TRUCK MOUNTED SOLAR POWERED CHANGEABLE MESSAGE SIGN MGS-06-07B

1.0 DESCRIPTION. All truck mounted solar powered changeable message signs, hereinafter referred to as a CMS, shall be designed and manufactured in accordance with this specification.

2.0 MATERIAL. The truck mounted CMS shall consist of a CMS board, mounting frame and rotating or folding mechanism, remote control switches and circuitry, and a lockable control cabinet housing electronic components in a self-contained power supply. Each unit shall be fully assembled when delivered.

Each CMS shall consist of an all LED (light emitting diode) pixel matrix message board, solar/battery power supply and a user operated interface.

2.1 Each CMS shall have the following minimum characteristics:

1. Full Matrix - Each CMS shall be the Full Matrix type with the capability of providing one, two, and three lines of changeable characters with a minimum height of 10.5 inches (265 mm). Full Matrix signs shall be capable of both static and dynamic graphics, and full display sized messages.

2. Character Matrix (Three Line) – Each CMS shall consist of a minimum of three lines containing six individual changeable characters per line. Each character shall be a minimum height of 10.5 inches (265 mm).

3. Full matrix CMS and character matrix CMS shall meet the following:

(a) The overall sign dimensions should be approximately 42 inches (1060 mm) high x 76 inches (1900 mm) wide. The screen dimensions shall be a minimum of 38 inches high x 68 inches wide.

(b) The CMS shall be legible up to a distance of 650 feet (200 m) for both day and night operations and shall be visible for ½-mile (800 m).

(c) The average truck bed height is 52 to 56 inches. When fully raised in the display position, the bottom of the CMS board shall be at least a height of 8 feet (2100 mm) from the ground. The CMS shall have an electrical-hydraulic lifting mechanism. The CMS shall be designed to maintain a maximum height of 11 feet - 9 inches in the storage/travel position.

(d) All LED displays and control circuitry shall be operational from -20 F (6 C) to 120 F (50 C). The LED's shall have a rated life of 100,000 hours. The LED's shall be ITE amber in color on a flat black background.

(e) CMS Panel and Pixel

1) The CMS face shall be constructed such that if an individual panel fails or is disconnected, all other panels shall continue to display the message. The CMS face shall be constructed such that if an individual pixel fails all other pixels shall continue to display the message.

Or

2) The CMS shall be provided with diagnostic software and training. The software shall be capable of locating all failed pixels within the CMS face.

(f) The sign controller shall provide storage capacity for additional messages in addition to preprogrammed messages, graphics and all other required controls for the operation of the display.

(g) Solar Panels: Wattage of the solar panels shall be adequate to fully charge batteries, and shall contain a remote battery charger back-up as described below. Solar panels shall be mounted above top of CMS panel with a minimum 4 degree pitch from the horizontal position to encourage shedding of dirt and rainwater.

(h) Battery Charger: The battery charger with charge indicator shall be included and shall be mounted at the base of the frame of the CMS panel support, inside a lockable, weatherproof, battery box. The battery charger shall have the capability to charge the battery bank within a 48 to 72 hour time period from a 120 VAC utility power source.

(i) Batteries shall be the A.G.M. type (Absorb Glass Mat), class GC2, rated at no less than 200 amp hours per battery when fully charged. The quantity of batteries shall provide enough power to run the unit at full load for 15 consecutive days on battery power only. Solar charging shall be disabled during this 15 day period. An optional package shall be provided for 30 day continuous days.

Battery Box: A fully enclosed (sides, top, bottom) lockable, weatherproof box, mounted at the base of the frame of the CMS panel support, shall be made of minimum 14-guage steel, with louvered side panels for cross-flow ventilation and with the sides and bottom coated with acid-resistant protector. The battery box shall be large enough to sufficiently house and service the batteries and charger. The lid of the battery box shall be hinged and include a stabilizer rod to allow ease of maintenance and repair of batteries, charger and or photoelectric control.

(j) Voltage Regulator: The voltage regulator shall be solid-state, micro-processor-based, utilizing constant positive voltage and pulse with modulation to optimize battery charging, measuring battery voltage and adjusting current from the solar panels so the batteries are not overcharged and also prevent overcharging of the batteries by the solar panels when the panel is turned off. An automatic disconnect device shall be included to protect the entire system in case of low voltage.

(k) Disconnect and Enclosures: Disconnect plug and receptacle shall be determined by the current, voltage, and number of contacts required for proper operation. Connectors shall have screw terminations and accommodate a wire size of up to #12AWG. The male connector shall be enclosed in a NEMA 4 rated surface base enclosure and cover. The female connector shall be enclosed in a NEMA 4 side-entry hood enclosure. Multi-conductor cable shall enter the bottom of the enclosures through a waterproof, flame-resistant, salt and corrosion resistant cable connector with a sealing nut and internal ratchet containing a neoprene cable gland.

