post structure with four (4) Alloy Almag 535 Hollaender® Speed-Rail® model #97-8 Cast Retention Fittings.
 - b. Hardware shall be internal/external, reverse knurl, cup point, hex head set screws.
 - c. Hardware material shall be JS 600 Zinc Plated 3/8"–16 x 7/16".
 6. Coating: Aluminum with Powder Coat
 - a. Entire panel shall be powder coated with Powder Coat Finish
 - b. AAMA-2604 compliance with designated Powder Coat Finish
 - 1) Tiger-Drylac® RAL Color #138/91021 – Anodized Silver or an approved equivalent to match Clear Anodized Pipe and Fittings.
 - 2) Powder Coat Finish for Fittings/Components/Infill: AAMA-2604 compliance with designated Tiger-Drylac® RAL Color #061/80079 – Black Anodized Effect or an approved equivalent to match Black Anodized Pipe.
 - 3) Tiger-Drylac® RAL Color #061/868001 – Dark Bronze Anodized Effect or an approved equivalent to match Dark Bronze Anodized Pipe.
 - 4) Powder Coat Finish for Pipe Extrusion: AAMA-2604 compliance with designated PPG® RAL 1018 Super Durable Zinc Yellow

2.8 FABRICATION SPEED-RAIL® WITH ALUMINUM MESH 2X2" INFILL LEVEL CONDITIONS

- A.** General: Fabricate railings to comply with requirements indicated for design, dimensions, member sizes and spacing, details, finish, and anchorage, but not less than that required to support structural loads.
- B.** Assemble railings in the shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation. Use connections that maintain structural value of joined pieces.
- C.** Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch, unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.
- D.** Form work true to line and level with accurate angles and surfaces.
- E.** Fabricate connections that will be exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate.
- F.** Cut, reinforce, drill, and tap as indicated to receive finish hardware, screws, and similar items.
- G.** Connections: Fabricate railings with mechanical, non-welded fastener connections, unless otherwise indicated. Welding, rivets and adhesive connections will not be accepted.
- H.** Non-welded Connections: Connect members with Speed-Rail® fittings of the structural slip-on type which fastens to the exterior of the pipe by means of an internal/external reverse knurl cup point set screw. Reverse knurl is required to ensure that screw does not come loose under vibration. Plain cup point screws will not be accepted.
