SECTION 101419 - DIMENSIONAL LETTER SIGNAGE

Revise this Section by deleting and inserting text to meet Project-specific requirements.

Verify that Section titles referenced in this Section are correct for this Project's Specifications; Section titles may have changed.

1. GENERAL
	* + 1. RELATED DOCUMENTS
				1. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
			2. SUMMARY
				1. Section Includes:

Cast dimensional characters.

Cutout dimensional characters.

Fabricated channel dimensional characters.

Illuminated, fabricated channel dimensional characters.

Molded-plastic dimensional characters.

Illuminated, molded-plastic dimensional characters.

* + - 1. DEFINITIONS

Retain terms that remain after this Section has been edited for a Project.

* + - * 1. Illuminated: Illuminated by lighting source integrally constructed as part of the sign unit.
			1. COORDINATION

Retain this article if signs are mounted on permanent construction with preinstalled electrical service; delete article if signs have no electrical service.

Retain Paragraph below for illuminated dimensional characters that require accurate installation of electrical service embedded in permanent construction by other installers.

* + - * 1. Furnish templates for placement of electrical service embedded in permanent construction by other installers.
			1. SUBMITTALS
				1. Submittals for this section are subject to the re-evaluation fee identified in Article 4 of the General Conditions.
				2. Manufacturer’s installation instructions shall be provided along with product data.
				3. Submittals shall be provided in the order in which they are specified and tabbed (for combined submittals).
				4. Product Data: For each type of product.
				5. Sustainable Design Submittals:
				6. Shop Drawings: For signs.

Include fabrication and installation details and attachments to other work.

Show sign mounting heights, locations of supplementary supports to be provided by other installers, and accessories.

Show message list, typestyles, graphic elements, and layout for each sign at least half size.

Retain two Subparagraphs below if signs are electrically powered.

Show locations of electrical service connections.

Include diagrams for power, signal, and control wiring.

Retain "Samples for Initial Selection" and "Samples for Verification" Paragraphs for two-stage Samples.

* + - * 1. Samples for Initial Selection: For each type of sign assembly, exposed component, and exposed finish.

Retain Subparagraph below if typestyle has not been previously selected.

Include representative Samples of available typestyles and graphic symbols.

* + - * 1. Samples for Verification: For each type of sign assembly showing all components and with the required finish(es), in manufacturer's standard size unless otherwise indicated and as follows:

Revise list below to suit Project. Insert specific sign Samples and sizes if required.

Dimensional Characters: Full-size Sample of dimensional character.

Exposed Accessories: Full-size Sample of each accessory type.

Retain Subparagraph below if applicable; revise to suit Project.

Full-size Samples, if approved, will be returned to Contractor for use in the Project.

* + - * 1. Product Schedule: For dimensional letter signs. Use same designations indicated on Drawings or specified.

Retain "Delegated-Design Submittal" Paragraph below if design services have been delegated to Contractor.

* + - * 1. Delegated-Design Submittal: For [**signs indicated in "Performance Requirements" Article**] <**Insert sign designations**>.

Include structural analysis calculations for signs indicated to comply with design loads; signed and sealed by the qualified professional engineer, licensed in the State of New York, responsible for their preparation.

Coordinate "Qualification Data" Paragraph below with qualification requirements in "Quality Assurance" Article.

* + - * 1. Qualification Data: For [**Installer**] [**and**] [**manufacturer**].
				2. Sample Warranty: For special warranty.
			1. CLOSEOUT SUBMITTALS
				1. Maintenance Data: For signs to include in maintenance manuals.
			2. QUALITY ASSURANCE

Retain "Installer Qualifications" Paragraph below to suit Project; revise if Installer qualification is required only for specific sign(s). Verify availability with sign manufacturer; some manufacturers do not offer installation services, particularly for smaller signs.

* + - * 1. Installer Qualifications: [**Manufacturer of products**] [**An entity that employs installers and supervisors who are trained and approved by manufacturer**].
			1. FIELD CONDITIONS

Retain "Field Measurements" Paragraph below for signs that require installation of electrical service embedded in permanent construction by other installers.

* + - * 1. Field Measurements: Verify locations of electrical service embedded in permanent construction by other installers by field measurements before fabrication, and indicate measurements on Shop Drawings.
			1. WARRANTY
				1. Special Warranty: Manufacturer agrees to repair or replace components of signs that fail in materials or workmanship within specified warranty period.

