

SECTION 10 14 23

PANEL SIGNAGE

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
1. Panel signs.
 2. Room identification signs.
 3. Illuminated panel signs.
 4. Field applied, vinyl character signs.

1.2 DEFINITIONS

- A. Illuminated: Illuminated by lighting source integrally constructed as part of the sign unit.

1.3 ACTION SUBMITTALS

- A. Product Data: Technical data for each type of product including installation methods.
- B. Shop Drawings: Indicate fabrication and installation details and attachments to other work.
1. Show sign mounting heights, locations of supplementary supports to be provided by other installers, and accessories.
 2. Show message list, typestyles, graphic elements, including raised characters and Braille, and layout for each sign at least half size.
 3. Show locations of electrical service connections.
 4. Include diagrams for power, signal, and control wiring.
- C. Samples: Submit 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:
1. Panel Signs: Full size sample.
 2. Field Applied, Vinyl Character Signs: Full size Sample of characters on glass.
 3. Variable Component Materials: Full size sample of each base material, character (letter, number, and graphic element) in each exposed color and finish not included in Samples above.
 4. Exposed Accessories: Full size Sample of each accessory type.
- D. Product Schedule: Use same designations indicated on Drawings or specified.

- E. Delegated Design Submittal: Submit for signage indicated, including structural analysis calculations for signs indicated to comply with design loads; signed and sealed by the qualified professional engineer responsible for their preparation.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: Submit for Installer and manufacturer.
- B. Evaluation Reports: ICC-ES report for post installed anchors and power actuated fasteners from ICC-ES or other qualified testing agency acceptable to authorities having jurisdiction.

1.5 CLOSEOUT SUBMITTALS

- A. Maintenance Data: Submit data for signs to include in maintenance manuals.

1.6 QUALITY ASSURANCE

- A. Single Source Responsibility: Provide each type of signage by a single manufacturer.

1.7 COORDINATION

- A. Furnish templates for placement of sign anchorage devices embedded in permanent construction by other installers.
- B. Furnish templates for placement of electrical service embedded in permanent construction by other installers.

1.8 FIELD CONDITIONS

- A. Field Measurements: Verify locations, capacity, amperage and voltage of anchorage devices and electrical service embedded in permanent construction by other installers by field measurements before fabrication and indicate measurements on Shop Drawings.

1.9 WARRANTY

- A. Written warranty signed by manufacturer in which manufacturer agrees to repair or replace components of signs that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Deterioration of finishes beyond normal weathering.
 - b. Deterioration of embedded graphic image.
 - c. Separation or delamination of sheet materials and components.
 - 2. Warranty Period: Five years from date of Substantial Completion.

1.10 EXTRA MATERIAL

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Variable Component Materials: 12 replaceable text inserts and interchangeable characters (letters, numbers, and graphic elements) of each type.
 - 2. Tools: One set of specialty tools for assembling signs and replacing variable sign components.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Engage a qualified professional engineer to design sign structure and anchorage of site and illuminated panel signage sign type(s) according to structural performance requirements.
- B. Structural Performance: Signs and supporting elements shall withstand the effects of gravity and other loads within limits and under conditions indicated.
 - 1. Uniform Wind Load: Indicated on Drawings.
 - 2. Concentrated Horizontal Load: Indicated on Drawings.
 - 3. Other Design Load: Indicated on Drawings.
 - 4. Uniform and concentrated loads need not be assumed to act concurrently.
- C. Thermal Movements: For exterior signs, allow for thermal movements from ambient and surface temperature changes.
 - 1. Temperature Change: 120 degrees F (67 degrees C), ambient; 180 degrees F (100 degrees C), material surfaces.
- D. Accessibility Requirements: Comply with applicable requirements.
 - 1. U.S. Architectural and Transportation Barriers Compliance Board Americans with Disabilities Act Accessibility Guidelines for Buildings and Facilities (ADAAG) 2010.
 - 2. ICC/ANSI A117.1 Accessible and Useable Building and Facilities.
 - 3.
- E. 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.

