

## SECTION 10 1419 - DIMENSIONAL LETTER SIGNAGE

### PART 1 - GENERAL

#### 1.01 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### 1.02 SUMMARY

- A. Section Includes:
1. Cast dimensional characters.

#### 1.03 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: For signs.
1. Include fabrication and installation details and attachments to other work.
  2. Show sign mounting heights, locations of supplementary supports to be provided by other installers, and accessories.
  3. Show message list, typestyles, graphic elements, and layout for each sign at least half size.
  4. Show locations of electrical service connections.
  5. Include diagrams for power, signal, and control wiring.

#### 1.04 FIELD CONDITIONS

- A. 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.

#### 1.05 WARRANTY

- A. Special Warranty: 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.

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- b. Separation or delamination of sheet materials and components.
2. Warranty Period: Five years from date of Substantial Completion.

## **PART 2 - PRODUCTS**

### **2.01 DIMENSIONAL CHARACTERS**

- A. **Cast Characters <Insert drawing designation>**: Characters with 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. A.R.K. Ramos.
    - b. ACE Sign Systems, Inc.
    - c. Gemini Incorporated.
    - d. Metallic Arts.
  2. **Character Material**: Cast aluminum.
  3. **Character Height**: As indicated on Drawings.
  4. **Thickness**: 1 inch.
  5. **Finishes**:
    - a. **Integral Aluminum Finish**: Anodized color as selected by Architect from full range of industry colors and color densities.
  6. **Mounting**: Projecting studs.
  7. **Typeface**: Insert requirement.

### **2.02 DIMENSIONAL CHARACTER MATERIALS**

- A. **Aluminum Castings**: ASTM B 26/B 26M, alloy and temper recommended by sign manufacturer for casting process used and for type of use and finish indicated.
- B. **Aluminum Extrusions**: ASTM B 221, alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated.

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2.03 ACCESSORIES

- A. 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:
1. Use concealed fasteners and anchors unless indicated to be exposed.
  2. For exterior exposure, furnish [nonferrous-metal] [stainless-steel] [or] [hot-dip galvanized] <Insert requirement> devices unless otherwise indicated.
  3. Sign Mounting Fasteners:
    - a. 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.

2.04 FABRICATION

- A. General: Provide manufacturer's standard sign assemblies according to requirements indicated.
1. 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.
  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 dimensional characters 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.
  7. 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.

2.05 GENERAL 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.

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- 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.

2.06 ALUMINUM FINISHES

- A. Clear Anodic Finish: AAMA 611, Class I, 0.018 mm or thicker.
- B. Color Anodic Finish: AAMA 611, Class I, 0.018 mm or thicker.

**PART 3 - EXECUTION**

3.01 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance.
- B. 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.
- C. Verify that electrical service is correctly sized and located to accommodate signs.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION

- A. General: 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. Before installation, verify that sign surfaces are clean and free of materials or debris that would impair installation.
  - 3. 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. Mounting Methods:
  - 1. 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.
  - 2. 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.

3.03 ADJUSTING AND CLEANING

- A. 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.

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- 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 10 1419**

## **SECTION 10 14 23 INTERIOR UNFRAMED SIGNAGE**

### **PART 1 GENERAL**

#### **1.1 SUMMARY**

- A. Related Documents: Provisions established within the General and Supplementary Conditions of the Contract, Division 1 – General Requirements and the Drawings are collectively applicable to this Section.
- B. Section includes:
  - 1. Unframed, chemically welded, square or radius corner signs, for interior applications.
  - 2. ADA signage for interior applications
  - 3. EVAC Maps

#### **1.2 QUALITY ASSURANCE**

- A. Installer Qualifications: An employer of workers trained and approved by manufacturer.. Installation shall be performed by installer specialized and experienced in work similar to that required for this project.
- B. Source Limitations for Signs: Obtain all products in this section from one source from a single manufacturer.
- C. Regulatory Requirements: Products shall meet requirements ADA-ABA Accessibilitu Guidelines: US Architectural & Transportation Barriers Compliance Board's "Americans with Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities; Architectural Barriers Act (ABA) Accessibility Guidelines and local amendments and modifications.

