



SECTION 101900

EXHIBITS AND GRAPHICS

PART 1 - GENERAL

1.01 SECTION INCLUDES

- A. Fabrication and installation of exterior and interior exhibits and graphics.
- B. Specialty exhibits and graphics structures.
- C. Engineering of exhibit and graphic structures including framing system, seismic restraint and attachment to structure.
- D. Permitting.
- E. Preparation of Production-Ready digital files.

1.02 RELATED SECTIONS

- A. Section 033000 Concrete: Refer to General Contractor package
- B. Section 061000 Rough Carpentry: Refer to General Contractor package
- C. Section 092116 Gypsum Board Assemblies: Wall substrate. Walls to receive application of vinyl graphics prepare to Level 5 finish: Refer to General Contractor package

1.03 SCOPE OF WORK - GENERAL

- A. Provide creation of production-ready digital files, production of graphic output, fabrication of exhibit structures, mounting, and installation of exhibits and graphics including structural.
- B. Permitting:
 - 1. Contractor shall obtain and pay for permit application fees required for the Work.
 - 2. Contractor shall obtain and pay for construction permits required by Work, including disposal permits and fees.
- C. Work of this section shall meet local code and ADA requirements.
 - 1. Refer to Section 011100 Summary of Project and Section 014116 Accessibility for Persons with Disabilities.
- D. Provide structural engineering of structural and support of exhibits and graphics including footings.
- E. Testing and Inspections:
 - 1. Contractor shall obtain required construction inspections including structural observation, intermediate, and final as required by this Work.
- F. Review Contract Documents and digital graphic layouts.
 - 1. Confirm digital graphics provided matches the Contract Documents.
 - 2. Confirm digital format is acceptable for use.
 - 3. Confirm output size of each graphic layout is compatible with the size of the corresponding position.
 - 4. Verify the fit and cropping of images within graphic layouts.
 - 5. Verify that required files are furnished with the digital files.
- G. Purchase licensing agreement for fonts.
- H. Create Production-Ready digital files, including:
 - 1. Preparation of digital files for specified output.
 - 2. Adjusting digital graphic layouts for color corrections and bleed.
- I. Produce Sample Proofs and Product Submittals:

1. Produce and submit intermediate proofs, samples, and revised layouts for review and approval.
 2. Refer to Part 1 Submittals of this section.
- J. Produce Graphic Media:
1. Media may include, but is not limited to, digital output processes, photographic prints and transparencies, pressure sensitive graphics, heat transfer films, screen printing, porcelain enamel graphics, fiberglass embedded prints, photo-etched or sandblasted materials, cut-out lettering, hand painting, and applique.
- K. Provide an electronic copy of Production-Ready digital files on labeled CDs, USB, or on-line to the Owner with Project Closeout documents.
1. Refer to Part 3 Execution.

1.04 QUALITY ASSURANCE

- A. Contractor's Qualifications:
1. Contractor and Subcontractors shall be experienced in producing exhibits and graphics similar to those indicated for this Project, with a record of successful in-service performance of not less than three (3) years.
 2. Contractor and Subcontractors shall have sufficient production capacity to produce the exhibits and graphics without causing delays in the project schedule.
 3. Contractor shall furnish and install the elements, the structural support system and connections and accessories required to provide a complete installation.
- B. Delegated-Design Submittal:
1. Structural members and electrical equipment indicated on the Exhibits and Graphics documents are intended for aesthetic or thematic intent only. Such indication on the drawings shall not negate the requirement for engineered design and review.
 2. Structural Engineering: Include structural analysis data for fabrications to comply with design loads; signed and sealed by the qualified professional engineer responsible for their preparation and licensed by the authority having jurisdiction.
 3. Electrical Engineering: Lighting and electrical connection to permanent power signed and sealed by the qualified professional engineer responsible for their preparation and licensed by the authority having jurisdiction.
- C. In-Fabrication Review:
1. Owner and/or Designer will visit the Contractor's fabrication facility to review the progress and condition of the Work, at mutually agreed upon times. Contractor will make available for review by Owner and Designer documentation of the source and quality of materials used in the fabrication of the exhibits and graphics.
 - a. Quantity of fabrication facility visits: Two (2).
- D. Products:
1. Products shall be new stock, free from defects.
 2. Fabrication or installation methods or procedures shall not change the material warranty, quality, nor have an adverse effect on existing materials and surfaces.
 3. Handle and install products according to manufacturer's instructions.
- E. Fire Resistance:
1. Potentially combustible materials shall be fire-resistant. Whenever possible, fire resistance shall be inherent in the material. If necessary, applied fire retardants will be acceptable if they do not adversely affect the quality of the finished material.
 - a. Documentation of flammability testing by qualified testing services shall be required for potentially combustible materials.
 - b. Fire Resistance: For each material, Class A (1) fire-rating for any interior sign.
- F. Painting and Finishing:

1. Contractor or its subcontractor shall have no less than three (3) years of successful experience in painting work similar in scope to the work of this project and are qualified to fulfill the requirements of the Work.
2. For each individual system: Provide primer and other undercoat paint produced by the same manufacturer as finish coat.
3. Exhibits and graphics shall have finished fronts, sides and backs whether or not shown on the Drawings.