2.2 PANEL SIGNS

- A. Panel Sign: Sign with smooth, uniform surfaces; with message and characters having uniform faces, sharp corners, and precisely formed lines and profiles; and as follows:
 - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. ACE Sign Systems, Inc.

- b. Advance Corporation.
 - c. APCO Graphics, Inc.
 - d. ASE, Inc.
 - e. ASI Sign Systems, Inc.
 - f. Best Sign Systems, Inc.
 - g. Clarke Systems.
 - h. Diskey Architectural Signage Inc.
 - i. Fossil Industries, Inc.
 - j. InPro Corporation (IPC).
 - k. Mohawk Sign Systems.
 - l. Nelson-Harkins Industries.
 - m. Poblocki Sign Company, LLC.
 - n. Seton Identification Products.
 - o. Signs & Decal Corp.
 - p. Stamprite Supersine; a division of Stamp Rite Inc.
 - q. Vista System.
 - r. Vomar Products, Inc.
2. Illuminated Panel Sign: Backlighted Edgelighted or lighted as indicated; construction with LED 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 and weatherproof construction for exterior signage lighting. Space lamps apart from each other and away from sign surfaces as needed to illuminate evenly.
- a. Power: Indicated on electrical Drawings.
 - b. Weeps: Provide weep holes to drain water at lowest part of exterior signs. Equip weeps with permanent baffles to block light leakage without inhibiting drainage.
3. Solid Sheet Sign, Returns, and Back: Stainless steel and Acrylic sheet as indicated with finish specified:
- a. Thickness: 0.125 inch (3.18 mm).
 - b. Surface Applied, Flat Graphics: Applied vinyl film, baked enamel or powder coat and photo image as indicated.
 - c. Surface Applied, Raised Graphics: Applied polymer characters and Braille.
 - d. Etched and Filled Graphics: Sign face etched or routed to receive enamel paint infill.
 - e. Inset, Cutout Characters: Sign face routed to receive push through acrylic graphics flush with the sign panel.
4. Laminated Aluminum Sheet Sign: Aluminum sheet laminated to both sides of phenolic core sheet with edge molding as indicated.
- a. Composite Sheet Thickness: 0.25 inch (6.35 mm).
 - b. Surface Applied, Flat Graphics: Applied vinyl film and photo image as indicated.
 - c. Surface Applied, Raised Graphics: Applied polymer characters and Braille.

5. Composite Phenolic Core Sign: Solid phenolic panel core with integral subsurface graphic image covered with integral, polymeric face layer.
 - a. Composite Sheet Thickness: 0.5 inch (12.7 mm) unless otherwise indicated.
6. Laminated Polycarbonate Sheet Sign: Polycarbonate face sheet laminated to each side of phenolic base sheet to produce composite sheet.
 - a. Composite Sheet Thickness: 0.125 inch (3.18 mm) minimum.
 - b. Surface Applied, Raised Graphics: Applied polymer characters and Braille.
 - c. Subsurface Graphics where indicated: Reverse halftone or dot screen image.
7. Engraved Plastic Laminate Sign: Plastic laminate face laminated to contrasting phenolic core to produce composite sheet.
 - a. Composite Sheet Thickness: 0.25 inch (6.35 mm).
 - b. Engraved Graphics: Characters engraved through plastic laminate face sheet to expose contrasting phenolic core.
 - c. Plastic Laminate Color and Pattern: Selected by Architect.
 - d. Core Color: Selected by Architect.
8. Sign Panel Perimeter: Finish edges smooth.
 - a. Edge Condition: At all edges or as Indicated on Drawings Bullnosed or round over.
 - b. Corner Condition in Elevation: Rounded to radius indicated or as indicated..
9. Frame: Entire perimeter.
 - a. Material: Stainless steel.
 - b. Material Thickness: .0.125 inches unless otherwise indicated..
 - c. Frame Depth: As indicated.
 - d. Profile: Rounded or as indicated.
 - e. Corner Condition in Elevation: Mitered or Rounded to radius indicated as selected by Architect.
 - f. Finish and Color: Selected by Architect.
10. Mounting: Stainless steel bracket with concealed anchors.
11. Surface Finish and Applied Graphics:
 - a. Integral Metal Finish: Selected by Architect.
 - b. Integral Aluminum Finish: Clear anodized.
 - c. Integral Stainless Steel Finish: No. 4.
 - d. Integral Acrylic Sheet Color: Selected by Architect.
 - e. Baked Enamel or Powder Coat Finish and Graphics: Color selected by Architect.
 - f. Painted Finish and Graphics: Factory applied acrylic polyurethane, in color selected by Architect.
 - g. Photo Image Graphics: multicolor, 600 dpi halftone or dot screen image.
 - h. Overcoat: Baked on clear coating.
12. Text and Typeface: , typeface selected by Architect and variable content as required. Finish raised characters to contrast with background color, and finish Braille to match background color.

