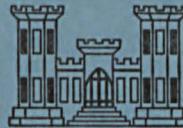


TECHNICAL REPORT N-69-1

MODELING OF BEAMS AND ARCHES MADE FROM PROCESSED SNOW AND SUBJECTED TO STATIC LOADS

by

J. M. Watt



January 1969

Sponsored by

Defense Atomic Support Agency

Conducted by

U. S. Army Engineer Waterways Experiment Station
CORPS OF ENGINEERS

Vicksburg, Mississippi

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NWER Subtask No. 13.010

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ARMY-MRC VICKSBURG, MISS.

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ABSTRACT

This report describes the modeling procedures and results of static loading of structural elements made of processed snow. The experiments were performed at Camp Century, Greenland, during the summers of 1961 and 1962 by the U. S. Army Engineer Waterways Experiment Station (WES) and were sponsored by the Defense Atomic Support Agency.

The general objective of this investigation was to study the response of processed-snow beams and arches to static loads, and to formulate criteria that will make it possible to design processed-snow structures to resist the airblast effects of nuclear explosions. The primary objective of the study reported herein was to determine the response and verify the adequacy of the modeling procedures for snow structures subjected to static loadings. Calibration of the loading devices is discussed in Appendix A. Data obtained from static tests of 507 beam, 256 arch, and 1,758 cylinder specimens are presented in tabular form in Appendix B. The arches and beams were of three sizes, i.e. a prototype (length ratio n of 1) having a span length of 9 feet, a model (n of 2.4) having a span length of 3.75 feet, and another model (n of 6) having a span length of 1.5 feet. The test cylinders were 3 inches in diameter by 6 inches long.

Because of the many variables involved, the modeling procedures for structures made of snow were not verified. However, the response

of beams, arches, and cylinders made of processed snow is described and ranges of pressure that cause collapse have been determined, i.e. 0.25 to 8 psi for the beams, 2 to 60 psi for the arches, and 2 to 69 psi for the cylinders. The most significant results are curves that relate the strength of processed snow to such parameters as temperature, age, specific weight, and loading rate.

PREFACE

This report describes the modeling procedures and results of static loading of structural elements made of processed snow. The experiments were performed at Camp Century, Greenland, during the summers of 1961 and 1962 by the U. S. Army Engineer Waterways Experiment Station (WES) and were sponsored by the Defense Atomic Support Agency under NWER Subtask No. 13.010.

Work was accomplished under the general supervision of Mr. F. R. Brown, former Chief of the Nuclear Weapons Effects Division, WES; Mr. G. L. Arbuthnot, Jr., Chief of the Nuclear Weapons Effects Division, WES; and under the direct supervision of Mr. W. J. Flathau, Chief of the Protective Structures Branch, WES. The members of the field party were Messrs. L. F. Ingram, R. A. Sager, K. Daymond, C. M. Wright, W. D. Rutland, T. E. Kennedy, G. R. McDonald, B. J. Cross, A. G. Reno, C. D. McMillion, E. L. Sadler, SP 5 F. H. Abrew, SP 5 D. Gee, SP 4 T. G. Elias, and SP 4 W. F. Ballard of WES and SP 5 H. Szostak of the U. S. Army Engineer Research and Development Detachment (ER&DD) of the U. S. Army Polar Research and Development Center (PR&DC). This report was prepared by J. M. Watt with the assistance of PFC L. Horvath and SP 5 Abrew. Data reduction was performed by several members of the field party and PFC D. Del Mar. Logistical support including transportation, mess, quarters, clothing,

and special arctic equipment was provided by PR&DC. Direct field support was provided by ER&DD during the summer of 1961 and by PR&DC during the summer of 1962.

COL Edmund H. Lang, CE, COL Alex G. Sutton, Jr., CE, COL John R. Oswalt, Jr., CE, and COL Levi A. Brown, CE, were Directors of WES during the course of this investigation and the preparation of this report. Mr. J. B. Tiffany was Technical Director.

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NOTATION

d	Deflection, inches
E	Modulus of elasticity, psi
k	Conversion factor used to convert g/cc to psi
ℓ	Length, inches
m (subscript)	Model
n	Similitude geometry scale
p (subscript)	Prototype
P	Applied pressure, psi
P'	Applied pressure, corrected, psi
S	Stress, psi
T	Temperature, degrees Centigrade
γ	Specific weight, g/cc
ϵ	Strain, in/in
λ	Any length, inches

CONVERSION FACTORS, BRITISH TO METRIC UNITS OF MEASUREMENT

British units of measurement used in this report can be converted to metric units as follows.

Multiply	By	To Obtain
inches	2.54	centimeters
feet	0.3048	meters
miles	1.609344	kilometers
pounds	0.45359237	kilograms
tons	907.185	kilograms
pounds per square inch	0.070307	kilograms per square centimeter
horsepower	745.700	watts
miles per hour	1.609344	kilometers per hour
Fahrenheit degrees	5/9	Celsius or Kelvin degrees ^a

^a To obtain Celsius (C) temperature readings from Fahrenheit (F) readings, use the following formula: $C = (5/9)(F - 32)$. To obtain Kelvin (K) readings, use $K = (5/9)(F - 32) + 273.15$.

CHAPTER 1

INTRODUCTION

1.1 BACKGROUND

For many years, inhabitants of arctic regions have used ice and/or snow as a construction material (Reference 1) to build houses, logging roads, bridges, storage areas, etc.

One of the more recent construction methods developed for arctic regions is a cut-and-cover process (Reference 2) in which a snowplow excavates the natural snow, mills it (processed snow), and blows it from the excavated trench. The trench is then covered with a snow roof made by placing a metal arch into the newly cut trench and then blowing processed snow on top of the arch until the fill is level with the original snow surface. Because the finely ground processed snow has greater strength than natural snow, it is a better construction material.

With the development of this unique building method, the need arose for knowledge of the vulnerability of undersnow structures to damage from explosively generated loads. This type of knowledge was needed to supplement protective construction design methods.

1.2 OBJECTIVES AND SCOPE OF INVESTIGATION

1.2.1 Objectives. The general objective of this investigation was to study the response of processed-snow beams and arches to static

loads, and to formulate criteria that will enable design of processed-snow structures to resist the effects of nuclear explosions. The primary objective of the study reported herein was to verify the adequacy of the modeling procedures for snow structures subjected to static loadings. A secondary objective was to provide additional information on the response of processed-snow structures to static live loads of short duration, as most response information presently available is for long-duration loadings.

1.2.2 Scope. Based on the general procedures presented in Reference 3, similitude equations were developed for modeling structures for static loads.

An explanation of the calibration of loading devices is presented in Appendix A, and data obtained from static tests of 1,758 cylinder, 707 beam, and 256 arch specimens are presented in tabular form in Appendix B. The test cylinders were 3 inches¹ in diameter by 6 inches long. The arches and beams were of three sizes, i.e. a prototype (length ratio n of 1) having a span length of 9 feet, a model (n of 2.4) having a span length of 3.75 feet, and another model (n of 6) having a span length of 1.5 feet. Failure pressures ranged from 2 to 69 psi for the cylinders, 0.25 to 8 psi for the beams, and 2 to 60 psi for the arches.

¹ A table of factors for converting British units of measurement to metric units is presented on page 13.

Testing equipment and procedures are described herein.

1.3 SIMILITUDE RELATIONS

For static loads, applied force and internal stress are both independent of time. Thus, the response of a structural member subjected to static loads is a function of the forces applied, the geometry of the cross section of the member, and the properties of the material. In this study, deflection was chosen as the dependent variable. Thus, the following functional equation is written:

$$d = f(\ell, \lambda, P, E, S, \gamma) \quad (1.1)$$

The parameters involved in Equation 1.1 are described in Table 1.1.

To establish design conditions, Equation 1.1 is written in dimensionless form as a function of 5-pi terms using length ℓ and modulus of elasticity E as repeating variables and is:

$$\frac{d}{\ell} = f\left(\frac{\lambda}{\ell}, \frac{P}{E}, \frac{S}{E}, \frac{\gamma\ell}{E}\right) \quad (1.2)$$

If Equation 1.2 represents the equation for a prototype, a similar equation is valid for a model. Further, it will be assumed that E is equal for model and prototype. Since the structural elements will be loaded to collapse, the error introduced by this assumption is considered negligible.

A length scale is defined as:

$$n = \frac{\ell_p}{\ell_m} \quad (1.3)$$

The prediction equation

$$\frac{d_p}{\ell_p} = \frac{d_m}{\ell_m} \quad \text{or} \quad d_p = n d_m \quad (1.4)$$

is true if the following conditions are met:

$$\frac{\lambda_p}{\ell_p} = \frac{\lambda_m}{\ell_m} \quad \lambda_p = \lambda_m n \quad (1.5)$$

$$\frac{P_p}{E_p} = \frac{P_m}{E_m} \quad P_p = P_m \quad (1.6)$$

$$\frac{S_p}{E_p} = \frac{S_m}{E_m} \quad S_p = S_m \quad (1.7)$$

$$\frac{\gamma_p \ell_p}{E_p} = \frac{\gamma_m \ell_m}{E_m} \quad n \gamma_p = \gamma_m \quad (1.8)$$

Condition Equation 1.5 requires geometric similarity. Condition Equations 1.6 and 1.7 indicate equal load and internal stress for model and prototype. Condition Equation 1.8 requires modeling of the specific weight. This problem, which is considered significant, can be handled by adding a surcharge load to the model. The actual applied load P_m will be reduced by an amount equal to the needed increase in specific weight γ_m . The equation satisfying this condition is as follows:

$$P'_m = P_m - [(n\gamma_p - \gamma_m) k] \quad (1.9)$$

where

P'_m = Load altered, due to satisfying $n\gamma_p = \gamma_m$

P_m = Actual load applied to element

$[(n\gamma_p - \gamma_m) k]$ = The surcharge load required to effect the specific weight change

If all the pertinent parameters have been considered and the condition equations satisfied, a valid method for predicting deflections of a prototype structure from its model will have been established.

TABLE 1.1 DESCRIPTION OF PHYSICAL PARAMETERS FOR STATIC LOADS

Physical Parameter	Symbol	Dimensional Formula
Force:		
Pressure	P	FL^{-2}
Geometry:		
Deflection	d	L
Length	l	L
Any Length	λ	L
Material:		
Ultimate-Stress	s	FL^{-2}
Modulus of Elasticity	E	FL^{-2}
Specific Weight	γ	FL^{-3}

CHAPTER 2

PROCEDURES

2.1 TEST SITE

All static tests were conducted at the U. S. Army Engineers Research Facility, Camp Century, Greenland, located approximately 138 miles inland from Thule Air Force Base on the Greenland Ice Cap.

A cut-and-cover trench (Reference 2) was constructed at Camp Century and served as the field laboratory for the project during the two summers of operation (1961 and 1962). In plan, the trench was 130 feet long by 22 feet wide and provided a protected working area that included a heated instrumentation building, a specimen preparation and curing area, and a specimen testing area. A ramp connected the trench to the outside perimeter of the camp, making the trench accessible to vehicles. Figure 2.1 shows a plan view of the camp, and Figure 2.2 shows the plan and elevation of the project trench. An aerial view of the entrance to the project trench is shown in Figure 2.3, and an interior view of the trench is shown in Figure 2.4.

2.2 TEST GEOMETRY

The following general geometric modeling relations were selected for the static tests of arch and beam elements: a prototype condition in which $n = 1$, a model condition in which $n = 2.4$, and a second model

condition in which $n = 6$. An unsupported length of 9 feet was selected for the prototype beams, with resulting model lengths of 45 and 18 inches, respectively. For each of the two model beam sizes, five different depths were selected. For the prototype specimens, only 24-inch-deep specimens were tested. For all of the general arch specimen sizes, five different radii were selected. Table 2.1 presents a summary of pertinent specimen dimensions and total number of each type of specimen tested. Figure 2.5 shows the general dimensions of the arch and beam specimens.

2.3 TEST EQUIPMENT

2.3.1 Three-Unit Loader. Based on general knowledge of the strength of the specimen material and the fact that uniform loading would be used in the test program, it was possible to determine the general requirements of the loading device needed for the static testing of arches and beams. A view of the device with an arch specimen in each unit is shown in Figure 2.6.

Two systems were employed to apply the load to the specimen. In the first system, nine hydraulic cylinders mounted on a steel frame were evenly spaced over the desired loading surface. As shown in Figure 2.6, these cylinders had shoes or loading pads that distributed the load from the cylinder to the specimen. Each pad was connected to the shaft of the hydraulic cylinder by a universal joint that provided

rotation freedom in all directions. This allowed a uniform load to be applied without significantly disrupting the natural response of the specimen. This system was used for all static tests conducted during the summer of 1961.

While the 1961 summer testing program was in progress, certain difficulties with the three-unit loader became evident. The hydraulic cylinders were designed for heavy loads but were operated at a fraction of their capacity, causing a relatively large portion of the applied load to be lost due to friction in the piston-cylinder assembly. Trouble was also encountered in bringing all nine loading heads into intimate contact with the test specimen. In addition, the friction values were inconsistent and differed by ± 0.5 psi for the large cylinders, ± 1.0 psi for the medium cylinders, and ± 10 psi for the small cylinders. Therefore, it became difficult to determine the actual applied pressure for low pressure ranges. This problem was further magnified by effects of low temperatures.

As the majority of the difficulty resulted from using hydraulic cylinders in the loading device, a modification to the device was made employing a diaphragm loader. It was believed that the use of a diaphragm would make it possible to apply a uniform pressure over the entire loading surface of the specimen. The design criteria for the diaphragm required a flexible loading surface that would follow the

response of the test specimen without loss in the pressure applied to the specimen.

Uniform membrane loaders (Figure 2.7) were built to test the $n = 6$ and $n = 2.4$ models. The membrane loaders were calibrated and proved satisfactory for pressures up to 40 psi and deflections up to 1 inch. A prototype testing membrane loader was not built because of inherent problems of size and handling. Figure 2.8 shows test specimens in the two smaller devices of the three-unit loader with the uniform membrane loader in place.

Figure 2.9 shows the loading geometry for each system. The results of the arch and beam tests were monitored electronically on a direct-writing oscilloscope. Line pressure and deflections at selected points on the specimen were measured.

2.3.2 Cylinder Testing Device. In order to obtain the compressive and tensile strengths of processed snow, a second loading device was designed and constructed. This device was capable of applying load at a constant rate of strain that could be controlled for rates ranging from 1.1 to 99 in/min. The basic components (Figure 2.10) consisted of a steel frame on which was mounted a 1-hp variable-speed electric motor, a 5-ton worm-gear jack that required 16 revolutions for a deflection of 1 inch, a 2,000-pound-capacity load cell, and a linear-transformer-type deflection measuring instrument. The jack was powered by a variable-speed motor, and the loading speed was controlled

by varying the motor speed and changing gear ratios. In addition to the standard cylinder tests that were conducted, the effect of strain rate on the strength of snow was investigated. Cylinders were placed in a vertical position for compression tests and in a horizontal position for tensile-splitting tests. Deflection of the specimen was measured by monitoring the deflection between the movable bottom loading plate and a fixed reference point on the frame.

2.3.3 Sieve Shaker. The particle size distribution of the various snow materials was measured in a temperature-controlled room using a standard sieve shaker (Figure 2.11). The shaker is of a conventional design and is commercially available from many soil-testing equipment manufacturers. Seven sieves were used in taking particle-size distribution.

2.3.4 Snow Cylinder Miller. Snow cylinder samples were cut from the various test specimen materials so that compressive and tensile strengths could be determined. A snow cylinder miller and mitre box (Figure 2.12) were constructed to ensure that all cylinders would be uniformly cut (3-inch-diameter by 6-inch-long specimens). A block of snow was inserted into the cylinder miller, and a cylinder specimen was pulled out. The ends of the cylinder were then trimmed squarely in the mitre box.

2.3.5 Instrumentation. Pressure and deflection measurements were recorded electronically. The pressure cells were of two types--

the potentiometer type, known as a Bourns gage, and the diaphragm type, known as a CEC cell. The deflection-measuring transducer was a linear, variable-differential transformer. Load on the cylinder-testing device was monitored using a 2,000-pound-capacity strain-gage load cell.

The output signals of the transducers were amplified for maximum control and gain and transmitted to a recording oscillograph (Figure 2.13).

2.4 TEST SPECIMENS

All test specimens were made of processed snow. The processed-snow test specimens were formed by one of two methods. One method was to blow the snow into a structural form having appropriate inside dimensions; another was to cut specimens from a large pad of processed snow. The processed snow was made by using either a large or small snowplow. The large snowplow is a tracked vehicle capable of cutting a trench 9 feet wide and 4 feet deep (Figure 2.14). The small plow is a hand-operated machine that can make a cut 1 foot deep and 2 feet wide (Figure 2.15).

Complete records were made of the snow and air temperatures, wind velocity and direction, cloud conditions, type of plow used, and the height to which the snow was blown when specimens were prepared. Also, a sieve analysis was performed after the snow had been blown to determine the particle-size distribution of each snow material. The

procedure and equipment used were those of CRREL Project 13.4 (Reference 4). Snow samples weighing from 200 to 500 grams were used. After each sample had been disaggregated by rubbing the pieces of the hard snow together, it was weighed. Each sample was shaken for 3 minutes, the weight of snow retained on each sieve was recorded, and the resulting percentages were calculated.

Test cylinders and structural specimens were formed, cured, and tested simultaneously in order to reduce unknown parameter effects.

2.4.1 Preparation of Formed Specimens. The arch specimens (the models and the prototype) were formed with interchangeable arch-ring forms with universal mounting holes (Figure 2.16). The beam specimens were prepared on forms with movable inside inserts so that various beam depths could be obtained for each particular specimen size. Both types of forms were used extensively in the 1961 testing program. For the 1962 testing program, a box capable of holding all the arch rings of each specimen size was constructed (Figure 2.17). This allowed all the arches in a particular test series to be formed from the same material.

The forms were positioned and filled with snow that had been processed either by the large or the small snowplow. The specimens were then placed in the curing area. The forms for the $n = 1$ (prototype) arches and beams were not rigid enough to allow movement of the specimens without cracking the specimens; therefore, the $n = 1$ specimens

were formed in a location where they could be lifted easily onto the loading device (Figure 2.18). It should be noted that the $n = 1$ specimens were formed by first transporting the raw snow into the trench (laboratory area), milling it, and then placing it in the forms. All other models were formed with processed snow milled and placed at the site of the raw snow.

After a curing period of about three days, the forms for the single arches and beams were stripped from the specimens. The specimens in the large multiarch forms were allowed to cure for about six weeks before the forms were stripped. Afterwards, the specimens were cured in the air for five or six days and then prepared for placement in the testing device.

2.4.2 Preparation of Cut Specimens. During the middle of the 1961 test season, many samples were prepared by sawing the specimens from a rough block of snow in an effort to expedite the test program. In this procedure, a pad of processed snow was blown and allowed to cure as deposited for a minimum of two weeks before any samples were removed.

At various times after the initial two-week period, large blocks of snow were cut from the pad with a gasoline-powered chain saw (Figure 2.19) and moved into the project trench. Having been cured an additional day or two, the blocks were shaped into rough specimens and finally trimmed to the desired specimen shape using a special cutter

(Figure 2.20) or a hand saw. The specimen curing area in the rear of the project trench and some of the cut specimens are shown in Figure 2.21.

During the curing period, day to day temperatures were recorded to obtain a temperature profile.

2.4.3 Testing Procedures. Before a beam was placed in the loading device, the simple supports were positioned and the correct span distance was measured. Then the specimen was placed on the supports, which were raised by a system of wedges until firm contact between the membrane loader and specimen was obtained. After the deflection gages had been installed and the pressure sensors activated, the specimen was ready for testing.

In the arch tests, the specimens were placed on a platform that had a wedge lifting system similar to that of the beams. Once the arch had been placed on this platform and raised to the membrane loader, its ends were wedged into place to ensure that they made intimate contact with the loading device. As soon as instrumentation had been placed and checked, the specimen was loaded.

The only variation in the outlined test procedures occurred when the hydraulic cylinders instead of the membrane loader were used to load the specimens. In this case, the cylinders were brought down to meet the specimens rather than the specimens being brought up to the cylinders.

To facilitate the handling of the large arches, the specimens were kept in the forms until they were in position for the test.

After a test had been completed, the specific weight of the specimen was determined from samples taken near the failure plane. Snow and air temperatures were recorded, and both photographic and visual observations of each type failure were made.

TABLE 2.1 SUMMARY OF TEST DESIGN

	Prototype n = 1					Model n = 2.4					Model n = 6				
Arches:															
Arch Radius, inches	48	42	36	30	24	20	17.5	15	12.5	10	8	7	6	5	4
Crown Cover, inches	6	12	18	24	30	2.5	5	7.5	10	12.5	1	2	3	4	5
Number of Tests	0	3	3	3	3	4	15	7	6	6	0	50	48	52	56
Beams:															
Length, inches	.108	108	108	108	108	45	45	45	45	45	18	18	18	18	18
Depth, inches	36	30	24	18	12	15	12.5	10	7.5	5	6	5	4	3	2
Number of Tests	0	0	6	0	0	19	15	32	21	17	71	52	94	93	87
Cylinders:															
Diameter = 3 inches						1,389 Compression Tests					369 Tensile Splitting Tests				
Length = 6 inches															

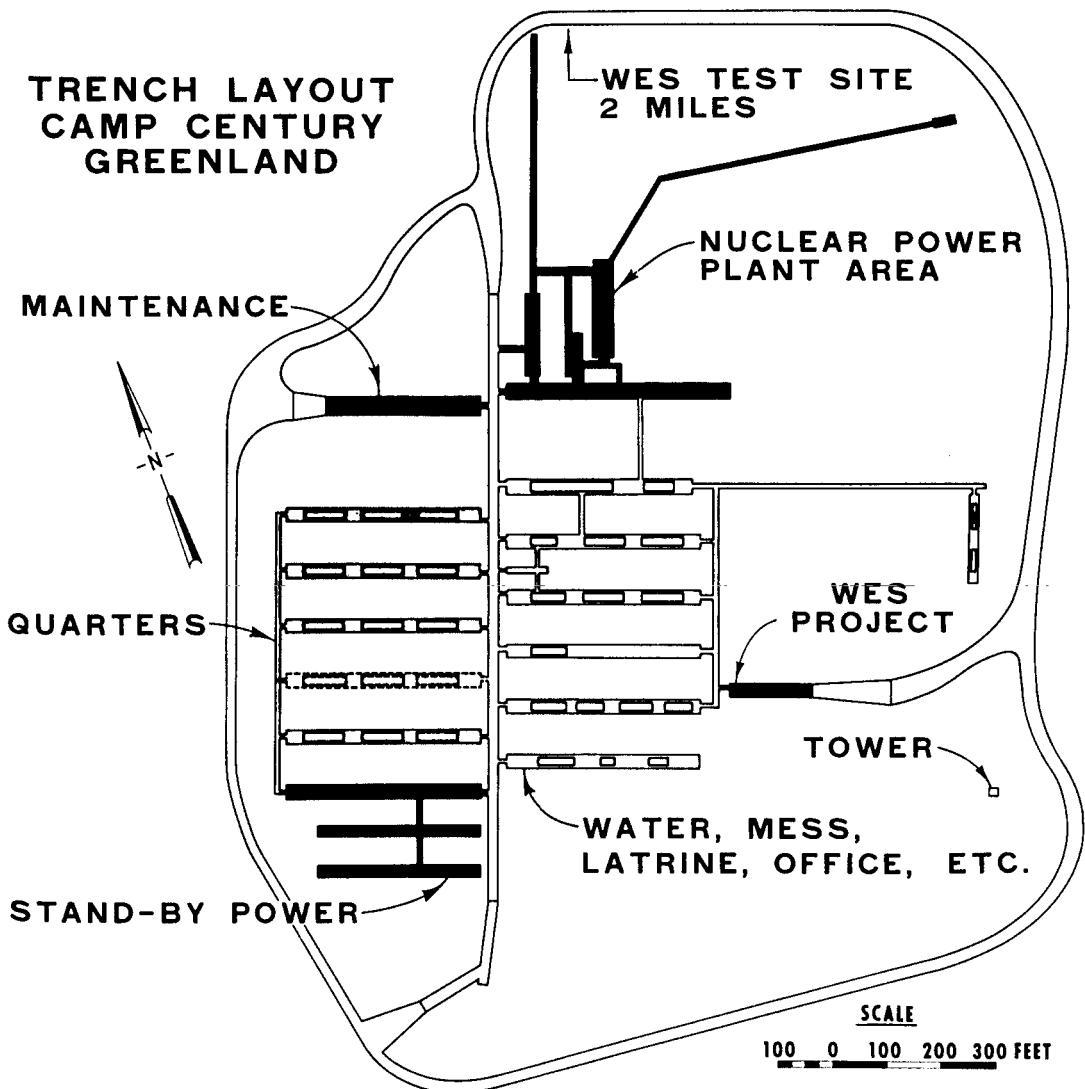
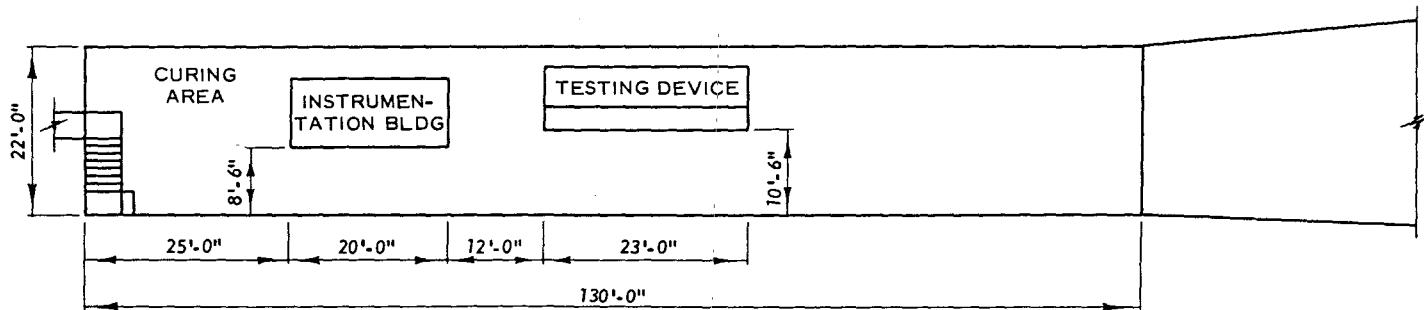
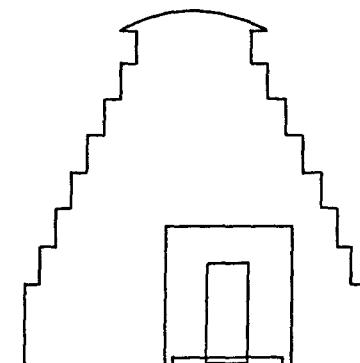
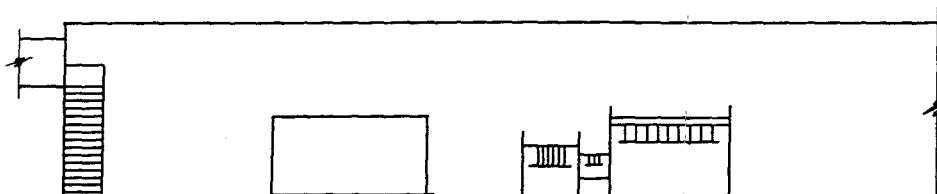


Figure 2.1 Trench layout, Camp Century, Greenland.



32



SCALE IN FEET

1 0 1 2 3

SCALE IN FEET

1 0 1

Figure 2.2 Plan and elevation of project trench.



Figure 2.3 Aerial view of entrance to project trench.

34.

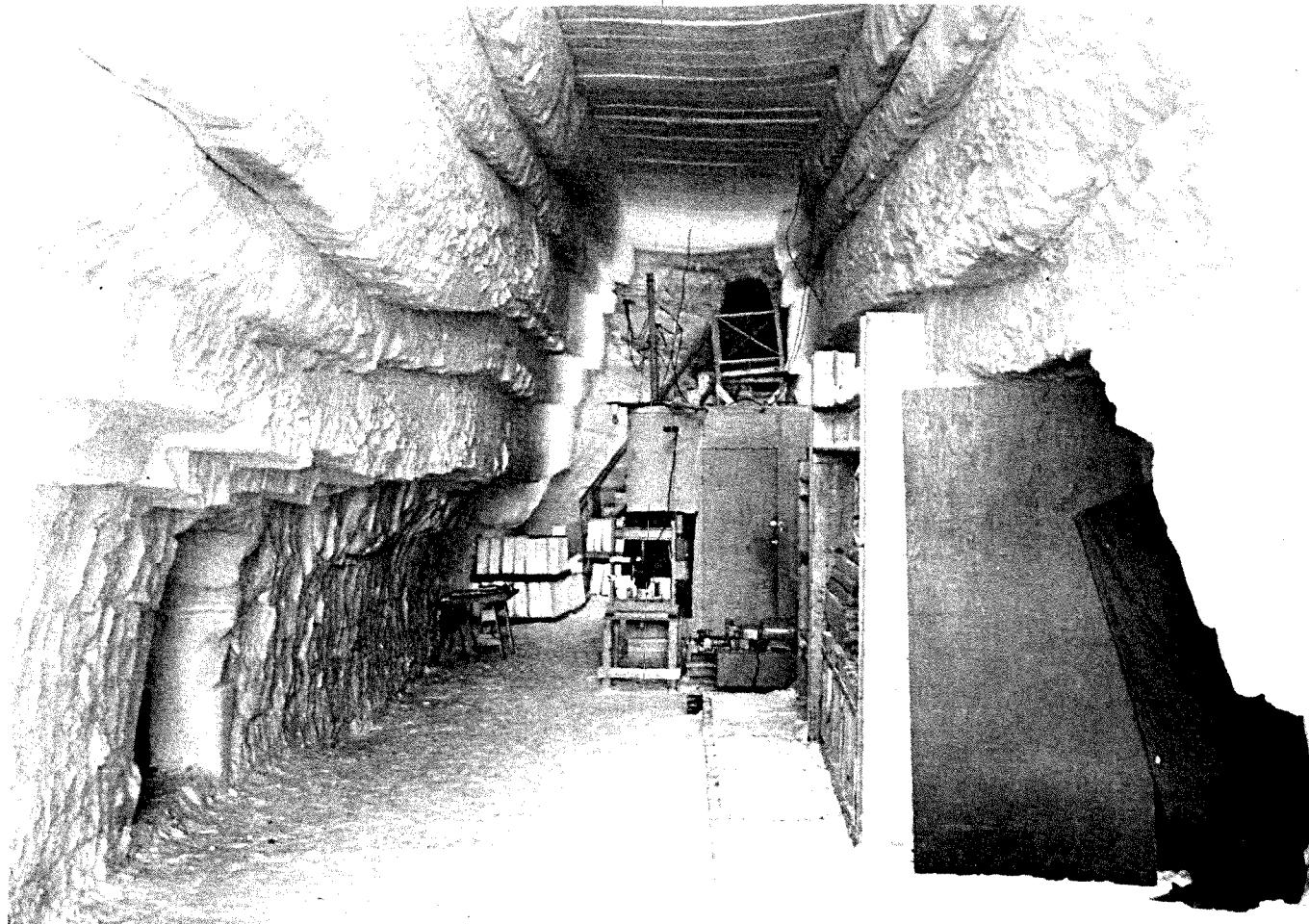
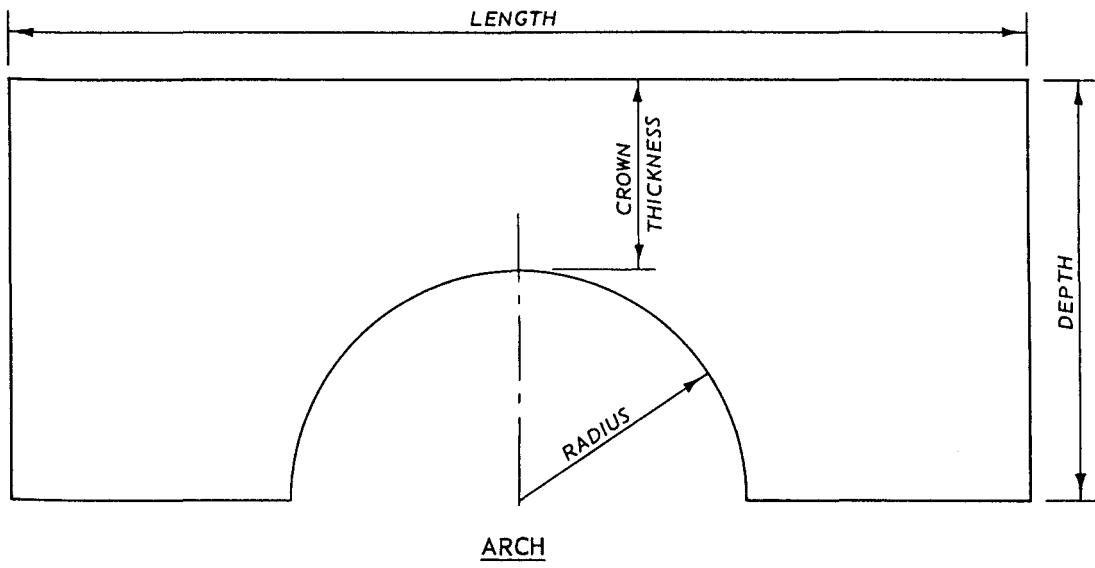
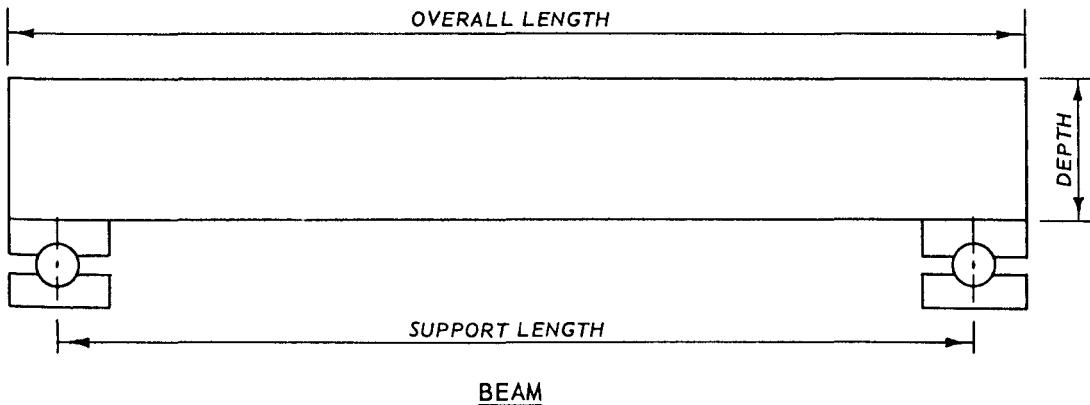


Figure 2.4 Interior view of project trench.



ARCH



BEAM

Figure 2.5 General dimensions of arch and beam specimens.

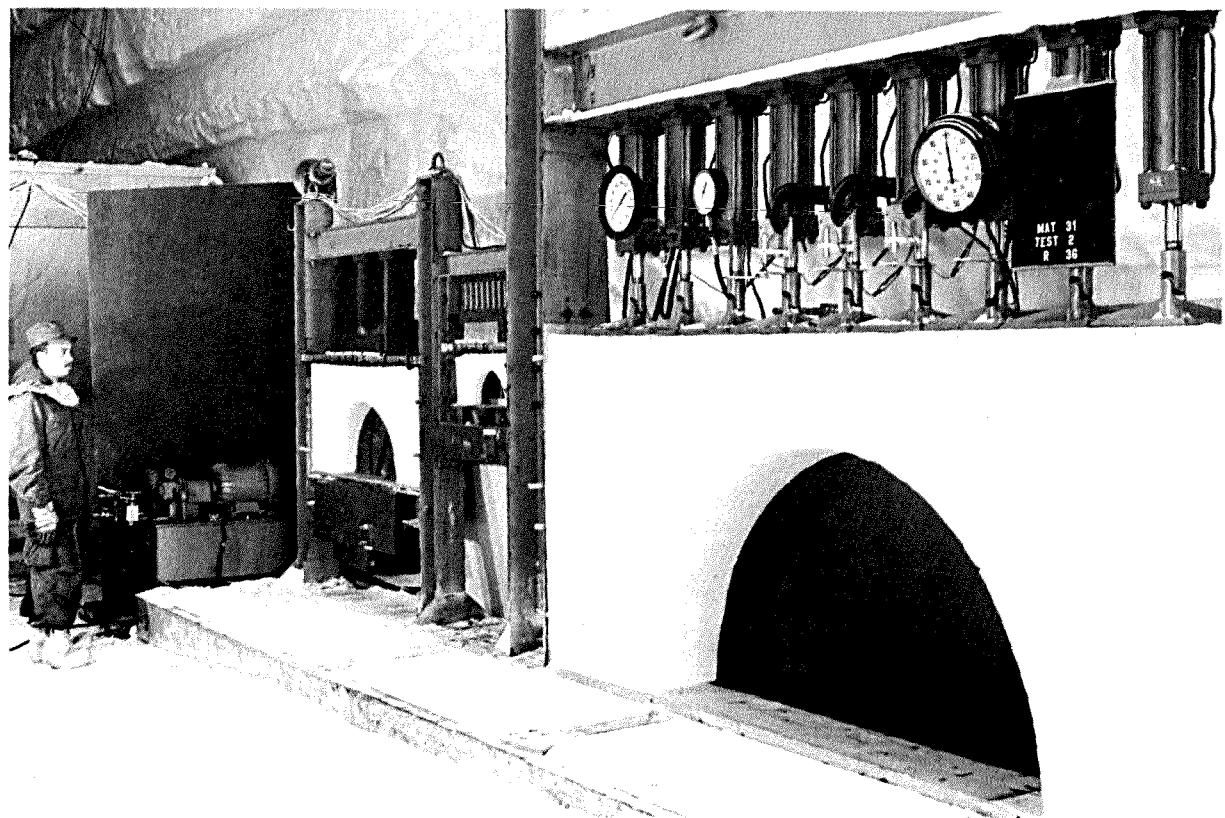
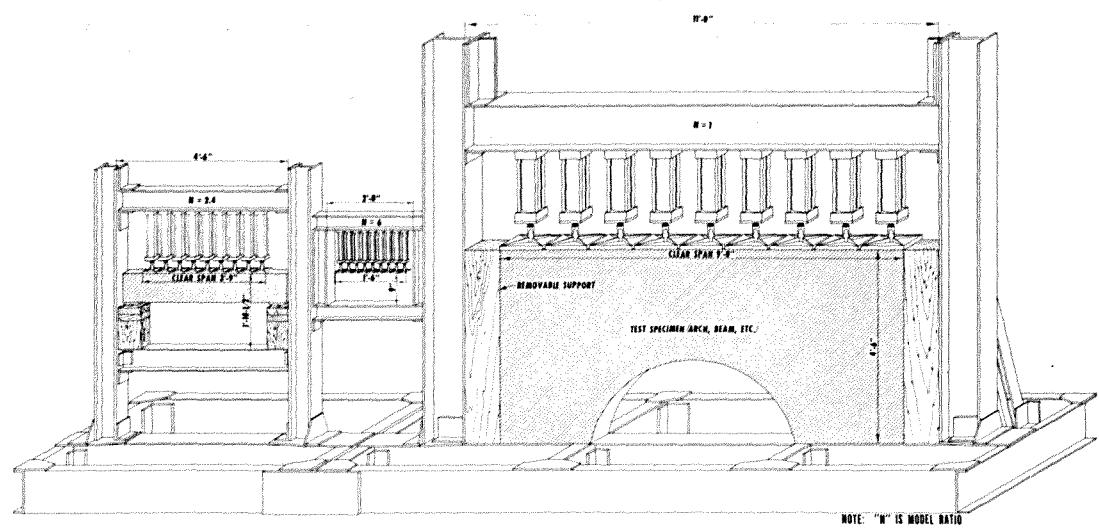


Figure 2.6 Three-unit loading device with specimens in place.

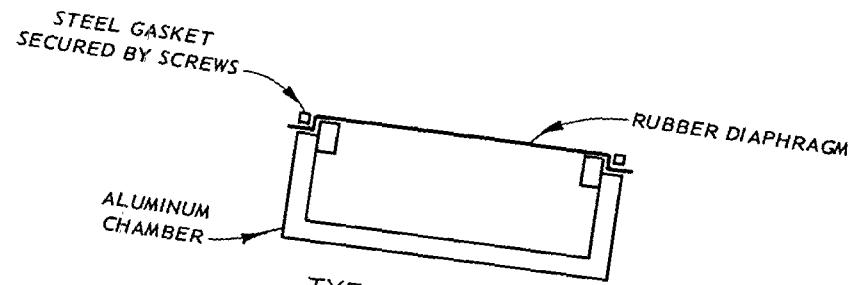
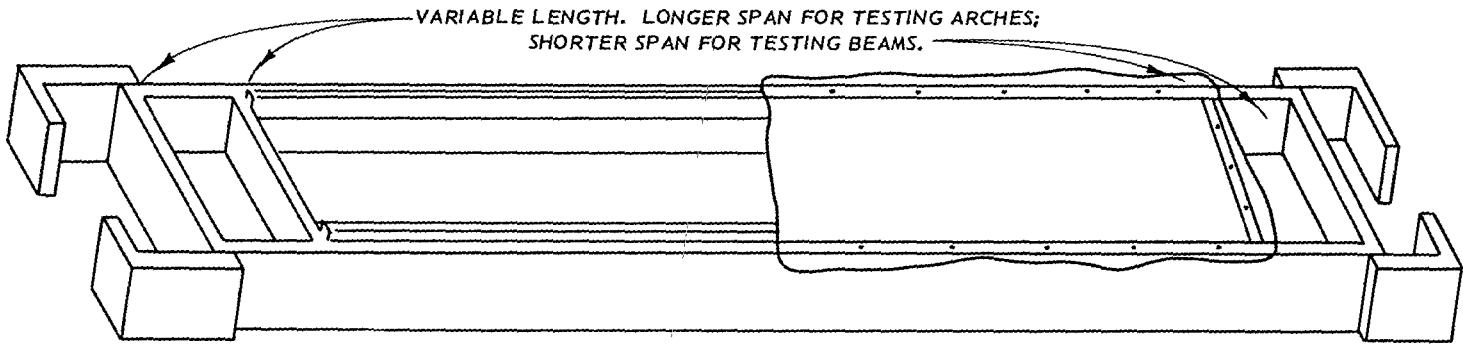


Figure 2.7 Uniform membrane loader.

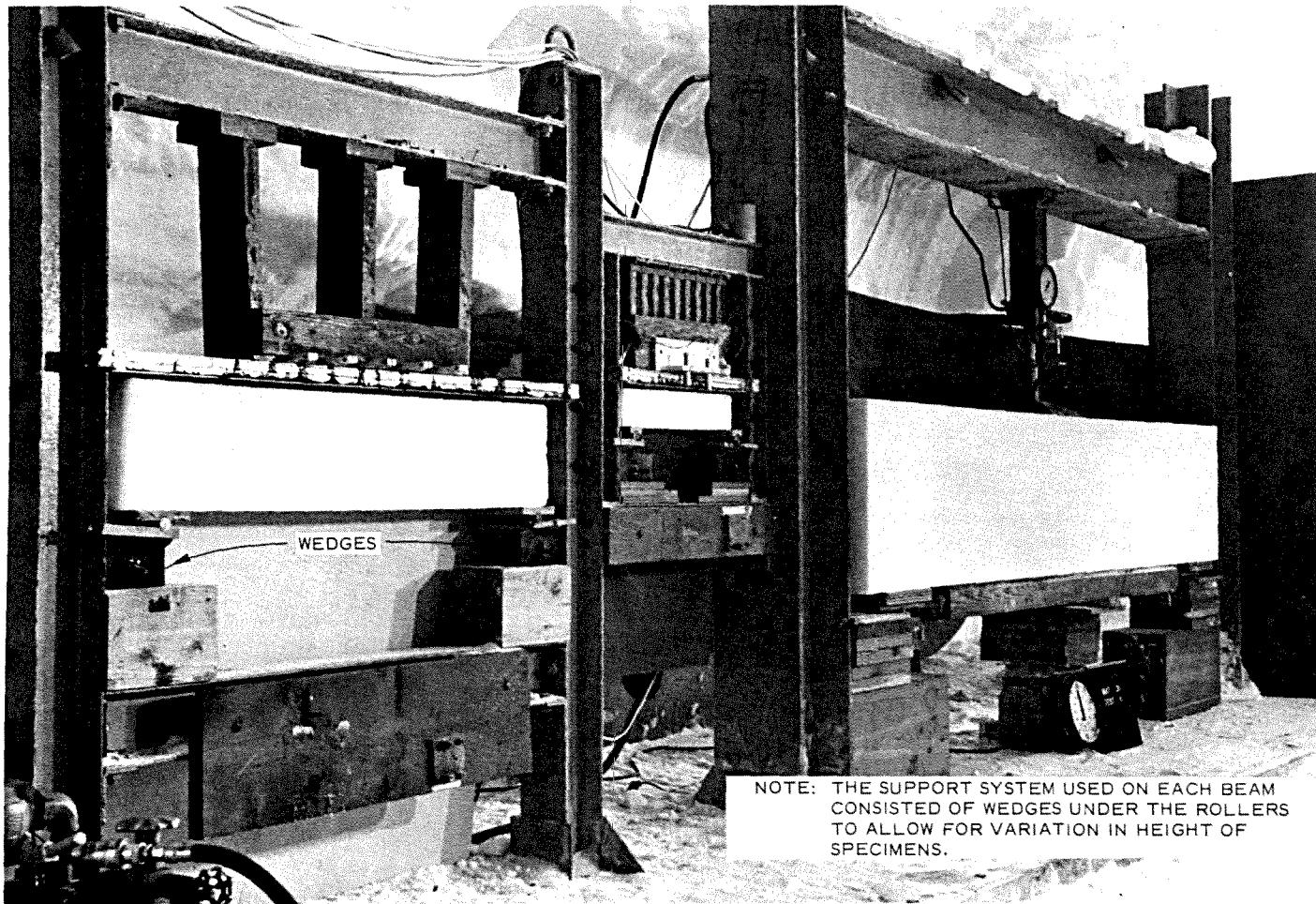
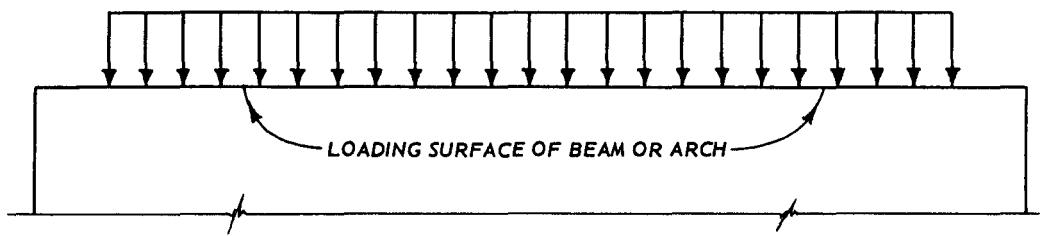
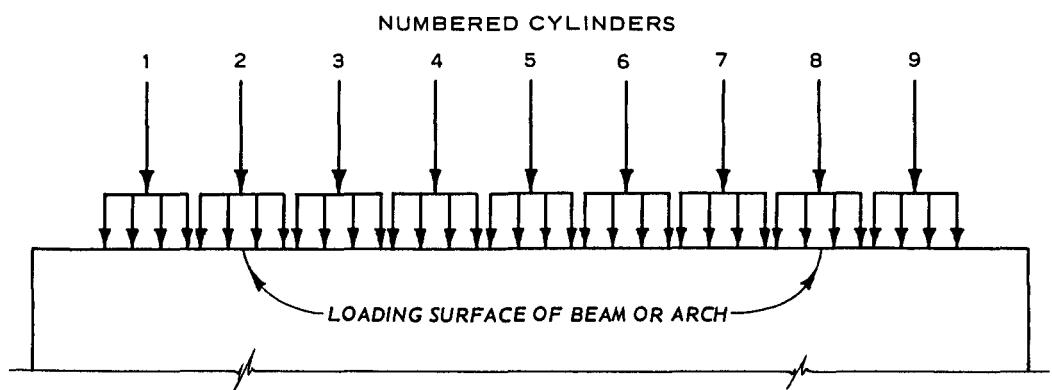
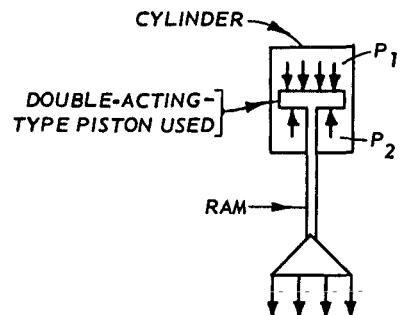


Figure 2.8 Three-unit loader with membrane loading modification.



a. UNIFORM MEMBRANE LOADER



b. UNIFORM CYLINDER LOADER

Figure 2.9 Loading simulated by testing devices.

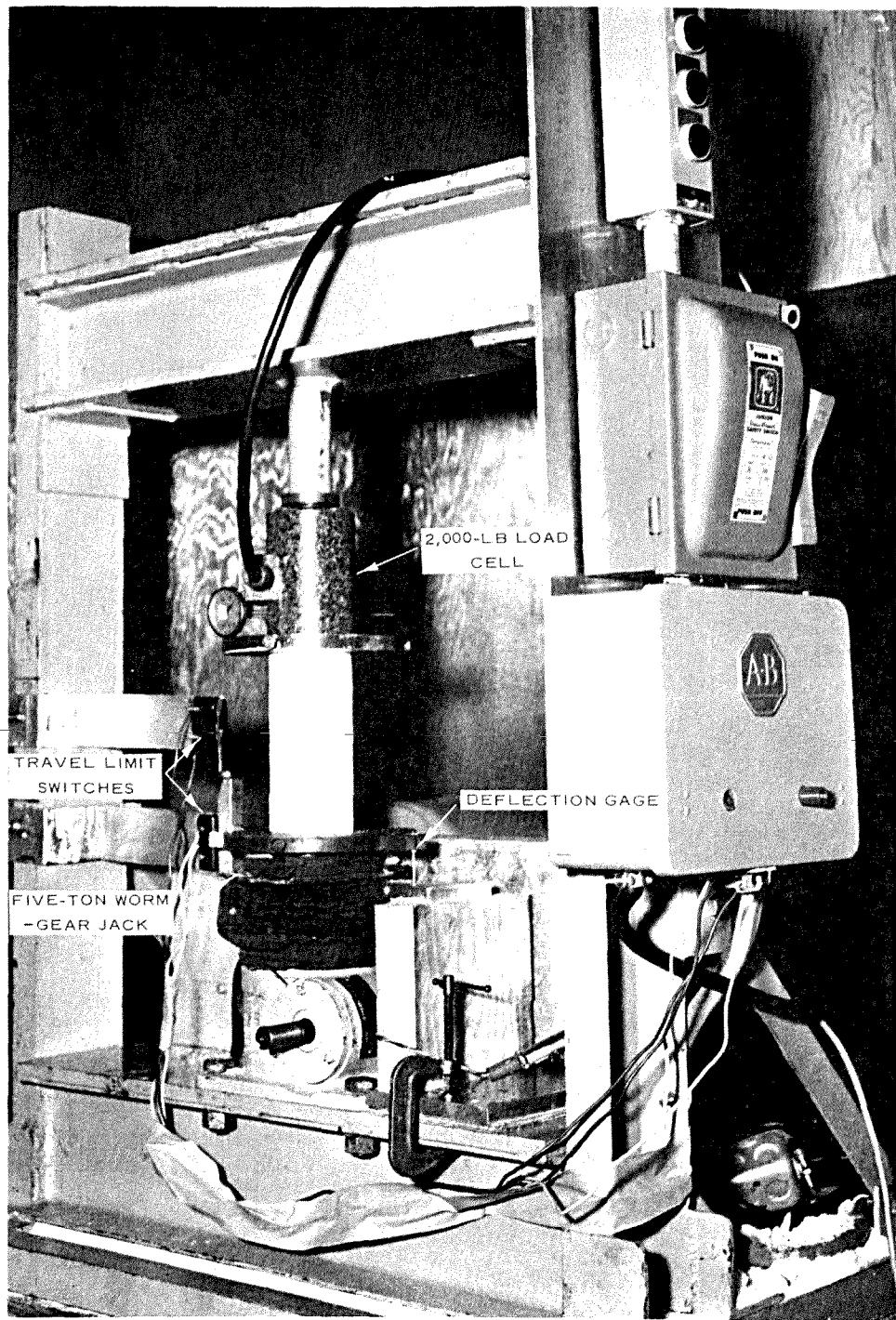


Figure 2.10 Cylinder testing device.



Figure 2.11 Standard sieve shaker.

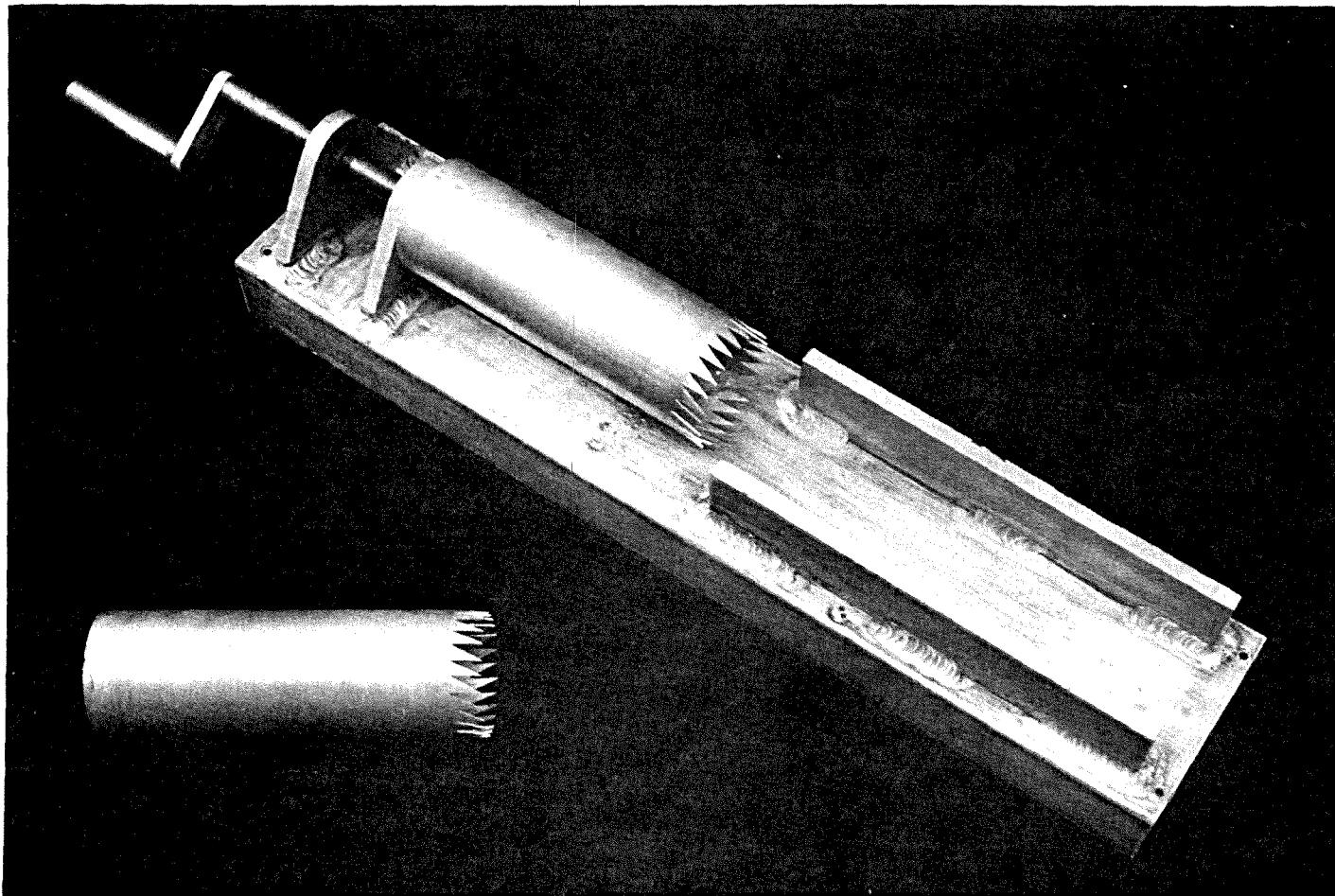


Figure 2.12 Snow cylinder miller used to obtain cylinder samples for unconfined compression tests.

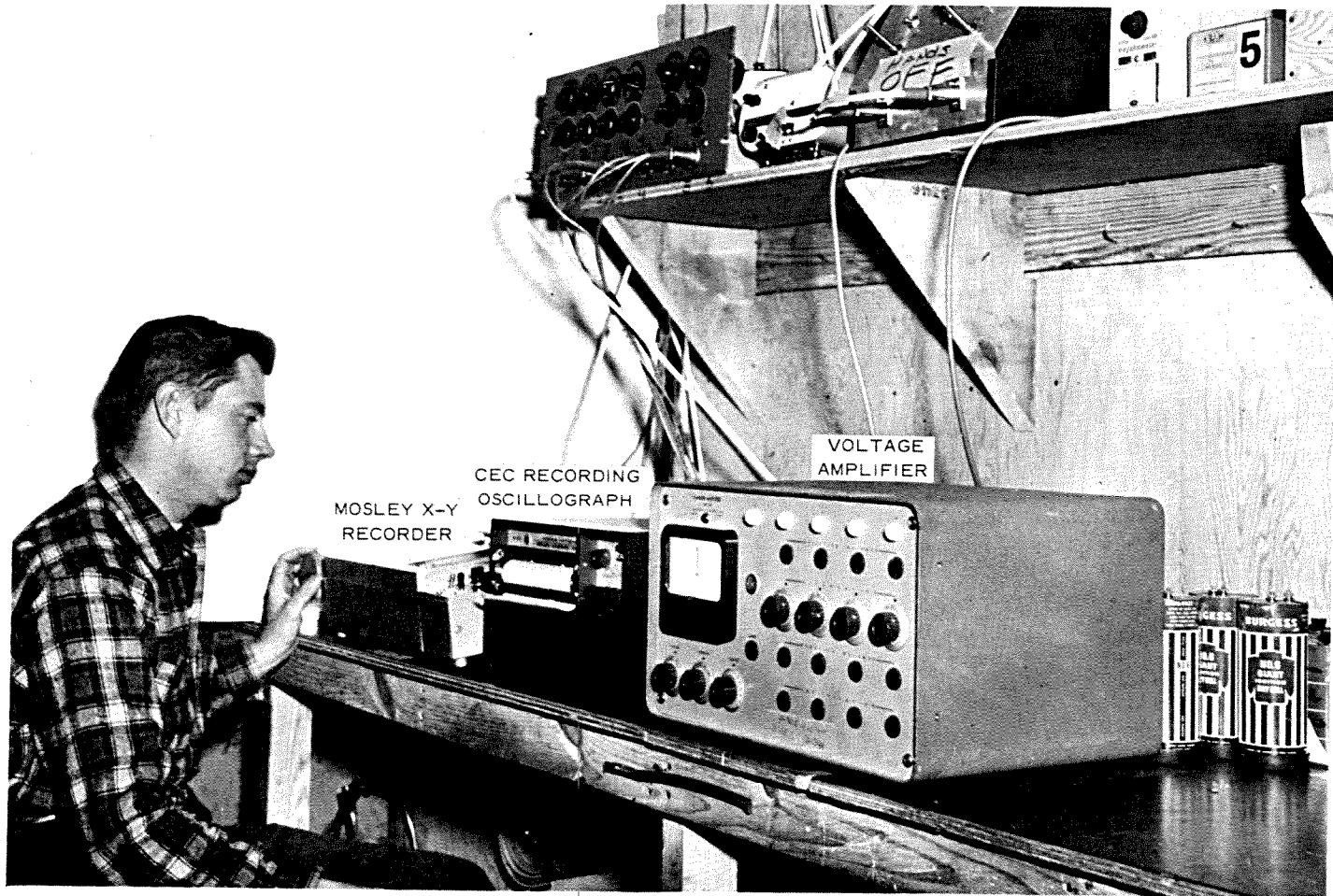


Figure 2.13 Static recording instrumentation.