1.05 PREQUALIFIED CONTRACTORS

- A. Prequalified Contractors that will be considered for the work.
 1. 4MC Corp., 8040 Jordan Rd., Argenta, IL, 217-795-4416, 800-628-8960, <http://4mccorp.com>
 2. Adirondack Scenic Studios, 439 County Route 45, Argyle, NY 12809, 513-638-8000, www.adkstudios.com
 3. Craftsmen, 3101 Elm Point Industrial Drive, St. Charles, MO 63301
 4. Engraphix 132 Hanley Industrial Ct., St. Louis MO 63144, 314-781-7878 www.engraphix.net
 5. Dimensional Innovations, 3421 Merriam Lane, Overland Park, KS 66203
Tel. 913-384-3488 <http://www.dimin.com>
 6. Star Signs, 801 E 9th St., Lawrence, KS 66044, 785-842-4892, www.starsignsllc.com
 7. Pacific Studios, 5311 Shilshole Ave. NW, Seattle, WA 98107, 206-783-5226 ext. 112, www.pacificstudio.com
 8. Ravenswood Studio, 6900 N. Central Park Ave., Lincolnwood, IL 60712, 847-679-2800 <http://www.ravenswoodstudio.com/>
 9. Taylor Studios, 1320 Harmon Drive, Rantoul, IL 61866, 217-893-4874 <http://www.taylorstudios.com> Weber Group, Inc., 5233 Progress Way, Sellersburg, IN 47172, 812-246-2100 www.webergroupinc.com
 10. Zymo Sculpture Studio, 1520 N Broadway, St. Louis, MO 63102 Tel. 314-421-9966, <http://www.zymostudio.com>

1.06 PROJECT CONDITIONS

- A. Field Measurements: Contractor to take field measurements prior fabrication to ensure proper fitting. Show recorded measurements on shop drawings.
- B. Coordinate supports, anchors, footings, and utilities with locations of adjacent site and building elements.
- C. Exhibits and graphics shall not have protrusions, sharp edges, and other potential hazards for both guests and employees.
- D. Exhibits and graphics are to be installed in a commercial, high-traffic area with exposure to weather, including high humidity, heat, and winds. Exhibits and graphics must be durable under these conditions.
- E. Exhibits and graphics will be within reach of guests and employees. Exhibits and graphics must be durable under these conditions.

1.07 DIGITAL FILE PRODUCTION

- A. Digital Files:
 1. FPO Image Files (For Position Only, also known as For Placement Only): The digital files used to prepare the Drawings are FPO (For Position Only.) These digital files are not Production-Ready for graphic media output.
 - a. FPO Image Files are the digital files used to prepare the comp images for exhibits and graphics; panels, labels, captions, images, and three-dimensional text and objects.
 2. Graphic Production Files: Designer to prepare digital files as outlined in "Graphic Production Files," with a file structure in a universal format for distribution to the Contractor.

3. Production-Ready Files: Contractor to prepare digital files for specified graphic media output including, but not limited to, file management, file translation, dust-busting (correction of damage on original hard copy or negative), retouching, color correction, bleeds, cropping, and scaling of the digital files as required for the design intent.
- B. Text Content:
1. Text content (message copy) shown on the Drawings is FPO. Owner to provide final content for text layout to Designer. Designer to prepare outlined (vector) text and distribute digital files to the Contractor. Contractor to submit graphic layout with content for approval by the Owner prior to fabrication.
- C. High Resolution Images:
1. Images shown on Drawings are FPO. Designer will provide layouts with high-resolution images inserted. Contractor to manipulate digital files, as needed, to achieve the design intent.
- D. Graphic Production Files:
1. Software: The most current version, or one major release prior to the most current version of the following software:
 - a. Adobe InDesign for graphic layout files.
 - b. Adobe Photoshop for image (raster based continuous tone) files.
 - c. Adobe Illustrator for vector based graphic illustration work.
 - d. Adobe Acrobat for PDF (portable document format) files.
 2. Graphic Production Files: Designer shall provide electronic files as vector artwork (Adobe Illustrator CS6), or as scaled raster (concept) artwork (Adobe Photoshop CS6) at 150 (ppi) pixels per line a length of one inch, depending upon the design intent.
 - a. Contractor to provide field verified graphic dimensions to Designer for use in preparation of Graphic Production Files.
 3. Production-Ready Files: Contractor to develop Production-Ready digital files at a minimum resolution of 150 (ppi) pixels per line a length of one inch. Printer output shall be at a minimum resolution of 600 (dpi) dots per line a length of one inch.
 - a. Contractor to confirm output resolution for each production method.
 4. Digital File Structure:
 - a. Files shall have a specific file structure in a universal format that can be read by current Microsoft Windows and Apple Macintosh operating systems.
 - b. Raster Files
 - 1) Raw Files: Unimproved scan files, supplied files, and digital camera raw files.
 - 2) Working Files: Layered psd (Photoshop native file format) files.
 - 3) FPO Image Files: Low resolution such as JPG versions of images for developmental purposes.
 - 4) Graphic Production Files: Flattened files linked to the layouts.
 - c. Vector Illustration Files
 - 1) Adobe Illustrator files organized into layers.
 - 2) Supporting information shall be located in the document margin and placed on a separate layer.
- E. Typography and Font Licensing:
1. Designer to provide a listing of fonts shown in layouts.
 2. Contractor to purchase license for fonts for the production of the project. Contractor is responsible for securing a software licensing requirement from the font copyright owner.
 - a. Terms of the font licensing agreement to include commercial reproduction for the purposes of the Scope of Work, one back up copy, embedment in documents as required for distribution and review, and for display on a minimum of five (5) computers and printers at more than one geographic location,
 - b. If desired, Owner shall purchase a license for fonts for the maintenance of the project.

