

10463 - ILLUMINATED MARQUEE SIGN

SPECIFIER:

CSI MasterFormat 2004 number 10 14 63

PART 1 GENERAL

1.1 SUMMARY

- A. Section includes an exterior electronic marquee sign comprising of the following components.
 - 1. An identification cabinet with internally lighted panel (two-sided) displaying the school name, logo and address.
 - 2. An LED cabinet located below the identification cabinet. This cabinet will also be two-sided and incorporate High Definition Electronic - LED technology programmable message display on each side.
 - 3. A support pylon consisting of aluminum panel sides enclosing a structural steel support column anchored to a concrete foundation, designed to withstand wind velocity pressures in accordance with the FBC - ASCE 7.

1.2 RELATED SECTIONS

- A. Section 03300 - Cast-in-Place Concrete
- B. Section 05120 - Structural Steel
- C. Section 05500 - Metal Fabrications
- D. Section 16112 – Wire and Cable
- E. Division 16 - Electrical

1.3 REFERENCES

- A. American Society for Testing and Materials (ASTM). Latest publications for:
 - 1. A36 - Standard Specification for Carbon Structural Steel.
 - 2. A307 - Standard Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.
 - 3. A500 -Standard Specification for Cold-Formed Welded and Seamless Carbon Structural Tubing in Rounds and Shapes.
 - 4. A615 - Standard Specification for Deformed and Plain Carbon Steel Bars for Concrete Reinforcement.
 - 5. B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
 - 6. B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
 - 7. C33 - Standard Specification for Concrete Aggregates.
 - 8. C150 - Standard Specification for Portland Cement.

- B. Florida Building Code (FBC)
- C. ASCE 7 - Minimum Design Loads for Buildings and Other Structures
- D. Underwriters Laboratories, Inc. (UL) or other OSHA approved Nationally Recognized Testing Laboratory (NRTL).
- E. NFPA 70 - National Electric Code (NEC).
- F. National Electrical Manufacturers Association (NEMA) Standards.

1.4 SUBMITTALS

- A. Submit properly identified product data including specifications, catalog cuts, and printed installation instructions before starting work.
- B. Submit complete shop drawings showing plans, elevations, sections, and details of sign cabinet, lighting, and structural supports. Shop drawings shall show dimensions, types of materials, fasteners, wiring diagrams, finishes and method of installation of all marquee sign components, including location and type of electrical connections for the identification cabinet and the LED cabinet.
- C. Submit color samples and samples of graphics being applied to sign for A/E and M-DCPS approval.
- D. Submit to A/E and Building Official design drawings with calculations signed and sealed by a Professional Engineer registered in the State of Florida, indicating sign structure complies with wind loads requirements per FBC and ASCE-7.
- E. Submit erection drawings showing foundation bolt settings and erection details.
- F. Submit two samples of each type material, illustrating type of exposed finish, prepared on components that are of the same composition and thickness as will be on final constructed unit.
- G. List of references for similar projects by Manufacturer and Installer.
- H. Operation and Maintenance Data: Submit manufacturer's installation, operation, and maintenance manuals.
- I. Provide all operating software to M-DCPS along with required usage licenses and software updates.
- J. Submit executed warranty as specified in this Section.

1.5 QUALITY ASSURANCE

- A. Sign Fabricator/Installer Qualifications: Firm with not less than five years successful documented experienced in fabrication and installation of illuminated exterior signs similar to that indicated for this Project.

- B. Design Work shall be under direct supervision of a Professional Structural Engineer and Electrical Engineer experienced in design of this work and licensed in the State of Florida.
- C. Electrical Components, Devices, and Accessories shall be listed and labeled as defined in NFPA 70, Article 100, by a NRTL acceptable to authorities having jurisdiction, and marked for intended use.