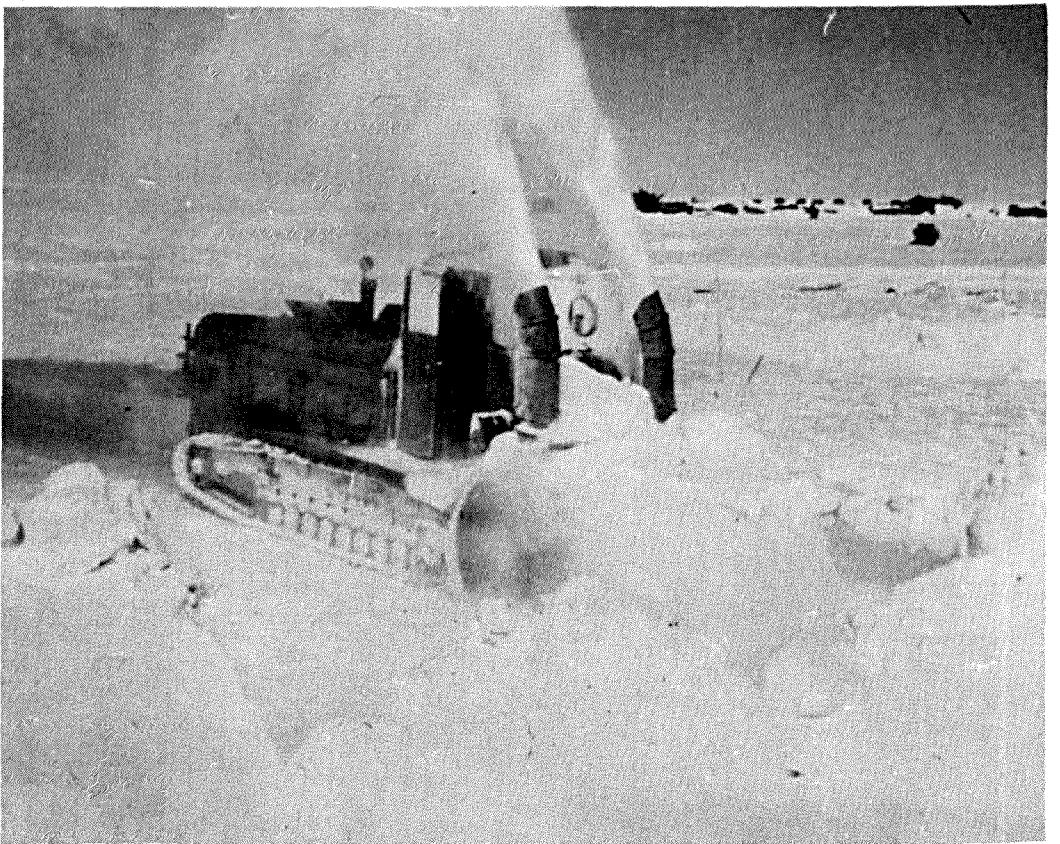


Figure 2.14 Large snowplow.

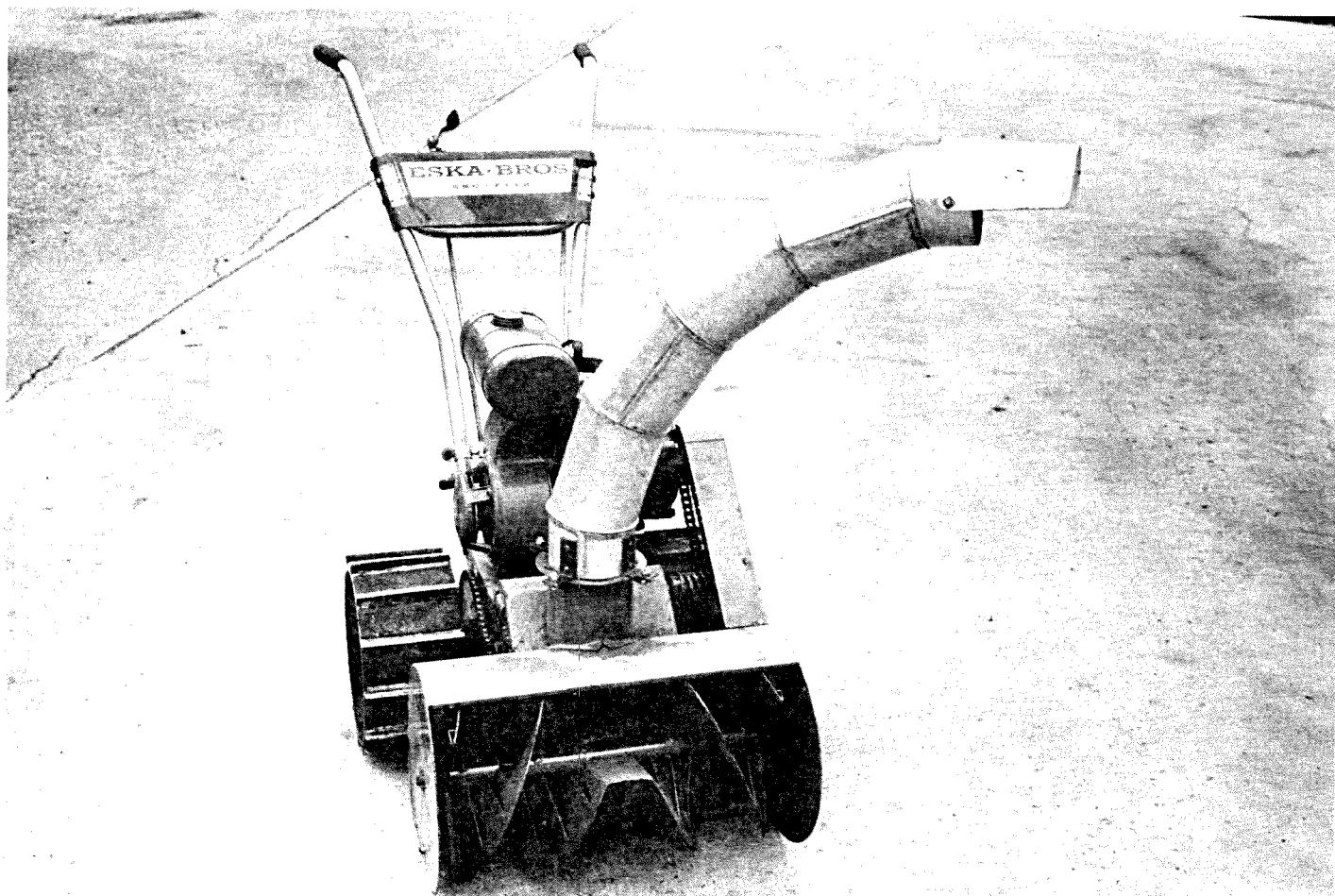


Figure 2.15 Small hand-operated snowplow.

76

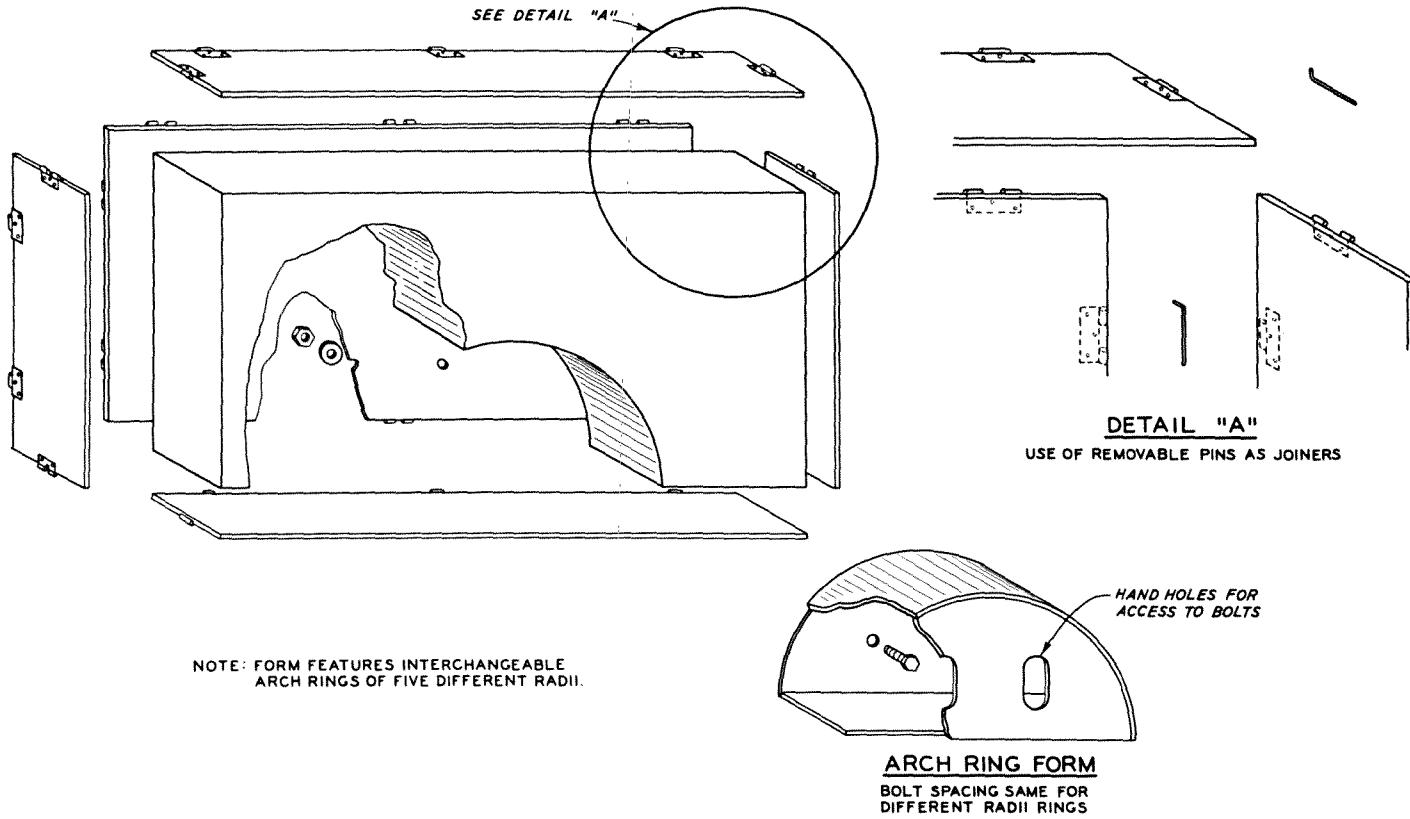


Figure 2.16 Details of a single arch form.

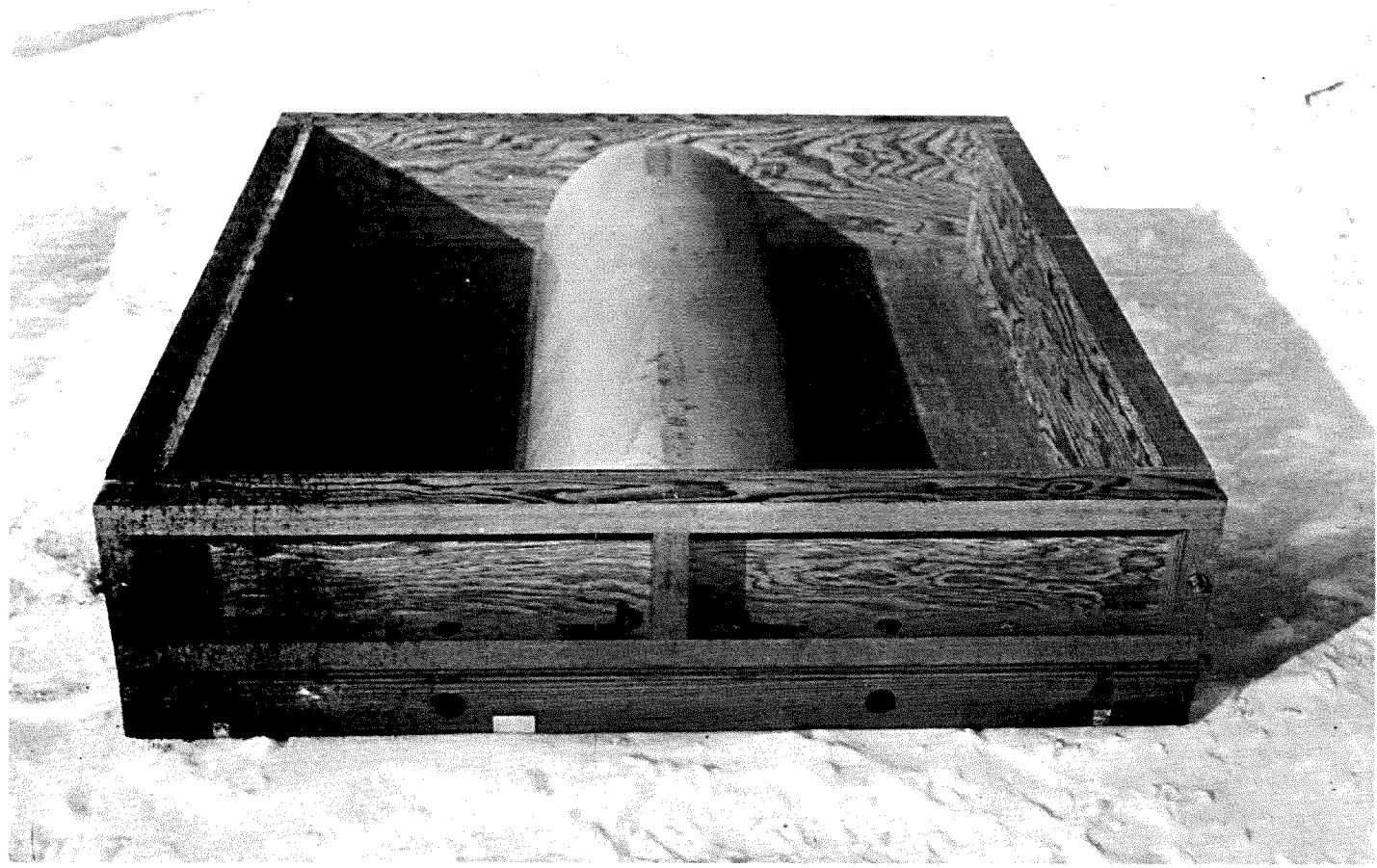


Figure 2.17 Small arch form from which a large number of arches could be obtained.

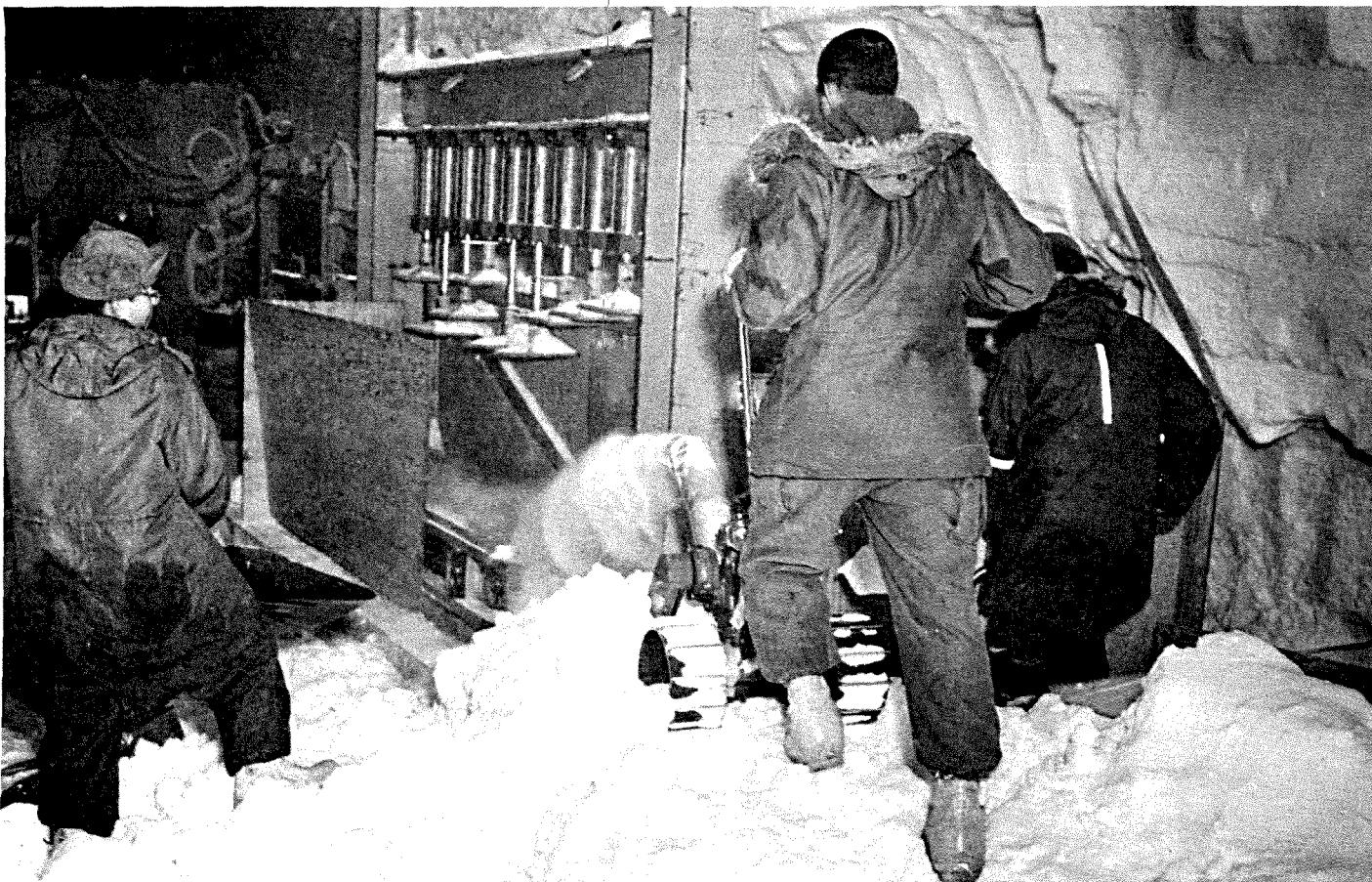


Figure 2.18 Filling large arch and beam forms with the small snowplow in test trench.



Figure 2.19 Cutting blocks from a pad of processed snow with a gasoline-powered chain saw.

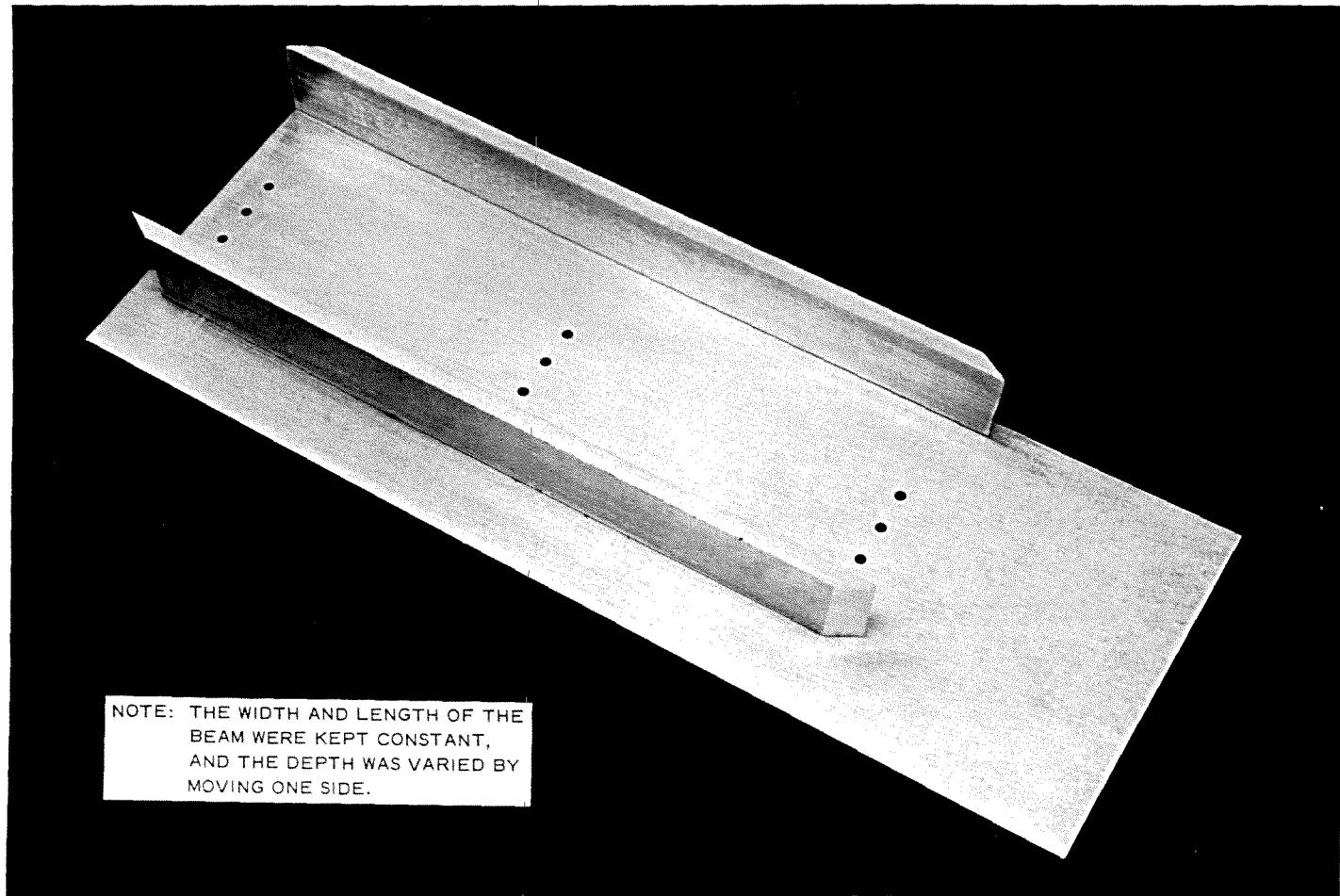


Figure 2.20 Beam cutter used to cut small model beams.



Figure 2.21 Specimen curing area and cut specimens.

CHAPTER 3

RESULTS

3.1 MATERIAL DATA

Data concerning each type of processed-snow material were recorded and are presented in tabular form in Appendix B. These data include such items as atmospheric conditions when the snow was formed, grain-size distribution, and other parameters that are considered pertinent to the final strength of the snow. Locations at which processed-snow material was taken for the test specimens are shown in Figure 3.1.

3.2 CYLINDER TESTS

Four general types of failure (Figure 3.2) were observed for the compression tests: (1) crushing, (2) diagonal tension in a vertical plane, (3) shear, and (4) the formation of a compressive cone. The plots shown in Figure 3.3 correspond to the failure modes shown in Figure 3.2.

Figure 3.4 shows a typical diagonal tension failure of a cylinder in the horizontal position along with load-deflection plots of cylinders loaded at various strain rates. The loading rate and specific weight of Cylinder 74 (Figure 3.4c) are representative of most tests. Results of cylinder tests of the various snow materials are also summarized in Appendix B.

3.3 ARCH AND BEAM TESTS

3.3.1 Sample Records. A typical oscillograph record for a beam or arch test is shown in Figure 3.5. The traces have been numbered from 1 through 6 from top to bottom and can be separated into three groups. The first four are the traces produced by displacement gages. The fifth is a timing trace having 1-second timing blips. For this test, the membrane loader was used, and only one pressure measurement was necessary. That measurement is shown as the sixth trace in Figure 3.5. This trace indicates that there is an exponential-type increase in pressure with time. At a point approximately equal to two-thirds of the peak pressure, a sudden drop in pressure is observed. It is interesting to note that three of the four deflection traces exhibit this same behavior at the same instant. The pressure then recovers and increases to a maximum value and then decreases rapidly. At this same instant, all four of the deflection traces show that a sudden yielding has occurred. It is at this time that the structure fails. For the test shown, the maximum pressure was 11.28 psi, with Trace 3 showing a deflection of 0.0877 inch.

3.3.2 Typical Failures. The snow arches displayed several different types of failure, whereas the snow beams all failed in flexure.

Typical failure modes for arch specimens are shown in Figure 3.6. The photographs shown in Figure 3.6 were made of tests conducted in the small unit ($n = 6$) of the three-unit testing device. A detailed

view of a typical failure pattern for a small arch is shown in Figure 3.7. The shearing planes in the haunch of the arch can be seen clearly. Also, the ability of the loading membrane to conform to the deformed surface of the structure can be noted. Four deflection gages used in the test can be seen. A typical test in the large or prototype ($n = 1$) loader is shown in Figure 3.8, and the shearing planes that developed are clearly visible.

A typical beam failure is shown in Figure 3.9. The end supports for the beam can be observed. The wedge blocks under the roller-support system were used to bring the beam specimens in intimate contact with the membrane loader.

Beam and arch test results are presented in tabular form in Appendix B.

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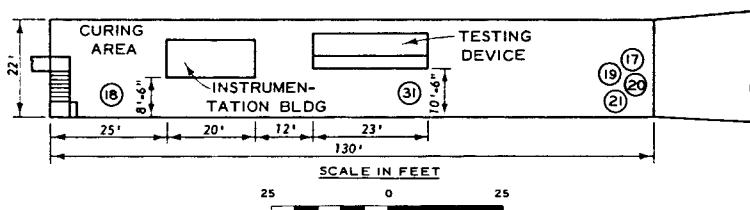
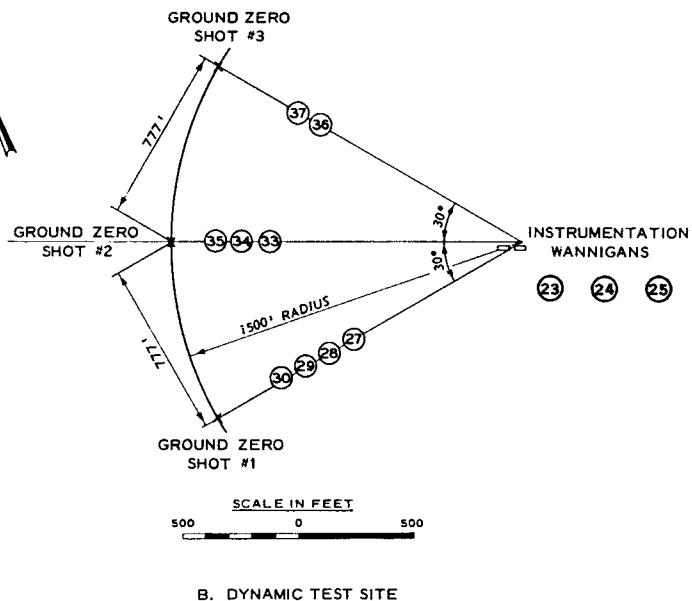
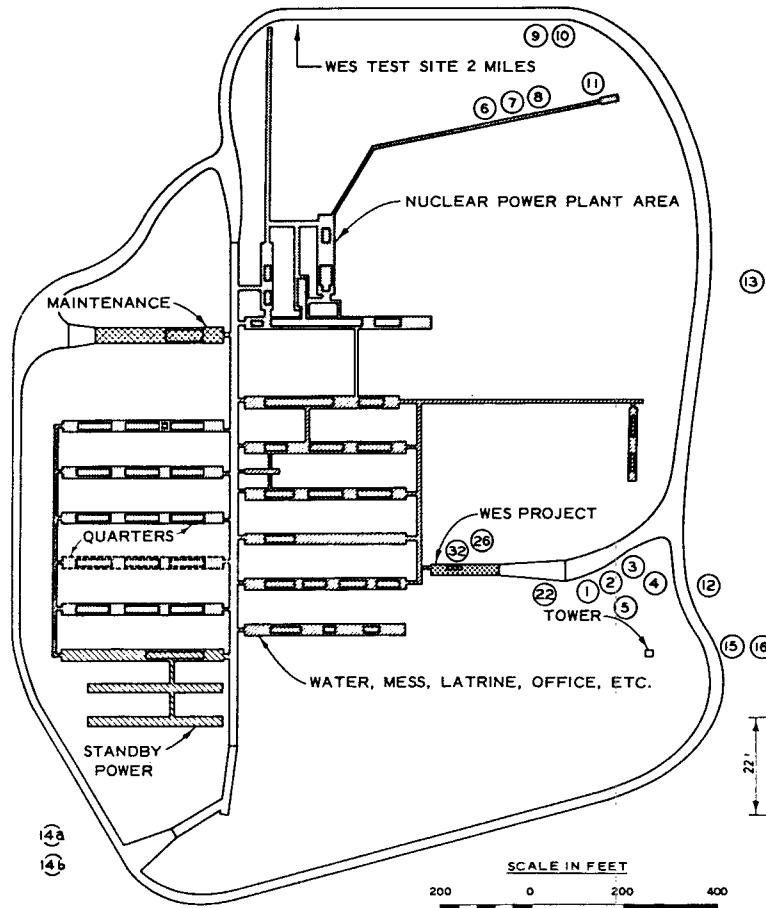
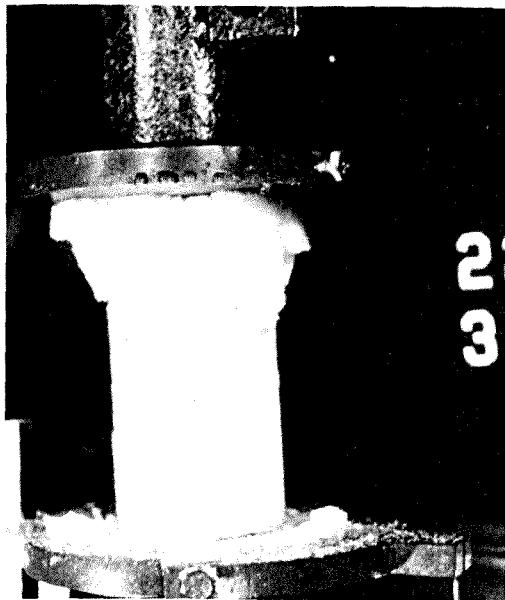
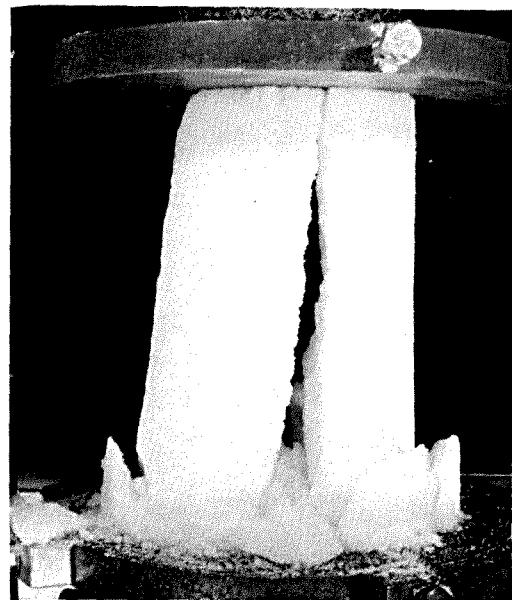


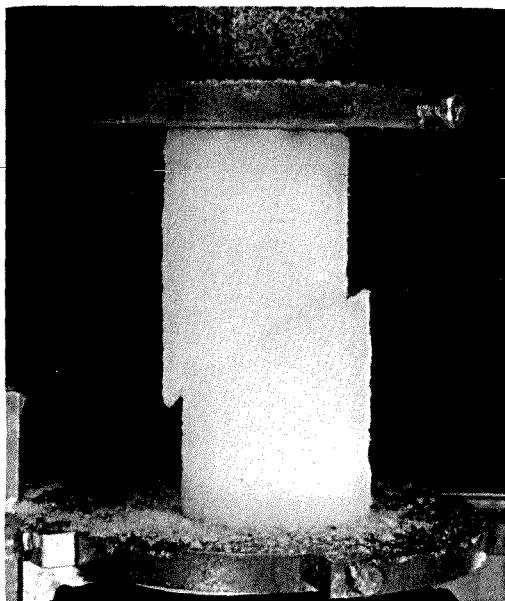
Figure 3.1 Processed-snow material locations.



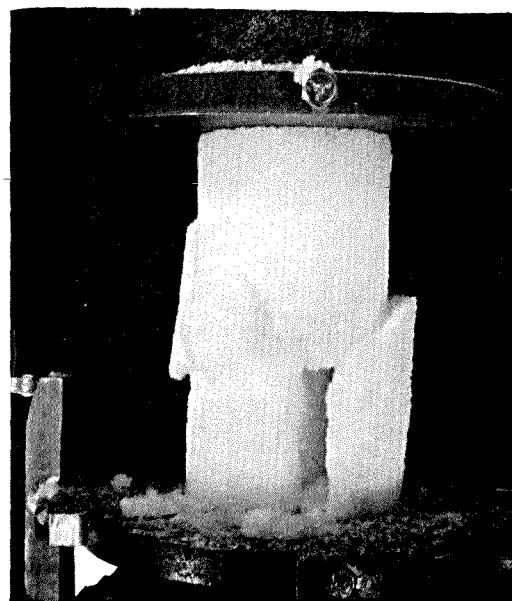
a. Crushing at the top.



b. Diagonal tension.

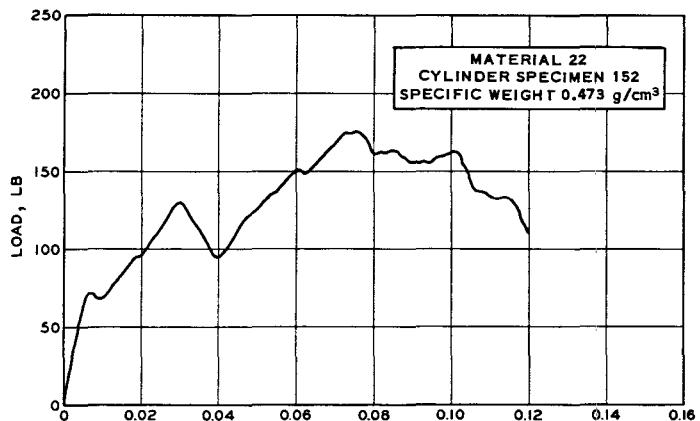


c. Shear .

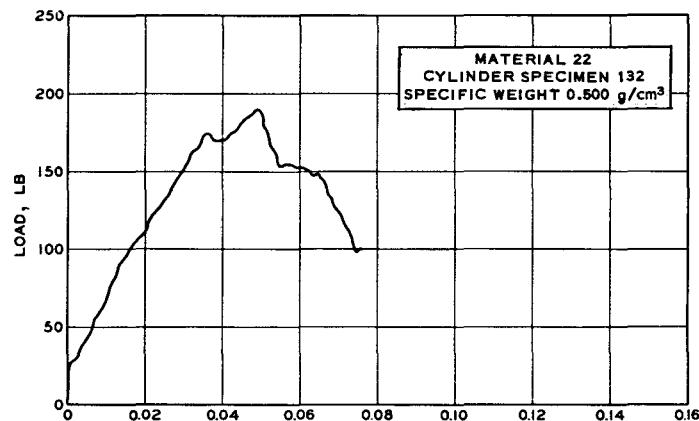


d. Compression .

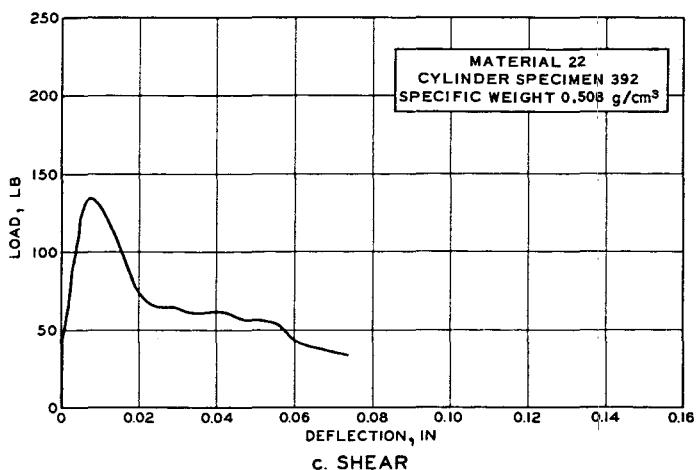
Figure 3.2 Types of failure for cylinders tested in a vertical position.



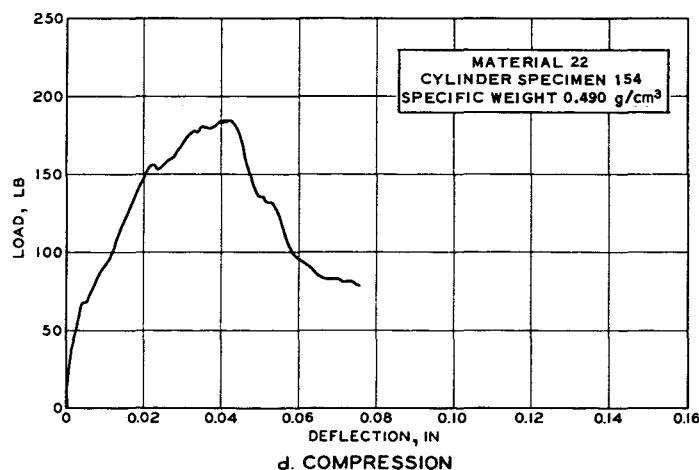
a. CRUSHING AT THE TOP



b. DIAGONAL TENSION

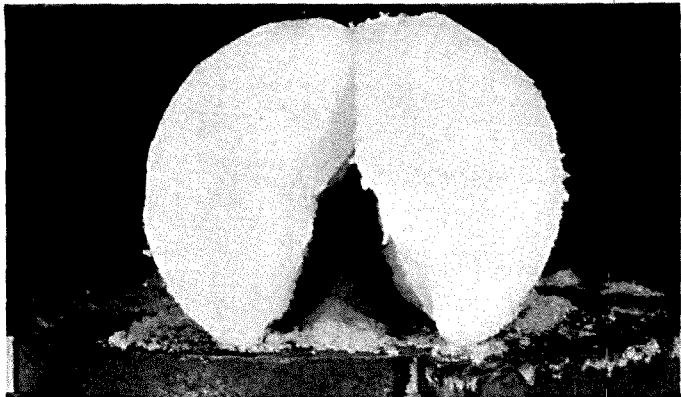


c. SHEAR

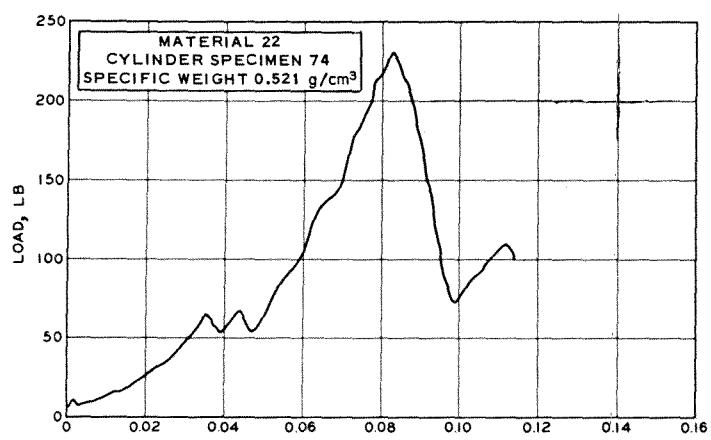


d. COMPRESSION

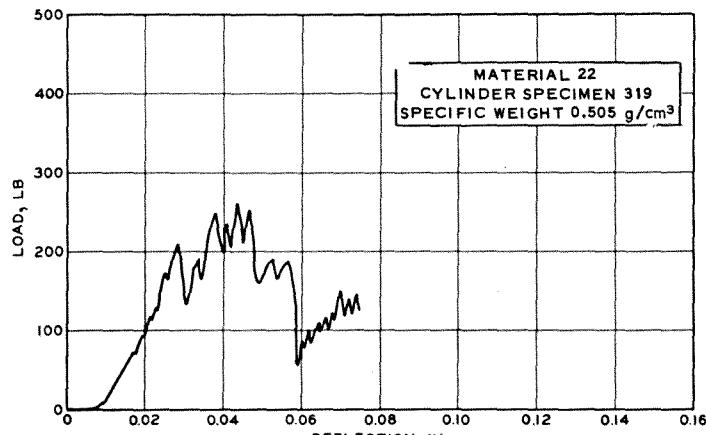
Figure 3.3 Records corresponding to typical cylinder failures shown in Figure 3.2.



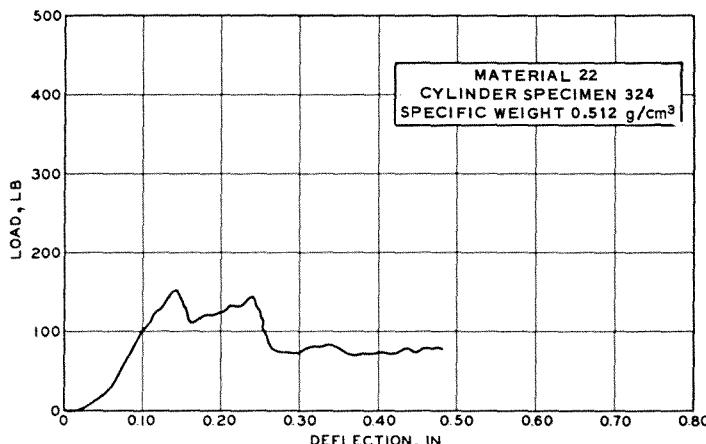
a. TYPICAL FAILURE



c. STRAIN RATE OF 3.89 IN/MIN



b. STRAIN RATE OF 1.1 IN/MIN



d. STRAIN RATE OF 18.0 IN/MIN

Figure 3.4 Diagonal tension failure with records showing effects of different strain rates.

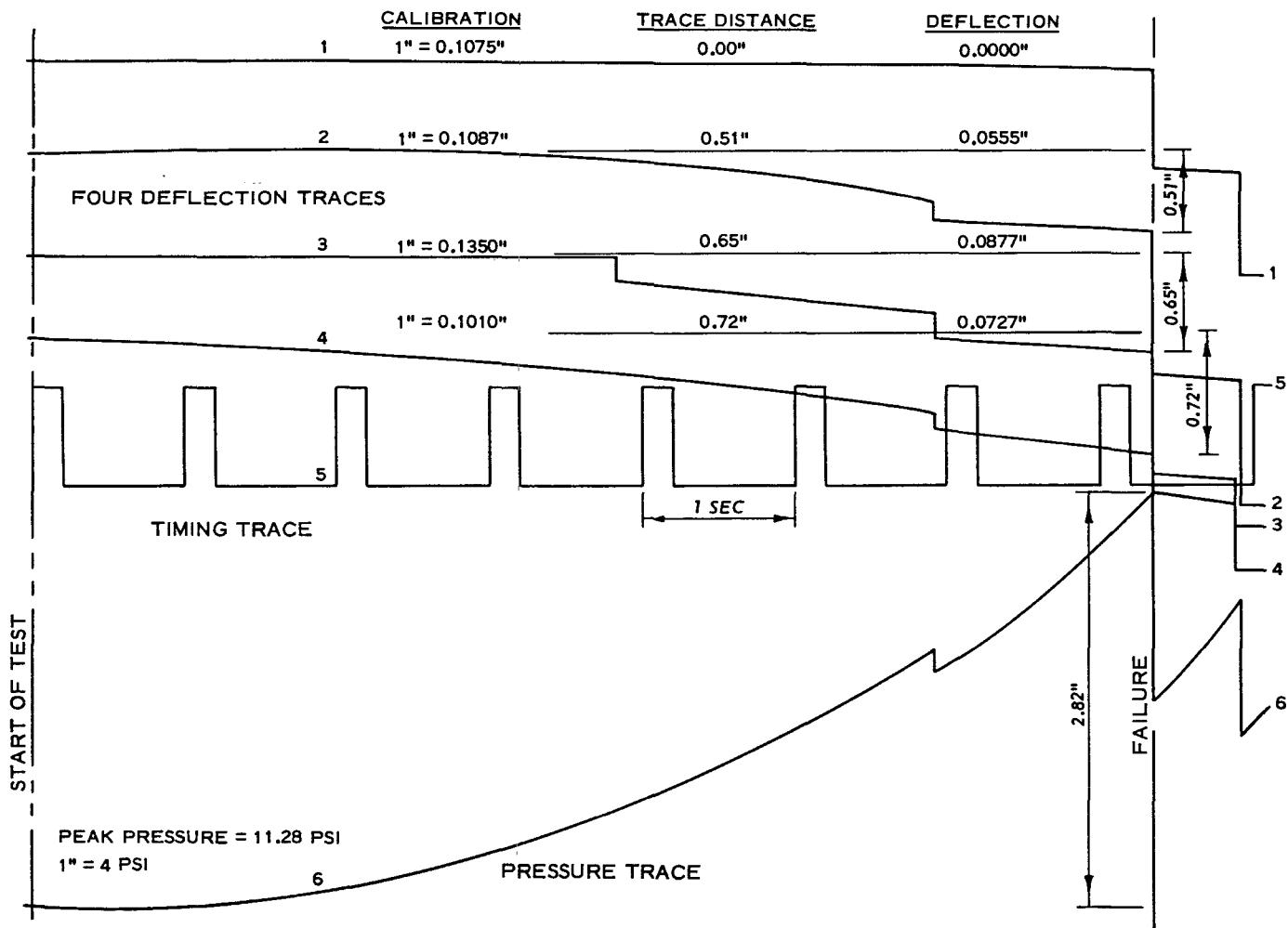
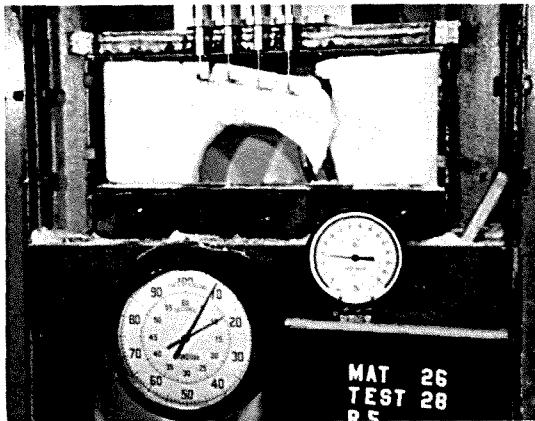
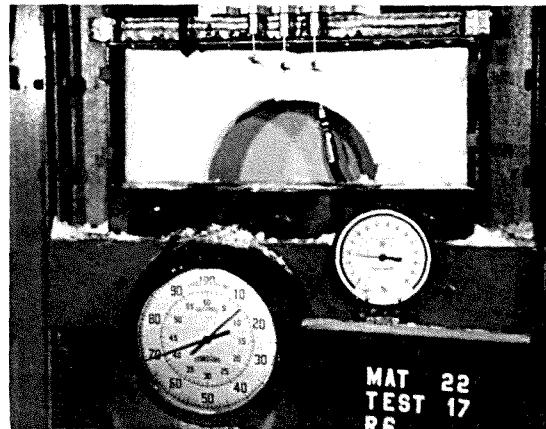


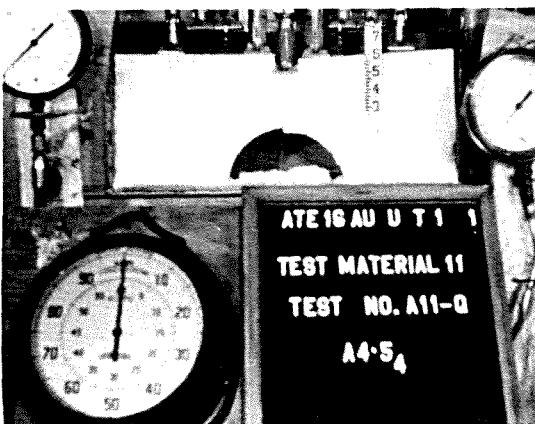
Figure 3.5 Typical arch or beam oscillograph record.



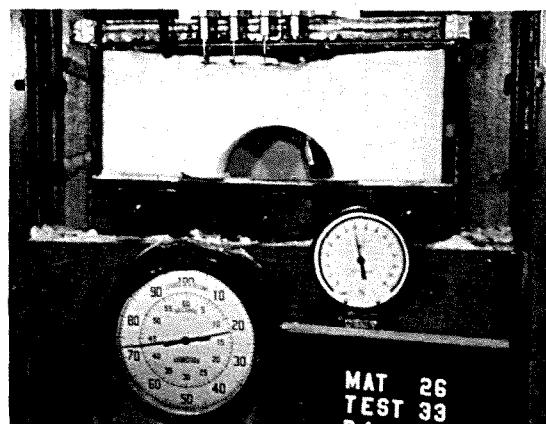
a. Haunch shear.



b. Support crushing and crown shear.



c. Punching (produced by hydraulic cylinders).



d. Punching (produced by uniform membrane loader).

Figure 3.6 Various types of arch failure as produced by the uniform membrane loader.

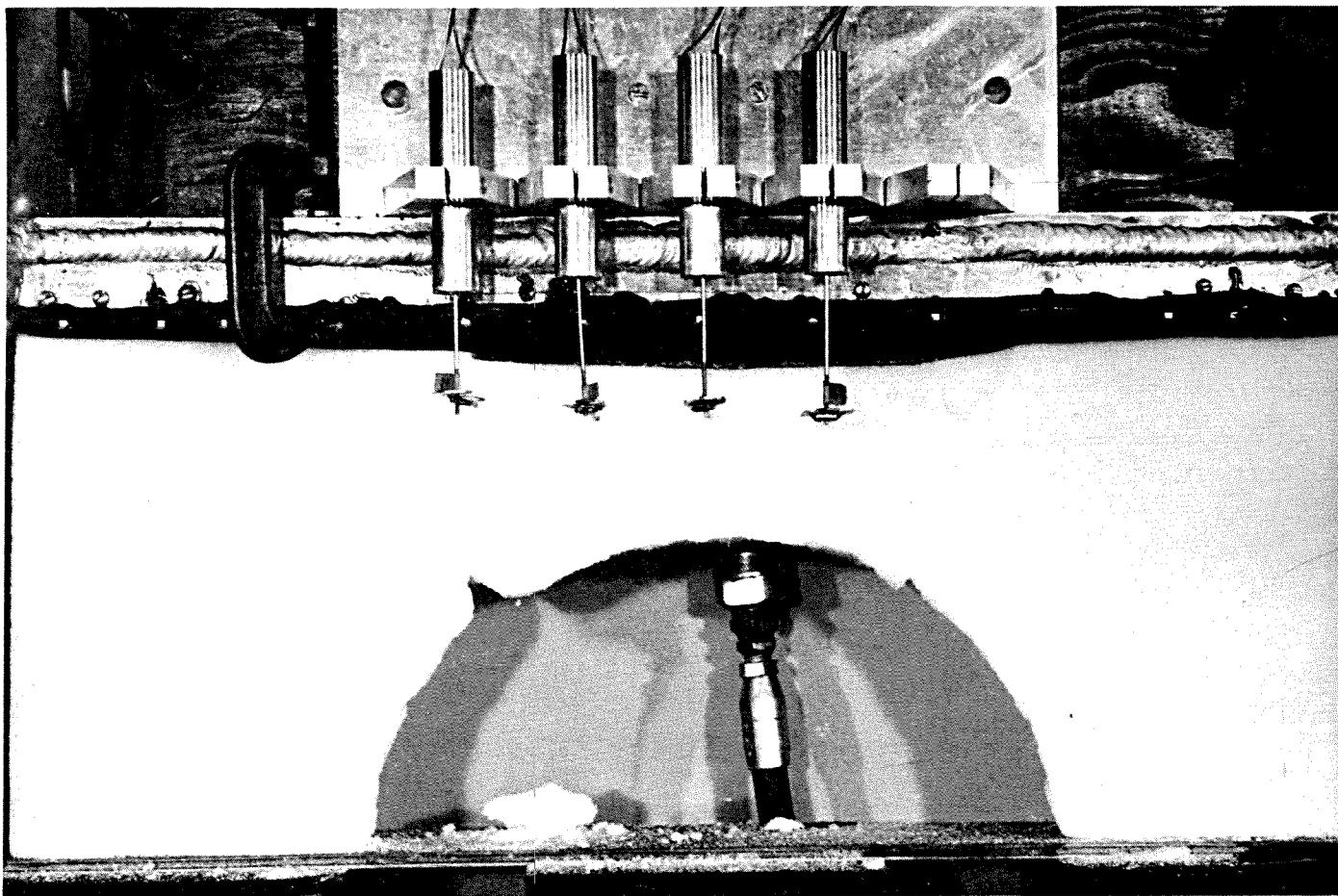


Figure 3.7 Typical test failure of a small arch showing the deflection gage array and the loading of the arch by the membrane.

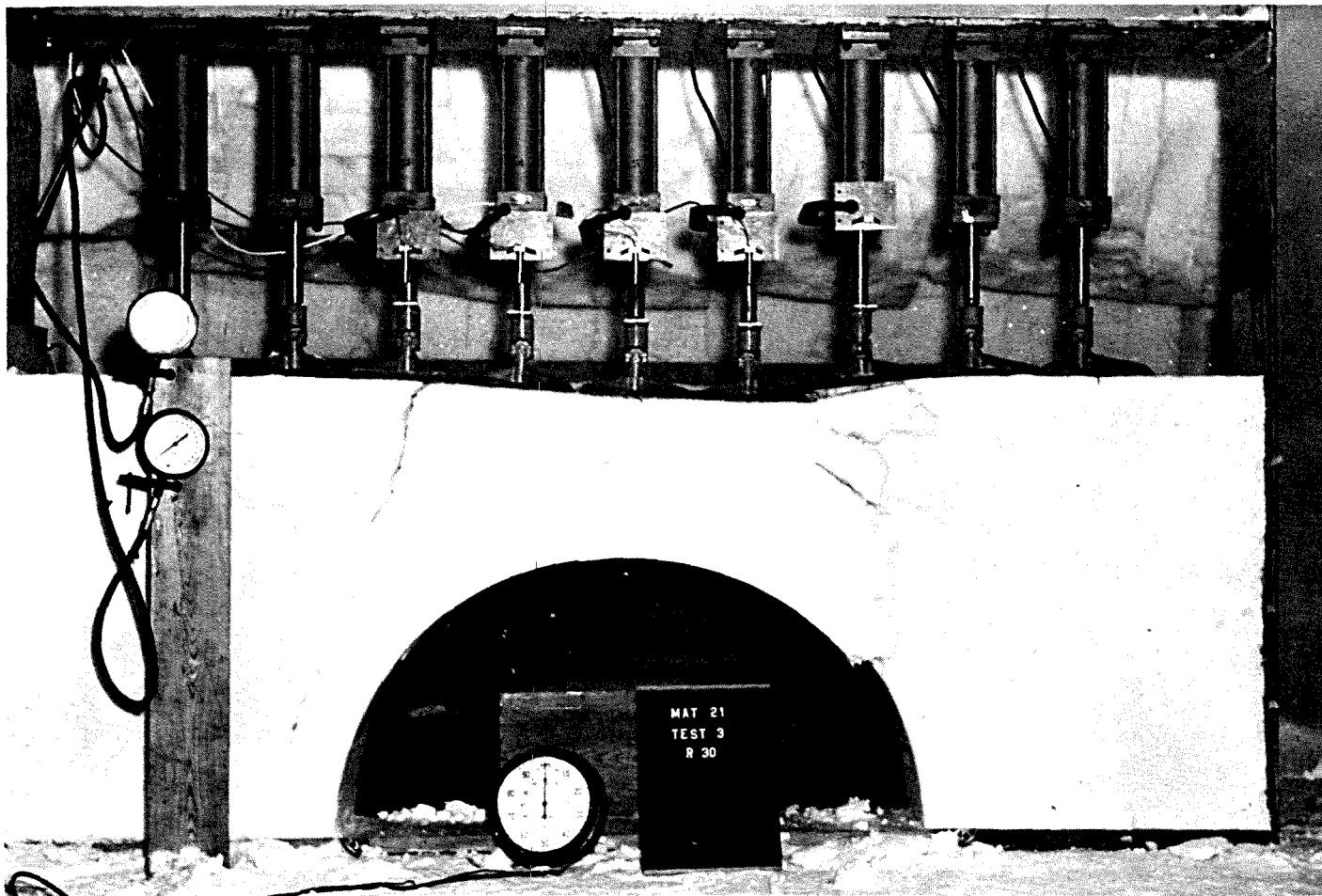


Figure 3.8 Typical large arch test.

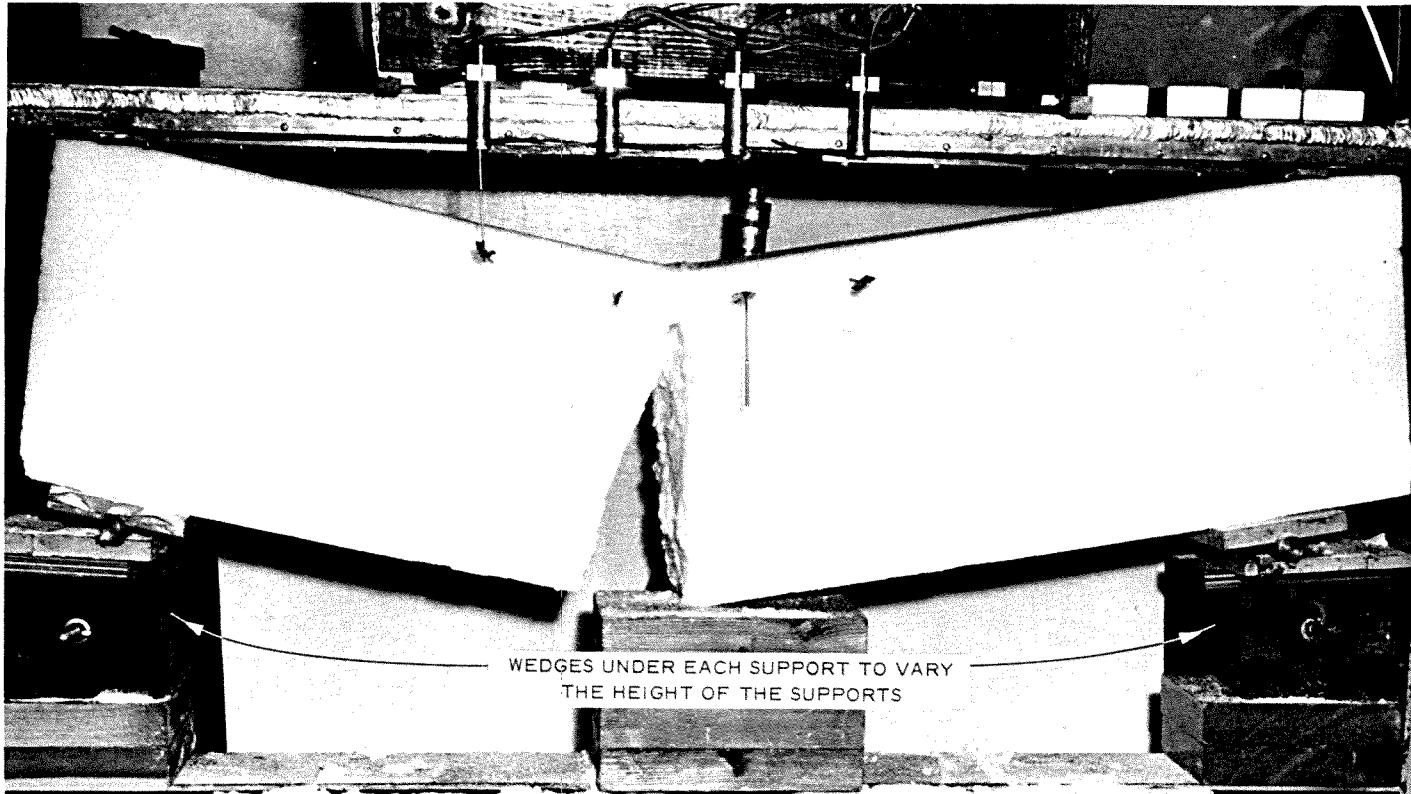


Figure 3.9 Typical failure pattern for a snow beam.