3. Contractor to provide text in the typefaces, sizes, and colors as indicated on Drawings.
 - a. Fonts, text, and message copy shown on Drawings shall not be used in lieu of Production-Ready templates or Production-Ready digital art. Type fonts shown are guidelines for layouts and type size and are based on scale calculations of the message lengths within given and estimated graphic areas.
 - b. Should conflicts arise in the message layout, the Designer shall be notified before the Contractor proceeds with fabrication.
 4. Standard, commercially available and customized type shall be accurately and cleanly reproduced unless noted otherwise. Edges and corners of text shall be executed as true, clean, correctly spaced, and precise to accurately reproduce the letterforms.
 5. Alignment of letterforms shall maintain a horizontal base line, unless otherwise indicated. Letterforms shall be aligned to maintain a baseline parallel to the sign format, unless otherwise noted. Margins shall be maintained as indicated in the layouts.
- F. Logo / Brand Graphics:
- a. Owner/Designer to provide licensed logo graphics to Contractor.
 - b. Contractor to submit logo graphics on shop drawings for verification and review by the Owner.
- G. Color Management:
1. Color selections for both digital and non-digital processes shall be provided in the Contract Documents, or provided by the Designer to the Contractor upon Notice of Award.
 2. Designer to provide color selections and identify using Pantone PMS system colors.

1.08 CORRECTIONS TO DIGITAL FILES AND PROOFS

- A. Contractor shall be responsible for the correctness of Contractor-generated layouts.
- B. Contractor shall make corrections to the digital layouts and files when:
 1. Text and/or images are found to be incorrect due to errors in the preparation of the layouts or files.
 2. Legibility of text and/or images is unacceptable. Contractor to make adjustments to the layout and/or font size as needed to enhance contrast between text and the background.
 3. Color settings in digital files are inconsistent with the color specifications for the media output, in comparison to approved samples.

1.09 REVIEW OF GRAPHIC PRODUCTION

- A. Contractor shall not proceed with fabrication until full or scaled Production-Ready digital files are approved by the Designer and the Owner. Refer to Part 1 Submittals.
- B. Contractor to promptly notify the Designer of conflicts that may arise in Owner or Designer provided digital files.
- C. Designer will review submittals, samples and shop drawings for compliance with the Contract Documents.
- D. Proof Reading:
 1. Owner shall review spelling, punctuation and grammar.
 2. Owner shall approve text (message copy) in writing. Contractor shall not proceed with fabrication without approval in writing from the Designer and the Owner.
 3. Should the Contractor detect any errors, these shall be brought to the attention of the Designer and the Owner prior to fabrication.

1.10 PROPERTY RIGHTS

- A. Exhibits, graphics, and media shall be work for hire. Contractor and all applicable subcontractors will grant and assign to Owner all right, title and interest to the work done under this contract, and will sign and deliver to Owner necessary documents and otherwise assist the Owner to obtain

intellectual property or other appropriate legal rights of the United States and foreign countries and to vest title in the Owner. If Owner is unable for any reason to get Contractor's or any subcontractor's, as applicable, signature to any lawful document needed to obtain intellectual property or other appropriate legal rights, Contractor or the applicable subcontractor irrevocably appoints the Owner and Owner's duly authorized officers and agents as its attorney in fact to execute and file any such application, assignment, or document and do all other lawfully permitted acts to further the procurement and maintenance of copyrights and other proprietary rights with the same legal force and effect as if signed by the Contractor and/or applicable subcontractor.