Failures include, but are not limited to, the following:

Deterioration of finishes beyond normal weathering.

Separation or delamination of sheet materials and components.

Verify available warranties and warranty periods for units and components.

Warranty Period: Five years from date of Substantial Completion.

1. PRODUCTS

Manufacturers and products listed in SpecAgent and MasterWorks Paragraph Builder are neither recommended nor endorsed by the AIA or Deltek. Before inserting names, verify that manufacturers and products listed there comply with requirements retained or revised in descriptions and are both available and suitable for the intended applications.

* + - 1. PERFORMANCE REQUIREMENTS

Retain "Delegated Design" and "Structural Performance" Paragraphs below if Contractor is required to assume responsibility for design.

* + - * 1. Delegated Design: Engage a qualified professional engineer, licensed and registered to practice in the State of New York, to design sign structure and anchorage of [**rooftop**] [**dimensional character**] <**Insert description**> sign type(s) <**Insert drawing designation of sign(s)**> according to structural performance requirements.
				2. Structural Performance: Signs and supporting elements shall withstand the effects of gravity and other loads within limits and under conditions indicated.

Subparagraphs below are examples only; revise to suit Project and to comply with requirements of authorities having jurisdiction.

Uniform Wind Load: As indicated on Drawings.

Concentrated Horizontal Load: As indicated on Drawings.

Other Design Load: As indicated on Drawings

Uniform and concentrated loads need not be assumed to act concurrently.

Generally, retain "Thermal Movements" paragraph below for exterior fabricated channel dimensional characters.

* + - * 1. Thermal Movements: For exterior fabricated channel dimensional characters, allow for thermal movements from ambient and surface temperature changes.

Differential values in "Temperature Change" subparagraph below (for aluminum in particular) are suitable for most of the United States.

Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

Retain "Electrical Components, Devices, and Accessories" Paragraph below for illuminated signs.

* + - * 1. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
			1. DIMENSIONAL CHARACTERS

Retain this article for signs consisting of multiple, individually mounted characters.

Copy "Cast Characters," "Cutout Characters," "Fabricated Channel Characters," and "Molded-Plastic Characters" Paragraphs below and re-edit for each product.

Insert drawing designation. Use these designations on Drawings to identify each product.

* + - * 1. Cast Characters <**Insert drawing designation**>: Characters with uniform faces, sharp corners, and precisely formed lines and profiles, and as follows:

Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

A.R.K. Ramos.

ACE Sign Systems, Inc.

Approved equivalent.

Character Material: Cast [**aluminum**] [**brass**] [**bronze**] [**zinc**].

Character Height: [**As indicated on Drawings**].

Revise "Thickness" Subparagraph below for variable thickness of prismatic design characters if required, or show detail on Drawings.

Thickness: [**As indicated on Drawings**] [**Manufacturer's standard for size of character**].

Finishes:

Retain "Integral Metal Finish," "Integral Aluminum Finish," "Baked-Enamel or Powder-Coat Finish," and "Overcoat" Subparagraphs below as required. Insert requirements or annotate Drawings if integral metal finish with contrasting baked enamel or powder coat or other finish combinations are required. Delete Subparagraphs not required.

Retain "Integral Metal Finish" subparagraph for integral finishes on metals other than aluminum.

Integral Metal Finish: [**Mill**] [**Antique oxidized**] [**As indicated by manufacturer's designation**] [**Match Director’s Representative's sample**] [**As selected by Director’s Representative from full range of industry finishes**].

Retain "Integral Aluminum Finish" subparagraph below for integral finishes on aluminum. Some manufacturers do not recommend anodized finishes on sand-cast aluminum.

Integral Aluminum Finish: [**Clear anodized**] [**Light bronze anodized**] [**Medium bronze anodized**] [**Match Director’s Representative's sample**] [**Anodized color as selected by Director’s Representative from full range of industry colors and color densities**].

Retain "Baked-Enamel or Powder-Coat Finish" Subparagraph below for applied finish on metals; revise to suit Project. If required, insert color(s) from color-matching system, such as Pantone. Revise text if multicolored image is required.

Baked-Enamel or Powder-Coat Finish: Manufacturer's standard, in color [**as indicated by manufacturer's designation**] [**matching Director’s Representative's sample**] [**as selected by Director’s Representative from manufacturer's full range**].

Retain "Overcoat" subparagraph below if required. Overcoat is a topcoat used to protect interior finishes and reduce color change.

