State of Nevada
Department of Highways
Materials and Testing Division

METHOD OF OPERATION OF THE MECHANICAL COMPACTOR

SCOPE

This method describes the operation of the mechanical compactor used for fabrication of treated or untreated soil specimens for the R-value test.

A. APPARATUS

1. Mechanical Compactor and accessories (see Figures I & II).

B. PRINCIPLE OF OPERATION

1. The mechanical compactor, (Figure I) is a piece of equipment designed to fabricate stabilometer test specimens of soils. Compaction is accomplished by applying a kneading-like pressure to the specimen through a special tamping foot (see Figure II), by means of a controlled slow speed dynamic force, and the cushioning action of a nitrogen filled hydraulic accumulator.

2. Referring to the diagram, (Figure I), the kinetic energy required for compaction is developed from an electric motor, and is applied through a hydraulic ram system.

3. The tamper foot can be raised or lowered through a distance of about 1 ft. by raising or lowering the piston hydraulically. With the motor running, the compactor foot travels up and down through the adjusted distance alternately applying and releasing a pressure on the specimen according to a fixed cycle.

4. The complete time cycle for each stroke is about 2 seconds. The force applied by the tamper foot on the test specimen is equal to the force on the piston.

5. The kneading action is developed by the application of pressure alternately to a small localized area (about 3.2 sq. in.) of the specimen while the remainder of the surface is free to move. Damaging or abnormal impact is avoided by the slow speed of the ram at the time of contact with the specimen, and the shock absorbing action of the nitrogen accumulator.

C. PROCEDURE

1. Turn on-off switch (A) to the "on" position, to start motor.

2. Turn the tamper foot switch (B) to "on" position and press down button (D) to bring tamping foot down to adjust pressure.

3. Adjust manual valve (E) to give desired pressure on pressure indicator.

4. Adjust manual valve (F) to give desired pressure on pressure regulator.

5. When the tamper foot makes contact with the surface of the specimen and the pressure has been set, turn switch (B) to "off" position.

6. Adjust the height-adjust knob (G) to the correct position for the desired height of the tamper foot.

7. Push button (C) to start the automatic cycling operation.

8. At the completion of the compacting cycle, turn height-adjust knob (G) back to "up" position to raise tamper foot and then turn switch (A) to "off" position.

HAZARDS

Caution must be exercised when compacting test specimens so as not to allow any object other than the sample itself to intercede between the compactor foot and the mold at any time while the ram is in motion. The clearance between the inside edge of the mold and the compactor foot is approximately 1/16 in. The applied shearing force of from 1,100 to 1,600 lb. could cause severe injury to an operator's hand if caught between the compactor foot and the mold.