- B. Contractor shall not employ the use of any material, method, system, component or process that is patented and/or copyrighted for which the use would require payment of a royalty or license fee without first obtaining the copyright owner's or their representative's written consent to the use of such patented material, method, system, component or process.
- C. Contractor shall indemnify and hold the Owner and the Designer harmless from and against liability, judgments, losses, costs or expenses including attorneys' fees incurred to defend any claims for infringement of any patent rights relating to or arising out of any materials delivered which constitute or is claimed to constitute an infringement of any patent rights or copyrights related thereto.
- D. In the event the use of designated materials or methods are enjoined, the Contractor at its expense shall secure for the Owner the right to continue using said materials or methods, replace the materials or methods with non-infringing materials, modify them so they become non-infringing, or remove the infringing materials or methods and refund to the Owner costs and damages associated therewith without prejudice to any other rights the Owner may have.

1.11 SUBMITTALS

- A. Shop drawings showing fabrication and erection of exhibits and graphics. Include plans, elevations, and large-scale sections of typical members and other components. Show anchors, grounds, layout, reinforcement, accessories, and installation details, as needed to effectively communicate the Contractor's fabrication and installation.
 - 1. For exhibits and graphics supported by or anchored to permanent construction, provide setting drawings, templates and directions for installation of anchor bolts.
 - 2. For self-supporting exhibits and graphics, provide elevations, plans and sections, including footing details.
- B. Engineer's signed and sealed drawings and calculations.
- C. Product data for materials used. Include chemical composition, flame spread, and fire rating information for each product used.
 - 1. Substitutions: Submit in accordance with Section 016000 - Product Requirements.
- D. Art and copy layouts for proofing.
- E. Samples for verification of color, pattern, and texture selected and compliance with requirements indicated. Provide three (3) of each unless noted otherwise.
 - 1. Actual paint samples on 8-1/2" x 11" cardboard (4 each).
 - 2. 6" x 6" sample of metal patterns.
 - 3. Sample of each type of decorative material.
 - 4. 12" x 12" color sample of each type of graphic on the material/substrate, showing the base PMS color matches for background and text.
 - 5. Sample of each typical dimensional letter with finish.
 - 6. Sample of each typical dimensional letter and/or box for each light fixture assembly for evaluation of illumination brightness, intensity and uniformity of light.
 - 7. Progress Photos, as requested by the Owner or Designer.

- 8. Records of stain, sealer and top coat, paint mixing equations and any other pertinent information for use in making repairs and replacement parts in the future.
- 9. See Schedule of Mock Ups for additional requirements.
- F. Project Closeout: Electronic production-ready vectored artwork files are to be given to the Owner upon project completion on labeled CDs, USB, or on-line.
- G. Cleaning and Maintenance Data: Include procedures for operation and maintenance including stain removal.
- H. Warranties: Submit warranties from manufacturers, fabricators and installers.

1.12 MOCK UPS

- A. Mock ups shall be representative of the construction and finish of the exhibits and graphics.
- B. Install mock up on site in location designated by the Owner's Representative. Mock-up may remain as part of the Work, if approved by Owner's Representative.
- C. Construct mock-up panel sized 3'-7" wide, by 6' feet high by 4 inches deep. Include supports and accessories.
- D. Construct mock-up interactive Kerplunk device sized 1'-7" wide, by 3' feet high, by 7" deep.
- E. Mock Up Schedule: Provide mock ups of the following:
 - 1. EX02.46: Kerplunk device – provide prototype for testing and approval by owner.
 - 2. EX02.43: Mock up a typical graphic panel

1.13 DELIVERY, STORAGE AND HANDLING

- A. Inspect buy-out material upon receipt from the manufacturer. Reject any defective or damaged materials.
- B. Handle and store materials according to manufacturer's instructions.
- C. Deliver elements to the project site in undamaged protective packaging labeled with specific contents.
- D. Protect materials from damage on construction site and store in a safe, dry location.
- E. Any material that becomes damaged during manufacture, shipping, or while being stored shall be replaced at no additional cost to the Owner.

1.14 WARRANTY

- A. Contractor shall warranty works under this section for three (3) years from the date of Substantial Completion.
 - 1. Paint finishes are to be warranted against fading, discoloration, cracking and peeling for a minimum of five (5) years from the date of Substantial Completion.
- B. Products with a manufacturer's warranty exceeding one year shall be warranted for the manufacturer's specified length of time from the date of Substantial Completion.
- C. Contractor shall provide copies of written statements of warranty to the Owner prior to Substantial Completion.

PART 2 - PRODUCTS

2.01 APPLIED VINYL ON WALLS

- A. Premium Cast Vinyl:
 - 1. Thickness: 2 mil without adhesive, 3 to 4 mil with adhesive.
 - 2. Roll Width: 60 inches.
 - 3. Properties: Capable of electronically generated cuts.

