CALIFORNIA
DEPARTMENT OF JUSTICE
STANDARDS

FOR

HAND-HELD AEROSOL TEAR GAS WEAPONS
CONTAINING OLEORESIN CAPSICUM

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FOREWORD

The standards and test procedures specified by these guidelines are intended to implement the laws governing the possession, use, and sale of tear gas containing oleoresin capsicum (heretofore known as OC) and OC tear gas devices within the State of California.

OC tear gas and tear gas devices certified by the Department of Justice under these standards are considered to be "non-lethal" weapons when used according to the instructions issued by the manufacturer.

Certification of OC tear gas devices by the Department of Justice does not guarantee, even when such a device functions normally, is used according to prescribed instructions, and with all reasonable care, that:

1. Serious injury or death may not occur;

2. Its use will always be effective in incapacitating or distracting the intended target individual.

It is, therefore, assumed that individuals who use OC tear gas devices certified under these standards do so voluntarily and assume all risks and liability resulting from their use.

The Department of Justice certification standards are established on the premise that:

1. Independent testing laboratories shall complete required tear gas weapon and device tests according to standards such as those published by the American Spice Trade Association, the American Society for Testing and Materials (ASTM), the National Institute of Standards and Technology, the Chemical Specialties Manufacturers Association, or the U.S. Department of Defense; or alternatively according to any other test standards recognized by the OC tear gas weapon industry and independent testing laboratories if first approved by the Department of Justice.

2. The establishment of Department of Justice certification standards is intended to provide a documentation process to assure that OC tear gas weapons and devices marketed in California meet these specifications and accomplish the purposes as specified by the Department of Justice.

STANDARDS FOR THE CERTIFICATION OF HAND-HELD AEROSOL TEAR GAS WEAPONS CONTAINING OLEORESIN CAPSICUM BY THE STATE OF CALIFORNIA, DEPARTMENT OF JUSTICE

1. General

1.1 Purpose and Scope

These standards establish minimum performance and safety requirements as well as methods of test for hand-held aerosol tear gas (non-lethal) weapons containing oleoresin capsicum (OC) used by law enforcement agencies and private individuals for self-defense.

The devices certified for law enforcement use are intended to restrain or incapacitate one or more subjects, with minimal physical contact, whose behavior must be controlled in a situation which may otherwise involve more lethal force.

The devices certified for use by private individuals are intended solely for self-defense purposes.

The standard distinguishes physical properties of the material delivery, but does not evaluate this or other tactical criteria. The standard addresses those properties which affect the safety of storage, handling, and use as well as selected gross performance indices.

1.2 Authority

California Penal Code Sections 12401 through 12458.

1.3 Provisional Certification

Provisional certification, for a period not to exceed 180 days, may be issued to any manufacturer's Chief Executive Officer or President who has submitted an application package which has passed an initial review by both the Department of Justice (DOJ) and the California Environmental Protection Agency (CEPA), and who has certified under penalty of perjury that the lacrimating agent and tear gas device meet the following conditions:

1.3.1 Applicable DOJ/CEPA Standards

The product(s) have met or exceeded all DOJ standards and tests, and independent laboratory verification will be provided within 170 days of issuance of the provisional certification.

The manufacturer will provide additional test data and information sufficient for CEPA to make a health hazard assessment of the product(s).

1.3.2 Independent Laboratory

The manufacturer will ensure that an independent laboratory certifies that their product(s) meets or exceeds all applicable DOJ standards and that the laboratory delivers the independent test results to DOJ within 170 days of issuance of the provisional certification.

1.3.3 Length of Use

The product(s) has been in use in more than ten states for a minimum of six months and the manufacturer has no knowledge of any health or medical claims resulting from the use of the product(s).

1.3.4 Training

The manufacturer will provide training materials to local law enforcement officials who receive the product(s), as set forth in DOJ standards.

1.3.5 Insurance

The manufacturer has provided proof of the ability to respond in damages resulting from the utilization of the tear gas or tear gas device and arising from the personal injury to, or death of, any one person, of at least $300,000.00.

Regular tear gas certification will be issued after the manufacturer has satisfactorily completed the requirements of the provisional certification.

1.4 Decertification Procedure

If the manufacturer fails to complete the requirements of the provisional certification, the provisional certification will be terminated and the certification holder shall:

Give public notice of the termination or revocation of the certification to all law enforcement agencies and/or individuals who purchased or received the devices.

Mail notice to each person who is a manufacturer, distributor, or retailer of such tear gas or tear gas weapon.

Mail notice to every law enforcement agency and/or individual to whom the certification holder knows such product was delivered or sold.

The notice required to be given under the decertification shall include:

A statement that the certification for the tear gas or tear gas weapon has been terminated or revoked, that the tear gas or tear gas weapon is no longer considered "acceptable" by the Department of Justice, and that the Department no longer considers such tear gas or tear gas weapon to be reasonably free from any undue hazard.

The specific reason for the termination or revocation of the certification.

A warning that continued possession, sale, transportation or use of such tear gas weapon may constitute a criminal violation of Section 12403.7 or Section 12420 of the Penal Code.

An admonition that such tear gas or tear gas weapons be turned over to a local law enforcement agency for disposition in accordance with law.

2. Classification

For purposes of these standards, hand-held aerosol OC tear gas weapons are classified by the physical characteristics of the material delivery and the type of active agent.