13. Flatness Tolerance: Sign shall remain flat or uniformly curved under installed conditions as indicated on Drawings and within a tolerance of plus or minus 1/16 inch (1.5 mm) measured diagonally from corner to corner.

2.3 FIELD APPLIED, VINYL CHARACTER SIGNS

- A. Field Applied, Vinyl Character Sign: Prespaced characters die cut from 3 mil to 3.5 mil (0.076 mm to 0.089 mm) thick, weather resistant vinyl film with release liner on the back and carrier film on the front for on-site alignment and application.
 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Allen Markings.
 - b. APCO Graphics, Inc.
 - c. Mohawk Sign Systems.
 - d. Seton Identification Products.
 2. Size: Indicated on Drawings.
 3. Substrate: Indicated on Drawings.
 4. Text and Font: Indicated on Drawings or as selected by Architect.

2.4 PANEL SIGN MATERIALS

- A. Aluminum Sheet and Plate: ASTM B 209 (ASTM B 209M), alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated.
- B. Aluminum Extrusions: ASTM B 221 (ASTM B 221M), alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated.
- C. Steel Materials:
 1. Metallic Coated Steel Sheet: ASTM A 653/A 653M, G90 (Z275) coating, either commercial or forming steel.
 2. Steel Sheet: Uncoated, cold rolled, ASTM A 1008/A 1008M, commercial steel, Type B, exposed or electrolytic zinc coated, ASTM A 879/A 879M, Coating Designation 08Z (24G), with steel sheet substrate according to ASTM A 1008/A 1008M, commercial steel, exposed.

Electrolytic coated materials shall NOT be utilized at the building interior to avoid the zinc whiskers phenomenon.
 3. Steel Members Fabricated from Plate or Bar Stock: ASTM A 529/A 529M or ASTM A 572/A 572M, 42,000-psi (290-MPa) minimum yield strength.
 4. For steel exposed to view on completion, provide materials having flat, smooth surfaces without blemishes. Do not use materials whose surfaces exhibit pitting, seam marks, roller marks, rolled trade names, or roughness.
- D. Stainless Steel Sheet: ASTM A 240/A 240M or ASTM A 666, Type 304, stretcher leveled standard of flatness.
- E. Acrylic Sheet: ASTM D 4802, category as standard with manufacturer for each sign, Type UVF (UV filtering).

