|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | FDOT Traffic Engineering Research Laboratory (TERL)  Portable Changeable Message Sign (PCMS) Compliance Matrix | By signing this form, the applicant declares that he/she has read and understands the provisions of Section 990 of the FDOT *Standard Specifications for Road and Bridge Construction* and all implemented modifications. The requirements listed on this matrix are derived from Section 990 and are the basis for determining a product’s compliance and its acceptability for use on Florida’s roads. |  |  |

|  |  |  |  |
| --- | --- | --- | --- |
| Date: | Click here to enter a date. | Applicant’s  Name (print): |  |
| Manufacturer: |  |  |  |
| Item, Model No.: |  | Signature: |  |

|  |  | **\*\* Greyed out rows in table below are for TERL use only \*\*** |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **ID No** | **Section** | **Requirement** | **Item Comply? (Yes/No/NA)** | **Comments (Applicant must provide information as indicated)** | **TERL Evaluation Method** |
| 1 | 990-3.1 | Device meets the physical display and operational requirements of the Manual on Uniform Traffic Control Devices (MUTCD) for Streets and Highways. |  | *Provide documentation specified in MUTCD line items below.* | Document Review, Physical Inspection and Functional Inspection |
| The following compliance matrix criteria (referencing the MUTCD) are from the MUTCD and for all PCMS. | | | | | |
| 2 | MUTCD Section 2L.01.07 | No items other than inventory or maintenance-related information are displayed on the front or back of a PCMS. |  | *Applicant may provide comments in this field.* | Physical Inspection |
|  |  | TERL Test Cases (Steps): PCMS002 (Step 1) |  |  | Init.: |
| 3 |  | Names or logos of the manufacturer, brand, or model are not displayed on a PCMS, either in the message display itself or on  the exterior housing. |  | *Applicant may provide comments in this field.* | Physical Inspection and Functional Inspection |
|  |  | TERL Test Cases (Steps): PCMS002 (Step 2), PCMS003 (Step 4) |  |  | Init.: |
| 4 | MUTCD Section 2L.04.19 | The colors used for the legends and backgrounds are as provided in Table 2A-2 Common Uses of Sign Colors, i.e., yellow and orange for the legend, and black for the background. |  | *Provide product literature, specifications, user manual, or similar information that shows the product meets this requirement.* | Document Review and Functional Inspection |
|  |  |  |  | *Indicate location of requested information in submittal.* |  |
|  |  | TERL Test Cases (Steps): PCMS001 (Step 1), PCMS003 (Step 5) |  |  | Init.: |
| 5 | MUTCD Section 6L.05.23 | In order to maintain legibility, PCMS automatically adjusts its brightness under varying light conditions. |  | *Provide a statement of conformance in this field.* | Compliance Matrix Review |
|  |  | TERL Test Cases (Steps): PCMS001 (Step 2) |  |  | Init.: |
| 6 | MUTCD Section 6L.05.24 | The control system includes a display screen upon which messages can be reviewed before being displayed on the message sign. |  | *Provide product literature, specifications, user manual, or similar information that shows the product meets this requirement.* | Document Review and Functional Inspection |
|  |  |  |  | *Indicate location of requested information in submittal.* |  |
|  |  | TERL Test Cases (Steps): PCMS001 (Step 3), PCMS003 (Step 2, 3) |  |  | Init.: |
| 7 |  | The control system is capable of maintaining memory when power is unavailable. |  | *Applicant may provide comments in this field.* | Functional Inspection |
|  |  | TERL Test Cases (Steps): PCMS005 (Step 5) |  |  | Init.: |
| 8 | MUTCD Section 6L.05.25 | PCMS is equipped with a power source and a battery back-up to provide continuous operation when failure of the primary power source occurs. |  | *Provide product literature, specifications, user manual, or similar information that shows the product meets this requirement.* | Document Review and Physical Inspection |