2.1 Material Delivery

2.1.1 Coherent Liquid Stream

Devices which deliver a liquid stream from the nozzle which may become a spray of ballistic droplets, either immediately or; after traveling some distance through the air.

2.1.2 Fog

Devices which deliver very small, dry droplets, which behave aerodynamically.

2.1.3 Mist

Devices which deliver very small, wet or liquid, droplets, which behave aerodynamically.

2.1.4 Foam

Devices which deliver a cohesive projectile of material (length determined by trigger pull duration) with a volume consisting largely of entrained bubbles of gas.

2.1.5 Other

Devices not encountered to date, including dry powder projectors.

2.2 Type of Agent

2.2.1 Permissible Agent

The active ingredient in hand-held aerosol tear gas weapons certified pursuant to this standard shall be oleoresin capsicum (OC). Oleoresin capsicum is the oleoresin (solvent-free) extracted from fruits of cultivated plants of the genus Capsicum (family Solanaceae) specifically C. annum L. and C. frutescens L. The oleoresin contains the active ingredient capsaicin { (E) -N- [(4-Hydroxy-3-methoxyphenyl) -methyl]-8-methyl-6-nonenamide or trans-8-methyl-N-vanillyl-6-nonenamide}, and related compounds classified as capsaicinoids.

2.2.2 Quantity and Concentration of Agent

1. Devices Certified for Law Enforcement Use

Hand-held aerosol devices certified for law enforcement use shall contain a net charge of no less than 10 grams. The concentration of the active component, as measured by the approved Method, shall be as follows:

- Capsaicin within the range of 0.20% to 0.90% of the total liquid contents, exclusive of propellant charge.

2. Devices Certified for Self-Defense

Hand-held aerosol devices certified for self-defense purposes shall contain a net charge of no more than 150 grams. The concentration of active component, as measured by the approved Method, shall be as follows:

- Capsaicin within the range of 0.08% to 0.12% of the total liquid contents, exclusive of propellant charge.

Further, only devices that deliver either a mist or a liquid stream from the nozzle which becomes a spray of ballistic droplets shall be certified for use for self-defense purposes.

3. Definitions

3.1 Oleoresin Capsicum - The oleoresin (solvent-free) extracted from fruits of cultivated plants of the genus Capsicum (family Solanaceae) specifically C. annum L. and C. frutescens L. The oleoresin contains the active ingredient capsaicin { (E)-N-[(4-Hydroxy-3-methoxyphenyl)-methyl] -8-methyl-6-nonenamide or trans-8-methyl-N-vanillyl-6-nonenamide}, and related compounds classified as capsaicinoids.

3.2 Tear Gas Agent - An active material, for this standard the lacrimator OC.

3.3 Aerosol - An agent dispensed from a container in which a gas under pressure or low boiling liquid is used to expel the liquid containing the agent.

3.4 Inert Ingredient - For this standard, all ingredients of the aerosol device (other than the agent) which are found completely or partially in the liquid phase in a full device at 20°C.

3.5 Manufacturer - The supplier of record for aerosol devices, without regard to the place of assembly and/or filling.

3.6 Tear Gas Weapon - A device intended for the propulsion of OC tear gas from a portable source of supply to or toward an intended target individual or group.

3.7 Batch - The least of the three quantities including:

1. All items of identical design constituting a single delivery from a supplier to a user or evaluation laboratory.

2. All units of identical design continuously produced by a manufacturer without a change in its supplier's batch number of agent, carrier, propellant, valve, or container.

3. 1000 continuously manufactured units in accordance with #2 above.

3.8 Independent Testing Laboratory - A nationally recognized testing facility staffed and equipped to verify that OC tear gas weapons and devices meet manufacturer specifications and Department of Justice standards. Both the manufacturer and laboratory must certify that they are independent of one another, unaffiliated in any way, and have no financial interest in one another.

3.9 Law enforcement - All agencies, departments and individuals with the power to arrest.

4. Requirements

4.1 Independent Laboratory Testing

Manufacturers applying for OC tear gas Certificates of Acceptability must submit weapons or devices and copies of all the supporting material described in Section 4 of these Standards to an independent testing laboratory. Alternatively, the manufacturer may arrange for an approved independent testing laboratory representative to supervise testing at the manufacturer's facility. The independent testing laboratory must, at the manufacturer's expense, test weapons and devices and submit a copy of the final test report directly to the Department of Justice, after which the Department of Justice shall notify the manufacturer of its receipt.

4.1.1 The independent testing laboratory report must include the following:

1. Date of report.

2. Unique report number.

3. Name, address, and telephone number of the laboratory.

4. Place of testing. (If testing is performed at the manufacturer's facility, then the independent laboratory representative must report that all facility testing equipment was inspected and the calibration verified by the independent laboratory representative.)

5. Statement identifying the test methods used in testing weapons and devices. As a separate attachment to the report, enclose a complete copy of the standard used for testing: For example, American Society for Testing and Materials (ASTM) Part 1* Standard 3.7*; or National Institute of Standards and Technology Part 5* Standard 2.1.1*; or Department of Defense U.S. Army Munitions Command - Army Chemical Center Standard 3*.

*Part/Standard numbers used in 4.1.1.5 are shown as examples only. They are not actual Part/Standard numbers.

