SECTION 05 52 17

HANDRAILS AND RAILINGS

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\*\* NOTE TO SPECIFIER \*\* InKan Ltd.; interior and exterior glass assemblies.
 .
 This section is based on the products of InKan Ltd., which is located at:

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 Brampton, ON, Canada L6T 3Y3
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[ [Click Here](http://www.arcat.com/company/33272) ] for additional information.

InKan Limited operates out of its own 50,000 square foot (4645 m2) facility in Brampton, Ontario. Its resources include in-house metal shear and brake equipment, a skilled welding department and a complete machine shop. InKan's tempering division boasts the most technologically advanced glass processing and handling equipment in the industry. A computerized, tong-free electric tempering furnace guarantees the highest quality of finish available.

 Suspended Glass Wall and Glass Canopy:
 The ideal solution for a large wall opening: the suspended glass assembly. The glass wall, acting as one unit, hanging from the head of the structure, not only provides a transparent, weatherproof membrane, but also acts as a structural wall. The wall may be interrupted by tempered glass doors or revolving doors to provide access where required.

 Kiosks, Entrances and Partitions:
 Entrances
 Ultra-View by RDM complements any interior or exterior. Tempered glass doors and sidelites of 12mm (1/2 inch) or 10mm (3/8 inch) thickness permit minimal obstruction, creating the ultimate in open concept design. Entrance doors, kiosk boutiques and screens of tempered glass can be custom designed to suit virtually any application. Specially crafted hardware is available in a variety of finishes to enhance the crystal clarity of the glass.

 Kiosks and Showcases:
 Free standing or top and bottom secured, RDM glass kiosks can transform idle space into profitable, functional space. Choose from InKan's range of expertly crafted metal fittings and either 10mm (3/8 inch) or 12mm (1/2 inch) fully tempered Ultralite glass.

 Partitions
 To achieve the Ultra-View concept, RDM glass wall partitions can incorporate top and bottom rails or U-channels, either surface mounted or recessed. Not only attractive, RDM glass wall partitions also act as excellent sound barriers.

 Glass Doors and Hardware:
 Centre hung or offset pivot doors. Ultralite tempered clear glass or tinted glass. Standard or custom hardware. Aluminum, stainless steel, brass, bronze in a variety of finishes. Curved glass sliding doors.

 Glass Balustrade:
 A custom manufactured handrail in any combination of available finishes and styles, complemented by 12mm (1/2 inch), 15mm (5/8 inch) or 19mm (3/4 inch) clear tempered glass, will ensure lasting beauty, safety and that distinctive look so desirable in any decor.

 Spandrel Glass:
 OPACI-COAT-300 is a water-based silicone coating designed for use as a coloured opacifier for spandrel applications. OPACI-COAT-300 offers a unique alternative for glass coatings for exterior or interior decor.

 Custom Metal and Sculpture:
 No job is too small or too large to warrant our superior attention to detail, quality and safety.

 Racquetball and Squash Courts:
 All walls and fins are 12mm (1/2 inch) clear tempered glass with finished edges. All holes on the playing side are countersunk and dimensioned to receive special flush mounted fittings and hardware. A clear silicone compound is used to bond all joints. No glass-to-glass or glass-to-metal contact is permitted.
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1. GENERAL
	1. SECTION INCLUDES

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

* + 1. Glass railings and balustrades with handrails and railing caps.
	1. RELATED SECTIONS