Overcoat: Manufacturer's standard baked-on clear coating.

Retain one option in "Mounting" Subparagraph below; revise to suit Project. Insert specific material or exposed fastener design if required; verify available materials and designs with manufacturers.

Mounting: [**As indicated on Drawings**] [**Concealed studs**] [**Projecting studs**] [**Rosette-head through fasteners**] [**Countersunk flathead through fasteners**].

Retain "Typeface" subparagraph below if not indicated on Drawings.

Typeface: [**Times Roman**].

* + - * 1. Cutout Characters <**Insert drawing designation**>: Characters with uniform faces; square-cut, smooth[**, eased**] edges; precisely formed lines and profiles; and as follows:

Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

A.R.K. Ramos.

ACE Sign Systems, Inc.

Southwell Company (The).

Approved equivalent.

Acrylic with laminated metal facing options in "Character Material" Subparagraph below is generally not recommended for exterior exposure; see "Painted Edges" Subparagraph below for optional edge treatment.

Character Material: Sheet or plate [**aluminum**] [**brass**] [**bronze**] [**copper**] [**stainless steel**] [**zinc**] [**acrylic**] [**acrylic with laminated aluminum facing**] [**acrylic with laminated brass facing**] [**acrylic with laminated bronze facing**] [**acrylic with laminated stainless-steel facing**].

Character Height: [**As indicated on Drawings**] <**Insert dimension**>.

Thickness: [**As indicated on Drawings**] [**Manufacturer's standard for size of character**] [**0.125 inch**] [**0.25 inch**].

Finishes:

Retain "Integral Metal Finish," "Integral Aluminum Finish," "Integral Stainless-Steel Finish, "Integral Acrylic Color," "Baked-Enamel or Powder-Coat Finish," and "Overcoat" Subparagraphs below as required. Insert requirements or annotate Drawings if integral metal finish with contrasting baked enamel or powder coat or other finish combinations are required. Delete Subparagraphs not required.

Retain "Integral Metal Finish" Subparagraph for integral finishes on metals other than aluminum and stainless steel.

Integral Metal Finish: [**Mill**] [**Antique oxidized**] [**As indicated by manufacturer's designation**] [**Match Director’s Representative's sample**] [**As selected by Director’s Representative from full range of industry finishes**].

Retain "Integral Aluminum Finish" Subparagraph below for integral finishes on aluminum.

Integral Aluminum Finish: [**Clear anodized**] [**Light bronze anodized**] [**Medium bronze anodized**] [**Match Director’s Representative's sample**] [**Anodized color as selected by Director’s Representative from full range of industry colors and color densities**].

Retain "Integral Stainless-Steel Finish" Subparagraph below for integral finishes on stainless steel.

Integral Stainless-Steel Finish: [**No. 4**] [**No. 8**] [**Match Director’s Representative's sample**] [**As selected by Director’s Representative from full range of industry finishes**].

Integral Acrylic Color: [**As indicated by manufacturer's designation**] [**Match Director’s Representative's sample**] [**As selected by Director’s Representative from full range of industry colors**].

Retain "Baked-Enamel or Powder-Coat Finish" Subparagraph below for applied finish on metals; revise to suit Project. If required, insert color(s) from color-matching system, such as Pantone. Revise text if multicolored image is required.

Baked-Enamel or Powder-Coat Finish: Manufacturer's standard, in color [**as indicated by manufacturer's designation**] [**matching Director’s Representative's sample**] [**as selected by Director’s Representative from manufacturer's full range**].

Retain "Overcoat" Subparagraph below if required. Overcoat is a topcoat used to protect interior finishes and reduce color change.

Overcoat: [**Manufacturer's standard baked-on clear coating**] [**Clear organic coating**].

Retain "Painted Edges" Subparagraph below if required. Some manufacturers claim that acrylic characters with laminated metal facing can have exterior exposure if edges are painted.

Painted Edges: Paint edges of acrylic characters with laminated metal facing as recommended in writing by manufacturer.

Retain one option in "Mounting" Subparagraph below; revise to suit Project. Insert specific material or exposed fastener design if required; verify available materials and designs with manufacturers.

Mounting: [**As indicated on Drawings**] [**Concealed studs**] [**Projecting studs**] [**Rosette-head through fasteners**] [**Countersunk flathead through fasteners**] [**Concealed, painted aluminum back bar or bracket assembly**] [**Concealed, stainless-steel back bar or bracket assembly**] [**Adhesive**].

