

6590000 MAST ARM, SPAN WIRE, AND POLE MOUNTING ASSEMBLIES
COMMENTS FROM INTERNAL/INDUSTRY REVIEW

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Comment: (7-9-14)

1. Throughout the Specification, whenever grades of stainless steel are called out, you have to specify the grading system. 304, 316, 302, etc. are SAE grades and should be referred to as, "SAE Type 304" etc.

Response: Agree. "SAE" was added to 659-2.1.
Change made.

2. 659-2.1: The sentence "Hardware (studs, bolts and u-bolts) must be a minimum of 5/16 inch diameter unless otherwise specified." is improper. If something is labeled 1/4", then it meets the Spec.

Response: Language changed to "unless otherwise specified in this Section".
Change made.

3. 659-2.1: The sentence, "Grade 8 bolts and nuts are acceptable where high stress and strong load bearing pressures are present" is improper. The words "strong" and "high" are not defined and arbitrary. Also, "Grade 8" is an SAE Grade and should be referenced correctly.

Response: "SAE" will be added and "acceptable where high stress and strong load bearing pressures are present" will be deleted.
Change made.

4. 659-2.1: The sentence, "All assemblies must be constructed to support the wind load and weight of any combination of signal indications with all accessories such as back plates and visors." needs clarification. Where are the wind design parameters?

Response: The wind loading requirements are addressed sufficiently in 659-2.5.8. Sentence edited to remove "wind load and" in 659-2.1.
Change made.

5. Throughout the Specification, language like, "a minimum yield strength 22 (16) ksi...". Why are there two different numbers? This appears several times in the Spec. If the two numbers refer to different ASTM testing methods, you have to list the methods each time they are referenced.

Response: Duplicate values removed.
Changes made.

6. 659-2.4: You have to provide a Specification for the T5 temper designation. Is this an ASM designation? This occurs elsewhere in the Spec.

Response: Temper requirement removed.

Change made.

7. 659-2.4.3: “Type 316 or 304 stainless steel aircraft grade”. Aircraft grade is not a defined term. You have to provide a material Specification.

Response: Wire strand, wire rope, and aircraft cable are commonly used to describe the cables used by manufacturers of these products. Edited to read “...aircraft type wire strand cable” for clarity.

Change made.

8. 659-2.4.5: Capitalize “National Pipe Thread Straight” and “National Pipe Thread Taper”

Response: Changes made.

9. 659-2.5.6: Define “RMS”

Response: “rms” is Root Mean Square.

Change made.

10. 659-2.5.6: “with Type 304 or 316 stainless steel or brass fastening hardware.” You need to provide a material Spec for the Brass hardware.

Response: Brass” is used to describe fasteners throughout the specification book without a material specification (e.g. 556-4.4, 700-4.8.1, others).

No change made.

11. 659-4: Insert the word “Section” before “5-11”

Response: We do not use the word “Section” when referring to an Article or subarticle.

No change made.

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Comment: (7-30-14)

1. Is there a need to reference either 603 or 608. Very similar information is included.

Response: References to Sections 603 and 608 may not be necessary, but are provided to emphasize where requirements for APL approval and other relevant requirements exist. These cross-references currently appear in many of the 600-series specifications for consistency.

No change made.

2. Check numbering. There are two articles 659-5.

Response: Second 659-5 will be changed to 659-6.

Change made.

3. Method of Measurement Article - Please modify to either add all types of mounting assemblies (should match title or description)not just signals. Or just say "mounting assemblies".

Response: Article 659-5 will be changed to the following:

~~**659-5.Method-of-Measurement.**~~
→ ~~The Contract unit price per assembly for each signal head auxiliary mounting assembly, furnished and installed, will include all materials specified in the Contract Documents and all labor, equipment, and miscellaneous items necessary for a complete and acceptable installation.~~
→ ~~No separate payment will be made for mounting assemblies for new signal installations. All incidentals required by the Plans for new signal installations, including mounting hardware, will be included in cost of the new signal, sign, camera, detector, or other traffic control device.~~

Change made.

