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|  | FDOT Traffic Engineering Research Laboratory (TERL)  Mast Arm, Span Wire, and Pole Mounting Assembly Compliance Matrix | By signing this form, the applicant declares that he/she has read and understands the provisions of Sections 659 and 995 of the FDOT *Standard Specifications for Road and Bridge Construction* and all implemented modifications. The requirements listed on this matrix are derived from Section 659 and 995, and are the basis for determining a product’s compliance and its acceptability for use on Florida’s roads. |  |

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

| **ID No** | **Section** | **Requirement** | **Item Comply? (Yes/No/NA)** | **Comments (Applicant must provide information as indicated)** | **TERL Evaluation Method** |
| --- | --- | --- | --- | --- | --- |
| The following compliance matrix criteria are for all supports and attachments. | | | | | |
| 1 | 995-1.1 | All equipment is permanently marked with manufacturer name or trademark, part number, and date of manufacture or serial number. |  | *Applicant may provide comments in this field.* | Physical Inspection |
| 2 | 995-7.1 | All fastening hardware, such as bolts, nuts, washers, set screws, studs, U-bolts, cable and cable swags, are provided by the mounting assembly manufacturer, and are SAE Type 316 or 304 stainless steel. |  | *Provide statement of conformance from hardware supplier that shows the product meets this requirement.* | Document Review and  Physical Inspection |
|  |  |  |  | *Indicate location of requested information in submittal.* |  |
| 3 |  | Hardware (studs, bolts and U-bolts) are a minimum of 5/16 inch diameter unless otherwise specified in this Section. |  | *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.* |  |
| 4 |  | Metallic mounting assembly meets ASTM B117 for corrosion resistance. |  | *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.* |  |
| 5 |  | Connections that provide an entrance to the interior of a traffic device are weather-resistant. |  | *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.* |  |
| 6 |  | Assembly is constructed to support the weight of any combination of signal indications with all accessories such as back plates and visors. |  | *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.* |  |
| 7 |  | Connections between signal, disconnect and disconnect hanging hardware are tri-stud design. Tri-stud washers are a minimum 0.090 inches thick unless otherwise specified in this Section. |  | *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.* |  |
| 8 |  | Connections mate with a standard traffic signal’s two-inch I.D. opening and provide positive positioning and alignment of the traffic device. |  | *Provide product literature, specifications, user manual, or similar information that shows the product meets this requirement.* | Document Review, Physical Inspection and  Functional Inspection |
|  |  |  |  | *Indicate location of requested information in submittal.* |  |
| 9 |  | If the connection uses a 72-tooth serrated edge, all teeth are clean and sharp and at least 1/8 inch wide and 3/64 inch deep. |  | *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.* |  |
| 10 |  | All connection types between the signal and the upper brackets are weather resistant. |  | *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.* |  |
| 11 |  | Mounting assembly is capable of providing adjustment in multiple directions for proper alignment of the attached traffic device and to prevent rotation around the vertical axis or misalignment after installation. |  | *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.* |  |
| 12 |  | Studs are either cast directly into the aluminum during the casting process or tapped and locked with a locking material. |  | *Provide product literature, specifications, user manual, or similar information that shows the product meets this requirement.* ***Indicate pull-out force.*** | Document Review and  Physical Inspection |
|  |  |  |  | *Indicate location of requested information in submittal.* |  |
| 13 |  | Messenger wire clamps are extruded aluminum six inches long or cast U-bolt type. |  | *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.* |  |
| 14 |  | Torque specifications for all fastening hardware are included with the assembly installation instructions. |  | *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.* |  |
