

NAVSEA
STANDARD ITEM

FY-14

ITEM NO: 009-25
DATE: 13 JAN 2013
CATEGORY: II

1. SCOPE:

1.1 Title: Structural Boundary Test; accomplish

2. REFERENCES:

2.1 **None.**

3. REQUIREMENTS:

3.1 Accomplish a preliminary air test of spaces **to determine existing tightness prior to start of work** in accordance with the following:

3.1.1 Install 2 independent pressure gages.

3.1.1.1 Gage range shall be such that the test pressure is in the middle third of the scale.

3.1.2 Install 2 relief valves set at **a maximum of 10** percent above test pressure.

3.1.3 Install one vent valve.

3.1.4 The air source shall not exceed 25 PSIG and shall have a supply capability less than the exhaust capability of either relief valve.

3.1.5 Apply a soapy solution to the opposite side of the structure, **associated tank piping, overflow and air escape piping**, and inspect for leakage.

(I) "UNOBSTRUCTED FLOW"

3.1.6 Accomplish unobstructed airflow test of air escape and overflow piping.

(V) "VISUAL INSPECTION"

3.1.7 Accomplish a visual inspection of disturbed mechanical joints for leakage upon completion of filling each tank. Allowable leakage: None.

3.1.8 Submit one legible copy, in approved transferrable media, of a report listing results of the preliminary air test, to the SUPERVISOR.

(I)(G) "AIR TEST"

3.2 Accomplish an air test of spaces in accordance with the following:

3.2.1 Install 2 independent pressure gages.

3.2.1.1 Gage range shall be such that the test pressure is in the middle third of the scale.

3.2.2 Install 2 relief valves set at **a maximum of 10** percent above test pressure.

3.2.3 Install one vent valve.

3.2.4 The air source shall not exceed 25 PSIG and shall have a supply capability less than the exhaust capability of either relief valve.

3.2.5 Apply a soapy solution to the opposite side of the structure, associated tank piping, overflow and air escape piping, and inspect for leaks.

(I) "UNOBSTRUCTED FLOW"

3.2.6 Accomplish unobstructed airflow test of air escape and overflow piping.

(V) "VISUAL INSPECTION"

3.2.7 Accomplish a visual inspection of disturbed mechanical joints for leakage upon completion of filling each tank. Allowable leakage: None.

(I)(G) "AIR HOSE TEST"

3.3 Accomplish a local air hose test in accordance with the following:

3.3.1 Air hose nozzle shall be as close as possible (within 3 inches) and pressure directed at the structure under test in a manner most likely to disclose leaks.

3.3.1.1 The minimum nozzle diameter shall be 3/8 inch and the nozzle pressure shall be 60 to 90 PSIG as monitored at the nozzle.

3.3.2 Apply a soapy solution to the opposite side of the structure and inspect for leaks.

(I)(G) "WATER HOSE TEST"

3.4 Accomplish a water hose test in accordance with the following:

3.4.1 Use a one and one-half inch hose with a minimum nozzle diameter of one-half inch. **Pressure at the nozzle shall be 50 to 55 PSIG** at a maximum distance of 10 feet from the surface being tested.

3.4.2 The stream of water shall be directed against the structure in a manner most likely to disclose leaks. The opposite side of the structure shall be inspected to detect and locate leaks. **Allowable leakage: None.**

(I)(G) "VACUUM BOX TEST"

3.5 Accomplish a local vacuum box test in accordance with the following:

3.5.1 Apply a soapy solution to the structure being tested.

3.5.2 Install a vacuum box with a clear cover over the entire joint or fitting being tested.

3.5.2.1 Install the vacuum box so that the pressure differential is in the direction of an air test.

3.5.3 Draw a vacuum of at least 10.2 inches of mercury and inspect for leaks.

3.5.3.1 **Inspect the joint or fitting for leakage by observing through the clear cover for no formation of bubbles.**

(I)(G) "COFFERDAM TEST METHOD"

3.6 Accomplish a cofferdam test in accordance with the following:

3.6.1 **Install the cofferdam over the joint or fitting to be tested so that the pressure differential will be in the same direction of an air test.**

3.6.2 **Pressurize the air space inside the cofferdam to the test pressure specified for the air test.**

3.6.3 **Apply a soapy solution to the opposite side of the structure being tested.**

3.6.4 **Inspect the joint or fitting for leakage by observing for formation of bubbles. Allowable leakage: None.**

3.6.5 **If the opposite side of the structure is inaccessible, an alternate method of proving tightness is to measure the drop in pressure within the cofferdam over a 10 minute period. The gasket and fittings in the cofferdam should be checked for leakage using a soapy solution. Allowable drop in pressure: None.**

(I)(G) "CHALK TEST"

3.7 Accomplish a chalk test of each *knife edge and gasket on watertight doors, hatches, and scuttles.*

3.7.1 *A chalk test may only be used as a preliminary test.*

3.7.2 *Apply chalk to the bearing surface of the knife edge and close the door, hatch or scuttle by normal procedure.*

3.7.3 *When the door, hatch or scuttle is opened, the chalk from the knife shall have been transferred to the gasket.*

3.7.4 *The chalk imprint shall be in the center three-fifths of the width of the gasket with 100 percent continuous contact of knife edge to gasket.*

3.8 Repaired areas requiring a structural boundary test shall remain uninsulated and unpainted until completion of successful inspection and test.

4. NOTES:

4.1 Associated **tank** piping is defined as, "An assembly of pipe, tubing, valves, fittings, and related components forming a whole or a part of a system which starts or terminates in subject area, thus being common to and associated with same."