NOT
MEASUREMENT
SENSITIVE

A-A-59607
6 August 2004

COMMERCIAL ITEM DESCRIPTION

GROUT MATERIAL, RAPID SETTING

The General Services Administration has authorized the use of this commercial item description for all federal agencies.

1. SCOPE. This commercial item description (CID) covers one type of rapid setting grout material.

2. CLASSIFICATION

Not applicable

3. SALIENT CHARACTERISTICS

3.1 Material. The selection of materials and processes shall be optional with the manufacturer, but shall be restricted by the requirements specified herein. Additionally, the grout material shall not contain any substance which will corrode steel.

3.2 Mixing properties. The grout material shall be sufficiently pre-mixed so that no additional mixing is required other than the liquid required to obtain a pourable state. No more than 2 minutes shall be required for mixing the grout mixture and liquid and no special equipment shall be needed, when tested as specified in 5.5.1.

3.3 Gel and set time. When tested as specified in 5.5.3, the gel and set times (in minutes) shall not exceed the times specified in table I.

Beneficial comments, recommendations, additions, deletions, clarifications. etc. and any data that may improve this document should be sent to: Commander Naval Air Warfare Center Aircraft Division, Code 414100B120-3, Highway 547, Lakehurst, NJ 08733-5100

AMSC N/A FSC 5610

TABLE I. Gel and setting times

Condition	Gel (time) max	Set (time) max
Normal	15	35
Sea water Mix	10	20
Cold Mix	25	100
Hot Mix	5	60

3.4 Drip test. The maximum acceptable depth penetration shall be 0.090 inch after 24 hours and 0.275 inch after 96 hours when tested as specified in 5.5.4.

3.5 Physical properties. The grout material shall conform to the physical properties listed in table II.

TABLE II. Physical properties.

Characteristic	Requirement				Test Method
	Air cure	Fresh water cure	Fresh water pour & cure	Seawater pour & cure	
Compression test, psi-min.	2,500	2250	1250	1000	5.5.5
Shear test, psi-min.	700		400	50	5.5.6
Tension test, psi-min.	75				5.5.7
Adherence test, lbs.-min.	2,500				5.5.8
Bond test, lbs.-min.	35,000		20,000	9000	5.5.9

3.6 Field test. The grout material shall withstand a pull test of 20,000 pounds in a properly installed earth anchor, after a setting time of no more than 1 hour. The installed grout shall show no depreciation of physical properties for a period of 1 year after installation.

3.7 Dimensional stability. After mixing, the grout shall not exhibit any shrinkage and expansion shall be limited to 1 percent maximum, when hard.

3.8 Storage stability. The storage life of the grout material shall be not less than 5 years and still retain the characteristics originally required. The grout material shall be not greater than 6 months old at time of delivery.

4. REGULATORY REQUIREMENTS

Not applicable

5. PRODUCT CONFORMANCE PROVISION

5.1 Product conformance. The products provided shall meet the salient characteristics of this Commercial Item Description, conform to the producer's own drawings, specifications, standards, and quality assurance practices, and be the same product offered for sale in the commercial marketplace. The government reserves the right to require proof of such conformance.

5.1.1 Certification of compliance. When certificates of compliance are submitted, the Government reserves the right to test such items to determine the validity of the certification.

5.2 Sampling instructions. Test samples shall consist of a 100-pound sample in a steel drum. Samples shall be forwarded to the Commander, Naval Air Warfare Center Aircraft Division, Code 4.8.10.2, Highway 547, Lakehurst, NJ 08733. Sample shall be plainly and durably marked with the following information:

Sample for test
Grout Material
Manufacturer's Formula No.---------- and date compounded
Submitted by (name) (date) for product conformance inspection in accordance with requirements of CID A-A-59607.

5.2.1 Field test samples. Field test samples shall consist of ten 100-pound drums of grout material. Samples shall be forwarded in accordance with instructions contained in the authorizing letter granting service tests, which shall be sent to the manufacturer on satisfactory completion of all laboratory tests.

5.2.2 Manufacturer's data. The manufacturer shall submit a report, in duplicate, to accompany the test sample. This report shall include the results of the manufacturer's tests, reported quantitatively, where applicable, in the units specified for all of the requirements specified herein, except storage stability. Tests not conducted due to lack of special test facilities or materials shall be so noted in the report. The formulation shall be clearly identified by the manufacturer's formula number.