|  |  |  |  | *Indicate location of requested information in submittal.* |  |
|  |  | TERL Test Cases (Steps): PCMS001 (Step 4), PCMS002 (Step 3) |  |  | Init.: |
| The following compliance matrix criteria are for all PCMS. | | | | | |
| 9 | 990-3.1 | All assembly hardware less than 5/8 inch in diameter is type 304 or 316 passivated stainless steel. Stainless steel bolts, screws and studs meet ASTM F593, and nuts meet ASTM F594. |  | *Provide statement of conformance from hardware supplier that shows the product meets this requirement.* | Document Review |
|  |  |  |  | *Indicate location of requested information in submittal.* |  |
|  |  | TERL Test Cases (Steps): PCMS001 (Step 5) |  |  | Init.: |
| 10 |  | All assembly hardware greater than or equal to 5/8 inch in diameter is galvanized. Bolts, studs, and threaded rod meet ASTM A307, and structural bolts meet ASTM F3125 Grade A325. |  | *Provide statement of conformance from hardware supplier that shows the product meets this requirement.* | Document Review |
|  |  |  |  | *Indicate location of requested information in submittal.* |  |
|  |  | TERL Test Cases (Steps): PCMS001 (Step 6) |  |  | Init.: |
| 11 |  | All electronic assemblies meet the environmental requirements of NEMA TS-4. |  | *Provide a third party test report that demonstrates compliance with this requirement. Also, provide a completed Testing Laboratory and Report Checklist and NEMA TS4 2.2.3-2.2.6, 3.1.1 & 5.4 Checklist.* | Document Review |
|  |  |  |  | *Indicate location of requested information in submittal.* |  |
|  |  | TERL Test Cases (Steps): PCMS001 (Step 7) |  |  | Init.: |
| 12 |  | The controller and associated on-board circuitry are not affected by mobile radio, or any other radio transmissions. |  | *Provide a statement of conformance in this field.* | Compliance Matrix Review |
|  |  | TERL Test Cases (Steps): PCMS001 (Step 8) |  |  | Init.: |
| 13 |  | An operator’s manual is furnished with each unit. |  | *Provide a statement of conformance in this field.* | Compliance Matrix Review |
|  |  | TERL Test Cases (Steps): PCMS001 (Step 9) |  |  | Init.: |
| 14 |  | All portable devices are permanently marked with manufacturer’s name or trademark, model/part number, and date of manufacture or serial number. |  | *Applicant may provide comments in this field.* | Physical Inspection |
|  |  | TERL Test Cases (Steps): PCMS002 (Step 4) |  |  | Init.: |
| 15 |  | Portable devices and trailers are delineated on a permanent basis by affixing retroreflective sheeting in a continuous line on the face of the trailer as seen by oncoming road users. |  | *Applicant may provide comments in this field.* | Physical Inspection |
|  |  | TERL Test Cases (Steps): PCMS002 (Step 5) |  |  | Init.: |
| 16 | 990-3.1.1 | Batteries are protected from overcharging and over-discharging. |  | *Provide product literature, specifications, user manual, or similar information that shows the product meets this requirement.* | Document Review |
|  |  |  |  | *Indicate location of requested information in submittal.* |  |
|  |  | TERL Test Cases (Steps): PCMS001 (Step 10) |  |  | Init.: |
| 17 |  | An external battery charge level indicator is provided. |  | *Provide product literature, specifications, user manual, or similar information that shows the product meets this requirement.* | Document Review and  Physical Inspection |
|  |  |  |  | *Indicate location of requested information in submittal.* |  |
|  |  | TERL Test Cases (Steps): PCMS001 (Step 11), PCMS002 (Step 6) |  |  | Init.: |
| 18 |  | Automatic recharging of batteries is provided using a charge controller that includes charging status and battery charge level indicators. |  | *Applicant may provide comments in this field.* | Physical Inspection |
|  |  | TERL Test Cases (Steps): PCMS002 (Step 7) |  |  | Init.: |