4. Basis of Payment Article - Suggest using a new pay item series "659-", changing the Description and modifying the BOE to match. Additionally the BOE 650-2 series has other items besides mounting assemblies included which likely need to be included in a seperate Spec if not already done so. Note that there is also a 659-series in the BOE for the same work.

Response: Pay Item No. will be 659-1, Mast Arm, Span Wire and Pole Mounting Assemblies - each.

Change made.

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Comment: (7-30-14)

1. Section 659-2.1, Paragraph 5 discusses tri-stud washers. I suggest changing the last sentence to the following (changes in red): Tri-stud washers must be a minimum of 0.090 inches thick unless otherwise specified.

Response: Changes made.

2. Section 659-2.4: Do the yield strength and tensile strength shown in parentheses apply to clamps, while the strengths not shown in parentheses apply to the mounting assemblies? This is a little unclear to me as I read it. It may be clearer just to spell out the requirements for the mounting assemblies and then have a separate sentence that spells out the requirements for the clamps. Also suggest changing the next to last sentence to read, "... a minimum yield strength of 22 (16) ksi..."

Response: Duplicate values removed.
Changes made.

3. **Section 659-2.4** gives a different minimum yield strength [22 (16) ksi] than the minimum yield strengths shown in Sections 659-2.4.1 and 659-2.4.2 [18 (16) ksi]. Please verify that the intent is to have different values for these assemblies.

Response: Duplicate values removed.
Changes made.

4. **Sections 659-2.4.1 and 2.4.2** both refer to minimum ultimate yield strength, while Section 659-2.4 simply refers to minimum yield strength. Is there a reason for the difference?

Response: Language will be changed for consistency.
Change made.

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Comment: (8-1-14)

Regarding both 65000000 and 65900000: As per the origination form, it states that one of the reasons for the language change is to “include hurricane resistant requirements”. General Comment: With the exception of 659-2.5.8 “Qualification Loading Requirements” and the total exclusion of the Signal Safe current Design Standard, everything else is derived from the status quo of all the other manufacturers; which in some regards, makes sense only as a general baseline. But due to the fact that their span wire devices historically fail during hurricanes, why make the spec’s so specific to just these manufacturers?

1. In lieu of the Department limiting itself to certain manufacturers and only their specifications, why not just add “minimum” or “equal to” preceding each spec requirement or as general note. Not providing in the spec’s a means for betterment and innovation by simply adding in “at a minimum” or “equal to” only protects the status quo.

Response: The material requirements in these specifications are minimum requirements based upon nationally accepted, standard, and proven designs. Manufacturers are encouraged to submit products with innovative or alternate designs that meet the functionality required. The Department’s Approved Product List certification process is able to accommodate the evaluation of alternate designs and update requirements as necessary based upon the results of product evaluation.
No change made.

2. 659-2.5.4 Cable Hanger Historically, as demonstrated repeatedly during hurricanes, the cable hanger is the most destructive and detrimental type hanger system ever utilized. Example; just one storm (Wilma) caused \$43.5 million in signal repair costs – FIN. NO. 420529-2. What makes it the worst system out there is that it allows, (actually provides) for harmful wind induced erratic signal movements (due to messenger / catenary sags) during hurricanes. The basic mechanics is that turbulent winds, primarily wind gust, blow the signal assemblies upward (1-3 sec.) and then they drop due to gravity. This puts shock loading throughout the connections, which explains why areas of the structural failures always varied. In other words, the higher the

fall, the greater the damage. On rigid and semi-rigid systems, the vertical range of movement is restricted and in some instances act together in resisting wind induced lift by adding weight along the messenger cable). The flexible cable hanger system not only allows a wide range of vertical movement (greater dropping height) but also lets the signals respond almost entirely independent to one another (not utilizing the adjacent signals weight/mass).

Response: Acknowledged. The Department is in the process of developing specific hurricane survivability test methods to address these issues. The current specification reflects the results of research and testing performed to date on several attachment methods. No change made at this time.