CHAPTER 4

ANALYSIS OF RESULTS

4.1 CYLINDER ANALYSIS

It was hoped that the cylinder test program would provide basic strength information that could be applied to the analysis of the beams and arches.

Once the analysis was under way, it was apparent that it would be difficult to determine how parameters such as age, temperature, and specific weight affected the strength of the processed snow. A useful equation developed in Reference 5 that relates temperature to stress for snow whose temperature is $\leq -5^{\circ}\text{C}$ was employed and is as follows:

$$\log \frac{S_2}{S_1} = 0.16 \frac{T_2}{T_1} \quad (4.1)$$

A test cylinder with a stress S_1 determined at a temperature T_1 can be altered to a stress S_2 for a selected temperature T_2 . Based on a selected testing temperature, it was possible to use Equation 4.1 to determine the ultimate unconfined compressive strength of all the cylinders.

Since the data concerned cylinders of varying ages (from 200 to 1,400 hours) from the same snow, the next logical step was to determine the effect of age for specific weight groups. This was possible because many cylinders were tested for a particular snow (Material 22)

that represented a wide range of specific weights. The average specific weight was determined for all the cylinders within a particular specific weight group, and the mean values usually fell at the midpoint of the specific weight range. This meant that the average strength of a cylinder would be unaffected by specific weight. Figure 4.1 shows the distribution of samples for various specific weight ranges.

Within each specific weight range, 100-hour age groups were set up, and the average stress was computed for all samples that were in each particular age group. These averages were then plotted, and a curve of age (time) versus unconfined compressive strength for each particular specific weight group was determined (see Figure 4.2). Since all of these plots for each specific weight group were well fitted by a straight line, the slope of the line for each group was determined. This slope was plotted against the specific weight of the material it represented, yielding an age correction curve (see Figure 4.3). Using these curves, it would be possible to correct a given value of stress at a particular time to a new value of stress at some other time.

The correction procedure is as follows. Assume an unconfined compressive cylinder strength of 22.3 psi, a specific weight of 0.482 g/cm^3 , and an age of 500 hours. Now, correct this cylinder strength to 1,000 hours. From Figure 4.3, the correction factor for this test cylinder equals 0.015 psi/hr. At this rate, in 500 hours

the test cylinder would have gained an additional strength of 7.5 psi, or its strength at 1,000 hours would be 29.8 psi ($22.3 + 7.5$ psi).

The curve in Figure 4.3 has proved to be quite dependable when used in conjunction with averaged stresses from averaged specific weight groups.

With the parameters of age and temperature resolved, it was then necessary to determine the effect of specific weight on stress. It was possible to investigate the effects of specific weight at this point, because the majority of Material 22 cylinders were loaded at essentially the same rate, 4.0 in/min. In order to plot a curve of unconfined compressive strength versus specific weight, the cylinders of Material 22 were again set up in specific weight groups.

The average age and specific weight for each weight group were obtained. Each cylinder strength was corrected to -10 C, and the corrected average stress of each specific weight group was calculated. The age correction was then applied to the corrected average stress for each weight group, and a value for a temperature-and age-corrected stress was obtained. It was necessary to correct individual cylinder stresses for temperature because the correction equation is exponential. For age correction, the average stress for a specific weight group could be used because previous plots indicated that stress varies with age in a direct relation.

When all the corrected values of stress for each specific weight group were plotted, the curve in Figure 4.4 was obtained.

With a curve for correcting the stress of snow to a base value of specific weight, temperature, and age available, the next step was to establish a relation between loading rate and stress. From this curve, it would be possible to determine the stress at any loading rate from a stress at the test loading rate. To obtain this type of curve, it was necessary to test the set of Material 22 cylinders that had been expressly formed for this investigation.

The cylinders in this group were corrected to -10 C and to a common base specific weight of 0.490 g/cm^3 . Age was not corrected because the age of the cylinders varied only by about 24 hours. The corrected values of stress were then plotted on logarithmic coordinates, and the curve in Figure 4.5 was obtained.

The change in stress between some predetermined loading rate and a loading rate of 4.0 in/min was then calculated. These values were plotted against loading rate, and the curve in Figure 4.6 was obtained. This curve gives the value by which a stress is increased or decreased due to loading rate.

It now becomes evident that by applying all the correction factors for temperature, age, and loading rate, all the cylinders can be corrected to a common base and can be correlated according to specific weight. However, it should be noted that there was a

maximum deviation on the high side of 173 percent and on the low side of 73.5 percent when specific weight versus stress was plotted.

Two additional plots, while not pertinent to the objective, have been included because of their interest. The first plot (Figure 4.7) shows the relation of stress versus specific weight for increasing steps in strain. The second plot (Figure 4.8) shows the relation between load per deflection versus increasing specific weight ranges. Both these plots indicate the important role that specific weight plays in the strength of processed snow.

Studies^{6,7} have indicated that bond between the particles of ice and snow is the major factor contributing to the strength of snow. The growth of these bonds, known as sintering, is a function of evaporation and condensation. Consequently, the rate at which snow gains strength is dictated by parameters that aid the evaporation-condensation process.

The importance of temperature history has been established by a study in which curves were developed⁸ that indicated strength rate at a constant temperature. In the analysis of this report, it was necessary to make simplifying assumptions because of the inability to control temperature and other parameters influencing bond growth and hence, snow strength. The randomness of these parameters coupled with a lack of understanding made impracticable the exact correlation of the final cylinder strength.

4.2 BEAM TEST ANALYSIS

Various attempts were made to verify the modeling relations, but due to the relatively small number of beams tested and the lack of control of the strength-influencing parameters, it was impracticable. The model beams were subject to the same problems associated with the cylinders plus a possible problem arising from strength growth as a function of specimen size.

Even in view of the above problems, a trend is indicated in the average failure pressure of the beams. The depth of the beams within each model group was varied. The ranges of average failure pressures for the beams of $n = 6$ and $n = 2.4$ were 0.7 to 2.6 and 0.3 to 2.6 psi, respectively. The prototype beam ($n = 1$) was not tested due to forming and transporting problems.

4.3 ARCH TEST ANALYSIS

Analysis of the arch test data proved to be as great a task as analysis of the beam test data. The problem was further complicated by considerable variation in the mode of failure (Figures 3.6 through 3.8).

It is interesting to note the range of average failure pressures within each model group. For various radii and amounts of crown cover, the average failure pressure for the arches of $n = 6$ ranged between 8.48 and 14.34 psi. Similarly, average failure pressures for the

arches of $n = 2.4$ and $n = 1$ ranged between 4.52 and 17.02 psi and 1.49 and 11.22 psi, respectively.

TL

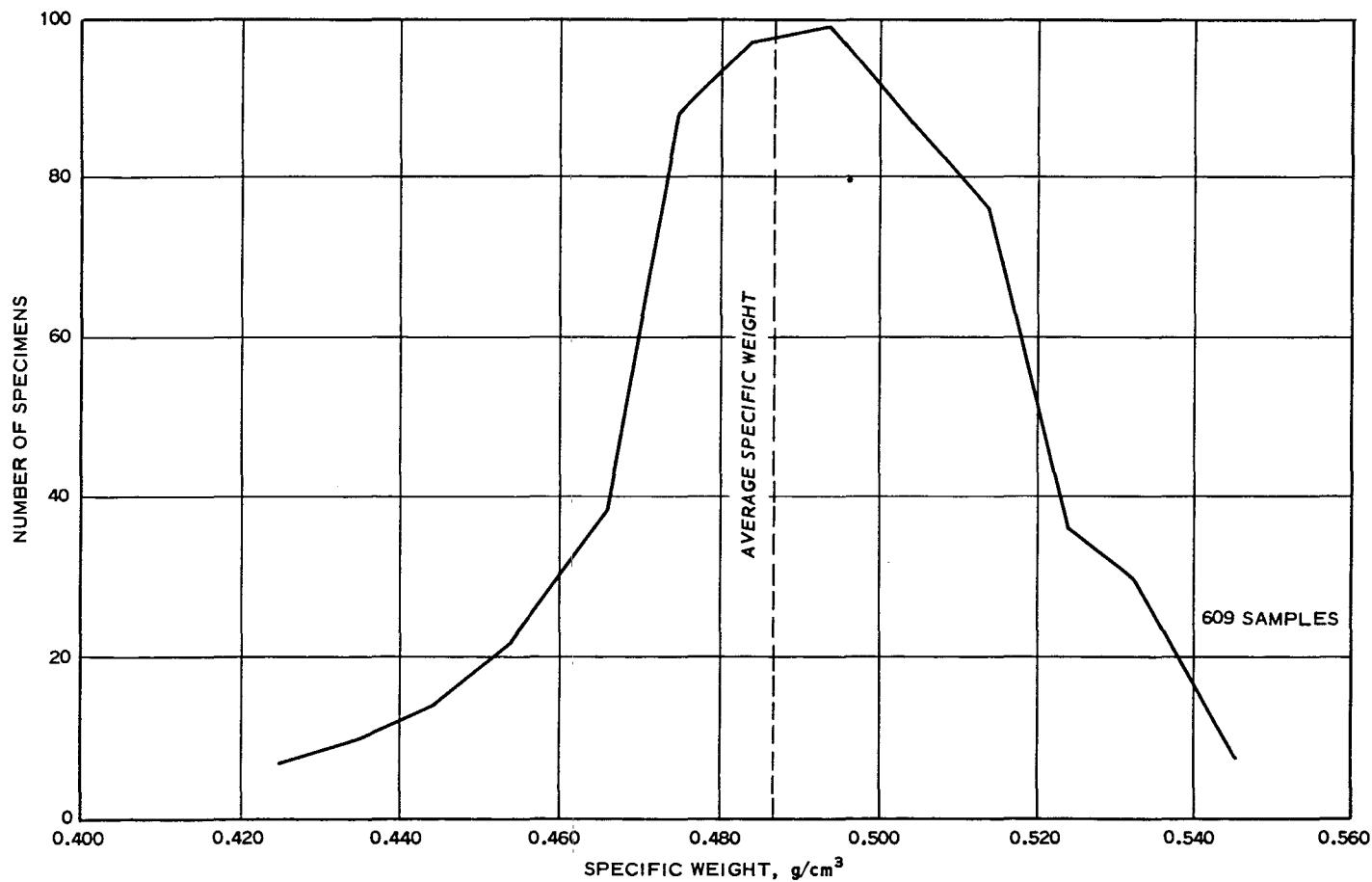


Figure 4.1 Material 22 specimen distribution.

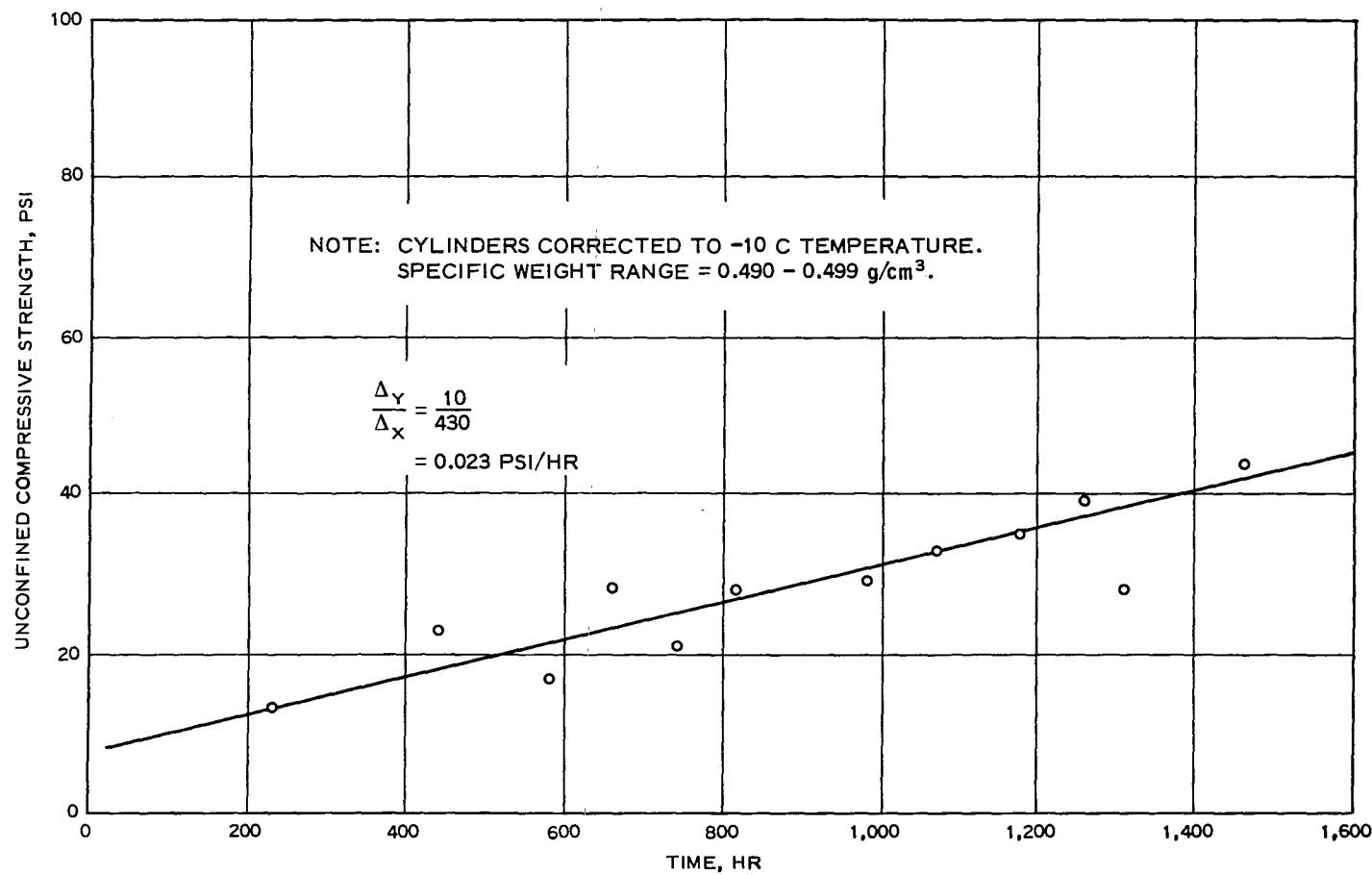


Figure 4.2 Unconfined compressive strength versus time; Material 22.

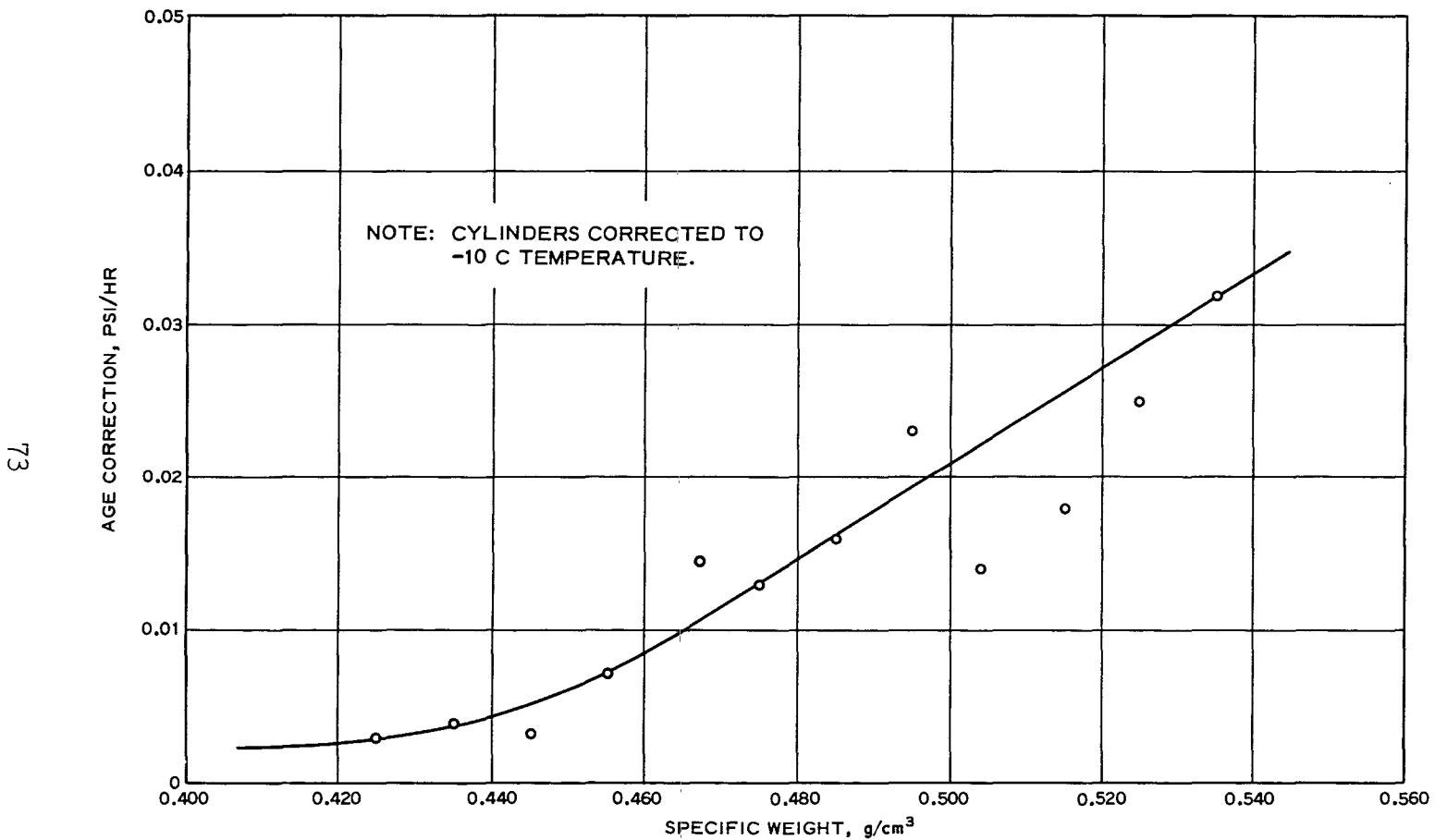


Figure 4.3 Age correction versus specific weight; Material 22.

tL

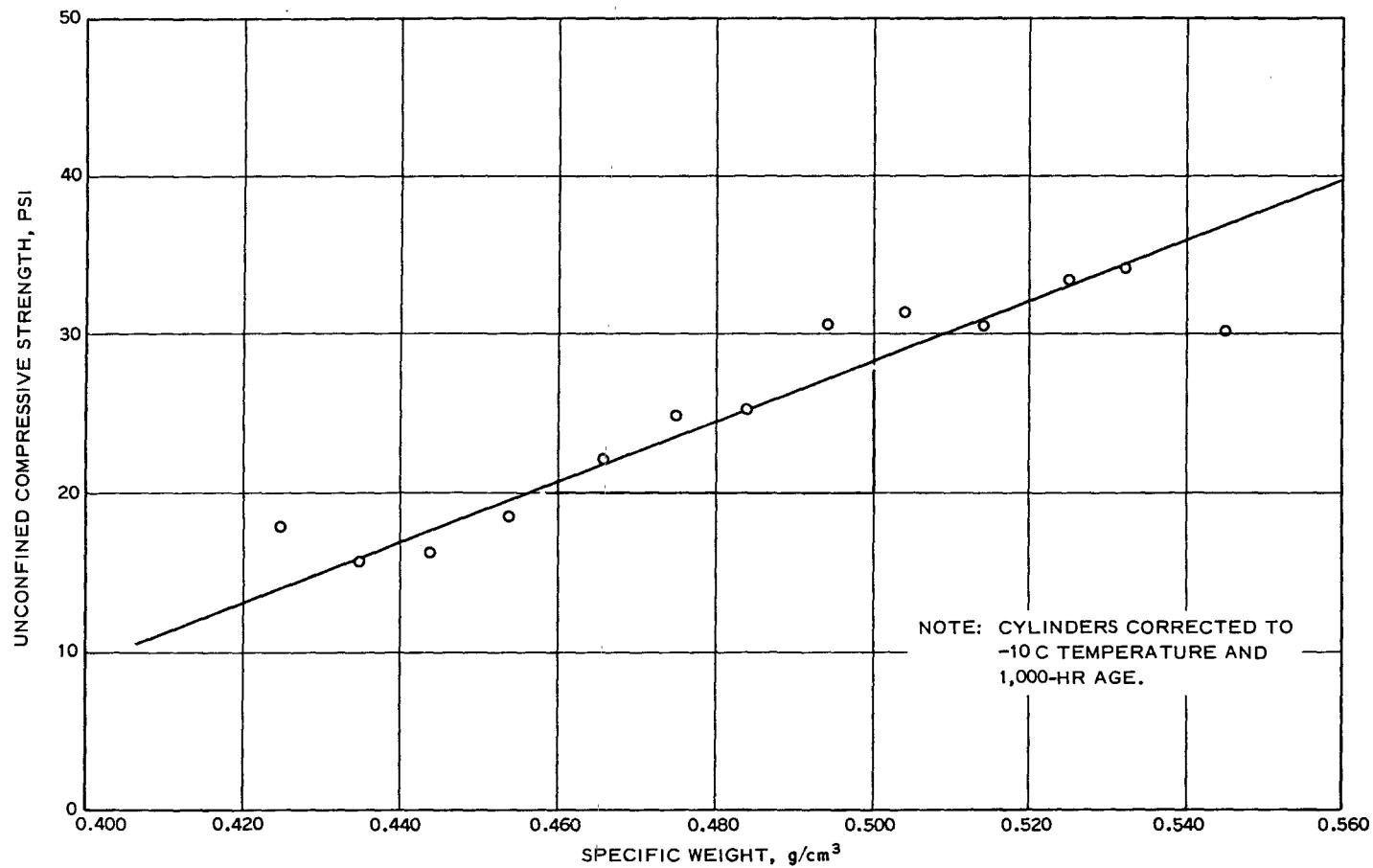


Figure 4.4 Unconfined compressive strength versus specific weight.

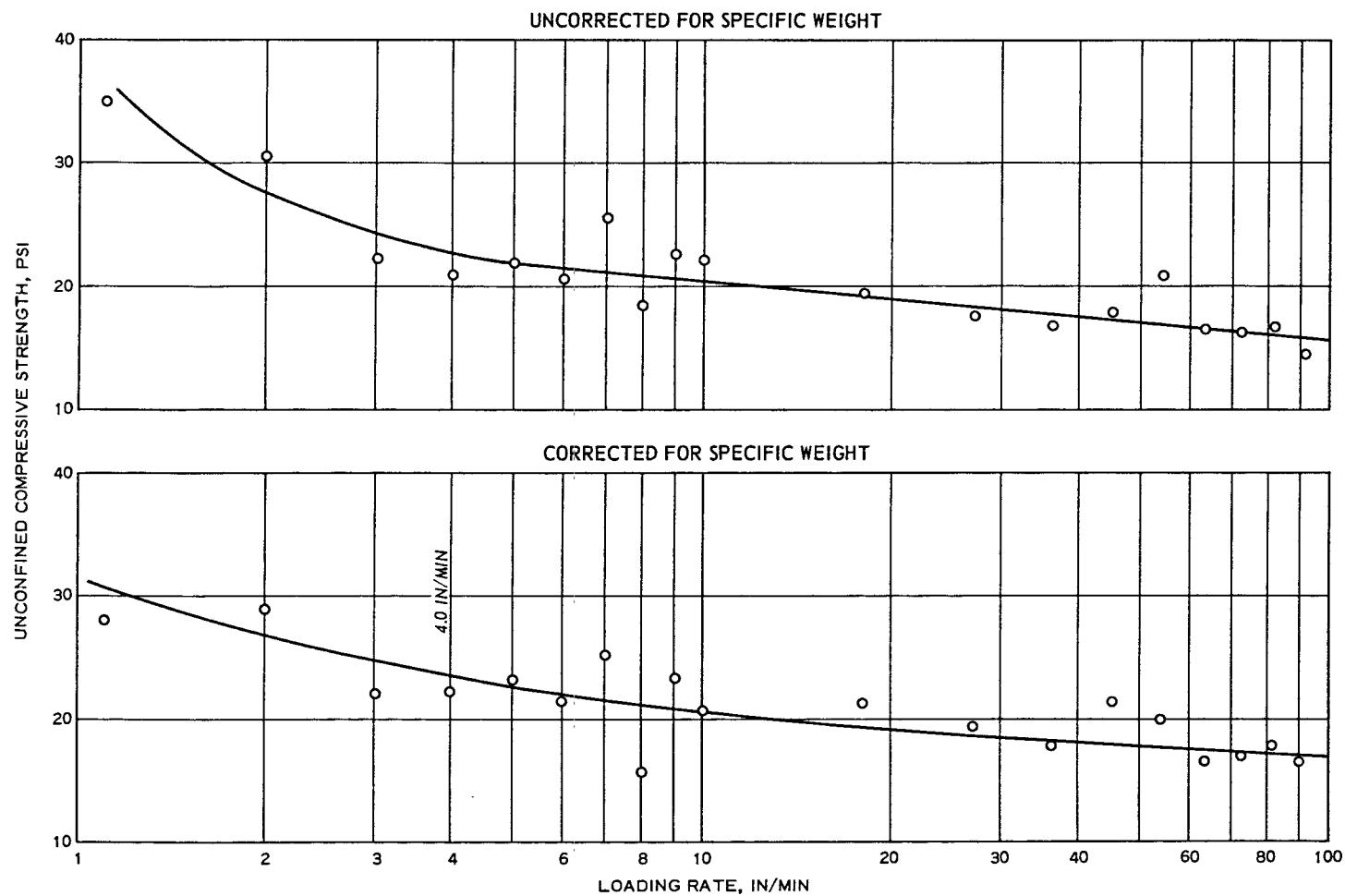


Figure 4.5 Unconfined compressive strength versus loading rate.

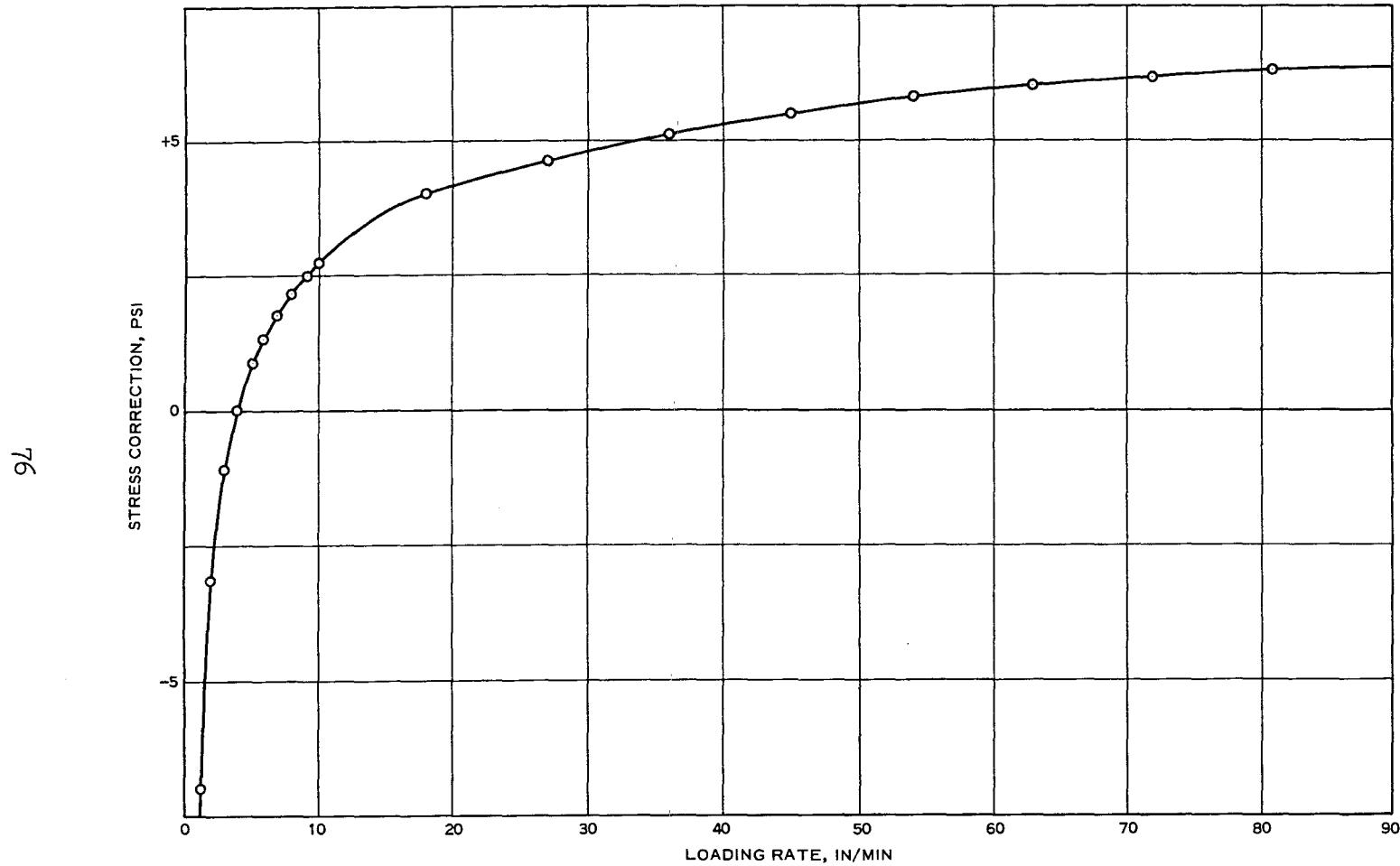


Figure 4.6 Stress correction versus loading rate.

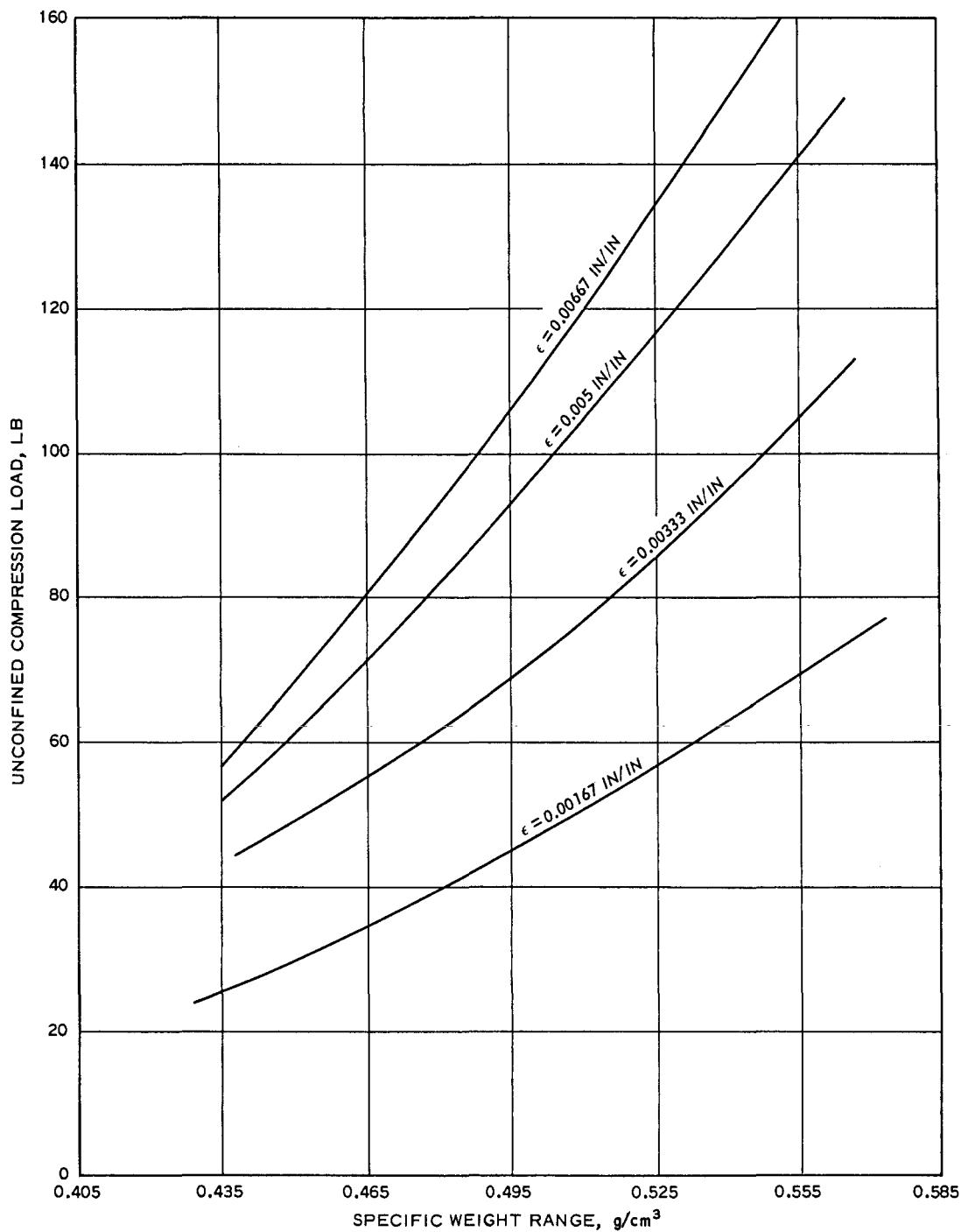


Figure 4.7 Load versus specific weight for Material 22 cylinders.

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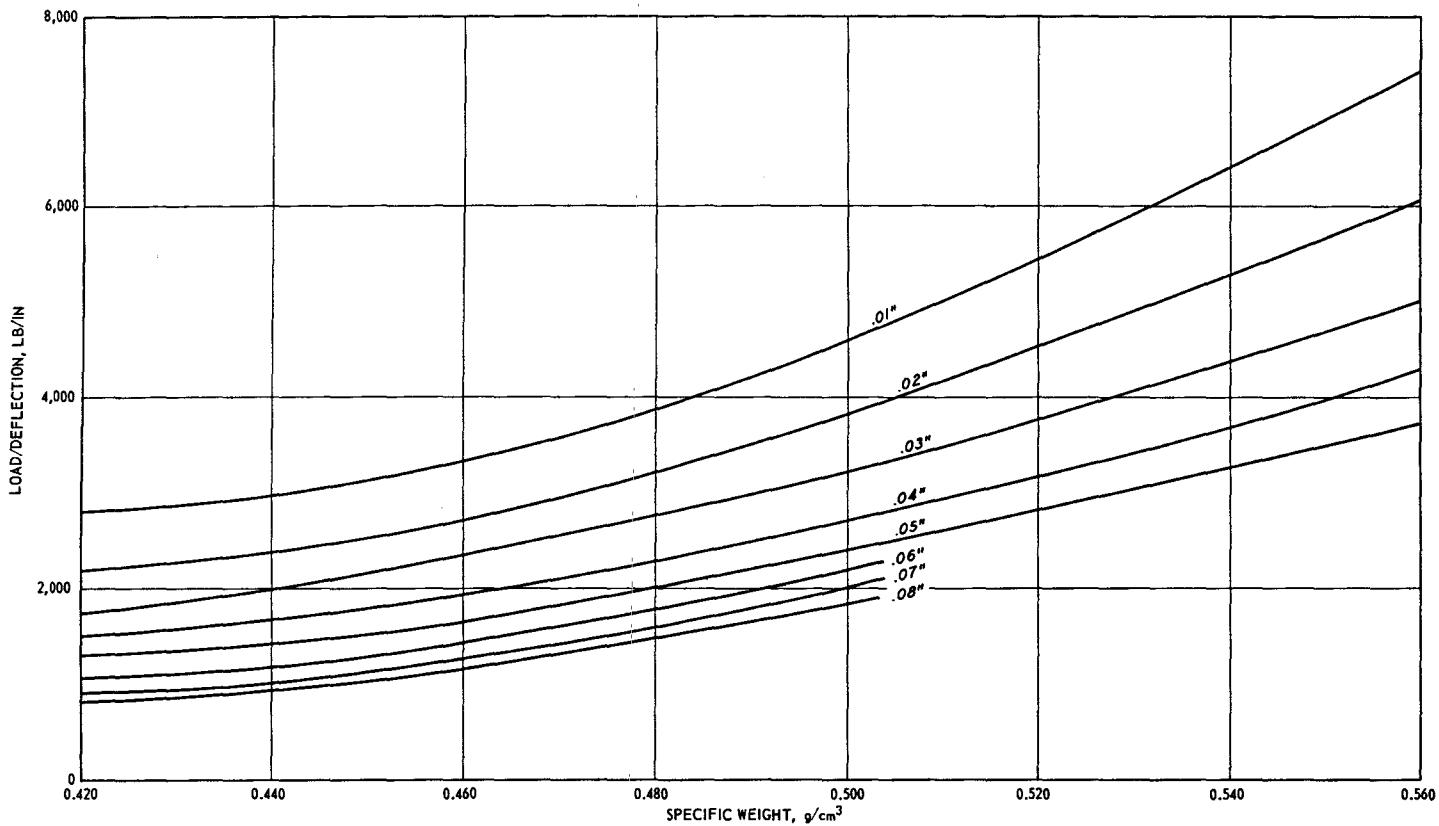


Figure 4.8 Material 22 cylinders; load/deflection versus specific weight (for increments of deflection).

CHAPTER 5

CONCLUSIONS

5.1 CYLINDERS

Applying the equation⁵ that shows the dependency of snow strength on temperature proved to be the best solution in analyzing the snow cylinders. This equation led to determining strength-correction curves as a function of snow age. Two curves have been developed, one in which a correction factor is plotted against specific weight and one in which unconfined compressive strength has been plotted against time. Test results indicate that the former is more desirable since the strength of snow appears to be highly dependent on specific weight.

Applying these two correction curves, a plot of unconfined compressive strength versus specific weight was developed with all plotted values corrected to -10 C and 1,000 hours age. The specific weight of the specimen and its bond structure are believed to influence greatly the cylinder strength and the mode of failure. Also, a curve was developed relating the effect of loading rate on the unconfined compressive strength.

The curves resulting from the numerous cylinder tests are a valuable contribution to the understanding of the properties of processed snow. However, statistical certainty of these curves is limited

by a high degree of test data deviation. If these curves are used, it is imperative that a large number of samples be tested before attempting to implement the results.

5.2 BEAMS

Numerous attempts were made to verify the modeling procedure from the beam test data, but correlation with statistical certainty could not be established. The apparent sensitivity of snow to the numerous parameters is evidenced by the large scatter of the cylinder test data. This condition existing in the beams prevented any meaningful analysis.

It is believed that until the properties of processed snow as a function of its environment can be precisely defined, modeling will be a questionable if not an impracticable tool for predicting the response of snow structures to static loads. Thus, the beam test data are retained in hope that future research will reveal their significance.

5.3 ARCHES

As a result of erratic failure patterns and scatter of test data, an analysis was impracticable; hence, no pertinent conclusions were made concerning modeling of arches subjected to static loads.

APPENDIX A
CALIBRATION OF LOADING DEVICES

APPENDIX A

CALIBRATION OF LOADING DEVICES

A.1 CALIBRATION PROCEDURE

The calibration of the hydraulic cylinders and the membrane loading device was performed in the temperature-controlled cold room at WES. All calibration was done at a temperature of 22 F to simulate the temperatures recorded in the field. This precaution was necessary because of the effect of temperature on the viscosity of the oil used in the loading system.

A.1.1 Membrane Loader. During the calibration tests, each loading membrane was attached to its respective test frame (Figure A.1). Load was then applied to a dummy specimen made of wood. The pressure applied was measured by means of a pressure transducer and a Bourdon gage, both monitoring pressure at the center of the loader. Underneath the loader, two 2,000-pound load cells were used to support the calibrating system and to measure output load. A Collins gage (LVD-type gage) was used to measure the deflection of the specimen. Two different depth dummy specimens were used in the calibration tests for each size of loader so that two deflections for the same load could be obtained, making it possible to determine the effect of deflection with load. The specimens used to calibrate both loaders were made of hardwood and had dimensions of 1 by 2 by 20 inches

and 2 by 2 by 20 inches for the small loader and 2 by 5 by 50 inches and 3 by 5 by 50 inches for the medium-sized loader.

A.1.2 Cylinder Loader. It was necessary to calibrate each cylinder individually (Figure A.2). The pressure above and below the double-acting piston was monitored by two 100-psi pressure transducers, and the output load was measured by a 2,000-pound load cell. A 2,000-pound proving ring was mounted under the cylinder to obtain a slight amount of deflection that was proportional to the load. This deflection was monitored by means of a Collins gage.

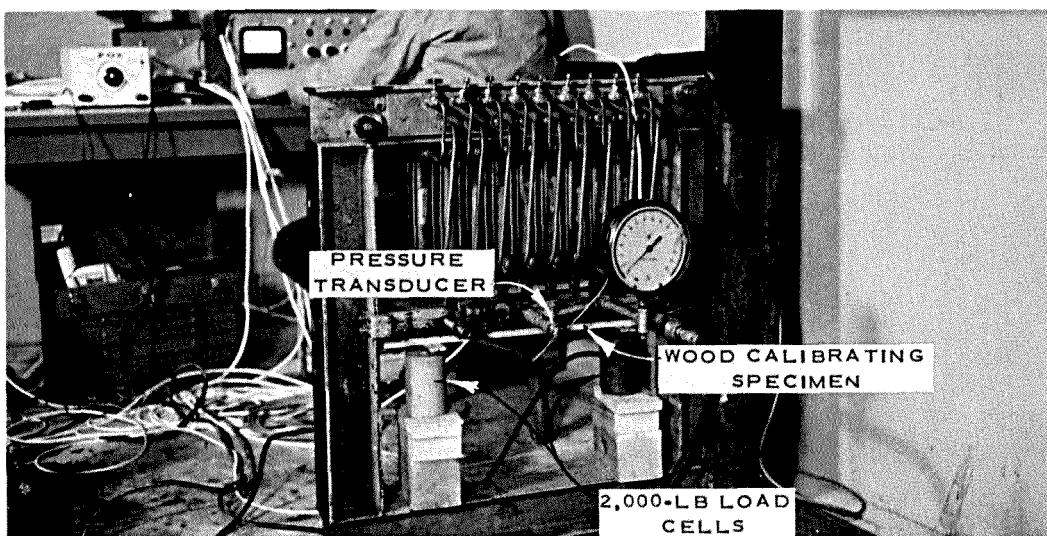
All pressures, loads, and deflections were recorded on a direct-reading oscillograph with respect to time so that any time lag existing between input load and output load could be detected.

A.2 CALIBRATION RESULTS

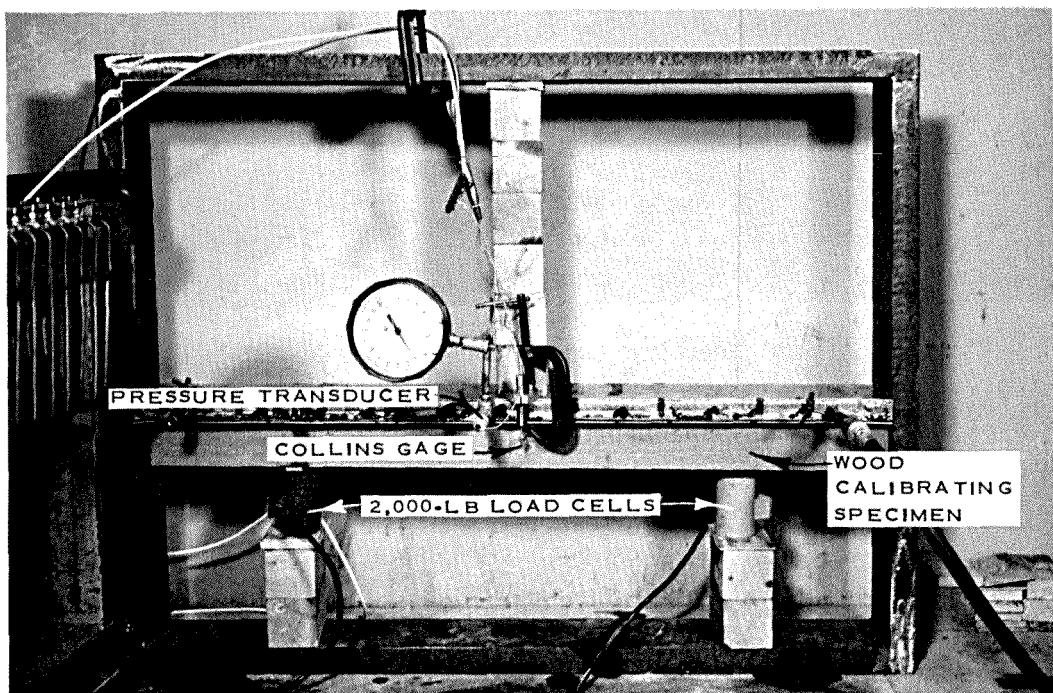
The calibration results showed that the membrane loaders would give a more uniform pressure distribution than was possible with the cylinders and showed that the membrane loaders performed satisfactorily up to deflections of 1 inch and pressures up to 40 psi.

The results of the calibration tests for the cylinders showed scatter that was caused by variations in frictional losses in the individual cylinders. This variation was as great as 100 psi for the small cylinders, 1.0 psi for the medium cylinders, and 0.5 psi for the large cylinders.

The calibration curves and resulting equations are shown in Figures A.3 through A.7.



Small membrane loader (for $n = 6$ models).



b. Medium-sized membrane loader (for $n = 2.4$ models).

Figure A.1 Calibrating the uniform membrane loaders.

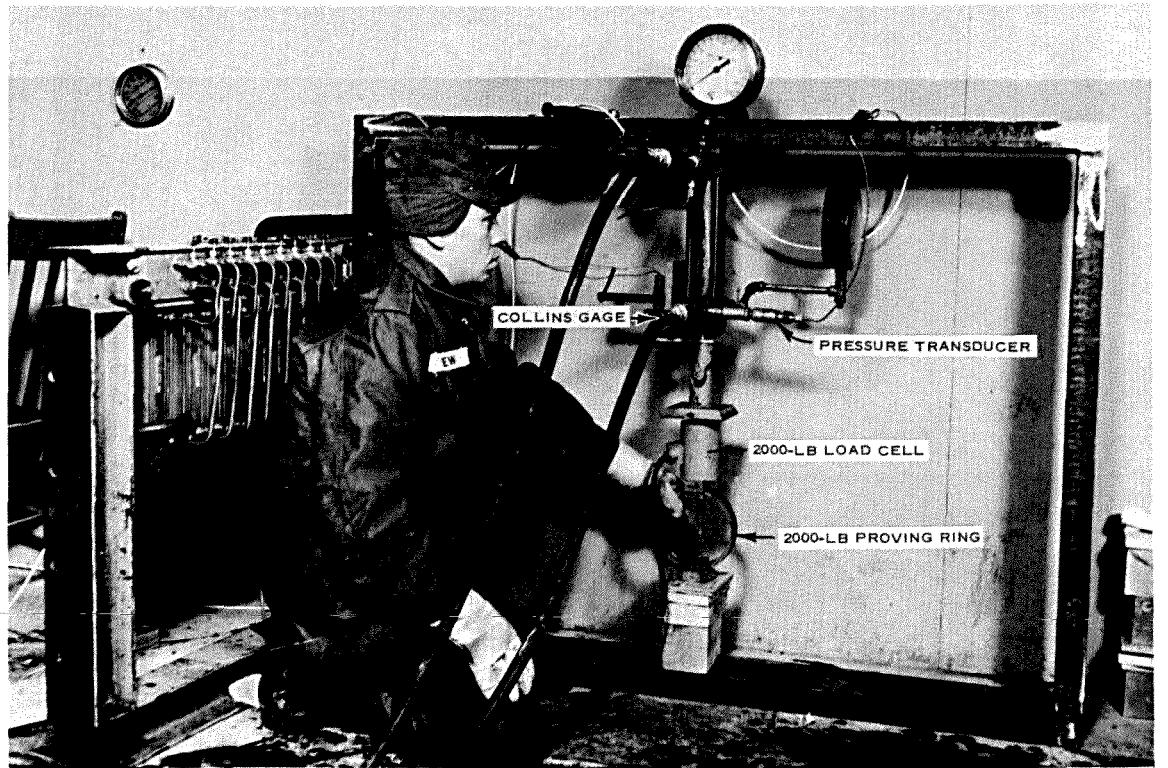


Figure A.2 Calibrating one of the medium-sized cylinders.

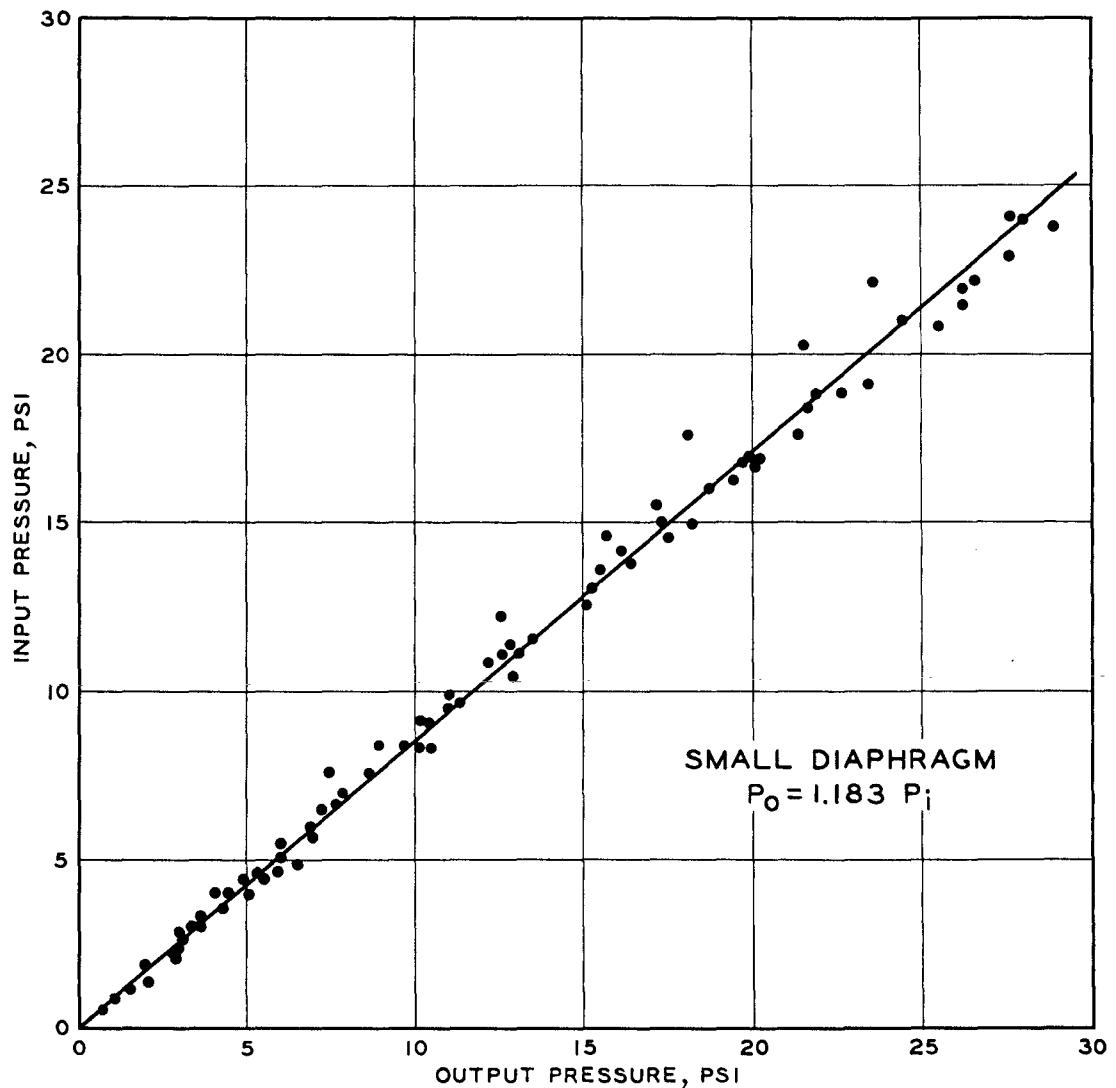


Figure A.3 Calibration curve for the small membrane loader ($n = 6$ models).

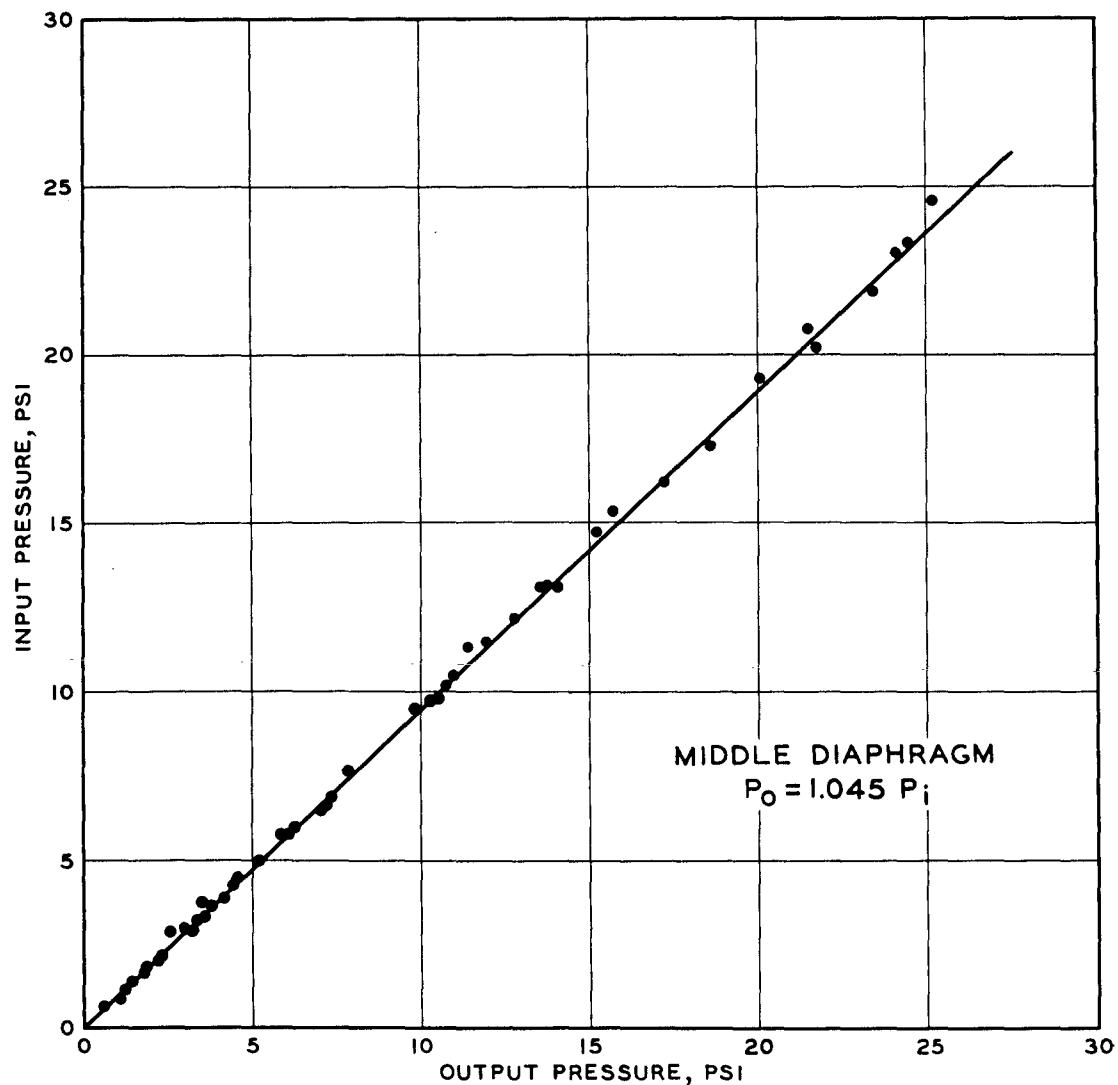
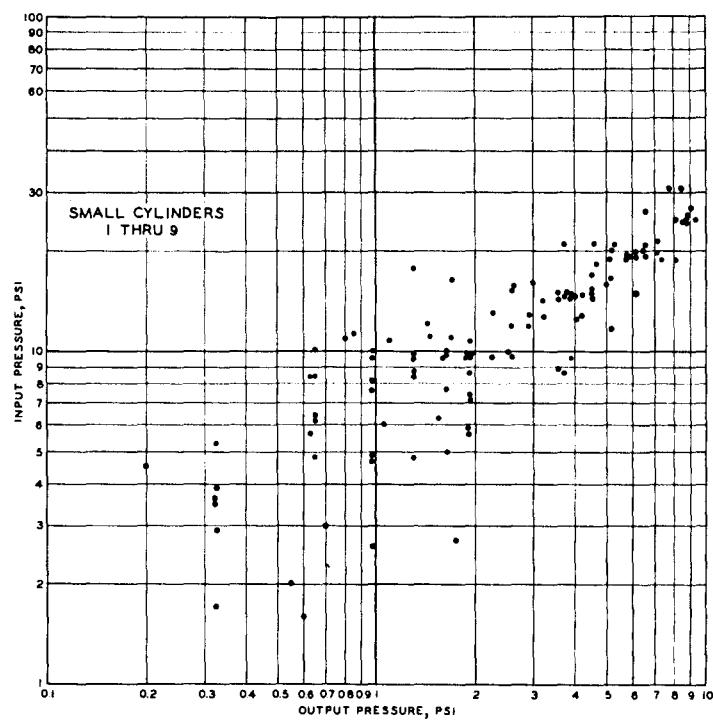
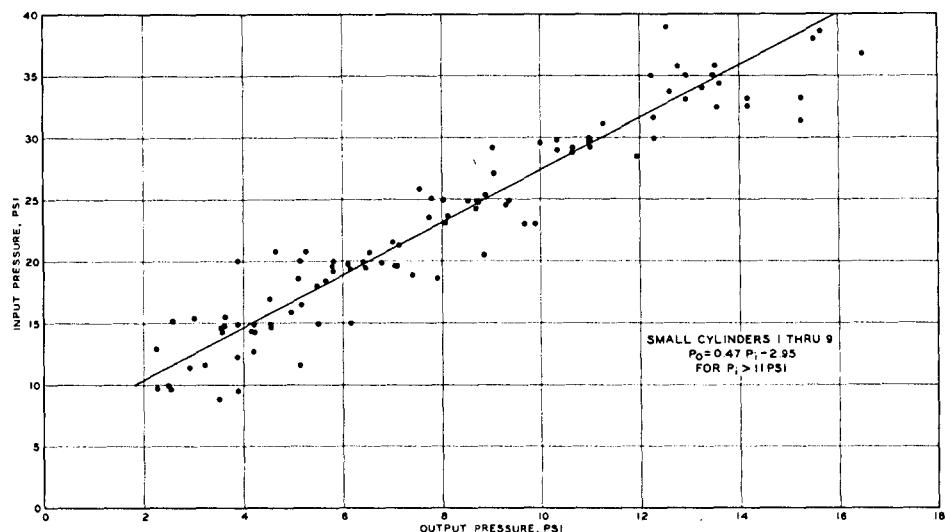


Figure A.4 Calibration curve for the medium-sized membrane loader ($n = 24$ models).