#### **1.3 SUBMITTALS**

- A. Submit in accordance with requirements of Section 01 33 00 – Submittals.
- B. Product Data: Submit product data for specified products. Include material details for each sign specified.
- C. Shop Drawings: Submit shop drawings showing layout, profiles, and product components, including dimensions, anchorage, accessories, and installation details. Provide message list, typestyles, graphic elements; including tactile characters and Braille, and layout for each sign.
- D. Samples for Initial Selection: Submit supplier's standard color chart for selection purposes, and selected colors for verification purposes.
- E. Installation: Submit supplier's installation instructions.
- F. Closeout Submittals:
  - 1. Submit operation and maintenance data for installed products, including precautions against harmful cleaning materials and methods.

2. Submit warranty documents specified within.
- G. The Architect will provide a schedule of room names, room numbers, symbols and pictographs (male, female, stair, handicap, etc. and quantities for the project that will be verified by the APS Project Manager.. Schedule shall be compiled from the construction documents/drawings.

#### **1.4 DELIVERY, STORAGE, AND HANDLING**

- A. Comply with requirements of Division 1.
1. Comply with manufacturer's ordering instructions and lead time requirements to avoid construction delays.
  2. Deliver products in manufacturer's original, unopened, undamaged containers with identification labels intact, only after the building is enclosed and designated areas are ready to receive work.
  3. Store products protected from weather, temperature, and other harmful conditions as recommended by supplier.
  4. Handle products in accordance with manufacturer's instructions.
  5. Cover or otherwise protect installed signage from damage or stains for remainder of work.

#### **1.5 WARRANTY:**

- A. Project Warranty: Comply with requirements of Division 1.
- B. Manufacturer's Warranty: Submit manufacturer's standard warranty document executed by authorized company official, 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 metal and polymer finishes beyond normal wear and tear.
    - b. Deterioration of graphic image and colors.
- C. Warranty Period: One (1) year from project date of Substantial Completion.

## **PART 2 PRODUCTS**

### **SIGNAGE SYSTEMS**

**A. Product:**

Unframed square or radius-corner signage with Graphic insert. Manufacturer's proprietary software to be provided for use with existing APS Microsoft Word software for convenient revision of Signage inserts. Signs shall be fabricated from solid-color modified acrylic polymer. Raised letters and symbols recessed into sign face and chemically welded,

**B ADA Compliant signage with text and standard pictograms.**

**C. Fabrication**

1. Chemically welded in compliance with indicated materials, thickness, finish, colors, designs, shapes, sizes, and details. Subsurface graphics to comply with manufacturer's standard process for precisely formed, uniformly opaque graphics for indicated size, style, spacing, content, position, and colors.
2. Clear matte lens with paper insert (paper to be 24 lb. White, perforated to 4 5/8" H x 5 1/2" W)
3. Panel Size: 6 3/8" high x 6 3/8" wide.
4. Panel Finish: Selected from one of the following colors:
  - a. Navy Blue
  - b. Forrest Green
  - c. Burgundy
  - d. Light Grey
5. Back Plate: 0.125 inch thick acrylic panel, clear, matte first surface.
6. Fastener: .030 inch thick double-face tape and/or concealed mechanical.

**D. ADA Signage (standard header):**

1. Size: 1-1/2" high x 6" wide, chemically welded
2. Text or graphic color(s): Black (confirm with Architect)
3. Letter style: Helvetica Regular Font, capitals, lower case, and numerals.
4. Letter size: 5/8" high, 3/8" spacing between lines of text
5. Text Schedule: Provided by architect; includes room names and numbers to be reviewed by APS Project Manager.
6. Tactile Graphics and Text: Provide tactile copy raised 1/32" minimum from plaque first surface by manufacturer's stratification process
7. Provide lettering and graphics precisely formed, uniformly opaque to comply with relevant ADA regulations and requirements indicated for size, style, spacing, content, position, and colors.