- F. Fiberglass Sheet: Multiple laminations of glass fiber reinforced polyester resin with UV-light stable, colorfast, nonfading, weather and stain resistant, colored polyester gel coat, and with standard finish.
- G. Polycarbonate Sheet: ASTM C 1349, Appendix X1, Type II (coated, mar resistant, UV-stabilized polycarbonate), with coating on both sides.
- H. PVC Sheet: UV-light stable, PVC plastic.
- I. Plastic aminate Sheet: NEMA LD 3, general purpose HGS grade, 0.048 inch (1.2 mm) nominal thickness.
- J. Vinyl Film: UV resistant vinyl film of nominal thickness indicated, with pressure sensitive, permanent adhesive on back; die cut to form characters or images as indicated on Drawings and suitable for exterior applications.
- K. 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.
- L. Accessories:
 - 1. Fasteners and Anchors: Fastening necessary for secure anchorage of signs, noncorrosive and compatible with each material joined, and complying with the following unless otherwise indicated:
 - a. Use concealed fasteners and anchors unless indicated to be exposed.
 - b. For exterior exposure, furnish stainless steel devices unless otherwise indicated.
 - c. Exposed Metal Fastener Components:
 - 1) Fabricated from same basic metal and finish of fastened metal unless otherwise indicated.
 - 2) Fastener Heads: For nonstructural connections, use flathead or oval countersunk screws and bolts with tamper resistant Allen head slots unless otherwise indicated.
 - d. Sign Mounting Fasteners:
 - 1) Concealed Studs: Concealed (blind), threaded studs welded or brazed to back of sign material or screwed into back of sign assembly unless otherwise indicated.
 - 2) Projecting Studs: Threaded studs with sleeve spacer, welded or brazed to back of sign material or screwed into back of sign assembly, unless otherwise indicated.
 - 3) Through Fasteners: Exposed metal fasteners matching sign finish, with type of head indicated, and installed in predrilled holes.
 - e. Inserts: Furnish inserts to be set by others into concrete or masonry work.
 - 2. Post Installed Anchors: Fastener systems with bolts of same basic metal as fastened metal, if visible, unless otherwise indicated; with working capacity greater than or equal to the design load, according to an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC01 ICC-ES AC193 ICC-ES AC58 or ICC-ES AC308 as appropriate for the substrate.
 - a. Uses: Securing signs with imposed loads to structure.

- b. Type: torque controlled, adhesive anchor or adhesive anchor.
 - c. Material for Interior Locations: Carbon steel components zinc plated to comply with ASTM B 633 or ASTM F 1941 (ASTM F 1941M), Class Fe/Zn 5, unless otherwise indicated.
 - d. Material for Exterior or Interior Locations and Where Stainless Steel Is Indicated: Alloy Group 1 (A1) stainless steel bolts, ASTM F 593 (ASTM F 738M), and nuts, ASTM F 594 (ASTM F 836M).
3. Power Actuated Anchors: Fastener systems with working capacity greater than or equal to the design load, according to an evaluation report acceptable to authorities having jurisdiction, based on ICC-ES AC70.
 4. Adhesive: Type recommended by sign manufacturer.
 5. Two Face Tape: High bond, foam core tape, 0.045 inch (1.14 mm) thick, with adhesive on both sides. Provide VHB Heavy Duty Mounting Tape by 3 M.
 6. Hook and Loop Tape: Two-part tape consisting of hooked part on sign back and looped side on mounting surface.
 7. Magnetic Tape: Magnetic tape with adhesive on one side.
 8. Bituminous Paint: Cold applied asphalt emulsion complying with ASTM D 1187/D 1187M.
 9. Lighting: Provide LED lighting and all required accessories including but not limited to power supplies, disconnect switches and photocells for all illuminated signage.
 - a. Provide LED lighting certified for wet locations for all exterior applications.
 - b. Provide sufficient lighting for all signage indicated to be illuminated to meet required lighting levels for signage.
 - c. Lighting shall be Bright White 6500K unless otherwise noted.
 - d. All components, wiring and configurations shall meet NEC requirements.
 10. Mounting Brackets and Supplemental Supports: Provide mounting brackets, framing and sufficient supplemental supports compatible with substrate to which all signage will be mounted. Provide concealed fasteners and welds for all components and maintain weather tight construction for all envelope conditions.
 - a. Provide aluminum framing components and supports with finishes to match surrounding fenestration, wall panels or other envelope assemblies. Provide brackets and components sized for loading conditions governing the Project; all plates and brackets shall be minimum 1/4 inch in thickness.