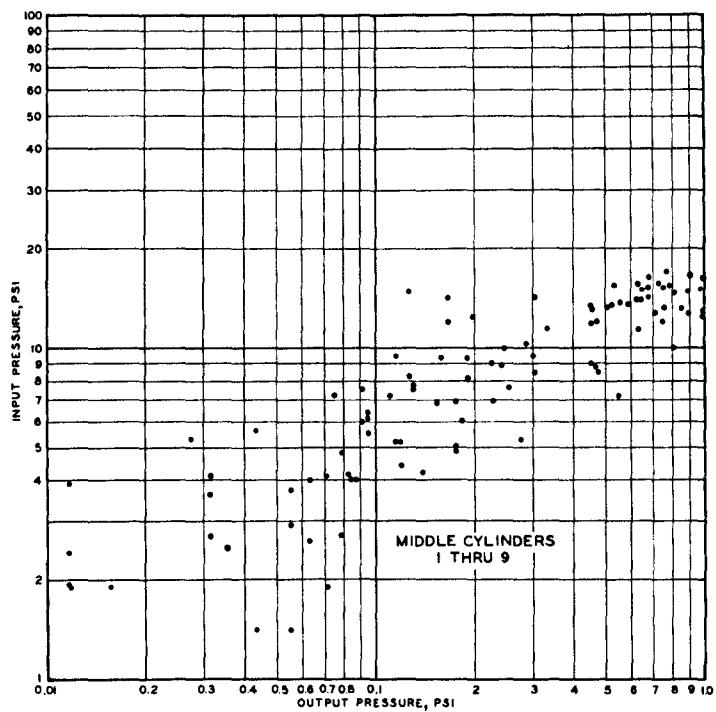


a. For input pressures less than 11 psi.

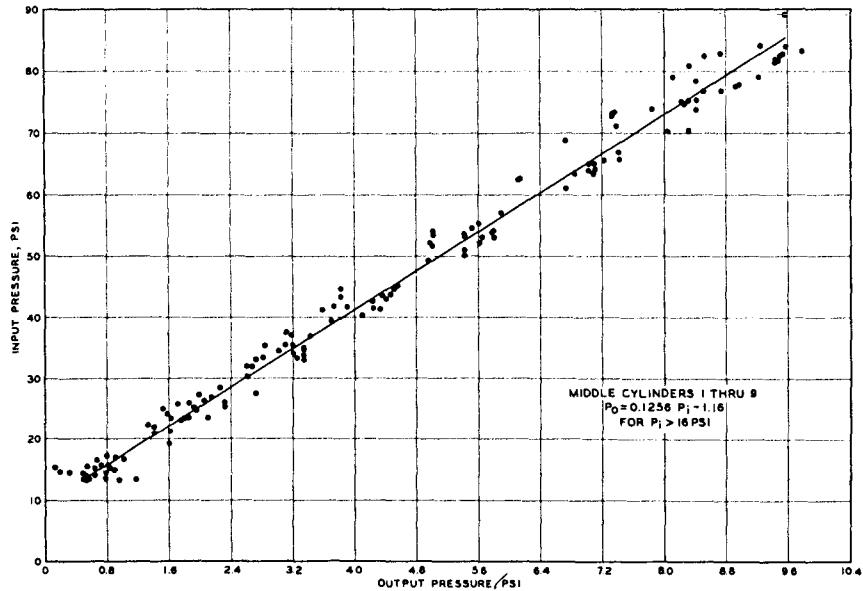


b. For input pressures greater than 11 psi.

Figure A.5 Calibration curves for the small cylinders ($n = 6$ models).

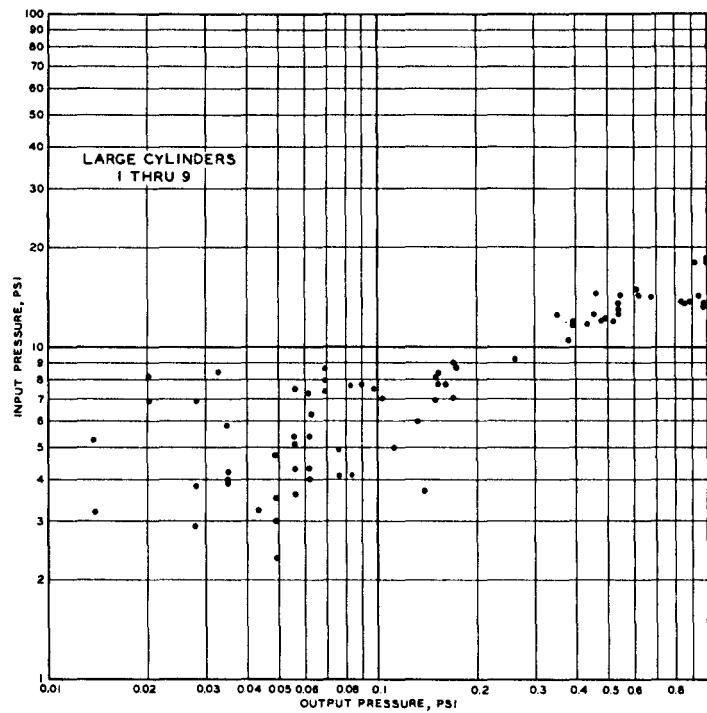


a. For input pressures less than 16 psi.

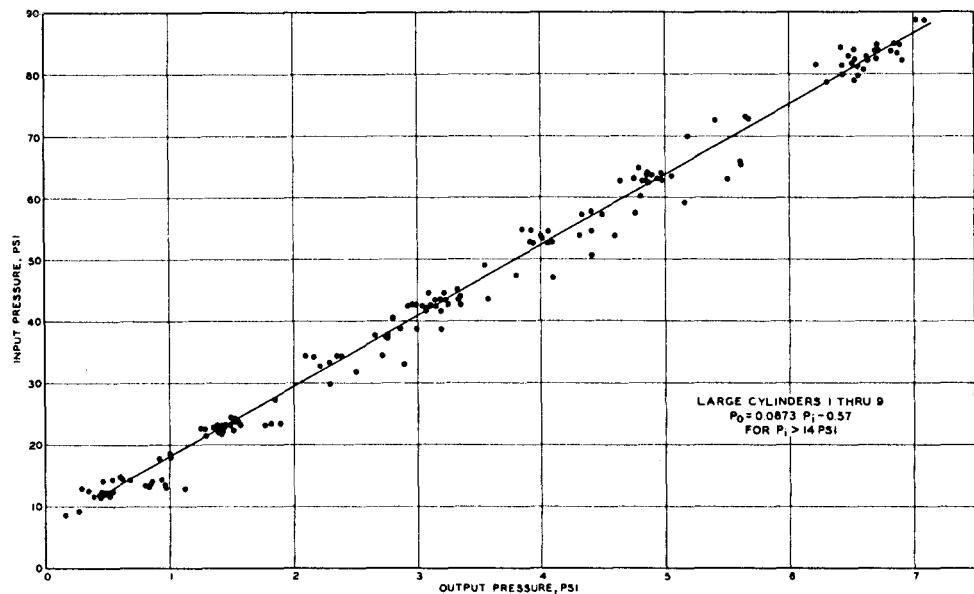


b. For input pressures greater than 16 psi.

Figure A.6 Calibration curves for the medium-sized cylinders ($n = 2.4$ models).



a. For input pressures less than 14 psi.



b. For input pressures greater than 14 psi.

Figure A.7 Calibration curves for the large cylinders (prototype).

APPENDIX B
TABULATED TEST DATA

TABLE B.1 MATERIAL LIST; GREENLAND, 1961 AND 1962

Item No.	Material No.	Type of Plow	Date Blown	Time Blown	Temperature, °C			Sky Condition	Wind Direction	Wind Speed mph	Height Blown ft	Distance Blown ft	Location	Specimens Formed
					Air	Nat- ural Snow	Proc- essed Snow							
1	1	Small	10 July 61	1600	-10	-8	--	Cloudy and blowing snow	E	16	2 to 6	2 to 10	Outside WES trench	Static beams
2	2	Small	14 July 61	0900	-12	-8	--	7000 ft, overcast	ESE	8	2 to 6	2 to 10	Outside WES trench	Static beams and arches
3	3	Small	15 July 61	1500	-3	-9	--	6000 ft, overcast	SSE	10	2 to 6	2 to 10	Outside WES trench	Static beams and arches
4	4	Small	18 July 61	1000	-3	-9	--	7000 ft, scattered	SSE	12	2 to 6	2 to 10	Outside Wes trench	Static beams
5	5	Small	19 July 61	0900	-11	-9	--	Fog	ESE	6	2 to 6	2 to 10	Outside WES trench	Static arches
6	6	Large	20 July 61	1030	-4	--	--	High, thin, scattered	ESE	7	20 to 30	10 to 40	Glycol heat trench	Static beams and arches
7	7	Large	20 July 61	1500	3	-3	--	High, thin, scattered	ESE	8	20 to 30	10 to 40	Glycol heat trench	Static arches
8	8	Large	22 July 61	1600	-1	-5	--	High, thin, scattered	SE	9	20 to 30	10 to 40	Glycol heat trench	Static beams and arches
9	9	Large	26 July 61	1430	-5	-7	--	High, overcast	ESE	5	20 to 30	10 to 40	Glycol heat trench	Static beams and arches
10	10	Large	29 July 61	1030	-5	-7	--	Fog, 700 ft, overcast	SE	15	20 to 30	10 to 60	Glycol heat trench	Static beams and arches
11	11	Large	20 July 61	1200	-9	--	--	700 ft, overcast	SSW	18	20 to 30	5 to 30	Glycol heat trench	Beams and arches cut from processed pad blocks
12	12	Small	5 Aug 61	1445	-3	-5	--	Clear	ESE	10	2 to 6	2 to 10	Beyond test trench	Static beams and arches
13	13	Large	7 Aug 61	1545	-4	-7	--	High, thin, scattered	E	7	20 to 30	10 to 40	Project 33 area	Static beams and arches
14	14A	Large	8 Aug 61	1400	-4	-7	--	6000 ft, scattered	SE	15	20 to 30	10 to 40	Near south entrance	Cylinder tests
15	14B	Small	8 Aug 61	1500	-4	-7	--	6000 ft, scattered	SE	15	2 to 6	2 to 15	Near south entrance	Cylinder tests
16	15	Small	11 Aug 61	1100	-5	-7	--	1800 ft, broken	ESE	12	2 to 6	2 to 10	Outside WES trench	Three small static arches
17	16	Small	15 Aug 61	1530	-8	-10	--	3000 ft, broken	ESE	8	2 to 6	2 to 10	Outside WES trench	Six beams and six arches
18	17	Small	17 Aug 61	1630	--	--	--	NA	NA	2 to 4	3 to 15	Blown inside tunnel	One large arch	
19	18	Small	18 Aug 61	1030	--	--	--	NA	NA	2 to 4	3 to 16	Blown inside tunnel	Two large beams	
20	19	Small	31 Aug 61	1330	--	--	--	NA	NA	2 to 4	3 to 18	Blown inside tunnel using snow blown in tunnel by wind	One large, three middle, three small arches	

(Continued)

Note: NA = not applicable.

TABLE B.1 (CONCLUDED)

Item No.	Material No	Type of Plow	Date Blown	Time Blown	Temperature, °C			Sky Condition	Wind Direction	Speed mph	Height Blown ft	Distance Blown ft	Location	Specimens Formed
					Air	Nat- ural Snow	Proc- essed Snow							
21	20	Small	Sept 61	--	--	--	--	NA	NA	NA	2 to 6	3 to 10	Blown inside tunnel	Small and middle arches to be tested in 1962
22	21	Small	Sept 61	--	--	--	--	NA	NA	NA	4 to 10	6 to 20	Blown inside tunnel	Large arches and beams to be tested in 1962
23	22	Large	4 June 62	0830-0300	--	--	--	95% clear	NE	10	Varied from few to several dozen feet	Processed pad at opening of WES trench	Specimen blocks cut from resultant Peter pad	
24	23	Small	11 June 62	1000-1630	0	-10	-6	95% clear	E	12	2 to 3	3 to 8	Behind HE test site Wannigans	Dynamic arches
25	24	Small	12 June 62	1500-1630	-2	-8	-4	95% clear	E	13	2 to 3	3 to 8	Behind HE test site Wannigans	Dynamic arches
26	25	Small	13 June 62	0945	-9	-11	-9	95% clear	ENE	18	2 to 3	3 to 8	Behind HE test site Wannigans	Dynamic beam slabs
27	26	Small	13 June 62	1530	-8	-11	--	95% clear	ENE	23	1 to 6	3 to 30	Next to ramp of WES trench	Static arch specimens
28	27	Small	17 June 62	1500	-9	--	--	95% clear	E	11	1 to 4	3 to 10	HE shot site No. 1	Dynamic arch specimens
29	28	Small	18 June 62	1600	-5	--	--	95% clear	E	14	1 to 4	3 to 10	HE shot site No. 1	Dynamic arch specimens
30	29	Small	19 June 62	1100	-6	--	--	95% clear	E	17	1 to 4	3 to 10	HE shot site No. 1	Dynamic arch specimens
31	30	Small	22 June 62	1515	-3	-8	-6	Cloudy, no sun	SE	10	1 to 4	3 to 10	HE shot site No. 1	Dynamic arch specimens
32	31	Small	24 June 62	1200-1430	-10	-12	-11	Clear	ENE	9	1 to 10	5 to 25	Blown inside trench	Five large arches and three large beams
33	32	Small	25 June 62	1015	-8	-12	--	Cloudy, no sun	ESE	21	2 to 5	4 to 20	Blown next to ramp of WES trench	Twelve middle and twelve small static arches
34	33	Small	3 July 62	1330-1700	-4	--	--	Cloudy, no sun	E	12	1 to 4	3 to 10	HE shot site No. 2	Dynamic arch specimens
35	34	Small	4 July 62	1100-1500	-4	-7	-7	Cloudy, no sun	SSE	6	1 to 4	3 to 10	HE shot site No. 2	Dynamic arch specimens
36	35	Small	5 July 62	845-1015	-7	--	--	Cloudy, no sun	ESE	22	1 to 4	3 to 30	HE shot site No. 2	Dynamic arch specimens
37	36	Small	15 July 62	1445-1515	-2	--	--	Clear	ENE	14	1 to 4	3 to 10	HE shot site No. 3	Dynamic arch specimens
38	37	Small	16 July 62	0845-1120	-4	--	--	Clear	ENE	17	1 to 4	3 to 10	HE shot site No. 3	Dynamic arch specimens

TABLE B.2 SIEVE ANALYSIS; GREENLAND, 1961 AND 1962

Item No.	Material No.	Temperature °C		Percent Retained								Total Sample Weight g	Type of Plow
		Air	Snow	No. 10	No. 20	No. 30	No. 40	No. 60	No. 100	Pan			
39	4	-8	--	6	48	--	40	6	--	--		100	Small
40	6	--	--	6	30	--	64	2	--	--		102	Large
41	8	-8	--	2	40	--	51	1	--	--		94	Large
42	8	--	--	9	22	--	52	8	6	--		97	Large
43	9	-8	--	4	41	--	44	3	--	--		98	Large
44	10	-8	--	5	46	--	42	7	--	--		100	Large
45	11	-8	--	5	45	--	47	6	--	--		103	Large
46	12	--	--	9	20	--	52	20	--	--		101	Small
47	13	--	--	6	28	--	60	8	--	--		102	Large
48	14A	--	--	9	64	--	26	2	--	--		101	Large
49	14B	--	--	1	12	--	84	6	--	--		103	Small
50	15	-8	--	11	36	--	47	2	1	--		96	Small
51	16	-8	--	--	29	--	57	7	--	--		93	Small
52	16	-8	--	--	25	--	62	8	--	--		95	Small
53	16	--	--	5	26	--	60	8	--	--		99	Small
54	17	--	--	5	22	--	60	16	--	--		103	Small
55	18	--	--	1	26	--	62	16	--	--		105	Small
56	19	-10	--	5	4	--	74	12	2	--		97	Small
57	20	-9	--	15	4	--	57	24	--	--		100	Small
58	20	-7	-10	1.2	3.5	23.4	55.5	16.0	0.4	--		263	Small
59	21	-8	-12	9.2	12.6	17.6	41.2	13.4	0.8	--		250	Small
60	21	-8	-12	8.5	17.1	23.3	39.5	10.7	0.8	--		250	Small
61	21	-8	-10	3.3	13.2	34.7	38.8	9.1	0.8	--		242	Small
62	21	-8	-10	5.8	18.3	31.7	35.0	7.5	0.8	0.8		240	Small
63	22	-6	-8	16.2	19.7	18.5	27.8	16.2	--	1.5		248	Large
64	22	-6	-8	19.2	19.2	18.0	28.6	13.9	--	0.8		262	Large
65	22	-6	-10	16.0	17.1	16.7	34.2	13.6	--	2.3		260	Large
66	22	-6	-10	19.5	20.2	18.3	26.8	13.6	--	1.6		253	Large
67	22	-6	-8	17.9	19.8	17.9	27.4	15.1	--	2.0		250	Large
68	24	-6	-10	2.9	12.1	39.3	29.7	15.1	--	0.8		236	Small
69	24	-6	-10	1.2	8.7	41.2	33.8	13.9	--	1.2		251	Small
70	24	-6	-10	2.2	9.5	38.6	35.0	13.9	--	0.7		268	Small
71	24	-6	-10	2.5	13.1	38.6	33.6	10.6	--	1.6		242	Small
72	24	-6	-10	2.2	5.9	43.3	33.3	13.7	--	1.5		262	Small
73	25	-6	-10	1.3	4.3	49.3	28.1	15.3	--	1.7		238	Small
74	25	-6	-10	0.8	5.9	48.3	39.8	4.2	--	0.8		238	Small
75	25	-6	-10	1.7	2.5	48.4	42.4	4.2	--	0.8		238	Small
76	25	-6	-10	2.4	6.9	35.2	39.3	15.8	--	0.4		251	Small
77	25	-6	-10	2.5	5.4	37.8	39.8	13.7	--	0.8		240	Small
78	26	-9	-9	1.9	4.5	42.4	33.0	15.9	--	2.3		256	Small
79	26	-9	-9	1.9	6.3	50.0	28.4	11.9	--	1.5		259	Small
80	26	-8	-9	0.8	3.8	41.0	37.3	16.7	--	0.4		270	Small

(Continued)

TABLE B.2 (CONCLUDED)

Item No.	Material No.	Temperature °C										Total Sample Weight g	Type of Plow
		Air	Snow	No. 10	No. 20	No. 30	No. 40	No. 60	No. 100	Pan			
81	26	-8	-9	2.8	5.7	31.0	41.6	16.3	--	2.5	240	Small	
82	26	-8	-9	2.5	3.4	24.6	47.4	20.3	--	1.7	230	Small	
83	30	-7	-13	6.8	62.2	15.1	9.9	5.2	0.2	--	519.7	Small	
84	30	-7	-13	8.9	70.5	7.4	7.9	4.9	0.4	0.03	681.7	Small	
85	30	-7	-13	4.1	44.8	28.9	19.5	2.4	0.4	--	365.2	Small	
86	30	-5	-7	10.4	26.0	40.0	19.3	4.4	0.2	0.05	179.2	Small	
87	30	-7	-8	1.6	16.7	36.2	29.9	12.7	2.0	0.8	248	Small	
88	31	-7	-9	4.5	38.4	28.6	19.3	8.1	1.2	--	249	Small	
89	31	-7	-9	0.8	38.3	31.2	20.0	8.3	1.3	--	235	Small	
90	31	-8	-10	0.9	31.0	32.7	23.3	10.0	1.7	--	248	Small	
91	31	-8	-10	1.2	21.6	52.0	16.7	9.0	--	--	247	Small	
92	31	-8	-10	1.1	22.9	36.4	25.6	10.8	2.7	0.4	260	Small	
93	33	-6	-10	0.7	42.8	27.7	18.8	8.3	--	2.2	280	Small	
94	33	-6	-10	1.1	43.3	26.7	18.8	8.7	--	1.4	282	Small	
95	33	-6	-10	1.6	35.6	28.8	23.3	9.9	--	0.8	258	Small	
96	33	-6	-10	1.1	43.0	26.0	19.6	9.2	--	1.1	275	Small	
97	33	-6	-10	0.4	10.6	42.3	29.1	15.0	--	2.6	220	Small	
98	34	-6	-8	1.5	28.6	29.1	24.3	8.7	6.8	1.0	208	Small	
99	34	-6	-8	1.2	29.9	35.7	26.1	6.6	0.4	--	248	Small	
100	34	-6	-8	2.5	51.9	22.6	14.5	8.1	0.4	--	248	Small	
101	34	-6	-8	1.6	29.6	36.2	26.3	5.7	0.4	--	247	Small	
102	34	-6	-8	1.5	33.4	36.9	18.8	6.5	2.7	--	267	Small	
103	37	-2	-8	0.7	41.2	28.0	19.9	8.4	2.1	0.7	276	Small	
104	37	-2	-8	0.4	51.2	23.1	18.8	4.2	1.7	--	240	Small	
105	37	-2	-8	1.6	62.0	20.6	15.1	--	--	--	250	Small	
106	37	-2	-8	2.1	66.5	24.2	6.4	--	0.8	--	246	Small	
107	37	-2	-8	1.6	62.8	21.0	14.4	0.4	--	--	252	Small	

TABLE B.3 CYLINDER TESTS; GREENLAND, 1961 AND 1962

Item No.	Material No.	Test No.	Snow days	Age hr	Cylinder days	Age hr	Diameter in.	Length in.	Specific Weight g/cm ³	Loading Rate in./min	Failure Stress psi	Deflection in.	Temperature of Air, °C	Type of Failure	Remarks
108	4	38	20	4	20	4	3	6	0.461	6.50	42.7	0.088	-13.8	Crushing	
109	4	39	20	4	20	4	3	6	0.461	2.66	43.95	0.095	-13.8	Crushing	
110	4	40	20	5	20	5	3	6	0.490	3.20	18.61	0.036	-13.8	Shear	
111	4	41	25	4	25	4	3	6	0.514	1.86	52.93	0.052	-13.8	Cone	
112	4	42	25	5	25	5	3	6	0.467	0.98	18.61	0.050	-13.8	Crushing	
113	4	43	25	5	25	5	3	6	0.478	2.30	33.81	0.066	-13.8	Crushing	
114	4	44	25	5	25	5	3	6	0.491	2.80	21.09	0.120	-13.8	Crushing	
115	4	45	25	5	25	5	3	6	0.495	3.88	15.65	0.081	-13.8	Diagonal tension	
116	4	46	25	6	25	6	3	6	0.456	1.48	12.05	0.088	-13.8	Diagonal tension	
117	8	70	16	--	16	--	3	6	0.499	3.70	11.0	0.045	-10.0	Crushing	
118	8	71	16	--	16	--	3	6	0.475	1.20	69.3	0.018	-10.0	Crushing	
119	8	72	16	--	16	--	3	6	0.481	1.50	19.1	0.102	-10.0	Crushing	
120	8	73	33	21	33	21	3	6	0.486	1.35	76.0	0.071	-10.6	Crushing and shear	
121	8	74	33	22	33	22	3	6	0.509	2.90	21.8	0.118	-10.6	Crushing	
122	8	75	33	22	33	22	3	6	0.506	2.80	46.5	0.043	-10.6	Crushing	
123	8	76	33	22	33	22	3	6	0.516	1.78	22.1	0.086	-10.6	Tension	
124	8	77	33	22	33	22	3	6	0.506	1.00	13.3	0.066	-10.6	Tension	
125	8	78	33	22	33	22	3	6	0.516	4.10	18.55	0.092	-10.6	Tension	
126	9	86	12	2	12	2	3	6	0.505	3.26	32.0	0.035	-9.4	Shear	
127	9	87	12	2	12	2	3	6	0.509	2.10	30.74	0.038	-9.4	Crushing	
128	9	88	30	19	30	19	3	5-1/2	0.481	7.20	30.53	0.062	-10.6	Crushing	
129	9	89	30	19	30	19	3	6	0.478	3.10	8.73	0.027	-10.6	Shear	
130	9	90	30	19	30	19	3	6	0.514	3.40	16.8	0.084	-10.6	Shear	
131	9	91	30	19	30	19	3	6	0.504	4.60	19.0	0.118	-10.6	Tension	
132	9	92	30	19	30	19	3	7	0.500	3.00	11.47	0.067	-10.6	Tension	
133	9	93	30	19	30	19	3	5-3/4	0.516	2.50	20.1	0.085	-10.6	Tension	
134	10	99	20	5	20	5	3	6	0.501	5.40	21.1	--	-11.1	Shear	
135	10	100	20	5	20	5	3	6	0.491	2.50	21.1	0.110	-11.1	Crushing	
136	10	101	20	5	20	5	3	6	0.505	2.83	25.7	0.071	-11.1	Shear	
137	10	102	24	5	24	5	3	6	0.505	4.20	33.8	0.080	-13.8	Shear	
138	10	103	24	5	24	5	3	5	0.522	3.40	19.88	0.112	-13.8	Diagonal tension	

(Continued)

(1 of 45 sheets)

TABLE B.3 (CONTINUED)

Item No.	Material No.	Test No.	Snow Age days	Age hr	Cylinder Age days	Age hr	Diameter in.	Length in.	Specific Weight g/cm ³	Loading Rate in./min	Failure Stress psi	Deflection in.	Temperature of Air, °C	Type of Failure	Remarks
139	10	104	24	5	24	5	3	6	0.524	2.00	24.9	0.047	-13.8	Crushing	
140	10	105	24	5	24	5	3	6	0.539	5.00	15.91	0.099	-13.8	Diagonal tension	
141	10	106	24	5	24	5	3	6	0.497	3.50	12.8	0.054	-13.8	Diagonal tension	
142	10	107	24	5	24	5	3	6	0.484	5.20	16.44	0.142	-13.8	Diagonal tension	
143	10	108	30	6	30	6	3	6	0.517	1.58	29.8	0.082	-16.7	Shear	
144	10	109	30	5	30	5	3	6	0.520	1.59	20.5	0.102	-16.7	Wedge split	
145	10	110	30	5	30	5	3	6	0.525	1.05	20.7	--	-16.7	Shear	
146	10	111	30	5	30	5	3	6	0.495	2.00	20.3	0.158	-16.7	Tension	
147	10	112	30	5	30	5	3	6	0.531	4.30	21.4	--	-16.7	Tension	
148	11	120	18	5	18	5	3	6	0.570	2.75	45.2	0.064	-9.4	Crushing	
149	11	121	17	23	17	23	3	6	0.552	5.50	47.2	0.069	-9.4	Crushing	
150	11	122	18	5	18	5	3	6	0.552	3.95	54.0	0.052	-9.4	Crushing	
151	11	123	22	22	22	22	2-3/4	6	0.557	1.75	54.3	0.127	-8.3	Crushing	
152	11	125	24	22	24	22	3	6	0.497	3.91	42.6	0.085	-11.1	Crushing	
153	11	126	24	22	24	22	3	6	0.511	1.60	33.7	0.101	-11.1	Crushing	
154	11	127	24	22	24	22	3	6	0.511	1.50	34.3	0.043	-11.1	Shear	
155	11	128	26	2	26	2	3	6	0.520	4.00	49.0	0.074	-10.6	Crushing	
156	11	129	26	2	26	2	3	6	0.559	3.20	49.0	0.070	-10.6	Crushing	
157	11	130	26	2	36	2	3	6	0.522	3.60	26.6	--	-10.6	Shear	
158	11	131	30	21	30	21	3	6	0.573	--	43.9	--	-9.4	Splitting tension	
159	11	132	30	22	30	22	3	6	0.564	0.97	26.2	0.070	-9.4	Crushing	
160	11	135	32	21	32	21	3	6	0.555	1.46	62.2	0.052	-10.0	Crushing	
161	11	136	32	21	32	21	3	6	0.559	1.35	60.4	0.066	-10.0	Shear	
162	11	137	32	21	32	21	3	6	0.541	2.35	51.6	0.050	-10.0	Crushing	
163	11	138	32	21	32	21	3	6	0.564	2.09	25.3	0.123	-10.0	Tension	
164	11	139	32	21	32	21	3	6	0.552	1.40	23.1	0.106	-10.0	Tension	
165	11	140	32	21	32	21	3	6	0.536	1.97	19.9	0.103	-10.0	Tension	
166	11	141	40	1	40	1	3	6	0.561	1.40	61.7	0.075	-15.0	Crushing	
167	11	145	40	2	40	2	3	6	0.530	1.80	11.8	0.098	-15.0	Tension	
168	11	146	40	2	40	2	3	6	0.517	1.37	23.1	--	-15.0	Tension	
169	12	159	17	1	17	1	3	6	0.503	5.80	57.7	0.075	-10.3	Crushing	

(Continued)

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TABLE B.3 (CONTINUED)

Item No.	Material No.	Test No.	Snow days	Age hr	Cylinder Age days	Age hr	Diameter in.	Length in.	Specific Weight g/cm ³	Loading Rate in./min	Failure Stress psi	Deflection in.	Temperature of Air, °C	Type of Failure	Remarks
170	12	160	17	1	17	1	3	6	0.472	2.00	36.3	0.062	-10.3	Crushing	
171	12	161	17	2	17	2	3	6	0.525	3.70	51.4	0.050	-10.3	Shear	
172	12	162	17	2	17	2	3	6	0.479	3.20	12.8	0.120	-10.3	Diagonal tension	
173	12	163	17	2	17	2	3	6	0.475	4.00	12.1	0.085	-10.3	Diagonal tension	
174	12	164	17	2	17	2	3	6	0.468	5.50	18.0	0.131	-10.3	Diagonal tension	
175	12	165	26	1	26	1	3	6	0.468	2.22	37.5	0.121	-12.2	Crushing	
176	12	166	26	1	26	1	3	6	0.468	5.50	37.2	0.050	-12.2	Crushing	
177	12	167	26	1	26	1	3	6	0.489	1.50	51.0	0.101	-12.2	Crushing	
178	13	168	1	19	1	19	3	6	0.443	4.20	3.91	0.071	-6.7	Shear	
179	13	169	1	19	1	19	3	6	0.418	2.40	5.19	0.143	-6.7	Crushing	
180	13	170	1	19	1	19	3	6	0.445	1.10	12.0	0.142	-6.7	Shear	
181	13	171	6	18	6	18	3	6	0.484	3.22	24.1	0.034	-11.1	Shear	
182	13	172	6	18	6	18	3	6	0.481	4.80	33.6	0.044	-11.1	Shear	
183	13	173	6	18	6	18	3	6	0.486	1.00	18.7	0.037	-11.1	Crushing	
184	13	174	11	--	11	--	3	6	0.486	2.20	21.8	0.052	-9.4	Crushing	
185	13	175	11	--	11	--	3	6	0.500	3.80	23.7	0.050	-9.4	Shear	
186	13	176	11	--	11	--	3	6	0.522	3.10	42.0	0.090	-9.4	Crushing	
187	13	177	14	--	14	--	3	6	0.502	1.70	36.3	0.061	-10.0	Crushing	
188	13	178	14	--	14	--	3	6	0.497	2.30	68.0	0.047	-10.0	Shear	
189	13	180	14	1/2	14	1/2	3	6	0.509	5.40	21.5	0.162	-10.0	Diagonal tension	
190	13	181	14	1/2	14	1/2	3	6	0.497	2.50	15.1	0.152	-10.0	Diagonal tension	
191	13	182	14	1/2	14	1/2	3	6	0.511	5.50	20.7	0.129	-10.0	Diagonal tension	
192	13	183	24	--	24	--	3	6	0.523	1.00	43.9	0.042	-14.2	Crushing	
193	13	185	24	--	24	--	3	6	0.506	6.00	43.9	0.050	-14.2	Crushing	
194	13	186	24	1/2	24	1/2	3	6	0.503	3.20	20.6	0.108	-14.2	Crushing	
195	13	188	24	1/2	24	1/2	3	6	0.456	1.10	14.4	0.182	-14.2	Tension	
196	14A	198	3	19	3	19	3	6	0.455	2.60	13.5	0.280	-8.3	Crushing	
197	14A	199	3	19	3	19	3	6	0.475	3.70	14.9	0.324	-8.3	Crushing	
198	14A	200	3	20	3	20	3	6	0.466	3.50	10.5	0.108	-10.0	Crushing	
199	14A	201	3	20	3	20	3	6	0.497	4.10	13.7	0.140	-10.0	Crushing	
200	14A	202	5	19	5	19	3	6	0.470	4.60	16.1	0.051	-10.6	Crushing	

(Continued)

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TABLE B.3 (CONTINUED)

Item No.	Material No.	Test No.	Snow days	Age hr	Cylinder days	Age hr	Diameter in.	Length in.	Specific Weight g/cm³	Loading Rate in./min	Failure Stress psi	Deflection in.	Temperature of Air, °C	Type of Failure	Remarks
201	14A	204	5	19	5	19	3	6	0.475	3.68	9.8	0.042	-10.6	Crushing	
202	14A	205	7	1	7	1	3	6	0.486	3.80	11.2	0.032	-12.2	Shear	
203	14A	206	7	1	7	1	3	6	0.486	4.30	25.5	0.043	-12.2	Crushing	
204	14A	207	7	1	7	1	3	6	0.483	4.35	9.7	0.029	-12.2	Crushing	
205	14A	208	10	--	10	--	3	6	0.474	4.65	6.68	0.037	-9.4	Crushing	
206	14A	209	10	--	10	--	3	6	0.480	3.65	21.8	0.058	-9.4	Crushing	
207	14A	210	10	--	10	--	3	6	0.484	3.25	22.1	0.047	-9.4	Shear	
208	14A	211	14	20	14	20	3	6	0.486	1.70	28.7	0.110	-11.7	Shear	
209	14A	212	14	20	14	20	3	6	0.470	1.00	17.3	0.076	-11.7	Shear	
210	14A	213	14	21	14	21	3	6	0.497	2.51	24.9	0.077	-11.7	Crushed	
211	14A	214	15	--	15	--	3	6	0.522	2.80	9.9	--	-11.7	Tension	
212	14A	215	15	--	15	--	3	6	0.497	7.30	10.3	0.110	-11.7	Tension	
213	14A	216	15	--	15	--	3	6	0.465	1.87	6.18	0.034	-11.7	Tension	
214	14A	217	17	20	17	20	3	6	0.443	2.80	27.1	0.042	-15.0	Crushing	
215	14A	218	17	20	17	20	3	6	0.476	1.50	17.3	0.034	-15.0	Crushing	
216	14A	219	17	20	17	20	3	6	0.484	1.75	32.5	0.021	-15.0	Shear	
217	14A	220	17	20	17	20	3	6	0.506	1.60	15.8	0.127	-11.7	Tension	
218	14A	221	17	20	17	20	3	6	0.484	3.10	9.4	0.098	-15.0	Tension	
219	14A	222	17	20	17	20	3	6	0.456	2.72	7.63	0.090	-15.0	Tension	
220	14A	223	23	19	23	19	3	6	0.489	3.20	11.1	0.044	-11.7	Crushing	
221	14A	224	23	19	23	19	3	6	0.489	1.45	5.0	0.030	-11.7	Shear	
222	14A	225	23	20	23	20	3	6	0.492	0.76	24.2	0.026	-11.7	Crushing	
223	14A	226	23	20	23	20	3	6	0.484	0.78	19.8	0.072	-11.7	Crushing	
224	14A	227	23	20	23	20	3	6	0.475	0.81	13.9	0.025	-11.7	Shear	
225	14A	228	23	20	23	20	3	6	0.486	2.50	26.6	0.051	-11.7	Shear	
226	14A	229	23	20	23	20	3	6	0.470	0.42	26.3	0.055	-11.7	Crushing	
227	14A	230	23	20	23	20	3	6	0.486	0.35	21.1	0.039	-11.7	Crushing	
228	14A	231	23	20	23	20	3	6	0.514	0.32	22.1	0.035	-11.7	Shear	
229	14A	232	23	21	23	21	3	6	0.522	23.90	20.5	0.081	-11.7	Shear	
230	14A	233	23	21	23	21	3	6	0.489	--	58.5	0.073	-11.7	Crushing	
231	14A	234	23	21	23	21	3	6	0.491	18.20	35.6	0.066	-11.7	Crushing	

(Continued)

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TABLE B.3 (CONTINUED)

Item No.	Material No.	Test No.	Snow Age days	Snow Age hr	Cylinder Age days	Cylinder Age hr	Diameter in.	Length in.	Specific Weight g/cm ³	Loading Rate in./min	Failure Stress psi	Deflection in.	Temperature of Air, °C	Type of Failure	Remarks
232	14A	235	23	21	23	21	3	6	0.486	13.30	35.6	0.052	-11.7	Crushing	
233	14A	237	23	21	23	21	3	6	0.503	--	20.2	0.038	-11.7	Wedge split	
234	14A	239	23	21	23	21	3	6	0.511	--	34.2	0.018	-11.7	Crushing	
235	14B	240	--	19	--	19	3	6	0.476	3.0	18.34	0.084	-6.7	Shear	
236	14B	241	--	19	--	19	3	6	0.476	3.60	14.55	0.091	-6.7	Crushing	
237	14B	243	1	19	1	19	3	6	0.423	15.50	14.6	--	-6.1	Crushing	
238	14B	246	1	19	1	19	3	6	0.398	1.35	7.0	0.284	-6.1	Compression	
239	14B	249	2	19	2	19	3	6	0.440	6.40	14.0	0.047	-10.0	Crushing	
240	14B	250	3	17	3	17	3	6	0.470	4.20	15.0	0.070	-8.3	Shear	
241	14B	251	3	17	3	17	3	6	0.428	5.00	10.5	0.180	-8.3	Shear	
242	14B	252	3	18	3	18	3	6	0.428	3.00	10.8	0.262	-8.3	Shear	
243	14B	253	3	18	3	18	3	6	0.442	2.20	14.9	0.316	-8.3	Crushing	
244	14B	254	5	18	5	18	3	6	0.428	8.70	21.8	0.077	-13.3	Crushing	
245	14B	255	5	18	5	18	3	6	0.422	4.30	11.3	0.042	-13.3	Crushing	
246	14B	256	5	18	5	18	3	6	0.459	4.00	8.6	0.069	-13.3	Shear	
247	14B	257	7	--	7	--	3	6	0.469	5.50	37.4	0.072	-11.1	Crushing	
248	14B	259	7	--	7	--	3	6	0.472	3.00	30.2	0.044	-11.1	Crushing	
249	14B	260	10	--	10	--	3	6	0.440	4.70	18.8	--	-8.8	Crushing	
250	14B	261	10	--	10	--	3	6	0.445	0.70	23.7	0.225	-8.8	Crushing	
251	14B	262	10	--	10	--	3	6	0.436	5.80	21.1	0.112	-8.8	Crushing	
252	14B	263	15	--	15	--	3	6	0.456	5.00	7.65	0.078	-11.7	Tension	
253	14B	264	15	--	15	--	3	6	0.461	3.50	12.6	0.018	-11.7	Tension	
254	14B	265	15	--	15	--	3	6	0.451	4.60	11.8	0.155	-11.7	Tension	
255	14B	266	15	--	15	--	3	6	0.429	2.50	23.1	--	-11.7	Crushing	
256	14B	267	15	--	15	--	3	6	0.456	4.00	27.4	0.109	-11.7	Crushing	
257	14B	268	15	--	15	--	3	6	0.453	1.30	16.8	0.120	-11.7	Shear	
258	14B	269	17	20	17	20	3	6	0.476	2.00	19.1	0.026	-12.2	Shear	
259	14B	270	17	20	17	20	3	6	0.421	2.50	12.3	0.037	-12.2	Crushing	
260	14B	271	17	20	17	20	3	6	0.442	0.60	30.0	0.081	-12.2	Crushing	
261	14B	272	17	20	17	20	3	6	0.479	1.40	15.6	0.103	-12.2	Tension	
262	14B	273	17	20	17	20	3	6	0.442	1.00	11.3	0.114	-12.2	Tension	

(Continued)

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TABLE B.3 (CONTINUED)

Item No.	Material No.	Test No.	Snow days	Age hr	Cylinder days	Age hr	Diameter in.	Length in.	Specific Weight g/cm ³	Loading Rate in./min	Failure Stress psi	Deflection in.	Temperature of Air, °C	Type of Failure	Remarks
263	14B	275	23	23	23	23	3	6	0.415	1.00	9.2	0.819	-12.7	Crushing	
264	14B	276	23	23	23	23	3	6	0.442	2.80	49.0	0.068	-12.7	Crushing	
265	14B	277	23	23	23	23	3	6	0.594	1.00	11.7	0.088	-12.7	Crushing	
266	14B	278	23	23	23	23	3	6	0.442	1.20	26.0	0.070	-12.7	Crushing	
267	14B	279	23	23	23	23	3	6	0.456	0.40	23.0	0.039	-12.7	Shear	
268	14B	280	23	23	23	23	3	6	0.423	0.98	20.0	0.057	-12.7	Crushing	
269	14B	281	23	23	23	23	3	6	0.429	1.20	40.6	0.088	-12.7	Crushing	
270	14B	282	23	23	23	23	3	6	0.429	1.00	25.2	0.129	-12.7	Compression	
271	14B	283	23	23	23	23	3	6	0.415	0.70	26.2	0.095	-12.7	Crushing	
272	14B	284	23	23	23	23	3	6	0.415	0.60	24.4	0.681	-12.7	Compression	
273	14B	285	24	--	24	--	3	6	0.470	1.00	47.1	0.038	-12.7	Crushing	
274	14B	286	24	--	24	--	3	6	0.456	0.70	29.3	0.100	-12.7	Crushing	
275	14B	287	24	--	24	--	3	6	0.422	4.80	39.6	0.093	-12.7	Crushing	
276	14B	288	24	--	24	--	3	6	0.442	2.50	11.4	0.032	-12.7	Crushing	
277	14B	290	24	--	24	--	3	6	0.434	2.70	41.6	0.110	-12.7	Crushing	
278	14B	292	24	1	24	1	3	6	0.415	1.30	32.8	0.086	-12.7	Shear	
279	14B	293	24	1	24	1	3	6	0.442	1.20	34.6	0.042	-12.7	Crushing	
280	14B	294	24	1	24	1	3	6	0.442	1.00	42.7	0.064	-12.7	Crushing	
281	14B	295	24	1	24	1	3	6	0.428	1.30	34.9	1.290	-12.7	Shear	
282	16	296	8	23	8	23	3	6	0.475	2.70	23.1	0.060	-8.3	Wedge split	
283	16	297	8	23	8	23	3	6	0.473	3.00	14.6	0.059	-8.3	Crushing	
284	16	298	8	23	8	23	3	6	0.470	3.90	18.6	0.069	-8.3	Crushing	
285	16	299	9	--	9	--	3	6	0.491	3.70	12.2	0.110	-8.3	Tension	
286	16	300	9	--	9	--	3	6	0.478	3.90	5.88	0.076	-13.8	Tension	
287	16	301	15	23	15	23	3	6	0.454	2.80	7.33	0.200	-13.8	Crushing	
288	16	302	15	23	15	23	3	6	0.491	1.70	35.5	0.083	-13.3	Crushing	
289	16	303	15	23	15	23	3	6	0.470	1.70	24.5	0.099	-13.3	Shear	
290	16	304	15	23	15	23	3	6	0.470	1.55	35.9	0.087	-13.3	Compression	
291	16	305	15	23	15	23	3	6	0.436	0.85	17.07	0.175	-13.3	Crushing	
292	16	306	15	23	15	23	3	6	0.467	2.45	13.1	--	-13.3	Tension	
293	16	307	15	23	15	23	3	6	0.454	3.20	41.6	--	-13.3	Crushing	

(Continued)

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TABLE B.3 (CONTINUED)

Item No.	Material No.	Test No.	Snow Age		Cylinder Age		Diameter in.	Length in.	Specific Weight g/cm³	Loading Rate in./min	Failure Stress psi		Deflection in.	Temperature of Air, °C	Type of Failure	Remarks
			days	hr	days	hr					in.	in.				
294	16	308	19	19	19	19	3	6	0.495	5.30	38.9	0.106	-8.8	Crushing		
295	16	309	19	19	19	19	3	6	0.490	2.50	39.7	0.074	-8.8	Crushing		
296	16	310	19	19	19	19	3	6	0.488	3.10	28.1	0.055	-8.8	Shear		
297	16	311	19	19	19	19	3	6	0.486	3.10	20.9	0.080	-8.8	Shear		
298	16	312	19	19	19	19	3	6	0.485	2.80	15.6	0.053	-8.8	Tension		
299	16	313	19	19	19	19	3	6	0.484	1.90	13.2	0.093	-8.8	Crushing		
300	18	314	20	22	20	22	3	6	0.472	1.60	33.4	0.103	-12.2	Crushing		
301	18	315	20	22	20	22	3	6	0.500	1.95	37.6	0.036	-12.2	Crushing		
302	18	316	20	22	20	22	3	6	0.511	9.25	45.9	0.044	-12.2	Crushing		
303	18	317	20	22	20	22	3	6	0.513	7.25	21.5	0.081	-12.2	Tension		
304	18	318	20	22	20	22	3	6	0.509	6.60	25.2	0.090	-12.2	Tension		
305	18	319	20	22	20	22	3	6	0.502	5.50	14.4	0.070	-12.2	Tension		
306	19	320	3	22	3	22	3	6	0.384	3.18	19.0	0.088	-16.7	Crushing		
307	19	321	3	22	3	22	3	6	0.406	3.85	16.6	0.040	-16.7	Crushing		
308	19	322	3	22	3	22	3	6	0.401	8.25	22.6	0.120	-16.7	Crushing		
309	19	323	3	22	3	22	3	6	0.398	12.60	13.55	0.165	-16.7	Crushing		
310	19	324	3	22	3	22	3	6	3.82	2.85	8.99	0.160	-16.7	Crushing		
311	19	325	3	22	3	22	3	6	0.379	3.00	2.86	0.108	-16.7	Crushing		
312	19	326	6	19	6	19	3	6	0.351	5.98	11.7	0.107	-11.1	Crushing		
313	19	327	6	19	6	19	3	6	0.387	2.70	8.5	0.032	-11.1	Crushing		
314	19	328	6	19	6	19	3	6	0.403	0.63	16.1	0.040	-11.1	Crushing		
315	19	329	6	19	6	19	3	6	0.393	3.20	6.1	0.039	-11.1	Crushing		
316	19	330	6	19	6	19	3	6	0.398	0.70	5.9	0.050	-11.1	Crushing		
317	19	331	6	19	6	19	3	6	0.398	1.41	12.7	0.017	-11.1	Tension		
318	19	332	7	19	7	19	3	6	0.454	7.56	5.6	0.081	-11.1	Crushing		
319	19	333	7	19	7	19	3	6	0.434	7.08	40.1	0.088	-11.1	Crushing		
320	19	334	7	19	7	19	3	6	0.409	5.60	23.1	0.040	-11.1	Crushing		
321	19	335	7	19	7	19	3	6	0.390	3.20	19.9	0.083	-11.1	Crushing		
322	19	336	7	20	7	20	3	6	0.387	2.92	10.8	0.137	-11.1	Tension		
323	19	337	7	20	7	20	3	6	0.384	1.50	5.90	0.110	-11.1	Crushing		

(Continued)

TABLE B.3 (CONTINUED)

Item No.	Material No.	Test No.	Rough Sample				Cylinder Age days	Diameter in.	Length in.	Specific Weight lb/cm³	Loading Rate in./min	Failure Stress psi	Deflection in.	Temperature °C			Type of Failure	Remarks
			Snow days	Age hr	days	hr								Air	Snow			
324	20	1	284	15-3/4	--	1/2	--	1/4	2-3/4	6	0.465	3.89	7.77	0.1250	-9	-10	Tension	Horizontal position
325	20	2	284	15-3/4	--	1/2	--	1/4	2-3/4	6	0.465	3.89	6.37	0.0480	-9	-10	Tension	Horizontal position
326	20	4	284	16	--	1/2	--	1/2	2-3/4	6	0.486	3.89	17.0	0.0460	-9	-10	Tension	Crushing at base first
327	20	5	284	16	--	1/2	--	1/2	2-3/4	6	0.453	3.89	16.0	0.0260	-9	-10	Compression	
328	20	6	284	16-1/4	--	1/2	--	3/4	2-3/4	6	0.476	3.89	16.8	0.0180	-9	-10	Compression	
329	20	7	284	16-1/4	--	1/2	--	3/4	2-3/4	6	0.505	3.89	46.4	0.0000	-9	-10	Crushing	Collins gage hung up during first of test
330	20	8	284	15-3/4	--	1/2	--	1/4	2-3/4	6	0.512	3.89	43.0	0.0320	-9	-10	Tension	Crushing first
331	20	9	284	16-1/4	--	1/2	--	3/4	2-3/4	6	0.424	3.89	6.56	0.0370	-9	-10	Compression	
332	20	10	284	16-1/4	--	1/2	--	3/4	2-3/4	6	0.480	3.89	27.0	0.0340	-9	-10	Compression	Specimen slip during test
333	20	11	284	16-1/2	--	1/2	--	1	2-3/4	6	0.465	3.89	18.3	0.0410	-9	-10	Compression	
334	20	12	284	16-1/2	--	1/2	--	1	2-3/4	6	0.465	3.89	21.5	0.1050	-9	-10	Crushing	At top
335	20	13	285	8	--	1/2	--	1/2	2-3/4	6	0.445	3.89	17.5	0.0550	-12	-14	Compression	
336	20	14	285	8	--	1/2	--	1/2	2-3/4	6	0.455	3.89	18.2	0.0270	-12	-14	Compression	
337	20	15	285	8	--	1/2	--	1/2	2-3/4	6	0.445	3.89	18.5	0.0550	-12	-14	Crushing	At base
338	20	16	285	8	--	1/2	--	1/2	2-3/4	6	0.445	3.89	24.4	0.0470	-12	-14	Tension	
339	20	17	285	8-1/4	--	1/2	--	3/4	2-3/4	6	0.420	3.89	12.6	0.0000	-12	-14	Compression	Record very poor
340	20	18	285	8-1/4	--	1/2	--	3/4	2-3/4	6	0.445	3.89	12.1	0.0080	-12	-14	Crushing	At base
341	20	19	285	8-1/4	--	1/2	--	3/4	2-3/4	6	0.485	3.89	25.0	0.0110	-12	-14	Crushing	At top
342	20	20	285	8-1/4	--	1/2	--	3/4	2-3/4	6	0.435	3.89	35.5	0.0000	-12	-14	Compression	Record very poor
343	20	21	285	8-1/4	--	1/2	--	3/4	2-3/4	6	0.418	3.89	7.75	0.0470	-12	-14	Crushing	At base
344	20	22	285	8-1/4	--	1/2	--	3/4	2-3/4	6	0.488	3.89	5.10	0.1240	-12	-14	Tension	Horizontal position, 1 in. = 50 lb
345	20	23	285	8-1/2	--	1/2	--	1	2-3/4	6	0.462	3.89	12.73	0.1250	-12	-14	Tension	Horizontal position, 1 in. = 50 lb
346	20	25	287	11-1/4	--	1	--	3/4	2-3/4	6	0.434	3.82	12.18	0.0960	-10	-10	Tension	Horizontal position, 1 in. = 50 lb
347	20	26	287	11-1/4	--	1	--	3/4	2-3/4	6	0.405	3.89	10.89	0.1470	-10	-10	Tension	Horizontal position, 1 in. = 100 lb
348	20	27	287	11-1/4	--	1	--	3/4	2-3/4	6	0.400	3.89	7.00	0.1040	-10	-10	Tension	Horizontal position, 1 in. = 100 lb
349	20	28	287	11-1/2	--	1-1/2	--	1	2-3/4	6	0.425	3.89	12.3	0.1260	-10	-10	Crushing	At top
350	20	29	287	11-1/2	--	1-1/2	--	1	2-3/4	6	0.436	3.89	23.9	0.0720	-10	-10	Tension	
351	20	30	287	11-1/2	--	1-1/2	--	1	2-3/4	6	0.420	3.89	26.4	0.0690	-10	-10	Tension	Crushing first
352	20	31	287	11-1/2	--	1	--	1	2-3/4	6	0.425	3.89	29.0	0.0660	-10	-10	Compression	
353	20	32	287	11-1/2	--	1	--	1	2-3/4	6	0.402	3.89	13.5	0.0610	-10	-10	Compression	
354	20	33	287	11-1/2	--	1	--	1	2-3/4	6	0.428	3.89	15.6	0.0298	-10	-10	Crushing	At base
355	20	34	287	11-3/4	--	1	--	1-1/4	2-3/4	6	0.441	3.89	23.6	0.0510	-10	-10	Crushing	At top
356	20	35	287	10-3/4	--	1	--	1/4	2-3/4	6	0.418	3.89	14.5	0.0380	-10	-10	Crushing	At top
357	20	36	287	10-3/4	--	1	--	1/4	2-3/4	6	0.390	3.89	18.0	0.0685	-10	-10	Compression	
358	20	37	288	12-1/2	--	1/4	--	2-1/4	2-3/4	6	0.480	3.89	11.08	0.1410	-9	-10	Tension	Horizontal position
359	20	38	288	12-3/4	--	1/4	--	2-1/2	2-3/4	6	0.460	3.89	9.55	0.1075	-9	-10	Tension	Horizontal position

(Continued)

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Table (Continued)

Cylinder Tests
Greenland 1962

TABLE B.3 (CONTINUED)

Item No.	Material No.	Test No.	Rough Sample				Diameter in.	Length in.	Specific Weight g/cm³	Loading Rate in./min	Failure Stress psi	Deflection in.	Temperature °C			Remarks		
			Snow days	Age hr	Age days	hr							Air	Snow	Type of Failure			
360	20	40	288	13	--	1/4	--	2-3/4	2-3/4	6	0.436	3.89	26.6	0.0540	-9	-10	Crushing	At base
361	20	41	288	13	--	1/4	--	2-3/4	2-3/4	6	0.480	3.89	28.8	0.0630	-9	-10	Compression	
362	20	42	288	13	--	1/4	--	2-3/4	2-3/4	6	0.458	3.89	30.0	0.0665	-9	-7	Tension	Crushing at first
363	20	43	288	13	--	1/4	--	2-3/4	2-3/4	6	0.462	3.89	16.3	0.1840	-9	-7	Crushing	At top
364	20	44	288	13	--	1/4	--	2-3/4	2-3/4	6	0.462	3.89	27.8	0.1260	-9	-7	Tension	Crushing first
365	20	45	288	13	--	1/4	--	2-3/4	2-3/4	6	0.460	3.89	22.4	0.0750	-9	-7	Crushing	At top
366	20	46	288	13-1/4	--	1/4	--	3	2-3/4	6	0.464	3.89	33.0	0.0840	-9	-7	Compression	
367	20	47	288	13-1/4	--	1/4	--	3	2-3/4	6	0.432	3.89	10.1	0.0370	-9	-7	Compression	
368	20	48	288	13-1/4	--	1/4	--	3	2-3/4	6	0.467	3.89	30.0	0.0940	-9	-7	Compression	
369	20	49	289	8-1/4	4	20-1/4	--	1/2	2-3/4	6	0.407	3.89	18.0	0.0840	-10	-10	Compression	At top
370	20	50	289	8-1/4	4	20-1/4	--	1/2	2-3/4	6	0.385	3.89	9.76	0.0610	-10	-10	Compression	
371	20	51	289	8-1/4	4	20-1/4	--	1/2	2-3/4	6	0.430	3.89	26.4	0.1390	-10	-10	Crushing	At base
372	20	52	289	8-1/2	4	20-1/4	--	3/4	2-3/4	6	0.410	3.89	22.4	0.0610	-10	-10	Compression	
373	20	53	289	8-1/2	4	20-1/4	--	3/4	2-3/4	6	0.426	3.89	25.6	0.0590	-10	-10	Compression	
374	20	54	289	8-1/2	4	20-1/4	--	3/4	2-3/4	6	0.444	3.89	35.0	0.0800	-10	-10	Tension	Crushing first
375	20	55	289	8-1/2	4	20-1/4	--	3/4	2-3/4	6	0.410	3.89	24.1	0.0740	-10	-10	Tension	Crushing first
376	20	56	289	8-1/2	4	20-1/4	--	3/4	2-3/4	6	0.414	3.89	21.0	0.0720	-10	-10	Tension	
377	20	58	289	8-3/4	4	20-1/4	--	1	2-3/4	6	0.430	3.89	4.40	0.1800	-10	-10	Tension	Horizontal position
378	20	59	289	8-3/4	4	20-1/4	--	1	2-3/4	6	0.438	3.89	8.60	0.1260	-10	-10	Tension	Horizontal position
379	20	60	289	8-3/4	4	20-1/4	--	1	2-3/4	6	0.415	3.89	15.20	0.0820	-10	-10	Tension	Horizontal position
380	21	1	283	17	--	6-1/2	--	2-1/2	2-3/4	6	0.473	3.82	16.0	0.0640	-9	-12	Crushing	At base
381	21	2	283	17	--	6-1/2	--	2-1/2	2-3/4	6	0.436	3.82	18.9	0.1090	-9	-12	Crushing	At base
382	21	4	283	17	--	6-1/2	--	2-1/2	2-3/4	6	0.447	3.82	13.6	0.1280	-9	-12	Compression	
383	21	5	283	17	--	6-1/2	--	2-1/2	2-3/4	6	0.444	3.82	11.4	0.0280	-9	-12	Crushing	
384	21	6	283	17-1/4	--	6-1/2	--	2-3/4	2-3/4	6	0.435	3.82	8.6	0.0820	-9	-12	Crushing	At top
385	21	7	283	17-1/4	--	6-1/2	--	2-3/4	2-3/4	6	0.425	3.82	19.9	0.0820	-9	-12	Crushing	At top
386	21	8	283	17-1/4	--	6-1/2	--	2-3/4	2-3/4	6	0.403	3.82	4.4	0.0060	-9	-12	Compression	
387	21	9	283	17-1/4	--	6-1/2	--	2-3/4	2-3/4	6	0.425	3.82	14.1	0.0870	-9	-12	Crushing	Poor specimen
388	21	11	283	17-1/2	--	6-1/2	--	3	2-3/4	6	0.413	3.82	3.82	0.1840	-9	-12	Tension	Horizontal position
389	21	12	283	17-1/2	--	6-1/2	--	3	2-3/4	6	0.431	3.82	6.37	0.1800	-9	-12	Tension	Horizontal position
390	21	13	284	14-1/4	--	3-1/2	--	1-3/4	2-3/4	6	0.495	3.82	16.0	0.0600	-9	-11	Compression	
391	21	14	284	14-1/4	--	3-1/2	--	1-3/4	2-3/4	6	0.521	3.82	29.8	0.0400	-9	-11	Compression	
392	21	15	284	14-1/4	--	3-1/2	--	1-3/4	2-3/4	6	0.499	3.82	13.1	0.1650	-9	-11	Crushing	Then tension at top
393	21	16	284	14-1/4	--	3-1/2	--	1-3/4	2-3/4	6	0.524	3.82	19.4	0.1280	-9	-11	Tension	Crushing first
394	21	17	284	14-1/4	--	3-1/2	--	1-3/4	2-3/4	6	0.490	3.82	21.0	0.1840	-9	-11	Compression	
395	21	18	284	14-1/4	--	3-1/2	--	1-3/4	2-3/4	6	0.516	3.82	40.0	0.0670	-9	-11	Crushing	At base
396	21	19	284	14-1/2	--	3-1/2	--	2	2-3/4	6	0.522	3.82	48.1	0.0510	-9	-11	Tension	Crushing first

(Continued)

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TABLE B.3 (CONTINUED)