**E. EVAC Maps**

1. Evacuation Plan Signs Artwork to be provided by the Architect or Life Safety Engineer.
2. Designed for a Changeable Paper insert in a clear window
3. Subsurface painted border to receive an 8 1/2" x 11" Evacuation Plan insert
4. Signage Contractor shall create appropriate quantity (consult Architect) with "you are here" noted for each Stair Sign. Print and install the initial insert

5. Install EVAC signs at entry door to each Stairwell on the adjacent hall wall or as determined by the Architect.

F. Signage: **See "Exhibit A" attached.**

1. Size: 6 3/8" x 6 3/8" overall with square or radius corners
2. Frame Color: (Selected from one of the following colors):
  - a. Navy Blue
  - b. Forrest Green
  - c. Burgundy
  - d. Light Grey
3. Paper Color: White
4. Text or graphic color: White (recessed text)
5. Letter style: Helvetica Regular Font, capitals, lower case, and numerals.
6. Letter size: 5/8" high
7. Lens panel: Clear Matte

## 2.2 SIGN MATERIALS

- A. Mounting Panel: Acrylic
- B. Face: Vacuum formed 1.5 mil, clear, scratch resistant PVC/vinyl acetate bonded to acrylic mounting panel.

## 2.3 FABRICATION OPTIONS

- A. Tactile Graphics and Text:
  1. Fabrication process: Provide tactile copy raised 1/32-inch minimum from plaque first surface by manufacturer's vacuum formed embossing process.
  2. Provide lettering and graphics precisely formed, uniformly opaque to comply with relevant ADA regulations and requirements.
- B. Mounting Panel Options:
  1. .125 inch thick matte finished black acrylic
- C. Background Appearance Options:
  1. Custom colors as selected by Owner.
- D. Tactile Lettering and Graphics Color Options: White
- E. Overall panel size 6 3/8" x 6 3/8".
- F. Shape: Standard with square corners
- G. Letter style: Helvetica Regular Font, capitals, lower case, and numerals.
- H. Letter size: 5/8" high

- I. Text schedule: To be provided by Architect
- J. Classrooms, offices and general rooms to be provided with Changeable Paper insert signs.
- K. Janitorial, MEP, Data (IDF, MDF), toilets (Boys, Girls, Faculty), Stair, Stairwell and In Case of Fire signs are to be provided as Full Tactile Plate Signs

## **2.4 INSTALLATION METHOD**

- A. Vinyl tape, silicone adhesive or concealed mechanical anchoring to insure adhesion to either painted gypsum board, wall covering, or masonry surfaces.

## **2.5 FABRICATION – GENERAL**

- A. General: Comply with requirements indicated for materials, thicknesses, finishes, colors, designs, shapes, sizes, and details of construction.
- B. Pre-assemble signs in the shop to the greatest extent possible to minimize field assembly. Disassemble signs only as necessary for shipping and handling limitations. Clearly mark units for re-assembly and installation, in a location not exposed to view after final assembly.
- C. Conceal fasteners, if possible; otherwise, locate fasteners to appear inconspicuous.
- D. Form panels to required size and shape. Comply with requirements indicated for design, dimensions, finish, color, and details of construction.
- E. Coordinate dimensions and attachment methods to produce message panels with closely fitting joints. Align edges and surfaces with one another in the relationship indicated.

# **PART 3 EXECUTION**

## **3.1 EXAMINATION**

- A. Site Verification of Conditions: Verify installation conditions previously established under other sections are acceptable for product installation in accordance with manufacturer's instructions.
- B. Installer proceeding with installation implies acceptance of substrate and conditions.

## **3.2 INSTALLATION**

- A. Install product in accordance with supplier's instructions/
- B. Install product in locations indicated, using mounting methods recommended by sign manufacturer and free from distortion, warp, or defect adversely affecting appearance.
- C. Install product level, plumb, and at heights indicated or directed by Project Manager.

- D. Install product at heights to conform to Americans With Disabilities Act Accessibility Guidelines (ADAAG) and applicable local amendments and regulations.
- E. Seven days prior to date of Substantial Completion, clean and polish surfaces. Remove stains and repair or replace damaged work.
- F. Quality to meet or exceed acceptable industry standards.