3. Re: 659-2.5.8 Qualification Loading Requirements The first requirement is basically a material test specific to just the disconnect hanger component of a typical signal assembly excluding and not applicable to signal heads, hangers or the connection points of the entire traffic control device. For the record, our devices far exceed this spec, so it is of no consequence to me; however, it is my opinion that this spec in itself, will do little to nothing in preventing post-storm “dark intersections”. My recommendation would be to not make the disconnect spec an “either/or” but have it directly relative only to disconnects (659-2.5.6) and not as baseline for hurricane resistance. In fact, in my opinion, it should be incorporated as part of what is now referred to as an alternative which does address an entire assembly. Comment #3a: In my opinion, what is now referred to as an alternative, should be the primary and only specification outlining a language change that describes hurricane resistance requirements. In other words, why piecemeal individual components such as disconnect hangers? Since hurricanes have different wind speeds, are turbulent and durational, all the wind induced dynamics should be part of any test requirement. Therefore, I would suggest adding ‘capable of withstanding for a minimum of one hour hurricane force winds, wind induced dynamics and a range of wind speeds no less than 70 mph. and up to 150 mph’. In other words, if the goal is hurricane resistant signal assemblies, why not test to it?

Response: See response to #2.

4. Is it appropriate to reference the ITE specification within this specification since FDOT is not involved in any changes that may take place in this ITE specification? Do such references to other specifications meet FDOT policy on Specification development and changes? Would it be more appropriate to include the desired requirement from another specification into this FDOT specification?

Response: See response provided in Section 650 file.

5. Consider providing a detail description of what is included in a “vehicular signal assembly” in section 650-1. Is the “assembly” different (disconnect , signal heads and back plate) or is it still “everything” from the attachment to the catenary wire of a span wire to the bottom of the signal heads?

Response: See response provided in Section 650 file.

5. Revise section 650-2.27 to indicate that attaching the backplate to the signal assembly is one way, but making the backplate integral to the signal head is also acceptable. Why restrict

backplates to be constructed of only aluminum or polycarbonate? Is there a documented, engineering based reason for requiring “louvers for all backplates”?

Response: See response provided in Section 650 file.

6. How and why is there a “flexure requirement in section 659-2.2.11 (should be 650-2.2.11)” when the required pivotal hanger is part of the assembly?

Response: See response provided in Section 650 file.

7. What is the purpose of section 650-3.1. This section implies that the “assembly” consists of signal heads only.

Response: See response provided in Section 650 file.

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Comment: (8-1-14)

1. 659-2.4 Mast Arm Mounting Assemblies We believe it is not correct to specify the temper of “T5 or higher” because it implies the casting must be heat treated. There are casting alloys that meet the specified minimum yield and ultimate tensile strengths without artificial aging.

Response: Temper requirement removed.
Change made.

2. 659-2.4 Top Support Arm As with our above comment, we believe it is not correct to specify the temper of “T5 or higher” because it implies the casting must be heat treated. There are casting alloys that meet the specified minimum yield and ultimate tensile strengths without artificial aging.

Response: See response to #1.

3. 659-2.4.7 Bottom Support Arm Here again, we believe the T5 minimum temper requirement should be eliminated.

Response: See response to #1.

4. 659-2.4.7 Bottom Support Arm For the bottom support arm cover change to read: “can be either aluminum or plastic, such as 0.156” ABS with UVV inhibitor, with haircell on one side,” *and be strong*.... Pelco has used that plastic cover material for years without issues of installation problems or wrapping over time.

Response: Change made.

5. 659-2.5.1 Span Wire Clamp As requested by Pelco in our May 2014 comments we strongly urge that the material required for the span wire clamp not be restricted to just Aluminum alloy 535.0-F. Pelco has never had a span wire clamp failure in the material it uses which is not 535 alloy. Rather, the aluminum alloy should be specified to have a minimum ultimate tensile strength of 32 ksi and minimum tensile yield strength of 22 ksi in accordance with ASTM B28 or ASTM B108

Response: Change made.

6. 659-2.5.3 Adjustable Hanger it is not clear which specific devices are included in this category. But, with all due respect to FDOT, Pelco believes that calling out a specific aluminum alloy in a “serrated adjustable hanger” unfairly limits suppliers in providing improved designs in this area. Rather, the performance requirements should be identified and suppliers should have the freedom to design assemblies that meet the performance requirements without being constrained by such a narrow material specification.

Response: Acknowledged. The Department is in the process of developing test methods to address these issues.

No change made at this time.