Item No.	Material No.	Test No.	Rough Sample				Diameter in.	Length in.	Specific Weight g/cm³	Loading Rate in./min	Failure Stress psi	Deflection in.	Temperature °C			Type of Failure	Remark	
			Snow days	Age hr	Age days	Cylinder hr							Air	Snow				
397	21	20	284	14-1/2	--	3-1/2	--	2	2-3/4	6	0.501	3.82	21.2	0.0610	-9	-11	Compression	
398	21	21	284	14-1/2	--	3-1/2	--	2	2-3/4	6	0.520	3.82	50.5	0.0440	-9	-11	Tension	Crushing first
399	21	22	284	14-3/4	--	3-1/2	--	2-1/4	2-3/4	6	0.490	3.82	6.75	0.0970	-9	-11	Tension	Horizontal position
400	21	23	284	14-3/4	--	3-1/2	--	2-1/4	2-3/4	6	0.504	3.82	8.09	1.3000	-9	-11	Tension	Horizontal position
401	21	24	284	14-3/4	--	3-1/2	--	2-1/4	2-3/4	6	0.480	3.82	11.21	0.1820	-9	-11	Tension	Horizontal position, twin failure planes
402	21	25	286	15-1/4	--	23	--	2-1/4	2-3/4	6	0.444	3.82	24.2	0.0530	-9	-10	Compression	
403	21	26	286	15-1/2	--	23	--	2-1/2	2-3/4	6	0.442	3.82	34.6	0.0430	-9	-8	Compression	
404	21	27	286	15-1/2	--	23	--	2-1/2	2-3/4	6	0.449	3.82	35.4	0.0590	-9	-8	Crushing	At base
405	21	28	286	15-1/2	--	23	--	2-1/2	2-3/4	6	0.440	3.82	27.0	0.1170	-9	-8	Compression	
406	21	29	286	15-1/2	--	23	--	2-1/2	2-3/4	6	0.439	3.82	25.9	0.0630	-9	-8	Tension	Crushing first
407	21	30	286	15-3/4	--	23	--	2-3/4	2-3/4	6	0.437	3.82	32.0	0.0670	-9	-8	Crushing	At base
408	21	31	286	15-3/4	--	23	--	2-3/4	2-3/4	6	0.425	3.82	22.9	0.0570	-9	-8	Compression	
409	21	32	286	15-3/4	--	23	--	2-3/4	2-3/4	6	0.442	3.82	32.0	0.0900	-9	-8	Tension	Crushing at top first
410	21	33	286	15-3/4	--	23	--	2-3/4	2-3/4	6	0.433	3.82	30.2	0.0430	-9	-8	Tension	Crushing at base first
411	21	34	286	16	--	23	--	3	2-3/4	6	0.433	3.82	10.0	0.1550	-9	-8	Tension	Horizontal position
412	21	35	286	16	--	23	--	3	2-3/4	6	0.444	3.82	9.23	0.1180	-9	-8	Tension	Horizontal position
413	21	36	286	16	--	23	--	3	2-3/4	6	0.446	3.82	10.19	0.1260	-9	-8	Tension	Horizontal position, poor record
414	21	38	295	14-1/4	--	23	--	1-1/4	2-3/4	6	0.498	3.89	10.33	0.1400	-10	-8	Tension	Horizontal position
415	21	39	295	14-1/4	--	23	--	1-1/4	2-3/4	6	0.471	3.89	5.56	0.0760	-10	-8	Tension	Horizontal position
416	21	40	295	14-1/2	--	23	--	1-1/2	2-3/4	6	0.493	3.89	28.30	0.0320	-10	-8	Tension	Crushing at top first
417	21	41	295	14-1/2	--	23	--	1-1/2	2-3/4	6	0.488	3.89	18.50	0.0460	-10	-8	Compression	
418	21	42	295	14-1/2	--	23	--	1-1/2	2-3/4	6	0.495	3.89	23.55	0.0240	-10	-8	Compression	
419	21	43	295	14-1/2	--	23	--	1-1/2	2-3/4	6	0.440	3.89	5.90	0.0350	-10	-8	Compression	
420	21	44	295	14-1/2	--	23	--	1-1/2	2-3/4	6	0.488	3.89	15.81	0.1540	-10	-8	Compression	
421	21	45	295	14-1/2	--	23	--	1-1/2	2-3/4	6	0.476	3.89	19.18	0.0300	-10	-8	Compression	
422	21	46	295	14-1/2	--	23	--	1-1/2	2-3/4	6	0.493	3.89	13.80	0.0210	-10	-8	Compression	
423	21	47	295	14-3/4	--	23	--	1-3/4	2-3/4	6	0.491	3.89	12.30	0.1320	-10	-8	Crushing	At base
424	21	48	295	14-3/4	--	23	--	1-3/4	2-3/4	6	0.481	3.89	25.70	0.0450	-10	-8	Compression	
425	22	2	9	16	--	3	--	2	2-3/4	6	0.512	3.82	12.1	0.0180	-5	-12	Compression	
426	22	3	9	16-1/4	--	3	--	2-1/4	2-3/4	6	0.514	3.82	14.3	0.0160	-9	-12	Tension	Crushing first
427	22	4	9	16-1/4	--	3	--	2-1/4	2-3/4	6	0.486	3.82	30.4	0.0750	-9	-12	Crushing	At top
428	22	5	9	16-1/4	--	3	--	2-1/4	2-3/4	6	0.505	3.82	32.2	0.0410	-9	-12	Crushing	At base, then tension
429	22	6	9	16-1/4	--	3	--	2-1/4	2-3/4	6	0.483	3.82	14.8	0.0670	-9	-12	Compression	At top
430	22	7	9	16-1/2	--	3	--	2-1/2	2-3/4	6	0.495	3.82	13.5	0.0850	-9	-12	Compression	At top
431	22	8	9	16-1/2	--	3	--	2-1/2	2-3/4	6	0.485	3.82	12.95	0.0320	-9	-11	Tension	
432	22	9	9	16-1/2	--	3	--	2-1/2	2-3/4	6	0.522	3.82	35.4	0.0630	-9	-11	Tension	
433	22	10	9	16-3/4	--	3	--	2-3/4	2-3/4	6	0.522	3.82	10.06	0.1230	-9	-11	Tension	In horizontal position

(Continued)

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TABLE B.3 (CONTINUED)

Item No.	Material No.	Test No.	Rough Sample				Cylinder Age days	Diameter in.	Length in.	Specific Weight g/cm³	Loading Rate in./min.	Failure Stress psi	Deflection in.	Temperature °C			Type of Failure	Remarks
			Snow days	Age hr	days	hr								Air	Snow			
434	22	11	9	16-3/4	--	3	--	2-3/4	2-3/4	6	0.503	3.82	2.20	0.0660	-9	-11	Tension	In horizontal position
435	22	13	10	16-1/4	--	--	--	1/2	2-3/4	6	0.518	3.82	14.8	0.0720	-10	-10	Compression	
436	22	14	10	16-1/2	--	--	--	1/2	2-3/4	6	0.528	3.82	17.35	0.0460	-10	-10	Compression	
437	22	15	10	16-1/2	--	--	--	1/2	2-3/4	6	0.519	3.82	14.7	0.0930	-10	-10	Cone compression	
438	22	16	10	16-1/2	--	--	--	3/4	2-3/4	6	0.520	3.82	8.43	0.0110	-10	-10	Crushing	At top
439	22	17	10	16-1/2	--	--	--	3/4	2-3/4	6	0.514	3.82	14.2	0.0205	-10	-10	Cone compression	
440	22	18	10	16-1/2	--	--	--	3/4	2-3/4	6	0.530	3.82	16.8	0.0185	-10	-10	Tension	
441	22	19	10	16-1/2	--	--	--	3/4	2-3/4	6	0.530	3.82	16.8	0.0210	-10	-10	Compression then tension	
442	22	20	10	16-1/2	--	--	--	3/4	2-3/4	6	0.530	3.82	18.5	0.0390	-10	-10	Compression	
443	22	21	10	16-3/4	--	--	--	3/4	2-3/4	6	0.531	3.82	21.2	0.0420	-10	-10	Tension	
444	22	23	10	17	--	--	--	1	2-3/4	6	0.536	3.82	6.22	0.0880	-10	-10	Tension	In horizontal position
445	22	24	10	17	--	--	--	1	2-3/4	6	0.527	3.82	7.65	0.1060	-10	-10	Tension	In horizontal position
446	22	25	10	17	--	1	--	1-1/4	2-3/4	6	0.540	3.82	5.78	0.0840	-10	-10	Tension	In horizontal position
447	22	26	15	14	--	1/4	--	1/4	2-3/4	6	0.465	3.82	18.35	0.0570	-10	-10	Compression	
448	22	27	15	14	--	1/4	--	1/4	2-3/4	6	0.457	3.82	13.5	0.0470	-10	-10	Compression	
449	22	28	15	14-1/4	--	1/4	--	1/2	2-3/4	6	0.461	3.82	14.1	0.0580	-10	-10	Compression	
450	22	29	15	14-1/4	--	1/4	--	1/2	2-3/4	6	0.461	3.82	17.7	0.0450	-10	-10	Compression	
451	22	30	15	14-1/4	--	1/4	--	1/2	2-3/4	6	0.452	3.82	13.0	0.0900	-10	-10	Compression	
452	22	31	15	14-1/4	--	1/4	--	1/2	2-3/4	6	0.446	3.82	10.45	0.0470	-10	-10	Compression	
453	22	32	15	14-1/4	--	1/4	--	1/2	2-3/4	6	0.471	3.82	18.2	0.0460	-10	-10	Compression	
454	22	33	15	14-1/4	--	1/4	--	1/2	2-3/4	6	0.446	3.82	15.0	0.0520	-10	-10	Compression	
455	22	34	15	14-1/4	--	1/4	--	1/2	2-3/4	6	0.479	3.82	17.35	0.0630	-10	-10	Compression then tension	
456	22	35	15	14-1/2	--	1/4	--	3/4	2-3/4	6	0.464	3.82	6.07	0.1080	-10	-10	Tension	In horizontal position
457	22	36	15	14-1/2	--	1/4	--	3/4	2-3/4	6	0.459	3.82	7.18	0.0340	-10	-10	Tension	In horizontal position
458	22	37	15	14-1/2	--	1/4	--	3/4	2-3/4	6	0.456	3.82	9.18	0.1120	-10	-10	Tension	In horizontal position
459	22	38	16	11	--	20	--	1-1/2	2-3/4	6	0.456	3.89	13.7	0.0460	-10	-8	Compression	
460	22	39	16	11	--	20	--	1-1/2	2-3/4	6	0.479	3.89	23.1	0.0470	-10	-8	Crushing	At top
461	22	40	16	11	--	20	--	1-1/2	2-3/4	6	0.477	3.89	13.15	0.0370	-10	-8	Compression	
462	22	41	16	11-1/4	--	20	--	1-3/4	2-3/4	6	0.453	3.89	15.0	0.0560	-10	-8	Compression	
463	22	42	16	11-1/4	--	20	--	1-3/4	2-3/4	6	0.469	3.89	21.0	0.0640	-10	-8	Tension	Crushing first
464	22	43	16	11-1/4	--	20	--	1-3/4	2-3/4	6	0.471	3.89	16.35	0.0520	-10	-8	Shear	60° angle
465	22	44	16	11-1/4	--	20	--	1-3/4	2-3/4	6	0.513	3.89	20.2	0.0270	-10	-8	Compression	
466	22	45	16	11-1/4	--	20	--	1-3/4	2-3/4	6	0.469	3.89	18.85	0.0450	-10	-8	Compression	
467	22	46	16	11-1/4	--	20	--	1-3/4	2-3/4	6	0.471	3.89	15.5	0.0690	-10	-8	Crushing	At top
468	22	47	16	11-1/2	--	20	--	2	2-3/4	6	0.484	3.89	5.98	0.0990	-10	-8	Tension	In horizontal position
469	22	48	16	11-1/2	--	1/2	--	2	2-3/4	6	0.464	3.89	6.18	0.1000	-10	-9	Tension	In horizontal position

(Continued)

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TABLE B.3 (CONTINUED)

Item No.	Material No.	Test No.	Rough Sample						Specific Weight g/cm³	Loading Rate in./min	Failure Stress psi	Deflection in.	Temperature °C			Remarks		
			Snow days	Age hr	Age days	Age hr	Cylinder days	Diameter hr					Air	Snow	Type of Failure			
470	22	49	16	11-1/2	--	1/2	--	2	2-3/4	6	0.471	3.89	7.33	0.1400	-10	-9	Tension	In horizontal position
471	22	50	17	13	--	1	--	2	2-3/4	6	0.452	3.89	4.35	0.1160	-9	-9	Tension	In horizontal position
472	22	51	17	13	--	1	--	2	2-3/4	6	0.413	3.89	5.55	0.1510	-9	-9	Tension	In horizontal position
473	22	52	17	13	--	1	--	2	2-3/4	6	0.462	3.89	4.99	0.1130	-9	-9	Tension	In horizontal position
474	22	54	17	13-1/4	--	1	--	2-1/4	2-3/4	6	0.452	3.89	11.25	0.0950	-9	-9	Crushing	At base
475	22	55	17	13-1/4	--	1	--	2-1/4	2-3/4	6	0.438	3.89	18.2	0.0390	-9	-9	Compression	
476	22	56	17	13-1/4	--	1	--	2-1/4	2-3/4	6	0.434	3.89	18.85	0.0930	-9	-9	Tension	
477	22	57	17	13-1/4	--	1	--	2-1/4	2-3/4	6	0.424	3.89	12.65	0.0330	-9	-9	Compression	
478	22	58	17	13-1/2	--	1	--	2-1/2	2-3/4	6	0.440	3.89	23.1	0.0950	-9	-9	Compression	
479	22	59	17	13-1/2	--	1	--	2-1/2	2-3/4	6	0.440	3.89	18.5	0.0930	-9	-8	Compression	
480	22	61	17	13-1/2	--	1	--	2-1/2	2-3/4	6	0.474	3.89	18.7	0.0280	-9	-8	Tension	Crushing
481	22	62	18	13	--	22-1/2	--	3-1/2	2-3/4	6	0.522	3.89	37.1	0.0450	-10	-12	Crushing	At top
482	22	63	18	13-1/2	--	22-1/2	--	3-3/4	2-3/4	6	0.524	3.89	16.2	0.0520	-10	-12	Compression	
483	22	64	18	13-1/2	--	22-1/2	--	4	2-3/4	6	0.473	3.89	20.6	0.0795	-10	-12	Compression	
484	22	65	18	13-1/2	--	22-1/2	--	4	2-3/4	6	0.493	3.89	23.6	0.0640	-10	-12	Compression	
485	22	66	18	13-1/2	--	22-1/2	--	4	2-3/4	6	0.471	3.89	16.0	0.0630	-10	-12	Tension	
486	22	67	18	13-1/2	--	1-1/2	--	4	2-3/4	6	0.511	3.89	22.3	0.1405	-10	-12	Crushing	
487	22	68	18	13-1/2	--	1-1/2	--	4	2-3/4	6	0.513	3.89	21.5	0.0490	-10	-12	Compression	
488	22	69	18	13-1/2	--	1-1/2	--	4	2-3/4	6	0.482	3.89	14.3	0.0590	-10	-12	Compression	
489	22	70	18	13-3/4	--	1-1/2	--	4-1/4	2-3/4	6	0.507	3.89	18.2	0.0550	-10	-12	Crushing then tension	
490	22	71	18	13-3/4	--	1-1/2	--	4-1/4	2-3/4	6	0.527	3.89	9.62	0.0620	-10	-12	Tension	In horizontal position
491	22	72	18	13-3/4	--	1-1/2	--	4-1/4	2-3/4	6	0.513	3.89	8.66	0.1640	-10	-12	Tension	In horizontal position
492	22	73	18	14	--	1-1/2	--	4-1/2	2-3/4	6	0.511	3.89	5.10	0.1060	-10	-12	Tension	In horizontal position
493	22	74	21	14-1/2	--	1/4	--	1-3/4	2-3/4	6	0.521	3.89	4.06	0.0440	-5	-10	Tension	In horizontal position
494	22	76	21	15	--	1/4	--	2-1/4	2-3/4	6	0.523	3.89	25.6	0.0845	-5	-10	Tension	In horizontal position
495	22	77	21	15	--	1/4	--	2-1/4	2-3/4	6	0.514	3.89	22.4	0.0485	-8	-10	Tension	Crushing first
496	22	78	21	15	--	1/4	--	2-1/4	2-3/4	6	0.479	3.89	44.8	0.0390	-8	-10	Tension	Crushing at top
497	22	79	21	15-1/4	--	1/4	--	2-1/2	2-3/4	6	0.519	3.89	33.0	0.0450	-8	-10	Compression	
498	22	80	21	15-1/4	--	1/4	--	2-1/2	2-3/4	6	0.507	3.89	60.5	0.0500	-8	-10	Tension	
499	22	81	21	15-1/4	--	1/4	--	2-1/2	2-3/4	6	0.526	3.89	57.0	0.0270	-8	-10	Tension	Crushing first
500	22	82	21	15-1/4	--	1/4	--	2-1/2	2-3/4	6	0.514	3.89	26.3	0.0250	-8	-10	Crushing	At top
501	22	83	21	15-1/4	--	1/4	--	2-1/2	2-3/4	6	0.523	3.89	65.0	0.0800	-8	-10	Crushing	Slid out (at base)
502	22	84	21	15-1/4	--	1/4	--	2-1/2	2-3/4	6	0.511	3.89	16.15	0.0350	-8	-10	Compression	
503	22	85	21	15-1/4	--	1/4	--	2-1/2	2-3/4	6	0.511	3.89	38.8	0.0330	-10	-8	Compression	
504	22	87	22	14-1/4	2	1-1/2	--	3/4	2-3/4	6	0.510	3.89	13.45	0.0240	-10	-8	Tension	Crushing at top
505	22	88	23	13-1/2	2	21	--	4-1/2	2-3/4	6	0.514	3.89	10.9	0.0760	-10	-10	Compression	

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TABLE B.3 (CONTINUED)

Item No.	Material No.	Test No.	Rough Sample				Specific Weight g/cm³	Loading Rate in./min	Failure Stress psi	Deflection in.	Temperature °C		Type of Failure	Remarks				
			Snow days	Age hr	days	Age hr					Air	Snow						
506	22	89	23	13-1/2	2	21	--	4-1/2	2-3/4	6	0.515	3.89	40.4	0.0470	-10	-10	Crushing	At top
507	22	90	23	13-1/2	2	21	--	4-1/2	2-3/4	6	0.456	3.89	17.4	0.0640	-10	-10	Tension	Crushing first
508	22	91	23	13-1/2	2	21	--	4-1/2	2-3/4	6	0.476	3.89	22.1	0.0710	-10	-10	Compression	
509	22	92	23	13-1/2	2	21	--	4-1/2	2-3/4	6	0.503	3.89	23.7	0.0370	-10	-10	Compression	
510	22	93	23	13-1/2	2	21	--	4-1/2	2-3/4	6	0.471	3.89	7.41	0.0210	-10	-10	Compression	
511	22	94	23	13-3/4	2	21	--	4-3/4	2-3/4	6	0.504	3.89	20.85	0.0920	-10	-10	Crushing	At base
512	22	95	23	13-3/4	2	21	--	4-3/4	2-3/4	6	0.526	3.89	32.8	0.1240	-10	-10	Compression	
513	22	96	23	13-3/4	2	21	--	4-3/4	2-3/4	6	0.470	3.89	14.6	0.0440	-10	-10	Compression	
514	22	97	23	13-3/4	2	21	--	4-3/4	2-3/4	6	0.474	3.89	11.32	0.0610	-10	-10	Tension	In horizontal position
515	22	98	23	14	2	21	--	5	2-3/4	6	0.474	3.89	4.83	0.0870	-10	-10	Tension	In horizontal position
516	22	99	23	14	2	21	--	5	2-3/4	6	0.498	3.89	8.03	0.0900	-10	-8	Tension	In horizontal position
517	22	100	24	10-1/2	3	22	--	1/2	2-3/4	6	0.494	3.80	11.6	0.0080	-12	-12	Crushing	At top
518	22	101	24	10-1/2	3	22	--	1/2	2-3/4	6	0.504	3.80	25.2	0.0380	-12	-12	Tension	Crushing first
519	22	102	24	10-3/4	3	22	--	3/4	2-3/4	6	0.491	3.80	23.8	0.0150	-12	-12	Compression	
520	22	103	24	10-3/4	3	22	--	3/4	2-3/4	6	0.507	3.80	21.0	0.0730	-12	-12	Crushing and tension	Crushing at base, then tension
521	22	104	24	10-3/4	3	22	--	3/4	2-3/4	6	0.506	3.80	26.2	0.0420	-12	-12	Crushing and shear	At top 60°
522	22	105	24	10-3/4	3	22	--	3/4	2-3/4	6	0.512	3.80	31.4	0.0550	-11	-12	Compression	
523	22	106	24	10-3/4	3	22	--	3/4	2-3/4	6	0.479	3.80	20.7	0.1220	-11	-12	Crushing	At base, slid out
524	22	107	24	10-3/4	3	22	--	3/4	2-3/4	6	0.470	3.80	15.8	0.0750	-11	-12	Compression	In middle, poor specimen
525	22	108	24	11	3	22	--	1	2-3/4	6	0.515	3.80	34.1	0.0720	-11	-12	Compression	
526	22	109	24	11	3	22	--	1	2-3/4	6	0.481	3.80	6.49	0.0920	-11	-12	Tension	In horizontal position
527	22	110	24	11	3	22	--	1	2-3/4	6	0.495	3.80	9.07	0.0590	-11	-12	Tension	In horizontal position
528	22	111	24	11-1/4	3	22	--	1-1/4	2-3/4	6	0.482	3.80	8.65	0.0930	-11	-12	Tension	In horizontal position
529	22	112	25	13-1/4	--	2	--	2-1/4	2-3/4	6	0.512	4.02	29.62	0.0635	-11	-11	Crushing	At top
530	22	113	25	13-1/4	--	2	--	2-1/4	2-3/4	6	0.507	4.02	25.58	0.0515	-11	-11	Compression	
531	22	114	25	13-1/4	--	2	--	2-1/4	2-3/4	6	0.486	4.02	23.2	0.0680	-11	-11	Compression	
532	22	115	25	13-1/4	--	2	--	2-1/4	2-3/4	6	0.518	4.02	25.5	0.0290	-11	-11	Crushing	At base
533	22	116	25	13-1/4	--	2	--	2-1/4	2-3/4	6	0.501	4.02	12.6	0.0320	-11	-11	Crushing	At top
534	22	118	25	13-1/2	--	2	--	2-1/2	2-3/4	6	0.513	4.02	50.3	0.0540	-11	-11	Tension	Crushing first
535	22	119	25	13-1/2	--	2	--	2-1/2	2-3/4	6	0.498	4.02	27.4	0.0755	-11	-11	Crushing	At top, specimen tilted
536	22	121	25	13-1/2	--	2	--	2-1/2	2-3/4	6	0.501	4.02	5.21	0.0465	-11	-11	Tension	In horizontal position
537	22	122	25	13-1/2	--	2	--	2-1/2	2-3/4	6	0.500	4.02	7.96	0.1040	-11	-11	Tension	In horizontal position
538	22	123	25	13-3/4	--	2	--	2-3/4	2-3/4	6	0.526	4.02	8.04	0.0850	-11	-11	Tension	In horizontal position
539	22	124	26	16-1/4	--	21-1/2	--	6-3/4	2-3/4	6	0.515	4.02	5.37	0.0250	-12	-10	Tension	In horizontal position
540	22	125	26	16-1/4	--	21-1/2	--	6-3/4	2-3/4	6	0.490	4.02	6.54	0.0930	-12	-10	Tension	In horizontal position, poor test
541	22	126	26	16-1/4	--	21-1/2	--	6-3/4	2-3/4	6	0.478	4.02	3.55	0.0340	-12	-10	Tension	In horizontal position

(Continued)

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TABLE B.3 (CONTINUED)

Item No.	Material No.	Test No.	Rough Sample				Diameter in.	Length in.	Specific Weight lb/cm^3	Loading Rate in./min	Failure Stress psi	Deflection in.	Temperature $^{\circ}\text{C}$		Type of Failure	Remarks		
			Snow days	Age hr	Age days	Age hr							Air	Snow				
542	22	127	26	16-1/2	--	21-1/2	--	7	2-3/4	6	0.497	4.02	35.8	0.0285	-12	-10	Compression	Slid a little
543	22	128	26	16-1/2	--	21-1/2	--	7	2-3/4	6	0.490	4.02	22.5	0.0270	-12	-10	Crushing then tension	At base
544	22	129	26	16-1/2	--	21-1/2	--	7	2-3/4	6	0.471	4.02	18.5	0.0420	-12	-10	Compression	
545	22	130	26	16-1/2	--	21-1/2	--	7	2-3/4	6	0.505	4.02	36.5	0.0430	-12	-10	Crushing	At top-partial shear, one side
546	22	131	26	16-1/2	--	21-1/2	--	7	2-3/4	6	0.505	4.02	34.5	0.0410	-12	-10	Crushing	At top
547	22	132	26	16-1/2	--	21-1/2	--	7	2-3/4	6	0.500	4.02	32.2	0.0490	-12	-10	Crushing then tension	At top and bottom
548	22	133	26	16-1/2	--	21-1/2	--	7	2-3/4	6	0.481	4.02	9.6	0.0070	-12	-10	Compression	
549	22	134	26	16-3/4	--	21-1/2	--	7-1/4	2-3/4	6	0.512	4.02	27.6	0.0150	-12	-10	Tension	
550	22	135	26	16-3/4	--	21-1/2	--	7-1/4	2-3/4	6	0.467	4.02	15.8	0.0465	-12	-10	Tension	
551	22	136	27	14-3/4	3	2	--	3/4	2-3/4	6	0.428	4.02	13.2	0.0785	-11	-12	Compression	
552	22	137	27	14-3/4	3	2	--	3/4	2-3/4	6	0.449	4.02	16.5	0.0335	-11	-12	Crushing	At base
553	22	138	27	14-3/4	3	2	--	3/4	2-3/4	6	0.438	4.02	16.7	0.0910	-11	-12	Crushing	At top
554	22	139	27	14-3/4	3	2	--	3/4	2-3/4	6	0.461	4.02	13.8	0.0280	-11	-12	Compression	
555	22	140	27	14-3/4	3	2	--	3/4	2-3/4	6	0.464	4.02	15.16	0.0210	-11	-12	Compression	
556	22	141	27	14-3/4	3	2	--	3/4	2-3/4	6	0.491	4.02	16.33	0.0245	-11	-12	Compression	
557	22	142	27	14-3/4	3	2	--	3/4	2-3/4	6	0.444	4.02	11.8	0.0455	-11	-12	Crushing	At top
558	22	143	27	14-3/4	3	2	--	3/4	2-3/4	6	0.442	4.02	14.65	0.0390	-11	-12	Crushing then shear	At base, 60° angle
559	22	144	27	15	3	2	--	1	2-3/4	6	0.512	4.02	29.0	0.0140	-11	-12	Crushing	At top
560	22	145	27	15	3	2	--	1	2-3/4	6	0.476	4.02	8.42	0.1268	-11	-12	Tension	In horizontal position
561	22	146	27	15	3	2	--	1	2-3/4	6	0.485	4.02	6.88	0.0865	-11	-12	Tension	In horizontal position
562	22	147	27	15	3	2	--	1	2-3/4	6	0.485	4.02	5.18	0.0420	-11	-12	Tension	In horizontal position
563	22	149	27	15-1/4	--	2	6	3-1/4	2-3/4	6	0.490	4.02	13.96	0.1330	-11	-12	Tension	In horizontal position
564	22	150	27	15-1/4	--	2	6	3-1/4	2-3/4	6	0.481	4.02	10.12	0.1210	-11	-12	Tension	In horizontal position
565	22	151	27	15-1/4	--	2	6	3-1/4	2-3/4	6	0.495	4.02	12.94	0.0950	-11	-12	Tension	In horizontal position
566	22	152	27	15-1/2	--	2	6	3-1/2	2-3/4	6	0.473	4.02	29.8	0.0760	-11	-12	Crushing at top then tension	
567	22	153	27	15-1/2	--	2	6	3-1/2	2-3/4	6	0.497	4.02	34.65	0.0820	-11	-12	Crushing then tension	At top
568	22	154	27	15-1/2	--	2	6	3-1/2	2-3/4	6	0.490	4.02	31.1	0.0400	-11	-12	Compression	
569	22	156	27	15-3/4	--	2	6	3-3/4	2-3/4	6	0.510	4.02	37.1	0.0110	-11	-12	Crushing	At top
570	22	157	27	15-3/4	--	2	6	3-3/4	2-3/4	6	0.471	4.02	28.6	0.0220	-11	-12	Compression	
571	22	158	27	15-3/4	--	2	6	3-3/4	2-3/4	6	0.490	4.02	28.26	0.0160	-11	-12	Compression	
572	22	159	27	15-3/4	--	2	6	3-3/4	2-3/4	6	0.505	4.02	53.0	0.0400	-11	-12	Compression	
573	22	160	27	15-3/4	--	2	6	3-3/4	2-3/4	6	0.491	4.02	46.2	0.0080	-11	-12	Compression	
574	22	161	27	15-3/4	--	2	6	3-3/4	2-3/4	6	0.478	4.02	70.0	0.0810	-11	-12	Crushing then tension	

(Continued)

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TABLE B.3 (CONTINUED)

Item No.	Material No.	Test No.	Rough Sample				Cylinder Age days	Diameter in.	Length in.	Specific Weight g/cm³	Loading Rate in./min	Failure Stress psi	Deflection in.	Temperature °C		Type of Failure	Remarks	
			Snow days	Age hr	days	hr								Air	Snow			
575	22	162	27	15-3/4	--	2	6	3-3/4	2-3/4	6	0.462	4.02	35.3	0.0160	-11	-12	Compression	
576	22	163	28	14-3/4	1	--	6	4-3/4	2-3/4	6	0.453	4.02	6.4	0.0080	-6	-11	Compression	
577	22	164	28	14-3/4	1	--	6	4-3/4	2-3/4	6	0.483	4.02	24.74	0.0200	-6	-11	Compression	
578	22	165	28	14-3/4	1	--	6	4-3/4	2-3/4	6	0.485	4.02	25.20	0.0120	-6	-11	Compression	
579	22	166	28	14-3/4	1	--	6	4-3/4	2-3/4	6	0.481	4.02	32.80	0.0640	-6	-11	Crushing	At top
580	22	167	28	14-3/4	1	--	6	4-3/4	2-3/4	6	0.464	4.02	16.32	0.0670	-6	-11	Compression	
581	22	168	28	14-3/4	1	--	6	4-3/4	2-3/4	6	0.452	4.02	14.80	0.0050	-6	-11	Compression	
582	22	169	28	15	1	--	6	5	2-3/4	6	0.438	4.02	15.14	0.0690	-6	-11	Compression	
583	22	170	28	14-3/4	1	--	6	4-3/4	2-3/4	6	0.498	4.02	13.97	0.0050	-6	-11	Compression	
584	22	171	28	15	1	--	6	5	2-3/4	6	0.486	4.02	24.40	0.0400	-6	-11	Crushing	At top
585	22	172	28	15	1	--	6	5	2-3/4	6	0.465	4.02	13.45	0.0330	-6	-11	Compression	
586	22	173	28	15	1	--	6	5	2-3/4	6	0.464	4.02	20.2	0.0320	-6	-11	Compression	
587	22	175	28	15	1	--	6	5	2-3/4	6	0.497	4.02	35.00	0.0370	-6	-11	Crushing	At base specimen slid
588	22	176	28	15	1	--	6	5	2-3/4	6	0.432	4.02	10.60	0.0270	-6	-11	Compression	
589	22	177	28	15-1/4	1	--	6	5-1/4	2-3/4	6	0.473	4.02	21.85	0.0340	-6	-11	Compression	
590	22	178	28	15-1/4	1	6	5	23-1/4	2-3/4	6	0.488	4.02	23.55	0.0140	-6	-11	Compression	
591	22	179	28	15-1/4	1	6	5	23-1/4	2-3/4	6	0.478	4.02	21.50	0.0380	-6	-11	Compression	
592	22	180	28	15-1/4	1	6	5	23-1/4	2-3/4	6	0.488	4.02	19.35	0.0330	-6	-11	Crushing	At base
593	22	181	28	15-1/4	1	6	5	23-1/4	2-3/4	6	0.488	4.02	22.70	0.0270	-6	-11	Compression	
594	22	182	28	15-1/4	1	6	5	23-1/4	2-3/4	6	0.493	4.02	21.00	0.0340	-6	-11	Tension	
595	22	183	28	15-1/2	1	6	5	23-1/2	2-3/4	6	0.451	4.02	4.37	0.0850	-6	-11	Tension	In horizontal position
596	22	184	28	15-1/2	1	6	5	23-1/2	2-3/4	6	0.478	4.02	7.22	0.0780	-6	-11	Tension	In horizontal position
597	22	185	28	15-1/2	1	6	5	23-1/2	2-3/4	6	0.485	4.02	6.68	0.1110	-6	-11	Tension	In horizontal position
598	22	186	28	15-1/2	1	6	5	23-1/2	2-3/4	6	0.491	4.02	7.37	0.0940	-6	-11	Tension	In horizontal position
599	22	187	28	15-1/2	1	6	5	23-1/2	2-3/4	6	0.481	4.02	6.68	0.1420	-6	-11	Tension	In horizontal position
600	22	188	28	15-1/2	4	1	--	2-1/2	2-3/4	6	0.524	4.02	11.78	0.0540	-6	-11	Tension	In horizontal position
601	22	189	28	15-1/2	4	1	--	2-1/2	2-3/4	6	0.533	4.02	11.74	0.0650	-6	-11	Tension	In horizontal position
602	22	190	28	15-1/2	4	1	--	2-1/2	2-3/4	6	0.524	4.02	9.73	0.1120	-6	-11	Tension	In horizontal position
603	22	191	28	15-1/2	4	1	--	2-1/2	2-3/4	6	0.528	4.02	12.50	0.0820	-6	-11	Tension	In horizontal position
604	22	192	28	15-1/2	4	1	--	2-1/2	2-3/4	6	0.533	4.02	12.88	0.0700	-6	-11	Tension	In horizontal position
605	22	193	28	15-3/4	4	1	--	2-3/4	2-3/4	6	0.531	4.02	33.2	0.0350	-6	-11	Compression	
606	22	194	28	15-3/4	4	1	--	2-3/4	2-3/4	6	0.527	4.02	30.0	0.0450	-6	-11	Compression	
607	22	195	28	15-3/4	4	1	--	2-3/4	2-3/4	6	0.481	4.02	11.6	0.0330	-6	-11	Crushing	At top
608	22	196	28	15-3/4	4	1	--	2-3/4	2-3/4	6	0.486	4.02	16.5	0.0610	-6	-11	Crushing	At base
609	22	197	28	15-3/4	4	1	--	2-3/4	2-3/4	6	0.481	4.02	15.16	0.0730	-6	-11	Compression	
610	22	198	28	15-3/4	4	1	--	2-3/4	2-3/4	6	0.481	4.02	17.0	0.0630	-6	-11	Crushing	At top
611	22	199	28	15-3/4	4	1	--	2-3/4	2-3/4	6	0.479	4.02	20.2	0.0720	-6	-11	Crushing	At base

(Continued)

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TABLE B.3 (CONTINUED)

Item No.	Material No.	Test No.	Rough Sample				Cylinder Age days	Diameter in.	Length in.	Specific Weight g/cm³	Loading Rate in./min	Failure Stress psi	Deflection in.	Temperature °C			Remarks	
			Snow days	Age hr	days	hr								Air	Snow	Type of Failure		
612	22	203	29	10-1/4	3	2	1	22-1/4	2-3/4	6	0.510	1.1	58.9	0.0880	-8	-11	Compression	
613	22	204	29	10-1/4	3	2	1	22-1/4	2-3/4	6	0.488	1.1	17.67	0.0230	-8	-11	Compression	
614	22	205	29	10-1/4	3	2	1	22-1/4	2-3/4	6	0.524	1.1	30.3	0.0370	-8	-11	Compression	
615	22	207	29	10-1/2	3	2	1	22-1/2	2-3/4	6	0.514	1.1	33.9	0.0240	-8	-11	Compression	
616	22	208	29	10-1/2	3	2	1	22-1/2	2-3/4	6	0.531	1.1	34.5	0.0760	-8	-11	Compression	
617	22	209	29	10-1/2	3	2	1	22-1/2	2-3/4	6	0.505	1.1	35.6	0.0720	-8	-11	Compression	
618	22	210	29	10-1/2	3	2	1	22-1/2	2-3/4	6	0.570	1.1	34.5	0.0650	-8	-11	Crushing	At top, then diagonal tension
619	22	211	29	10-1/2	3	2	1	22-1/2	2-3/4	6	0.565	2.0	41.2	0.0250	-8	-11	Compression	
620	22	212	29	10-1/2	3	2	1	22-1/2	2-3/4	6	0.506	2.0	34.5	0.0880	-8	-11	Compression	
621	22	213	29	10-1/2	3	2	1	22-1/2	2-3/4	6	0.486	2.0	31.5	0.1900	-8	-11	Compression	Then diagonal tension
622	22	214	29	10-1/2	3	2	1	22-1/2	2-3/4	6	0.420	2.0	15.99	0.1800	-8	-11	Compression	
623	22	215	29	10-3/4	3	2	1	22-3/4	2-3/4	6	0.486	2.0	25.2	0.0300	-8	-11	Crushing	At top
624	22	216	29	10-3/4	3	2	1	22-3/4	2-3/4	6	0.508	2.0	29.6	0.0240	-8	-11	Compression	
625	22	217	29	10-3/4	3	2	1	22-3/4	2-3/4	6	0.491	2.0	40.4	0.0600	-8	-11	Compression	
626	22	218	29	10-3/4	3	2	1	22-3/4	2-3/4	6	0.493	2.0	32.5	0.0320	-8	-11	Compression	
627	22	219	29	10-3/4	3	2	1	22-3/4	2-3/4	6	0.481	2.0	25.7	0.0100	-8	-11	Compression	
628	22	220	29	10-3/4	3	2	1	22-3/4	2-3/4	6	0.474	3.0	24.4	0.0150	-8	-11	Compression	
629	22	221	29	10-3/4	3	2	1	22-3/4	2-3/4	6	0.495	3.0	26.4	0.0560	-8	-11	Crushing	At base
630	22	222	29	10-3/4	3	2	1	22-3/4	2-3/4	6	0.447	3.0	13.10	0.0690	-8	-11	Compression	
631	22	223	29	11	3	2	1	23	2-3/4	6	0.471	3.0	22.2	0.0590	-8	-11	Compression	
632	22	225	29	11	3	2	1	23	2-3/4	6	0.510	3.0	15.65	0.0050	-8	-11	Crushing	At base
633	22	226	29	11	3	2	1	23	2-3/4	6	0.519	3.0	24.4	0.0990	-8	-11	Compression	
634	22	227	29	11	3	2	1	23	2-3/4	6	0.501	3.0	28.1	0.0150	-8	-11	Compression	
635	22	228	29	11	3	2	1	23	2-3/4	6	0.491	3.0	27.2	0.0540	-8	-11	Compression	
636	22	230	29	11	3	2	1	23	2-3/4	6	0.495	4.0	18.00	0.0440	-8	-11	Crushing	At top
637	22	231	29	11	3	2	1	23	2-3/4	6	0.474	4.0	15.49	0.0520	-8	-11	Compression	
638	22	232	29	11	3	2	1	23	2-3/4	6	0.447	4.0	14.62	0.0300	-8	-11	Crushing	At base
639	22	233	29	11	3	2	1	23	2-3/4	6	0.498	4.0	29.3	0.0350	-8	-11	Compression	
640	22	234	29	11	3	2	1	23	2-3/4	6	0.464	4.0	10.4	0.0640	-8	-11	Compression	
641	22	235	29	11-1/4	3	2	1	23-1/4	2-3/4	6	0.488	4.0	19.0	0.0160	-8	-11	Compression	
642	22	236	29	11-1/4	3	2	1	23-1/4	2-3/4	6	0.505	4.0	31.0	0.0820	-8	-11	Crushing	At top
643	22	237	29	11-1/4	3	2	1	23-1/4	2-3/4	6	0.442	4.0	15.49	0.0220	-8	-11	Compression	
644	22	238	29	11-1/4	3	2	1	23-1/4	2-3/4	6	0.485	5.0	21.0	0.0120	-8	-11	Compression	
645	22	239	29	11-1/4	3	2	1	23-1/4	2-3/4	6	0.530	5.0	36.70	0.0270	-8	-11	Compression	At top
646	22	240	29	11-1/4	3	2	1	23-1/4	2-3/4	6	0.455	5.0	28.3	0.0890	-8	-11	Compression	
647	22	241	29	11-1/4	3	2	1	23-1/4	2-3/4	6	0.501	5.0	24.9	0.0550	-8	-11	Crushing	At top
648	22	242	29	11-1/4	3	2	1	23-1/4	2-3/4	6	0.462	5.0	13.45	0.0370	-8	-11	Crushing	At base

(Continued)

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TABLE B.3 (CONTINUED)

Item No.	Material No.	Test No.	Rough Sample				Cylinder Age days	Diameter in.	Length in.	Specific Weight g/cm³	Loading Rate in./min	Failure Stress psi	Deflection in.	Temperature °C		Remarks		
			Snow days	Age hr	days	hr								Air	Snow	Type of Failure		
649	22	243	29	11-1/4	3	2	1	23-1/4	2-3/4	6	0.434	5.0	13.80	0.0370	-8	-11	Crushing	At top
650	22	244	29	11-1/4	3	2	1	23-1/4	2-3/4	6	0.505	5.0	16.82	0.0190	-8	-11	Crushing	At base
651	22	245	29	11-1/4	3	2	1	23-1/4	2-3/4	6	0.461	5.0	15.14	0.0070	-8	-11	Crushing	At base
652	22	246	29	11-1/4	3	2	1	23-1/4	2-3/4	6	0.486	5.0	28.30	0.0110	-8	-11	Compression	
653	22	247	29	11-1/4	3	2	1	23-1/4	2-3/4	6	0.453	6.0	18.50	0.0490	-8	-11	Crushing	At base
654	22	248	29	11-1/2	3	2	1	23-1/2	2-3/4	6	0.459	6.0	15.14	0.1080	-8	-11	Compression	
655	22	249	29	11-1/2	3	2	1	23-1/2	2-3/4	6	0.489	6.0	17.72	0.0230	-8	-11	Compression	
656	22	250	29	11-1/2	3	2	1	23-1/2	2-3/4	6	0.491	6.0	34.0	0.0220	-8	-11	Compression	
657	22	251	29	11-1/2	3	2	1	23-1/2	2-3/4	6	0.491	6.0	8.42	0.0060	-8	-11	Compression	
658	22	252	29	11-1/2	3	2	1	23-1/2	2-3/4	6	0.461	6.0	15.49	0.0240	-8	-11	Compression	
659	22	253	29	11-1/2	3	2	1	23-1/2	2-3/4	6	0.526	6.0	30.6	0.0190	-8	-11	Compression	
660	22	254	29	11-1/2	3	2	1	23-1/2	2-3/4	6	0.498	6.0	22.7	0.0390	-8	-11	Compression	
661	22	255	29	11-1/2	3	2	1	23-1/2	2-3/4	6	0.481	6.0	24.7	0.0360	-8	-11	Compression	
662	22	256	29	11-1/2	3	2	1	23-1/2	2-3/4	6	0.493	7.0	29.4	0.0370	-8	-11	Compression	
663	22	257	29	11-3/4	3	2	1	23-3/4	2-3/4	6	0.433	7.0	10.40	0.0240	-8	-11	Crushing	At top, specimen slid
664	22	258	29	11-3/4	3	2	1	23-3/4	2-3/4	6	0.474	7.0	16.82	0.3000	-8	-11	Compression	
665	22	259	29	11-3/4	3	2	1	23-3/4	2-3/4	6	0.517	7.0	17.0	0.0060	-8	-11	Compression	
666	22	260	29	11-3/4	3	2	1	23-3/4	2-3/4	6	0.465	7.0	32.5	0.0220	-8	-11	Compression	
667	22	261	29	11-3/4	3	2	1	23-3/4	2-3/4	6	0.515	7.0	38.2	0.0270	-8	-11	Compression	
668	22	262	29	11-3/4	3	2	1	23-3/4	2-3/4	6	0.501	7.0	34.30	0.0100	-8	-11	Compression	
669	22	263	29	11-3/4	3	2	1	23-3/4	2-3/4	6	0.491	7.0	23.2	0.0800	-8	-11	Compression	
670	22	264	29	11-3/4	3	2	1	23-3/4	2-3/4	6	0.497	7.0	28.6	0.0190	-8	-11	Compression	
671	22	265	29	11-3/4	3	2	1	23-3/4	2-3/4	6	0.497	8.0	17.84	0.0550	-8	-11	Crushing	At base
672	22	266	29	11-3/4	3	2	1	23-3/4	2-3/4	6	0.519	8.0	15.99	0.0400	-8	-11	Compression	
673	22	267	29	12	3	2	2	--	2-3/4	6	0.508	8.0	15.65	0.0400	-8	-11	Compression	
674	22	268	29	12	3	2	2	--	2-3/4	6	0.505	8.0	21.5	0.0400	-8	-11	Compression	
675	22	269	29	12	3	2	2	--	2-3/4	6	0.462	8.0	11.1	0.0040	-8	-11	Crushing	
676	22	270	29	12	3	2	2	--	2-3/4	6	0.498	8.0	6.74	0.0060	-8	-11	Compression	
677	22	271	29	12	3	2	2	--	2-3/4	6	0.498	8.0	19.00	0.0410	-8	-11	Compression	
678	22	272	29	12	3	2	2	--	2-3/4	6	0.508	8.0	36.50	0.0380	-7	-11	Crushing then tension	At top
679	22	273	29	12	3	2	2	--	2-3/4	6	0.488	8.0	24.2	0.0250	-7	-11	Crushing	At top
680	22	274	29	12	3	2	2	--	2-3/4	6	0.501	9.0	17.18	0.0320	-7	-11	Compression	
681	22	275	29	12	3	2	2	--	2-3/4	6	0.426	9.0	12.1	0.0280	-7	-11	Compression	
682	22	276	29	12-1/4	3	2	2	1/4	2-3/4	6	0.478	9.0	17.67	0.0430	-8	-11	Crushing	At base
683	22	277	29	12-1/4	3	2	2	1/4	2-3/4	6	0.507	9.0	32.3	0.0350	-7	-11	Compression	
684	22	278	29	12-1/4	3	2	2	1/4	2-3/4	6	0.493	9.0	21.7	0.0590	-7	-11	Crushing	

(Continued)

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TABLE B.3 (CONTINUED)

Item No.	Material No.	Test No.	Rough Sample						Specific Weight g/cm³	Loading Rate in./min.	Failure Stress psi	Deflection in.	Temperature °C			Type of Failure	Remarks	
			Snow days	Age hr	Age days	Age hr	Cylinder days	Diameter in.					Air	Snow	Type of Failure			
685	22	279	29	12-1/4	3	2	2	1/4	2-3/4	6	0.501	9.0	27.6	0.0860	-7	-11	Compression	
686	22	280	29	12-1/4	3	2	2	1/4	2-3/4	6	0.467	9.0	28.1	0.0350	-7	-11	Compression	
687	22	281	29	12-1/4	3	2	2	1/4	2-3/4	6	0.469	9.0	23.5	0.0350	-7	-11	Compression	
688	22	282	29	12-1/4	3	2	2	1/4	2-3/4	6	0.512	9.0	27.2	0.0240	-7	-11	Compression	
689	22	283	29	12-1/4	3	2	2	1/4	2-3/4	6	0.455	10.0	21.0	0.0630	-7	-11	Compression	At top
690	22	284	29	12-1/4	3	2	2	1/4	2-3/4	6	0.522	10.0	21.35	0.0090	-7	-11	Compression	
691	22	285	29	12-1/4	3	2	2	1/4	2-3/4	6	0.471	10.0	22.4	0.0390	-7	-11	Compression	
692	22	286	29	12-1/4	3	2	2	1/4	2-3/4	6	0.497	10.0	24.1	0.0460	-7	-11	Compression	
693	22	287	29	12-1/4	3	2	2	1/4	2-3/4	6	0.505	10.0	21.85	0.0280	-7	-11	Crushing	At top
694	22	288	29	12-1/4	3	2	2	1/4	2-3/4	6	0.496	10.0	26.10	0.0420	-7	-11	Compression	
695	22	289	29	12-1/2	3	2	2	1/2	2-3/4	6	0.490	10.0	26.7	0.0230	-7	-11	Compression	
696	22	290	29	13	3	2	2	1	2-3/4	6	0.500	10.0	16.49	0.0690	-8	-11	Crushing	At top
697	22	291	29	13	3	2	2	1	2-3/4	6	0.507	10.0	21.3	0.1090	-8	-11	Tension	
698	22	292	29	13	3	2	2	1	2-3/4	6	0.515	10.0	5.40	0.1420	-8	-11	Tension	In horizontal position
699	22	293	29	13	3	2	2	1	2-3/4	6	0.476	10.0	4.89	0.1130	-8	-11	Tension	In horizontal position
700	22	294	29	13	3	2	2	1	2-3/4	6	0.495	10.0	11.30	0.0770	-8	-11	Tension	In horizontal position
701	22	295	29	13	3	2	2	1	2-3/4	6	0.542	9.0	9.64	0.0900	-8	-11	Tension	In horizontal position
702	22	296	29	13	3	2	2	1	2-3/4	6	0.565	9.0	8.08	0.0640	-8	-11	Tension	In horizontal position
703	22	297	29	13	3	2	2	1	2-3/4	6	0.565	9.0	6.96	0.1100	-8	-11	Tension	In horizontal position
704	22	298	29	13	3	2	2	1	2-3/4	6	0.444	8.0	4.82	0.1950	-8	-11	Tension	In horizontal position
705	22	299	29	13-1/4	3	2	2	1-1/4	2-3/4	6	0.473	8.0	4.55	0.1420	-8	-11	Tension	In horizontal position
706	22	300	29	13-1/4	3	2	2	1-1/4	2-3/4	6	0.483	8.0	6.24	0.1280	-8	-11	Tension	In horizontal position
707	22	301	29	13-1/4	3	2	2	1-1/4	2-3/4	6	0.505	7.0	9.13	0.1180	-8	-11	Tension	In horizontal position
708	22	302	29	13-1/4	3	2	2	1-1/4	2-3/4	6	0.486	7.0	9.02	0.0840	-8	-11	Tension	In horizontal position
709	22	303	29	13-1/4	3	2	2	1-1/4	2-3/4	6	0.498	7.0	8.75	0.0860	-8	-11	Tension	In horizontal position
710	22	304	29	13-1/4	3	2	2	1-1/4	2-3/4	6	0.445	6.0	5.90	0.1640	-8	-11	Tension	In horizontal position
711	22	305	29	13-1/4	3	2	2	1-1/4	2-3/4	6	0.507	6.0	6.71	0.0420	-8	-11	Tension	In horizontal position
712	22	306	29	13-1/4	3	2	2	1-1/4	2-3/4	6	0.498	6.0	7.52	0.0910	-8	-11	Tension	In horizontal position
713	22	307	29	13-1/4	3	2	2	1-1/4	2-3/4	6	0.481	5.0	8.40	0.0570	-8	-11	Tension	In horizontal position
714	22	308	29	13-1/4	3	2	2	1-1/4	2-3/4	6	0.528	5.0	10.18	0.0620	-8	-11	Tension	In horizontal position
715	22	309	29	13-1/4	3	2	2	1-1/4	2-3/4	6	0.530	5.0	12.09	0.0650	-8	-11	Tension	In horizontal position
716	22	310	29	13-1/4	3	2	2	1-1/4	2-3/4	6	0.467	4.0	5.51	0.0950	-8	-11	Tension	In horizontal position
717	22	311	29	13-1/4	3	2	2	1-1/4	2-3/4	6	0.491	4.0	9.06	0.0590	-8	-11	Tension	In horizontal position
718	22	312	29	13-1/4	3	2	2	1-1/4	2-3/4	6	0.493	4.0	12.65	0.0790	-8	-11	Tension	In horizontal position
719	22	313	29	13-1/2	3	2	2	1-1/2	2-3/4	6	0.485	3.0	7.85	0.1010	-8	-11	Tension	In horizontal position
720	22	314	29	13-1/2	3	2	2	1-1/2	2-3/4	6	0.488	3.0	10.49	0.0450	-8	-11	Tension	In horizontal position
721	22	315	29	13-1/2	3	2	2	1-1/2	2-3/4	6	0.453	3.0	9.10	0.1040	-8	-11	Tension	In horizontal position

(Continued)

TABLE B.3 (CONTINUED)

Item No.	Material No.	Rough Sample				Cylinder Age	Diameter in.	Length in.	Specific Weight g/cm³	Loading Rate in./min	Failure Stress psi	Deflection in.	Temperature °C			Remarks	
		Test No.	Snow days	Age hr	Age days								Air	Snow	Type of Failure		
722	22	316	29	13-1/2	3	2	2	1-1/2	2-3/4	6	0.501	2.0	6.81	0.0940	-8	-11 Tension	In horizontal position
723	22	317	29	13-1/2	3	2	2	1-1/2	2-3/4	6	0.497	2.0	9.56	0.1220	-8	-11 Tension	In horizontal position
724	22	318	29	13-1/2	3	2	2	1-1/2	2-3/4	6	0.501	2.0	8.59	0.0690	-8	-11 Tension	In horizontal position
725	22	319	29	13-1/2	3	2	2	1-1/2	2-3/4	6	0.505	1.1	10.21	0.0440	-8	-11 Tension	In horizontal position
726	22	320	29	13-1/2	3	2	2	1-1/2	2-3/4	6	0.500	1.1	6.20	0.0540	-7	-11 Tension	In horizontal position
727	22	321	29	13-3/4	3	2	2	1-3/4	2-3/4	6	0.503	1.1	10.57	0.0660	-7	-11 Tension	In horizontal position
728	22	323	29	14-3/4	3	2	2	2-3/4	2-3/4	6	0.490	18.0	7.13	0.1820	-7	-11 Tension	In horizontal position
729	22	324	29	14-3/4	3	2	2	2-3/4	2-3/4	6	0.512	18.0	5.70	0.2410	-7	-11 Tension	In horizontal position
730	22	325	29	14-3/4	3	2	2	2-3/4	2-3/4	6	0.495	27.0	7.90	0.1450	-7	-11 Tension	In horizontal position
731	22	326	29	14-3/4	3	2	2	2-3/4	2-3/4	6	0.510	27.0	9.63	0.1560	-7	-11 Tension	In horizontal position
732	22	328	29	14-3/4	3	2	2	2-3/4	2-3/4	6	0.505	27.0	6.52	0.0950	-7	-11 Tension	In horizontal position
733	22	329	29	14-3/4	3	2	2	2-3/4	2-3/4	6	0.503	36.0	7.52	0.1250	-7	-11 Tension	In horizontal position
734	22	330	29	15	3	2	2	3	2-3/4	6	0.495	36.0	6.24	0.1450	-7	-11 Tension	In horizontal position
735	22	331	29	15	3	2	2	3	2-3/4	6	0.505	36.0	4.74	0.1200	-7	-11 Tension	In horizontal position
736	22	332	29	15	3	2	2	3	2-3/4	6	0.514	45.0	6.86	0.1550	-7	-11 Tension	In horizontal position
737	22	333	29	15	3	2	2	3	2-3/4	6	0.497	45.0	7.13	0.1450	-7	-11 Crushing	In horizontal position
738	22	334	29	15	3	2	2	3	2-3/4	6	0.510	45.0	6.48	0.1400	-7	-11 Tension	In horizontal position
739	22	335	29	15	3	2	2	3	2-3/4	6	0.510	54.0	7.44	0.1350	-7	-11 Crushing	In horizontal position
740	22	336	29	15	3	2	2	3	2-3/4	6	0.486	54.0	7.95	0.1350	-7	-11 Crushing	In horizontal position
741	22	337	29	15	3	2	2	3	2-3/4	6	0.517	54.0	6.24	0.1300	-7	-11 Crushing	In horizontal position
742	22	338	29	15	3	2	2	3	2-3/4	6	0.455	63.0	5.20	0.1480	-7	-11 Crushing	In horizontal position
743	22	339	29	15	3	2	2	3	2-3/4	6	0.474	63.0	5.13	0.1800	-7	-11 Crushing	In horizontal position
744	22	340	29	15	3	2	2	3	2-3/4	6	0.464	63.0	6.61	0.1800	-7	-11 Tension	In horizontal position
745	22	341	29	15	3	2	2	3	2-3/4	6	0.464	72.0	5.17	0.1650	-7	-11 Crushing	In horizontal position
746	22	342	29	15	3	2	2	3	2-3/4	6	0.467	72.0	5.70	0.1450	-7	-11 Tension	In horizontal position
747	22	343	29	15-1/4	3	2	2	3-1/4	2-3/4	6	0.503	72.0	3.43	0.0230	-7	-11 Tension	In horizontal position
748	22	344	29	15-1/4	3	2	2	3-1/4	2-3/4	6	0.479	81.0	5.63	0.1150	-7	-11 Tension	In horizontal position
749	22	345	29	15-1/4	3	2	2	3-1/4	2-3/4	6	0.483	81.0	4.89	0.0230	-7	-11 Tension	In horizontal position
750	22	346	29	15-1/4	3	2	2	3-1/4	2-3/4	6	0.469	81.0	7.01	0.0400	-7	-11 Crushing	In horizontal position
751	22	347	29	15-1/4	3	2	2	3-1/4	2-3/4	6	0.473	90.0	4.55	0.0300	-7	-11 Tension	In horizontal position
752	22	348	29	15-1/4	3	2	2	3-1/4	2-3/4	6	0.510	90.0	7.25	0.0240	-7	-11 Crushing	In horizontal position
753	22	349	29	15-1/4	3	2	2	3-1/4	2-3/4	6	0.465	90.0	6.05	0.0390	-7	-11 Tension	In horizontal position
754	22	350	29	15-1/4	3	2	2	3-1/4	2-3/4	6	0.493	18.0	26.5	0.0800	-7	-11 Compression	
755	22	351	29	15-1/4	3	2	2	3-1/4	2-3/4	6	0.508	18.0	23.2	0.0590	-7	-11 Crushing	At base
756	22	352	29	15-1/4	3	2	2	3-1/4	2-3/4	6	0.459	18.0	18.2	0.0650	-7	-11 Crushing then tension	
757	22	353	29	15-1/2	3	2	2	3-1/2	2-3/4	6	0.478	18.0	30.0	0.0880	-7	-11 Compression	

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TABLE B.3 (CONTINUED)