### **3.3 CLEANING, PROTECTION, AND REPAIR**

- A. Replace components where damage has occurred due to installation.
- B. Remove temporary coverings and protection to adjacent work areas. Clean installed products in accordance with manufacturer's instructions prior to Owner's acceptance. Remove construction debris from project in accordance with provisions in Division 1.

### **3.4 SIGN SCHEDULE**

- A. The Architect will provide a schedule of room names and numbers to be used by the signage contractor.

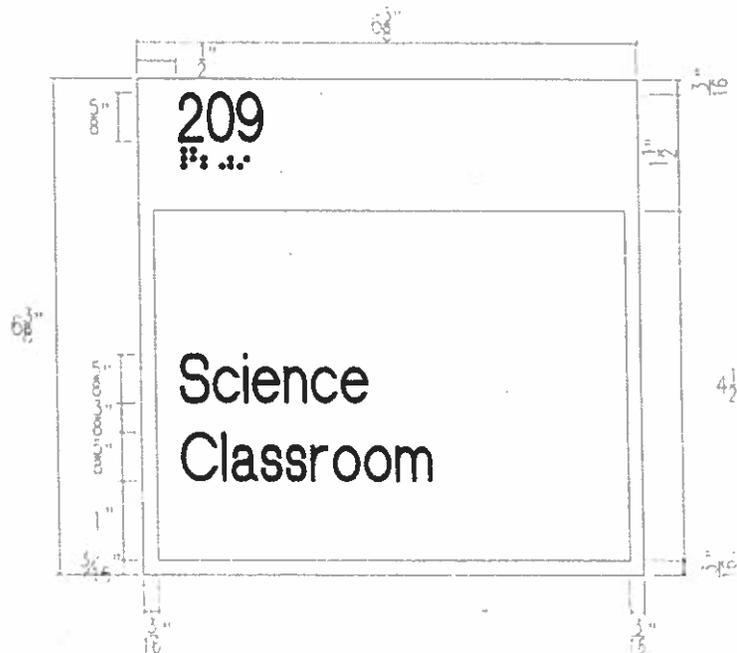
**END OF SECTION 10 14 23**

# 10 14 23 INTERIOR UNFRAMED SIGNAGE EXHIBIT "A"

## APS Interior Sign Specifications

**Interior Room Window Signs:** Provide smooth sign surfaces to remain flat under installed conditions within a tolerance of plus or minus 1/16" (1.5mm) measured diagonally from corner to corner, complying with the following requirements:

1. 6" x 6" 4-ply window sign comprised of 4 layers of .063"
  - a. Top Layer: 6" x 6" x .063" solid core acrylic with 3.5" x 5" radius cut away to show window, with raised text and Braille in top portion
  - b. Clear Layer: 6" x 6" x .063" Matte/Clear Acrylic
  - c. Spacer Layer: 1.875" x 6" x .063" at top, .375" x 6" x .063" at bottom, solid core acrylic positioned to give a slide-in area 3.625" in height
  - d. Backer Layer: 6" x 6" x .063" solid core acrylic with finger hole cut-away on either side to ease changing of client supplied 3.625" x 6" insert.
2. Edge Condition: Square or Radius
3. Corner Condition: Square or Radius
4. Letter Style: Helvetica Medium
5. Mounting: Unframed
6. Color: As selected by Architect from manufacturer's full range
7. Tactile Characters: Characters and Grade 2 Braille raised 1/32" (8mm) above surface with contrasting colors.
8. Layers shall be chemically welded



## **SECTION 10 14 63 LED EXTERIOR MONUMENT SIGN**

The Exterior Monument/Marquee Sign shall be designed and installed in a strategic location that provides for maximum visibility and ease of operation for managing and changing the display. The final placement and design configuration shall be selected and approved by the APS Project Manager. The LED Sign shall be the initial resource for disseminating information to the community and general public; and must be configured for remote monitoring and remote access.