1.6 WARRANTY

- A. Provide 10 Year Warranty for sign assembly including Identification Cabinet, LED Message Center Cabinet and Pylon, except as indicated below:
 - 1. Identification Cabinet:
 - a. Polycarbonate and Lexan Faces: Lifetime Warranty.
 - b. Ballasts: 3-year warranty from date of Substantial Completion.
 - 2. LED Electronic Message Center Display: Manufacturer shall warrant the LED Electronic Display to be free from defects in workmanship or materials for a period of 5-years from date of Substantial Completion.
 - 3. Communications: Manufacturer shall warrant the LED Wireless transmitter / receiver to be free from defects in workmanship or materials for a period of 5-years from date of Substantial Completion.
- B. General:
 - 1. All parts and installation labor shall be included under each warranty period expressed in this Section.
 - 2. Warranty forms shall be provided with shop drawings.
 - 3. Manufacturer shall certify that all replacement parts will be available for a minimum of 5 years from date of Substantial Completion.
 - 4. Warranty repairs shall be performed within 72 hours from moment notice is provided to the sign installer.
 - 5. Software: Manufacturer shall certify that software technical support and updates will be available for a minimum of 5 years from the date of Substantial Completion

PART 2 PRODUCTS

2.1 APPROVED MANUFACTURERS

- 1. Accolite/Claude.
- 2. Economy Signs.
- 3. Tropical Signs.
- 4. Modern Display Signs.
- 5. Stewart Signs.

2.2 IDENTIFICATION CABINET, LED MESSAGE CENTER CABINET AND PYLON CLADDING - GENERAL

- A. Materials:

1. Aluminum products produce for type of use indicated, and tempered to meet or exceed the strength and durability of components designated below:
 - a. Extruded Posts & Tubes: ASTM B 221, 6061-T6.
 - b. Extruded Bar and Shapes: ASTM B 221, 6063-T5/T52.
 - c. Sheet: ASTM B 209, 5005-H15. Thickness shall be not less than 0.080"
2. All fasteners shall be stainless steel.

B. Full reinforced, inside mitered-welded corners.

C. Provide internal mounting brackets for support and attachment of identification sign cabinet, message center cabinet and pylon to each other. Use anchor-bolt support system allowing for any future removal of components.

D. Powder coated paint finish: 3.0 to 4.0 mils thick electrostatically applied at factory and permanently bonded guaranteed non-fading, gloss finish, UV resistant, free of lead and heavy metals, graffiti resistant and chip and impact resistant. Powder coating shall be Dupont Acrylic or A/E approved equal. Color to be selected by A/E and M-DCPS School Administration personnel.

E. Cabinets shall be weather resistant and shall have weather-tight hinged panels for provide access for servicing.

2.3 SIGN SIZE

SPECIFIER: Select size of the Identification Cabinet and LED Cabinet based on the following criteria:

For Elementary Schools, Middle Schools and K-8 Centers, and other non-Senior High School Facilities located away from prominent thoroughfares:

*Identification Cabinet: 3'-0" H x 8'-0" W.
LED Cabinet: 2'-0" H x 8'-0" W.*

For ALL Senior High Schools and other Facilities (Elementary, Middle or K-8 Centers) located adjacent to prominent thoroughfares:

*Identification Cabinet: 3'-0" H x 10'-0" W.
LED Cabinet: 3'-0" H x 10'-0" W.*

- A. Identification Cabinet: **[3'-0" H x 8'-0" W][3'-0" H x 10'-0" W]** x Depth as necessary to accommodate back-to-back double-sided sign display to match LED cabinet.
- B. LED Cabinet: **[2'-0" H x 8'-0" W][3'-0" H x 10'-0" W]** x Depth as necessary to accommodate back-to-back double-sided LED displays.
- C. Pylon: Depth of pylon shall match depth of LED cabinet.

- D. Height: As indicated on Contract Documents. Maintain minimum of 8'-0" clear distance from lowest point on sign cabinet to highest point of the immediate surrounding grade.

2.4 IDENTIFICATION CABINET:

- A. Construct identification cabinet with materials described in this Section.

- B. Cabinet Message - Back-to-Back (2 Sides):

1. Provide vandal proof clear UV solar grade high-impact resistant polycarbonate sign cover (Lexan or equal).
2. Provide weather-tight, inconspicuous method of accessing internal areas of cabinets for servicing lighting components. Provide locks, stainless steel hinges, and industrial grade gas shocks to hold panel open in-place when servicing internal components.
3. Identification cabinet shall be internally lighted displaying graphics containing school name, school logo and type of school (ie, Elementary, Middle, K-8 Center, Senior High, etc.).
4. Sign shall be translucent colored, cast vinyl films with clear adhesive backing made expressly for panel sign use (3M high performance pressure sensitive vinyl or equal); film shall have a 7 year service life and be applied to second surface.