 - 1.** Level Post Assemblies
 - a. End Post Conditions: Hollaender® model #19010 Speed-Rail® Quik Connect™ End Post Assembly. Components include:
 - 1) 1.5 (1.90 O.D.) Schedule 80 IPS
 - 2) Speed-Rail® structural pipe #3-8 Elbow and #5E-8 Tee
 - 3) #45SBC-8 Square Floor Flange to Substrate Connection
 - b. Line Post Conditions: Hollaender® model #19020 Speed-Rail® Quik Connect™ Line Post Assembly. Components include:
 - 1) 1.5 (1.90 O.D.) Schedule 80 IPS
 - 2) Speed-Rail® Structural Pipe Fittings: #5-8 Elbow and #7E-8 Cross-E
 - 3) #45SBC-8 Square Floor Flange to Substrate Connection
 - c. 90° Corner Post Conditions: Hollaender® model #19030 Speed-Rail® Quik Connect™ Corner Post Assembly. Components include:
 - 1) 1.5 (1.90 O.D.) Schedule 80 IPS
 - 2) Speed-Rail® Structural Pipe Fittings: #9-8 Side Outlet Elbow and #11E-8 Side Outlet Tee
 - 3) #45SBC-8 Square Floor Flange to Substrate Connection
 - d. Non-90° Corner Post Conditions: Hollaender® model #19040 Speed-Rail® Quik Connect™ Adjustable Angle Post Assembly. Components include:
 - 1) 1.5 (1.90 O.D.) Schedule 80 IPS
 - 2) Speed-Rail® Structural Pipe Fittings: #65-8 Cap and two (2) #30C-8 Adjustable Swivels
 - 3) #45SBC-8 Floor Flange to Substrate Connection
 - 2.** Level Infill Panel Assemblies
 - a. For Level Spaces between Post Assemblies from thirteen (13) inches to twenty (20) inches use Quik Connect™ Panel Assembly 13" to 20" Hollaender® model#19050 to be secured to designated Post Assembly.
 - 1) Four (4) Alloy Almag 535 Hollaender® Speed-Rail® model #97-8 cast retention fittings
 - a) Hardware shall be internal/external, reverse knurl, cup point, hex head set screws.
 - b) Hardware material shall be JS 600 Zinc Plated 3/8 – 16 x 7/16.
 - 2) Two (2) eighteen (18) inch 1 ½ in IPS, (1.90 in OD) Schedule 40 Alloy 6063-T6 pipe for Horizontal Rails (Top and Bottom)
 - b. For Level Spaces between Post Assemblies from twenty (20) inches to twenty-seven (27) inches use Quik Connect™ Panel Assembly 20" to 27" Hollaender® model#19060 to be secured to designated Post Assembly.
 - 1) Four (4) Alloy Almag 535 Hollaender® Speed-Rail® model #97-8 cast retention fittings
 - a) Hardware shall be internal/external, reverse knurl, cup point, hex head set screws.