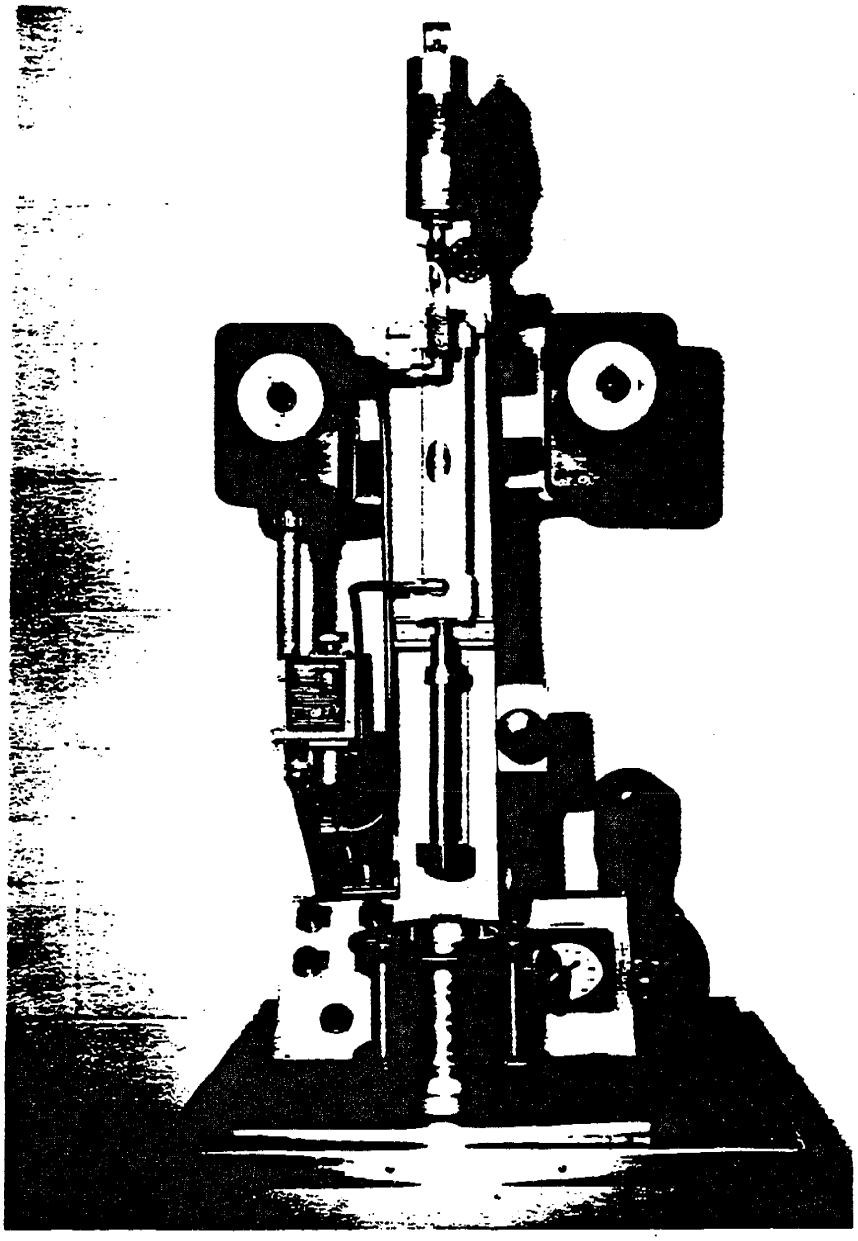

FIGURE 1

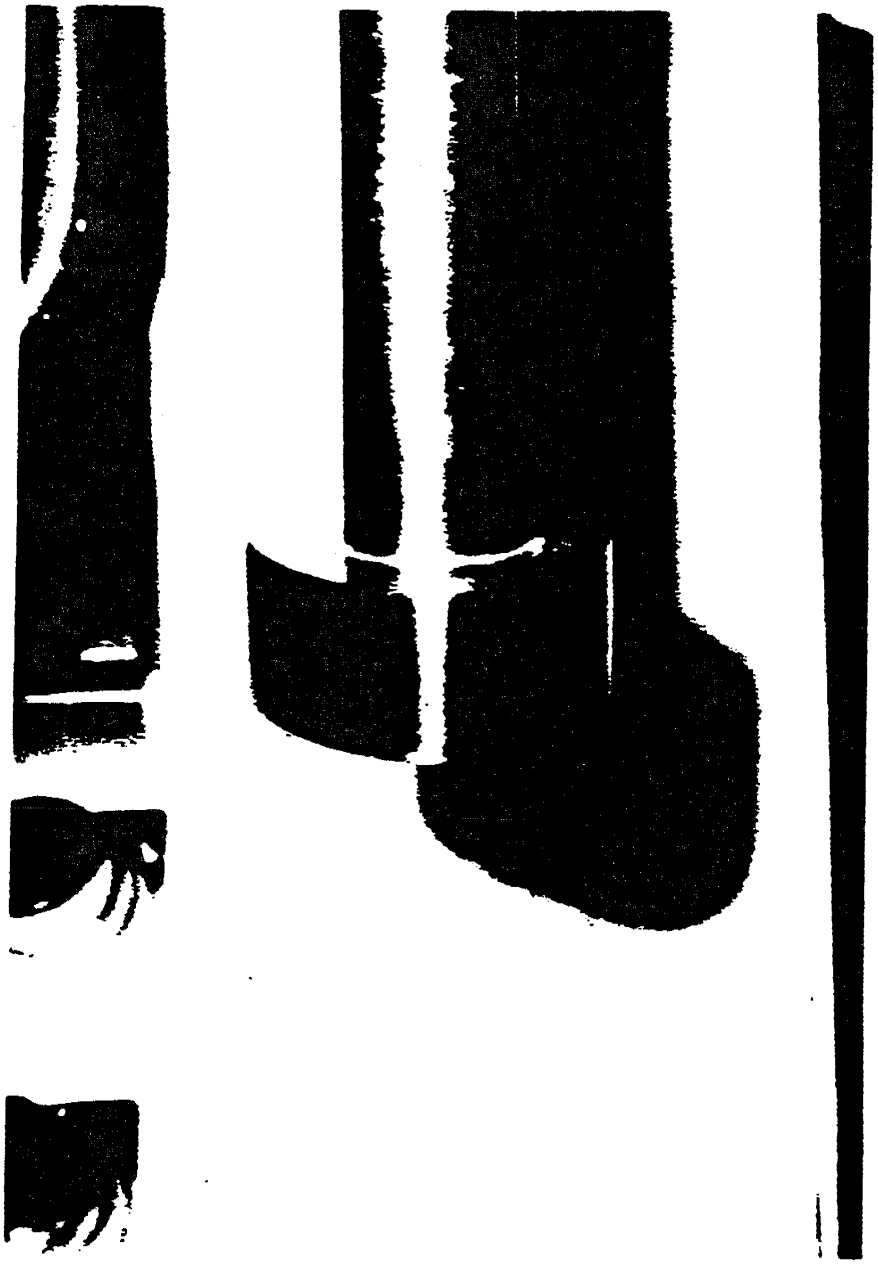

FIGURE 2