- C. Lighting

1. Provide high output instant- start T-8 fluorescent tubes with electronic ballasts, spaced at 12" on-center maximum, to provide uniform lighting over entire face of the sign.
2. Power shall be either 110 volt or 277 volt - 20 amp circuit.
3. Provide photocell system to power lights during night time use only.

2.5 LED SIGN CABINET

- A. General:

1. Construct sign cabinet with materials described in this Section and as indicated on A/E approved shop drawings.
2. Provide sign cabinet a weather-tight ventilation system with a thermostatically-controlled heavy duty cooling fans.
3. Protective LED Display Covers: Transparent, vandal-resistant, watertight lens, GE Lexan polycarbonate SGC-100, or other A/E approved equal.
4. Lifts: Gas cylinder assist lifts, one on each end of LED covers.
5. Weather resistant cabinets designed to meet the classification requirements of NEMA 4X construction.

- B. LED Display

1. Compliant with UL or other OSHA approved Nationally Recognized Testing Laboratory (NRTL).
2. Double sided. Each side is one self-contained LED Display.
3. Each side of LED display to contain its own processor and be capable of displaying different independent messages at the same time.
4. Minimum pixel pitch: 16 mm.
5. Pixel Configuration: Minimum of three - 1 red, 1 green, 1 blue.

6. LED Lifetime: Minimum 100,000 hours.
7. Full color streaming video capabilities: 4.4 trillion colors, minimum 60 frames/second, avi, jpg, tiff, mp4 files and capable of fully animated graphics.
8. Have electronic control of speed and vertical/horizontal movement of sign text.
9. Technology to overcome direct sunlight and photocell on both sides of sign to allow for changes in sunlight direction.
10. Service: Serial port provided within Electronic Message Center for troubleshooting by direct connection to PC.
11. Capable of displaying the following:
 - a. Up to 4 lines of text depending on matrix size.
 - b. Text sizes range from 5.5" - 22.4" depending on matrix size.
 - c. Viewing a minimum view angle of 140 degrees horizontal / 70 degrees vertical.
 - d. Day-night auto dimmer (with photocell sensor).

C. Software Features:

1. Scheduling will be made in 12 or 24-hour formats.
2. Scheduler shall reside within the LED display cabinet as an onboard processor and not require a PC to operate the messaging schedule
3. Highest Level on Password protection capability.
4. Bad Word Checker prevents unacceptable words to be displayed.
 - a. Library of words is password protected - Library is fully editable for adding or deleting words.
 - b. Access manufacture's Library of Graphics with password and access codes
5. User-friendly menu and icon based software.
6. Wizards will be built in to allow graphics and text to be incorporated together.
7. On-line help will provide excerpts from the Owner's Manual.
8. Simultaneous display and edit capability.
9. Scheduler Storage System shall have the capability to be pre-programmed more than 1 year in advance.
10. Message display shall hold messages in memory for up to 60 days without power.
11. Automatic rebooting of system disk shall be made after power outage; system clock and calendar shall continue to function during power failure.
12. Software, program sequences and schedules must be able to be stored on cd or portable drive to allow operator to edit previously used messages.
13. Automatic Rebooting: Of system disk, after power outage:
14. Text Module shall provide:
 - a. Traveling text.
 - b. Text of various types.
 - c. Text scalable in size.
15. Traveling text.
16. Menu guided control of all software features.
17. Unlimited online upgrades to software for life.
18. Unlimited access to online graphics library for life.
19. Master Slave capability.
20. Provide all incidental equipment, i.e., software, controller(s), wireless radio, etc., necessary for a fully operational system. Must be compatible with Windows XP, 7 and 8 operation systems.