6. Test results to include:

   a. Name, address, and telephone number of the manufacturer.

   b. Device name, model number, lot number and unique sample number assigned by laboratory to each device tested.

   c. Total number of devices required by the laboratory to be submitted for testing, the sample size tested, and the confidence factor for each test.

   d. Test findings.

7. A conclusionary statement that the weapons or devices tested either do or do not meet all the requirements of Sections 2.2 and 4 of these standards.

8. A statement that the laboratory shall maintain a file containing all correspondence with the manufacturer related to the testing of weapons submitted to the Department of Justice for certification, all records of the tests and all supporting material for the report submitted to the Department of Justice for 7 years from date of submission.

9. Signatures of:

   a. Person(s) who conducted the tests.

   b. Person authorized to issue test reports, with title of position held with the laboratory.

4.2 Acceptance Criteria

A hand-held aerosol device meets the requirements of this standard if five of five units from a batch meet the safety requirements and four of five units meet the performance tests. The units are to be selected at random.

4.3 User Information

Five of five units must conform to this requirement as determined by Test 5.1.

4.3.1 Minimum Labeling of Device

The information supplied to the user by the manufacturer, in the form of clearly legible and permanent labeling on the device itself, shall include:

1. Name and/or model number uniquely identifying the weapon.

2. A serial number for each such weapon which correlates to records maintained by the weapon manufacturer which identify, lot, month, and year of manufacture.

3. Name and address of manufacturer.

4. The generic nomenclature of the lacrimator (OC) with or without its chemical name.

5. The following warning, prominently and conspicuously displayed on devices certified for self-defense purposes.

   "WARNING: The use of this substance or device for any purpose other than self-defense is a felony under California law. The contents are dangerous -- use with care."

6. A date on which the useful life of the weapon expires.

4.3.2 Other Information

The additional information supplied to the user by the manufacturer in the form of labeling on the device or on either unit packaging or supplementary printed matter (one of which accompanies each device) shall include:

1. Instructions for use, with detailed explanation of any atypical features or procedures, including but not limited to reloading.

2. First aid information which shall include a phrase similar to the following: "FIRST AID -- Rinse contaminated area with cold water only. Do not rub."

3. If applicable, warnings similar to the following:

   CONTENTS UNDER PRESSURE. DO NOT PUNCTURE OR INCINERATE CAN. DO NOT EXPOSE TO HEAT, SPARK OR FLAME OR STORE ABOVE 120 DEGREES FAHRENHEIT (50 DEGREES CELSIUS).

   AVOID ACCIDENTAL CONTACT WITH EYES, SKIN OR MUCOUS MEMBRANES. KEEP OUT OF REACH OF CHILDREN.

   FLAMMABLE. Refer to manufacturer's instructions.

4. The quantity of the active component (capsaicin) either by weight or by percentage of total liquid contents exclusive of propellant; net weight of the total liquid contents including propellant of the device; and the tare weight (weight of the device without its contents).

5. The identity of the non-agent contents, both carrier and propellant. The generic name, chemical name, or chemical formula shall be given. Harmless impurities of less than 1% each, totaling less than 5%, need not be listed.

6. The weapon's material delivery characterization, impact pattern at 1.5 meters, and minimum range.

4.4 Workmanship

Five of five units shall be of visually uniform high quality, free from tool marks, scratches, dents, illegibilities of labeling or other defects as determined by Test 5.1.

4.5 Formulation

4.5.1 Agent Identity and Quantity

The total net weight of the charge delivered for law enforcement use shall be 10 grams or greater. The concentration of the active component capsaicin, as measured by the approved Method, shall be between 0.20% and 0.90% of the total liquid contents, exclusive of propellant charge.

The total net weight of charge for self-defense use shall be no more than 150 grams. The concentration of the active component capsaicin, as measured by the approved Method, shall be between 0.08% and 0.12% of the total liquid contents, exclusive of propellant charge.

4.5.2 Inert Ingredient Identity

The identity of the carrier and/or propellant (all those non-agent ingredients which are found in the liquid phase in the can at its normal filled pressure at 20°C) shall be verified to be in agreement with the labeling by Test 5.2.2.

4.5.3 Inert Ingredients Harmless

No ingredient other than the agent shall have any known or be reasonably suspected of any deleterious biological effects in the context of the intended use.

4.6 Container and Valving Integrity

4.6.1 Basic Standard

The vessel shall conform to the Federal Code of Regulations, commencing with Part 178.33a, specification 2Q (see Appendix), and shall be inspected for conformance and tested as set forth therein.

The valve release/triggering system shall be designed to permit rapid bursts, but not unintentional discharge, or discharge directed at the user.

The devices subjected to the 30-day heat soak (Test 5.5) shall, upon dissection, show no evidence of corrosion or deterioration.

4.7 Device Performance

4.7.1 Delivery Performance and Characterization

The agent in the form of liquid droplets shall produce a pattern with a minimum diameter of 0.1 meters (4") at distance of 1.5 meters (60") with a minimum range of 3.0 meters (120") when tested according to Tests 5.3.1.1 and 5.3.1.2.

The number of bursts provided shall attain 90% or more of the number specified by the manufacturer of the device when tested according to Test 5.3.2.

4.7.2 Minimum Operating Temperature

At least four of five of the devices shall function at - 20°C (-4°F) in Test 5.4.