5.3 Product conformance inspection. The product conformance inspection of the grout material shall consist of all the tests in table II except storage stability and field test.

5.3.1 Lot. A lot shall consist of all grout material manufactured at approximately the same time from the same batch of materials and submitted for acceptance at the same time.

5.3.2 Product conformance test samples. Product conformance test samples shall consist of a 100-pound sample in a steel drum. Each sample shall be clearly identified by the manufacturer's formula number as specified in. 5.2.2. The test samples shall be forwarded to the Naval Air Engineering Center as specified in 5.2. The manufacturer shall furnish with each lot a certificate to the effect that the material has been processed in the same manner and degree using the same base ingredients as the approved test sample.

5.3.3 Sampling for inspection of filled containers. A random sample of filled containers shall be selected from each lot to verify conformance to all requirements of this specification regarding fill, closure, marking, and other requirements not involving tests.

5.4 Inspection conditions. Unless otherwise specified herein, all tests required by this CID shall be conducted at a temperature of 70 to 95 °F.

5.5 Test methods.

5.5.1 Mixing test. The grout mixture for test coupons shall be based upon the ratio of four gallons of fresh water or seawater, as specified, to 100 pounds of clean dry grout. The grout mixture shall be weighed accurately, mixed thoroughly, and be of consistent uniformity, with ambient temperatures between 70 and 95 °F.

5.5.2 Test coupons. The test coupons shall be air-cured or water-cured, as specified, for one hour and all tests started within the second hour. The forming of some test coupons will require the mold to be submerged in fresh water or seawater, as directed. No shrinkage and not more than 1 percent expansion shall be permitted.

5.5.3 Gel and set tests.

5.5.3.1 Normal. Accurately measured amounts of dry grout and fresh water shall be stabilized at an ambient temperature of 70 to 95 °F. The dry grout and fresh water shall be mixed in an environment of 70 to 95 °F, then gel and set times shall be recorded. The gel time and set time shall conform to 3.3.

5.5.3.2 Seawater. The preceding test shall also be performed utilizing seawater in lieu of fresh water. Gel and set times shall conform to 3.3.

5.5.3.3 Cold. A measured amount of loose dry grout shall be stabilized at a temperature of 20 ± 2 °F and a measured amount of fresh water shall be stabilized at a temperature of 32 ± 2 °F (ice begins to form). The dry grout and fresh water shall be properly mixed in an environment of 20 ± 2 °F, then gel and set times are to be recorded. The gel and set times shall conform to 3.3.

5.5.3.4 Hot. Accurately measured amounts of dry grout and fresh water shall be stabilized at an ambient temperature of 160 ± 2 °F. The dry grout and fresh water shall be properly mixed and gel and set times are to be recorded. The gel and set times shall conform to 3.3.

5.5.4 Drip tests. Fresh water grout mixture and seawater grout mixture drip test specimens shall be prepared and subjected to air-cure. Three test specimens of each type shall be prepared. Each test specimen shall be placed in a test fixture at an angular attitude of 15 degrees from horizontal. Fresh water, at a rate of 30 drops per minute, shall strike the angled face of the test specimen from a height of 18 inches. After 24 hours of test, and again after 96 hours of test, the test specimens shall be measured for depth of penetration using a depth micrometer. The maximum acceptable depth penetration shall not be grater than that specified in 3.4.

5.5.5 Compression tests.

5.5.5.1 Air cure. Fresh water grout mixture shall be poured into square and tubular molds (see figures 1 and 2), and subjected to air cure. Three test coupons of each type shall be prepared. Each test coupon shall be centered in a test press and a compression load applied. The compression load shall be in accordance with the value in table II.

5.5.5.2 Underwater cure. The fresh water grout mixture shall be poured into square and tubular molds and subjected to underwater cure (see figures 1 and 2). Three test coupons of each type shall be prepared. Each test coupon shall be centered in a test press and a compression load applied. The compression load shall be in accordance with the value in table II.

5.5.5.3 Underwater pour and cure (fresh water). Fresh water grout mixture shall be poured through a tube into tubular molds submerged in fresh water (see figures 2 and 3) and subjected to underwater cure. Three test coupons shall be prepared. After cure, release from the mold and face off the test coupon in a lathe; then test for compression loading. The compression load shall be in accordance with the value in table II.