- b) Hardware material shall be JS 600 Zinc Plated 3/8 – 16 x 7/16.
 - 2) Two (2) twenty-five (25) inch 1 ½ in IPS, (1.90 in OD) Schedule 40 Alloy 6063-T6 pipe for Horizontal Rails (Top and Bottom)
 - c. For Level Spaces between Post Assemblies from twenty-seven (27) inches to thirty-four (34) inches use Quik Connect™ Panel Assembly 27" to 34" Hollaender® model#19070 to be secured to designated Post Assembly.
 - 1) Four (4) Alloy Almag 535 Hollaender® Speed-Rail® model #97-8 cast retention fittings
 - a) Hardware shall be internal/external, reverse knurl, cup point, hex head set screws.
 - b) Hardware material shall be JS 600 Zinc Plated 3/8 – 16 x 7/16.
 - 2) Two (2) thirty-two (32) inch 1 ½ in IPS, (1.90 in OD) Schedule 40 Alloy 6063-T6 pipe for Horizontal Rails (Top and Bottom)
 - d. For Level Spaces between Post Assemblies from thirty-four (34) inches to forty-one (41) inches use Quik Connect™ Panel Assembly 34" to 41" Hollaender® model#19080 to be secured to designated Post Assembly.
 - 1) Four (4) Alloy Almag 535 Hollaender® Speed-Rail® model #97-8 cast retention fittings
 - a) Hardware shall be internal/external, reverse knurl, cup point, hex head set screws.
 - b) Hardware material shall be JS 600 Zinc Plated 3/8 – 16 x 7/16.
 - 2) Two (2) thirty-nine (39) inch 1 ½ in IPS, (1.90 in OD) Schedule 40 Alloy 6063-T6 pipe for Horizontal Rails (Top and Bottom)
 - e. For Level Spaces between Post Assemblies from forty-one (41) inches to forty-eight (48) inches use Quik Connect™ Panel Assembly 41" to 48" Hollaender® model #19090 to be secured to designated Post Assembly.
 - 1) Four (4) Alloy Almag 535 Hollaender® Speed-Rail® model #97-8 cast retention fittings
 - a) Hardware shall be internal/external, reverse knurl, cup point, hex head set screws.
 - b) Hardware material shall be JS 600 Zinc Plated 3/8 – 16 x 7/16.
 - 2) Two (2) forty-six (46) inch 1 ½ in IPS, (1.90 in OD) Schedule 40 Alloy 6063-T6 pipe for Horizontal Rails (Top and Bottom)
3. Sloping and Stairway Areas
 - a. For Post to Substrate Connection use Alloy Almag 535 Hollaender® Speed-Rail® cast structural fittings:
 - 1) Hollaender® model #45SBCS-8 Square Floor Flange (1 to 12 slope)
 - 2) Hollaender® model #46AF1-8 Angle Flange Slotted 28° to 32° slope
 - 3) Hollaender® model #46AF2-8 Angle Flange Slotted 32° to 36° slope
 - 4) Hollaender® model #46AF3-8 Angle Flange Slotted 36° to 46° slope
 - 5) Hollaender® model #46AF4-8 Angle Flange Slotted 24° to 27° slope
 - b. For Rail to Post Connections use Alloy Almag 535 Hollaender® Speed-Rail® cast structural fittings
 - 1) For Top Rail to Post Connection
 - a) Hollaender® model #19E-8 Adjustable Cross Assembly with 65-8 Cap
 - b) Hollaender® model #17E-8 Adjustable Tee Fitting with 65-8 Cap
 - c) Hollaender® model #3AE-8 Adjustable elbow
 - 2) For Bottom Rail to Post Connection
 - a) Hollaender® model #21-35-8 Adjustable Cross Fitting 10° to 35° for slope
 - b) Hollaender® model #21-45-8 Adjustable Cross Fitting 30° to 45° slope
 - c) Hollaender® model #19E-8 Adjustable Cross Assembly
 - d) Hollaender® model #17E-8 Adjustable Tee Fitting
 - 3) For Top Rail Expansion Joints where needed use Alloy Almag 535 Hollaender® Speed-Rail® cast structural fittings
 - a) Hollaender® model #70-8 External Coupling
 - b) Hollaender® model #70ES-8 Internal Locking Splice
 - c. For Panel to Rail Connections use Alloy Almag 535 Hollaender® Speed-Rail® cast structural fittings
 - 1) Four (4) Hollaender® model #97-8 Panel Retention Fittings
 - 2) All Fastening Hardware shall be internal/external, reverse knurl, cup point, hex head set screws.
 - 3) Hardware material shall be JS 600 Zinc Plated 3/8 – 16 x 7/16.
 - d. Panels to be constructed as described in Section 2.7
 - 1) Panel size not to exceed maximum allowance of 5 ft. post spacing
 - 2) Slope and dimensions vary based on specific requirement of project
 - e. Post and Rail Materials
 - 1) 1-1/2 Inch Aluminum 1.90 O.D. Schedule 80 Posts
 - 2) 1-1/2 Inch Aluminum 1.90 O.D. Schedule 40 Bottom Rail, Mid-Rail and Top Rail