4.7.3 Storage Stability

After a 30-day heat soak at 54.4°C (130°F), all five devices shall have maintained structural integrity. In addition, four of the five devices shall assay between 80% and 120% of the specified agent quantity, deliver at least 75% of the specified number of one-second bursts, function normally and exhibit no signs of corrosion upon dissection. This test is defined at Test 5.5.

4.7.4 Valve Assembly Leakage

When subjected to ASTM method D3094-72, four of five devices shall not leak at a rate exceeding 0.05 ml (displacement at 1 atm) per day (corrected for solubility).

4.7.5 Rough Handling

In the course of Test 102.1 (Jumble), Test 108 (Waterproofness), and Test 111 (5-foot drop, modified to 1.5 meters) of MIL-STD-331 (Test 5.6 herein), none of five devices shall undergo rupture or a valve misfunction causing loss of more than 20% of the net contents. Four out of five devices shall experience no more than a 10% total weight loss, sustain no damage which renders normal handling or storage unsafe, and shall function normally when triggered.

4.8 Separable Housing Devices - Special Requirements

Devices having an outer housing separable from the pressurized agent container, whether intended to give dual capability (e.g., nightstick, flashlight, etc.) or not, will be exposed to performance tests and rough handling tests with outer housing in place. In cases where configuration prevents attachment to test fixtures (e.g., long nightsticks) non-aerosol-related structures may be altered at the discretion of the test administrator.

Devices intended to be reloaded must be designed to prevent inadvertent agent discharge during reloading and prevent incorrect refill orientations during insertion.

5. Test Methods

CAUTION: In many cases within this section, tests are described which would be hazardous if performed without proper training and/or facilities. These tests are therefore intended only for conduct by persons familiar with the materials and precautions involved.

5.1 Inspect Labeling

Five units shall be inspected for completeness and legibility of labeling and adequate workmanship.

5.2 Assay Procedure

5.2.1 Irritant Agent OC Assay

1. Method 21.1 of the Official Analytical Methods of the American Spice Trade Association

   The result shall be reported as total capsaicin, calculated by the formula of this method which factors the capsaicinoids present.

2. Standard Test Conditions

   This test will take place under standard conditions.

5.2.2 Driver Gas and Agent Carrier Analysis

1. Standard Test Conditions

   This test will take place under standard conditions.

This test shall be accepted and recognized by the aerosol industry.

5.3 Firing Tests

5.3.1 Material Delivery Test

1. Range Test

A fresh device shall be placed in an electrical firing stand functionally equivalent to that shown in Figure 1, controlled by the circuit shown in Figure 2 and placed on a test range conforming with Figure 3. One or more one-second bursts shall be fired (count must be kept) until a consistent range measurement to the nearest .25m has been observed. Also record material category (liquid stream, fog, mist, foam, or other).

When the design of device does not permit the use of the electrical firing stand, the test administrator for the independent laboratory may use an appropriate alternative.

2. Impact Pattern

The device, just having completed Test 5.3.1 still placed in the electrical firing stand, shall be moved to a test range as shown in Figure 4. One one-second burst shall be fired against the paper target. The measurements illustrated in Figure 5 shall be recorded to the nearest 1/2 cm.

5.3.2 Number of Bursts

The device just having completed Test 5.3.2 shall be emptied (no discharge or discharge consisting partially of non-formula gas) using the 10-shot switch on the control. The total number of shots, including those in Tests 5.3.1 and 5.3.2 shall be recorded.

5.3.3 Firing Test Procedure

The two foregoing tests (5.3.1 and 5.3.2) shall be repeated for each of five devices, with weights before and after testing recorded to the nearest 1/10 gram.

5.4 Minimum Operating Temperature Test

The samples shall be equilibrated at $-20^{\circ}C$ ($-4^{\circ}F$) by soaking at that temperature for six hours in an environmental chamber. Four of five devices must function in a visually normal manner.

5.5 Storage Stability Test

Samples weighed to the nearest 1/10 gram shall be subjected to a 30-day heat soak at 54.4°C (130°F). They shall be inspected daily for deterioration and leakage. A structural or valve failure resulting in a loss of 20% or more of net weight in any unit shall constitute failure of this test.

At the end of the heat soak period, the devices shall be allowed to cool slowly to ambient temperature. They shall be weighed to the nearest 1/10 gram. They shall be emptied with counted 1 sec bursts as for test 5.3.2. The devices will then be vented and dissected by an experienced technician.

. No more than one of five units may:

- Lose more than 10% of total weight.
- Achieve less than 75% of the average number of one-second bursts listed on the label.
- Fail to function normally.
- Show evidence of internal corrosion.

5.6 Leakage Tests

To be performed according to ASTM Method D3094-72, Seepage Rate for Aerosol Products.

5.7 Rough Handling Tests

5.7.1 Jumble

To be performed according to MIL-STD-331 (Fuze and Fuze Components, Environmental and Performance Tests for), Tests 102.1.

5.7.2 Waterproofness

To be performed according to MIL-STD-331 (Fuze and Fuze Components, Environmental and Performance Tests for), Test 108.

5.7.3 Drop Test

To be performed according to MIL-STD-331 (Fuze and Fuze Components, Environmental and Drop Tests for), Test 111 with the exception that the drop height will be 1.5 meters, as illustrated in Figure 6.

APPENDIX

CODE OF FEDERAL REGULATIONS Part 178.33a

Part 178 - Shipping Container Specifications

178.33a Specification 2Q; inside non-refillable metal containers.

178.33a-1 Compliance.