| 19 |  | An AC/DC battery charger unit is provided. |  | *Applicant may provide comments in this field.* | Physical Inspection |
|  |  | TERL Test Cases (Steps): PCMS002 (Step 8) |  |  | Init.: |
| 20 |  | Batteries, charge controllers, and power panels are protected from the elements and vandalism. |  | *Applicant may provide comments in this field.* | Physical Inspection |
|  |  | TERL Test Cases (Steps): PCMS002 (Step 9) |  |  | Init.: |
| 21 | 990-3.1.1.1 | Solar powered systems provide automatic recharging of power supply batteries to normal operating levels with meters showing charge. |  | *Applicant may provide comments in this field.* | Functional Inspection |
|  |  | TERL Test Cases (Steps): PCMS005 (Step 4) |  |  | Init.: |
| 22 |  | Changeable message sign is designed to provide 180 days of continuous operation with minimum onsite maintenance. |  | *Provide a statement of conformance in this field.* | Compliance Matrix Review |
|  |  | TERL Test Cases (Steps): PCMS001 (Step 12) |  |  | Init.: |
| 23 |  | Solar array recovery time is accomplished in a maximum of three hours. |  | *Applicant may provide comments in this field.* | Functional Inspection |
|  |  | TERL Test Cases (Steps): PCMS005 (Step 4) |  |  | Init.: |
| 24 | 990-3.1.1.2 | Electrical system batteries are designed to provide 21 days of continuous operation without sunlight with a minimum of onsite maintenance. |  | *Provide product literature, specifications, user manual, or similar information that shows the product meets this requirement.* | Document Review and  Functional Inspection |
|  |  |  |  | *Indicate location of requested information in submittal.* |  |
|  |  | TERL Test Cases (Steps): PCMS001 (Step 13), PCMS006 |  |  | Init.: |
| 25 | 990-3.1.2 | The display housing assembly is weather tight. |  | *Provide a statement of conformance in this field.* | Compliance Matrix Review |
|  |  | TERL Test Cases (Steps): PCMS001 (Step 14) |  |  | Init.: |
| 26 |  | The display assembly is equipped with an automatic dimming operational mode capable of a minimum of 50 percent dimming and a separate manual dimmer switch. |  | *Provide product literature, specifications, user manual, or similar information that shows the product meets this requirement.* | Document Review and  Functional Inspection |
|  |  |  |  | *Indicate location of requested information in submittal.* |  |
|  |  | TERL Test Cases (Steps): PCMS001 (Step 15), PCMS004 |  |  | Init.: |
| 27 |  | The display panel background and frame for the display assembly is painted flat black and meets Federal Specification TT-E-489. |  | *Provide product literature, specifications, user manual, or similar information that shows the product meets this requirement.* | Document Review |
|  |  |  |  | *Indicate location of requested information in submittal.* |  |
|  |  | TERL Test Cases (Steps): PCMS001 (Step 16) |  |  | Init.: |
| 28 |  | The display panel for arrow boards and changeable message signs, when raised in the upright position, shall have a minimum height of 7 feet from the bottom of the panel to the ground, in accordance with the MUTCD. |  | *Provide product literature, specifications, user manual, or similar information that shows the product meets this requirement.* | Document Review and  Physical Inspection |
|  |  |  |  | *Indicate location of requested information in submittal.* |  |
|  |  | TERL Test Cases (Steps): PCMS001 (Step 17), PCMS002 (Step 10) |  |  | Init.: |
| 29 |  | The unit has an accessible mechanism to easily raise and lower the display assembly; a locking device is also provided to ensure the display panel will remain in the raised or lowered position. |  | *Provide product literature, specifications, user manual, or similar information that shows the product meets this requirement.* | Document Review and  Functional Inspection |
|  |  |  |  | *Indicate location of requested information in submittal.* |  |