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

* + 1. Section 05 50 00 - Metal Fabrications.
		2. Section 06 10 00 - Rough Carpentry.
		3. Section 06 41 13 - Wood-Veneer-Faced Architectural Cabinets.
		4. Section 08 83 13 - Mirrored Glass Glazing.
	1. SYSTEM DESCRIPTION
		1. Infill and free standing glass railing types with associated ornamental rails and handrails. Refer to drawings.
		2. Performance Requirements:
			1. Railing shall comply with applicable requirements of the ADA and OSHA regulations.
			2. Handrail and guardrail assemblies and attachments shall withstand a minimum concentrated load of 90719 g (200 pounds) applied horizontally or vertically down at any point on the top rail.
			3. Infill area of guardrail system capable of withstanding a horizontal concentrated load of 90719 g/sm (200 pd/sf) at any point in the system. Load not to act concurrently with loads on top rail of system in determining stress on guardrail.
			4. Handrail assemblies and guards shall be designed to resist a load of 0.73 kN/m (50 pds/sf) applied in any direction at the top and to transfer this load through the supports to the structure.
	2. SUBMITTALS
		1. Submit under provisions of Section 01 30 00.
		2. Product Data: Manufacturer's data sheets on each product to be used, including:
			1. Preparation instructions and recommendations.
			2. Storage and handling requirements and recommendations.
			3. Installation methods.
		3. Shop Drawings: Submit Shop Drawings for fabrication and installation. Include the following:
			1. Plans, elevations, and detail sections.
			2. Indicate materials, methods, finishes, and types of joinery, fasteners, anchorages, and accessory items. Specify finishes.
			3. Provide setting diagrams and templates for anchorages, sleeves, and bolts installed by others.
			4. Where materials or fabrications are indicated to comply with certain design loadings, include structural computations, material properties, and other information needed for structural analysis.
		4. Test Reports: Submit independent testing report developed for this Project certifying proposed railing system including attachment method detailing compliance with load requirements.

\*\* 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.
			1. Where normal color and texture variations are to be expected, include 2 or more units in each set of samples showing the limits of such variations.
			2. Finish shall represent color range, finish thickness, and sheen to be expected in the finished Work.
		2. Verification Samples: For each finish product specified, two samples, minimum size 150 mm (6 inches) square, representing actual product, color, and patterns.
	1. QUALITY ASSURANCE
		1. Manufacturer Qualifications: Not less than 10 years experience in the actual production of specified products.
			1. Components shall be factory fabricated and engineered by single entity.
		2. Installer Qualifications: Firm with 3 years experience in installation of systems similar in complexity to those required for this Project.

\*\* 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-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.

\*\* NOTE TO SPECIFIER \*\* Include mock-up structural testing for non-standard configurations or applications. Delete if not required.

* + - 1. Special Quality Assurance: Fabricate sample test railing not less than 10 feet long and provide an independent testing laboratory to test railing system for loading certification.
				1. Test area may be part of finished Work, unless railing system is damaged by testing.
				2. Contractor is responsible for all testing.
				3. Loading requirements:

As specified above in combinations to provide worst case loading, without failure.

Top rail designed with maximum deflection of not more than 51 mm (2 inches) and no resultant breakage of components.

* + - * 1. Do not proceed with fabrication until sample is approved.
	1. DELIVERY, STORAGE, AND HANDLING
		1. Store products in manufacturer's unopened packaging until ready for installation.
		2. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.
	2. 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.
1. PRODUCTS
	1. MANUFACTURERS
		1. Acceptable Manufacturer: INKAN Ltd., which is located at:14 Indell Ln.Brampton, ON, Canada L6T 3Y3Toll Free Tel: 800-387-2481Tel: 905-793-4747Fax: 905-793-9367Email: [request info (info@inkan.ca)](https://arcat.com/rfi?action=email&company=INKAN%252BLtd.&message=RE%253A%2520Spec%2520Question%2520(05520ikl)%253A%2520&coid=33272&spec=05520ikl&rep=&fax=905-793-9367);Web: <https://inkan.ca>

\*\* 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.
	1. APPLICATIONS/SCOPE

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

* + 1. Ornamental metal rails and handrails with glass in-fill panels as indicated and detailed on drawings.
		2. Ornamental metal rails and handrails with glass in-fill panels supported by forged spider fittings and spider handrail brackets as indicated and detailed on drawings.
		3. Structural glass balustrade and glass fins as required with ornamental metal handrails as indicated and detailed on drawings.
		4. Structural glass balustrade and supporting forged spiders handrail bracket with handrails as indicated and detailed on drawings.
	1. MATERIALS
		1. Glass Balustrade: 12mm (1/2 inch), 15mm (5/8 inch) and 19mm (3/4 inch) clear tempered glass as detailed or required for application.