| 15 | 995-7.3 | Mounting assembly and components are supplied with a natural finish. Mill scale is removed in accordance with Military Standard MIL-PRF-24712A or AAMA 2603-02 and meets the requirements of ASTM 3359 and ASTM D3363. |  | *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.* |  |
| 16 |  | Disconnect (interior and exterior) and disconnect hub are powder-coat painted dull black (Federal Standard 595A-37038) with a reflectance value not exceeding 25 percent as measured by ASTM E97. |  | *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.* |  |
| 17 |  | All finished surfaces have a smooth finish free from cracks, blowholes, shrinks, excessive material, and other flaws. |  | *Provide product literature, specifications, user manual, or similar information that shows the product meets this requirement.* | Physical Inspection |
|  |  |  |  | *Indicate location of requested information in submittal.* |  |
| The following compliance matrix criteria are for Mast Arm Mounting Assemblies. | | | | | |
| 18 | 995-7.4 | Mast arm mounting assembly includes mast arm saddle, swivel, attachment cables (with cable clamp mechanism) or bands, support tube, and top and bottom support arms. |  | *Provide product literature, specifications, user manual, or similar information that shows the product meets this requirement.* | Physical Inspection |
|  |  |  |  | *Indicate location of requested information in submittal.* |  |
| 19 |  | Mounting assemblies can be attached to a mast arm by cables or bands and must prevent movement when 250 pounds of downward force is applied to the completed vehicular traffic signal assembly. |  | *Provide a first or third party test report that demonstrates compliance with this requirement. The test report must be less than 5 years old and meet the requirements of FDOT Product Certification Handbook, section 7.2.* | Document Review and Physical Inspection |
|  |  |  |  | *Indicate location of requested information in submittal.* |  |
| 20 | 995-7.4.1 | Saddles are aluminum or stainless steel and have a minimum yield strength of 16 ksi and a minimum ultimate tensile strength of 23 ksi in accordance with ASTM B26, ASTM B108, or ASTM A240. |  | *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.* |  |
| 21 | 995-7.4.2 | Swivels are aluminum or stainless steel and have a minimum yield strength of 16 ksi and a minimum ultimate tensile strength of 23 ksi in accordance with ASTM B26, ASTM B108, ASTM B85 or ASTM A240. |  | *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.* |  |
| 22 |  | Swivel provides at least two connection devices to secure the support tube to the swivel and is configured to permit the support tube to provide adjustment in multiple directions in a plane parallel to the mast arm. |  | *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.* |  |
| 23 |  | Castings used to attach the support tube to the swivel are manufactured from the same alloy as the swivel. |  | *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.* |  |
| 24 | 995-7.4.3 | Mast arm saddle attachment cables are 3/16-inch minimum diameter, Type 316 or 304 stainless steel aircraft type wire strand cable. |  | *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.* |  |
| 25 |  | The swage at the ends of the cable is Type 316 or 304 stainless steel with a minimum 3/8-inch diameter thread. The swage can be held with a wrench to prevent rotation while tightening the nut at the end of the swage. |  | *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.* |  |
| 26 |  | Any cable end without swaged clamp screws is sintered, welded, or otherwise secured without adhesives to prevent unraveling of the cable. |  | *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.* |  |
| 27 |  | If banding is provided, include two Type 304 or 201 series stainless steel 3/4-inch-wide bands and Type 316 stainless steel buckles (clamp screws). All banding edges are de-burred. |  | *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.* |  |
| 28 | 995-7.4.4 | Mast arm mount components used to secure the cable to the saddle must be aluminum or stainless steel and must have a minimum yield strength of 23 ksi and a minimum ultimate tensile strength of 30 ksi in accordance with ASTM B26, ASTM B221, ASTM B85 or ASTM A240. |  | *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.* |  |
| 29 | 995-7.4.5 | Support tubes used in mast arm mounting assemblies are aluminum or stainless steel and must have a minimum yield strength of 25 ksi and a minimum ultimate tensile strength of 30 ksi in accordance with ASTM B221 or ASTM A240. |  | *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.* |  |