|  |  | TERL Test Cases (Steps): PCMS001 (Step 18), PCMS008 (Steps 1-3) |  |  | Init.: |
| 30 |  | The unit has a safety system to protect against the panel falling from the trailer to the roadway should the panel separate from the lift system. |  | *Provide product literature, specifications, user manual, or similar information that shows the product meets this requirement.* | Document Review and  Physical Inspection |
|  |  |  |  | *Indicate location of requested information in submittal.* |  |
|  |  | TERL Test Cases (Steps): PCMS001 (Step 19), PCMS002 (Step 11) |  |  | Init.: |
| 31 | 990-3.1.3 | Controller and control panel are housed in a weather, dust, and vandal resistant lockable cabinet. |  | *Provide product literature, specifications, user manual, or similar information that shows the product meets this requirement.* | Document Review and  Physical Inspection |
|  |  |  |  | *Indicate location of requested information in submittal.* |  |
|  |  | TERL Test Cases (Steps): PCMS001 (Step 20), PCMS002 (Step 12) |  |  | Init.: |
| 32 |  | If remote communication is included, the sign controller is addressable through the Ethernet communications network using software that complies with the National Transportation Communications for ITS Protocol (NTCIP) 1101 base standard, including all amendments as published at the time of contract letting, the NTCIP Simple Transportation Management Framework, and conforms to Compliance Level 1. |  | *Provide a statement of conformance in this field.* | Compliance Matrix Review |
|  |  | TERL Test Cases (Steps): PCMS001 (Step 21) |  |  | Init.: |
| 33 |  | If remote communication is included, the software implements all mandatory objects in the supplemental requirement SR-700-4-1,.1-01, FDOT Dynamic Message Sign NTCIP Requirements, as published on the FDOT State Traffic Engineering and Operations Office web site at the time of contract letting. |  | *Applicant may provide comments in this field.* | Functional Inspection |
|  |  | TERL Test Cases (Steps): PCMS007 |  |  | Init.: |
| 34 | 990-3.1.4 | The support chassis is self-contained and self-supporting without the use of additional equipment or tools. |  | *Applicant may provide comments in this field.* | Physical Inspection |
|  |  | TERL Test Cases (Steps): PCMS002 (Step 13) |  |  | Init.: |
| 35 |  | The sign, power supply unit and all support systems are mounted on a wheeled trailer. |  | *Applicant may provide comments in this field.* | Physical Inspection |
|  |  | TERL Test Cases (Steps): PCMS002 (Step 14) |  |  | Init.: |
| 36 |  | The trailer is equipped with class-A lights, using a plug adapter. |  | *Provide product literature, specifications, user manual, or similar information that shows the product meets this requirement.* | Document Review and  Physical Inspection |
|  |  |  |  | *Indicate location of requested information in submittal.* |  |
|  |  | TERL Test Cases (Steps): PCMS001 (Step 22), PCMS002 (Step 15) |  |  | Init.: |
| 37 |  | The trailer is equipped with adjustable outrigger leveling pads, one on each of the four frame corners. |  | *Applicant may provide comments in this field.* | Physical Inspection |
|  |  | TERL Test Cases (Steps): PCMS002 (Step 16) |  |  | Init.: |
| 38 |  | The trailer can be set up at the site with its own chassis and outriggers, without being hitched to a vehicle. |  | *Applicant may provide comments in this field.* | Physical Inspection |
|  |  | TERL Test Cases (Steps): PCMS002 (Step 17) |  |  | Init.: |
| 39 |  | The trailer is equipped with fenders over the tires. |  | *Applicant may provide comments in this field.* | Physical Inspection |
|  |  | TERL Test Cases (Steps): PCMS002 (Step 18) |  |  | Init.: |
| 40 |  | The trailer meets all equipment specifications set forth in Chapter 316 of the Florida Statutes, and by such rule, regulation or code that may be adopted by the Department of Highway Safety and Motor Vehicles. |  | *Applicant may provide comments in this field.* | Functional Inspection |
