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DIVISION OF ENGINEERING SERVICES
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METHOD OF TEST FOR SEAM QUALITY CONTROL STANDARD FOR HELICAL LOCK SEAM CORRUGATED METAL PIPE

A. SCOPE

This test method describes the procedure for ascertaining the quality of the seam of a helical lock seam corrugated metal pipe by visual observation of the lock seam cross section and by determining the tensile strength of coupons cut from production pipe across and normal to the lock seam.

B. REFERENCES

ASTM E 4 – Force Verification of Testing Machines

C. APPARATUS

A standard calibrated tensile testing machine having an accuracy of 1 % of scale reading in accordance with ASTM Designation E-4 is required.

D. SAMPLES

1. Torch or saw cut sample approximately 4 in. × 6 in. from pipe. See Figure 1 for orientation and location of sample.

2. Saw-cut 1 in. × 6 in. coupon perpendicular to lock seam. Strive to obtain parallel edges.

3. Dress up cross section of test specimens as necessary with a file to aid in visual evaluation of the lock seam. For visual control only, saw a triangular sample from the seam at one end of a length of pipe so as to show the cross section normal to the seam. The base of the triangular sample shall be of sufficient width to show the complete lock seam profile. See Figure 1.

4. Flatten ends of coupon for gripping in test machine. Do this in a vise one end at a time, inserting strip in vise to ½ in. from the lock seam. As vise flattens the corrugation, the strip will rotate. Realign lock seam with the flattened ends by use of a crescent wrench or vise grips tightened over the lock seam to prevent distortion of the seam itself while bending the strip back into line.

E. PROCEDURE

1. Determine lock seam quality visually by examining samples of the lock seam cross section sawed from the pipe. See Figure 1 for location of sample. See Figure 2 for the cross section of the sample. Inspect the cross section normal to the seam to determine that all lapped surfaces are in tight contact. Inspect the cross section of tensile coupons prior to flattening of the corrugations. Measure the seam lap and

retaining offset distances (see Figure 2) for conformance with specified minimum dimensions. See Figure 3 for examples of unacceptable seam cross sections.

2. Measure actual length of lock seam tensile specimens to the nearest 0.01 in. (dimension normal to length of coupon).

3. Tensile test the coupon on standard laboratory tensile testing machine using self aligning grips.

4. Determine maximum tensile load per inch of seam length by dividing total load by actual seam length.

5. Compare resulting tensile load per inch of seam length to that required in the specifications.

6. Record test data with test number, date, sheet thickness and brand.

7. Be sure that each run of pipe fabricated is marked or otherwise identified with the identification number of the corresponding tension test.

F. SAMPLING FREQUENCY

Have the manufacturer cut seam samples as required during the startup of each change of pipe diameter, brand of sheet, or sheet thickness until the lock seam meets all the requirements specified. Obtain a minimum of one triangular seam sample for visual evaluation per day for each size and thickness of pipe produced per day. Instruct the manufacturer to identify seam samples to the pipe produced by date and retain for review by the State Inspector. If visual evaluation indicates a borderline seam quality, instruct the manufacturer to cut additional samples for tensile testing.

G. REPORTING OF RESULTS

Create a form showing the test number, date, sheet thickness, brand, visual inspection observations, seam lap, retaining offset distance, length of actual tensile specimen, maximum tensile load. Record the test data as determined in Part E, Procedure. Indicate compliance to both physical and visual requirements. Notify the fabricator of results.

H. HEALTH AND SAFETY

It is the responsibility of the user of this test method to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use. Prior to handling, testing or disposing of any materials, testers must be knowledgeable about safe laboratory practices, hazards and exposure, chemical procurement and storage, and personal protective apparel and equipment.

Caltrans Laboratory Safety Manual is available at:

http://www.dot.ca.gov/hq/esc/ctms/pdf/lab_safety_manual.pdf

End of Text

(California Test 662 contains 4 pages)

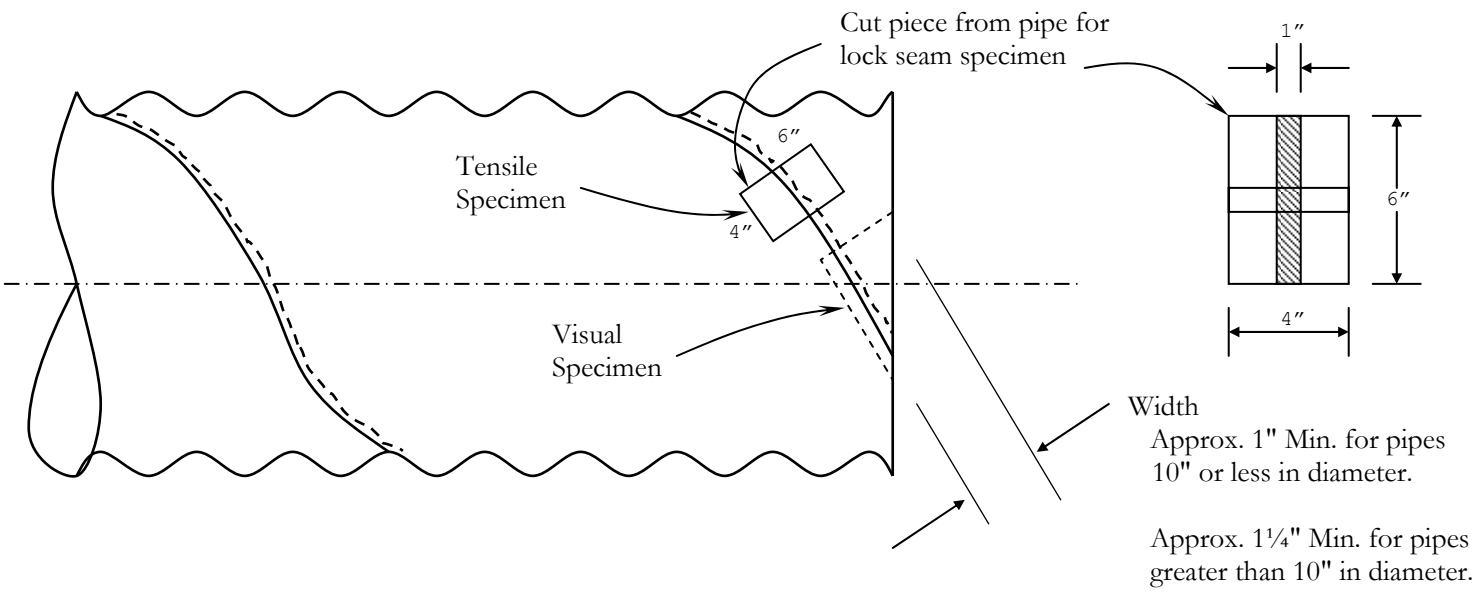


FIGURE 1. Location of Sample

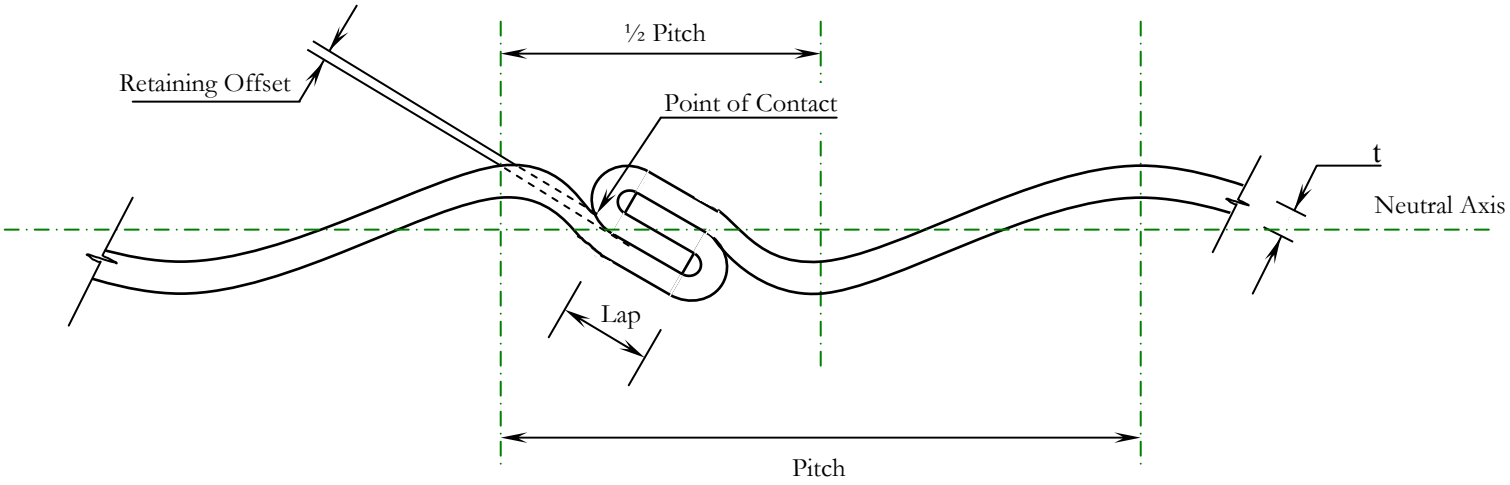
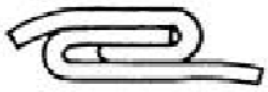


FIGURE 2. Lock Seam Cross Section

Excessive
Interior Angularity



Insufficient Retaining Offset

Excessive
Interior Angularity
and Roller Indentation

FIGURE 3. Example of Unacceptable Seams