- 3) 1-1/2 Inch Aluminum 1.90 O.D. Schedule 40 Grab/Assist Rail affixed with Hollaender® model #285 Grab-Rail Brackets.

2.9 HANDRAIL FOR ADA RAMPS OR STAIRWAYS (AS REQUIRED)

- A. Ramps that have a drop off of 30 inches or more on the side require guardrail, per above spec. Ramps with a rise greater than 6 inches shall have handrails on both sides.
- B. Stairways shall have handrails on both sides.
- C. Handrail will be attached to the guardrail sections using Hollaender® model #285 Grab Rail Brackets
- D. Handrail will be installed at a height of 34–38 inches above ramp surface or stair tread nosing.
 - 1. Handrail will be anodized aluminum 6063 Sch 40, 1 ½ in IPS nominal (1.90 in. OD) and shall have a continuous surface.
 - 2. Where necessary, lengths of the handrail will be spliced using Hollaender® model #70ES-8 internal locking splices.
 - 3. Handrails shall return to a wall, guard or walking surface. If returning to the guard, Hollaender® model #185 Post Return Swivel shall be used to connect the end of the handrail to the guardrail post.

2.9

- E. Form changes in direction as follows: By flush bends or by inserting prefabricated Interna-Rail® Internal flush-elbow fittings or with Speed-Rail® External Fittings.
- F. Form simple and compound curves by bending members in jigs to produce uniform curvature for each repetitive configuration required; maintain cross section of member throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces of components.
- G. Close exposed ends of railing members with prefabricated Interna-Rail® end fittings.
- H. Provide wall returns at ends of wall-mounted handrails, unless otherwise indicated. Close ends of returns unless clearance between end of rail and wall is 1/4 inch or less.
- I. Brackets, Flanges, Fittings, and Anchors: Provide wall brackets, flanges, miscellaneous fittings, and anchors to interconnect railing members to other work, unless otherwise indicated. Flanges to be sand cast from aluminum alloy 535 with anodized finish and fastened directly to the post by means of two reverse knurl cup point set screws.
- J. Fabricate splice joints for field connection using an epoxy structural adhesive if this is manufacturer's standard splicing method. Fabricate anchorage devices capable of withstanding loads imposed by railings. Coordinate anchorage devices with supporting structure.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine plaster and gypsum board assemblies, where reinforced 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.

3.2 INSTALLATION, GENERAL

- A. Fit exposed connections together to form tight, hairline joints.
- B. Perform cutting, drilling, and fitting required for installing railings. Set railings accurately in location, alignment, and elevation; measured from established lines and levels and free of rack.
- C. Do not weld, cut, or abrade surfaces of railing components that have been coated or finished after fabrication and that are intended for field connection by mechanical or other means without further cutting or fitting.
- D. Set posts plumb within a tolerance of 1/16 inch in 3 feet.

- E. Align rails so variations from level for horizontal members and variations from parallel with rake of steps and ramps for sloping members do not exceed 1/4 inch in 12 feet.
- F. Corrosion Protection: Coat concealed surfaces of aluminum that will be in contact with grout, concrete, masonry, wood, or dissimilar metals, with a heavy coat of bituminous paint, or provide protective gaskets.
- G. Adjust railings before anchoring to ensure matching alignment at abutting joints.
- H. Fastening to In-Place Construction: Use anchorage devices and fasteners where necessary for securing railings and for properly transferring loads to in-place construction.

3.3 RAILING CONNECTIONS

- A. Non-welded Connections: Use mechanical joints for permanently connecting railing components. Use wood blocks and padding to prevent damage to railing members and fittings.
- B. Expansion Joints for Top Rail: Install Hollaender® model #70-8 Speed-Rail® External Coupling for Top Rail Expansion joint where needed but not farther apart than required to accommodate thermal movement. Secure one set screw to allow for movement.

3.4 ANCHORING RAILING ENDS

- A. Anchor railing ends to concrete and masonry with round flanges connected to railing ends and anchored to wall construction with anchors and bolts.
- B. Anchor railing ends to metal surfaces with flanges bolted to metal surfaces and connected to railing ends using non-welded connections.

3.5 ATTACHING HANDRAILS TO WALLS

- A. Attach handrails to wall with wall brackets. Provide brackets with 1-1/2 inch clearance from inside face of handrail and finished wall surface.
- B. Locate brackets as indicated or, if not indicated, at spacing required to support structural loads.
- C. Secure wall brackets to building construction as indicated, or if not indicated, as follows:
 1. For concrete and solid masonry anchorage, use drilled-in expansion shields and hanger or lag bolts.
 2. For hollow masonry anchorage, use toggle bolts.
 3. Provide blocking between studs in stud wall construction.

3.6 ADJUSTING AND CLEANING

- A. Clean aluminum and stainless steel by washing thoroughly with clean water and soap and rinsing with clean water.

3.7 PROTECTION

- A. 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.
- B. Restore finishes damaged during installation and construction period so no evidence remains of correction work. Return items that cannot be refinished in the field to the shop; make required alterations and refinish entire unit, or provide new units.

END OF SECTION 057300 DECORATIVE METAL RAILINGS