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

* + 1. Metal Material: Extruded 304 or 316 stainless steel to size and shape indicated.
		2. Metal Material: Brass/bronze to size and shape indicated. Alloy as scheduled.
		3. Metal Material: Aluminum to size and shape indicated. Alloy as scheduled.
		4. Balustrade Cap: 64 mm (2-1/2 inches) diameter extruded metal as scheduled in alloy and finish.
		5. Handrail: 38 mm (1-1/2 inches) O.D. tube in alloy and finish as scheduled.
		6. Frame Tube: Hard drawn tube in size, alloy and finish as scheduled.
		7. Balustrade and Handrail Fittings:
			1. Spider Fittings 442 as manufactured by InKan Ltd.
				1. Finish as scheduled.
				2. Produced from Marine Grade Austenite 316 grade stainless steel. Size as required for structural engineering requirements.
			2. Balustrade Handrail Bracket: AustVision Spider Austfix System. Finish as scheduled.
		8. Balustrade Cap Setting Materials: Polyethylene setting block and silicone sealant.
		9. Hydraulic Cement: As supplied and required by manufacturer.
		10. Bolts, Screws and Nuts: Stainless steel with finish as scheduled for base material.
	1. FABRICATION
		1. Tolerances: Verify dimensions on Site prior to shop fabrication.
			1. Fabricate items with joints neatly fitted and properly secured.
			2. Mill joints to a tight, hairline fit.
			3. Cope or miter corner joints.
		2. Design components to allow for expansion and contraction without causing buckling, excessive opening of joints, or overstressing of welds and fasteners.
		3. Form metal to the required shapes and sizes, with true curves, lines, and angles.
		4. Properly mark and match-mark materials for field assembly. Fabricate for delivery sequence which will expedite erection and minimize field handling of materials.
		5. Where finishing is required, complete assembly, including welding of units, before start of finishing operations. Provide finish surfaces of members exposed in final structure free of markings, burrs, and other defects.
		6. Preassemble items in shop to greatest extent possible to minimize field splicing and assembly. Disassembly units only as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation.
		7. Supply components required for proper anchorage of ornamental metals. Fabricate anchorage and related components of same material and finish as metal fabrication, unless otherwise specified herein.
1. EXECUTION
	1. EXAMINATION
		1. Verification of Conditions: Examine areas and conditions under which Work is to be performed and identify conditions detrimental to proper and or timely completion.
			1. Fully inspect the existing structure to verify a structurally sound base for anchoring railing system.
		2. Do not begin installation until substrates have been properly prepared.
		3. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
	2. PREPARATION
		1. Surface Preparation: Coordinate and furnish anchorages and setting drawings, diagrams, templates, instructions, and directions for the installation of items having integral anchors which are to be embedded in concrete or masonry construction. Coordinate delivery of such items to the Project Site.
		2. Clean surfaces thoroughly prior to installation.
		3. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
	3. INSTALLATION
		1. Comply with manufacturer's recommendations.
		2. Provide anchorage devices and fasteners including threaded fasteners for concrete and masonry inserts, toggle bolts, through-bolts, lag bolts, wood screws, and other connectors.
		3. Perform cutting, drilling, and fitting required for installation. Set accurately in location, alignment and elevation, plumb, level, and true, measured from established lines and levels.
			1. Provide temporary bracing or anchors in formwork for items which are to be built into concrete, masonry, or similar construction.
		4. Form tight joints with exposed connections accurately fitted with uniform reveals and spaces for sealants and joint fillers.
			1. Where cutting, welding, and grinding are required for proper shop fitting and jointing. Restore finished eliminating evidence of such corrective work.
		5. Do not cut or abrade finishes which cannot be completely restored in the field. At contractor's option do either of the following:
			1. Return items with such finishes to shop for required alterations, followed by complete refinishing.
			2. Provide new units.
			3. Field touch-up of finishes are not acceptable.
		6. Mounting brackets shall be securely mounted to building structure in a positive manner including sufficient reinforcements and anchors as required.
		7. Install brackets and handrails at stairs as indicated.
		8. Installation shall be rigid and secure, installed by mechanics experienced in erection of architectural metal. All screws and fittings shall be drawn up tightly. Rails shall be set plumb and aligned.
	4. PROTECTION
		1. Protect installed products until completion of project.
		2. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION