FLORIDA DEPARTMENT OF TRANSPORTATION
State Materials Office
5007 NE 39th Avenue
Gainesville, Florida 32609
March 16, 2012

FLORIDA METHOD OF TEST
FOR
EVALUATION OF BEARING PADS
Designation: FM 5-598

1. Scope

   This method delineates the testing protocol required to evaluate Bearing pads. This Florida Sampling and Test Method (FSTM) is intended to be used in conjunction with Section 932 of the Florida Department of Transportation, Standard Specifications for Road and Bridge Construction.

   All test apparatus used to determine conformance with this method of test shall be calibrated annually in accordance with AASHTO T-67.

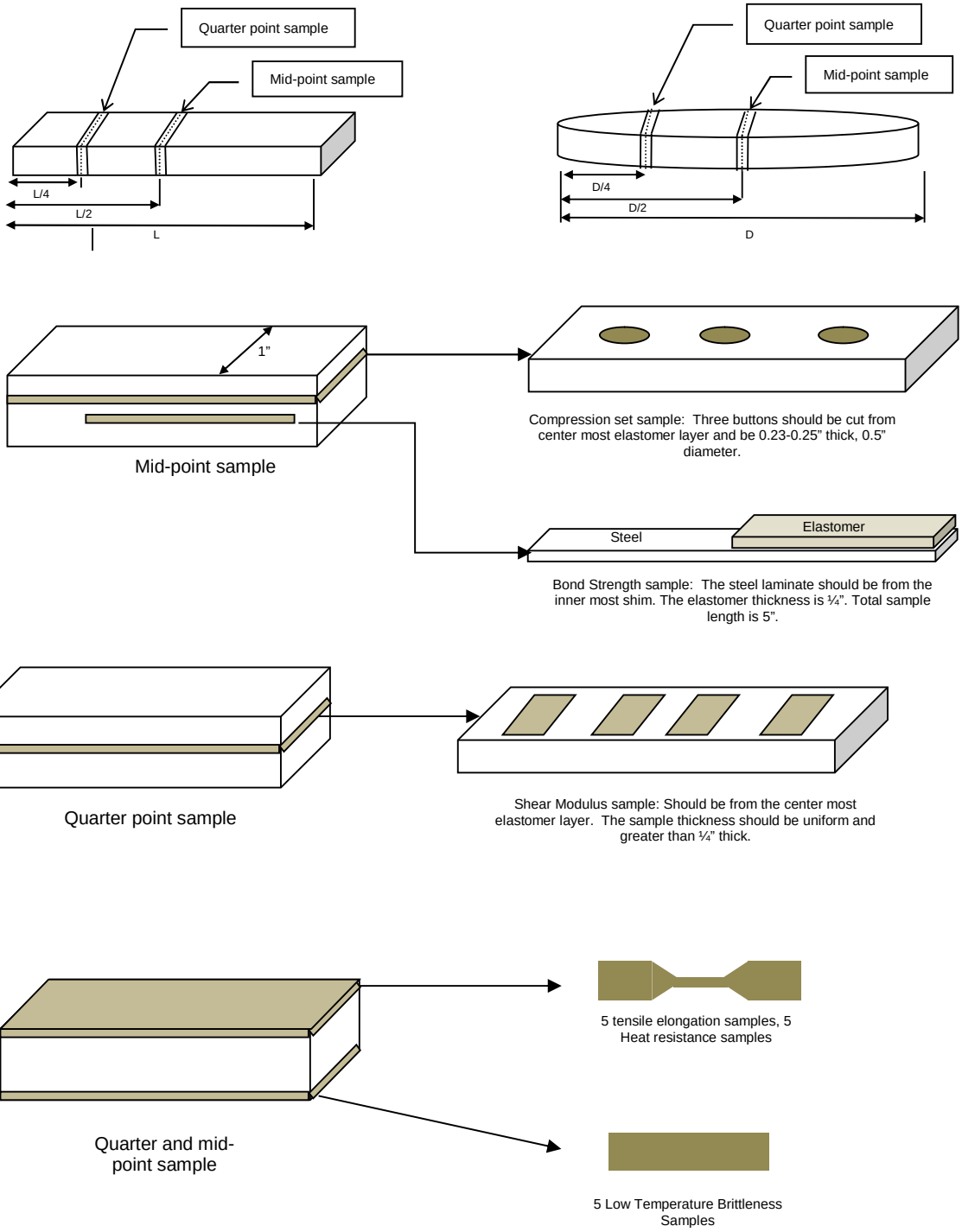
2. Measure the dimensions of the bearing pad and confirm that the finished dimensions meet the requirements of Section 932-2.

3. The sample shall be subjected to a ***compressive load*** of 2400 psi for laminated bridge bearings and 1200 psi for plain bridge bearing pads. The load shall be held for five minutes, removed, and reapplied for a second period of five minutes. The bearing shall be visually examined while under loading. If the bearing exhibits three separate surface cracks which are greater than 0.083 inches wide and 0.083 inches deep, or a single crack 0.125 inches deep or wider than 0.25 inches, the bearing shall be rejected. For laminated bearings, if bulging patterns indicate laminate placement which does not satisfy the design criteria, and manufacturing tolerances, or suggests poor bonding, the bearing shall be rejected.

4. The ***shear modulus*** of the sample shall be determined at 73°F (±2°F) in accordance with ASTM D 4014 Annex A1, modified as follows: the initial cycles shall be taken to a strain of 0.7 and on the last cycle the shear modulus shall be determined at 0.5 strain. If the shear modulus is not within ±15% of the value specified, the bearing shall be rejected. If the shear modulus is not greater than or equal to 80 psi, the bearing shall be rejected. In addition, the shear modulus shall be determined in an enclosed freezer subsequent to conditioning for 7 days at 0°F (±4°F). A 25% strain cycle shall be applied with a period of 100 seconds. The first ¾ cycle of strain shall be discarded and the stiffness shall be determined by the slope of the force deflection curve for the next ½ cycle of loading. If the measured stiffness exceeds 4 times the stiffness measured at 73°F (±2°F) the bearing shall be rejected.

5. ***Sample Preparation:***

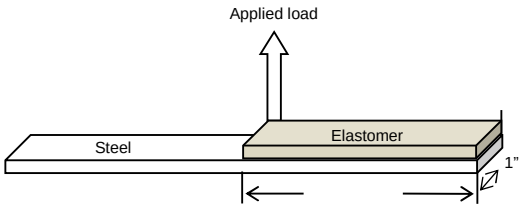
Take two samples cut from the finished bearing as follows:



6. The Cured elastomer shall meet the following minimum requirements:

Material Property	Standard	Polyisoprene	Polychloroprene	Units
Physical Properties				
Min. Tensile Strength	ASTM D 412	2248	2248	psi
Minimum Ultimate Elongation	ASTM D 412	450	400	%
Heat Resistance				
Hardness	ASTM D 573	Aged 168 hrs @ 158°F. Max change +10	Aged 70 hrs @ 212°F. Max change +15	Shore A
Tensile strength	ASTM D 573	Aged 168 hrs @ 158°F. Max change -25	Aged 70 hrs @ 212°F. Max change -15	%
Ultimate Elongation	ASTM D 573	Aged 168 hrs @ 158°F. Max change -25	Aged 70 hrs @ 212°F. Max change -40	%
Compression Set	ASTM D 395 Method B	Aged 22 hrs @ 158°F. Max change 25	Aged 22 hrs @ 212°F. Max change 35	%

7. The ***Bond Strength*** of the elastomer to the steel laminate shall be tested in accordance with ASTM D429 Method B as modified herein. The bond strength test shall be performed on samples cut from the sample bearing as prescribed above. The strip size shall be 1 inch wide, 5 inches in length, and at least ¼ inch thick.



Peeling of the elastomer strip from the internal laminate shall be initiated by carefully cutting the elastomer back to create a tab long enough to install in the grips of the testing machine. Draw lines across the strip at 0.5 inch and 1.5 inches from where the peeled portion of the strip meets the internal laminate. Install the specimen in the grips so that the angle between the elastomer tab and the surface of the bearing will be approximately 90° for the duration of the test. Apply the tensile load at the required rate until the elastomer peels back beyond the 1.5 inch mark while

recording the load as required. If the load reaches 60 lbf without the elastomer starting to peel from the laminate surface, end the test and record the bond strength as +61 psi. If the elastomer peels back to the 1.5 inch mark without reaching 60 lbf of load, record the bond strength as the average load in psi of width required to peel the elastomer between the marks. If the elastomer tab rips off the bearing before reaching the 1.5 inch mark or reaching 60 lbf, retest using another sample from the bearing. The minimum bond strength of the sample shall be 40 lbf/in. If the sample fails to meet the minimum bond strength the bearing shall be rejected.