Item No.	Material No.	Test No.	Rough Sample				Cylinder Age days	Diameter in.	Length in.	Specific Weight g/cm³	Loading Rate in./min	Failure Stress psi	Deflection in.	Temperature °C		Type of Failure	Remarks	
			Snow days	Age hr	days	hr								Air	Snow			
758	22	354	29	15-1/2	3	2	2	3-1/2	2-3/4	6	0.478	18.0	19.5	0.0250	-7	-11	Compression	
759	22	355	29	15-1/2	3	2	2	3-1/2	2-3/4	6	0.510	18.0	17.3	0.0940	-7	-11	Crushing then tension	At top
760	22	356	29	15-1/2	3	2	2	3-1/2	2-3/4	6	0.465	18.0	13.97	0.0600	-7	-11	Compression	
761	22	357	29	15-1/2	3	2	2	3-1/2	2-3/4	6	0.471	18.0	12.3	0.1300	-7	-11	Crushing	At base
762	22	358	29	15-1/2	3	2	2	3-1/2	2-3/4	6	0.451	18.0	15.99	0.0110	-7	-11	Compression	
763	22	359	29	15-1/2	3	2	2	3-1/2	2-3/4	6	0.501	.0	19.85	0.9000	-7	-11	Crushing	At base
764	22	360	29	15-1/2	3	2	2	3-1/2	2-3/4	6	0.452	27.0	15.99	0.0700	-7	-11	Crushing	At base
765	22	361	29	15-1/2	3	2	2	3-1/2	2-3/4	6	0.464	27.0	8.08	0.0150	-7	-11	Shear	At 45° angle
766	22	362	29	15-1/2	3	2	2	3-1/2	2-3/4	6	0.459	27.0	14.8	0.0350	-7	-11	Shear	At 45° angle
767	22	363	29	15-1/2	3	2	2	3-1/2	2-3/4	6	0.498	27.0	22.2	0.0800	-7	-11	Compression	
768	22	364	29	15-1/2	3	2	2	3-1/2	2-3/4	6	0.476	27.0	8.75	0.0500	-7	-11	--	Specimen slid
769	22	365	29	15-1/2	3	2	2	3-1/2	2-3/4	6	0.505	27.0	29.6	0.0800	-7	-11	Crushing	At top, then diagonal tension
770	22	366	29	15-1/2	3	2	2	3-1/2	2-3/4	6	0.493	27.0	19.85	0.0400	-7	-11	Compression	
771	22	367	29	15-1/2	3	2	2	3-1/2	2-3/4	6	0.464	27.0	22.2	0.0600	-7	-11	Compression	
772	22	368	29	15-3/4	3	2	2	3-3/4	2-3/4	6	0.455	36.0	15.65	0.0800	-7	-11	Crushing	At top
773	22	369	29	15-3/4	3	2	2	3-3/4	2-3/4	6	0.510	36.0	25.40	0.0600	-7	-11	Crushing	At top
774	22	370	29	15-3/4	3	2	2	3-3/4	2-3/4	6	0.501	36.0	13.45	0.0350	-7	-11	Compression	
775	22	371	29	15-3/4	3	2	2	3-3/4	2-3/4	6	0.481	36.0	14.30	0.0900	-7	-11	Compression	
776	22	372	29	15-3/4	3	2	2	3-3/4	2-3/4	6	0.491	36.0	24.4	0.0700	-7	-11	Compression	
777	22	374	29	15-3/4	3	2	2	3-3/4	2-3/4	6	0.444	36.0	17.18	0.0700	-7	-11	Crushing	At base
778	22	375	29	15-3/4	3	2	2	3-3/4	2-3/4	6	0.508	36.0	14.8	0.1010	-7	-11	Compression	
779	22	376	29	15-3/4	3	2	2	3-3/4	2-3/4	6	0.474	36.0	12.45	0.0800	-7	-11	Compression	
780	22	377	29	15-3/4	3	2	2	3-3/4	2-3/4	6	0.453	45.0	16.49	0.0550	-7	-11	Compression	
781	22	378	29	15-3/4	3	2	2	3-3/4	2-3/4	6	0.473	45.0	14.8	0.0900	-7	-11	Compression	
782	22	379	29	15-3/4	3	2	2	3-3/4	2-3/4	6	0.469	45.0	17.18	0.0800	-7	-11	Compression	
783	22	380	29	15-3/4	3	2	2	3-3/4	2-3/4	6	0.479	45.0	26.40	0.1500	-7	-11	Compression	
784	22	381	29	16	3	2	2	4	2-3/4	6	0.488	45.0	19.69	0.0550	-7	-11	Crushing	At base
785	22	382	29	16	3	2	2	4	2-3/4	6	0.495	45.0	18.82	0.1700	-7	-11	Compression	
786	22	383	29	16	3	2	2	4	2-3/4	6	0.459	45.0	17.50	0.0450	-7	-11	Compression	
787	22	384	29	16	3	2	2	4	2-3/4	6	0.479	45.0	13.10	0.0700	-7	-11	Crushing	At base
788	22	385	29	16	3	2	2	4	2-3/4	6	0.453	45.0	20.2	0.0500	-7	-11	Compression	
789	22	386	30	7-3/4	3	2	2	19-3/4	2-3/4	6	0.493	54.0	13.45	0.0550	-7	-11	Compression	
790	22	387	30	7-3/4	3	2	2	19-1/2	2-3/4	6	0.505	54.0	27.8	0.0650	-7	-11	Crushing	At top
791	22	388	30	7-3/4	3	2	2	19-1/2	2-3/4	6	0.476	54.0	11.43	0.0400	-7	-11	Crushing	At base
792	22	389	30	7-3/4	3	2	2	19-3/4	2-3/4	6	0.508	54.0	28.90	0.0550	-7	-11	Compression	
793	22	390	30	7-3/4	3	2	2	19-3/4	2-3/4	6	0.478	54.0	21.0	0.0500	-7	-11	Compression	

(Continued)

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TABLE B.3 (CONTINUED)

Item No.	Material No.	Test No.	Rough Sample				Specific Weight g/cm³	Loading Rate in./min	Failure Stress psi	Deflection in.	Temperature °C			Type of Failure	Remarks
			Snow days	Age hr	Sample Age days	Cylinder Age hr					Air	Snow	Type of Failure		
794	22	391	30	7-3/4	3	2	2 19-3/4	2-3/4	6	0.495	54.0	19.35	0.0500	-7	-11 Compression
795	22	392	30	7-3/4	3	2	2 19-3/4	2-3/4	6	0.508	54.0	22.55	0.0400	-7	-11 Shear 35°
796	22	393	30	7-3/4	3	2	2 19-3/4	2-3/4	6	0.481	54.0	22.55	0.0750	-7	-11 Compression
797	22	394	30	7-3/4	3	2	2 19-3/4	2-3/4	6	0.488	54.0	23.20	0.0500	-7	-11 Crushing
798	22	395	30	7-3/4	3	2	2 19-3/4	2-3/4	6	0.503	63.0	26.40	0.0600	-7	-11 Crushing
799	22	396	30	7-3/4	3	2	2 19-3/4	2-3/4	6	0.486	63.0	15.30	0.0650	-7	-11 Compression
800	22	397	30	7-3/4	3	4	2 19-3/4	2-3/4	6	0.495	63.0	19.69	0.0400	-7	-11 Crushing
801	22	400	30	8	3	4	2 18	2-3/4	6	0.488	63.0	8.92	0.1500	-7	-11 Compression
802	22	401	30	8	3	4	2 18	2-3/4	6	0.485	63.0	13.45	0.5200	-7	-11 Crushing, then compression
803	22	402	30	8	3	4	2 18	2-3/4	6	0.464	63.0	12.62	0.0350	-7	-11 Compression
804	22	403	30	8	3	4	2 18	2-3/4	6	0.500	63.0	19.69	0.0600	-7	-11 Crushing
805	22	404	30	8	3	4	2 18	2-3/4	6	0.469	63.0	16.32	0.0500	-7	-11 Compression
806	22	405	30	8	3	4	2 18	2-3/4	6	0.481	72.0	13.97	0.0750	-7	-11 Crushing
807	22	406	30	8	3	4	2 18	2-3/4	6	0.479	72.0	19.35	0.0600	-7	-11 Crushing
808	22	407	30	8	3	4	2 18	2-3/4	6	0.473	72.0	18.50	0.0400	-7	-11 Crushing
809	22	410	30	8	3	4	2 18	2-3/4	6	0.497	72.0	15.14	0.1200	-8	-10 Compression
810	22	411	30	8	3	4	2 18	2-3/4	6	0.469	72.0	10.60	0.0400	-8	-10 Compression
811	22	412	30	8	3	4	2 18	2-3/4	6	0.471	72.0	12.95	0.0610	-8	-10 Compression
812	22	413	30	8	3	4	2 18	2-3/4	6	0.510	72.0	17.32	0.0600	-8	-10 Crushing
813	22	414	30	8	3	4	2 18	2-3/4	6	0.497	72.0	16.32	0.0650	-8	-10 Crushing
814	22	415	30	8	3	4	2 18	2-3/4	6	0.488	81.0	11.80	0.0200	-8	-10 Crushing
815	22	416	30	8	3	4	2 18	2-3/4	6	0.464	81.0	17.67	0.0250	-8	-10 Compression
816	22	417	30	8	3	4	2 18	2-3/4	6	0.500	81.0	11.80	0.0610	-8	-10 Crushing
817	22	418	30	8-1/4	3	4	2 18-1/4	2-3/4	6	0.452	81.0	19.35	0.0550	-8	-10 Compression
818	22	419	30	8-1/4	3	4	2 18-1/4	2-3/4	6	0.476	81.0	18.50	0.0650	-8	-10 Compression
819	22	420	30	8-1/4	3	4	2 18-1/4	2-3/4	6	0.488	81.0	16.32	0.0750	-8	-10 Compression
820	22	421	30	8-1/4	3	4	2 18-1/4	2-3/4	6	0.500	81.0	14.30	0.0500	-8	-10 Compression
821	22	422	30	8-1/4	3	4	2 18-1/4	2-3/4	6	0.473	81.0	19.50	0.0650	-8	-10 Compression
822	22	423	30	8-1/4	3	4	2 18-1/4	2-3/4	6	0.493	81.0	20.2	0.0700	-8	-10 Compression
823	22	424	30	8-1/4	3	4	2 18-1/4	2-3/4	6	0.510	90.0	9.76	0.0500	-8	-10 Crushing
824	22	425	30	8-1/4	3	4	2 18-1/4	2-3/4	6	0.491	90.0	10.40	0.0700	-8	-10 Crushing
825	22	427	30	8-1/4	3	4	2 18-1/4	2-3/4	6	0.433	90.0	15.14	0.0600	-8	-10 Crushing
826	22	428	30	8-1/4	3	4	2 18-1/4	2-3/4	6	0.452	90.0	11.43	0.0550	-8	-10 Crushing
827	22	429	30	8-1/2	3	4	2 18-1/2	2-3/4	6	0.426	90.0	23.10	0.0700	-8	-10 Tension
828	22	430	30	8-1/2	3	4	2 18-1/2	2-3/4	6	0.512	90.0	12.62	0.0550	-8	-10 Crushing
829	22	431	30	8-1/2	3	4	2 18-1/2	2-3/4	6	0.457	90.0	22.4	0.0450	-8	-10 Crushing

(Continued)

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TABLE B.3 (CONTINUED)

Item No.	Material No.	Test No.	Rough Sample				Cylinder Age days	Diameter in.	Length in.	Specific Weight g/cm³	Loading Rate in./min	Failure Stress psi	Deflection in.	Temperature °C			Type of Failure	Remarks
			Snow Age days	Age hr	days	hr								Air	Snow			
830	22	432	30	8-1/2	3	4	2	18-1/2	2-3/4	6	0.500	90.00	12.62	0.055	-8	-10	Compression	
831	22	433	30	8-3/4	3	4	2	18-3/4	2-3/4	6	0.479	4.00	22.40	0.070	-7	-10	Crushing	At base
832	22	434	30	9	3	4	2	19	2-3/4	6	0.486	4.00	21.0	0.006	-7	-10	Compression	
833	22	435	30	9	3	4	2	19	2-3/4	6	0.473	4.00	18.50	0.026	-7	-10	Compression	
834	22	436	30	9	3	4	2	19	2-3/4	6	0.498	4.00	9.60	0.002	-7	-10	Crushing	
835	22	437	30	9	3	4	2	19	2-3/4	6	0.465	4.00	10.93	0.006	-7	-10	Compression	
836	22	438	30	9	3	4	2	19	2-3/4	6	0.455	4.00	18.50	0.126	-7	-10	Compression	
837	22	439	30	9-1/4	3	4	2	19-1/4	2-3/4	6	0.473	4.00	19.35	0.052	-7	-10	Compression	
838	22	440	30	9-1/4	3	4	2	19-1/4	2-3/4	6	0.485	4.00	10.1	0.010	-7	-10	Compression	
839	22	441	30	9-1/4	3	4	2	19-1/4	2-3/4	6	0.467	4.00	15.99	0.002	-7	-10	Compression	
840	22	442	30	9-1/4	3	4	2	19-1/4	2-3/4	6	0.491	4.00	14.30	0.002	-7	-10	Compression	
841	22	443	30	9-1/4	3	4	2	19-1/4	2-3/4	6	0.488	4.00	33.20	0.029	-7	-10	Crushing	At base
842	22	444	30	9-1/4	3	4	2	19-1/4	2-3/4	6	0.491	4.00	22.0	0.031	-7	-10	Crushing	At base
843	22	445	30	9-1/4	3	4	2	19-1/4	2-3/4	6	0.481	4.00	23.20	0.075	-7	-10	Compression	
844	22	446	31	13-3/4	1	21	5	4-3/4	2-3/4	6	0.527	4.00	30.30	0.024	-4	-7	Compression	
845	22	447	31	13-3/4	1	21	5	4-3/4	2-3/4	6	0.526	4.00	9.60	0.030	-4	-7	Crushing	At top
846	22	448	31	13-3/4	1	21	5	4-3/4	2-3/4	6	0.507	4.00	28.90	0.062	-4	-7	Crushing	At base
847	22	449	31	13-3/4	1	21	5	4-3/4	2-3/4	6	0.495	4.00	22.70	0.048	-4	-7	Compression	
848	22	450	31	13-3/4	1	21	5	4-3/4	2-3/4	6	0.486	4.00	22.40	0.092	-4	-7	Compression	
849	22	451	31	13-3/4	1	21	5	4-3/4	2-3/4	6	0.483	4.00	22.40	0.070	-4	-7	Crushing, then tension	At top
850	22	452	31	13-3/4	1	21	5	4-3/4	2-3/4	6	0.490	4.00	14.98	0.078	-4	-7	Crushing	At top
851	22	454	31	13-3/4	1	21	5	4-3/4	2-3/4	6	0.531	4.00	33.65	0.023	-4	-7	Crushing, then tension	At base
852	22	455	31	13-3/4	1	21	5	4-3/4	2-3/4	6	0.512	4.00	19.69	0.036	-4	-7	Compression	
853	22	456	31	13-3/4	1	21	5	4-3/4	2-3/4	6	0.524	4.00	23.40	0.036	-4	-7	Compression	
854	22	457	31	14	1	21	5	5	2-3/4	6	0.490	4.00	24.90	0.030	-4	-7	Compression	
855	22	458	31	14	1	21	5	5	2-3/4	6	0.507	4.00	26.90	0.090	-4	-7	Compression	
856	22	459	31	14	1	21	5	5	2-3/4	6	0.510	4.00	24.10	0.058	-4	-7	Tension	
857	22	460	31	14	1	21	5	5	2-3/4	6	0.528	4.00	25.70	0.064	-4	-7	Crushing	At top, bad test
858	22	461	31	14	2	3	4	23	2-3/4	6	0.507	4.00	26.90	0.044	-4	-7	Compression	
859	22	462	31	14	2	3	4	23	2-3/4	6	0.538	4.00	39.90	0.044	-4	-7	Compression	
860	22	464	31	14	2	3	4	23	2-3/4	6	0.530	4.00	29.80	0.045	-4	-7	Crushing, then tension	At top
861	22	465	31	14	2	3	4	23	2-3/4	6	0.465	4.00	14.30	0.048	-4	-7	Crushing	At top
862	22	466	31	14	2	3	4	23	2-3/4	6	0.465	4.00	15.14	0.140	-4	-7	Crushing, then compression	At base, bad cylinder
863	22	467	31	14	2	3	4	23	2-3/4	6	0.495	4.00	26.90	0.110	-4	-7	Compression	
864	22	468	31	14	2	3	4	23	2-3/4	6	0.534	4.00	21.0	0.029	-4	-7	Crushing	At top

(Continued)

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TABLE B.3 (CONTINUED)

Item No.	Material No.	Test No.	Snow Age		Rough Sample Age		Cylinder Age days	Diameter in.	Length in.	Specific Weight g/cm³	Loading Rate in./min	Failure Stress psi	Deflection in.	Temperature °C		Type of Failure	Remarks	
			days	hr	days	hr								Air	Snow			
865	22	469	31	14	2	3	4	23	2-3/4	6	0.486	4.00	12.62	0.033	-4	-7	Compression	
866	22	470	31	14	2	3	4	23	2-3/4	6	0.524	4.00	25.70	0.044	-4	-7	Crushing, then tension	At top
867	22	471	31	14-1/4	2	3	4	23-1/4	2-3/4	6	0.531	4.00	7.13	0.050	-4	-7	Tension	In horizontal position
868	22	472	31	14-1/4	2	3	4	23-1/4	2-3/4	6	0.485	4.00	4.97	0.058	-4	-7	Tension	In horizontal position
869	22	473	31	14-1/4	2	3	4	23-1/4	2-3/4	6	0.497	4.00	5.78	0.078	-4	-7	Tension	In horizontal position
870	22	474	31	14-1/4	2	3	4	23-1/4	2-3/4	6	0.471	4.00	4.05	0.088	-4	-7	Tension	In horizontal position
871	22	475	31	14-1/4	2	3	4	23-1/4	2-3/4	6	0.524	4.00	3.36	0.092	-4	-7	Tension	In horizontal position
872	22	478	31	14-1/2	7	1	--	1-1/2	2-3/4	6	0.515	4.00	6.43	0.066	-4	-7	Tension	In horizontal position
873	22	479	31	14-1/2	7	1	--	1-1/2	2-3/4	6	0.442	4.00	3.47	0.084	-4	-7	Tension	In horizontal position
874	22	480	31	14-1/2	7	1	--	1-1/2	2-3/4	6	0.469	4.00	26.1	0.030	-4	-7	Compression	
875	22	481	31	14-3/4	7	1	--	1-3/4	2-3/4	6	0.517	4.00	16.32	0.042	-4	-7	Compression	
876	22	482	31	14-3/4	7	1	--	1-3/4	2-3/4	6	0.505	4.00	30.3	0.040	-4	-7	Compression	
877	22	483	31	14-3/4	7	1	--	1-3/4	2-3/4	6	0.495	4.00	27.2	0.085	-4	-7	Crushing, then tension	
878	22	486	31	14-3/4	7	1	--	1-3/4	2-3/4	6	0.498	4.00	27.8	0.072	-4	-7	Compression	
879	22	487	31	14-3/4	7	1	--	1-3/4	2-3/4	6	0.530	4.00	24.7	0.057	-4	-7	Compression	
880	22	488	33	10-1/2	1	22	--	2-1/2	2-3/4	6	0.457	4.00	7.91	0.033	-3	-8	Compression	
881	22	489	33	10-3/4	1	22	--	2-3/4	2-3/4	6	0.520	4.00	32.5	0.039	-3	-8	Crushing	At top possibly tension
882	22	490	33	10-3/4	1	22	--	2-3/4	2-3/4	6	0.467	4.00	17.67	0.052	-3	-8	Compression	
883	22	491	33	10-3/4	1	22	--	2-3/4	2-3/4	6	0.519	4.00	28.3	0.026	-3	-8	Compression	
884	22	492	33	10-3/4	1	22	--	2-3/4	2-3/4	6	0.512	4.00	25.2	0.024	-3	-8	Compression	
885	22	493	33	10-3/4	1	22	--	2-3/4	2-3/4	6	0.495	4.00	29.8	0.022	-3	-8	Crushing	
886	22	494	33	10-3/4	1	22	--	2-3/4	2-3/4	6	0.473	4.00	36.0	0.064	-3	-8	Compression	
887	22	495	33	10-3/4	1	22	--	2-3/4	2-3/4	6	0.465	4.00	18.5	0.044	-3	-8	Crushing, then tension	
888	22	496	33	10-3/4	1	22	--	2-3/4	2-3/4	6	0.453	4.00	10.78	0.025	-3	-8	Shear	Angle of 30°
889	22	498	33	10-3/4	1	22	--	2-3/4	2-3/4	6	0.485	4.00	2.70	0.085	-3	-8	Tension	In horizontal position
890	22	499	33	10-3/4	1	22	--	2-3/4	2-3/4	6	0.493	4.00	8.17	0.140	-3	-8	Tension	In horizontal position
891	22	500	34	10-1/4	1	21-1/2	--	2-3/4	2-3/4	6	0.479	4.02	18.50	0.191	-4	-8	Crushing	At base
892	22	501	34	10-1/4	1	21-1/2	--	2-3/4	2-3/4	6	0.483	4.02	14.98	0.098	-4	-8	Compression	
893	22	502	34	10-1/4	1	21-1/2	--	2-3/4	2-3/4	6	0.473	4.02	15.99	0.076	-4	-8	Compression	At base
894	22	503	34	10-1/4	1	21-1/2	--	2-3/4	2-3/4	6	0.498	4.02	23.9	0.055	-4	-8	Crushing	At base
895	22	504	34	10-1/4	1	21-1/2	--	2-3/4	2-3/4	6	0.478	4.02	30.8	0.174	-4	-8	Crushing	At top
896	22	505	34	10-1/4	1	21-1/2	--	2-3/4	2-3/4	6	0.510	4.02	15.65	0.095	-4	-8	Crushing	At top
897	22	506	34	10-1/4	1	21-1/2	--	2-3/4	2-3/4	6	0.481	4.02	22.55	0.183	-4	-8	Compression	
898	22	507	34	10-1/2	1	21-1/2	--	3	2-3/4	6	0.500	4.02	18.00	0.077	-4	-8	Compression	At top
899	22	508	34	10-1/2	1	21-1/2	--	3	2-3/4	6	0.486	4.02	14.98	0.092	-4	-8	Crushing	At top then compression

(Continued)

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TABLE B.3 (CONTINUED)

Item No.	Material No.	Test No.	Rough Sample				Cylinder Age	Diameter in.	Length in.	Specific Weight g/cm³	Loading Rate in./min	Failure Stress psi	Deflection in.	Temperature °C			Remarks	
			Snow days	Age hr	days	hr								Air	Snow	Type of Failure		
900	22	509	34	10-1/2	1	21-1/2	--	3	2-3/4	6	0.497	4.02	5.20	0.149	-4	-8	Diagonal tension	In horizontal position
901	22	510	34	10-1/2	1	21-1/2	--	3	2-3/4	6	0.512	4.02	4.86	0.124	-4	-8	Tension	In horizontal position
902	22	511	34	10-1/2	1	21-1/2	--	3	2-3/4	6	0.505	4.02	4.55	0.083	-4	-8	Tension	In horizontal position
903	22	512	38	22	1	4	13	8	2-3/4	6	0.495	4.02	20.7	0.076	-7	-9	Compression	
904	22	513	38	22	1	4	13	8	2-3/4	6	0.483	4.02	25.6	0.118	-7	-9	Compression	
905	22	514	38	22	1	4	13	8	2-3/4	6	0.519	4.02	26.2	0.082	-7	-9	Crushing, then tension	At base
906	22	515	38	22-1/4	1	4	13	8-1/4	2-3/4	6	0.493	4.02	24.9	0.049	-7	-9	Crushing, then tension	At base
907	22	516	38	22-1/4	1	4	13	8-1/4	2-3/4	6	0.478	4.02	16.82	0.078	-7	-9	Crushing	At base
908	22	517	38	22-1/4	1	4	13	8-1/4	2-3/4	6	0.488	4.02	17.32	0.122	-7	-9	Compression	
909	22	518	38	22-1/4	1	4	13	8-1/4	2-3/4	6	0.519	4.02	10.60	0.021	-7	-9	Compression	
910	22	519	38	22-1/4	1	4	13	8-1/4	2-3/4	6	0.508	4.02	27.80	0.166	-7	-9	Compression	
911	22	520	38	22-1/4	1	4	13	8-1/4	2-3/4	6	0.510	4.02	19.00	0.026	-7	-9	Compression	
912	22	521	38	23	1	4	13	9	2-3/4	6	0.514	4.02	11.56	0.098	-7	-9	Tension	In horizontal position
913	22	522	38	23	1	4	13	9	2-3/4	6	0.503	4.02	4.40	0.091	-7	-9	Tension	In horizontal position
914	22	523	38	23	1	4	13	9	2-3/4	6	0.508	4.02	5.01	0.096	-7	-9	Tension	In horizontal position
915	22	524A	41	11-1/4	17	1/2	--	3/4	2-3/4	6	0.476	4.02	5.90	0.109	-4	-9	Tension	In horizontal position
916	22	525A	41	11-1/4	17	1/2	--	3/4	2-3/4	6	0.517	4.02	10.18	0.172	-4	-9	Crushing	In horizontal position
917	22	526A	41	11-1/4	17	1/2	--	3/4	2-3/4	6	0.519	4.02	10.22	0.073	-4	-7	Tension	In horizontal position
918	22	527A	41	11-1/2	17	1/2	--	1	2-3/4	6	0.510	4.02	26.40	0.045	-4	-7	Compression	
919	22	528A	41	11-1/2	17	1/2	--	1	2-3/4	6	0.453	4.02	12.62	0.049	-4	-7	Compression	
920	22	529A	41	11-1/2	17	1/2	--	1	2-3/4	6	0.520	4.02	33.65	0.069	-4	-7	Compression	
921	22	530A	41	11-1/2	17	1/2	--	1	2-3/4	6	0.522	4.02	35.30	0.058	-4	-7	Crushing, then tension	
922	22	531A	41	11-1/2	17	1/2	--	1	2-3/4	6	0.432	4.02	9.60	0.029	-4	-7	Compression	
923	22	532A	41	11-1/2	17	1/2	--	1	2-3/4	6	0.497	4.02	24.70	0.048	-4	-7	Crushing	
924	22	533A	41	11-1/2	17	1/2	--	1	2-3/4	6	0.538	4.02	31.10	0.050	-4	-7	Crushing	
925	22	534A	41	11-1/2	17	1/2	--	1	2-3/4	6	0.505	4.02	25.90	0.063	-4	-7	Compression	
926	22	535A	41	11-1/2	17	1/2	--	1	2-3/4	6	0.481	4.02	18.00	0.022	-4	-7	Compression	
927	22	537A	41	12-1/2	17	1/4	--	2	2-3/4	6	0.490	4.02	34.65	0.030	-4	-9	Compression	
928	22	538A	41	12-1/2	17	1/4	--	2	2-3/4	6	0.505	4.02	36.20	0.053	-4	-9	Compression	
929	22	539A	41	12-1/2	17	1/4	--	2	2-3/4	6	0.498	4.02	33.65	0.046	-4	-9	Compression	
930	22	540A	41	12-1/2	17	1/4	--	2	2-3/4	6	0.508	4.02	29.40	0.085	-4	-9	Compression	
931	22	541A	41	12-1/2	17	1/4	--	2	2-3/4	6	0.483	4.02	27.40	0.052	-4	-9	Compression	
932	22	542A	41	12-1/2	17	1/4	--	2-1/4	2-3/4	6	0.495	4.02	32.00	0.076	-4	-9	Shear (45°)	Specimen slid out
933	22	543A	41	12-1/2	17	1/4	--	2-1/4	2-3/4	6	0.528	4.02	28.90	0.030	-4	-9	Compression	
934	22	544A	41	12-1/2	17	1/4	--	2-1/4	2-3/4	6	0.481	4.02	21.85	0.067	-4	-9	Compression	

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TABLE B.3 (CONTINUED)

Item No.	Material No.	Test No.	Rough Sample			Cylinder Age days	Diameter in.	Length in.	Specific Weight g/cm³	Loading Rate in./min	Failure Stress psi	Deflection in.	Temperature °C		Type of Failure	Remarks		
			Snow days	Age hr	Cylinder Age days								Air	Snow				
935	22	545A	41	12-3/4	17	1/4	--	2-1/2	2-3/4	6	0.522	4.02	8.48	0.072	-4	-9	Tension	In horizontal position
936	22	546A	41	12-3/4	17	1/4	--	2-1/2	2-3/4	6	0.488	4.02	8.29	0.079	-4	-9	Tension	In horizontal position
937	22	547A	41	12-3/4	17	1/4	--	2-1/2	2-3/4	6	0.491	4.02	5.78	0.098	-4	-9	Tension	In horizontal position
938	22	548A	41	13	17	1/4	--	3	2-3/4	6	0.495	4.02	7.05	0.106	-4	-9	Tension	In horizontal position
939	22	549A	41	13	17	1/4	--	3	2-3/4	6	0.493	4.02	8.08	0.089	-4	-9	Crushing	In horizontal position
940	22	550A	41	13	17	1/4	--	3	2-3/4	6	0.508	4.02	13.97	0.048	-4	-9	Tension	In horizontal position
941	22	551A	41	13-1/4	17	1/4	--	3	2-3/4	6	0.486	4.02	18.18	0.040	-4	-9	Crushing	At top
942	22	552A	41	13-1/4	17	1/4	--	3	2-3/4	6	0.479	4.02	13.10	0.035	-4	-9	Compression	
943	22	553A	41	13-1/4	17	1/4	--	3-1/4	2-3/4	6	0.473	4.02	22.70	0.060	-4	-9	Compression	
944	22	554A	41	13-1/4	17	1/4	--	3-1/4	2-3/4	6	0.481	4.02	14.12	0.038	-4	-9	Compression	
945	22	555A	41	13-1/4	17	1/4	--	3-1/4	2-3/4	6	0.476	4.02	10.93	0.060	-4	-9	Crushing	At base
946	22	556A	41	13-1/4	17	1/4	--	3-1/4	2-3/4	6	0.483	4.02	32.00	0.041	-4	-9	Compression	
947	22	557A	41	13-1/4	17	1/4	--	3-1/4	2-3/4	6	0.491	4.02	26.60	0.118	-4	-9	Compression	
948	22	558A	41	13-1/2	17	1/4	--	3-1/4	2-3/4	6	0.490	4.02	32.00	0.055	-4	-9	Compression	
949	22	559A	41	13-1/2	17	1/4	--	3-1/4	2-3/4	6	0.471	4.02	13.97	0.048	-4	-9	Crushing	At base
950	22	560A	41	13-3/4	16	23	--	4-3/4	2-3/4	6	0.488	4.02	34.50	0.046	-4	-9	Compression	
951	22	561A	41	13-3/4	16	23	--	4-3/4	2-3/4	6	0.503	4.02	53.87	0.063	-4	-9	Crushing	
952	22	563A	41	13-3/4	16	23	--	4-3/4	2-3/4	6	0.488	4.02	30.30	0.093	-4	-9	Compression	
953	22	564A	41	13-3/4	16	23	--	4-3/4	2-3/4	6	0.465	4.02	19.85	0.066	-4	-9	Crushing	At top
954	22	565A	41	13-3/4	16	23	--	4-3/4	2-3/4	6	0.495	4.02	34.30	0.076	-4	-9	Compression	
955	22	566A	41	13-3/4	16	23	--	4-3/4	2-3/4	6	0.481	4.02	13.45	0.054	-4	-9	Compression	
956	22	567A	41	13-3/4	16	23	--	4-3/4	2-3/4	6	0.483	4.02	24.40	0.066	-4	-9	Crushing	At top
957	22	568A	41	13-3/4	16	23	--	4-3/4	2-3/4	6	0.483	4.02	17.18	0.114	-4	-9	Crushing	At top
958	22	569A	41	14	16	23	--	5	2-3/4	6	0.491	4.02	12.74	0.159	-4	-9	Tension	In horizontal position
959	22	570A	41	13-3/4	16	23	--	4-3/4	2-3/4	6	0.479	4.02	18.57	0.088	-4	-9	Tension	In horizontal position
960	22	571A	41	13-3/4	16	23	--	4-3/4	2-3/4	6	0.486	4.02	11.12	0.110	-4	-9	Tension	In horizontal position
961	22	572A	41	14	16	23-3/4	--	4-1/4	2-3/4	6	0.517	4.02	9.46	0.114	-4	-9	Tension	In horizontal position
962	22	573A	41	14	16	23-3/4	--	4-1/4	2-3/4	6	0.512	4.02	11.97	0.085	-4	-9	Tension	In horizontal position
963	22	574A	41	14	16	23-3/4	--	4-1/4	2-3/4	6	0.512	4.02	6.56	0.080	-4	-9	Tension	In horizontal position
964	22	575A	41	14	16	23-3/4	--	4-1/2	2-3/4	6	0.546	4.02	21.0	0.094	-4	-9	Compression	
965	22	577A	41	14-1/4	16	23-3/4	--	4-1/2	2-3/4	6	0.478	4.02	32.00	0.070	-4	-9	Compression	
966	22	578A	41	14-1/4	16	23-3/4	--	4-1/2	2-3/4	6	0.451	4.02	24.10	0.115	-4	-9	Crushing	At top
967	22	579A	41	14-1/4	16	23-3/4	--	4-1/2	2-3/4	6	0.488	4.02	20.85	0.077	-4	-9	Compression	
968	22	580A	41	14-1/4	16	23-3/4	--	4-1/2	2-3/4	6	0.464	4.02	21.35	0.032	-4	-9	Compression	
969	22	581A	41	14-1/4	16	23-3/4	--	4-1/2	2-3/4	6	0.524	4.02	17.67	0.086	-4	-9	Crushing	At base
970	22	582A	41	14-1/4	16	23-3/4	--	4-1/2	2-3/4	6	0.500	4.02	26.40	0.068	-4	-9	Compression	
971	22	583A	41	14-1/4	16	23-3/4	--	4-1/2	2-3/4	6	0.478	4.02	37.40	0.098	-4	-9	Compression	

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TABLE B.3 (CONTINUED)

Item No.	Material No.	Test No.	Rough Sample				Specific Weight g/cm^3	Loading Rate in./min	Failure Stress psi	Deflection in.	Temperature $^{\circ}\text{C}$			Remarks		
			Snow days	Age hr	Age days	Age hr					Air	Snow	Type of Failure			
972	22	585A	41	17	17	--	7	2-3/4	6	0.473	4.02	17.67	0.047	-4	-9 Compression	
973	22	586A	41	17	17	--	7	2-3/4	6	0.498	4.02	22.70	0.071	-4	-9 Compression	
974	22	587A	41	17	17	--	7	2-3/4	6	0.503	4.02	28.30	0.047	-4	-9 Compression	
975	22	588A	41	17	17	--	7	2-3/4	6	0.471	4.02	13.10	0.035	-4	-9 Crushing	
976	22	589A	41	17	17	--	7	2-3/4	6	0.474	4.02	14.62	0.047	-4	-9 Compression	
977	22	590A	41	17	17	--	7	2-3/4	6	0.469	4.02	15.81	0.080	-4	-9 Crushing	
978	22	591A	41	17	17	--	7	2-3/4	6	0.488	4.02	19.85	0.098	-4	-9 Compression	
979	22	592A	41	17	17	--	7	2-3/4	6	0.471	4.02	19.18	0.083	-4	-9 Compression	
980	22	593A	41	17	17	--	7	2-3/4	6	0.488	4.02	6.43	0.155	-4	-9 Tension	
981	22	594A	41	17	17	--	7	2-3/4	6	0.508	4.02	6.37	0.113	-4	-9 Tension	
982	22	595A	41	17	17	--	7	2-3/4	6	0.471	4.02	3.90	0.166	-4	-9 Tension	
983	22	596A	41	18-1/2	16	22-1/2	--	10	2-3/4	6	0.467	4.02	6.25	0.124	-3	-6 Tension
984	22	597A	41	18-1/2	16	22-1/2	--	10	2-3/4	6	0.497	4.02	8.48	0.107	-3	-6 Tension
985	22	598A	41	18-1/2	16	22-1/2	--	10	2-3/4	6	0.514	4.02	6.48	0.042	-3	-8 Tension
986	22	599A	41	18-1/2	16	22-1/2	--	10	2-3/4	6	0.483	4.02	24.4	0.046	-3	-6 Tension
987	22	600A	41	18-1/2	16	22-1/2	--	10	2-3/4	6	0.467	4.02	17.32	0.063	-3	-6 Compression
988	22	601A	41	18-1/2	16	22-1/2	--	10	2-3/4	6	0.452	4.02	15.14	0.047	-3	-6 Crushing
989	22	602A	41	18-1/2	16	22-1/2	--	10	2-3/4	6	0.503	4.02	27.20	0.043	-3	-6 Compression
990	22	603A	41	18-1/2	16	22-1/2	--	10	2-3/4	6	0.538	4.02	30.80	0.057	-3	-6 Crushing
991	22	604A	41	18-1/2	16	22-1/2	--	10	2-3/4	6	0.449	4.02	14.98	0.066	-3	-6 Crushing
992	22	605A	41	18-1/2	16	22-1/2	--	10	2-3/4	6	0.548	4.02	36.20	0.048	-3	-6 Crushing
993	22	606A	41	18-1/2	16	22-1/2	--	10	2-3/4	6	0.445	4.02	10.40	0.091	-3	-6 Crushing
994	22	608A	42	15	17	5	1	1/4	2-3/4	6	0.447	4.02	--	-3	-5 Compression	
995	22	609A	42	15-1/2	17	5	1	1/4	2-3/4	6	0.507	4.02	25.20	0.059	-3	-5 Compression
996	22	610A	42	15-1/2	17	5	1	1/4	2-3/4	6	0.501	4.02	23.55	0.052	-2	-5 Compression
997	22	611A	42	15-1/2	17	5	1	1/4	2-3/4	6	0.473	4.02	22.2	0.054	-2	-5 Compression
998	22	612A	42	15-1/2	17	5	1	1/4	2-3/4	6	0.479	4.02	15.99	0.070	-2	-5 Crushing
999	22	613A	42	15-1/2	17	5	1	1/4	2-3/4	6	0.510	4.02	32.00	0.054	-2	-5 Crushing
1000	22	614A	42	15-1/2	17	5	1	1/2	2-3/4	6	0.440	4.02	14.30	0.134	-2	-5 Compression
1001	22	615A	42	15-1/2	17	5	1	1/2	2-3/4	6	0.520	4.02	16.82	0.062	-2	-5 Crushing
1002	22	616A	42	15-1/2	17	5	1	1/2	2-3/4	6	0.517	4.02	26.40	0.054	-2	-5 Crushing
1003	22	617A	42	15-1/2	17	5	1	1/2	2-3/4	6	0.510	4.02	5.59	0.089	-2	-5 Tension
1004	22	618A	42	15-1/2	17	5	1	1/2	2-3/4	6	0.514	4.02	6.94	0.072	-2	-5 Tension
1005	22	619A	42	15-3/4	17	5	1	1/2	2-3/4	6	0.495	4.02	6.37	0.075	-2	-5 Tension
1006	22	620A	43	14-3/4	17	5	1	23-3/4	2-3/4	6	0.531	4.02	7.90	0.055	-3	-5 Tension
1007	22	621A	43	14-3/4	17	5	1	23-3/4	2-3/4	6	0.500	4.02	6.18	0.056	-3	-5 Tension
1008	22	622A	43	14-3/4	17	5	1	23-3/4	2-3/4	6	0.530	4.02	6.18	0.069	-3	-5 Tension

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TABLE B.3 (CONTINUED)

Item No.	Material No.	Test No.	Rough Sample				Diameter in.	Length in.	Specific Weight lb/cm^3	Loading Rate in./min.	Failure Stress psi	Deflection in.	Temperature			Remarks		
			Snow days	Age hr	Age days	Age hr							in.	in.	°C	Air	Snow	Type of Failure
1009	22	623A	43	14-3/4	17	5	1	23-3/4	2-3/4	6	0.491	4.02	38.20	0.054	-3	-5	Crushing	At base
1010	22	624A	43	14-3/4	17	5	1	23-3/4	2-3/4	6	0.500	4.02	27.80	0.030	-3	-6	Crushing	At top
1011	22	625A	43	15	17	5	2	--	2-3/4	6	0.507	4.02	31.10	0.042	-4	-6	Compression	
1012	22	626A	43	15	17	5	2	--	2-3/4	6	0.500	4.02	30.60	0.053	-4	-6	Compression	
1013	22	627A	43	15	17	5	2	--	2-3/4	6	0.451	4.02	13.45	0.026	-4	-6	Compression	
1014	22	628A	43	15	17	5	2	--	2-3/4	6	0.432	4.02	8.42	0.116	-4	-6	Compression	
1015	22	629A	43	15	17	5	2	--	2-3/4	6	0.505	4.02	44.40	0.061	-4	-6	Compression	
1016	22	630A	43	15	17	5	2	--	2-3/4	6	0.486	4.02	31.40	0.043	-4	-6	Compression	
1017	22	631A	43	15	17	5	2	--	2-3/4	6	0.444	4.02	8.92	0.059	-4	-6	Compression	
1018	22	632	43	15	7	1	12	2	2-3/4	6	0.478	4.02	25.20	0.027	-2	-5	Compression	
1019	22	633	43	15	7	1	12	2	2-3/4	6	0.514	4.02	24.70	0.084	-2	-5	Compression	
1020	22	634	43	15-1/4	7	1	12	2-1/4	2-3/4	6	0.503	4.02	20.85	0.041	-2	-5	Compression	
1021	22	635	43	15-1/4	7	1	12	2-1/4	2-3/4	6	0.500	4.02	34.50	0.080	-2	-5	Crushing	At top
1022	22	636	43	15-1/4	7	1	12	2-1/4	2-3/4	6	0.497	4.02	16.82	0.119	-2	-5	Compression	
1023	22	639	43	15-1/4	7	1	12	2-1/4	2-3/4	6	0.565	4.02	25.10	0.040	-2	-5	Crushing	At base
1024	22	640	43	15-1/4	7	1	12	2-1/4	2-3/4	6	0.531	4.02	28.10	0.112	-2	-5	Compression	
1025	22	641	43	15-1/4	7	1	12	2-1/4	2-3/4	6	0.517	4.02	19.69	0.155	-2	-5	Crushing	At top
1026	22	642	43	15-1/4	7	1	12	2-1/4	2-3/4	6	0.505	4.02	20.50	0.090	-2	-5	Crushing	At base
1027	22	643	43	15-1/4	7	1	12	2-1/4	2-3/4	6	0.503	4.02	14.62	0.131	-2	-5	Crushing	At top
1028	22	644	43	15-1/2	7	1	12	2-1/2	2-3/4	6	0.507	4.02	6.18	0.058	-2	-5	Tension	In horizontal position
1029	22	645	43	15-1/2	7	1	12	2-1/2	2-3/4	6	0.512	4.02	7.87	0.060	-2	-5	Tension	In horizontal position
1030	22	646	43	15-1/2	7	1	12	2-1/2	2-3/4	6	0.497	4.02	17.00	0.133	-2	-5	Tension	In horizontal position
1031	22	647	43	15-1/2	7	22	11	5-1/2	2-3/4	6	0.495	4.02	7.21	0.058	-3	-6	Tension	In horizontal position
1032	22	648	43	15-3/4	7	22	11	5-3/4	2-3/4	6	0.467	4.02	8.41	0.040	-3	-6	Tension	In horizontal position
1033	22	649	43	15-3/4	7	22	11	5-3/4	2-3/4	6	0.490	4.02	6.98	0.078	-3	-6	Tension	In horizontal position
1034	22	651	43	16	7	22	11	6	2-3/4	6	0.514	4.02	32.50	0.142	-3	-6	Crushing	At top
1035	22	652	43	16	7	22	11	6	2-3/4	6	0.519	4.02	36.65	0.056	-3	-6	Compression	
1036	22	653	43	16	7	22	11	6	2-3/4	6	0.493	4.02	19.00	0.028	-3	-6	Crushing	At base
1037	22	654	43	16	7	22	11	6	2-3/4	6	0.488	4.02	21.2	0.037	-3	-6	Crushing	At top
1038	22	655	43	16	7	22	11	6	2-3/4	6	0.486	4.02	12.62	0.054	-3	-6	Crushing	At base
1039	22	656	43	16	7	22	11	6	2-3/4	6	0.505	4.02	30.00	0.074	-3	-6	Compression	
1040	22	657	43	16	7	22	11	6	2-3/4	6	0.500	4.02	23.40	0.026	-3	-6	Compression	
1041	22	658	43	16	7	22	11	6	2-3/4	6	0.498	4.02	43.40	0.040	-3	-6	Shear	45° angle
1042	22	659	43	16	7	22	11	6	2-3/4	6	0.479	4.02	42.75	0.052	-3	-6	Crushing	At top
1043	22	660	43	16	7	22	11	6	2-3/4	6	0.495	4.02	31.00	0.068	-3	-6	Crushing	
1044	22	661	43	16	7	22	11	6	2-3/4	6	0.507	4.02	35.80	0.056	-3	-6	Crushing	At base
1045	22	662	44	12-3/4	--	5	11	21-3/4	2-3/4	6	0.493	4.02	37.00	0.019	-2	-10	Crushing	

(Continued)

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TABLE B.3 (CONTINUED)

Item No.	Material No.	Test No.	Rough Sample				Cylinder Age days	Diameter in.	Length in.	Specific Weight g/cm³	Loading Rate in./min	Failure Stress psi	Deflection in.	Temperature °C		Type of Failure	Remarks	
			Snow days	Age hr	days	hr								Air	Snow			
1046	22	663	44	12-3/4	--	5	11	21-3/4	2-3/4	6	0.474	4.02	13.62	0.009	-2	-10	Compression	
1047	22	664	44	12-3/4	--	5	11	21-3/4	2-3/4	6	0.490	4.02	42.25	0.027	-2	-10	Compression	At top
1048	22	665	44	12-3/4	--	5	11	21-3/4	2-3/4	6	0.478	4.02	41.75	0.047	-2	-10	Crushing	At base
1049	22	666	44	12-3/4	--	5	11	21-3/4	2-3/4	6	0.488	4.02	18.18	0.056	-2	-10	Compression	
1050	22	667	44	12-3/4	--	5	11	21-3/4	2-3/4	6	0.485	4.02	19.35	0.012	-2	-10	Compression	
1051	22	668	44	12-3/4	--	5	11	21-3/4	2-3/4	6	0.476	4.02	23.55	0.087	-2	-10	Compression	
1052	22	669	44	12-3/4	--	5	11	21-3/4	2-3/4	6	0.498	4.02	25.10	0.128	-2	-10	Compression	
1053	22	670	44	12-3/4	--	5	11	21-3/4	2-3/4	6	0.491	4.02	18.50	0.008	-2	-10	Compression	
1054	22	671	44	12-3/4	--	5	11	21-3/4	2-3/4	6	0.485	4.02	17.50	0.010	-2	-10	Compression	
1055	22	672	44	12-3/4	--	5	11	21-3/4	2-3/4	6	0.498	4.02	48.80	0.049	-2	-10	Crushing	
1056	22	673	44	12-3/4	--	5	11	21-3/4	2-3/4	6	0.483	4.02	19.85	0.012	-2	-10	Compression	
1057	22	674	44	12-3/4	--	23	11	3-3/4	2-3/4	6	0.476	4.02	19.35	0.044	-2	-10	Compression	
1058	22	675	44	13	--	23	11	4	2-3/4	6	0.488	4.02	23.90	0.087	-2	-10	Compression	
1059	22	676	44	13	--	23	11	4	2-3/4	6	0.483	4.02	43.40	0.042	-2	-10	Tension	
1060	22	677	44	13	--	23	11	4	2-3/4	6	0.503	4.02	18.35	0.021	-2	-10	Compression	
1061	22	678	44	13	--	23	11	4	2-3/4	6	0.486	4.02	32.00	0.024	-2	-10	Compression	
1062	22	679	44	13	--	23	11	4	2-3/4	6	0.491	4.02	41.40	0.057	-2	-10	Crushing	At top
1063	22	680	44	13	--	23	11	4	2-3/4	6	0.455	4.02	28.30	0.032	-2	-10	Compression	
1064	22	681	44	13	--	23	11	4	2-3/4	6	0.483	4.02	17.50	0.085	-2	-10	Compression	
1065	22	682	44	13	--	23	11	4	2-3/4	6	0.462	4.02	32.20	0.056	-2	-10	Compression	
1066	22	683	44	13	--	23	11	4	2-3/4	6	0.483	4.02	27.40	0.053	-2	-10	Crushing	At top
1067	22	684	44	13-1/4	--	23	11	4-1/4	2-3/4	6	0.467	4.02	16.65	0.164	-2	-10	Compression	No failure type listed
1068	22	685	44	13	--	--	10	5	2-3/4	6	0.471	4.02	25.10	0.054	-2	-10	Compression	
1069	22	686	44	13	--	--	10	5	2-3/4	6	0.471	4.02	19.69	0.038	-2	-10	Crushing	
1070	22	687	44	13-1/4	--	--	10	5-1/4	2-3/4	6	0.473	4.02	25.90	0.079	-2	-10	Compression	
1071	22	688	44	13-1/4	--	--	10	5-1/4	2-3/4	6	0.465	4.02	22.2	0.121	-2	-10	Compression	
1072	22	689	44	13-1/4	--	--	10	5-1/4	2-3/4	6	0.497	4.02	18.50	0.150	-2	-10	Compression	
1073	22	690	44	13-1/4	--	--	10	5-1/4	2-3/4	6	0.478	4.02	19.00	0.163	-2	-10	Crushing	At base
1074	22	691	44	13-1/4	--	--	10	4-1/4	2-3/4	6	0.474	4.02	21.35	0.162	-2	-10	Compression	
1075	22	692	44	13-1/4	--	--	10	5-1/4	2-3/4	6	0.485	4.02	24.10	0.142	-2	-10	Crushing	Then tension at top
1076	22	693	44	13-1/4	--	--	10	5-1/4	2-3/4	6	0.483	4.02	7.58	0.144	-2	-10	Compression	
1077	22	694	44	13-1/4	--	--	10	5-1/4	2-3/4	6	0.473	4.02	18.00	0.174	-2	-10	Compression	
1078	22	695	44	13-1/4	--	--	10	5-1/4	2-3/4	6	0.478	4.02	17.67	0.184	-2	-10	Compression	
1079	22	696	44	13-1/4	--	--	10	5-1/4	2-3/4	6	0.469	4.02	18.50	0.114	-2	-10	Crushing	Crushing at top and bottom
1080	22	697	44	13-1/2	--	5	11	22-1/2	2-3/4	6	0.500	4.02	9.62	0.068	-2	-10	Tension	In horizontal position, 1 in. = 100 lb
1081	22	698	44	13-1/2	--	5	11	22-1/2	2-3/4	6	0.462	4.02	9.30	0.089	-2	-10	Tension	In horizontal position, 1 in. = 100 lb
1082	22	699	44	13-1/2	--	5	11	22-1/2	2-3/4	6	0.493	4.02	8.76	0.051	-2	-10	Tension	In horizontal position, 1 in. = 100 lb

(Continued)

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TABLE B.3 (CONTINUED)

Item No.	Material No.	Test No.	Rough Sample				Cylinder Age	Diameter in.	Length in.	Specific Weight lb/cm^3	Loading Rate in./min	Failure Stress psi	Deflection in.	Temperature $^{\circ}\text{C}$			Type of Failure	Remarks
			Snow days	Age hr	days	hr								Air	Snow			
1083	22	700	44	13-1/2	--	23	11	4-1/2	2-3/4	6	0.451	4.02	4.62	0.107	-2	-10	Tension	In horizontal position, 1 in. = 100 lb
1084	22	701	44	13-1/2	--	23	11	4-1/2	2-3/4	6	0.474	4.02	6.83	0.032	-2	-10	Tension	In horizontal position, 1 in. = 100 lb
1085	22	702	44	13-1/2	--	23	11	4-1/2	2-3/4	6	0.491	4.02	4.17	0.106	-2	-10	Tension	In horizontal position, 1 in. = 100 lb
1086	22	703	44	13-1/2	--	--	10	5-1/2	2-3/4	6	0.476	4.02	6.98	0.063	-2	-10	Tension	In horizontal position, 1 in. = 100 lb
1087	22	704	44	13-1/2	--	--	10	5-1/2	2-3/4	6	0.496	4.02	6.40	0.085	-2	-10	Tension	In horizontal position, 1 in. = 100 lb
1088	22	705	44	13-1/2	--	--	10	5-1/2	2-3/4	6	0.473	4.02	5.13	0.061	-2	-10	Tension	In horizontal position, 1 in. = 100 lb
1089	22	706A	44	13-1/2	17	4-3/4	2	22-3/4	2-3/4	6	0.453	4.02	6.33	0.131	-2	-10	Crushing	In horizontal position, 1 in. = 100 lb
1090	22	707A	44	13-1/2	17	4-3/4	2	22-3/4	2-3/4	6	0.438	4.02	5.52	0.126	-2	-10	Tension	In horizontal position, 1 in. = 100 lb
1091	22	708A	44	13-1/2	17	4-3/4	2	22-3/4	2-3/4	6	0.469	4.02	4.52	0.099	-2	-10	Tension	In horizontal position, 1 in. = 100 lb
1092	22	709A	44	13-3/4	17	4-3/4	2	22-3/4	2-3/4	6	0.493	4.02	37.04	0.061	-2	-10	Compression	Loading rate, 1 in. = 100 lb A. S.
1093	22	710A	44	13-3/4	17	4-3/4	2	22-3/4	2-3/4	6	0.505	4.02	27.10	0.065	-2	-10	Compression	Age series
1094	22	711A	44	13-3/4	17	4-3/4	2	22-3/4	2-3/4	6	0.519	4.02	30.30	0.057	-2	-10	Crushing then tension	
1095	22	712A	44	13-3/4	17	4-3/4	2	22-3/4	2-3/4	6	0.497	4.02	36.20	0.042	-2	-10	Crushing	Age series at base
1096	22	713A	44	13-3/4	17	4-3/4	2	22-3/4	2-3/4	6	0.505	4.02	45.00	0.055	-2	-10	Crushing	Age series at base
1097	22	714A	44	13-3/4	17	4-3/4	'2	23	2-3/4	6	0.526	4.02	30.00	0.056	-2	-10	Compression	Age series
1098	22	716A	44	13-3/4	17	4-3/4	2	23	2-3/4	6	0.546	4.02	27.80	0.049	-2	-10	Crushing	Age series at base
1099	22	717A	44	13-3/4	17	4-3/4	2	23	2-3/4	6	0.540	4.02	26.40	0.036	-2	-10	Crushing then tension	Age series
1100	22	718	45	17-1/4	9	2	12	3-1/4	2-3/4	6	0.497	4.02	8.68	0.110	-2	-8	Crushing	On side, 1 in. = 100 lb
1101	22	719	45	17-1/4	9	2	12	3-1/4	2-3/4	6	0.488	4.02	9.49	0.081	-2	-8	Tension	On side, 1 in. = 100 lb
1102	22	720	45	17-1/4	9	2	12	3-1/4	2-3/4	6	0.508	4.02	8.76	0.069	-2	-8	Tension	In horizontal position
1103	22	721	45	17-1/2	9	2	12	3-1/2	2-3/4	6	0.497	4.02	31.40	0.036	-2	-8	Compression	
1104	22	722	45	17-1/2	9	2	12	3-1/2	2-3/4	6	0.507	4.02	21.5	0.018	-2	-8	Crushing	At base then tension
1105	22	723	45	17-1/2	9	2	12	3-1/2	2-3/4	6	0.498	4.02	17.67	0.089	-2	-8	Compression	
1106	22	724	45	17-1/2	9	2	12	3-1/2	2-3/4	6	0.498	4.02	27.60	0.024	-2	-8	Compression	
1107	22	725	45	17-1/2	9	2	12	3-1/2	2-3/4	6	0.497	4.02	43.40	0.048	-2	-8	Compression	
1108	22	726	45	17-1/2	9	2	12	3-1/2	2-3/4	6	0.474	4.02	31.40	0.057	-2	-8	Compression	
1109	22	727	45	17-1/2	9	2	12	3-1/2	2-3/4	6	0.473	4.02	33.0	0.131	-2	-8	Compression	
1110	22	728	45	17-1/2	9	2	12	3-1/2	2-3/4	6	0.508	4.02	30.3	0.042	-2	-8	Crushing	At top then tension
1111	22	729	45	17-1/2	9	2	12	3-1/2	2-3/4	6	0.485	4.02	43.30	0.076	-2	-8	Crushing	At top then tension
1112	22	730	45	17-1/2	9	2	12	3-1/2	2-3/4	6	0.488	4.02	33.50	0.024	-2	-8	Compression	
1113	22	731	45	17-1/2	9	2	12	3-1/2	2-3/4	6	0.505	4.02	28.4	0.025	-2	-8	Crushing	At top
1114	22	732	45	17-1/2	9	2	12	3-1/2	2-3/4	6	0.485	4.02	34.0	0.027	-2	-8	Crushing	At top
1115	22	733A	46	16-1/2	17	4-3/4	5	2	2-3/4	6	0.476	4.02	26.9	0.050	-3	-6	Crushing	Start age series
1116	22	734A	46	16-3/4	17	4-3/4	5	2	2-3/4	6	0.476	4.02	23.9	0.048	-3	-6	Crushing	At top
1117	22	735A	46	16-3/4	17	4-3/4	5	2	2-3/4	6	0.497	4.02	27.4	0.042	-3	-6	Crushing	At top

(Continued)

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TABLE B.3 (CONTINUED)

Item No.	Material No.	Test No.	Rough Sample				Cylinder Age days	Diameter in.	Length in.	Specific Weight g/cm³	Loading Rate in./min	Failure Stress psi	Deflection in.	Temperature °C		Type of Failure	Remarks	
			Snow days	Age hr	Age days	hr								Air	Snow			
1118	22	736A	46	16-3/4	17	4-3/4	5	2	2-3/4	6	0.474	4.02	20.5	0.500	-3	-6	Compression	
1119	22	737A	46	16-3/4	17	4-3/4	5	2	2-3/4	6	0.481	4.02	17.18	0.187	-3	-6	Crushing, then tension	At top, then tension
1120	22	738A	46	17	17	4-3/4	5	2-1/4	2-3/4	6	0.471	4.02	24.9	0.046	-3	-6	Compression	
1121	22	739A	46	16-3/4	17	4-3/4	5	2	2-3/4	6	0.507	4.02	30.8	0.050	-3	-6	Crushing, then tension	At top, then tension
1122	22	740A	46	16-3/4	17	4-3/4	5	2	2-3/4	6	0.455	4.02	20.2	0.031	-3	-6	Compression	
1123	22	741A	46	16-3/4	17	4-3/4	5	2	2-3/4	6	0.510	4.02	36.65	0.041	-3	-6	Crushing then tension	At top, then tension
1124	22	742A	46	16-3/4	17	4-3/4	5	2	2-3/4	6	0.503	4.02	7.71	0.091	-3	-6	Tension	In horizontal position
1125	22	743A	46	16-3/4	17	4-3/4	5	2	2-3/4	6	0.498	4.02	8.97	0.074	-3	-6	Tension	In horizontal position
1126	22	744A	46	16-3/4	17	4-3/4	5	2-1/4	2-3/4	6	0.483	4.02	11.58	0.089	-3	-6	Tension	In horizontal position
1127	22	745A	47	16-1/2	17	4-3/4	6	1-3/4	2-3/4	6	0.514	4.02	30.60	0.052	-3	-6	Crushing	At top then tension
1128	22	746A	47	16-1/2	17	4-3/4	6	1-3/4	2-3/4	6	0.519	4.02	33.5	0.050	-3	-6	Compression	
1129	22	747A	47	16-1/2	17	4-3/4	6	1-3/4	2-3/4	6	0.508	4	30.3	0.082	-3	-6	Crushing	At top, then tension
1130	22	748A	47	16-1/2	17	4-3/4	6	2	2-3/4	6	0.483	4	20.5	0.083	-3	-6	Compression	
1131	22	749A	47	16-1/2	17	4-3/4	6	2	2-3/4	6	0.451	4	14.3	0.640	-3	-6	Compression	
1132	22	750A	47	16-1/2	17	4-3/4	6	2	2-3/4	6	0.491	4	32.8	0.053	-3	-6	Compression	
1133	22	751A	47	16-1/2	17	4-3/4	6	2	2-3/4	6	0.500	4	22.9	0.070	-3	-6	Crushing	At base
1134	22	752A	47	16-1/2	17	4-3/4	6	2	2-3/4	6	0.493	4	25.2	0.046	-3	-6	Crushing	At base
1135	22	753A	47	16-1/2	17	4-3/4	6	2	2-3/4	6	0.520	4	23.9	0.036	-3	-6	Compression	
1136	22	755A	47	16-3/4	17	4-3/4	6	2	2-3/4	6	0.498	4	7.90	0.340	-3	-6	Tension	In horizontal position
1137	22	756A	47	16-3/4	17	4-3/4	6	2	2-3/4	6	0.526	4	9.84	0.058	-3	-6	Tension	In horizontal position
1138	22	757A	48	16-3/4	17	4-1/2	7	2-1/4	2-3/4	6	0.505	4	9.57	0.094	-4	-7	Tension	In horizontal position
1139	22	758A	48	17	17	4-1/2	7	2-1/2	2-3/4	6	0.503	4	8.48	0.066	-4	-7	Tension	In horizontal position
1140	22	759A	48	17	17	4-1/2	7	2-1/2	2-3/4	6	0.447	4	5.52	0.064	-4	-7	Tension	In horizontal position
1141	22	760A	48	17	17	4-1/2	7	2-1/2	2-3/4	6	0.485	4.02	--	--	-4	-7	Crushing	At top
1142	22	761A	48	17	17	4-1/2	7	2-1/2	2-3/4	6	0.519	4.02	33.65	0.041	-4	-7	Compression	
1143	22	762A	48	17	17	4-1/2	7	2-1/2	2-3/4	6	0.449	4.02	20.7	0.026	-4	-7	Crushing	At top
1144	22	763A	48	17	17	4-1/2	7	2-1/2	2-3/4	6	0.500	4.02	28.1	0.076	-4	-7	Crushing	At top
1145	22	764A	48	17	17	4-1/2	7	2-1/2	2-3/4	6	0.491	4.02	29.60	0.046	-4	-7	Crushing	At top
1146	22	765A	48	17-1/4	17	4-1/2	7	2-3/4	2-3/4	6	0.497	4.02	28.30	0.077	-4	-7	Bad test	
1147	22	766A	48	17-1/4	17	4-1/2	7	2-3/4	2-3/4	6	0.483	4.02	22.70	0.092	-4	-7	Crushing	At top
1148	22	767A	48	17-1/4	17	4-1/2	7	2-3/4	2-3/4	6	0.486	4.02	23.20	0.093	-4	-7	Crushing	At base
1149	22	768A	48	17-1/4	17	4-1/2	7	2-3/4	2-3/4	6	0.483	4.02	34.80	0.063	-4	-7	Crushing	At top
1150	22	769	48	17-1/4	--	3-1/2	2	3-3/4	2-3/4	6	0.481	4.02	37.00	0.066	-4	-7	Compression	
1151	22	770	48	17-1/4	--	3-1/2	2	3-3/4	2-3/4	6	0.497	4.02	43.60	0.047	-4	-7	Crushing	At base
1152	22	771	48	17-1/4	--	3-1/2	2	3-3/4	2-3/4	6	0.514	4.02	26.60	0.069	-4	-7	Compression	(Then tension)