Retain "Typeface" subparagraph below if not indicated on Drawings.

Typeface: [**Times Roman**].

* + - * 1. Fabricated Channel Characters <**Insert drawing designation**>: [**Metal face and side returns**] [**Open face with metal side returns**] [**Translucent face with metal side returns**], formed free from warp and distortion; with uniform faces, sharp corners, and precisely formed lines and profiles; internally braced for stability, to meet structural performance loading without oil-canning or other surface deformation, and for securing fasteners; and as follows.

Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

A.R.K. Ramos.

ACE Sign Systems, Inc.

Signs & Decal Corp.

Approved equivalent.

Retain "Illuminated Characters" subparagraph below if required.

Illuminated Characters: [**Backlighted**] [**Frontlighted**] character construction with [**fluorescent tube**] [**fiber-optic**] [**LED**] [**neon tube**] Insert requirement lighting, including transformers, insulators, and other accessories for operability, with provision for servicing and concealing connections to building electrical system. Use tight or sealed joint construction to prevent unintentional light leakage. Space lamps apart from each other and away from character surfaces as needed to illuminate evenly.

Retain "Power" Subparagraph below to suit Project. Consult manufacturer for power requirements and coordinate with Electrical Engineer. An array of characters or each character separately may require a power supply.

Power: [**As indicated on electrical Drawings**] [**120 V, 60 Hz, 1 phase, 15 A**].

Retain "Weeps" Subparagraph below to suit Project. Manufacturers generally provide weeps for exterior characters; baffles are uncommon but may be important where overhead, backlighted characters are close to the viewer. Consult manufacturer for recommendations.

Weeps: Provide weep holes to drain water at lowest part of exterior characters.[**Equip weeps with permanent baffles to block light leakage without inhibiting drainage.**]

Character Material: Sheet or plate [**aluminum**] [**brass**] [**bronze**] [**copper**] [**steel**] [**stainless steel**] [**zinc**].

Third option in "Material Thickness" Subparagraph below can be used for aluminum; fourth option can be used for brass, bronze, and copper; fifth option can be used for three-sided steel characters; and sixth option can be used for three-sided, stainless-steel characters. Consult manufacturer for thickness suitable for material and strength required.

Material Thickness: [**As indicated on Drawings**] [**Manufacturer's standard for size and design of character**] [**0.100 inch**] [**0.032 inch**] [**Nominal 0.048 inch thick for face and 0.030 inch thick for returns**] [**0.050 inch thick for face and 0.031 inch thick for returns**].

Retain "Translucent Face Sheet" Subparagraph below for translucent-face characters.

Translucent Face Sheet: Acrylic sheet with integral color [**matching Director’s Representative's sample**] [**as selected by Director’s Representative from manufacturer's full range**].

Sheet Thickness: [**As indicated on Drawings**] [**Manufacturer's standard thickness for size of character**] [**0.125 inch**] [**0.25 inch**].

Character Height: [**As indicated on Drawings**].

Character Depth: [**As indicated on Drawings**].

Finishes:

Retain "Integral Metal Finish," "Integral Aluminum Finish," "Integral Stainless-Steel Finish, "Baked-Enamel or Powder-Coat Finish," and "Overcoat" Subparagraphs below as required. Insert requirements or annotate Drawings if integral metal finish with contrasting baked enamel or powder coat or other finish combinations are required. Delete Subparagraphs not required.

Retain "Integral Metal Finish" Subparagraph for integral finishes on metals other than aluminum and stainless steel.

Integral Metal Finish: [**Mill**] [**Antique oxidized**] [**As indicated by manufacturer's designation**] [**Match Director’s Representative's sample**] [**As selected by Director’s Representative from full range of industry finishes**].

Retain "Integral Aluminum Finish" Subparagraph below for integral finishes on aluminum.

Integral Aluminum Finish: [**Clear anodized**] [**Light bronze anodized**] [**Medium bronze anodized**] [**Match Director’s Representative's sample**] [**Anodized color as selected by Director’s Representative from full range of industry colors and color densities**].

Retain "Integral Stainless-Steel Finish" Subparagraph below for integral finishes on stainless steel.

Integral Stainless-Steel Finish: [**No. 4**] [**No. 8**] [**Match Director’s Representative's sample**] [**As selected by Director’s Representative from full range of industry finishes**].