| 30 |  | Tube is a gusseted hollow design and its cross-sectional area’s principal moments of inertia average; at a minimum, that of a 1-1/2-inch standard aluminum Schedule 40 pipe or greater and the cross-sectional metal area is not less than that of a 1-1/2 inch Schedule 40 pipe. |  | *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.* |  |
| 31 |  | The bottom portion of the tube that supports the vertical load of the hanging device is threaded using National Pipe Thread Taper (NPT), National Pipe Thread Straight (NPS), non-threaded U-bolt secured, or a continuous arm support tube. |  | *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.* |  |
| 32 |  | Threaded support tubes that are fully slotted have an aluminum insert in the 3/4-inch slot extending a minimum of 1/2 inch beyond the threaded section. |  | *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.* |  |
| 33 |  | The tube has a minimum 0.562-inch wire entrance slot running the full length of the tube or stopping a minimum of 8 inches above the threaded or U-bolt secured end. |  | *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.* |  |
| 34 |  | Edges of slot are supported with internal gusseting and are free of sharp edges that may damage wiring. |  | *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.* |  |
| 35 |  | An easily installed and removable UV stabilized seal that completely fills the wire entrance 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.* |  |
| 36 | 995-7.4.6 | The top support arm of the mounting assembly is one-piece solid construction, or continuous arm with support tube, and capable of holding the signal head firmly in place. |  | *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.* |  |
| 37 |  | Top support arms are aluminum with a minimum ultimate tensile strength of 30 ksi and minimum yield strength of 18 ksi in accordance with ASTM B26 or be die cast with a minimum ultimate tensile strength of 27 ksi and a minimum yield strength of 24 ksi. |  | *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.* |  |
| 38 |  | One and two piece top arms are acceptable. For a one-piece top arm, use at least two 1/4-inch minimum diameter Type 316 or 304 stainless steel set screws to secure its position on the support tube; for a two-piece top arm, hardware required to connect components of the top arm must be 3/8-inch minimum diameter, Type 316 or 304 stainless steel. |  | *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.* |  |
| 39 |  | The top support arm has three 1/4 inch - 20 UNC-2B threaded holes to accept bolts for a tri-stud washer and gasket, or at least one imbedded or tapped and locked 5/16 inch - 18 threaded stud within the industry’s standard 72-tooth serrated circular design that facilitates 5-degree increment positioning. |  | *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.* |  |
| 40 |  | Washers, nuts, and lock washers for attaching signal heads are provided and are 0.090-inch thick (minimum) Type 316 or 304. |  | *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.* |  |
| 41 |  | A rubber washer, with dimensions similar to the large stainless-steel washer, is provided for traffic signals. |  | *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.* |  |
| 42 |  | When mast arm clamps are used to support illuminated signs with tri-stud arrangements, a rubber washer with dimensions similar to the steel washer is used. |  | *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.* |  |
| 43 | 995-7.4.7 | The bottom support arm, when not continuous arm with support tube, is hollow to allow the routing and enclosing of all signal wiring. Bottom support arms must be aluminum with a minimum ultimate tensile strength of 30 ksi and minimum yield strength of 18 ksi in accordance with ASTM B26 or be die cast with a minimum ultimate tensile strength of 27 ksi and a minimum yield strength of 24 ksi. |  | *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.* |  |
| 44 |  | Plastic bottom arm covers are constructed of ABS with a UV inhibitor and are strong enough to contain the signal cable in the bottom arm cavity without bending during installation and warping over time. |  | *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.* |  |
| 45 |  | If threaded, the end of the bottom support arm that attaches to the support tube has a 1-1/2 inch steel coupling imbedded and cast directly into the part during the solidification of the aluminum, or a 1-1/2 inch NPT or NPS pipe thread cut directly into the casting. |  | *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.* |  |