5.5.5.4 Underwater pour and cure (sea water). Seawater grout mixture shall be poured through a tube into tubular molds submerged in seawater (see figures 2 and 3) and subjected to underwater cure. Three test coupons shall be prepared. After cure, release from the mold and face off the test coupon in a lathe; then test for compression loading. The compression load shall be in accordance with the value in table II.

5.5.6 Shear tests.

5.5.6.1 Air-cure. Fresh water grout mixture shall be poured into tubular molds (see figure 2) and subjected to air-cure. Three test coupons shall be prepared. Each test coupon shall be inserted into a test fixture (see figure 4), placed in a test press, and a shear load applied. The shear load shall be in accordance with the value in table II.

5.5.6.2 Underwater pour and cure (fresh water). Fresh water grout mixture shall be poured through a tube into tubular molds submerged in fresh water (see figures 2 and 3) and subjected to underwater cure. Three test coupons shall be prepared. Each test coupon shall be inserted into a test fixture (see figure 4), placed in a test press, and a shear load applied. The shear load shall be in accordance with the value in table II.

5.5.6.3 Underwater pour and cure (sea water). Seawater grout mixture shall be poured through a tube into tubular molds submerged in seawater (see figures 2 and 3) and subjected to underwater cure. Three test coupons shall be prepared. Each test coupon shall be inserted into a test fixture (see figure 4), placed in a test press, and a shear load applied. The shear load shall be in accordance with the value in table II.

5.5.7 Tension tests. Fresh water grout mixture shall be poured into tension test mold (see figure 5) and subjected to air-cure. Three test coupons shall be prepared. Each test coupon is to be placed in a test press and subjected to a test load. The tension load shall be in accordance with the value in table II.

5.5.8 Adherence tests. Fresh water grout mixture shall be poured into the mold (see figure 6) and subjected to air-cure. Three test coupons shall be prepared. Each test coupon shall be pull-tested to determine withdrawal loads. The minimum acceptable withdrawal load for each test coupon shall be in accordance with table II.

5.5.9 Bond tests.

5.5.9.1 Air-cure. Fresh water grout mixture shall be poured into the test fixture (see figure 7) and subjected to air-cure. Three test coupons shall be prepared. Each test coupon shall be pull-tested to determine withdrawal loads. The withdrawal load for each test coupon shall be in accordance with table II.

5.5.9.2 Underwater pour and cure (fresh water). Fresh water grout mixture shall be poured through a pouring tube into the test fixture and submerged in fresh water (see figures 3 and 7) and subjected to underwater-cure. Three test coupons shall be prepared. Each test coupon shall be pull-tested to determine withdrawal loads. The minimum acceptable withdrawal load for each test coupon shall be in accordance with table II.

5.5.9.3 Underwater pour and cure (seawater). Seawater grout mixture shall be poured through a pouring tube into the test fixture and submerged in seawater (see figures 3 and 7) and subjected to underwater cure. Three test coupons shall be prepared. Each test coupon shall be pull-tested to determine withdrawal loads. The withdrawal load for each test coupon shall be in accordance with table II.

5.5.10 Field test. The Government shall provide the earth anchors, installation services and material, and perform the required tests. The field test (3.6) shall be performed when grout materials have met all the requirements of Section 3 except storage stability.

5.5.11 Dimensional stability. Dimensional stability (3.7) shall be certified by the manufacturer (see 5.1.1).

5.5.12 Storage stability. The storage stability (3.8) shall be certified by the manufacturer (see 5.1.1).

6. PACKAGING

6.1 Packaging. The grout material shall be packaged in quantities of 100 pounds in a heat sealed heavy duty plastic bag, in a metal drum conforming to MS27684-8, 12 gallon capacity and cover shall be in accordance with MS27684-24, Style 2.