Retain "Baked-Enamel or Powder-Coat Finish" Subparagraph below for applied finish on metals; revise to suit Project. If required, insert color(s) from color-matching system, such as Pantone. Revise text if multicolored image is required.

Baked-Enamel or Powder-Coat Finish: Manufacturer's standard, in color [**as indicated by manufacturer's designation**] [**matching Director’s Representative's sample**] [**as selected by Director’s Representative from manufacturer's full range**].

Retain "Overcoat" Subparagraph below if required. Overcoat is a topcoat used to protect interior finishes and reduce color change.

Overcoat: [**Manufacturer's standard baked-on clear coating**] [**Clear organic coating**].

Retain one option in "Mounting" Subparagraph below; revise to suit Project. Insert specific material or exposed fastener design if required; verify available materials and designs with manufacturers.

Mounting: [**As indicated on Drawings**] [**Manufacturer's standard for size and design of character**] [**Projecting studs**] [**Concealed, painted aluminum back bar or bracket assembly**] [**Concealed, stainless-steel back bar or bracket assembly**].

Retain first Subparagraph below for characters projecting from wall surface.

Hold characters at [**2-inch distance**] [**manufacturer's recommended distance**] [**distance as selected by Director’s Representative**] from wall surface.

Retain "Typeface" Subparagraph below if not indicated on Drawings.

Typeface: [**Times Roman**] <**Insert requirement**>.

Retain options in "Molded-Plastic Characters" Paragraph below to suit Project; consult manufacturers for recommendations. Manufacturers' product data generally does not indicate molding process.

* + - * 1. Molded-Plastic Characters <**Insert drawing designation**>: Injection molded or thermoformed characters having uniform faces and profiles, and as follows:

Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

ACE Sign Systems, Inc.

Gemini Incorporated.

Signs & Decal Corp.

Approved equivalent.

Retain "Illuminated Characters" Subparagraph below if required.

Illuminated Characters: Characters with concealed [**fluorescent tube**] [**fiber-optic**] [**LED**] [**neon tube**] lighting, including transformers, insulators, and other accessories; with provision for servicing and concealing connections to building electrical system. Space lamps apart from each other and away from character surfaces as needed to illuminate evenly.

Retain "Power" Subparagraph below to suit Project. Consult manufacturer for power requirements and coordinate with Electrical Engineer. An array of characters or each character separately may require a power supply.

Power: [**As indicated on electrical Drawings**] [**120 V, 60 Hz, 1 phase, 15 A**].

Retain "Weeps" Subparagraph below to suit Project. Manufacturers generally provide weeps for exterior characters; baffles are uncommon but may be important where overhead, backlighted characters are close to the viewer. Consult manufacturer for recommendations.

Weeps: Provide weep holes to drain water at lowest part of exterior characters.[**Equip weeps with permanent baffles to block light leakage without inhibiting drainage.**]

Color: Manufacturer's standard [**integral color**] [**painted finish**] process, in color [**as indicated by manufacturer's designation**] [**matching Director’s Representative's sample**] [**as selected by Director’s Representative from manufacturer's full range**].

Retain "Typeface" Subparagraph below if not indicated on Drawings.

Typeface: [**Times Roman**] <**Insert requirement**>.

* + - 1. DIMENSIONAL CHARACTER MATERIALS

Retain materials that are referenced in other articles under specific signage requirements. Revise to suit Project.

* + - * 1. Aluminum Castings: ASTM B26, alloy and temper recommended by sign manufacturer for casting process used and for type of use and finish indicated.
				2. Aluminum Sheet and Plate: ASTM B209, alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated.

Material in "Aluminum Extrusions" Paragraph below is generally used for internal stiffeners, caps, or other supporting elements.

* + - * 1. Aluminum Extrusions: ASTM B221, alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated.

Alloy UNS No. C85200 in "Brass Castings" Paragraph below has 3 percent lead content. Verify availability of lead-free alloy with sign manufacturer before retaining second option.

* + - * 1. Brass Castings: ASTM B584, [**alloy recommended by manufacturer and finisher for finish indicated**] [**lead-free alloy recommended by manufacturer and finisher for finish indicated**] [**Alloy UNS No. C85200 (high-copper yellow brass)**].

Alloy UNS No. C26000 (yellow brass) in "Brass Sheet (Yellow Brass)" Paragraph below has maximum 0.07 percent lead content. Verify availability of lead-free alloy with sign manufacturer before retaining second option.