| 46 |  | For non-threaded versions, the arm allows the support tube to sit a minimum of 2 inches into an arm pocket and be secured to the arm with minimum 5/16 full U-bolt to distribute the load evenly to the lower arm casting. |  | *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.* |  |
| 47 |  | The end of the bottom support arm that connects to the signal has either three equally spaced and plumb imbedded 5/16-inch Type 316 or 304 stainless steel threaded studs located in the center of the 72-tooth serrated circular design, or three 1/4 inch – 20 UNC-2B tapped holes to accept bolts for a tri-stud washer. |  | *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.* |  |
| The following compliance matrix criteria are for Mast Arm Mounting Assemblies Bottom Support Arm with Steel Coupling. | | | | | |
| 48 | 995-7.4.7.1 | The bottom arm is aluminum alloy 535.0-F in accordance with ASTM B26, with a minimum ultimate tensile strength of 23 ksi, meeting all standards listed in ASTM B26, including chemical composition listed in Table 1 and material mechanical properties listed in Table 2. The end of the bottom support arm must have at least two 1/4-inch diameter Type 316 or 304 stainless steel set screws to secure its position on the support tube. |  | *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.* |  |
| The following compliance matrix criteria are for Mast Arm Mounting Assemblies Bottom Support Arm with Threaded Arms. | | | | | |
| 49 | 995-7.4.7.2 | If threads are cut directly into the casting, the bottom arm is aluminum alloy 535.0-F in accordance with ASTM B26, with a minimum ultimate tensile strength of 35 ksi and elongation of 9.0% in a two-inch section, meeting all standards listed in ASTM B26, including chemical composition listed in Table 1 and material mechanical properties listed in Table 2. |  | *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.* |  |
| 50 |  | If the arm is die cast in aluminum, it has a minimum ultimate tensile strength of 27 ksi and a minimum yield strength of 24 ksi. |  | *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.* |  |
| 51 |  | The end of the bottom arm has at least two 1/4-inch minimum diameter Type 316 or 304 stainless steel set screws to secure its position on the support tube. |  | *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.* |  |
| The following compliance matrix criteria are for Mast Arm Mounting Assemblies Bottom Support Arm with Non-Threaded Arms. | | | | | |
| 52 | 995-7.4.7.3 | Lower arm is aluminum 356 having a minimum ultimate tensile strength of 30 ksi and meeting all standards listed in ASTM B26, including chemical composition listed in Table 1 and material mechanical properties listed in Table 2. The arm must have a locator tab to receive the support tube and be secured by a U-bolt. |  | *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.* |  |
| The following compliance matrix criteria are for Continuous Arm Support Tubes. | | | | | |
| 53 | 995-7.4.7.4 | Continuous arm support tube is of single form to support weight of any combination of signal indicators with all accessories such as backplates and visors. |  | *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.* |  |
| 54 |  | Continuous support tube is Type 316 or 304 stainless steel with a minimum ultimate tensile strength of 75 ksi and a minimum yield strength of 30ksi in accordance with ASTM A554, or aluminum with a minimum yield strength of 25 ksi and a minimum ultimate tensile strength of 30 ksi in accordance with ASTM B221. |  | *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.* |  |
| 55 |  | Continuous arm support tube attachment to the signal head has a minimum of two 5/16-18 Type 316 or 304 stainless steel bolts, nuts and washers. A rubber seal is provided between the support tube and signal head. |  | *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.* |  |
| The following compliance matrix criteria are for Span Wire Mounting Assemblies. | | | | | |
| 56 | 995-7.5 | Span wire mounting assembly includes a span wire clamp, a hanging device such as a drop pipe, adjustable hanger, or adjustable pivotal hangar with extension bar, messenger clamp, disconnect hanger, and multi-brackets. |  | *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.* |  |