D. Controller (CPU) Central Processing Unit:

1. The central processing unit provided in each display shall be a microprocessor based circuit board assembly.
2. Unit shall be minimum 10 MHz device with a minimum of 2-MB battery backed static RAM memory and 128K bytes Flash ROM with on board programmability.
3. Provide 1 GB compact flash memory for message storage.
4. Provide one RS-232, RS-485/422 input/output serial port jumper selectable.
5. CPU assembly shall provide automatic memory and program testing at power up, diagnostics, and full talk back.

E. Transmission Methods – Select one of the following:

1. OPTION 1 - Provide a 1 inch PVC conduit with CAT 5/6 data cable from location of the marquee sign to the data hub shown on the drawings or as otherwise indicated by M-DCPS Project Manager. This option may be used only when the distance from the display sign to the data hub connection point is less than 250 feet.
 - a. CAT 5/6 data cable shall be rated for wet location.
 - b. Connection to M-DCPS network shall be coordinated with prior approval from M-DCPS ITS Department.
2. OPTION 2 - Provide a complete wireless Ethernet Bridge Radio System connected to the data hub shown on the drawings. This transmission method shall only be considered when prior written approval from M-DCPS has been obtained and when the following site conditions exists:
 - a. RF Ethernet transmitter located on the exterior of the building must have clear line-of-sight to the RF receiver located at the sign.
 - b. Distance from the RF Ethernet transmitter to the network receiver does not exceed the maximum effective transmission distance published by the equipment manufacturer, or does not exceed 1,500 feet whoever is less.
 - c. Connection to M-DCPS network shall be coordinated with prior approval from M-DCPS ITS Department.

2.6 STEEL SUPPORT and FOOTING STRUCTURE

- A. Design the support structure including but not limited to sign, cabinet framing, support column, and concrete footing, to withstand wind loads as required by FBC and ASCE-7.
- B. Structural steel support column shall be hot dip galvanized after fabrication, according to ASTM A123 and ASTM A385.

2.7 ELECTRICAL – GENERAL

- A. Electric installation shall comply with NEC latest edition.
- B. All electrical components (including but not limited to the Illuminating sign, LED sign, etc.) shall be listed and labeled for their intended use by UL or other OSHA approved Nationally Recognized Testing Laboratory (NRTL).
- C. Provide a disconnect switch at power entrance to sign structure. Disconnect switch shall be located within a NEMA 3R lockable enclosure.

- D. Provide conduit(s) and necessary wiring to all electrical components for the sign. Power source shall be as indicated on the drawings or as otherwise directed by M-DCPS Project Manager.
- E. The electronic switching power supplies shall be short circuit protected. The electronic switching power supplies shall also be protected by an overload allowance ranging from 105 percent up to 150 percent.
- F. The LED display shall be powered by multiple solid-state electronic switching power supplies.
- G. A separate power supply for the CPU shall be used to isolate the processor power from the LED drive power.
- H. Provide grounding lugs and a properly design surge protection system for all electrical components.

2.8 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. Corners shall be mitered and heliarc welded. 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. Internally brace signs for stability and for securing fasteners.
 - 5. Provide rebates, lugs, and brackets 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 and are inconspicuously located.
 - 6. Coat concealed metal surfaces in contact with concrete or dissimilar metals, with a heavy coat of bituminous paint.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of signage work.
- B. Verify that sign-support surfaces are within tolerances to accommodate signs without gaps or irregularities between backs of signs and support surfaces.

- C. Verify that anchor inserts 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. General: Install signs in strict accordance with manufacturer's written instructions, and in full compliance with applicable Code and regulations.
- B. Install signs level, plumb, true to line, and at locations and heights indicated, with sign surfaces free from distortion or other defects.

3.3 DEMONSTRATION / INSTRUCTION

- A. Provide M-DCPS the following training:
 - 1. Provide (2) DVD training disks, one for School use and for use by Facilities Maintenance Operations Department.
 - 2. Provide a minimum of two hours of on-site training to at least two M-DCPS-designated school staff personnel.
 - 3. The vendor and the LED manufacturer shall provide technical support to M-DCPS by telephone at no charge.

3.4 ADJUSTING AND CLEANING

- A. Remove temporary protective coverings and strippable films as signs are installed.
- B. 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 sign in a clean condition during construction and protect from damage until acceptance by M-DCPS.

END OF SECTION