* + - * 1. Brass Sheet (Yellow Brass): ASTM B36, [**alloy recommended by manufacturer and finisher for finish indicated**] [**lead-free alloy recommended by manufacturer and finisher for finish indicated**] [**Alloy UNS No. C26000 (yellow brass)**].

Alloy UNS No. C86500 in "Bronze Castings" Paragraph below has no listed lead content. Verify availability of lead-free alloy with sign manufacturer before retaining second option.

* + - * 1. Bronze Castings: ASTM B584, [**alloy recommended by manufacturer and finisher for finish indicated**] [**lead-free alloy recommended by manufacturer and finisher for finish indicated**] [**Alloy UNS No. C86500 (No. 1 manganese bronze)**].

Alloy UNS No. C22000 in "Bronze Plate" Paragraph below has a maximum 0.05 percent lead content. Verify availability of lead-free alloy with sign manufacturer before retaining second option.

* + - * 1. Bronze Plate: ASTM B36, [**alloy recommended by manufacturer and finisher for finish indicated**] [**lead-free alloy recommended by manufacturer and finisher for finish indicated**] [**Alloy UNS No. C22000 (commercial bronze)**].
				2. Copper Sheet: ASTM B152.

Generally, retain one option in "Stainless-Steel Sheet" Paragraph below. Type 316 is more corrosion resistant and more expensive than Type 304.

* + - * 1. Stainless-Steel Sheet: ASTM A240 or ASTM A666, [**Type 304,**] [**Type 316,**] stretcher-leveled standard of flatness.
				2. Zinc Castings: ASTM B240, alloy and temper recommended by sign manufacturer for type of use and finish indicated.

Zinc sheet available in the United States is often imported from Europe or made to European standards such as EN 988. Sign manufacturers generally do not indicate a standard.

* + - * 1. Zinc Sheet: ASTM B69, alloy and temper recommended by sign manufacturer for type of use and finish indicated.

Retain "Acrylic Sheet" Paragraph below if using acrylic sheet for sign message panels, cutout dimensional characters, or characters on illuminated signs.

* + - * 1. Acrylic Sheet: ASTM D4802, category as standard with manufacturer for each sign, Type UVF (UV filtering).
				2. Paints and Coatings for Sheet Materials: Inks, dyes, and paints that are recommended by manufacturer for optimum adherence to surface and are UV and water resistant for colors and exposure indicated.
			1. ACCESSORIES
				1. Fasteners and Anchors: Manufacturer's standard as required for secure anchorage of signs, noncorrosive and compatible with each material joined, and complying with the following:

Use concealed fasteners and anchors unless indicated to be exposed.

For exterior exposure, furnish [**nonferrous-metal**] [**stainless-steel**] [**or**] [**hot-dip galvanized**] devices unless otherwise indicated.

Exposed Metal-Fastener Components, General:

Fabricated from same basic metal and finish of fastened metal unless otherwise indicated.

Retain "Fastener Heads" Subparagraph below if required for sign security or maintenance; revise to suit Project. Verify Director’s Representative preferences. "One-Way-Head" option cannot be removed after tightening.

Fastener Heads: For nonstructural connections, use [**flathead**] [**or**] [**oval countersunk**] screws and bolts with tamper-resistant [**Allen-head**] [**spanner-head**] [**or**] [**one-way-head**] slots unless otherwise indicated.

Sign Mounting Fasteners:

Concealed Studs: Concealed (blind), threaded studs welded or brazed to back of sign material, screwed into back of sign assembly, or screwed into tapped lugs cast integrally into back of cast sign material, unless otherwise indicated.

Projecting Studs: Threaded studs with sleeve spacer, welded or brazed to back of sign material, screwed into back of sign assembly, or screwed into tapped lugs cast integrally into back of cast sign material, unless otherwise indicated.

Through Fasteners: Exposed metal fasteners matching sign finish, with type of head indicated, installed in predrilled holes.

* + - * 1. Adhesive: As recommended by sign manufacturer.

Adhesives to have a VOC content of 250 g/L or less.

Use material in "Two-Face Tape" Paragraph below for small signs only; it is suitable for smooth, nonporous surfaces. Two-face tape is generally 3M brand's "VHB Heavy Duty Mounting Tape."

* + - * 1. Two-Face Tape: Manufacturer's standard high-bond, foam-core tape, 0.045 inch thick, with adhesive on both sides.
				2. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D1187.
			1. FABRICATION
				1. General: Provide manufacturer's standard sign assemblies according to requirements indicated.