4. Color: White.
 5. Finish: Luster.
 6. Adhesion: Clear, pressure sensitive, with synthetic liner.
- B. Products:
1. 3M™ Controltac Graphic film Series 180 with Comply Adhesive 180C, 3M™ Commercial Graphics Division, 1-888-364-3577, <http://solutions.3M™.com>
 2. AveryDennison, formerly Avery Graphics, <http://www.na.averygraphics.com>
 3. Substitutions: Submit in accordance with Section 016000 - Product Requirements.
- C. Wall Preparation:
1. Finish gypsum board in accordance with levels defined in ASTM C 840, as follows:
 - a. Level 5: Walls and ceilings to receive semi-gloss, gloss paint finish, graphics applied directly to walls, graphic wall coverings, and other areas specifically indicated.
 2. Gypsum board dust or debris must be removed prior to painting the wall.
 3. Entire wall must be painted with primer.
 4. Check the wall for any imperfections. Any imperfection will be magnified two or three times when the graphic is installed.
 5. The wall must be painted with no less than a semi-gloss finish, with even distribution and full coverage.
 6. The paint must dry/cure for a minimum of 72 hours prior to installation of vinyl graphics. Oil based paint to cure is two times the drying time recommended by the manufacturer.
 7. The entire area of the wall intended for graphics applied is to be painted, evenly with full coverage.
 8. Vinyl graphics will not adhere well to gypsum board, gypsum board compound or primer or paints that have a flat or eggshell finish.
- D. Graphic Protection: 3M™ Screen Print Clear Coat, recommended by manufacture for installation and compatible with inks used to produce the graphic. Provide two coats of over-laminate at applications on wall surfaces.
- E. Warranty to be a three (3) years against fading, cracking, chipping and peeling.
1. Graphics to be installed by a manufacturer's certified installer to preserve warranty.

2.02 DIMENSIONAL CHARACTERS

- A. Aluminum Extrusions: ASTM B 221 (ASTM B 221M), 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 6063-T5.
- B. Cutout Characters: Cut characters from solid plate of thickness and metal indicated. Produce precisely cut characters with square cut, smooth edges. Comply with requirements indicated for finish, style, and size.
1. Metal: Aluminum
 2. Finish: Painted
 3. Characters 1" thick or less shall be solid plate. Characters greater than 1" thick shall be Reverse Fabricated.
 4. Edges: Square cut, polished.
 5. Mounting Methods: Use concealed fasteners fabricated from materials that are not corrosive to sign material and mounting surface.
- C. Channel Letters, Non-Illuminated:
1. Backs: .063", .080" (letters over 4'), thick aluminum. Mounting holes precision routed into backs.
 2. Returns: .063" thick aluminum welded to backs.
 3. Supports: 1" aluminum square tube frame.

2.03 ENCAPSULATED ALUMINUM

- A. Encapsulated dye sublimation to aluminum substrate, containing 97% recycled content.
 - 1. Aluminum Substrate Thickness: .050" minimum.
 - 2. Sheet Size: 48" x 96".
 - 3. Sheet Color: White
 - 4. Finish: Clear, matte finish.
 - 5. UV resistance: No change after 2000 hours, based on ASTM G26/A.
 - 6. Scratch Resistant Coating: Applied prior to dye sublimation.
 - 7. Minimum embedment of graphic: .03125 inches (1/32").
 - 8. Fabricator to indicate required use of material for additional thickness for the encapsulated aluminum panel.
 - 9. Recommended that panels are pressed using a 77"x108" press.
- B. Product / Fabricator:
 - 1. Gopher Sign Company, 1310 Randolph Ave. St. Paul, MN. 651-698-5095
 - 2. Alto Decorative Powder Coating, Systeme Huntingdon Inc. (SHI) 1-800-363-5304 Melanie Daigle, 1-800-363-5304 x254 <http://www.altoaluminum.com>
 - 3. Substitutions: Submit in accordance with Section 016000 - Product Requirements.
- C. Warranty to be a ten (10) years against fading, cracking, chipping and peeling.
 - 1. Graphics to be installed by a manufacturer's certified installer to preserve warranty.

2.04 METAL PLAQUE

- A. Cast Metal Plaque:
 - 1. Material: Cast aluminum.
 - a. Type: Virgin ingots, F-214 Aluminum Alloy, Aluminum Association Alloy Designation C443.2.
 - b. Thickness .375".
 - 2. Material: Cast bronze.
 - a. Type: Virgin ingots, 89833, Federal Alloy, lead and mercury free.
 - b. Thickness: Minimum .25" for small graphics. Minimum .31" for larger graphics. Minimum .375" for graphics larger than 36" x 30".
 - 3. Overall Size: As indicated on Drawings.
 - 4. Edge: Single line
 - 5. Letter Style: Custom. Designer to provide vector art.
 - 6. Background Texture: Pebbled.
 - 7. Finish: Dark Metallic (Matthews Paint MP18149).
 - 8. Mounting Method: Rosettes and Toggles
 - a. Provide rough blocking as required to support weight of plaque.
 - 9. Content: As indicated on Drawings.
- B. Manufacturers:
 - a. Matthews International Architectural Products, Zelienople, PA 16063, www.matw.com , 800-628-8439.
 - b. Trigard Memorials, Danville, IL 61832, www.trigardengravedbronze.com , 800-798-4900.
 - c. The Southwell Company, San Antonio, TX 78215, www.southwellco.com , 210-223-1831.
 - d. Substitutions: Submit in accordance with Section 016000 - Product Requirements.