6.1.1 Marking. Each container shall be marked as follows:

a. Title and number of this specification

b. Net weight of contents

c. Date of-manufacture

d. Name of manufacturer

e. Contract number

7. NOTES

7.1 SOURCE OF DOCUMENTS

7.1.1 Federal Government activities may obtain copies of MS27684 from established distribution points within their agencies; military activities may obtain this document on line at http://assist.daps.dla.mil/quicksearch/ or www.dodssp.daps.mil or from the Standardization Order Desk, 700 Robins Avenue, Building 4D, Philadelphia, PA 19111-5049. Other activities may obtain MS27684 from the General Services Administration, Federal Supply Service, Specification Section, Suite 8100, 479 L'Enfant Plaza, SW, Washington, DC 20407.

7.2 Ordering data. The contract or order should specify the following:

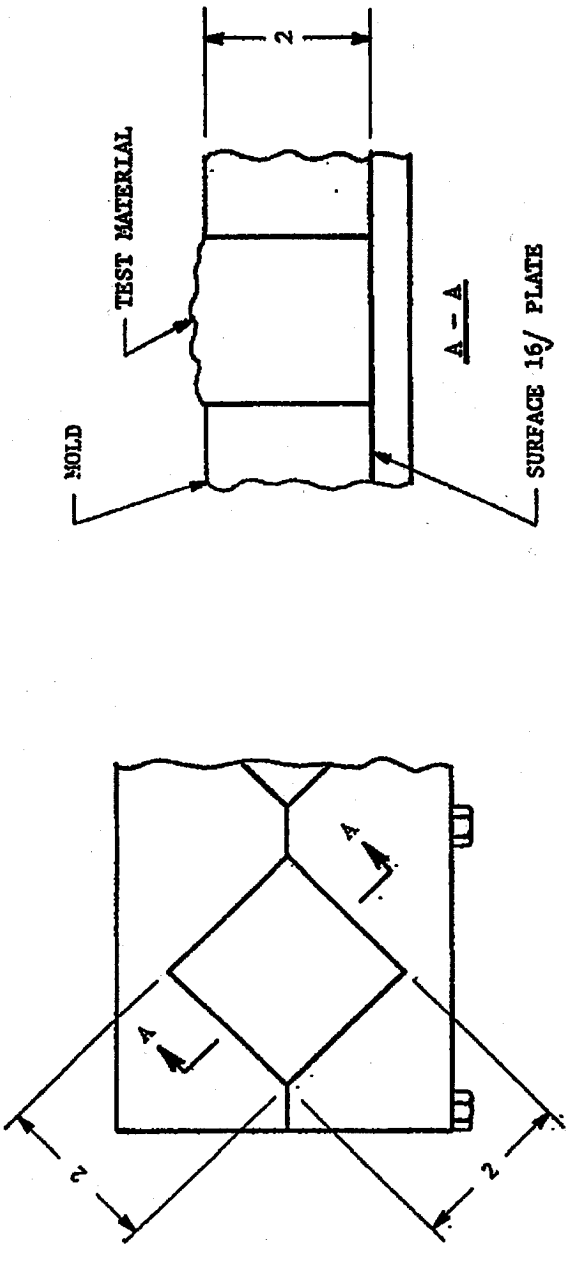
a. CID document number and revision.
b. Product conformance provisions.
c. Packaging provisions.

7.3 Key words:

Anchor material
Grout

Custodian:
Navy - AS

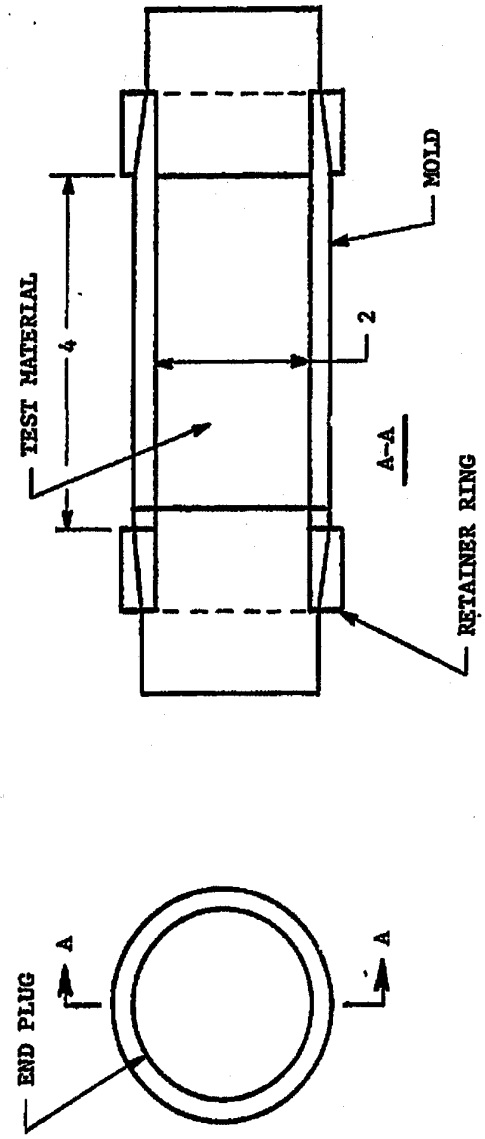
Preparing Activity
Navy-AS
(Project No. 5610-0106)