Preassemble signs and assemblies in the shop to greatest extent possible. Disassemble signs and assemblies only as necessary for shipping and handling limitations. Clearly mark units for reassembly and installation; apply markings in locations concealed from view after final assembly.

Mill joints to a tight, hairline fit. Form assemblies and joints exposed to weather to resist water penetration and retention.

Comply with AWS for recommended practices in welding and brazing. Provide welds and brazes behind finished surfaces without distorting or discoloring exposed side. Clean exposed welded and brazed connections of flux, and dress exposed and contact surfaces.

Conceal connections if possible; otherwise, locate connections where they are inconspicuous.

Internally brace dimensional characters for stability, to meet structural performance loading without oil-canning or other surface deformation, and for securing fasteners.

Provide rabbets, lugs, and tabs necessary to assemble components and to attach to existing work. Drill and tap for required fasteners. Use concealed fasteners where possible; use exposed fasteners that match sign finish.

Castings: Fabricate castings free of warp, cracks, blowholes, pits, scale, sand holes, and other defects that impair appearance or strength. Grind, wire brush, sandblast, and buff castings to remove seams, gate marks, casting flash, and other casting marks before finishing.

Revise "Brackets" Paragraph below to suit Project. Some manufacturers offer standard brackets for wall and railing applications.

* + - * 1. Brackets: Fabricate brackets, fittings, and hardware for bracket-mounted signs to suit sign construction and mounting conditions indicated. Modify manufacturer's standard brackets as required.

Aluminum Brackets: Factory finish brackets with baked-enamel or powder-coat finish [**to match sign-background color**] [**to match Director’s Representative's sample**] color unless otherwise indicated.

Stainless-Steel Brackets: Factory finish brackets [**to match sign background**] [**to match Director’s Representative's sample**] [**with No. 4**] finish unless otherwise indicated.

* + - 1. GENERAL FINISH REQUIREMENTS
				1. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
				2. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

Retain "Directional Finishes" Paragraph below for directional finishes; revise to suit Project.

* + - * 1. Directional Finishes: Run grain with long dimension of each piece and perpendicular to long dimension of finished trim or border surface unless otherwise indicated.
				2. Organic, Anodic, and Chemically Produced Finishes: Apply to formed metal after fabrication but before applying contrasting polished finishes on raised features unless otherwise indicated.
			1. ALUMINUM FINISHES

Generally, retain one of two options in "Clear Anodic Finish" Paragraph below. Verify availability with manufacturers. If retaining both options, indicate location of each on Drawings or by inserts in sign-description paragraphs retained in Part 2.

* + - * 1. Clear Anodic Finish: AAMA 611, Class I, 0.018 mm or thicker.

Generally, retain one of two options in "Color Anodic Finish" Paragraph below. Verify availability with manufacturers. If retaining both options, indicate location of each on Drawings or by inserts in sign-description paragraphs retained in Part 2.

* + - * 1. Color Anodic Finish: AAMA 611, Class I, 0.018 mm or thicker.

"Baked-Enamel or Powder-Coat Finish" Paragraph below references AAMA Standard For Pigmented Organic Coating On Extrusions And Panels.

* + - * 1. Baked-Enamel or Powder-Coat Finish: AAMA 2603 except with a minimum dry film thickness of 1.5 mils. Comply with coating manufacturer's written instructions for cleaning, conversion coating, and applying and baking finish.
			1. STAINLESS-STEEL FINISHES
				1. Surface Preparation: Remove tool and die marks and stretch lines, or blend into finish.
				2. Polished Finishes: Grind and polish surfaces to produce uniform finish, free of cross scratches.

When polishing is completed, passivate and rinse surfaces. Remove embedded foreign matter and leave surfaces chemically clean.

Choose one of the following 4 finishes.

Directional Satin Finish: No. 4.

Dull Satin Finish: No. 6.

Reflective, Directional Polish: No. 7.

Mirrorlike Reflective, Nondirectional Polish: No. 8.

* + - 1. CLEAR ORGANIC COATING FOR COPPER-ALLOY FINISHES

"Clear Organic Coating" Paragraph below specifies a resin coating commonly used for application to interior and exterior copper alloys; for exterior use, it generally requires removing and reapplying every five years or more often. It can be applied to other metals but is generally not applied over decorative coatings. Verify with Director’s Representative that this coating is appropriate for Facility's continuing maintenance capability.