2.05 METALS

- A. General:
 - 1. Exposed metal work shall be smooth and free of surface blemishes including pitting, roughness, seam marks, roller marks and/or trade names. Do not use materials which have stains or discolorations.

2. Welds should be continuous, clean and ground smooth. Welds should not be visible under paint surface. Joints should be ground to a clean, tight corner.
 3. Paint surfaces unless otherwise noted.
- B. Aluminum:
1. Reference Standards: ASTM B209-07 and ASTM B221.
 2. Material:
 - a. Plates and Sheets: Alloy 6063-T5 meeting ASTM B209.
 - b. Extrusions: Alloy 6063-T5 meeting ASTM B221.
 - c. Perforated Sheet Metal: Aluminum Alloy 3003-H14, 1/4" round perforations on 5/16" staggered centers, 58% open area. Sheet metal thickness (gauge) to be determined by Contractor.
 3. Finish: As indicated in Exhibits and Graphics Drawings.
 - a. Coat aluminum in contact with concrete and cementitious materials with a conversion coating to prevent corrosion.
- C. Steel:
1. Steel Sections: ASTM A 36/A 36M, or as noted on drawings and scope of work.
 2. Steel Tubing: ASTM A 500, Grade B cold-formed structural tubing.
 3. Plates: ASTM A 283, ASTM A 276 - Type L, or as noted on drawings and scope of work.
 4. Pipe: ASTM A 53/A 53M, Grade B Schedule 40, black finish.
 5. Welded frames and bracing, hot-dipped galvanized steel.
 6. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.
 7. Bolts, Nuts, and Washers: ASTM A 325, galvanized to ASTM A 153/A 153M where connecting galvanized components. Made in the USA only
 8. Welding Materials: AWS D1.1/D1.1M; type required for materials being welded.
 9. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, Type I - Inorganic, complying with VOC limitations of authorities having jurisdiction.
 10. Size: Provide sizes appropriate for the fabrication condition to prevent warping and distortion.
 11. Finish: As indicated on Drawings.
- D. Stainless Steel:
1. ASTM A276 Type 304
 2. Bolts, Nuts, and Washers: ASTM A320. Made in the USA.

2.06 PAINT

- A. General:
1. Coloring agents used in this project shall be as stable as possible. Any fading, discoloration or delamination within the warranty periods shall be unacceptable.
 2. Paints and pigments shall contain no lead.
- B. Manufacturers:
1. Matthews Paint Company, a division of PPG Industries, Delaware, OH, 800-323-6593, www.ppg.com/coatings/matthewspaint
 2. Substitutions: No Substitutions.
- C. Provide the Manufacturer's premium grade product, top coat, undercoat and primer, complying with compositional requirements and recommended for anticipated exposures and substrates.
- D. Paints, pigments, inks or any other coloring agents used on acrylic coated fabrics shall be as recommended by the Manufacturer for optimum adherence to acrylic surfaces and fade resistance in the intended applications.
- E. Volatile Organic Compounds:
1. Painted items located on the interior of buildings shall be low VOC based on the California South Coast Air Quality Management District (SCAQMD) Rule 1113, Architectural Coatings.

- a. Graphic Arts (sign) Coatings, less than 500 g/L.
- F. Systems: Top coat colors and textures to be as indicated on Exhibits and Graphics Drawings. For each individual system, provide primer, other undercoat, and clear coat paint produced by the same manufacturer as the finish topcoat.
 - 1. Substrate Preparation: Matthews Paint pretreatment, fillers and/or undercoat as recommended by manufacturer.
 - 2. Provide manufacturer's recommended additives, intermediate surfacers, sealers and/or spray bond for application method and environmental conditions.
 - 3. Return of dimensional letters, channel letters and cabinets to be same as face color unless otherwise noted.
 - 4. Exposed rear faces of channel letters, dimensional letters and cabinets to be same as face color unless noted otherwise.
- G. Schedule: Sheen as specified, unless noted otherwise on Drawings.
 - 1. Interior Exhibits and Graphics:
 - a. Primer: Ultra Low VOC primer recommended by manufacture for substrate and topcoat.
 - b. Topcoat, minimum two coats: Series MAP-LV, acrylic polyurethane Ultra Low VOC.
 - c. Clear Coat: Series MAP-LVC 228, Ultra Low VOC, satin sheen.
 - 2. Exterior Exhibits and Graphics, and Non-Tempered Spaces:
 - a. Primer: Low VOC primer recommended by manufacture for substrate and topcoat.
 - b. Topcoat, minimum two coats: Series MAP SVOC (Satin VOC), acrylic polyurethane Low VOC, Satin sheen.
 - c. Clear Coat: Low VOC, Super Satin Series 290-228, satin sheen.
 - 3. Clear coating for ADA Graphics:
 - a. SOA 4158SP ADA Clear, meeting ADA requirements for gloss and appearance.
 - 4. Clear coating of surfaces where clear coat is noted, but no top coat is desired:
 - a. Super Satin Clear #290 228SP, two component fluoropolymer.
 - 5. Clear coating of metals where clear coating is noted, but no top coat is desired. Coating of stainless steel is not recommended.
 - a. Topcoat: Series SOA 6062SP Satin Gloss Clear.
 - b. Topcoat: Series 42-260SP Braco High Gloss Clear.
 - 6. Interior reflective surfaces of channel letters and lighted cabinets:
 - a. Primer and Top Coat: MP High Reflective White Paint.