2.5 FABRICATION

- A. Provide sign assemblies according to requirements indicated.
 1. Preassemble signs in the shop to greatest extent possible. Disassemble signs and assemblies as necessary for shipping and handling limitations. Clearly mark units for reassembly and installation; apply markings in locations concealed from view after final assembly.
 2. Mill joints to a tight, hairline fit. Form assemblies and joints exposed to weather to resist water penetration and retention.
 3. 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.
4. Conceal connections if possible; otherwise, locate connections where they are inconspicuous.
 5. Internally brace signs for stability, to meet structural performance loading without oil-canning or other surface deformation, and for securing fasteners.
 6. 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.
- B. Surface Engraved Graphics: Machine engrave characters and other graphic devices into indicated sign surface to produce precisely formed copy, incised to uniform depth.
1. Engraved Metal: Fill engraved graphics with baked enamel.
 2. Engraved Opaque Acrylic Sheet: Fill engraved graphics with enamel.
 3. Face Engraved Clear Acrylic Sheet: Fill engraved copy with enamel. Apply opaque background color coating to back face of acrylic sheet.
 4. Engraved Plastic Laminate: Engrave through exposed face ply of plastic laminate sheet to expose contrasting core ply.
- C. Subsurface Applied Graphics: Apply graphics to back face of clear face sheet material to produce precisely formed image. Image shall be free of rough edges.
- D. Subsurface Engraved Graphics: Reverse engrave back face of clear face sheet material. Fill resulting copy with enamel. Apply opaque background color coating over enamel filled copy.
- E. Shop and Subsurface Applied Vinyl: Align vinyl film in final position and apply to surface. Firmly press film from the middle outward to obtain good bond without blisters or fishmouths.
- F. Signs with Changeable Message Capability: Fabricate signs to allow insertion of changeable messages as follows:
1. For snap in changeable inserts beneath removable face sheet, furnish one suction or other device to assist in removing face sheet. Furnish initial changeable insert. Furnish two blank inserts for each sign for Owner's use.
 2. For slide in changeable inserts, fabricate slot without burrs or constrictions that inhibit function. Furnish initial changeable insert. Furnish two blank inserts for each sign for Owner's use.
 3. For frame to hold changeable sign panel, fabricate frame without burrs or constrictions that inhibit function. Furnish initial sign panel.
- G. Brackets: Fabricate brackets, fittings, and hardware for bracket mounted signs to suit sign construction and mounting conditions indicated. Modify brackets as required.
1. Aluminum Brackets: Factory finish brackets with baked enamel or powder coat finish to match sign background color unless otherwise indicated.
 2. Stainless Steel Brackets: Factory finish brackets with No. 4 finish unless otherwise indicated.