### **PART 1 – GENERAL**

#### **1.1 SCOPE OF WORK**

A .The Contractor must provide a single installation for a double-sided Exterior Monument Sign, 8 feet 4 inches wide (extended to 8' X 8" with decorative brick cap) X 7'-4" inches High X approximately 20" Deep. Brick monument sign constructed of brick to match new or existing brick and mortar on school building. Size of monument may vary per project.

1. The Design must be approved by the APS Construction Manager. The brick must be designed to surround signage face and provide solid brick finishing on edge fascia of signage. Two options should be provided to APS for final approval: with and without brick.
2. The Cast Aluminum Letters shall be manufactured and installed on the brick fascia with the school name and street number. **"An Atlanta Public School" wording shall also be installed on the brick fascia (size to be determined by architect).** Letters must be Time Roman, Huxley Modern, or any other font designated by owner, with letters, if required, to match letters on building fascia.
3. School Location number must be 6" High Caps School Name must be in 6" High Caps (or a combination of 6" & 4" letter height)
4. Elementary/Middle/High must be 4" High Caps

#### **1.2 RELATED DOCUMENTS**

A. Drawings and general provisions of the Contract, including General and Supplemental General Conditions and Division 1 Specification, Sections, shall apply to this section.

**1.3 SUMMARY:** This technical scope of work includes the following types of signs:

- A. Exterior cast aluminum letters
- B. Exterior illuminated electronic LED message signage

#### **1.4 SUBMITTALS**

A. **Product Data:** Include manufacturer's construction details relative to materials, dimensions of individual components, profiles and finishes for each type of sign required.

B. **Shop Drawings:** Provide shop drawings for fabrication and erection of signs. Include plans, elevations and large-scale sections of typical members and other components. Show anchors, grounds, reinforcements, accessories, layout, and network connectivity details.

1. Provide large-scale details of wording and layout of lettering and graphics. Indicate sizes, colors, sign copy, finish and installation details.
2. For cast aluminum letters supported by or anchored to permanent construction, provide drawings, templates and directions for installation of concealed fasteners.
3. Show LAN connection, power requirements and connection locations for electronic LED message board.
4. **Samples:** Provide samples of each sign component for verification of color, pattern and surface texture as required and for verification of compliance with requirements indicated.

#### **1.5 QUALITY ASSURANCE**

A. **Single-source Responsibility:** Vendor must provide sign, material and accessories from a single source manufacturer.

B. **Design Criteria:** Vendor must adhere to the drawing and specifications, size, profiles and dimensional requirements of sign.

C. All applicable signs shall meet ADA requirements

D. Cast aluminum letters must adhere to Aluminum Association (AA) standards.

## 1.6 DELIVERY, STORAGE AND HANDLING

- A. The vendor shall deliver exterior material only after building and designated areas are ready to receive work, and confirmation and approval has been provided by the APS Construction Project Manager. This must be confirmed by site superintendent.
- B. Each component must be properly packed and crated to insure safe delivery to the site. Upon receipt of shipment, an APS representative shall inventory and confirm components and software.
- C. It is the vendor's responsibility to insure that all materials are stored in a secure area and out of weather that insures protection from work of other trades; and must cover or otherwise protect installed signage from damage or stains for remainder of work. Software must NOT be left in the MDF/IDF.

## 1.7 WARRANTY:

- A. The Vendor must provide a written warranty that covers the physical sign and all encasing; and a separate warranty for all electronic components and software. The details of the warranty must include a call-out procedure that is seamless to the end-user and must provide a single source solution for ALL material, hardware, and software during the two (2) year warranty period.
1. Vendor must provide manufacturer's standard one (1) year limited warranty covering manufacturing defects for cast aluminum letters.
  2. Vendor must provide manufacturer's standard two (2) year warranty covering all electronics, and lifetime warranty against defects in workmanship, operability and materials.
  3. Vendor must provide a call-out procedure separate and apart from the manufacturer's warranty that clearly identifies the procedure for software related problems and/or outages. The information must contain the following:
    - a) Confirm 4-hour response time for normal hours of operation
    - b) Emergency response time for after-hours
    - c) Requirements of APS Network Control Center
    - d) Ticket close-out procedure
    - e) Out of warranty procedures.(provide a call-out procedure and hourly rate and response time for responding to out of warranty issues.)