| 57 | 995-7.5.1 | Span wire clamps is aluminum or stainless steel and must have a minimum ultimate tensile strength of 32 ksi and minimum yield strength of 22 ksi in accordance with ASTM B28, ASTM B108, ASTM B85 or ASTM A240. |  | *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.* |  |
| 58 | 995-7.5.2 | Drop pipe hangers are galvanized 1-1/2 inch steel or aluminum having a minimum yield strength of 35 ksi and a minimum ultimate tensile strength of 42 ksi in accordance with ASTM B221 and have NPT on each end for assembly. |  | *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.* |  |
| 59 | 995-7.5.3 | Aluminum adjustable hangers are aluminum alloy 535.0-F in accordance with ASTM B26 with a minimum ultimate tensile strength of 35 ksi and elongation of 9.0% in a two-inch section, meeting the chemical composition listed in Table 1 and material mechanical properties listed in Table 2 in ASTM B26. |  | *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.* |  |
| 60 | 995-7.5.4 | Stainless steel adjustable hangers are Type 316 or 304 stainless steel with a minimum ultimate tensile strength of 75 ksi and a minimum yield strength of 30 ksi in accordance with ASTM A276. |  | *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.* |  |
| 61 | 995-7.5.5 | Aluminum pivotal hangers are aluminum alloy 535.0-F in accordance with ASTM B26 with a minimum ultimate tensile strength of 35 ksi and elongation of 9.0% in a two-inch section, meeting the chemical composition listed in Table 1 and material mechanical properties listed in Table 2 in ASTM B26. |  | *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.* |  |
| 62 | 995-7.5.6 | Stainless steel pivotal hangers are either Type 316 or 304 stainless steel with a minimum ultimate tensile strength of 75 ksi and a minimum yield strength of 30 ksi in accordance with ASTM A276. |  | *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.* |  |
| 63 | 995-7.5.7 | Aluminum extension bars used to extend the length of the adjustable hanger are T6061-T6 extrusion aluminum having a minimum yield strength of 35 ksi and a minimum ultimate tensile strength of 42 ksi in accordance with ASTM B221. |  | *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.* |  |
| 64 | 995-7.5.8 | Stainless Steel Extension Bar used to extend the length of adjustable hangers is Type 316 or 304 stainless steel with a minimum ultimate tensile strength of 75 ksi and a minimum yield strength of 30 ksi in accordance with ASTM A276. |  | *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.* |  |
| 65 | 995-7.5.9 | The disconnect hanger is supplied with a wired screw type/compression terminal block and wiring rated at 600 VAC RMS (Root Mean Square) with 12 or 18 circuits. |  | *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.* |  |
| 66 |  | The terminal block is easily accessible for connection of the field wiring and is attached to the disconnect with Type 316 or 304 stainless steel or brass fastening hardware. |  | *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.* |  |
| 67 |  | The disconnect hanger is supplied with weather resistant grommets in each signal cable entrance of the disconnect hanger. |  | *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.* |  |
| 68 |  | The disconnect hanger has a two-inch opening in the top of the disconnect hanger with an integral serrated area (or 1-1/2-inch NPT threaded top section) to interface with the hanger method employed above it. |  | *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.* |  |
| 69 |  | The disconnect hanger has a securable door that allows access to all areas of the interior. The door securing device is Type 316 or 304 stainless steel and captive. |  | *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.* |  |
| 70 |  | Hinge or groove pins for the door are Type 316, 304, 303, or 302 stainless steel. |  | *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.* |  |
| 71 | 995-7.5.10 | Top and bottom (multi) brackets used in the assembly of span wire mounted multi directional signals are constructed of aluminum having a minimum yield strength of 13 ksi and a minimum ultimate tensile strength of 23 ksi per ASTM B26. |  | *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.* |  |
| 72 |  | Top bracket is a one-piece hollow design, with a cross-sectional diameter of at least 1-1/2 inch I.D. for receiving signal wires and have a wall thickness at least 3/16 inch. |  | *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.* |  |
| 73 |  | Top bracket has a two-inch diameter hole (with integral serrated boss as specified above) in the top side of the bracket for receiving a 1-1/2 inch entrance fitting. |  | *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.* |  |