* + - * 1. Clear Organic Coating: Clear, waterborne, air-drying, acrylic lacquer called "Incralac"; specially developed for coating copper-alloy products; consisting of a solution of methyl methacrylate copolymer with benzotriazole to prevent breakdown of the film in UV light; shop applied in two uniform coats according to manufacturer's written instructions, with interim drying between coats and without runs or other surface imperfections, to a total dry film thickness of 1 mil.
1. EXECUTION
	* + 1. EXAMINATION
				1. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance.
				2. Verify that sign-support surfaces are within tolerances to accommodate signs without gaps or irregularities between backs of signs and support surfaces unless otherwise indicated.

Retain first paragraph below for internally illuminated signs.

* + - * 1. Verify that electrical service is correctly sized and located to accommodate signs.
				2. Proceed with installation only after unsatisfactory conditions have been corrected.
			1. INSTALLATION

Retain mounting methods in this article that coordinate with mounting requirements in sign-description paragraphs retained in Part 2.

* + - * 1. General: Install signs using mounting methods indicated and according to manufacturer's written instructions.

Install signs level, plumb, true to line, and at locations and heights indicated, with sign surfaces free of distortion and other defects in appearance.

Before installation, verify that sign surfaces are clean and free of materials or debris that would impair installation.

Corrosion Protection: Coat concealed surfaces of exterior aluminum in contact with grout, concrete, masonry, wood, or dissimilar metals, with a heavy coat of bituminous paint.

* + - * 1. Mounting Methods:

Concealed Studs: Using a template, drill holes in substrate aligning with studs on back of sign. Remove loose debris from hole and substrate surface.

Masonry Substrates: Fill holes with adhesive. Leave recess space in hole for displaced adhesive. Place sign in position and push until flush to surface, embedding studs in holes. Temporarily support sign in position until adhesive fully sets.

Thin or Hollow Surfaces: Place sign in position and flush to surface, install washers and nuts on studs projecting through opposite side of surface, and tighten.

Projecting Studs: Using a template, drill holes in substrate aligning with studs on back of sign. Remove loose debris from hole and substrate surface.

Masonry Substrates: Fill holes with adhesive. Leave recess space in hole for displaced adhesive. Place spacers on studs, place sign in position, and push until spacers are pinched between sign and substrate, embedding the stud ends in holes. Temporarily support sign in position until adhesive fully sets.

Thin or Hollow Surfaces: Place spacers on studs, place sign in position with spacers pinched between sign and substrate, and install washers and nuts on stud ends projecting through opposite side of surface, and tighten.

Through Fasteners: Drill holes in substrate using predrilled holes in sign as template. Countersink holes in sign if required. Place sign in position and flush to surface. Install through fasteners and tighten.

Back Bar and Brackets: Remove loose debris from substrate surface and install backbar or bracket supports in position, so that signage is correctly located and aligned.

Adhesive: Clean bond-breaking materials from substrate surface and remove loose debris. Apply linear beads or spots of adhesive symmetrically to back of sign and of suitable quantity to support weight of sign after cure without slippage. Keep adhesive away from edges to prevent adhesive extrusion as sign is applied and to prevent visibility of cured adhesive at sign edges. Place sign in position, and push to engage adhesive. Temporarily support sign in position until adhesive fully sets.

Two-Face Tape: Clean bond-breaking materials from substrate surface and remove loose debris. Apply tape strips symmetrically to back of sign and of suitable quantity to support weight of sign without slippage. Keep strips away from edges to prevent visibility at sign edges. Place sign in position, and push to engage tape adhesive.

* + - 1. ADJUSTING AND CLEANING
				1. Remove and replace damaged or deformed characters and signs that do not comply with specified requirements. Replace characters with damaged or deteriorated finishes or components that cannot be successfully repaired by finish touchup or similar minor repair procedures.
				2. Remove temporary protective coverings and strippable films as signs are installed.
				3. On completion of installation, clean exposed surfaces of signs according to manufacturer's written instructions, and touch up minor nicks and abrasions in finish. Maintain signs in a clean condition during construction and protect from damage until acceptance by the Director’s Representative.

Insert a sign schedule here or on Drawings to list each sign type by drawing designation, text, and quantity, coordinated with Drawings. Also include sign size, font, colors, and locations to the extent that these items are not shown on Drawings. See the Evaluations for an example of a sign schedule.

END OF SECTION 101419