(a) Required in all details.

178.33a-2 Type and size.

(a) Single-trip inside containers. Must be seamless, or with seams welded, soldered, brazed, double-seamed, or swedged.

(b) The maximum capacity of containers in this class shall not exceed 50 cubic inches (27.7 fluid ounces). The maximum inside diameter shall not exceed 3 inches.

178.33a-3 Inspection.

(a) By competent inspector.

(b) [Reserved]

178.33a-4 Duties of Inspector.

(a) To inspect material and completed containers and witness tests, and to reject defective materials or containers.

(b) [Reserved]

178.33a-5 Material.

(a) Uniform quality steel plate such as black plate, electrotin plate, hot dipped tinplate, tern plate or other commercially accepted can making plate; or nonferrous metal of uniform drawing quality.

(b) Material with seams, cracks, laminations, or other injurious defects not authorized.

178.33a-6 Manufacture.

(a) By appliances and methods that will assure uniformity of completed containers; dirt and scale to be removed as necessary; no defect acceptable that is likely to weaken the finished container appreciably; reasonably smooth and uniform surface finish required.

(b) Seams when used must be as follows:

(1) Circumferential seams; by welding, swedging, brazing, soldering, or double seaming.

(2) Side seams. By welding, brazing, or soldering.

(c) Ends. The ends shall be of pressure design.

178.33a-7 Wall thickness.

(a) The minimum wall thickness for any container shall be 0.008 inch.

178.33a-8 Tests.

(a) One out of each lot of 25,000 containers or less, successively produced per day, shall be pressure tested to destruction and must not burst below 270 pounds per square inch gauge pressure. The container tested shall be complete with end assembled.

(b) Each such 25,000 containers or less, successively produced per day, shall constitute a lot and if the test container shall fail, the lot shall be rejected or ten additional containers may be selected at random and subjected to the test under which failure occurred. These containers shall be complete with ends assembled. Should any of the ten containers thus tested fail, the entire lot must be rejected. All containers constituting a lot shall be of like material, size, design, construction, finish, and quality.

178.33a-9 Marking

(a) By means of printing, lithographing, embossing, or stamping, each container must be marked to show:

(1) DOT-2Q.

(2) Name or symbol of person making the mark specified in paragraph (a)(1) of this section. Symbol if used, must be registered with the Associate Administrator for Hazardous Materials Safety.

(b) [Reserved]