2.07 CONCRETE

- A. Concrete – Refer to Section 033000 Concrete

2.08 FASTENERS

- A. Mechanical fasteners shall be concealed, unless noted otherwise as part of a thematic design.
- B. Fasteners shall be corrosion-resistant and chemically compatible with adjacent materials.
- C. Any screw, bolt head or other mechanical fastener that cannot be concealed shall be countersunk whenever possible and colored to match the surrounding area.
 - a. Any exposed screw ends are to be capped with stainless steel acorn nuts.
- D. Anchors and Inserts: Provide stainless steel anchors and inserts for exterior installations and elsewhere required for corrosion resistance. If fasteners are not available in stainless steel, provide hot-dipped galvanized anchors and inserts.
 - 1. Provide toothed steel expansion bolt devices for drilled in place anchors.
 - 2. Provide inserts, as required, to be set into concrete or masonry work.
- E. Attachment Hardware: Provide stainless steel attachment hardware. If hardware is not available in stainless steel, provide hot-dipped galvanized hardware.

- F. Two-Face Tape: Manufacturer's standard high-bond, foam-core tape, 0.045 inch (1.14 mm) thick, with adhesive on both sides.
 - 1. Product: 3M VHB (very high bond) double-sided adhesive transfer tape.
 - 2. Material: 2.0 mil 100MP adhesive with 4.2 mil 58 lb. poly-coated craft paper liner.
 - 3. Width: ½" wide.
 - 4. Color: Clear.
- G. Standoff Panel Supports and Caps:
 - 1. Type and size required for mounting method.
 - 2. Manufacturers:
 - a. Albion, 615-591-9731, <http://signdesignsystems.com>
 - b. Gyford Standoff Systems, 775-829-7272, <http://www.standoffsystems.com>
 - c. Nova Display, 800-753-9688, <http://www.novadisplay.com>
 - d. Substitutions: Submit in accordance with Section 016000 - Product Requirements.
 - 3. Material: Stainless steel.
 - 4. Optional: Hardware Snap Cover, as manufactured by 3Form, 800-726-0126, 206-524-2223, www.3-form.com
 - 5. Color: Paint to match returns of graphic.

PART 3 - EXECUTION

3.01 FABRICATION

- A. General:
 - 1. Components shall be shop-fabricated and shop-assembled to extent possible.
 - 2. Responsibility for methods and techniques used to construct the work lies solely with the Contractor.
 - 3. Exhibit and Graphic Media shall be free of bubbles, flaws, streaks or other anomalies.
- B. Substrate edges and backs shall be finished, primed and painted a color, unless noted otherwise.
- C. Graphic Media: Provide paints and inks compatible with printing films and substrates. Paints, inks, films, substrates, and over laminates shall be UV-resistant.

3.02 EXAMINATION

- A. Verify that field dimensions and conditions are acceptable and are ready to receive work.

3.03 PREPARATION

- A. Supply setting templates to the appropriate entities for steel items required to be cast into concrete.

3.04 PANEL FABRICATION

- A. Provide panel exhibits and graphics that comply with requirements indicated for materials, thicknesses, finishes, colors, designs, shapes, sizes, and details of construction.
- B. Conform to requirements of this section for structural design, concealment of fasteners and fabricated materials including attachment to structure.
- C. Produce smooth panel sign surfaces constructed to remain flat under installed conditions within tolerance of plus or minus 1/16 inch (1.5 mm) measured diagonally.
- D. Shop Fabrication: According to panel manufacturer's instructions.
- E. Edge finish to eliminate sharp edges, protrusions or other potential hazards.

3.05 METAL ASSEMBLY AND INSTALLATION

- A. Fabricate and shop-assemble in largest sections practical for delivery to site.
- B. Prepare and reinforce fabrications as necessary to receive applied items.