**Troubleshooting:** The vendor must provide a written procedure that defines roles and responsibilities for troubleshooting failures. The document must include a step-by-step process flow that clearly states desired outcomes; and next steps if the desired outcome is obtained. It is the vendor's responsibility to insure 100% functionality of the system during the 24 month warranty period with a 4-hour minimum response time.

## 1.8 DELIVERABLES

A. **MESSAGE BOARD:** Vendor must provide two (2), LED Message Boards with a minimum 230 pixels per sq. ft. and installed with four (4) lines of Amber Display of 20 mm with a 16x16 pixel configuration (with 64 shades of Amber for Graphics), to measure 6' 9" W X 2'9" H X 8" D per side, installed back to back on a 4" D steel post with a protective Lexan Vandal Cover to mount over each LED face.

B. **SOFTWARE:** LED Sign must be supplied with the appropriate software and controller; and must be network capable with TCP/IP Ethernet connection capabilities including modem cable and signal converter in order to network with APS LED network and software. The Software must have the following capabilities:

1. Traveling text with full editing capabilities in True-Type Fonts
2. Remote and on-site programming capability.
3. Windows environment for menu guided software controls; and must allow for pre-programming and separate messages for two-sided sign unless otherwise directed.

C. **HARDWARE:** The Atlanta Public Schools shall provide the following:

1. PC with Windows 98 or higher to be provided by each school
2. Pentium II 233 or higher
3. 32 MB RAM
4. 20 MB disk space
5. Current year's version of Microsoft Internet Explorer 4.01 with latest Service Pack or higher
6. Supported communication device (serial port, modem or Ethernet network)
7. CD ROM drive

D. **TRAINING:** Vendor must provide at least two (two-hour) training sessions for school personnel and one (two-hour) session for the designated APS Technology Account Manager. All training must be scheduled through and confirmed by the APS Construction Project Manager.

E. **INTEGRATION:** The Vendor must coordinate installation, integration and programming of the system through the APS Construction Project Manager; shall work with the APS Department of Technology for testing and final integration with APS Network and shall demonstrate functionality prior to scheduling training.

F. **CABLE:** The APS Project Manager will coordinate the installation of all cable with Department of Technology.. The installation of Fiber Optic Data Cable and Fiber Optic

Signal Converter will be the responsibility of cabling vendor; and shall insure all infrastructure and connectivity requirements are in place prior at the time of sign installation. Cable must be terminated and connected at the sign and at the network box inside the school's MDF or IDF. Twenty-Five feet (25') of cable must be available at each termination end

G. CLOSEOUT: The Vendor must not commence work at the site without prior approval from the APS Construction Project Manager; and shall not deliver hardware or software to the school's Administrative Office without prior permission from the Project Manager.

1. In the delivery of this service to the Atlanta Public Schools, the Vendor is required to provide a fully operational system that includes the sign and all associated programming.
2. The system must be tested and confirmed to be online, integrated into the LAN, and accessible by the designated point of contact in the school prior to acceptance and signoff.

## 1.9 PRODUCT

### A. CAST ALUMINUM LETTERS & NUMBERS

1. Type: Cast
2. Metal: Aluminum alloy
3. Letter Height and Style: See Part 1 Section 1.1.1 thru 1.1.3.
4. Finishes: Aluminum Class II, clear anodic or baked enamel, as selected by the APS Project Manager.

## 1.10 INSTALLATION

A. Type: 6'-9" X 2' 9" high LED pre-finished aluminum message board sign cabinet, double-faced (as determined by the APS Project Manager), with LED illumination providing four (4) lines of message board on each side. Vendor must install vandal cover with recessed locks. Cabinet & Sign Face must be installed in accordance with the following:

B. Extruded aluminum cabinets to have reinforced mitered and wire welded corners.

C. Cabinets to be painted with Aliphatic urethane powder coating with graffiti-resistant finish.

D. All faces to be pan-formed solar grade polycarbonate/ 3M Scotchcal translucent vinyl film on the 2<sup>nd</sup> surface.