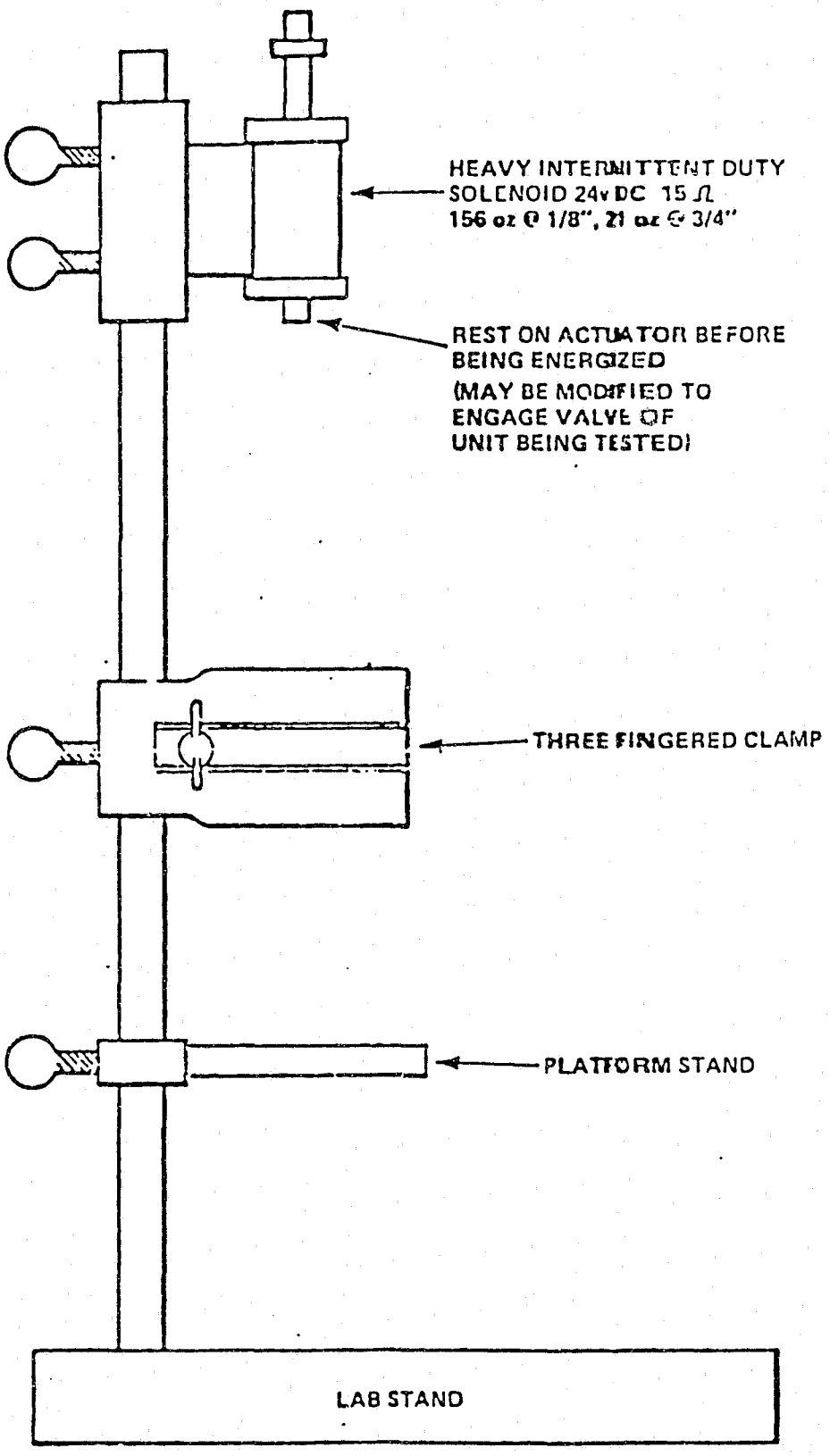

Figure 1 AEROSOL DEVICE TEST STAND

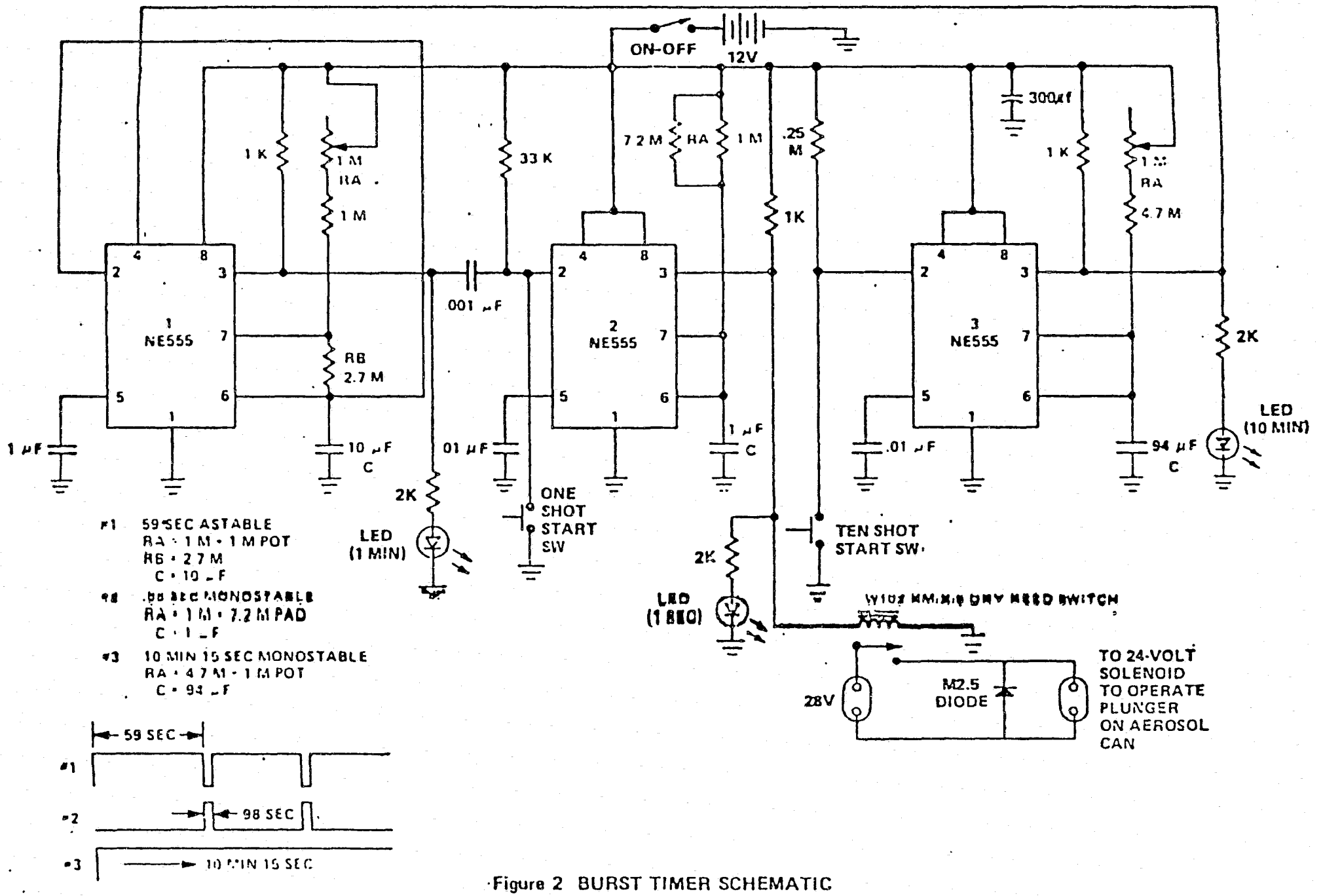

Figure 2 BURST TIMER SCHEMATIC