NOTES:

1. COAT INSIDE OF MOLD WITH HARD WAX BEFORE POURING TEST SAMPLE
2. DIMENSIONS IN INCHES, UNLESS OTHERWISE SPECIFIED

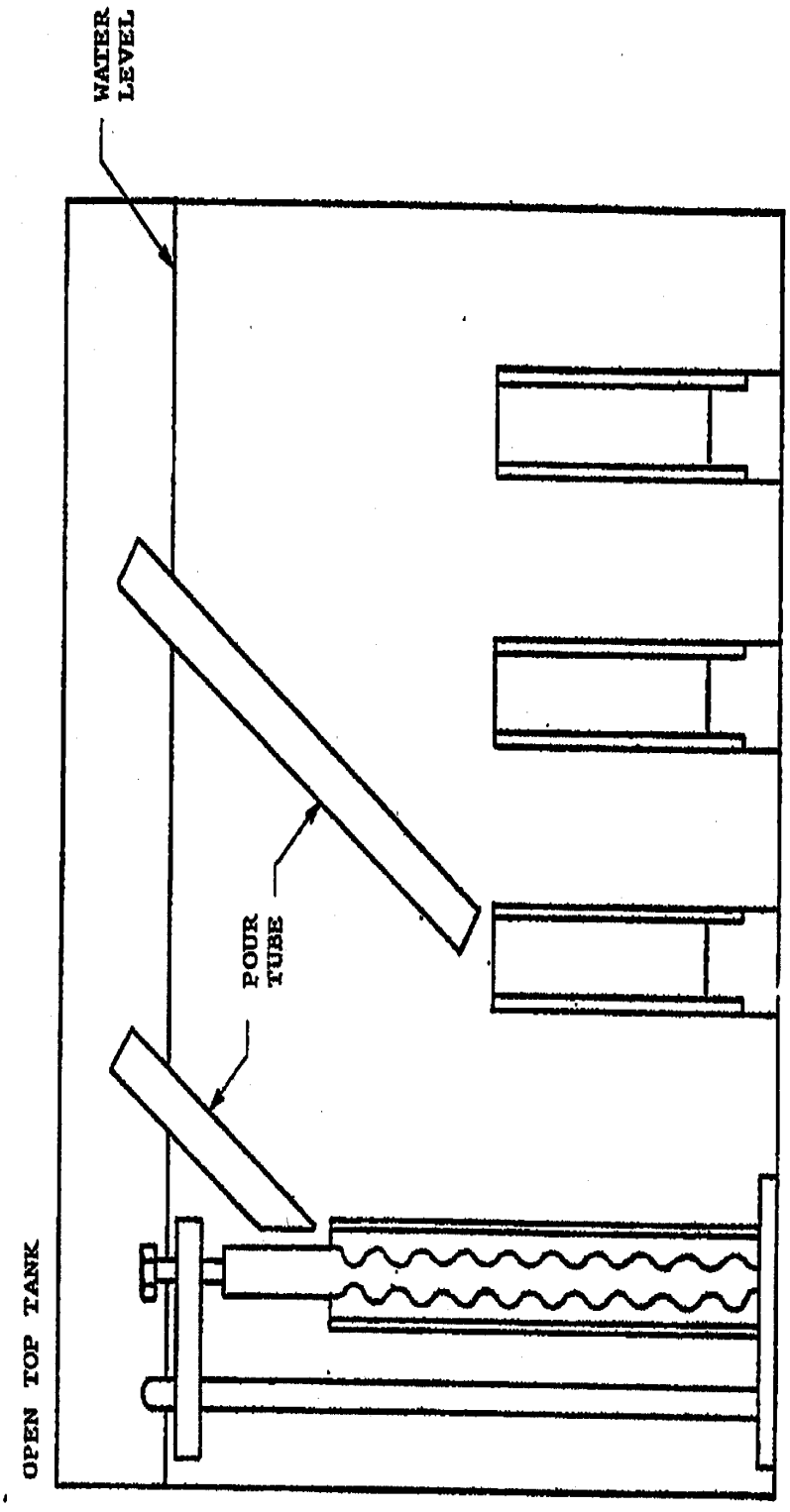
SQUARE MOLD
Figure 1



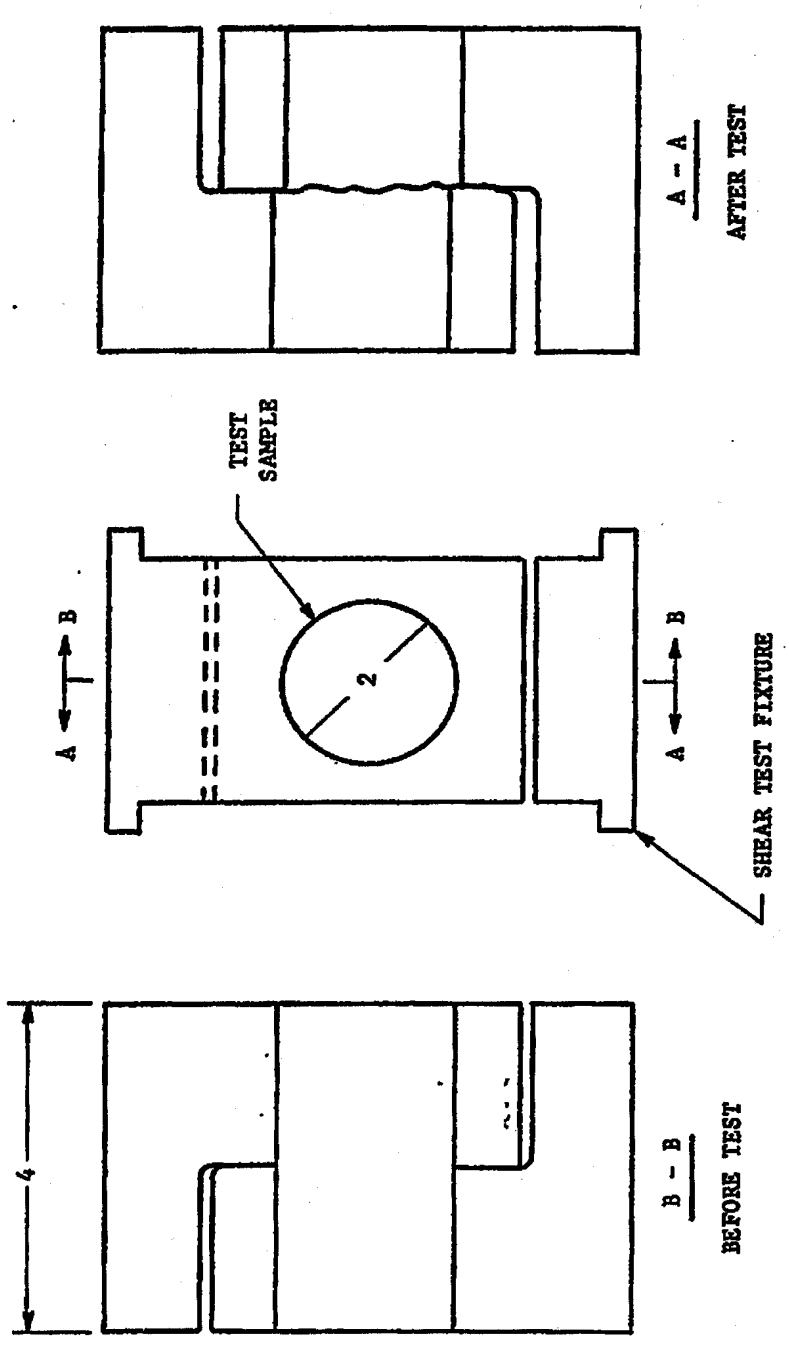
NOTES:

1. MOLD IS SPLIT LENGTHWISE TO FACILITATE REMOVAL OF TEST SAMPLE.
2. COAT INSIDE OF MOLD WITH HARD WAX BEFORE POURING TEST SAMPLE.
3. DIMENSIONS IN INCHES, UNLESS OTHERWISE SPECIFIED.