(Continued)

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TABLE B.3 (CONTINUED)

Item No.	Material No.	Test No.	Rough Sample				Specific Weight g/cm³	Loading Rate in./min	Failure Stress psi	Deflection in.	Temperature °C			Remarks	
			Snow days	Age hr	Age days	Age hr					Air	Snow	Type of Failure		
1153	22	773	48	17-1/4	--	3-1/2	2	3-3/4	2-3/4	6	0.488	4.02	13.10	0.069	-4 -7 Crushing At top
1154	22	774	48	17-1/4	--	3-1/2	2	3-3/4	2-3/4	6	0.517	4.02	24.60	0.057	-4 -7 Crushing At top
1155	22	775	48	17-1/4	--	3-1/2	2	3-3/4	2-3/4	6	0.503	4.02	31.40	0.084	-4 -7 Tension
1156	22	776	48	17-1/4	--	3-1/2	2	3-3/4	2-3/4	6	0.514	4.02	37.60	0.027	-4 -7 Crushing At top
1157	22	777	48	17-1/4	--	3-1/2	2	3-3/4	2-3/4	6	0.497	4.02	31.65	0.084	-4 -7 Crushing At base
1158	22	781	48	17-1/2	--	3-1/2	2	4	2-3/4	6	0.517	4.02	10.08	0.081	-4 -7 Tension In horizontal position
1159	22	782	48	17-1/2	--	3-1/2	2	4	2-3/4	6	0.514	4.02	8.61	0.079	-4 -7 Tension In horizontal position
1160	22	783	48	17-1/2	--	3-1/2	2	4	2-3/4	6	0.498	4.02	8.92	0.092	-4 -7 Tension In horizontal position
1161	22	784R	49	9	--	8-1/2	--	15-1/2	2-3/4	6	0.491	4.02	8.15	0.059	-5 -4 Tension In horizontal position
1162	22	785R	49	9	--	8-1/2	--	15-1/2	2-3/4	6	0.500	4.02	8.57	0.032	-5 -4 Tension In horizontal position
1163	22	786R	49	9	--	8-1/2	--	15-1/2	2-3/4	6	0.540	4.02	8.18	0.036	-5 -4 Tension In horizontal position
1164	22	787R	49	9	--	8-1/2	--	15-1/2	2-3/4	6	0.558	4.02	10.12	0.041	-5 -4 Crushing In horizontal position
1165	22	788R	49	9-1/4	--	8-1/2	--	15-3/4	2-3/4	6	0.500	4.02	9.49	0.103	-5 -4 Tension In horizontal position
1166	22	789R	49	9-1/4	--	8-1/2	--	15-3/4	2-3/4	6	0.543	4.02	14.66	0.080	-5 -4 Tension In horizontal position
1167	22	790R	49	9-1/4	--	8-1/2	--	15-3/4	2-3/4	6	0.533	4.02	10.41	0.062	-5 -4 Tension In horizontal position
1168	22	791R	49	9-1/4	--	8-1/2	--	15-3/4	2-3/4	6	0.474	4.02	7.13	0.130	-5 -4 Tension In horizontal position
1169	22	792R	49	9-1/4	--	8-1/2	--	15-3/4	2-3/4	6	0.524	4.02	11.12	0.027	-5 -4 Tension In horizontal position
1170	22	793R	49	9-1/4	--	8-1/2	--	15-3/4	2-3/4	6	0.528	4.02	13.75	0.030	-5 -4 Tension In horizontal position
1171	22	794R	49	9-1/4	--	8-1/2	--	15-3/4	2-3/4	6	0.510	4.02	10.96	0.020	-4 -6 Tension In horizontal position
1172	22	795R	49	9-1/4	--	8-1/2	--	15-3/4	2-3/4	6	0.451	4.02	6.87	0.059	-5 -4 Tension In horizontal position
1173	22	796R	49	9-1/4	--	8-1/2	--	15-3/4	2-3/4	6	0.483	4.02	9.38	0.064	-5 -4 Tension In horizontal position
1174	22	797R	49	9-1/4	--	8-1/2	--	15-3/4	2-3/4	6	0.485	4.02	6.94	0.078	-5 -4 Tension In horizontal position
1175	22	799R	49	9-1/2	--	8-1/2	--	16	2-3/4	6	0.528	4.02	10.78	0.035	-4 -6 Tension In horizontal position
1176	22	800R	49	9-1/2	--	8-1/2	--	16	2-3/4	6	0.501	4.02	10.77	0.054	-4 -6 Tension Horizontal position, 1 in. = 100 lb
1177	22	801R	49	9-1/2	--	8-1/2	--	16	2-3/4	6	0.478	4.02	12.50	0.042	-4 -6 Tension Horizontal position, 1 in. = 100 lb
1178	22	802R	49	9-1/2	--	8-1/2	--	16	2-3/4	6	0.534	4.02	7.96	0.021	-4 -6 Tension Horizontal position, 1 in. = 100 lb
1179	22	803R	49	9-1/2	--	8-1/2	--	16	2-3/4	6	0.530	4.02	12.23	0.058	-4 -6 Tension Horizontal position, 1 in. = 100 lb
1180	22	804R	49	9-3/4	--	8-1/2	--	16-1/4	2-3/4	6	0.531	4.02	37.65	0.072	-4 -6 Crushing At base
1181	22	805R	49	9-3/4	--	8-1/2	--	16-1/4	2-3/4	6	0.522	4.02	24.20	0.022	-4 -6 Compression
1182	22	806R	49	9-3/4	--	8-1/2	--	16-1/4	2-3/4	6	0.533	4.02	17.00	0.091	-4 -6 Compression
1183	22	807R	49	9-3/4	--	8-1/2	--	16-1/4	2-3/4	6	0.505	4.02	27.80	0.033	-4 -6 Compression
1184	22	808R	49	9-3/4	--	8-1/2	--	16-1/4	2-3/4	6	0.501	4.02	31.30	0.034	-4 -6 Compression
1185	22	809R	49	9-3/4	--	8-1/2	--	16-1/4	2-3/4	6	0.531	4.02	42.75	0.035	-4 -6 Compression
1186	22	810R	49	9-3/4	--	8-1/2	--	16-1/4	2-3/4	6	0.530	4.02	32.80	0.020	-4 -6 Shear At 30°
1187	22	811R	49	9-3/4	--	8-1/2	--	16-1/4	2-3/4	6	0.500	4.02	37.80	0.005	-4 -6 Compression
1188	22	812R	49	10	--	8-1/2	--	16-1/2	2-3/4	6	0.538	4.02	53.00	0.025	-4 -6 Crushing Then tension, estimated went off graph
1189	22	813R	49	10	--	8-1/2	--	16-1/2	2-3/4	6	0.522	4.02	42.60	0.028	-4 -6 Crushing At top

(Continued)

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TABLE B.3 (CONTINUED)

Item No.	Material No.	Test No.	Rough Sample				Specific Weight g/cm^3	Loading Rate in./min	Failure Stress psi	Deflection in.	Temperature $^{\circ}\text{C}$		Type of Failure	Remarks	
			Snow days	Age hr	Age days	Age hr					Air	Snow			
1190	22	814R	49	10	--	8-1/2	--	16-1/2	2-3/4	6	0.528	4.02	36.50	0.025	-4 -6 Crushing At top
1191	22	815R	49	10	--	8-1/2	--	16-1/2	2-3/4	6	0.528	4.02	25.60	0.022	-4 -6 Crushing At top
1192	22	816R	49	10	--	8-1/2	--	16-1/2	2-3/4	6	0.526	4.02	24.40	0.028	-4 -6 Compression
1193	22	817R	49	10	--	8-1/2	--	16-1/2	2-3/4	6	0.530	4.02	27.80	0.024	-4 -6 Compression
1194	22	818R	49	10	--	8-1/2	--	16-1/2	2-3/4	6	0.530	4.02	46.60	0.039	-4 -6 Compression
1195	22	819R	49	10	--	8-1/2	--	16-1/2	2-3/4	6	0.497	4.02	33.30	0.021	-4 -6 Compression Low density
1196	22	820R	49	10	--	8-1/2	--	16-1/2	2-3/4	6	0.519	4.02	40.90	0.051	-4 -6 Crushing Then tension
1197	22	821R	49	10	--	8-1/2	--	16-1/2	2-3/4	6	0.495	4.02	22.55	0.013	-4 -6 Compression
1198	22	822R	49	10	--	8-1/2	--	16-1/2	2-3/4	6	0.530	4.02	36.20	0.049	-4 -6 Compression
1199	22	823R	49	10	--	8-1/2	--	16-1/2	2-3/4	6	0.493	4.02	37.20	0.029	-4 -6 Compression
1200	22	824R	49	10	--	8-1/2	--	16-1/2	2-3/4	6	0.495	4.02	18.50	0.031	-4 -6 Compression
1201	22	825R	49	10	--	8-1/2	--	16-1/2	2-3/4	6	0.479	4.02	28.30	0.099	-4 -6 Compression
1202	22	826R	49	10	--	8-1/2	--	16-1/2	2-3/4	6	0.503	4.02	22.00	0.070	-4 -6 Crushing At base
1203	22	827R	49	10	--	8-1/2	--	16-1/2	2-3/4	6	0.512	4.02	25.90	0.111	-4 -6 Compression Then tension
1204	22	828R	49	10	--	8-1/2	--	16-1/2	2-3/4	6	0.505	4.02	26.60	0.113	-4 -6 Compression
1205	22	829R	49	10	--	8-1/2	--	16-1/2	2-3/4	6	0.497	4.02	31.65	0.033	-4 -6 Compression
1206	22	830R	49	10-1/4	--	8-1/2	--	16-3/4	2-3/4	6	0.519	4.02	35.30	0.062	-4 -6 Compression Then tension
1207	22	831R	49	10-1/4	--	8-1/2	--	16-3/4	2-3/4	6	0.507	4.02	25.20	0.034	-4 -6 Compression At 50°
1208	22	832R	49	10-1/4	--	8-1/2	--	16-3/4	2-3/4	6	0.520	4.02	46.30	0.052	-4 -6 Compression
1209	22	833R	49	10-1/4	--	8-1/2	--	16-3/4	2-3/4	6	0.546	4.02	35.00	0.040	-4 -6 Compression
1210	22	834R	49	10-1/4	--	8-1/2	--	16-3/4	2-3/4	6	0.522	4.02	37.80	0.032	-4 -6 Compression
1211	22	835R	49	10-1/4	--	8-1/2	--	16-3/4	2-3/4	6	0.503	4.02	21.50	0.023	-4 -6 Compression
1212	22	836R	49	10-1/4	--	8-1/2	--	16-3/4	2-3/4	6	0.519	4.02	24.60	0.028	-4 -6 Compression
1213	22	837R	49	10-1/4	--	8-1/2	--	16-3/4	2-3/4	6	0.534	4.02	27.40	0.034	-4 -6 Crushing At top
1214	22	838R	49	10-1/4	--	8-1/2	--	16-3/4	2-3/4	6	0.500	4.02	33.65	0.037	-4 -6 Crushing Then tension
1215	22	839R	49	10-1/4	--	8-1/2	--	16-3/4	2-3/4	6	0.530	4.02	24.20	0.023	-4 -6 Compression
1216	22	840R	49	10-1/4	--	8-1/2	--	16-3/4	2-3/4	6	0.514	4.02	28.60	0.058	-4 -6 Compression
1217	22	841R	49	10-1/2	--	8-1/2	--	17	2-3/4	6	0.512	4.02	21.85	0.023	-4 -6 Compression
1218	22	842R	49	10-1/2	--	8-1/2	--	17	2-3/4	6	0.538	4.02	23.20	0.047	-4 -6 Compression
1219	22	843R	49	10-1/2	--	8-1/2	--	17	2-3/4	6	0.520	4.02	22.4	0.024	-4 -6 Compression
1220	22	844R	49	10-1/2	--	8-1/2	--	17	2-3/4	6	0.556	4.02	26.9	0.019	-4 -6 Crushing then tension At top
1221	22	845R	49	10-1/2	--	8-1/2	--	17	2-3/4	6	0.491	4.02	32.00	0.022	-4 -6 Compression
1222	22	847R	49	10-1/2	--	8-1/2	--	17	2-3/4	6	0.533	4.02	44.40	0.055	-4 -6 Compression
1223	22	848R	49	10-1/2	--	8-1/2	--	17	2-3/4	6	0.556	4.02	11.80	0.018	-4 -6 Compression
1224	22	849R	49	10-1/2	--	8-1/2	--	17	2-3/4	6	0.495	4.02	28.30	0.063	-4 -6 Compression
1225	22	850R	49	10-1/2	--	8-1/2	--	17	2-3/4	6	0.515	4.02	19.90	0.060	-4 -6 Compression

(Continued)

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Table (Continued)

Cylinder Tests
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TABLE B.3 (CONTINUED)

Item No.	Material No.	Test No.	Rough Sample				Diameter in.	Length in.	Specific Weight g/cm³	Loading Rate in./min	Failure Stress psi	Deflection in.	Temperature °C			Remarks	
			Snow days	Age hr	days	hr							Air	Snow	Type of Failure		
1226	22	851R	49	10-1/2	--	8-1/2	--	17	2-3/4	6	0.501	4.02	16.49	0.019	-4	-6	Compression
1227	22	852R	49	10-1/2	--	8-1/2	--	17	2-3/4	6	0.512	4.02	13.30	0.091	-4	-6	Compression
1228	22	853R	49	10-1/2	--	8-1/2	--	17	2-3/4	6	0.471	4.02	46.60	0.033	-4	-6	Crushing
1229	22	854R	49	10-1/2	--	8-1/2	--	17	2-3/4	6	0.526	4.02	39.06	0.038	-4	-6	Compression
1230	22	855R	49	10-1/2	--	8-1/2	--	17	2-3/4	6	0.505	4.02	26.60	0.029	-4	-6	Crushing
1231	22	856R	49	10-1/2	--	8-1/2	--	17	2-3/4	6	0.503	4.02	26.60	0.033	-4	-6	Crushing
1232	22	857R	49	10-1/2	--	8-1/2	--	17	2-3/4	6	0.507	4.02	35.30	0.063	-4	-6	Compression
1233	22	858R	49	10-1/2	--	8-1/2	--	17	2-3/4	6	0.500	4.02	19.69	0.067	-4	-6	Compression
1234	22	859R	49	10-1/2	--	8-1/2	--	17	2-3/4	6	0.498	4.02	37.80	0.032	-4	-6	Compression
1235	22	860R	49	10-1/2	--	8-1/2	--	17	2-3/4	6	0.524	4.02	10.78	0.017	-4	-6	Compression
1236	22	861R	49	11	--	8-1/2	--	17-1/2	2-3/4	6	0.520	4.20	25.10	0.022	-4	-6	Compression
1237	22	862R	49	11	--	8-1/2	--	17-1/2	2-3/4	6	0.505	4.02	43.90	0.030	-4	-6	Compression
1238	22	864R	49	11	--	8-1/2	--	17-1/2	2-3/4	6	0.505	4.02	50.15	0.022	-4	-6	Crushing then tension
1239	22	866R	49	11-1/4	--	8-1/2	--	17-3/4	2-3/4	6	0.548	4.02	32.30	0.023	-4	-6	Crushing
1240	22	868R	49	11-1/4	--	8-1/2	--	17-3/4	2-3/4	6	0.536	4.02	30.00	0.034	-4	-6	Compression
1241	22	869R	49	11-1/4	--	8-1/2	--	17-3/4	2-3/4	6	0.508	4.02	30.30	0.030	-4	-6	Crushing then tension
1242	22	870R	49	12-1/2	--	8-1/2	--	19	2-3/4	6	0.515	4.02	20.20	0.034	-4	-6	Compression
1243	22	871R	49	12-1/2	--	8-1/2	--	19	2-3/4	6	0.515	4.02	30.30	0.056	-4	-6	Crushing
1244	22	872R	49	12-1/2	--	8-1/2	--	19	2-3/4	6	0.512	4.02	34.50	0.042	-4	-6	Compression
1245	22	873R	49	12-1/2	--	8-1/2	--	19	2-3/4	6	0.534	4.02	36.20	0.084	-4	-6	Crushing then tension
1246	22	874R	49	12-3/4	--	8-1/2	--	19-1/4	2-3/4	6	0.517	4.02	37.60	0.038	-4	-6	Compression
1247	22	875R	49	12-3/4	--	8-1/2	--	19-1/4	2-3/4	6	0.517	4.02	28.30	0.065	-4	-6	Compression
1248	22	876R	49	12-3/4	--	8-1/2	--	19-1/4	2-3/4	6	0.514	4.02	21.5	0.080	-4	-6	Compression
1249	22	877R	49	12-3/4	--	8-1/2	--	19-1/4	2-3/4	6	0.490	4.02	43.30	0.093	-4	-6	Compression
1250	22	879R	49	12-3/4	--	8-1/2	--	19-1/4	2-3/4	6	0.491	4.02	28.90	0.032	-4	-6	Crushing then tension
1251	22	880R	49	12-3/4	--	8-1/2	--	19-1/4	2-3/4	6	0.531	4.02	38.75	0.048	-4	-6	Crushing
1252	22	881R	49	12-3/4	--	8-1/2	--	19-1/4	2-3/4	6	0.560	4.02	23.40	0.032	-4	-6	Crushing then tension
1253	22	882A	49	12-3/4	16	22-3/4	8	4	2-3/4	6	0.438	4.02	18.50	0.071	-4	-6	Crushing then tension
1254	22	883A	49	13	16	22-3/4	8	4	2-3/4	6	0.474	4.02	28.80	0.066	-4	-6	Crushing
1255	22	884A	49	13	16	22-1/2	8	4-1/2	2-3/4	6	0.478	4.02	31.40	0.020	-4	-6	Crushing
1256	22	885A	49	13	16	22-1/2	8	4-1/2	2-3/4	6	0.488	4.02	39.20	0.069	-4	-6	Compression (Then tension)
1257	22	886A	49	13	16	22-1/2	8	4-1/2	2-3/4	6	0.491	4.02	39.55	0.037	-4	-6	Crushing then tension

(Continued)

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TABLE B.3 (CONTINUED)

Item No.	Material No.	Test No.	Rough Sample				Cylinder Age	Diameter in.	Length in.	Specific Weight g/cm³	Loading Rate in./min.	Failure Stress psi	Deflection in.	Temperature °C		Type of Failure	Remarks	
			Snow days	Age hr	days	hr								Air	Snow			
1258	22	887A	49	13	16	22-1/2	8	4-1/2	2-3/4	6	0.495	4.02	32.00	0.075	-4	-6	Crushing	At top
1259	22	888A	49	13	16	22-1/2	8	4-1/2	2-3/4	6	0.471	4.02	33.65	0.050	-4	-6	Crushing	(Then tension) at top
1260	22	889A	49	13	16	22-1/2	8	4-1/2	2-3/4	6	0.481	4.02	24.10	0.034	-4	-6	Compression	
1261	22	890A	49	13	16	22-1/2	8	4-1/2	2-3/4	6	0.495	4.02	31.00	0.055	-4	-6	Crushing	(Then tension) at top
1262	22	892A	49	13	16	22-1/2	8	4-1/2	2-3/4	6	0.495	4.02	12.36	0.024	-4	-6	Tension	Horizontal position
1263	22	893A	49	13	16	22-1/2	8	4-1/2	2-3/4	6	0.465	4.02	6.18	0.066	-4	-6	Tension	Horizontal position
1264	22	894	50	16	--	6	4	1	2-3/4	6	0.485	4.02	30.00	0.082	-2	-3	Compression	
1265	22	895	50	16	--	6	4	1	2-3/4	6	0.481	4.02	42.10	0.078	-2	-3	Compression	
1266	22	896	50	16	--	6	4	1	2-3/4	6	0.486	4.02	27.80	0.061	-2	-3	Compression	
1267	22	897	50	16	--	6	4	1	2-3/4	6	0.498	4.02	37.00	0.031	-2	-3	Compression	
1268	22	898	50	16	--	6	4	1	2-3/4	6	0.491	4.02	26.90	0.087	-2	-3	Compression	
1269	22	899	50	16	--	6	4	1	2-3/4	6	0.495	4.02	52.15	0.052	-2	-3	Crushing	At top
1270	22	900	50	16	--	6	4	1	2-3/4	6	0.508	4.02	24.20	0.075	-2	-3	Crushing	At top
1271	22	901	50	16	--	6	4	1	2-3/4	6	0.500	4.02	36.80	0.048	-2	-3	Compression	
1272	22	902	50	16	--	6	4	1	2-3/4	6	0.490	4.02	25.70	0.042	-2	-3	Compression	
1273	22	903	50	16	--	6	4	1	2-3/4	6	0.505	4.02	27.80	0.052	-2	-3	Tension	
1274	22	904	50	16	--	6	4	1	2-3/4	6	0.476	4.02	19.85	0.100	-2	-3	Crushing	At base
1275	22	905	50	16	--	6	4	1	2-3/4	6	0.473	4.02	26.90	0.087	-2	-3	Crushing	At top
1276	22	906	50	16-1/4	--	6	4	1-1/4	2-3/4	6	0.471	4.02	3.59	0.060	-2	-3	Tension	Horizontal position
1277	22	907	50	16	--	6	4	1-1/4	2-3/4	6	0.476	4.02	8.34	0.109	-2	-3	Tension	Horizontal position
1278	22	908	50	16	--	6	4	1-1/4	2-3/4	6	0.497	4.02	3.40	0.092	-2	-3	Tension	Horizontal position
1279	22	909	51	15-1/2	--	3-3/4	6	1-3/4	2-3/4	6	0.473	4.02	11.78	0.036	-4	-5	Tension	Horizontal position
1280	22	910	51	15-1/2	--	3-3/4	6	1-3/4	2-3/4	6	0.465	4.02	13.70	0.085	-4	-5	Tension	Horizontal position
1281	22	911	51	15-1/2	--	3-3/4	6	1-3/4	2-3/4	6	0.474	4.02	17.01	0.180	-4	-5	Tension	Horizontal position
1282	22	912	51	15-1/2	--	3-3/4	6	1-3/4	2-3/4	6	0.476	4.02	39.55	0.078	-4	-5	Crushing	
1283	22	913	51	15-1/2	--	3-3/4	6	1-3/4	2-3/4	6	0.464	4.02	27.90	0.057	-4	-5	Crushing	At base
1284	22	914	51	15-3/4	--	3-3/4	6	1-3/4	2-3/4	6	0.465	4.02	26.90	0.082	-4	-5	Crushing	
1285	22	915	51	15-3/4	--	3-3/4	6	1-3/4	2-3/4	6	0.493	4.02	41.25	0.097	-4	-5	Crushing	At top
1286	22	916	51	15-3/4	--	3-3/4	6	1-3/4	2-3/4	6	0.485	4.02	38.75	0.022	-4	-5	Crushing	
1287	22	917	51	15-3/4	--	3-3/4	6	1-3/4	2-3/4	6	0.500	4.02	36.30	0.131	-4	-5	Compression	
1288	22	918	51	15-3/4	--	3-3/4	6	1-3/4	2-3/4	6	0.486	4.02	34.80	0.110	-4	-5	Crushing	
1289	22	919	51	16	--	3-3/4	6	3-1/4	2-3/4	6	0.483	4.02	29.10	0.152	-4	-5	Crushing	
1290	22	920	51	16	--	3-3/4	6	2-1/4	2-3/4	6	0.485	4.02	40.0	0.119	-4	-5	Compression	
1291	22	921	51	16	--	3-3/4	6	2-1/4	2-3/4	6	0.483	4.02	38.75	0.119	-4	-5	Crushing then tension	
1292	22	922	51	16	--	3-3/4	6	2-1/4	2-3/4	6	0.493	4.02	45.40	0.125	-4	-5	Crushing	At top
1293	22	923	51	16	--	3-3/4	6	2-1/4	2-3/4	6	0.488	4.02	44.10	0.052	-4	-5	Compression	

(Continued)

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TABLE B.3 (CONTINUED)

Item No.	Material No.	Test No.	Rough Sample				Specific Weight g/cm ³	Loading Rate in./min	Failure Stress psi	Deflection in.	Temperature °C			Remarks		
			Snow days	Age hr	Age days	Age hr					Air	Snow	Type of Failure			
1294	22	924	52	12-1/2	--	5-1/2	5	21	2-3/4	6	0.479	4.02	22.2	0.025	-4	-7 Compression
1295	22	925	52	12-1/2	--	5-1/2	5	21	2-3/4	6	0.488	4.02	24.2	0.055	-4	-7 Compression
1296	22	926	52	12-1/2	--	5-1/2	5	21	2-3/4	6	0.476	4.02	12.95	0.147	-4	-7 Crushing
1297	22	927	52	12-1/2	--	5-1/2	5	21	2-3/4	6	0.497	4.02	26.40	0.087	-4	-7 Compression
1298	22	928	52	12-1/2	--	5-1/2	5	21	2-3/4	6	0.488	4.02	39.55	0.081	-4	-7 Compression
1299	22	929	52	12-1/2	--	5-1/2	5	21	2-3/4	6	0.503	4.02	22.55	0.025	-4	-7 Crushing
1300	22	930	52	12-3/4	--	5-1/2	5	21-1/4	2-3/4	6	0.498	4.02	37.65	0.035	-4	-7 Compression
1301	22	931	52	12-3/4	--	5-1/2	5	21-1/4	2-3/4	6	0.490	4.02	45.00	0.060	-4	-7 Crushing
1302	22	932	52	12-3/4	--	5-1/2	5	21-1/4	2-3/4	6	0.485	4.02	34.00	0.068	-4	-7 Crushing
1303	22	933	52	12-3/4	--	5-1/2	5	21-1/4	2-3/4	6	0.444	4.02	12.3	0.025	-4	-7 Compression
1304	22	934	52	12-3/4	--	5-1/2	5	21-1/4	2-3/4	6	0.490	4.02	24.4	0.044	-4	-7 Compression
1305	22	935	52	12-3/4	--	5-1/2	5	21-1/4	2-3/4	6	0.501	4.02	37.60	0.069	-4	-7 Crushing
1306	22	936	52	12-3/4	--	5-1/2	5	21-1/4	2-3/4	6	0.497	4.02	8.26	0.122	-4	-7 Tension
1307	22	937	52	12-3/4	--	5-1/2	5	21-1/4	2-3/4	6	0.479	4.02	7.52	0.113	-4	-7 Tension
1308	22	938	52	12-3/4	--	5-1/2	5	21-1/4	2-3/4	6	0.508	4.02	8.03	0.083	-4	-7 Tension
1309	22	939	53	16-3/4	--	6-1/2	7	1-1/4	2-3/4	6	0.498	4.02	6.06	0.087	-2	-2 Tension
1310	22	940	53	16-3/4	--	6-1/2	7	1-1/4	2-3/4	6	0.498	4.02	7.33	0.086	-2	-2 Tension
1311	22	941	53	16-3/4	--	6-1/2	7	1-1/4	2-3/4	6	0.520	4.02	9.62	0.102	-2	-2 Tension
1312	22	942	53	16-3/4	--	6-1/2	7	1-1/4	2-3/4	6	0.497	4.02	20.20	0.106	-1	-2 Crushing
1313	22	943	53	16-3/4	--	6-1/2	7	1-1/4	2-3/4	6	0.500	4.02	33.65	0.092	-1	-2 Compression
1314	22	944	53	16-3/4	--	6-1/2	7	1-1/4	2-3/4	6	0.515	4.02	23.20	0.088	-1	-2 Compression
1315	22	945	53	17	--	6-1/2	7	1-1/2	2-3/4	6	0.512	4.02	35.0	0.056	-1	-2 Crushing
1316	22	946	53	17	--	6-1/2	7	1-1/2	2-3/4	6	0.497	4.02	27.8	0.048	-1	-2 Crushing
1317	22	947	53	17	--	6-1/2	7	1-1/2	2-3/4	6	0.501	4.02	27.4	0.055	-1	-2 Crushing
1318	22	948	53	17	--	6-1/2	7	1-1/2	2-3/4	6	0.467	4.02	26.20	0.076	-1	-2 Crushing
1319	22	949	53	17	--	6-1/2	7	1-1/2	2-3/4	6	0.505	4.02	26.10	0.040	-1	-2 Crushing
1320	22	950	53	17	--	6-1/2	7	1-1/2	2-3/4	6	0.507	4.02	35.50	0.091	-1	-2 Compression
1321	22	951	53	17	--	6-1/2	7	1-1/2	2-3/4	6	0.510	4.02	17.67	0.120	-1	-2 Crushing
1322	22	952	53	17	--	6-1/2	7	1-1/2	2-3/4	6	0.493	4.02	23.10	0.062	-1	-2 Compression
1323	22	953	53	17	--	6-1/2	7	1-1/2	2-3/4	6	0.514	4.02	25.90	0.047	-1	-2 Crushing
1324	22	954	54	11-3/4	1	1-1/2	7	1/4	2-3/4	6	0.485	4.02	34.50	0.046	-8	-8 Compression
1325	22	955	54	12	1	1-1/2	7	1/2	2-3/4	6	0.426	4.02	32.00	0.180	-8	-8 Crushing
1326	22	956	54	12	1	1-1/2	7	1/2	2-3/4	6	0.421	4.02	7.24	0.093	-8	-8 Compression
1327	22	957	54	12	1	1-1/2	7	1/2	2-3/4	6	0.481	4.02	13.80	0.193	-8	-8 Crushing
1328	22	958	54	12	1	1-1/2	7	1/2	2-3/4	6	0.432	4.02	16.15	0.085	-8	-8 Crushing
1329	22	959	54	12	1	1-1/2	7	1/2	2-3/4	6	0.453	4.02	33.3	0.065	-7	-8 Crushing
1330	22	960	54	12	1	1-1/2	7	1/2	2-3/4	6	0.440	4.02	15.81	0.057	-7	-8 Compression

(Continued)

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TABLE B.3 (CONTINUED)

Item No.	Material No.	Test No.	Rough Sample								Specific Weight g/cm³	Loading Rate in./min.	Failure Stress psi	Deflection in.	Temperature °C			Type of Failure	Remarks
			Snow days	Age hr	Age days	Age hr	Cylinder diameter in.	Length in.	in./min.	Air					Air	Snow	Type of Failure		
1331	22	962	54	12	1	1-1/2	7	1/2	2-3/4	6	0.519	4.02	41.60	0.030	-7	-8	Compression		
1332	22	963	54	12	1	1-1/2	7	1/2	2-3/4	6	0.481	4.02	21.50	0.057	-6	-8	Crushing	At top	
1333	22	964	54	12	1	1-1/2	7	1/2	2-3/4	6	0.473	4.02	27.20	0.043	-6	-8	Compression		
1334	22	965	54	12	1	1-1/2	7	1/2	2-3/4	6	0.495	4.02	17.50	0.009	-6	-8	Compression		
1335	22	966	54	12-1/2	1	1-1/2	7	3/4	2-3/4	6	0.434	4.02	8.29	0.168	-6	-8	Tension	In horizontal position	
1336	22	967	54	12-1/2	1	1-1/2	7	3/4	2-3/4	6	0.442	4.02	7.06	0.176	-6	-8	Tension	In horizontal position	
1337	22	968	54	12-1/2	1	1-1/2	7	3/4	2-3/4	6	0.464	4.02	9.26	0.106	-6	-8	Tension	In horizontal position	
1338	22	969	54	12	--	5-1/2	7	20-1/2	2-3/4	6	0.510	4.02	39.40	0.026	-6	-8	Crushing	At base	
1339	22	970	54	12	--	5-1/2	7	20-1/2	2-3/4	6	0.490	4.02	23.55	0.020	-6	-8	Compression		
1340	22	971	54	12	--	5-1/2	7	20-1/2	2-3/4	6	0.520	4.02	48.10	0.031	-6	-8	Crushing	At top	
1341	22	972	54	12	--	5-1/2	7	20-1/2	2-3/4	6	0.497	4.02	32.30	0.023	-6	-8	Crushing	At top	
1342	22	973	54	12	--	5-1/2	7	20-1/2	2-3/4	6	0.486	4.02	23.70	0.032	-6	-8	Crushing	At top	
1343	22	974	54	12	--	5-1/2	7	20-1/2	2-3/4	6	0.478	4.02	19.00	0.032	-6	-8	Compression	At base	
1344	22	975	54	12	--	5-1/2	7	20-1/2	2-3/4	6	0.519	4.02	25.40	0.042	-6	-8	Compression		
1345	22	976	54	12	--	5-1/2	7	20-1/2	2-3/4	6	0.478	4.02	18.00	0.071	-6	-8	Crushing	Then tension	
1346	22	977	54	12	--	5-1/2	7	20-1/2	2-3/4	6	0.493	4.02	41.60	0.080	-6	-8	Compression		
1347	22	978	54	12	--	5-1/2	7	20-1/2	2-3/4	6	0.474	4.02	16.49	0.078	-6	-8	Compression		
1348	22	979	54	12	--	5-1/2	7	20-1/2	2-3/4	6	0.505	4.02	27.80	0.018	-6	-8	Compression		
1349	22	980	54	12	--	5-1/2	7	20-1/2	2-3/4	6	0.488	4.02	43.10	0.076	-6	-8	Compression		
1350	22	981	54	12-1/4	--	5-1/2	7	20-3/4	2-3/4	6	0.508	4.02	7.29	0.078	-6	-8	Tension	In horizontal position	
1351	22	982	54	12-1/4	--	5-1/2	7	20-3/4	2-3/4	6	0.510	4.02	10.73	0.069	-6	-8	Tension	In horizontal position	
1352	22	983	54	12-1/4	--	5-1/2	7	20-3/4	2-3/4	6	0.486	4.02	11.66	0.075	-6	-8	Tension	In horizontal position	
1353	22	984A	55	15-3/4	16	22-3/4	14	7	2-3/4	6	0.495	4.02	19.35	0.104	-2	-7	Shear	30°	
1354	22	985A	55	15-3/4	16	22-3/4	14	7	2-3/4	6	0.476	4.02	14.12	0.066	-2	-7	Crushing	At top	
1355	22	986A	55	15-3/4	16	22-3/4	14	7	2-3/4	6	0.473	4.02	19.50	0.167	-2	-7	Compression		
1356	22	987A	55	15-3/4	16	22-3/4	14	7	2-3/4	6	0.479	4.02	14.30	0.101	-2	-7	Crushing	At top	
1357	22	988A	55	15-3/4	16	22-3/4	14	7	2-3/4	6	0.469	4.02	28.10	0.140	-2	-7	Compression		
1358	22	989A	55	15-3/4	16	22-3/4	14	7	2-3/4	6	0.510	4.02	27.40	0.037	-2	-7	Compression	Then tension	
1359	22	990A	55	15-3/4	16	22-3/4	14	7	2-3/4	6	0.461	4.02	19.00	0.059	-2	-7	Crushing	At base	
1360	22	992A	55	15-3/4	16	22-3/4	14	7	2-3/4	6	0.488	4.02	28.10	0.066	-2	-7	Compression		
1361	22	993A	55	16-1/4	16	22-3/4	14	7-1/2	2-3/4	6	0.462	4.02	7.39	0.088	-2	-7	Compression		
1362	22	994A	55	16-1/4	16	22-3/4	14	7-1/2	2-3/4	6	0.464	4.02	8.18	0.081	-2	-7	Tension	In horizontal position	
1363	22	995A	55	16-1/4	16	22-3/4	14	7-1/2	2-3/4	6	0.457	4.02	8.48	0.079	-2	-7	Tension	In horizontal position	
1364	22	996	55	16	1	1-1/2	8	5	2-3/4	6	0.498	4.02	20.89	0.123	-2	-7	Tension	In horizontal position	
1365	22	997	55	16	1	1-1/2	8	5	2-3/4	6	0.503	4.02	35.30	0.037	-2	-7	Crushing	At top	
1366	22	998	55	16	1	1-1/2	8	5	2-3/4	6	0.544	4.02	47.60	0.046	-2	-7	Compression	Then tension	
1367	22	1000	55	16	1	1-1/2	8	5	2-3/4	6	0.493	4.02	35.00	0.057	-2	-7	Compression		

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TABLE B.3 (CONTINUED)

Item No.	Material No.	Test No.	Snow days	Age hr	Rough Sample Age			Cylinder days	Age hr	Diameter in.	Length in.	Specific Weight g/cm³	Loading Rate in./min	Failure Stress psi	Deflection in.	Temperature °C		Type of Failure	Remarks
					days	hr	days									Air	Snow		
1368	22	1001	55	16	1	1-1/2	8	5	2-3/4	6	0.490	4.02	17.32	0.085	-2	-7	Crushing	At top	
1369	22	1002	55	16	1	1-1/2	8	5	2-3/4	6	0.485	4.02	20.20	0.038	-2	-7	Compression		
1370	22	1003	55	16-1/4	1	1-1/2	8	5-1/4	2-3/4	6	0.476	4.02	31.00	0.050	-2	-7	Crushing		
1371	22	1004	55	16-1/4	1	1-1/2	8	5-1/4	2-3/4	6	0.540	4.02	28.90	0.015	-2	-7	Compression		
1372	22	1005	55	16-1/4	1	1-1/2	8	5-1/4	2-3/4	6	0.528	4.02	48.00	0.072	-2	-7	Crushing	At base	
1373	22	1006	55	16-1/4	1	1-1/2	8	5-1/4	2-3/4	6	0.534	4.02	37.00	0.030	-2	-7	Compression		
1374	22	1008	55	16-1/4	1	1-1/2	8	5-1/4	2-3/4	6	0.476	4.02	9.49	0.129	-2	-7	Tension	In horizontal position	
1375	22	1009	55	16-1/4	1	1-1/2	8	5-1/4	2-3/4	6	0.517	4.02	16.05	0.127	-2	-7	Tension	In horizontal position	
1376	22	1010	55	16-1/4	1	1-1/2	8	5-1/4	2-3/4	6	0.515	4.02	8.26	0.040	-2	-7	Tension	In horizontal position	
1377	22	1012	60	19	--	6	17	3	2-3/4	6	0.474	4.02	22.70	0.102	-5	-4	Crushing then tension	At top	
1378	22	1014	60	19	--	6	17	3	2-3/4	6	0.476	4.02	26.10	0.049	-5	-4	Compression		
1379	22	1015	60	19	--	6	17	3	2-3/4	6	0.483	4.02	20.50	0.080	-5	-4	Crushing	At top	
1380	22	1016	60	19	--	6	17	3	2-3/4	6	0.469	4.02	28.10	0.062	-5	-4	Crushing		
1381	22	1017	60	19	--	6	17	3	2-3/4	6	0.481	4.02	28.90	0.095	-5	-4	Compression		
1382	22	1018	60	19	--	6	17	3	2-3/4	6	0.497	4.02	47.00	0.079	-5	-4	Compression		
1383	22	1019	60	19	--	6	17	3	2-3/4	6	0.474	4.02	47.10	0.102	-5	-4	Compression		
1384	22	1020	60	19	--	6	17	3	2-3/4	6	0.483	4.02	19.69	0.066	-5	-4	Compression		
1385	22	1021	60	19	--	6	17	3	2-3/4	6	0.469	4.02	29.40	0.091	-5	-4	Compression		
1386	22	1022	60	19	--	6	17	3	2-3/4	6	0.483	4.02	19.85	0.086	-5	-4	Compression		
1387	22	1023	60	19-1/4	--	6	17	3-1/4	2-3/4	6	0.474	4.02	10.41	0.111	-5	-4	Tension	In horizontal position	
1388	22	1024	60	19-1/4	--	6	17	3-1/4	2-3/4	6	0.479	4.02	9.04	0.093	-5	-4	Tension	In horizontal position	
1389	22	1025	60	19-1/4	--	6	17	3-1/4	2-3/4	6	0.469	4.02	10.22	0.088	-5	-4	Tension	In horizontal position	
1390	22	1026	60	19-1/4	--	5-1/2	14	3-3/4	2-3/4	6	0.481	4.02	6.94	0.104	-5	-4	Tension	In horizontal position	
1391	22	1027	60	19-1/4	--	5-1/2	14	3-3/4	2-3/4	6	0.503	4.02	11.97	0.083	-5	-4	Tension	In horizontal position	
1392	22	1028	60	19-1/4	--	5-1/2	14	3-3/4	2-3/4	6	0.493	4.02	9.42	0.081	-5	-4	Tension	In horizontal position	
1393	22	1029	60	19-1/4	--	5-1/2	14	3-3/4	2-3/4	6	0.500	4.02	39.20	0.059	-5	-4	Compression		
1394	22	1030	60	19-1/2	--	5-1/2	14	4	2-3/4	6	0.508	4.02	35.30	0.041	-5	-4	Compression		
1395	22	1031	60	19-1/2	--	5-1/2	14	4	2-3/4	6	0.483	4.02	23.10	0.037	-5	-4	Crushing	At base	
1396	22	1033	60	19-1/2	--	3-3/4	14	5-1/2	2-3/4	6	0.505	4.02	36.20	0.109	-5	-4	Crushing	At top	
1397	22	1034	60	19-1/2	--	3-3/4	14	5-1/2	2-3/4	6	0.500	4.02	26.90	0.073	-5	-4	Crushing then tension	At base	
1398	22	1035	60	19-1/2	--	3-3/4	14	5-1/2	2-3/4	6	0.510	4.02	37.40	0.043	-3	-5	Crushing	At top	
1399	22	1036	60	19-1/2	--	3-3/4	14	5-3/4	2-3/4	6	0.488	4.02	36.50	0.047	-3	-5	Crushing	At base	
1400	22	1037	60	19-1/2	--	3-3/4	14	5-3/4	2-3/4	6	0.490	4.02	28.90	0.049	-3	-5	Compression		
1401	22	1038	60	19-1/2	--	3-3/4	14	5-3/4	2-3/4	6	0.514	4.02	24.60	0.078	-3	-5	Crushing		
1402	22	1039	60	19-1/2	--	3-3/4	14	5-3/4	2-3/4	6	0.505	4.02	38.90	0.103	-3	-5	Crushing		
1403	22	1040	60	19-3/4	--	3-3/4	14	5-3/4	2-3/4	6	0.515	4.02	30.60	0.016	-3	-5	Compression		

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TABLE B.3 (CONTINUED)

Item No.	Material No.	Test No.	Rough Sample			Cylinder Age hr	Diameter in.	Length in.	Specific Weight g/cm³	Loading Rate in./min	Failure Stress psi	Deflection in.	Temperature °C		Type of Failure	Remarks		
			Snow days	Age days	hr								Air	Snow				
1404	23	1	32	5-3/4	--	1-1/2	--	1-1/4	2-3/4	6	0.476	4.02	19.85	0.037	-7	-9	Crushing	At top, then diagonal tension
1405	23	2	32	5-3/4	--	1-1/2	--	1-1/4	2-3/4	6	0.488	4.02	17.50	0.035	-7	-9	Diagonal tension	From R = 5 in. arch
1406	23	3	32	5-3/4	--	1-1/2	--	1-1/4	2-3/4	6	0.467	4.02	14.30	0.070	-7	-9	Crushing	At base from 5 in. R arch
1407	23	4	32	5-3/4	--	1-1/2	--	1-1/4	2-3/4	6	0.497	4.02	20.7	0.053	-7	-9	Compression	From 5 in. R arch
1408	23	5	32	5-3/4	--	1-1/2	--	1-1/4	2-3/4	6	0.497	4.02	21.00	0.045	-7	-9	Compression	From 5 in. R arch
1409	23	6	32	5-3/4	--	1-1/2	--	1-1/4	2-3/4	6	0.490	4.02	27.20	0.065	-7	-9	Crushing	At top from 5 in. R arch
1410	23	7	32	5-3/4	--	1-1/2	--	1-1/4	2-3/4	6	0.505	4.02	36.00	0.030	-7	-9	Crushing	At top from 5 in. R arch
1411	23	8	32	5-3/4	--	1-1/2	--	1-1/4	2-3/4	6	0.495	4.02	38.75	0.067	-7	-9	Compression	From 5 in. R arch
1412	23	9	32	5-3/4	--	1-1/2	--	1-1/4	2-3/4	6	0.498	4.02	30.80	0.040	-7	-9	Compression	From 5 in. R arch
1413	23	10	32	6-1/2	--	1-1/2	--	2	2-3/4	6	0.507	4.02	10.61	0.057	-7	-9	Tension	Horizontal position from 5 in. R arch
1414	23	11	32	6-1/2	--	1-1/2	--	2	2-3/4	6	0.491	4.02	8.97	0.056	-7	-9	Tension	Horizontal position
1415	23	12	32	6-1/2	--	1-1/2	--	2	2-3/4	6	0.478	4.02	9.64	0.084	-7	-9	Tension	Horizontal position
1416	23	13	54	3-3/4	--	2-1/2	--	1-3/4	2-3/4	6	0.556	4.02	25.48	0.036	-3	-6	Tension	In horizontal position
1417	23	14	54	3-3/4	--	2-1/2	--	1-3/4	2-3/4	6	0.522	4.02	8.09	0.066	-3	-6	Tension	In horizontal position
1418	23	15	54	3-3/4	--	2-1/2	--	1-3/4	2-3/4	6	0.498	4.02	5.71	0.060	-3	-6	Tension	In horizontal position
1419	23	16	54	4	--	2-1/2	--	2	2-3/4	6	0.491	4.02	28.10	0.067	-3	-6	Crushing then tension	At base then tension
1420	23	17	54	4	--	2-1/2	--	2	2-3/4	6	0.479	4.02	44.10	0.082	-3	-6	Tension	
1421	23	18	54	4-1/4	--	2-1/2	--	2-1/4	2-3/4	6	0.490	4.02	32.50	0.083	-3	-6	Compression	
1422	23	19	54	4-1/4	--	2-1/2	--	2-1/4	2-3/4	6	0.465	4.02	12.80	0.107	-3	-6	Compression	
1423	23	20	54	4-1/4	--	2-1/2	--	2-1/4	2-3/4	6	0.501	4.02	18.18	0.088	-3	-7	Compression	
1424	23	21	54	4-1/4	--	2-1/2	--	2-1/4	2-3/4	6	0.520	4.02	14.48	0.098	-3	-7	Crushing	At base
1425	24	1	54	3-1/2	--	2-1/2	--	1-1/2	2-3/4	6	0.503	4.02	8.46	0.063	-3	-6	Tension	In horizontal position
1426	24	2	54	3-1/2	--	2-1/2	--	1-1/2	2-3/4	6	0.501	4.02	10.38	0.082	-3	-6	Tension	In horizontal position
1427	24	3	54	3-1/2	--	2-1/2	--	1-1/2	2-3/4	6	0.488	4.02	8.26	0.084	-3	-6	Tension	In horizontal position
1428	24	4	54	3-3/4	--	2-1/2	--	1-3/4	2-3/4	6	0.508	4.02	34.0	0.073	-3	-6	Compression	
1429	24	5	54	3-3/4	--	2-1/2	--	1-3/4	2-3/4	6	0.505	4.02	44.4	0.060	-3	-6	Compression	
1430	24	6	54	4	--	2-3/4	--	1-1/2	2-3/4	6	0.488	4.02	25.60	0.080	-3	-6	Compression	
1431	24	7	54	4	--	2-3/4	--	1-3/4	2-3/4	6	0.514	4.02	26.20	0.034	-3	-6	Compression	
1432	24	8	54	4	--	2-3/4	--	1-3/4	2-3/4	6	0.488	4.02	34.00	0.072	-3	-6	Compression	
1433	24	9	54	4	--	2-3/4	--	1-3/4	2-3/4	6	0.520	4.02	23.70	0.040	-3	-6	Crushing then tension	
1434	24	10	54	4	--	2-3/4	--	1-3/4	2-3/4	6	0.495	4.02	27.90	0.089	-3	-6	Crushing then tension	
1435	24	11	54	4	--	2-3/4	--	1-3/4	2-3/4	6	0.497	4.02	34.65	0.089	-3	-6	Compression	
1436	24	12	54	4	--	2-3/4	--	1-3/4	2-3/4	6	0.495	4.02	19.69	0.082	-3	-6	Crushing then tension	At base then tension
1437	25	1	30	13	--	1-1/2	--	1-3/4	2-3/4	6	0.476	4.02	21.35	0.035	-7	-9	Compression	

(Continued)

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TABLE B.3 (CONTINUED)

Item No.	Material No.	Test No.	Rough Sample				Cylinder Age days	Diameter in.	Length in.	Specific Weight g/cm³	Loading Rate in./min	Failure Stress psi	Deflection in.	Temperature °C		Remarks	
			Snow days	Age hr	Age days	Age hr								Air	Snow		
1438	25	2	30	13	--	1-1/2	--	2-3/4	6	0.503	4.02	18.82	0.021	-7	-9	Compression	Evidence of preload
1439	25	3	30	13	--	1-1/2	--	2	6	0.508	4.02	27.90	0.035	-7	-9	Compression	
1440	25	4	30	13	--	1-1/2	--	2	6	0.495	4.02	16.49	0.025	-7	-9	Compression	
1441	25	5	30	13	--	1-1/2	--	2	6	0.476	4.02	21.2	0.044	-7	-9	Crushing	At top
1442	25	6	30	13	--	1-1/2	--	2	6	0.505	4.02	24.70	0.038	-7	-9	Compression	
1443	25	7	30	13	--	1-1/2	--	2	6	0.464	4.02	18.50	0.030	-7	-9	Shear 30°	
1444	25	8	30	13	--	1-1/2	--	2	6	0.485	4.02	13.30	0.056	-7	-9	Crushing	At top
1445	25	9	30	13	--	1-1/2	--	2	6	0.510	4.02	19.69	0.051	-7	-9	Crushing	At base
1446	25	10	30	13-1/4	--	1-1/2	--	2-1/4	6	0.503	4.02	7.76	0.054	-7	-9	Tension	Horizontal position, then compression
1447	25	11	30	13-1/4	--	1-1/2	--	2-1/4	6	0.483	4.02	6.56	0.084	-7	-9	Tension	Horizontal position, then compression
1448	25	12	30	13-1/4	--	1-1/2	--	2-1/4	6	0.481	4.02	7.02	0.124	-7	-9	Tension	Horizontal position, then compression
1449	26	1	35	22-1/4	--	2	14	3/4	6	0.483	4.02	30.30	0.125	-2	-8	Crushing	At top
1450	26	2	35	22-1/4	--	2	14	3/4	6	0.478	4.02	30.30	0.068	-2	-8	Crushing	At top
1451	26	3	35	22-1/4	--	2	14	3/4	6	0.503	4.02	52.60	0.048	-2	-8	Crushing	At base
1452	26	4	35	22-1/2	--	2	14	1	6	0.461	4.02	18.18	0.084	-2	-8	Crushing	At top
1453	26	5	35	22-1/2	--	2	14	1	6	0.486	4.02	19.18	0.054	-2	-8	Crushing	At top
1454	26	6	35	22-1/2	--	2	14	1	6	0.483	4.02	19.69	0.026	-2	-8	Crushing	At top
1455	26	7	35	22-1/2	--	2	14	1	6	0.493	4.02	52.80	0.080	-2	-8	Compression	
1456	26	8	35	22-1/2	--	2	14	1	6	0.469	4.02	39.90	0.059	-2	-8	Compression	
1457	26	9	35	22-1/2	--	2	14	1	6	0.478	4.02	21.70	0.065	-2	-8	Crushing	At top
1458	26	10	35	22-1/2	--	2	14	1	6	0.485	4.02	11.50	0.119	-2	-8	Tension	Horizontal position
1459	26	11	35	22-1/2	--	2	14	1	6	0.493	4.02	3.08	0.031	-2	-8	Tension	Horizontal position
1460	26	12	35	22-1/2	--	2	14	1	6	0.501	4.02	6.18	0.058	-2	-8	Tension	Horizontal position, then crushing
1461	26	13	37	1-3/4	17	3	15	4-1/4	6	0.498	4.02	8.60	0.087	-2	-8	Tension	Horizontal position
1462	26	14	37	1-3/4	17	3	15	4-1/4	6	0.488	4.02	9.54	0.061	-2	-8	Tension	Horizontal position
1463	26	15	37	1-3/4	17	3	15	4-1/4	6	0.497	4.02	5.75	0.044	-2	-8	Tension	Horizontal position, then compression
1464	26	16	37	1-3/4	17	3	15	4-1/4	6	0.507	4.02	14.08	0.072	-2	-8	Tension	Horizontal position, then compression
1465	26	17	37	1-3/4	17	3	15	4-1/4	6	0.501	4.02	14.08	0.084	-2	-8	Tension	Horizontal position
1466	26	18	37	1-3/4	17	3	15	4-1/4	6	0.501	4.02	13.50	0.100	-2	-8	Tension	Horizontal position
1467	26	19	37	2	17	3	15	4-1/2	6	0.476	4.02	19.85	0.072	-2	-8	Compression	
1468	26	20	37	2	17	3	15	4-1/2	6	0.481	4.02	19.69	0.088	-2	-8	Crushing	At top
1469	26	21	37	2	17	3	15	4-1/2	6	0.505	4.02	34.65	0.046	-2	-8	Compression	
1470	26	22	37	2	17	3	15	4-1/2	6	0.485	4.02	33.65	0.082	-2	-8	Crushing	Then tension at base
1471	26	23	37	2	17	3	15	4-1/2	6	0.497	4.02	39.40	0.078	-2	-8	Compression	
1472	26	24	37	2	17	3	15	4-1/2	6	0.500	4.02	26.10	0.016	-2	-8	Crushing	At base
1473	26	25	37	2	17	3	15	4-1/2	6	0.479	4.02	13.10	0.078	-2	-8	Crushing	At top
1474	26	26	37	2	17	3	15	4-1/2	6	0.483	4.02	26.60	0.054	-2	-8	Compression	

(Continued)

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TABLE B-3 (CONTINUED)

Item No.	Material No.	Rough Sample						Specific Weight g/cm³	Loading Rate in./min.	Failure Stress psi	Deflection in.	Temperature °C		Type of Failure	Remarks			
		Test No.	Snow days	Age hr	Age days	Age hr	Cylinder Age days	Diameter in.	Length in.	Air	Snow							
1475	26	27	37	2	17	3	15	4-1/2	2-3/4	6	0.473	4.02	13.97	0.071	-2	-8	Crushing	Then compression and tension
1476	26	28	37	2	17	3	15	4-1/2	2-3/4	6	0.512	4.02	39.40	0.061	-2	-8	Crushing	Then tension at top
1477	26	29	37	2	17	3	15	4-1/2	2-3/4	6	0.493	4.02	40.74	0.046	-2	-8	Tension	No film
1478	26	30	37	2-1/4	17	3	15	4-3/4	2-3/4	6	0.476	4.02	28.90	0.063	-2	-8	Compression	
1479	26	31	37	2-1/4	17	3	15	4-3/4	2-3/4	6	0.488	4.02	48.00	0.059	-2	-8	Compression	
1480	26	32	37	2-1/4	17	3	15	4-3/4	2-3/4	6	0.530	4.02	46.60	0.024	-2	-8	Crushing	Then tension at top
1481	27	1	26	6-3/4	--	1-1/2	--	1-3/4	2-3/4	6	0.483	4.02	14.30	0.120	-7	-9	Crushing	No film at base
1482	27	2	26	6-3/4	--	1-1/2	--	1-3/4	2-3/4	6	0.453	4.02	18.50	0.062	-7	-9	Compression	
1483	27	3	26	6-3/4	--	1-1/2	--	1-3/4	2-3/4	6	0.478	4.02	23.10	0.077	-7	-9	Crushing	At top
1484	27	4	26	6-3/4	--	1-1/2	--	1-3/4	2-3/4	6	0.490	4.02	28.60	0.048	-7	-9	Compression	
1485	27	5	26	6-3/4	--	1-1/2	--	1-3/4	2-3/4	6	0.493	4.02	30.30	0.065	-7	-9	Crushing	At base
1486	27	6	26	6-3/4	--	1-1/2	--	1-3/4	2-3/4	6	0.495	4.02	13.45	0.016	-7	-9	Crushing	At top
1487	27	7	26	6-3/4	--	1-1/2	--	1-3/4	2-3/4	6	0.505	4.02	32.50	0.045	-7	-9	Compression	
1488	27	8	26	6-3/4	--	1-1/2	--	1-3/4	2-3/4	6	0.485	4.02	10.40	0.045	-7	-9	Crushing	Then tension at base
1489	27	9	26	6-3/4	--	1-1/2	--	1-3/4	2-3/4	6	0.495	4.02	32.30	0.036	-7	-9	Compression	
1490	27	10	26	7-1/4	--	1-1/2	--	2-1/4	2-3/4	6	0.483	4.02	6.18	0.058	-7	-9	Tension	Horizontal position, 1 in. = 100 lb
1491	27	11	26	7-1/4	--	1-1/2	--	2-1/4	2-3/4	6	0.471	4.02	6.25	0.110	-7	-9	Tension	Horizontal position, 1 in. = 100 lb
1492	27	12	26	7-1/4	--	1-1/2	--	2-1/4	2-3/4	6	0.481	4.02	6.18	0.046	-7	-9	Tension	Horizontal position, no slide
1493	28	1	25	7	--	1-1/2	--	1-1/2	2-3/4	6	0.453	4.02	23.20	0.080	-7	-9	Crushing	At top
1494	28	2	25	7	--	1-1/2	--	1-1/2	2-3/4	6	0.473	4.02	14.62	0.072	-7	-9	Compression	Cylinder no good
1495	28	3	25	7	--	1-1/2	--	1-1/2	2-3/4	6	0.498	4.02	35.00	0.035	-7	-9	Compression	From R = 4 in. arch
1496	28	4	25	7	--	1-1/2	--	1-1/2	2-3/4	6	0.488	4.02	19.18	0.034	-7	-9	Compression	
1497	28	5	25	7-1/4	--	1-1/2	--	1-3/4	2-3/4	6	0.467	4.02	18.35	0.052	-7	-9	Compression	
1498	28	6	25	7-1/4	--	1-1/2	--	1-3/4	2-3/4	6	0.473	4.02	21.0	0.031	-7	-9	Compression	
1499	28	7	25	7-1/4	--	1-1/2	--	1-3/4	2-3/4	6	0.478	4.02	19.50	0.030	-7	-9	Tension	Crushing at base 1st
1500	28	8	25	7-1/4	--	1-1/2	--	1-3/4	2-3/4	6	0.452	4.02	14.80	0.038	-7	-9	Compression	
1501	28	9	25	7-1/4	--	1-1/2	--	1-3/4	2-3/4	6	0.490	4.02	26.20	0.019	-7	-9	Compression	
1502	28	10	25	7-3/4	--	1-1/2	--	2-1/4	2-3/4	6	0.453	4.02	3.92	0.081	-7	-9	Tension	Horizontal position
1503	28	11	25	7-3/4	--	1-1/2	--	2-1/4	2-3/4	6	0.469	4.02	5.20	0.077	-7	-9	Tension	Horizontal position
1504	28	12	25	7-3/4	--	1-1/2	--	2-1/4	2-3/4	6	0.483	4.02	7.86	0.087	-7	-9	Tension	Horizontal position
1505	29	1	24	10-3/4	--	1-1/2	--	1-1/4	2-3/4	6	0.501	4.02	40.20	0.036	-7	-9	Compression	
1506	29	2	24	10-3/4	--	1-1/2	--	1-1/4	2-3/4	6	0.486	4.02	21.35	0.034	-7	-9	Compression	Poor failure
1507	29	3	24	10-3/4	--	1-1/2	--	1-1/4	2-3/4	6	0.469	4.02	13.97	0.038	-7	-9	Compression	
1508	29	4	24	10-3/4	--	1-1/2	--	1-1/4	2-3/4	6	0.501	4.02	29.40	0.032	-7	-9	Diagonal tension	
1509	29	5	24	11	--	1-1/2	--	1-1/2	2-3/4	6	0.503	4.02	26.40	0.062	-7	-9	Crushing	At top then diagonal tension
1510	29	6	24	11	--	1-1/2	--	1-1/2	2-3/4	6	0.507	4.02	24.10	0.039	-7	-9	Crushing at base then tension	