| 74 |  | The underside of the top bracket has a covered hole of at least three inches in diameter for the installation of the signal wires. |  | *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.* |  |
| 75 |  | Bottom bracket is one-piece solid construction and holds the signal heads firmly in place. |  | *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.* |  |
| 76 |  | The five-section cluster configuration is constructed using 3/8-inch-thick Type 316 or 304 stainless steel tri-stud washers and nylock nuts with lock washers. |  | *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.* |  |
| 77 |  | Bracket washer will not distort after assembly of the five-section cluster. Multi-bracket includes all fastening hardware necessary to attach to the signal. |  | *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.* |  |
| The following compliance matrix criteria are for Pole Mounting Assemblies. | | | | | |
| 78 | 995-7.6 | All trunnions, brackets, and suspensions used in mounting vehicular and pedestrian signals to concrete, steel, aluminum, or wood poles are an aluminum alloy cast fitting having minimum ultimate tensile strength of 35 ksi in accordance with ASTM B221, ASTM B85, or ASTM B26. |  | *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.* |  |
| The following compliance matrix criteria are for Mounting Assemblies for signs cameras, detectors and other devices. | | | | | |
| 79 | 995-7.7 | Mounting assemblies or assembly components are constructed of the same material and meet the same mechanical and chemical properties as mounting assemblies for signals. |  | *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.* |  |
| The following compliance matrix criteria are for Miscellaneous Mounting Components. | | | | | |
| 80 | 995-7.8 | Miscellaneous mast arm, span wire, and pole mounting components and accessories included with assemblies meet the mechanical properties for its associated main assembly components. |  | *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.* |  |
| The following compliance matrix criteria are for all supports and attachments. | | | | | |
| 81 | 659-4 | Mounting assemblies have a manufacturer’s warranty covering defects for a minimum of three years from the date of final acceptance in accordance with 5-11 and Section 608. |  | *Provide a statement of conformance in this field.* | Compliance Matrix Review |
| 82 |  | The warranty includes providing replacements, within 10 calendar days of notification, for defective parts and equipment during the warranty period at no cost to the Department or the maintaining agency. |  | *Provide a statement of conformance in this field.* | Compliance Matrix Review |

**Document History for:**

**Mast Arm, Span Wire, and Pole Mounting Assembly Compliance Matrix**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Rev | Description | Authored and Checked | Reviewed | Approved | Approval Date | Rev More Stringent? |
| 1.0 | Converting from Excel to Word and adding evaluation criteria | D. Bremer  A. Burleson | J. Morgan | J. Morgan | 07/29/2013 | 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 | 11/03/2014 | No |
| 3.0 | Transitioning from A659 to 659 | D. Bremer | J. Morgan  M. DeWitt | J. Morgan | 12/10/2014 | No |
| 4.0 | Updated to reflect latest FA approval date of 12/23/2014. No content change. | A. Burleson | J. Morgan | J. Morgan | 02/04/2016 | No |
| 5.0 | Updated to from proposed revisions 2018 Updated to from proposed revisions 2018Updated CM to reflect spec changes for FA 8/14/2017 update. | R. Brooks | J. Morgan | J. Morgan | 08/31/2017 | No |
| 6.0 | Updated to match FA date of 8-1-2019. Added fail-safe to prevent turning and 740/7400 static loading requirements. | J. Morgan | M. DeWitt | D. Vollmer | 02/11/2020 | No |
| 7.0 | Updated to remove the secondary fail-safe design to prevent slipping. Also removed disconnect hanger requirement to ensure the hanger could withstand 7400 pounds of tension and a perpendicular load of 7400 pounds. FA date of 7-2-20. | W. Geitz | C. Raimer  M. DeWitt | D. Vollmer | 10/27/2020 | No |
| 8.0 | Added warranty information. | A. Burleson | W. Geitz | M. DeWitt | 02/02/2022 | No |
| 9.0 | Updated to latest FA Date 10-24-22 | W. Geitz | M. DeWitt | D. Vollmer | 01/26/2023 | No |
| 10.0 | Added 995-1 for device markings. FA Date stays as 10-24-22 | W. Geitz | D. Christian  M. DeWitt | D. Vollmer | 06/19/2023 | No |