| The following compliance matrix criteria (referencing Florida Statutes (F.S.)) are from Chapter 316, F.S. and are for trailers. | | | | | |
| 41 | F.S. Section 316.221(1) | The trailer is equipped with at least two taillamps mounted on the rear, which, when lighted as required in 316.217, F.S., emit a red light plainly visible from a distance of 1,000 feet to the rear. |  | *Applicant may provide comments in this field.* | Functional Inspection |
|  |  | TERL Test Cases (Steps): PCMS008 (Step 7) |  |  | Init.: |
| 42 | F.S. Section 316.221(2) | Either a taillamp or a separate lamp is placed as to illuminate with a white light the rear registration plate of the trailer and render it clearly legible from a distance of 50 feet from the rear. |  | *Applicant may provide comments in this field.* | Functional Inspection |
|  |  | TERL Test Cases (Steps): PCMS008 (Step 6) |  |  | Init.: |
| 43 | F.S. Section 316.222(1) | The trailer is equipped with two or more stop lamps meeting the requirements of 316.234(1), F.S. |  | *Applicant may provide comments in this field.* | Functional Inspection |
|  |  | TERL Test Cases (Steps): PCMS008 (Step 4) |  |  | Init.: |
| 44 | F.S. Section 316.222(2) | The trailer is equipped with electric turn signal lamps meeting the requirements of 316.234(2), F.S. |  | *Applicant may provide comments in this field.* | Functional Inspection |
|  |  | TERL Test Cases (Steps): PCMS008 (Step 5) |  |  | Init.: |
| The following compliance matrix criteria are for all PCMS. | | | | | |
| 45 | 990-3.3.1 | Message matrix panel is a maximum height of 7 feet by a maximum width of 146 inches. |  | *Provide product literature, specifications, user manual, or similar information that shows the product meets this requirement.* | Document Review and Physical Inspection |
|  |  |  |  | *Indicate location of requested information in submittal.* |  |
|  |  | TERL Test Cases (Steps): PCMS001 (Step 23), PCMS002 (Step 19) |  |  | Init.: |
| 46 |  | The matrix is capable of displaying three lines of 8 characters using an 18 inch or 12-inch font. |  | *Provide product literature, specifications, user manual, or similar information that shows the product meets this requirement.* | Document Review and  Functional Inspection |
|  |  |  |  | *Indicate location of requested information in submittal.* |  |
|  |  | TERL Test Cases (Steps): PCMS001 (Step 24), PCMS003 (Step 1) |  |  | Init.: |
| 47 |  | The matrix displays characters that meet or exceed the numeral and letter sizes prescribed in the MUTCD and SHS (Standard Highway Signs) companion document. Fonts and graphics mimic the characteristics of fonts and graphics defined in NEMA TS4, the MUTCD, and SHS. |  | *Applicant may provide comments in this field.* | Functional Inspection |
|  |  | TERL Test Cases (Steps): PCMS003 (Step 8) |  |  | Init.: |
| 48 |  | LED modules used to form the message matrix are interchangeable. |  | *Applicant may provide comments in this field.* | Physical Inspection |
|  |  | TERL Test Cases (Steps): PCMS002 (Step 20) |  |  | Init.: |
| 49 | 990-3.3.2 | All text is displayed in upper case, except when lower case is project specific and allowed by the MUTCD. |  | *Applicant may provide comments in this field.* | Functional Inspection |
|  |  | TERL Test Cases (Steps): PCMS003 (Step 6) |  |  | Init.: |
| 50 |  | The message matrix panel is visible from one-half mile. |  | *Applicant may provide comments in this field.* | Functional Inspection |
|  |  | TERL Test Cases (Steps): PCMS008 (Steps 8-10,13) |  |  | Init.: |
| 51 |  | For 18” PCMS, the message matrix panel is legible from a distance of 650 feet under nighttime conditions and 800 feet for normal daylight conditions. |  | *Applicant may provide comments in this field.* | Functional Inspection |
|  |  | TERL Test Cases (Steps): PCMS008 (Steps 11,14) |  |  | Init.: |