2.6 FINISH REQUIREMENTS

- A. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- B. 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.
- C. Directional Finishes: Run grain with long dimension of each piece and perpendicular to long dimension of finished trim or border surface unless otherwise indicated.
- D. Organic, Anodic, and Chemically Produced Finishes: Apply to formed metal after fabrication but before applying contrasting polished finishes on raised features unless otherwise indicated.
- E. Aluminum Finishes:
 - 1. Clear Anodic Finish: AAMA 611, Class I, 0.018 mm or thicker.
 - 2. Color Anodic Finish: AAMA 611, Class I, 0.018 mm or thicker.
 - 3. Baked Enamel or Powder Coat Finish: AAMA 2603 except with a minimum dry film thickness of 1.5 mils (0.04 mm). Comply with coating manufacturer's written instructions for cleaning, conversion coating, and applying and baking finish.
- F. Metallic Coated Steel Finishes:
 - 1. Surface Preparation: Clean surfaces of oil and other contaminants. Use cleaning methods that do not leave residue. After cleaning, apply a conversion coating compatible with the organic coating to be applied over it. Clean welds, mechanical connections, and abraded areas and apply galvanizing repair paint, complying with SSPC-Paint 20, to comply with ASTM A 780/A 780M.
 - 2. Factory Prime Finish: After cleaning and pretreating, apply an air dried primer compatible with the organic coating to be applied over it.
 - 3. Baked Enamel or Powder Coat Finish: After cleaning and pretreating, apply two coat, baked on finish consisting of prime coat and thermosetting topcoat to a minimum dry film thickness of 2 mils (0.05 mm).
- G. Steel Finishes:
 - 1. Surface Preparation: Remove mill scale and rust, if present, from uncoated steel, and prepare for coating according to coating manufacturer's written instructions.
 - a. For Baked Enamel or Powder Coat Finish: After cleaning, apply a conversion coating compatible with the organic coating to be applied over it.
 - 2. Factory Prime Finish: After surface preparation and pretreatment, apply fast curing, lead free and chromate free, universal primer.
 - 3. Baked Enamel or Powder Coat Finish: After cleaning and pretreating, apply two coat, baked on finish consisting of prime coat and thermosetting topcoat to a minimum dry film thickness of 2 mils (0.05 mm).
- H. 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.
 - a. When polishing is completed, passivate and rinse surfaces. Remove embedded foreign matter and leave surfaces chemically clean.
 - b. Directional Satin Finish: No. 4.
 - c. Dull Satin Finish: No. 6.
 - d. Reflective, Directional Polish: No. 7.
 - e. Mirrorlike Reflective, Nondirectional Polish: No. 8.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions for compliance with requirements for installation tolerances and other conditions affecting performance of the work.
- B. Verify sign support surfaces are within tolerances to accommodate signs without gaps or irregularities between backs of signs and support surfaces unless otherwise indicated.
- C. Verify anchorage devices embedded in permanent construction are correctly sized and located to accommodate signs.
- D. Verify that electrical service is correctly sized and located to accommodate signs.
- E. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Install signs using mounting methods indicated and according to manufacturer's written instructions.
 1. Install signs level, plumb, true to line, and at locations and heights indicated, with sign surfaces free of distortion and other defects in appearance.
 2. Install signs so they do not protrude or obstruct according to the accessibility standard.
 3. Before installation, verify sign surfaces are clean and free of materials or debris that would impair installation.
 4. 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.
- B. Accessible Signage: Install in locations on walls in accordance with ADAAG and accessibility standards.
- C. Mounting Methods:

1. Concealed Studs: Using a template, drill holes in substrate aligning with studs on back of sign. Remove loose debris from hole and substrate surface.
 - a. 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.
 - b. 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.
 2. Projecting Studs: Using a template, drill holes in substrate aligning with studs on back of sign. Remove loose debris from hole and substrate surface.
 - a. 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.
 - b. 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.
 3. 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.
 4. Brackets: Remove loose debris from substrate surface and install backbar or bracket supports in position so that signage is correctly located and aligned.
 5. 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. Do not utilize adhesive on exterior signage.
 6. 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. Do not utilize two faced tape for exterior signage.
- D. Field Applied, Vinyl Character Signs: Clean and dry substrate. Align sign characters in final position before removing release liner. Remove release liner in stages and apply and firmly press characters into final position. Press from the middle outward to obtain good bond without blisters or fishmouths. Remove carrier film without disturbing applied vinyl film.
- E. Signs Mounted on Glass: Provide opaque sheet matching sign material and finish onto opposite side of glass to conceal back of sign.

3.3 ADJUSTING AND CLEANING

- A. Remove and replace damaged or deformed signs and signs that do not comply with specified requirements. Replace signs with damaged or deteriorated finishes or components that cannot be successfully repaired by finish touchup or similar minor repair procedures.
- B. Remove temporary protective coverings and strippable films as signs are installed.
- C. 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 Owner.

END OF SECTION

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