(l) Controller: Ability to program message and monitor messages from inside truck with vendor’s supplied handheld controller. For the wired and wireless option, provide a 35-foot controller cable. For the wireless option, provide controller charging from the vehicles 12-volt power outlet. Controller supplied shall not have a power saving sleep mode. Controller shall have the capability to store 100 factory preprogrammed messages and a minimum of 40 additional user-defined messages. The remote cab control switches shall provide MUTCD Sequential Arrow (Merge Right or Left), Flashing Double Arrow and Alternating Diamond Caution. All graphics shall completely fill display area and be legible. The lines of the graphics shall be 6 to 8 inches thick.

(m) The support frame shall be painted one coat of primer and one coat of high-visibility, Safety Orange Paint similar to Federal Standard 595B #12243.

2.2 Each CMS panel shall be supported on a four vertical post framework.

1. The four vertical post framework shall consist of welded steel tubing in accordance with American Welding Society standards. All open ends of tubing shall be capped and welded shut. When in the horizontal position, the panel shall rest on a rigid frame support, relieving the load from the rotating device. Each panel shall contain an anchor point on each side, (left, right) of the frame to accommodate a 4 to 6 inch (100-150 mm) wide strap to anchor to the truck. Angle and cross bracing of the vertical supports shall be provided at the top and bottom of the supports to ensure a rigid frame. See drawing on Attachment 1.

2. The support frame shall be painted one coat of primer and one of coat high-visibility, Safety Orange Paint similar to Federal Standard 595B #12243. Powder coat of the same color is acceptable.

2.3 Optional Emergency Alert Lights. The Emergency Alert System (EAS) shall be comprised of six white illumination LED light heads placed in two rows of three.

The three high mounted lights should be between 72 to 106 inches from the road surface; see attached photo suggested location A.

The three low mounted lights should be between 42 to 54 inches from the road surface; see attached photo suggested location B.

The vertical separation between the two rows of lights shall be a minimum of 38 inches.

The lights shall be visible when CMS is in the activated or deployed position.

The optional emergency alert lights shall be powered by the truck's battery system.

Nominal Criteria:

- Watts/Amps @ 12VDC: 27.2W / 2.26A
- Operating Voltage: 10~41 VDC
- Kelvin Rating: 6000K
- Shock Resistance: GB/T 10485-2007/11.4.4.2
- Raw Lumens: 2600
- Flashes: 90 per minute
- Automatic Dimming Feature
- Mounting Type: Universal Surface
- Operating Temp: -40~150 degrees C.
- Lead / Connector: 19" w/Waterproof ATP
- Dimensions: 7.59" L x 1.73" H x 3.05" D
- Housing: A403 High Purity Aluminum
- Virtually Unbreakable Polycarbonate Lens
- 93% Optic Purity
- Stainless Steel Mounting Bracket & Hardware

- UV Polyester Powder Coat Finish
- Instant On/Off – Means No Warm Up
- Pressure Relief Valve (Known as Military Breather)
- Over / Under Voltage Protection
- Integrated Thermal Management
- Beam pattern: Horizontal spread of 40 degrees or less / Vertical spread of 30 degrees or more
- Sharp optical " cut off "
- Easy disconnects shall be used on all wiring so that when the CMS is removed the (EAS) shall also be easily removed and stay attached to one of those devices.