| 52 |  | For a 12” PCMS, the message matrix panel is legible from 650 feet for both nighttime and normal daylight conditions. |  | *Applicant may provide comments in this field.* | Functional Inspection |
|  |  | TERL Test Cases (Steps): PCMS008 (Steps 12,15) |  |  | Init.: |
| 53 |  | The message panel has adjustable display rates, so the entire message can be read at least twice at the posted speed. |  | *Provide product literature, specifications, user manual, or similar information that shows the product meets this requirement.* | Document Review and Functional Inspection |
|  |  |  |  | *Indicate location of requested information in submittal.* |  |
|  |  | TERL Test Cases (Steps): PCMS001 (Step 26), PCMS008 (Step 16) |  |  | Init.: |
| 54 |  | The control panel has the capability to store a minimum 50 pre-programmed messages. |  | *Provide product literature, specifications, user manual, or similar information that shows the product meets this requirement.* | Document Review |
|  |  |  |  | *Indicate location of requested information in submittal.* |  |
|  |  | TERL Test Cases (Steps): PCMS001 (Step 27) |  |  | Init.: |
| 55 |  | The controller in the control panel can store messages during non-powered conditions. |  | *Applicant may provide comments in this field.* | Functional Inspection |
|  |  | TERL Test Cases (Steps): PCMS005 (Step 5) |  |  | Init.: |
| 56 |  | The controller allows the operator to generate additional messages on site via the keyboard. |  | *Provide product literature, specifications, user manual, or similar information that shows the product meets this requirement.* | Document Review and Functional Inspection |
|  |  |  |  | *Indicate location of requested information in submittal.* |  |
|  |  | TERL Test Cases (Steps): PCMS001 (Step 28), PCMS003 (Step 1) |  |  | Init.: |
| 57 |  | All messages are flashed or sequenced; in the sequence mode, the controller has the capability to sequence three-line messages during one cycle. |  | *Provide product literature, specifications, user manual, or similar information that shows the product meets this requirement.* | Document Review and Functional Inspection |
|  |  |  |  | *Indicate location of requested information in submittal.* |  |
|  |  | TERL Test Cases (Steps): PCMS001 (Step 29), PCMS003 (Step 7) |  |  | Init.: |

**Document History for:**

**Portable Changeable Message Sign Compliance Matrix**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Rev | Description | Authored and Checked | Reviewed | Approved | Approval Date | Rev More Stringent? |
| 1.0 | Conversion from Excel to Word and adding evaluation criteria. | D. Bremer | C. Morse  D. Vollmer | J. Morgan | 05/09/2013 | N/A |
| 2.0 | Replaced FDOT logo with latest approved one and added CM ID # to header. Revised document approver title. | A. Burleson  K. Moser | J. Morgan | J. Morgan | 10/31/2014 | No |
| 3.0 | Updating to latest FHWA. There is a current FHWA review, but the proposed changes do not affect arrow board. | D. Bremer | C. Morse  M. DeWitt | J. Morgan | 08/19/2015 | No |
| 4.0 | Updated to reflect latest FA approval date of 8-11-15. | A. Burleson | J. Morgan | J. Morgan | 02/05/2016 | No |
| 5.0 | Updated to reflect latest FA approval date of 8-20-18. | R. Brooks | F. Deasy | J. Morgan | 07/31/2019 | No |
| 6.0 | Updated to reflect latest FA approval date of 10-31-19. | W. Geitz | M. DeWitt  F. Deasy  J. Morgan | D. Vollmer | 12/28/2020 | No |
| 7.0 | Removed flip disk technology and updated to latest FA date of 2/22/2021. | W. Geitz | M. DeWitt | M. DeWitt | 06/03/2022 | No |
| 8.0 | Added MUTCD requirements and Florida Statute requirements regarding trailers. Updated to reflect latest FA date of 8-16-24 for spec 990. CM IDs 2 and 3 contain more stringent requirements. | W. Geitz | D. Bremer  A. Cramer  D. Vollmer | M. DeWitt | 03/26/2025 | Yes |
| 9.0 | Added test cases/steps. | A. Cramer | W. Geitz  D. Bremer | M. DeWitt | 05/19/2025 | No |