- C. Grind exposed edges. Give corners a radius of 1/8 inch. This includes edges created by routing or water jet cutting processes.
- D. Provide gasketing, insulation or other method necessary to prevent galvanic action between dissimilar materials.
- E. Joints: Joints are to fit tightly and securely. Joints to be ground to a clean, tight corner. Make exposed joints tight, flush and hairline.
- F. Welding:
 - 1. Make welds clean, continuous and ground clean.
 - 2. Welding shall be accomplished so that permanent distortions of flat surfaces are minimized.
 - 3. Remove welding flux and oxides by grinding or pickling so that these areas match the finish of adjacent surfaces.
 - 4. Any damaged cause by fabrication shall be repaired by grinding, polishing or buffing.
- G. Water Protection:
 - 1. Cap open ends to keep out water and provide adequate drainage for water that does penetrate.
 - 2. Weep holes to be placed in channel letters, sign cabinets and frames to allow proper drainage.
- H. Do not weld, cut, or abrade surfaces of exterior units that have been hot dip galvanized after fabrication and are for bolted or screwed field connections.
- I. Install items plumb and level, accurately fitted, free from distortion or defects.
- J. Provide for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.
- K. Obtain approval prior to site cutting or making adjustments not scheduled.
 - 1. Any field welding required is to be approved by Owner's representative before welding is to commence.
 - 2. Any approved field welds to be in accordance with AWS D1.1/D1.1M.
 - 3. Clean and strip primed steel items to bare metal where site welding is required.
 - 4. Fix exposed connections accurately together to form hairline joints.
 - 5. Materials may be rejected if galvanized coating is damaged in any way.
- L. After erection, prime welds, abrasions, and repair other finish defects to restore finishes.

3.06 APPLIED VINYL ASSEMBLY

- A. Clean and prepare substrates in accordance with manufacturer's recommendations for proper adhesion.
- B. Install according to manufacturer's instructions. Provide uniform adhesion free of distortion, bubbles or subsurface particles.
- C. Where seams are required within an image locate seam(s) to be inconspicuous. Allow for exact alignment of the image along seams.

3.07 PAINTING AND FINISHING

- A. General:
 - 1. Apply coatings to clean surfaces prepared in accordance with manufacturer's instructions for adhesion, optimal coating, and uniform finish.
 - a. Use applicators and techniques in accordance with manufacturer's instructions.
 - b. Apply coatings under manufacturer's recommended environmental conditions. Do not apply exterior coatings during inclement weather.
 - c. Sand gloss coats before applying subsequent coatings.
 - d. Ensure proper adhesion to avoid delamination.

2. Pigmented (Opaque) Finishes:
 - a. Completely cover to provide an opaque, smooth surface of uniform finish, appearance and coverage. Cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness or other surface imperfections shall not be acceptable.
 3. Transparent (Clear) Finishes:
 - a. Multiple coats shall be used to produce smooth-surfaced finishes of even luster. Finishes shall be free of laps, cloudiness, runs, brush marks, orange peel, nail holes, or other surface imperfections.
 4. Metal Assemblies:
 - a. Clean and prepare according to coating manufacturer's recommendation for maximum adhesion.
 5. Surfaces:
 - a. Exhibits and graphics shall have finished fronts, sides and backs whether or not shown on the Drawings. Apply primer to foam and aluminum backing.
 - b. Edges, corners, crevices, welds, exposed fasteners, and other "irregular" surfaces shall receive a dry film thickness equivalent to that of the substrate.
- B. Touch-Up:
1. Protect work from damage until coating is fully cured.
 2. At Substantial Completion, examine surfaces for damage to coatings and restore coatings.
 - a. Touch-up of minor damage will be acceptable where the result is not visible from surrounding surfaces. Where result is different as determined by the Owner and Designer either in color, sheen, or texture, recoat entire surface.

3.08 INSTALLATION

- A. Site Examination:
1. Verify that footings, blocking and backings installed by other trades have been installed in the appropriate locations for anchoring.
 2. Examine substrates and finishes of areas to receive graphic elements to determine if they are in satisfactory condition for installation of systems.
 3. Do not proceed with installation of elements until unsatisfactory conditions have been corrected.
- B. Locate exhibits and graphics where indicated on Drawings, using mounting methods of the type described and in compliance with the material manufacturers' instructions.
- C. Install exhibits and graphics level and plumb, without rack or warp.
- D. Donor panels installed in rockwork to be placed plumb with grade or parallel with surface.

3.09 CLEANING

- A. Repair or remove and replace defective work.
- B. Clean and touch up any soiled or damaged graphic, wall or casework surfaces.

3.10 PROTECTION

- A. Protect installed elements during construction period.
- B. Remove temporary protection at Substantial Completion.

3.11 SCHEDULE OF EXHIBITS AND GRAPHICS

- A. Refer to Exhibits and Graphics Drawings for exhibits and graphics schedule.

END OF SECTION