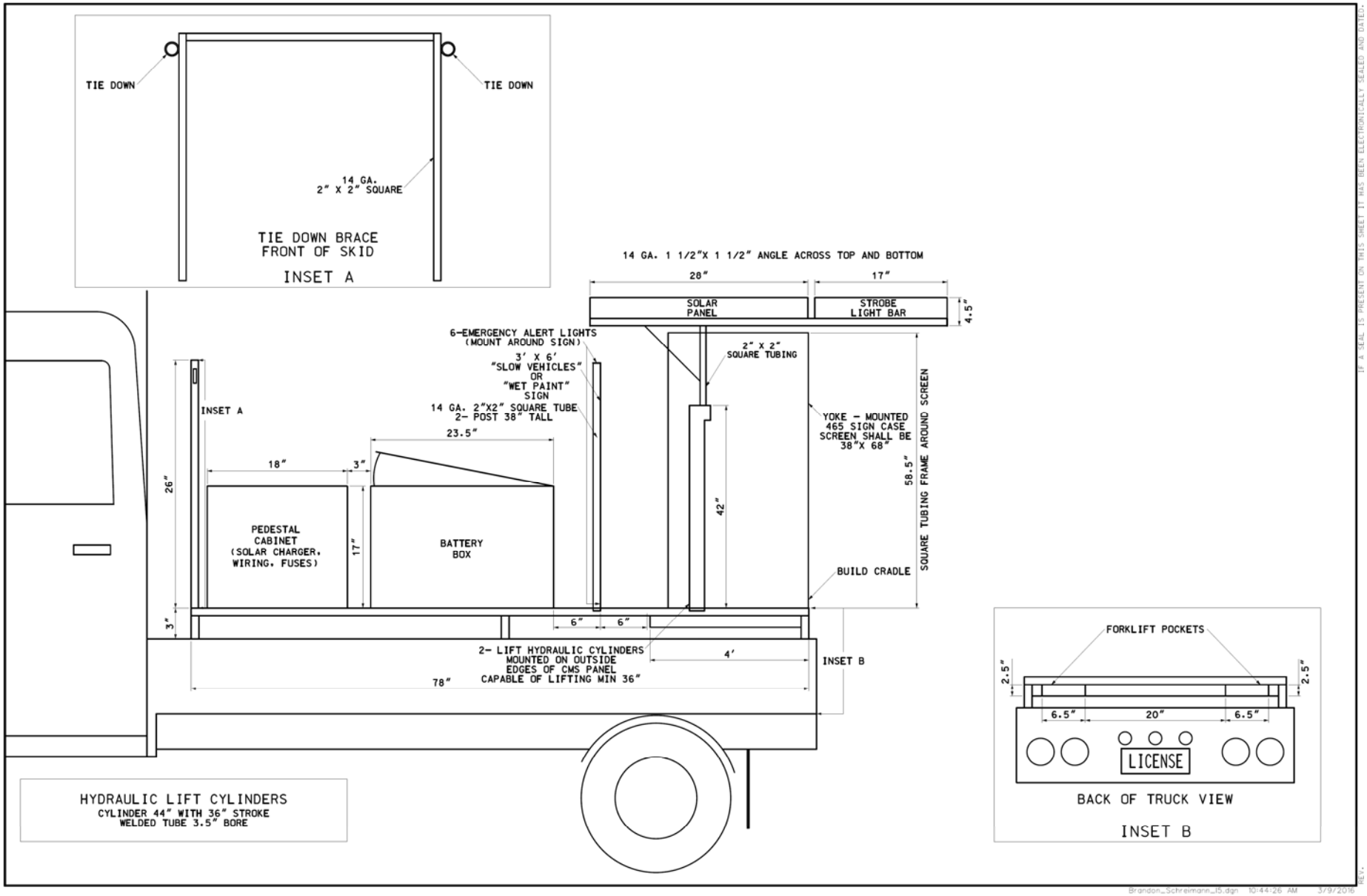
Handheld Controller shall be a momentary on/off switch. A 35 foot control wire with the handheld controller shall be supplied.

2.4 Owner's Manual. The successful bidder shall furnish two Owner's Manuals for each CMS. Each manual shall include the manufacturer's instructions for maintenance and operation of the CMS. Each manual shall also include a detailed, schematic, wiring diagram showing all circuits and components from the power supply through the control to the CMS. The schematic diagram shall list all transistors, resistors, triacs, diodes and other components with the manufacturer's name and part number.

3.0 WARRANTY. Units delivered to the Missouri Department of Transportation must be covered by the manufacturer's standard warranty for a minimum of one year, which includes on-site repair (parts, labor, and travel), at no expense to MoDOT.

3.1 All units manufactured shall be exactly the same as the units tested.

3.2 All units shall meet or exceed the specifications for CMS boards as listed in Part 6F.60 of the current Federal Highway Administration's Manual on Uniform Traffic Control Devices (MUTCD). Units shall be skid mounted to slip into the back of dump trucks.


TIE DOWN
TIE DOWN
14 GA.
2" X 2" SQUARE
TIE DOWN BRACE
FRONT OF SKID
INSET A
14 GA. 1 1/2"X 1 1/2" ANGLE ACROSS TOP AND BOTTOM
28"
17"
SOLAR PANEL
STROBE LIGHT BAR
4.5"
6-EMERGENCY ALERT LIGHTS
(MOUNT AROUND SIGN)
3' X 6'
"SLOW VEHICLES"
OR
"WET PAINT"
SIGN
14 GA. 2"X2" SQUARE TUBE
2- POST 38" TALL
2" X 2"
SQUARE TUBING
YOKE - MOUNTED
465 SIGN CASE
SCREEN SHALL BE
38"X 68"
58.5"
SQUARE TUBING FRAME AROUND SCREEN
INSET A
23.5"
18"
3"
26"
42"
PEDESTAL
CABINET
(SOLAR CHARGER,
WIRING, FUSES)
17"
BATTERY
BOX
BUILD CRADLE
3"
6"
6"
2- LIFT HYDRAULIC CYLINDERS
MOUNTED ON OUTSIDE
EDGES OF CMS PANEL
CAPABLE OF LIFTING MIN 36"
4'
INSET B
78"
HYDRAULIC LIFT CYLINDERS
CYLINDER 44" WITH 36" STROKE
WELDED TUBE 3.5" BORE
FORKLIFT POCKETS
2.5"
2.5"
6.5"
20"
6.5"
LICENSE
BACK OF TRUCK VIEW
INSET B
IF A SEAL IS PRESENT ON THIS SHEET IT WAS GEN ELECTRONICALLY SEALED AND DATED.
REV:
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