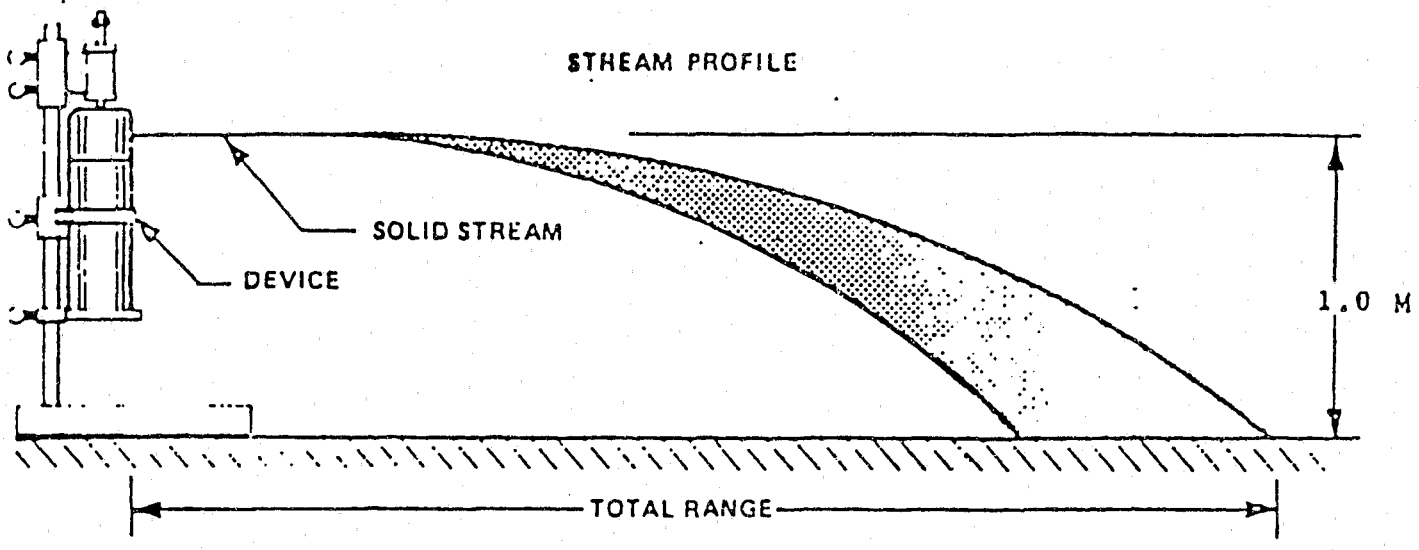

Figure 3 RANGE TEST

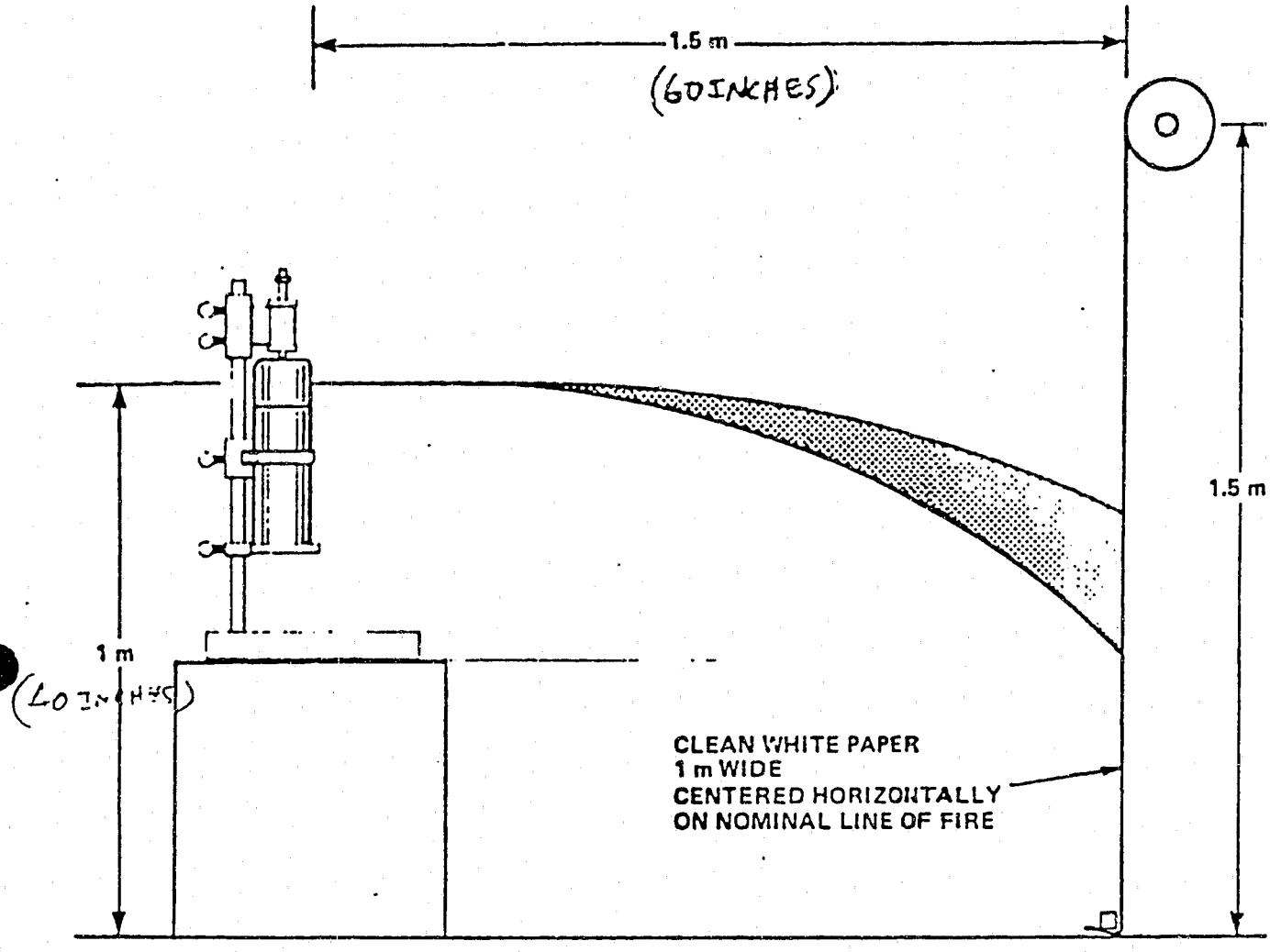

Figure 4 IMPACT PATTERN TEST