TUBULAR MOLD
Figure 2



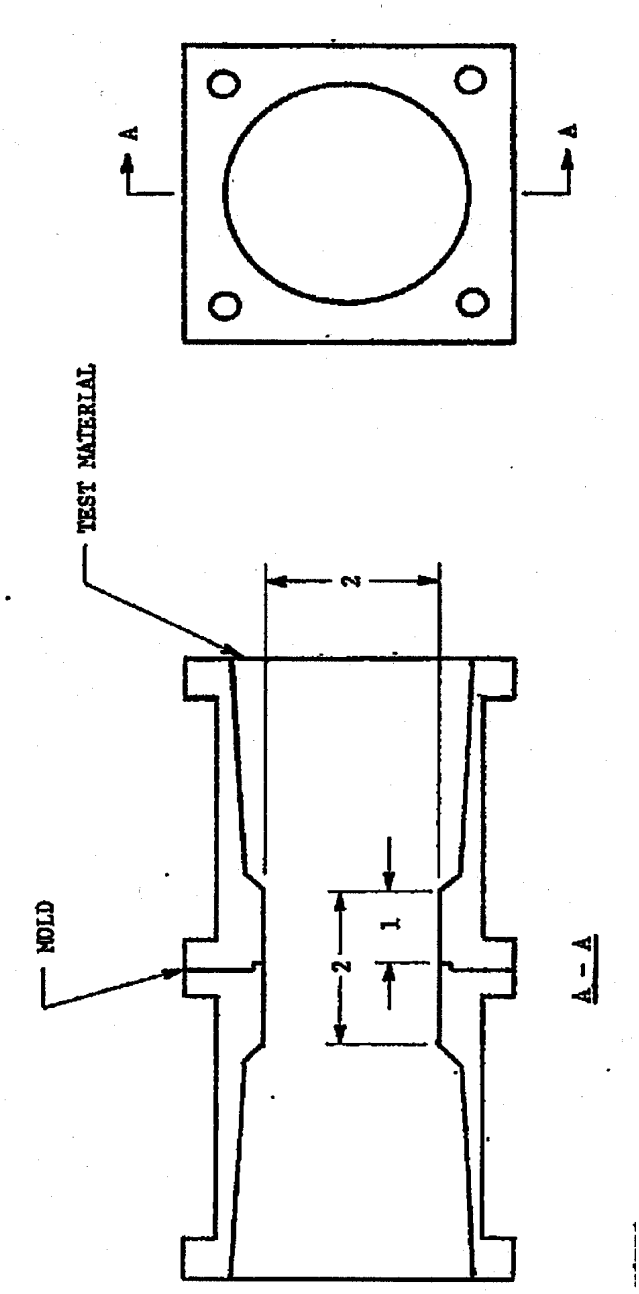
UNDERWATER POUR AND CURE FACILITY
Figure 3



NOTE:

1. DIMENSIONS IN INCHES UNLESS OTHERWISE SPECIFIED.

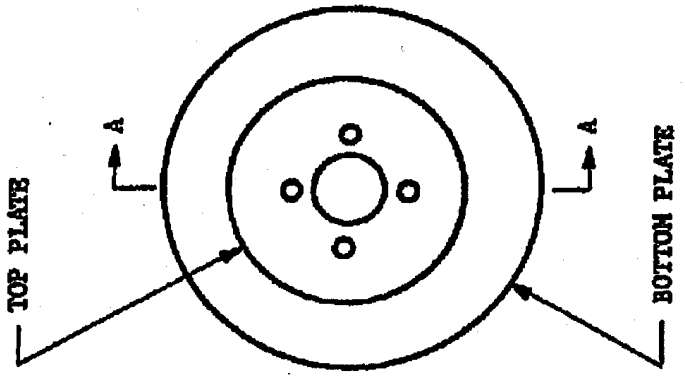
SHEAR TEST FIXTURE
Figure 4

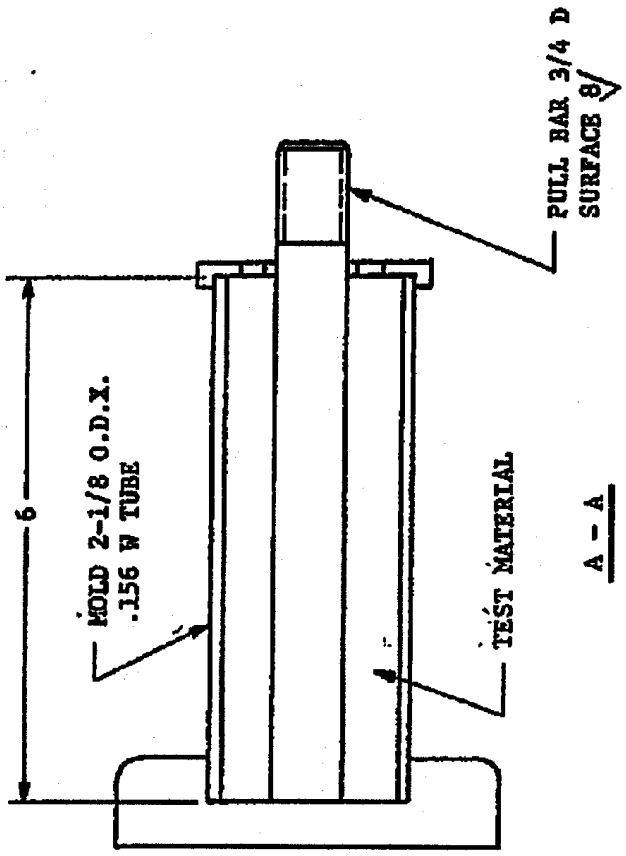


NOTES:

1. SURFACE DIMENSIONS 16/ INSIDE OF MOLD.
2. DIMENSIONS IN INCHES UNLESS OTHERWISE SPECIFIED.

TENSION TEST MOLD
Figure 5

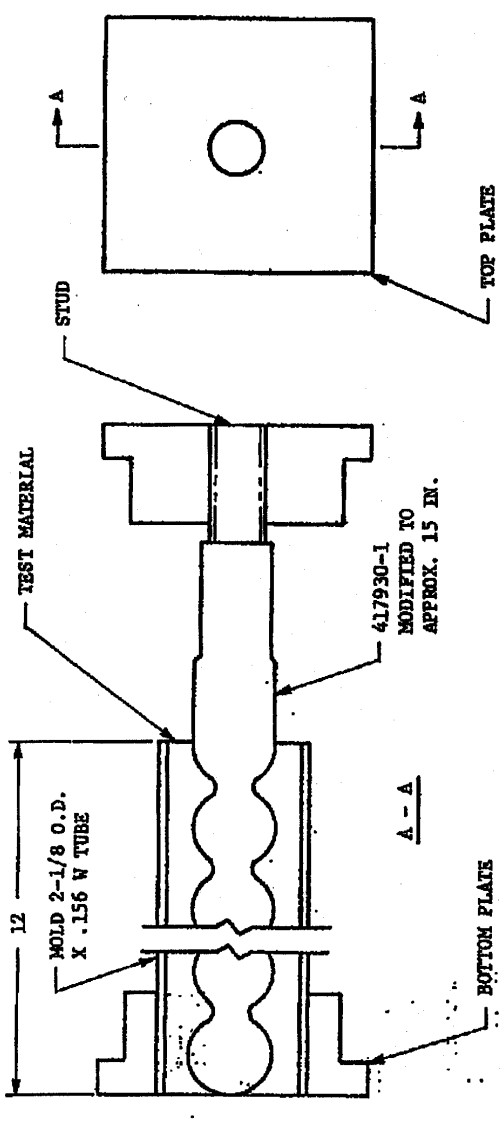




NOTE:

1. DIMENSIONS IN INCHES UNLESS OTHERWISE SPECIFIED.

ADHERENCE TEST MOLD
Figure 6



NOTES:

1. DIMENSIONS IN INCHES UNLESS OTHERWISE SPECIFIED.

BOND TEST FIXTURE
Figure 7