E. Locate signage and accessories as indicated on drawings, using mounting methods of the type described and in compliance with the manufacturer's instruction.

Sign location must be confirmed and approved by APS Project Manger prior to installation.

F. Install signs level, plumb and at the height indicated above finish grade and in accordance with ADA requirements, and with sign surfaces free from distortion or other defects in appearance.

G. Attach cast aluminum letters to wall surface with concealed mounting consisting of threaded studs mounted on back of letters, fitted into cement/adhesive-filled holes in masonry surface.

#### H. LED Display Module

1. Double sided signs to be master-master configurations
2. Message center must be able to be controlled by direct serial connection with RS232 connection.
3. LED (light emitting diode) Made in America, Hewlett-Packard HLMP amber, ultra-bright (can be seen in direct sunlight), Life expectancy of 100,000 hours.
4. Pixel Size: 1 LED per pixel (high definition) (high resolution)
5. Operating Conditions: From -40 to + 150 degrees Fahrenheit.
6. Viewing Angle: 90 degrees from center. Viewing Cone: 140 degrees.
7. Serviceable cabinet
8. LED Module

### 1.11 ELECTRICAL

A. Primary electrical cabling will be provided to the sign by the APS Construction Manager. (Vendor shall price with and without electrical material and labor; inclusive of trenching and moderate landscape.) The CM's electrician will lay one (1) 1" conduit, which slopes 90 degrees at all turns, from the sign into the school's MDF or IDF room for the fiber optic connection. The cable vendor shall pull fiber optic cable through the conduit from the sign to the MDF or IDF room; and shall insure proper testing, termination and coordination with the sign vendor/manufacturer. . The Electrical contractor will coordinate termination and connectivity with the sign vendor. Additional electrical requirements as follows:

1. Power: 120 volts per side on 20 AMP Dedicated circuit
2. Two circuits for the LED cabinet; one per side: Dedicated separate circuits required.
3. Power Cabling: Electrician will provide and run #10 wire in a 1" conduit from building power source to sign site and provide additional 25' of data wire at both

sign site and MDF or IDF room for use by LED engineer for final connection. Electrician will provide a 12" X 12" X 6" or larger junction box at sign site for electrical and data, cabling storage prior to connectivity by LED engineer.

**1.12 PROJECT COMPLETION:** All aspects of the installation must be in place and the LED Sign demonstrated and approved prior to signoff.

A. The Sign will not be considered to be complete if any point of connectivity is missing:

1. Fiber Connectivity from the sign to the facility. Any medium other than fiber must be approved by the Construction Project Manager in conjunction with the APS Department of Technology. The final sign-off and approval shall be provided by a designated APS representative.

2. Fiber must be properly run through fiber

3. LED Sign must be properly installed and enclosed

4. Software must be configured, tested, and demonstrated

5. Training manuals and manufacturer specifications

6. Training must be conducted for the end-user.

7. Warranty must be provided with call-out procedure

B. Network Connectivity: It is the vendor's responsibility to deliver a completely operational LED sign. This shall include the coordination of network connectivity and quality assurance. The option for wireless connectivity is to be addressed and approved by the APS Project manager in conjunction with the APS NOC. Prior to completing the installation, a designated APS Department of Technology staff representative will assign an IP address, coordinate loading software onto the school's PC, and coordinate testing, Vendor must contact the APS Project Manager to schedule an appointment with the APS NOC.

C. The Vendor is responsible for final handoff of software, documentation, manuals and controllers to the APS Project Manager. A signature is required.

D. Cleaning & Protection: At completion of the installation, vendor must clean soiled sign surfaces in accordance with the manufacturer's instructions. Protect units from damage until Final Acceptance by APS and seven (7) days prior to Date of Acceptance, clean and polish surfaces.

**END OF SECTION**

**TYPICAL LED MONUMENT SIGNAGE  
EXHIBIT A**