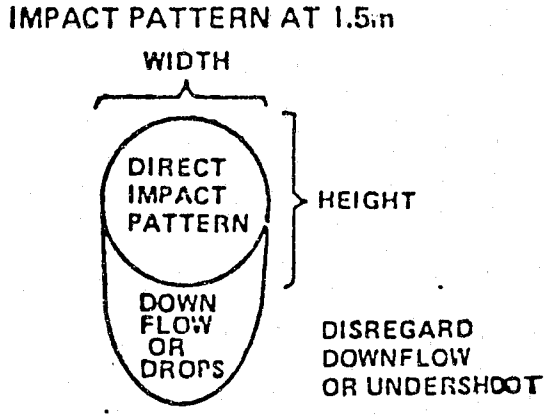

Figure 5 IMPACT PATTERN MEASUREMENTS

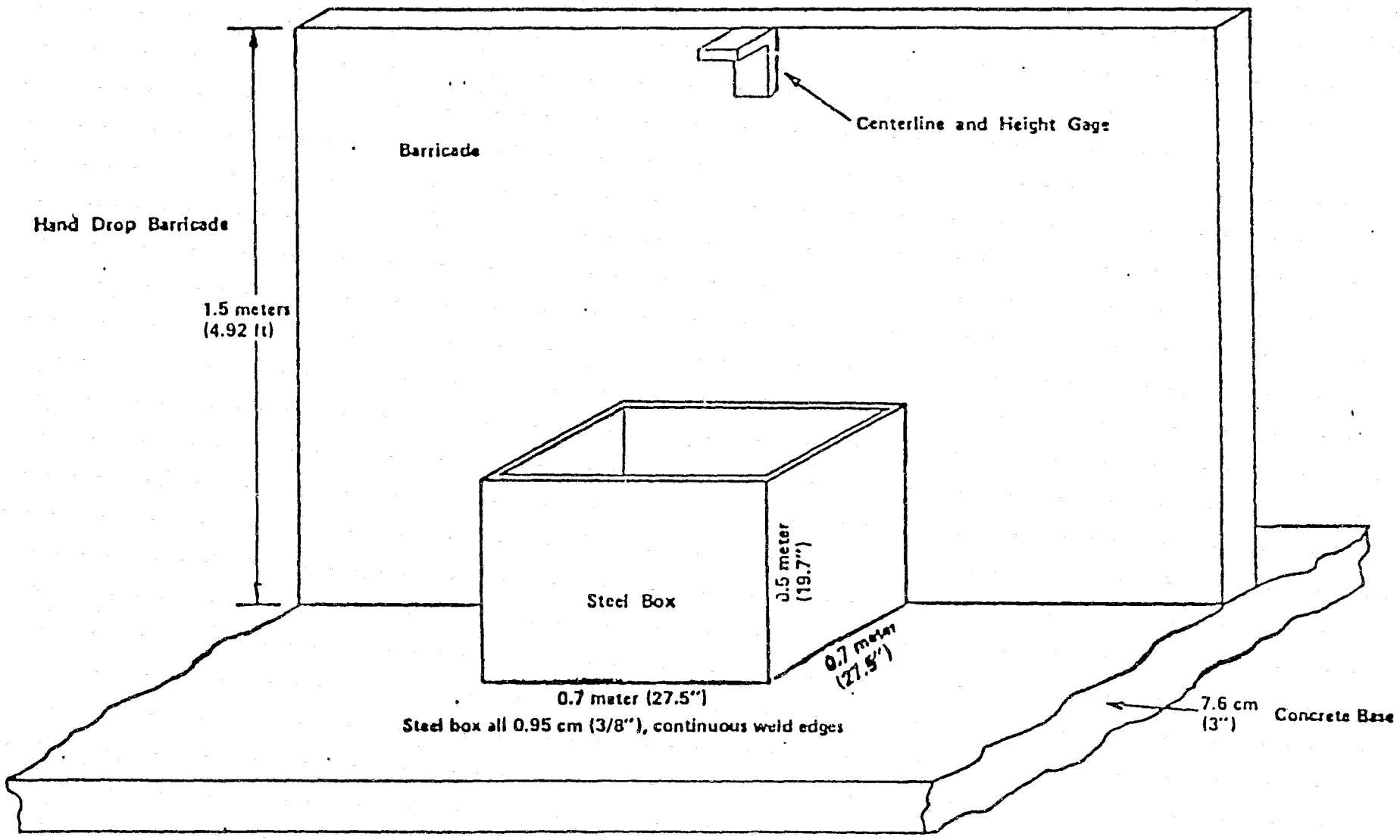

Figure 6 1.5 METER DROP TEST SETUP