(Continued)

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TABLE B.3 (CONTINUED)

Item No.	Material No.	Test No.	Rough Sample				Cylinder Age days	Diameter in.	Length in.	Specific Weight g/cm³	Loading Rate in./min	Failure Stress psi	Deflection in.	Temperature °C			Type of Failure	Remarks
			Snow days	Age hr	Age days	hr								Air	Snow			
1511	29	7	24	11	--	1-1/2	--	1-1/2	2-3/4	6	0.488	4.02	19.00	0.063	-7	-9	Crushing	At top
1512	29	8	24	11	--	1-1/2	--	1-1/2	2-3/4	6	0.485	4.02	19.69	0.054	-7	-9	Crushing	At top
1513	29	9	24	11	--	1-1/2	--	1-1/2	2-3/4	6	0.490	4.02	29.80	0.060	-7	-9	Crushing	At top then tension
1514	29	10	24	11-3/4	--	1-1/2	--	2-1/4	2-3/4	6	0.507	4.02	9.41	0.068	-7	-9	Tension	Horizontal position
1515	29	11	24	11-3/4	--	1-1/2	--	2-1/4	2-3/4	6	0.500	4.02	7.42	0.060	-7	-9	Tension	Horizontal position
1516	29	12	24	11-3/4	--	1-1/2	--	2-1/4	2-3/4	6	0.501	4.02	8.60	0.053	-7	-9	Tension	Horizontal position
1517	31	1	13	22	--	--	--	1	2-3/4	6	0.507	4.00	6.37	0.120	-3	-7	Tension	Horizontal position
1518	31	2	13	22	--	--	--	1	2-3/4	6	0.522	4.00	6.28	0.111	-3	-7	Tension	Horizontal position
1519	31	3	13	22	--	--	--	1	2-3/4	6	0.507	4.00	9.18	0.089	-3	-7	Tension	Horizontal position, poor test
1520	31	4	13	22	--	--	--	1	2-3/4	6	0.493	4.00	11.92	0.055	-3	-7	Shear at 45°	
1521	31	5	13	22	--	--	--	1	2-3/4	6	0.520	4.00	20.5	0.045	-3	-7	Shear at 45°	
1522	31	6	13	22-1/4	--	--	--	1-1/4	2-3/4	6	0.485	4.00	18.00	0.097	-3	-7	Compression	
1523	31	7	13	22-1/4	--	--	--	1-1/4	2-3/4	6	0.491	4.00	17.18	0.057	-3	-7	Crushing	At base then slid out
1524	31	8	13	22-1/4	--	--	--	1-1/4	2-3/4	6	0.490	4.00	17.50	0.082	-3	-7	Crushing	At top
1525	31	9	13	22-1/4	--	--	--	1-1/4	2-3/4	6	0.486	4.00	17.18	0.049	-3	-7	Crushing	At top
1526	31	10	13	22-1/4	--	--	--	1-1/4	2-3/4	6	0.508	4.00	22.4	0.026	-3	-7	Compression	
1527	31	11	13	22-1/4	--	--	--	1-1/4	2-3/4	6	0.485	4.00	11.80	0.030	-3	-7	Compression	
1528	31	13	28	2-3/4	--	--	--	3/4	2-3/4	6	0.490	4.02	8.18	0.055	-2	-6	Tension	Horizontal position
1529	31	14	28	2-3/4	--	--	--	3/4	2-3/4	6	0.493	4.02	9.56	0.067	-2	-6	Tension	Horizontal position
1530	31	15	28	2-3/4	--	--	--	3/4	2-3/4	6	0.500	4.02	10.72	0.059	-2	-6	Tension	Horizontal position
1531	31	16	28	3	--	--	--	1	2-3/4	6	0.488	4.00	28.6	0.076	-2	-6	Compression	
1532	31	17	28	3	--	--	--	1	2-3/4	6	0.514	4.00	26.7	0.037	-2	-6	Shear 25°	
1533	31	18	28	3	--	--	--	1	2-3/4	6	0.497	4.00	26.10	0.030	-2	-6	Compression	
1534	31	19	28	3	--	--	--	1	2-3/4	6	0.495	4.00	16.32	0.027	-2	-6	Compression	
1535	31	20	28	3	--	--	--	1	2-3/4	6	0.514	4.00	19.35	0.054	-2	-6	Compression	
1536	31	21	28	3	--	--	--	1	2-3/4	6	0.514	4.00	30.80	0.049	-2	-6	Compression	In Crooked
1537	31	22	28	3	--	--	--	1	2-3/4	6	0.491	4.00	9.60	0.030	-2	-6	Compression	
1538	31	23	28	3	--	--	--	1	2-3/4	6	0.486	4.00	24.60	0.032	-2	-6	Shear	45° angle
1539	31	24	28	3	--	--	--	1	2-3/4	6	0.490	4.00	26.20	0.076	-2	-6	Compression	No film
1540	31	25	28	2-3/4	--	--	--	3/4	2-3/4	6	0.526	4.02	6.40	0.095	-2	-6	Tension	Horizontal position
1541	31	26	28	2-3/4	--	--	--	3/4	2-3/4	6	0.507	4.02	12.48	0.050	-2	-6	Tension	Horizontal position
1542	31	27	28	2-3/4	--	--	--	3/4	2-3/4	6	0.530	4.02	9.18	0.109	-2	-6	Tension	Horizontal position
1543	31	28	28	3-1/4	--	--	--	1-1/4	2-3/4	6	0.507	4.00	23.10	0.044	-2	-6	Crushing then tension	At base
1544	31	29	28	3-1/4	--	--	--	1-1/4	2-3/4	6	0.493	4.00	32.30	0.047	-2	-6	Compression	
1545	31	30	28	3-1/4	--	--	--	1-1/4	2-3/4	6	0.505	4.00	31.00	0.055	-2	-6	Compression	
1546	31	31	28	3-1/4	--	--	--	1-1/4	2-3/4	6	0.449	4.00	15.65	0.104	-2	-6	Tension	

(Continued)

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TABLE B.3 (CONTINUED)

Item No.	Material No.	Test No.	Rough Sample						Specific Weight g/cm³	Loading Rate in./min	Failure Stress psi	Deflection in.	Temperature °C			Remarks	
			Snow days	Age days	Age hr	Cylinder Age days	hr	Diameter in.					Air	Snow	Type of Failure		
1547	31	32	28	3-1/4	--	--	--	1-1/4	2-3/4	6	0.486	4.00	31.65	0.065	-2	-6	Compression
1548	31	33	28	3-1/4	. .	--	--	1-1/4	2-3/4	6	0.517	4.00	25.10	0.047	-2	-6	Compression
1549	31	34	28	3-1/4	--	--	--	1-1/4	2-3/4	6	0.508	4.00	32.80	0.046	-2	-6	Crushing then tension
1550	31	35	28	3-1/4	--	--	--	1-1/4	2-3/4	6	0.508	4.00	--	--	-2	-6	Crushing then tension
1551	31	36	28	3-1/4	--	--	--	1-1/4	2-3/4	6	0.519	4.00	26.20	0.054	-2	-6	Crushing then tension
1552	31	37	31	1/2	--	--	--	6	2-3/4	6	0.503	4.02	26.20	0.056	-2	-3	Crushing
1553	31	38	31	1/2	--	--	--	6	2-3/4	6	0.512	4.02	29.1	0.050	-2	-3	Crushing then tension
1554	31	39	31	1/2	--	--	--	6	2-3/4	6	0.495	4.02	23.20	0.074	-2	-3	Crushing
1555	31	40	31	1/2	--	--	--	6	2-3/4	6	0.522	4.02	38.20	0.029	-2	-3	Crushing
1556	31	41	31	1/2	--	--	--	6	2-3/4	6	0.485	4.02	18.18	0.046	-2	-3	Crushing
1557	31	42	31	1/2	--	--	--	6	2-3/4	6	0.498	4.02	24.90	0.024	-2	-3	Compression
1558	31	43	31	3/4	--	--	--	6-1/4	2-3/4	6	0.515	4.02	39.55	0.048	-2	-3	Crushing
1559	31	44	31	3/4	--	--	--	6-1/4	2-3/4	6	0.500	4.02	25.6	0.024	-2	-3	Crushing
1560	31	45	31	3/4	--	--	--	6-1/4	2-3/4	6	0.526	4.02	32.5	0.045	-2	-3	Crushing then tension
1561	31	46	31	3/4	--	--	--	6-1/4	2-3/4	6	0.500	4.02	15.99	0.059	-2	-3	Crushing
1562	31	47	31	3/4	--	--	--	6-1/4	2-3/4	6	0.474	4.02	16.82	0.061	-2	-3	Crushing
1563	31	48	31	3/4	--	--	--	6-1/4	2-3/4	6	0.488	4.02	14.80	0.052	-2	-3	Crushing
1564	31	50	31	1	--	--	--	6-1/2	2-3/4	6	0.493	4.02	8.45	0.153	-2	-3	Tension
1565	31	51	31	1	--	--	--	6-1/2	2-3/4	6	0.483	4.02	7.25	0.198	-2	-3	Tension
1566	31	52	34	2-1/2	--	--	--	4	2-3/4	6	0.505	4.02	36.2	0.054	-4	-4	Crushing then tension
1567	31	53	34	2-1/2	--	--	--	4	2-3/4	6	0.500	4.02	31.00	0.035	-4	-2	Crushing
1568	31	54	34	2-1/2	--	--	--	4	2-3/4	6	0.515	4.02	37.80	0.036	-4	-2	Compression
1569	31	55	34	2-1/2	--	--	--	4	2-3/4	6	0.519	4.02	41.25	0.043	-4	-2	Compression
1570	31	56	34	2-1/2	--	--	--	4	2-3/4	6	0.519	4.02	53.0	0.038	-4	-2	Compression
1571	31	57	34	2-1/2	--	--	--	4	2-3/4	6	0.521	4.02	36.65	0.050	-3	-2	Compression
1572	31	58	34	2-1/2	--	--	--	4	2-3/4	6	0.514	4.02	35.00	0.057	-3	-2	Compression
1573	31	59	34	2-3/4	--	--	--	4-1/4	2-3/4	6	0.517	4.02	34.80	0.046	-3	-2	Tension
1574	31	60	34	2-3/4	--	--	--	4-1/4	2-3/4	6	0.528	4.02	36.65	0.035	-2	-2	Compression
1575	31	61	34	2-3/4	--	--	--	4-1/4	2-3/4	6	0.508	4.02	7.78	0.071	-2	-2	Tension
1576	31	62	34	2-3/4	--	--	--	4-1/4	2-3/4	6	0.515	4.02	8.69	0.064	-2	-2	Tension
1577	31	63	34	2-3/4	--	--	--	4-1/4	2-3/4	6	0.493	4.02	8.87	0.077	-2	-2	Tension
1578	32	31	30	5	--	1	16	1-1/2	2-3/4	6	0.479	4.02	5.79	0.134	-2	-3	Tension
1579	32	32	30	5	---	1	16	1-1/2	2-3/4	6	0.434	4.02	5.51	0.182	-2	-3	Tension

(Continued)

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TABLE B.3 (CONTINUED)

Item No.	Material No.	Test No.	Rough Sample				Cylinder Age days	Diameter in.	Length in.	Specific Weight g/cm³	Loading Rate in./min	Failure Stress psi	Deflection in.	Temperature °C		Type of Failure	Remarks	
			Snow days	Age hr	days	hr								Air	Snow			
1580	32	33	30	5	--	1	16	1-1/2	2-3/4	6	0.478	4.02	7.32	0.098	-2	-3	Tension	Horizontal position
1581	32	34	30	5	--	1	16	1-1/2	2-3/4	6	0.438	4.02	5.78	0.180	-2	-3	Tension	Horizontal position
1582	32	35	30	5	--	1	16	1-1/2	2-3/4	6	0.478	4.02	9.53	0.145	-2	-3	Tension	Horizontal position
1583	32	36	30	5	--	1	16	1-1/2	2-3/4	6	0.476	4.02	7.32	0.095	-2	-3	Tension	Horizontal position
1584	32	37	30	5	--	1	16	1-1/2	2-3/4	6	0.478	4.02	22.70	0.074	-2	-3	Compression	
1585	32	38	30	5	--	1	16	1-1/2	2-3/4	6	0.476	4.02	26.60	0.082	-2	-3	Crushing	Then tension
1586	32	39	30	5	--	1	16	1-1/2	2-3/4	6	0.505	4.02	26.60	0.087	-2	-3	Crushing	At top
1587	32	40	30	5	--	1	16	1-1/2	2-3/4	6	0.481	4.02	20.2	0.118	-2	-3	Crushing	At top
1588	32	41	30	5	--	1	16	1-1/2	2-3/4	6	0.479	4.02	20.85	0.040	-2	-3	Compression	
1589	32	42	30	5	--	1	16	1-1/2	2-3/4	6	0.455	4.02	21.0	0.197	-2	-3	Crushing	At top
1590	32	43	30	5	--	1	16	1-1/2	2-3/4	6	0.488	4.02	21.0	0.129	-2	-3	Crushing	At top
1591	32	44	30	5	--	1	16	1-1/2	2-3/4	6	0.498	4.02	31.10	0.088	-2	-3	Compression	
1592	32	45	30	5	--	1	16	1-1/2	2-3/4	6	0.485	4.02	21.0	0.147	-2	-3	Crushing	At base
1593	32	46	30	5	--	1	16	1-1/2	2-3/4	6	0.469	4.02	13.45	0.047	-2	-3	Crushing	At top
1594	32	47	30	5-1/4	--	1	16	1-3/4	2-3/4	6	0.481	4.02	35.80	0.101	-2	-3	Compression	Then tension
1595	32	48	30	5-1/4	--	1	16	1-3/4	2-3/4	6	0.476	4.02	12.62	0.084	-2	-3	Crushing	At top
1596	32	49	30	5-1/4	--	1	16	1-3/4	2-3/4	6	0.461	4.02	21.85	0.102	-2	-3	Compression	
1597	32	50	30	5-1/4	--	1	16	1-3/4	2-3/4	6	0.490	4.02	32.00	0.123	-2	-3	Crushing	Specimen sliding out at top and base
1598	32	51	30	5-1/4	--	1	16	1-3/4	2-3/4	6	0.500	4.02	23.10	0.087	-2	-3	Compression	
1599	32	52	30	5-1/4	--	1	16	1-3/4	2-3/4	6	0.476	4.02	19.18	0.098	-2	-3	Compression	Record not complete
1600	32	53	30	5-1/4	--	1	16	1-3/4	2-3/4	6	0.473	4.02	12.62	0.105	-2	-3	Crushing	
1601	32	54	30	5-1/4	--	1	16	1-3/4	2-3/4	6	0.514	4.02	25.70	0.087	-2	-3	Crushing	Poor record
1602	33	1	25	5-3/4	--	3/4	--	1/4	2-3/4	6	0.459	4.02	4.09	0.118	-3	-5	Tension	Horizontal position
1603	33	2	25	5-3/4	--	3/4	--	1/4	2-3/4	6	0.495	4.02	5.40	0.064	-3	-5	Tension	Horizontal position
1604	33	3	25	5-3/4	--	3/4	--	1/4	2-3/4	6	0.459	4.02	4.36	0.120	-3	-5	Tension	Horizontal position
1605	33	4	25	6	--	3/4	--	1/2	2-3/4	6	0.486	4.02	11.43	0.089	-3	-5	Crushing	At top
1606	33	5	25	6	--	3/4	--	1/2	2-3/4	6	0.483	4.02	19.69	0.093	-3	-5	Compression	
1607	33	6	25	6	--	3/4	--	1/2	2-3/4	6	0.476	4.02	9.76	0.077	-3	-5	Compression	
1608	33	7	25	6	--	3/4	--	1/2	2-3/4	6	0.479	4.02	18.50	0.052	-3	-5	Compression	
1609	33	8	25	6	--	3/4	--	1/2	2-3/4	6	0.491	4.02	13.97	0.064	-3	-5	Crushing	At base
1610	33	9	25	6-1/4	--	3/4	--	3/4	2-3/4	6	0.497	4.02	18.82	0.060	-3	-5	Compression	
1611	33	10	25	6-1/4	--	3/4	--	3/4	2-3/4	6	0.488	4.02	19.00	0.064	-3	-5	Crushing	At base
1612	33	11	25	6-1/4	--	3/4	--	3/4	2-3/4	6	0.485	4.02	23.20	0.064	-3	-5	Crushing	Then tension
1613	33	12	24	6-1/4	--	3/4	--	3/4	2-3/4	6	0.495	4.02	26.10	0.056	-3	-5	Crushing	At top
1614	34	1	23	8-3/4	--	3/4	--	1/4	2-3/4	6	0.473	4.00	3.63	0.062	-3	-5	Tension	Horizontal position
1615	34	2	23	8-3/4	--	3/4	--	1/4	2-3/4	6	0.479	4.02	6.18	0.090	-3	-5	Tension	Horizontal position
1616	34	3	23	8-3/4	--	3/4	--	1/4	2-3/4	6	0.471	4.02	4.24	0.054	-3	-5	Tension	Horizontal position

(Continued)

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TABLE B.3 (CONTINUED)

Item No.	Material No.	Test No.	Rough Sample				Diameter in.	Length in.	Specific weight g/cm³	Loading Rate in./min	Failure Stress psi	Deflection in.	Temperature °C		Type of Failure	Remarks		
			Snow days	Age days	hr	Cylinder Age days							Air	Snow				
1617	34	4	23	8-3/4	--	3/4	--	1/4	2-3/4	6	0.479	4.02	13.62	0.044	-3	-5	Tension	Crushing at top
1618	34	5	23	9-1/4	--	3/4	--	3/4	2-3/4	6	0.505	4.02	12.30	0.055	-3	-5	Compression	
1619	34	6	23	9-1/4	--	3/4	--	3/4	2-3/4	6	0.462	4.02	26.10	0.104	-3	-5	Crushing	Slid out at top
1620	34	7	23	9-1/2	--	3/4	--	1	2-3/4	6	0.469	4.02	19.85	0.040	-3	-5	Compression	
1621	34	8	23	9-1/2	--	3/4	--	1	2-3/4	6	0.476	4.02	13.45	0.074	-3	-5	Crushing	At base
1622	34	9	23	9-1/2	--	3/4	--	1	2-3/4	6	0.478	4.02	20.20	0.044	-3	-5	Crushing	At base
1623	34	10	23	9-1/2	--	3/4	--	1	2-3/4	6	0.474	4.02	11.43	0.076	-3	-5	Crushing	Slid out at base
1624	34	11	23	9-1/2	--	3/4	--	1	2-3/4	6	0.479	4.02	12.62	0.076	-3	-5	Crushing	At top
1625	34	12	23	9-1/2	--	3/4	--	1	2-3/4	6	0.469	4.02	14.30	0.075	-3	-5	Tension	Crushing at top
1626	34	13	23	6	--	3/4	--	1/4	2-3/4	6	0.459	4.02	4.16	0.080	-3	-5	Tension	Horizontal position
1627	34	14	23	6	--	3/4	--	1/4	2-3/4	6	0.498	4.02	5.28	0.042	-3	-5	Tension	Horizontal position
1628	34	15	23	6	--	3/4	--	1/4	2-3/4	6	0.490	4.02	6.25	0.068	-3	-5	Tension	Horizontal position
1629	34	16	23	6-3/4	--	3/4	--	1	2-3/4	6	0.478	4.02	24.4	0.105	-3	-4	Tension	Crushing at top
1630	34	17	23	6-3/4	--	3/4	--	1	2-3/4	6	0.507	4.02	26.4	0.068	-3	-4	Tension	Crushing at top
1631	34	18	23	6-3/4	--	3/4	--	1	2-3/4	6	0.474	4.02	22.7	0.107	-3	-4	Tension	Crushing at top
1632	34	19	23	6-3/4	--	3/4	--	1	2-3/4	6	0.490	4.02	23.55	0.137	-3	-4	Crushing	At top
1633	34	20	23	6-3/4	--	3/4	--	1	2-3/4	6	0.479	4.02	28.6	0.075	-3	-4	Compression	
1634	34	21	23	6-3/4	--	3/4	--	1	2-3/4	6	0.464	4.02	15.14	0.170	-3	-4	Crushing	Then tension at top
1635	34	22	23	6-3/4	--	3/4	--	1	2-3/4	6	0.461	4.02	13.45	0.143	-3	-4	Shear	At 45° angle
1636	34	23	23	6-3/4	--	3/4	--	1	2-3/4	6	0.467	4.02	20.70	0.109	-3	-4	Crushing	At top
1637	34	24	23	6-3/4	--	3/4	--	1	2-3/4	6	0.474	4.02	15.14	0.140	-3	-4	Shear	At 45° angle
1638	35	1	22	11-1/4	--	3/4	--	1/4	2-3/4	6	0.442	4.00	3.70	0.102	-3	-4	Tension	Horizontal position
1639	35	2	22	11-1/4	--	3/4	--	1/4	2-3/4	6	0.459	4.02	5.01	0.097	-3	-4	Tension	Horizontal position
1640	35	3	22	11-1/4	--	3/4	--	1/4	2-3/4	6	0.452	4.02	3.70	0.094	-3	-4	Tension	Horizontal position
1641	35	4	22	12-1/4	--	3/4	--	1-1/4	2-3/4	6	0.464	4.02	31.10	0.102	-3	-4	Compression	
1642	35	5	22	12-1/4	--	3/4	--	1-1/4	2-3/4	6	0.445	4.02	15.14	0.103	-3	-4	Crushing	At base
1643	35	6	22	12-1/4	--	3/4	--	1-1/4	2-3/4	6	0.438	4.02	13.80	0.075	-3	-4	Crushing	At top
1644	35	7	22	12-1/4	--	3/4	--	1-1/4	2-3/4	6	0.476	4.02	13.10	0.060	-3	-4	Crushing	At base
1645	35	8	22	12-1/4	--	3/4	--	1-1/4	2-3/4	6	0.445	4.02	21.50	0.085	-3	-6	Compression	
1646	35	9	22	12-1/4	--	3/4	--	1-1/4	2-3/4	6	0.469	4.02	17.50	0.113	-3	-6	Crushing	At top
1647	35	10	22	12-1/2	--	3/4	--	1-1/2	2-3/4	6	0.483	4.02	27.10	0.047	-3	-6	Crushing	At top
1648	35	11	22	12-1/2	--	3/4	--	1-1/2	2-3/4	6	0.445	4.02	6.90	0.069	-3	-6	Crushing	At top
1649	35	12	22	12-1/2	--	3/4	--	1-1/2	2-3/4	6	0.464	4.02	20.70	0.065	-3	-6	Compression	
1650	36	1	20	8-3/4	--	2-1/2	--	1-1/4	2-3/4	6	0.473	4.02	15.14	0.065	-3	-5	Crushing	Then tension at top
1651	36	2	20	8-3/4	--	2-1/2	--	1-1/4	2-3/4	6	0.476	4.02	15.49	0.110	-3	-6	Crushing	Then tension at top
1652	36	3	20	8-3/4	--	2-1/2	--	1-1/4	2-3/4	6	0.440	4.02	19.85	0.135	-3	-6	Crushing	At base
1653	36	4	20	8-3/4	--	2-1/2	--	1-1/4	2-3/4	6	0.465	4.02	20.5	0.131	-3	-6	Crushing	At top slipped out of machine

(Continued)

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TABLE B.3 (CONCLUDED)

Item No.	Material No.	Rough Sample						Specific Weight g/cm³	Loading Rate g/cu cm	Failure Stress psi	Deflection in.	Temperature °C			Remarks		
		Test No.	Snow days	Age hr	Cylinder days	Age hr	Diameter in.					Air	Snow	Type of Failure			
1654	36	5	20	8-3/4	--	2-1/2	--	1-1/4	2-3/4	6	0.467	4.02	27.8	0.121	-3	-6 Crushing	At top then tension
1655	36	6	20	8-3/4	--	2-1/2	--	1-1/4	2-3/4	6	0.474	4.02	22.4	0.079	-3	-6 Crushing	At top
1656	36	8	20	8-3/4	--	2-1/2	--	1-1/4	2-3/4	6	0.476	4.02	19.85	0.091	-3	-6 Crushing	At top then compression
1657	36	9	20	8-3/4	--	2-1/2	--	1-1/4	2-3/4	6	0.457	4.02	22.55	0.169	-3	-6 Tension	Crushing at top
1658	36	10	20	9	--	2-1/2	--	1-1/2	2-3/4	6	0.430	4.02	4.86	0.110	-3	-6 Tension	Horizontal position
1659	36	11	20	9	--	2-1/2	--	1-1/2	2-3/4	6	0.462	4.02	5.01	0.099	-3	-6 Tension	Horizontal position
1660	36	12	20	9	--	2-1/2	--	1-1/2	2-3/4	6	0.471	4.02	3.54	0.133	-3	-6 Tension	Horizontal position
1661	37	1	19	11	--	2-1/2	--	1-1/2	2-3/4	6	0.473	4.02	5.79	0.094	-3	-6 Tension	Horizontal position
1662	37	2	19	11	--	2-1/2	--	1-1/2	2-3/4	6	0.467	4.02	5.86	0.093	-3	-6 Tension	Horizontal position
1663	37	3	19	11	--	2-1/2	--	1-1/2	2-3/4	6	0.424	4.02	4.20	0.066	-3	-6 Tension	Horizontal position
1664	37	4	19	11-1/4	--	2-1/2	--	1-3/4	2-3/4	6	0.490	4.02	27.20	0.094	-3	-6 Crushing	At top then tension
1665	37	5	19	11-1/4	--	2-1/2	--	1-3/4	2-3/4	6	0.486	4.02	25.20	0.065	-3	-6 Compression	At top then tension
1666	37	6	19	11-1/4	--	2-1/2	--	1-3/4	2-3/4	6	0.481	4.02	12.30	0.106	-3	--	Slipped out of machine
1667	37	7	19	11-1/4	--	2-1/2	--	1-3/4	2-3/4	6	0.467	4.02	23.20	0.098	-3	-6 Crushing	At top slid out
1668	37	8	19	11-1/4	--	2-1/2	--	1-3/4	2-3/4	6	0.461	4.02	21.20	0.070	-3	-6 Crushing	At top then shear 60°
1669	37	9	19	11-1/4	--	2-1/2	--	1-3/4	2-3/4	6	0.465	4.02	21.85	0.115	-3	-6 Compression	At base then tension
1670	37	10	19	11-1/4	--	2-1/2	--	1-3/4	2-3/4	6	0.445	4.02	6.06	0.031	-3	-6 Shear	At 30° angle
1671	37	11	19	11-1/4	--	2-1/2	--	1-3/4	2-3/4	6	0.455	4.02	15.49	0.101	-3	-6 Shear	At 30° angle
1672	37	12	19	11-1/4	--	2-1/2	--	1-3/4	2-3/4	6	0.449	4.02	7.24	0.086	-3	-6 Crushing	At top

TABLE B.4 BEAM TESTS; GREENLAND, 1961 AND 1962

Item No.	Mat- erial No.	Test No.	Snow		Rough		Sample		Specimen		Overall Length in.	Unsup- ported Length in.	Specific Weight g/cm ³	Load Geometry	Line Pressure psi	Applied Pressure psi	Deflection at Center Line, in.	Load Rate psi/sec	Time to Failure sec	Temperature °C	Type of Failure	Remarks		
			days	hr	days	hr	days	hr	days	hr														
1673	4	29	35	--	34	--	1	3-3/4	20	18	2	2	0.480	9	5.36	0.71	--	--	--	-16.7	--	Flexure	--	
1674	6	50	36	4	34	--	2	4	20	18	2	2	0.579	9	5.92	0.83	0.017	--	1.78	-11.7	--	Flexure	--	
1675	8	64	33	17	30	20	"	2	21	20	18	2	2	0.589	9	7.64	1.26	0.021	--	8.90	-10.6	--	Flexure	--
1676	8	65	33	17	30	20		2	21	20	18	2	2	0.551	9	7.05	1.10	0.018	--	3.86	-10.6	--	Flexure	--
1677	8	66	33	17	30	20		2	21	20	18	2	2	0.589	9	9.04	1.64	0.027	--	3.86	-10.6	--	Flexure	--
1678	11	103	27	--	22	--	5	--	20	18	2	2-1/8	0.556	9	7.07	1.11	--	--	2.40	-11.7	--	Flexure	--	
1679	11	105	27	--	22	--	5	--	20	18	2	2	0.513	9	8.48	1.48	0.002	--	1.50	-11.7	--	Flexure	--	
1680	12	153	25	19	22	12	3	7	20	18	2	2	0.521	9	15.03	4.14	0.018	--	2.18	-12.2	--	Flexure	--	
1681	12	154	25	19	22	12	3	7	20	18	2	2	0.551	9	15.37	4.27	0.030	--	1.60	-12.2	--	Flexure	--	
1682	13	161	13	22	13	15	0	7	20	18	2	2	0.471	9	6.22	0.90	0.028	--	1.44	-10.8	--	Flexure	--	
1683	13	164	24	18	13	15	11	5	20	18	2	2	0.496	9	7.90	1.36	0.027	--	--	-10.8	--	Flexure	--	
1684	16	179	15	19	15	19	15	19	20	18	2	2	0.491	9	11.30	2.36	0.470	--	2.15	-15.5	--	Flexure	--	
1685	11	114	40	--	40	--	0	--	20	18	2-1/8	2-1/4	0.596	9	7.91	1.36	0.015	--	1.70	-15.0	--	Flexure	--	
1686	11	104	27	--	22	--	5	--	20	18	2-3/16	2	0.519	9	7.07	1.11	--	--	2.40	-11.7	--	Flexure	--	
1687	11	107	27	--	22	--	5	--	20	18	2-3/16	2-1/8	0.500	9	9.88	1.90	0.003	--	1.58	-11.7	--	Flexure	--	
1688	11	108	27	--	22	--	5	--	20	18	2-3/16	2-1/8	0.513	9	9.88	1.90	0.008	--	1.70	-11.7	--	Flexure	--	
1689	4	41	35	3	34	0	1	3	20	18	3	2	0.464	9	9.61	1.78	0.030	--	2.10	-10.0	--	--	--	
1690	6	55	36	5	34	0	2	5	20	18	3	2	0.564	9	8.18	1.40	0.036	--	5.20	-11.7	--	Flexure	--	
1691	6	56	36	5	34	0	2	5	20	18	3	2	0.574	9	7.05	1.10	0.012	--	5.20	-11.7	--	Flexure	--	
1692	6	57	36	5	34	0	2	5	20	18	3	2	0.569	9	7.86	1.31	0.010	--	4.80	-11.7	--	Flexure	--	
1693	8	67	33	18	30	20	2	22	20	18	3	2	0.564	9	11.30	2.36	0.030	--	2.20	-10.6	--	Flexure	--	
1694	8	68	33	18	30	20	2	22	20	18	3	2	0.567	9	11.57	2.49	0.024	--	2.01	-10.6	--	Flexure	--	
1695	10	81	30	3-1/2	23	0	7	3-1/2	20	18	3	2	0.571	9	7.05	1.10	0.019	--	5.90	-16.7	--	Flexure	--	
1696	10	82	30	3-1/2	23	0	7	3-1/2	20	18	3	1-7/8	0.499	9	8.48	1.48	0.017	--	2.20	--	--	Flexure	--	
1697	11	115	30	--	27	--	3	--	20	18	3	2	0.569	9	9.72	1.85	0.015	--	2.80	-9.8	--	Flexure	--	
1698	11	118	30	--	27	--	3	--	20	18	3	2	0.551	9	9.61	1.82	0.020	--	2.60	-15.0	--	Flexure	--	
1699	11	119	30	--	27	--	3	--	20	18	3	2	0.574	9	11.30	2.36	0.016	--	3.20	-15.0	--	Flexure	--	
1700	11	120	30	--	27	--	3	--	20	18	3	2	0.616	9	8.81	1.58	0.012	--	1.50	-15.0	--	Flexure	--	
1701	11	121	30	--	27	--	3	0	20	18	3	2	0.585	9	13.00	3.16	0.037	--	1.35	-9.8	--	Flexure	--	
1703	11	122	30	--	27	--	3	--	20	18	3	2	0.496	9	12.88	3.10	0.028	--	2.80	-9.8	--	Flexure	--	
1704	12	156	25	19	22	12	3	7	20	18	3	2-1/8	0.483	9	11.25	2.57	0.026	--	2.20	-12.2	--	Flexure	--	
1705	4	20	35	4	34	0	1	4	20	18	4	2	0.474	9	9.61	1.82	0.015	--	1.40	-10.0	--	Flexure	--	
1706	6	45	36	5	34	0	2	5	20	18	4	2	0.571	9	10.83	2.20	0.015	--	5.70	-11.7	--	Flexure	--	
1707	6	46	36	5	34	0	2	5	20	18	4	4	0.571	9	9.31	1.72	0.011	--	4.60	-11.7	--	Flexure	--	
1708	6	47	36	5	34	0	2	5	20	18	4	2	0.501	9	9.24	1.71	0.017	--	1.95	-11.7	--	Flexure	--	
1709	8	58	33	18	30	20	2	22	20	18	4	2	0.590	9	13.83	3.55	0.024	--	1.85	-10.6	--	Flexure	--	
1710	8	59	33	18	30	20	2	22	20	18	4	2	0.560	9	13.27	3.29	0.022	--	2.00	-10.6	--	Flexure	--	
1711	8	60	33	18	30	20	2	22	20	18	4	2	0.548	9	14.13	3.69	0.016	--	2.70	-10.6	--	Flexure	--	
1712	10	74	30	3-1/4	23	0	7	3-1/4	20	18	4	2	0.542	9	11.30	2.36	0.014	--	2.40	-16.7	--	Flexure	--	
1713	11	128	30	--	27	--	3	--	20-1/2	18	4	2	0.529	9	13.00	3.16	0.024	--	2.10	-9.8	--	Flexure	--	
1714	12	145	25	20	22	12	3	8	20	18	4	2	0.534	9	15.82	4.49	0.027	--	1.35	-12.2	--	Flexure	--	
1715	13	163	13	23	13	15	0	6	20	18	4	2	0.505	9	10.17	1.97	0.025	--	3.02	-16.2	--	Flexure	--	
1716	10	73	30	3	23	0	7	3	20	18	4-1/8	2	0.555	9	11.87	2.63	0.016	--	2.70	-16.7	--	Flexure	--	

(Continued)

(1 of 8 sheets)

TABLE B.4 (CONTINUED)

Item No.	Material No.	Test No.	Snow Age		Rough Sample Age		Specimen Age	Overall Length in.	Unsup-ported Length in.	Depth in.	Width in.	Specific Weight g/cm³	Load Geometry	Line Pressure psi	Applied Pressure psi	Deflection at Center Line, in.	Load Rate psi/sec	Time to Failure sec	Temperature °C	Type of Failure	Remarks		
			days	hr	days	hr																	
1717	6	49	36	5	34	0	2	5	20	18	6	2	0.554	9	15.87	4.51	0.022	--	2.00	-11.7	--	Flexure	--
1718	8	61	33	19	30	20	2	23	20	18	6	2-1/4	0.541	9	21.70	7.25	0.055	--	3.53	-10.6	--	Flexure	--
1719	8	62	33	19	30	20	2	23	20	18	6	2	0.570	9	23.17	7.93	0.026	--	3.00	-10.6	--	Flexure	--
1720	8	63	33	19	30	20	2	23	20	18	6	2	0.574	9	22.04	7.41	0.015	--	2.32	-10.6	--	Flexure	--
1721	10	75	30	3-1/2	23	0	7	3-1/2	20	18	6	2	0.481	9	15.26	4.22	0.022	--	3.01	-16.7	--	Flexure	--
1722	10	76	30	3-3/4	20	0	7	3-3/4	20	18	6	2	0.474	9	14.13	3.69	0.023	--	9.25	-16.7	--	Flexure	--
1723	10	77	30	4	23	0	7	4	20	18	6	1-3/4	0.505	9	12.88	3.10	0.016	--	3.40	-16.7	--	Flexure	--
1724	11	134	30	--	30	--	0	--	20	18	6	2	0.510	9	12.21	2.79	0.010	--	2.20	-9.8	--	--	--
1725	11	135	30	--	30	--	0	--	20	18	6	2	0.549	9	11.57	2.49	0.009	--	2.50	-9.8	--	Flexure	--
1726	12	150	25	20	22	12	3	8	20	18	6	2	0.504	9	18.65	5.82	0.030	--	2.90	-12.2	--	Flexure	--
1727	13	172	14	0	13	15	0	9	20	18	6	2	0.550	9	15.26	4.22	0.026	--	1.70	-16.2	--	Flexure	--
1728	11	111	30	--	30	--	0	--	20	18	--	2	0.569	9	10.17	1.97	0.016	--	2.20	-9.8	--	Flexure	--
1729	11	112	40	--	40	--	0	--	20	18	--	2	0.601	9	10.17	1.97	0.019	--	1.13	-15.0	--	Flexure	--
1730	11	113	40	--	40	--	0	--	20	18	--	2	0.580	9	8.25	1.42	0.024	--	2.80	-15.0	--	Flexure	--
1731	11	139	26	--	19	--	7	--	50	45	5	5	0.506	9	8.67	0.24	0.059	--	2.50	-10.6	--	Flexure	--
1732	11	140	26	--	19	--	7	--	50	45	5	5	0.586	9	8.90	0.27	0.051	--	1.88	-10.6	--	Flexure	--
1733	11	141	26	--	19	--	7	--	50	45	5	5	0.548	9	9.06	0.28	0.029	--	1.80	-10.6	--	Flexure	--
1734	11	143	41	--	30	--	11	--	50	45	5-3/4	4-3/4	0.547	9	9.06	0.28	0.053	--	3.20	-16.2	--	Flexure	--
1735	11	145	41	--	30	--	11	--	50	45	5-1/8	5	0.515	9	10.41	0.36	0.053	--	1.90	-16.2	--	Flexure	--
1736	16	174	19	23	19	23	19	23	50	45	7-3/10	5	0.522	9	12.32	0.49	--	--	0.58	-11.1	--	Flexure	Reinforced
1737	16	175	20	0	20	0	20	0	50	45	7-3/10	5	0.506	9	18.60	1.18	--	--	4.70	-11.1	--	Flexure	Reinforced
1738	16	176	20	0	20	0	20	0	50	45	7-3/10	5	0.490	9	22.34	1.65	0.046	--	0.64	-11.1	--	Flexure	--
1739	16	177	20	0	20	0	20	0	50	45	7-3/10	5	0.488	9	22.98	1.73	0.062	--	0.98	-11.1	--	Flexure	--
1740	11	89	26	--	19	--	27	--	50	45	7-1/2	5	0.560	9	10.97	0.40	0.042	--	4.10	-10.6	--	Flexure	--
1741	11	91	41	--	26	--	15	--	50	45	7-1/2	5	0.514	9	13.59	0.60	0.043	--	2.50	-16.2	--	Flexure	--
1742	11	92	41	--	26	--	15	--	50	45	7-1/2	5	0.535	9	15.98	0.81	0.034	--	4.80	-16.2	--	Flexure	--
1743	11	93	41	--	30	--	11	--	50	45	7-1/2	5	0.549	9	14.23	0.65	0.049	--	4.30	-16.2	--	Flexure	--
1744	11	96	26	--	18	--	8	--	50	45	10	5	0.554	9	17.25	1.01	0.026	--	6.70	-10.6	--	Flexure	--
1745	11	97	41	--	33	--	8	--	50	45	10	5	0.589	9	17.73	1.07	0.050	--	4.90	-16.2	--	Flexure	--
1746	11	98	41	--	33	--	8	--	50	45	10	5	0.545	9	18.36	1.15	0.037	--	4.90	-16.2	--	Flexure	--
1747	12	157	16	19	16	19	16	19	50	45	10	5	0.463	9	6.28	0.14	0.018	--	2.62	-10.3	--	Flexure	--
1748	11	99	41	--	33	--	8	--	50	45	15	5	0.569	9	24.65	1.94	0.037	--	2.30	-16.2	--	Flexure	--
1749	11	101	41	--	33	--	8	--	50	45	15	5	0.540	9	40.62	3.94	0.066	--	5.80	-16.2	--	Flexure	--
1750	11	102	41	--	33	--	8	--	50	45	15	5	0.543	9	33.39	3.03	0.032	--	4.30	-16.2	--	Flexure	--
1751	18	180	22	1	22	1	22	1	--	108	24	12	0.540	9	9.24	0.34	0.101	--	11.40	-12.2	--	Flexure	--

TABLE B.4 (CONTINUED)

Item No.	Material No.	Test No.	Snow days	Age hr	Rough Sample Age days	Specimen Age days	Overall Length in.	Unsupported Length in.	Unsup-ported Length in.										Deflection at Center Line, in.	Load Rate psi/sec	Time to Failure sec	Temperature °C	Type of Failure	Remarks
									Depth in.	Width in.	Specific Weight g/cm³	Load Geometry	Line Pressure psi	Applied Pressure psi	Deflection at Center Line, in.	Load Rate psi/sec	Time to Failure sec	Temperature °C						
1752	22	318	55	10-1/4	1	1	7	23-1/4	20	18	1-4/5	2-1/10	0.511	Uniform	0.41	0.48	0.037	0.141	2.90	-6.0	-8.0	Flexure	No. 6*	
1753	22	315	55	10	1	1	10	23	20	18	1-9/10	2	0.506	Uniform	0.39	0.46	0.008	0.155	2.60	-6.0	-8.0	Flexure	Nos. 1 and 2	
1754	22	210	54	14-3/4	1	1	7	3-3/4	20	18	2	2	0.398	Uniform	0.39	0.46	--	0.520	0.75	-7.0	-7.0	Flexure	Broke between Nos. 5 and 6	
1755	22	212	54	14-3/4	1	1	7	3-3/4	20-1/2	18	2	2	0.533	Uniform	1.58	1.87	--	0.929	1.70	-7.0	-7.0	Flexure	No. 5	
1756	22	215	54	14-3/4	1	1	7	3-3/4	20	18	2	2	0.482	Uniform	1.02	1.21	0.020	0.703	1.45	-7.0	-7.0	Flexure	No. 5	
1757	22	216	54	14-3/4	1	1	7	3-3/4	20-1/2	18	2	2	0.543	Uniform	1.08	1.28	0.012	0.617	1.75	-7.0	-7.0	Flexure	No. 5	
1758	22	217	54	14-3/4	1	1	7	3-3/4	20	18	2	2	0.509	Uniform	1.03	1.22	--	0.934	1.10	-7.0	-7.0	Flexure	No. 5	
1759	22	301	55	9-3/4	1	1	7	22-3/4	20	18	2	2	0.469	Uniform	0.69	0.82	0.032	0.120	--	-6.0	-8.0	Flexure	No. 5	
1760	22	304	55	9-3/4	1	1	7	22-3/4	20	18	2	2	0.468	Uniform	0.46	0.54	0.036	0.110	3.90	-6.0	-8.0	Flexure	Nos. 5 and 6	
1761	22	306	55	9-3/4	1	1	7	22-3/4	20	18	2	2	0.498	Uniform	0.55	0.66	0.007	0.139	4.00	-6.0	-8.0	Flexure	No. 3	
1762	22	307	55	10	1	1	7	23	20	18	2	2	0.494	Uniform	0.40	0.47	0.014	0.140	2.80	-6.0	-8.0	Flexure	Nos. 5 and 6	
1763	22	308	55	10	1	1	7	23	20	18	2	1-4/5	0.530	Uniform	0.66	0.78	0.020	0.120	5.10	-6.0	-8.0	Flexure	No. 3	
1764	22	312	55	10	1	1	7	23	20	18	2	2	0.478	Uniform	0.48	0.57	0.027	0.123	3.90	-6.0	-8.0	Flexure	Nos. 2 and 3	
1765	22	316	55	10	1	1	7	23	20	18	2	1-9/10	0.503	Uniform	0.56	0.66	0.016	0.140	4.00	-6.0	-8.0	Flexure	Nos. 1 and 2	
1766	22	317	55	10	1	1	7	23	20	18	2	2-1/10	0.492	Uniform	0.57	0.67	0.008	0.145	3.90	-6.0	-6.0	Flexure	No. 1	
1767	22	314	55	10	1	1	7	23	20	18	2-1/10	1-9/10	0.501	Uniform	0.54	0.63	0.013	0.140	3.50	-6.0	-8.0	Flexure	Nos. 5 and 6	
1768	22	116	43	14	7	1	12	1	20	18	2-1/4	2	0.479	Uniform	0.24	0.29	0.008	0.121	2.00	-3.0	-6.0	Flexure	No. 6	
1769	22	117	43	14-1/4	7	1	12	1	20	18	2-1/4	2	0.448	Uniform	--	--	0.026	--	4.00	-3.0	-6.0	Flexure	Between Nos. 4 and 5	
1770	22	118	43	14	7	1	12	1	20	18	2-1/4	2	0.463	Uniform	0.36	0.43	0.024	0.226	1.60	-3.0	-6.0	Flexure	Between Nos. 3 and 4	
1771	22	120	43	14-1/4	7	1	12	1-1/4	20	18	2-1/4	1-3/4	0.489	Uniform	0.48	0.57	0.016	0.255	1.90	-3.0	-6.0	Flexure	No. 6	
1772	22	123	43	14-1/4	7	1	12	1-1/4	20	18	2-1/4	2	0.525	Uniform	0.73	0.86	0.010(3)	0.162	4.50	-3.0	-5.0	Flexure	Between Nos. 2 and 3	
1773	22	124	43	14-1/2	7	1	12	1-1/2	20	18	2-1/4	2	0.531	Uniform	0.42	0.50	0.015	0.530	0.80	-3.0	-5.0	Flexure	Between Nos. 3 and 4	
1774	22	201	54	14-1/4	1	3	7	1-1/4	20-1/2	18	3	2	0.483	Uniform	0.73	0.86	0.017	0.634	1.15	-7.0	-7.0	Flexure	No. 6	
1775	22	202	54	14-1/4	1	3	7	1-1/4	20-1/2	18	3	2	0.467	Uniform	0.62	0.73	0.010	0.826	0.75	-7.0	-7.0	Flexure	No. 2	
1776	22	203	54	14-1/4	1	3	7	1-1/4	20	18	3	2	0.503	Uniform	0.82	0.97	0.022	0.729	1.12	-7.0	-7.0	Flexure	Between Nos. 3 and 5	
1777	22	205	54	14-1/4	1	3	7	1-1/4	20	18	3	2	0.490	Uniform	0.61	0.72	0.014	0.659	0.92	-7.0	-7.0	Flexure	Between Nos. 2 and 3	
1778	22	206	54	14-1/4	1	3	7	1-1/4	20	18	3	2	0.527	Uniform	1.87	2.22	0.023	1.360	1.38	-7.0	-7.0	Flexure	Between Nos. 3 and 5	
1779	22	207	54	14-1/2	1	3	7	1-1/2	20	18	3	2	0.512	Uniform	2.03	2.88	0.006	0.721	2.81	-7.0	-7.0	Flexure	No. 3	
1780	22	209	54	14-1/2	1	3	7	1-1/2	20	18	3	2	0.460	Uniform	1.12	1.32	0.013(5)	0.678	1.65	-7.0	-7.0	Flexure	Between Nos. 5 and 6	
1781	22	280	55	8-3/4	1	3	7	19-3/4	20	18	3	2	0.461	Uniform	0.89	1.05	--	0.410	6.30	-7.0	-8.0	Flexure	Nos. 2 and 3	
1782	22	283	55	8-3/4	1	3	7	19-3/4	20	18	3	1-9/10	0.509	Uniform	1.24	1.47	0.023	0.125	10.00	-7.0	-8.0	Flexure	Nos. 2 and 3	
1783	22	284	55	9-1/4	1	3	7	20-1/4	20	18	3	2	0.502	Uniform	1.09	1.29	0.014	0.145	8.10	-7.0	-8.0	Flexure	No. 2	
1784	22	287	55	9-1/4	1	3	7	20-1/4	20	18	3	2	0.477	Uniform	0.81	0.96	0.029	0.140	5.50	-7.0	-8.0	Flexure	No. 2	
1785	22	290	55	9-1/4	1	3	7	20-1/4	20	18	3	2	0.483	Uniform	0.84	0.99	0.021	0.130	6.10	-7.0	-8.0	Flexure	Nos. 3 and 5	
1786	22	295	55	9-1/2	1	3	7	20-1/2	20	18	3	1-9/10	0.514	Uniform	0.63	0.74	0.013	0.150	4.20	-7.0	-8.0	Flexure	No. 5	
1787	22	298	55	9-3/4	1	3	7	20-3/4	20	18	3	1-9/10	0.529	Uniform	1.03	1.22	0.023	0.161	6.40	-6.0	-8.0	Flexure	No. 5	
1788	22	286	55	9-1/4	1	3	7	20-1/4	20	18	3-1/10	1-9/10	0.513	Uniform	0.91	1.08	0.012	0.160	6.00	-7.0	-8.0	Flexure	Nos. 1 and 2	
1789	22	291	55	9-1/2	1	3	7	20-1/2	20	18	3-1/10	1-9/10	0.500	Uniform	0.86	1.02	0.021	0.151	5.70	-7.0	-8.0	Flexure	No. 1	
1790	22	292	55	9-1/2	1	3	7	20-1/2	20	18	3-1/10	1-9/10	0.519	Uniform	0.84	0.99	0.009	1.155	5.30	-7.0	-8.0	Flexure	No. 6	
1791	22	294	55	9-1/2	1	3	7	20-1/2	20	18	3-1/10	1-9/10	0.535	Uniform	0.74	0.88	0.010	0.165	4.40	-7.0	-8.0	Flexure	Nos. 5 and 6	
1792	22	296	55	9-1/2	1	3	7	20-1/2	20	18	3-1/10	2	0.512	Uniform	1.04	1.23	0.024	0.062	16.90	-6.0	-8.0	Flexure	No. 2	

(Continued)

Note: Numbers in parentheses refer to gage locations other than center line.

* Number refers Collins gage (for measuring deflection) location at which flexure break occurs. Gages are numbered from left to right in the central portion of the beam with No. 3 gage at the center line.
(3 of 8 sheets)

TABLE B.4 (CONTINUED)

Item No.	Material No.	Test No.	Snow days	Age hr	Rough Sample Age		Specimen Age		Overall Length in.	Unsup-ported Length in.	Depth in.	Width in.	Specific Weight g/cm³	Load Geometry	Line Pressure psi	Applied Pressure psi	Deflection at Center Line, in.	Load Rate psi/sec	Time to Failure sec	Temperature °C	Type of Failure	Remarks	
					days	hr	days	hr															
1793	22	297	55	9-3/4	1	3	7	20-3/4	20	18	3-1/10	2	0.507	Uniform	1.26	1.49	0.031	0.153	8.20	-6.0	-8.0	Flexure	No. 6
1794	22	285	55	9-1/4	1	3	7	20-1/4	20	18	3-1/5	1-9/10	0.520	Uniform	1.91	2.26	0.024	0.210	9.10	-7.0	-8.0	Flexure	Nos. 5 and 6
1795	22	288	55	9-1/4	1	3	7	20-1/4	20	18	3-1/5	1-9/10	0.519	Uniform	1.31	1.55	0.006	0.161	8.10	-7.0	-8.0	Flexure	No. 2
1796	22	22	28	11	1	2	5	23	20	18	3-1/4	2	0.480	Uniform	0.97	1.15	0.024	0.341	2.84	-9.0	-12.0	Flexure	Between Nos. 4 and 5 d = 2
1797	22	23	28	11-1/4	1	2	5	23-1/4	20	18	3-1/4	2	0.455	Uniform	0.85	1.00	0.025	0.808	1.05	-9.0	-12.0	Flexure	Between Nos. 4 and 5
1798	22	25	28	11-1/4	1	2	5	23-1/4	20	18	3-1/4	2	0.479	Uniform	No Record	--	--	--	--	-9.0	-12.0	Flexure	Between Nos. 2 and 3
1799	22	26	28	11-1/2	1	2	5	23-1/2	20	18	3-1/4	2	0.447	Uniform	0.48	0.57	0.023	0.201	2.40	-9.0	-12.0	Flexure	No. 3
1800	22	104	43	13-1/2	7	4	11	21-1/2	20	18	3-1/4	2	0.618	Uniform	2.36	2.79	0.024	0.787	3.00	-3.0	-5.0	Flexure	Between Nos. 4 and 5
1801	22	106	43	13-1/2	7	2	11	23-1/2	20	18	3-1/4	2	0.497	Uniform	0.48	0.57	0.008	1.210	0.40	-3.0	-5.0	Flexure	No. 5
1802	22	109	43	13-3/4	7	2	11	23-3/4	20	18	3-1/4	2	0.466	Uniform	0.42	0.50	0.007(5)	0.531	0.80	-3.0	-5.0	Flexure	Between Nos. 3 and 4
1803	22	110	43	13-3/4	7	2	11	23-3/4	20	18	3-1/4	2	0.497	Uniform	0.73	0.86	0.016	0.220	3.30	-3.0	-5.0	Flexure	Between Nos. 4 and 5
1804	22	111	43	13-3/4	7	2	11	23-3/4	20	18	3-1/4	2	0.512	Uniform	0.30	0.36	--	0.275	1.10	-3.0	-5.0	Flexure	Between Nos. 4 and 5
1805	22	112	43	13-3/4	7	2	11	23-3/4	20	18	3-1/4	2	0.510	Uniform	0.48	0.57	--	0.970	0.50	-3.0	-5.0	Flexure	No. 3
1806	22	113	43	13-3/4	7	2	11	23-3/4	20	18	3-1/4	2	0.510	Uniform	0.54	0.64	0.014	0.273	2.00	-3.0	-5.0	Flexure	Between Nos. 4 and 5
1807	22	114	43	14	7	2	12	0	20	18	3-1/4	2	0.471	Uniform	0.36	0.43	0.021	0.303	1.20	-3.0	-6.0	Flexure	Between Nos. 4 and 5
1808	22	268	55	8-1/4	1	4-1/2	7	17-3/4	20	18	3-9/10	1-4/5	0.558	Uniform	1.21	1.43	--	0.327	3.70	-7.0	-8.0	Flexure	No. 1
1809	22	193	54	13-3/4	1	4-1/2	6	23-1/2	21	18	4	2	0.532	Uniform	1.51	1.79	0.009	1.062	1.42	-7.0	-7.0	Flexure	No. 5
1810	22	194	54	14	1	4-1/2	6	23-1/2	23	18	4	2	0.603	Uniform	1.88	2.22	1.880	1.140	1.65	*-7.0	-7.0	Flexure	No. 5
1811	22	195	54	14	1	4-1/2	6	23-1/2	20	18	4	2	0.526	Uniform	0.84	1.00	0.010	0.840	1.00	-7.0	-7.0	Flexure	No. 3
1812	22	196	54	14	1	4-1/2	6	23-1/2	20	18	4	2	0.583	Uniform	1.48	1.75	0.009	1.205	1.23	-7.0	-7.0	Flexure	No. 5
1813	22	197	54	14-1/4	1	4-1/2	6	23-3/4	20	18	4	2	0.561	Uniform	0.96	1.14	--	0.640	1.50	-7.0	-7.0	Flexure	Between Nos. 3 and 5
1814	22	199	54	14-1/4	1	4-1/2	6	23-3/4	20	18	4	2	0.563	Uniform	1.75	2.07	--	0.609	2.88	-7.0	-7.0	Flexure	No. 3
1815	22	260	55	8	1	4-1/2	7	17-1/2	20	18	4	2	0.480	Uniform	2.24	2.65	0.018	0.105	21.25	-7.0	-8.0	Flexure	No. 5
1816	22	261	55	8	1	4-1/2	7	17-1/2	20	18	4	2	0.469	Uniform	1.09	1.29	0.023	0.168	6.50	-7.0	-8.0	Flexure	Nos. 5 and 6
1817	22	262	55	8-1/4	1	4-1/2	7	17-3/4	20	18	4	2	0.485	Uniform	0.60	0.72	0.006(5)	0.220	2.75	-7.0	-8.0	Flexure	Nos. 2 and 3
1818	22	264	55	8-1/4	1	4-1/2	7	17-3/4	20	18	4	2	0.472	Uniform	1.07	1.27	0.014	0.218	4.90	-7.0	-8.0	Flexure	Nos. 3 and 5
1819	22	265	55	8-1/4	1	4-1/2	7	17-3/4	20	18	4	2-1/10	0.494	Uniform	0.83	0.98	0.009	0.286	2.90	-7.0	-8.0	Flexure	No. 5
1820	22	266	55	8-1/4	1	4-1/2	7	17-3/4	20	18	4	2	0.502	Uniform	0.91	1.08	0.003(5)	0.325	2.80	-7.0	-8.0	Flexure	No. 5
1821	22	270	55	8-1/4	1	4-1/2	7	17-3/4	20	18	4	2	0.509	Uniform	1.21	1.43	0.011(5)	0.356	3.40	-7.0	-8.0	Flexure	Nos. 2 and 3
1822	22	272	55	8-1/2	1	4-1/2	7	18	20	18	4	1-4/5	0.500	Uniform	1.36	1.61	0.014	0.340	4.00	-7.0	-8.0	Flexure	Nos. 3 and 5
1823	22	273	55	8-1/2	1	4-1/2	7	18	20	18	4	2	0.525	Uniform	1.64	1.94	0.014	0.432	3.80	-7.0	-8.0	Flexure	Nos. 2 and 3
1824	22	275	55	8-1/2	1	4-1/2	7	18	20	18	4	1-4/5	0.540	Uniform	1.38	1.63	0.022	0.157	8.40	-7.0	-8.0	Flexure	No. 3
1825	22	276	55	8-1/2	1	4-1/2	7	18	20	18	4	1-9/10	0.564	Uniform	1.18	1.40	0.015	0.142	8.30	-7.0	-8.0	Flexure	No. 1
1826	22	278	55	8-1/2	1	4-1/2	7	18	20	18	4	1-4/5	0.534	Uniform	1.62	1.91	0.055	0.151	10.70	-7.0	-8.0	Flexure	Nos. 5 and 6
1827	22	279	55	8-3/4	1	4-1/2	7	18-1/4	20	18	4	1-9/10	0.489	Uniform	2.31	2.73	0.039	0.150	15.40	-7.0	-8.0	Flexure	Nos. 3 and 5
1828	21	2	295	--	7	1	3	1-1/4	20	18	4	2	0.424	Uniform	0.36	0.43	0.015	0.182	2.00	-9.0	-8.0	Flexure	No. 2
1829	21	6	295	--	7	1	3	2-1/4	20	18	4	2	0.417	Uniform	0.60	0.71	0.018	0.613	9.80	-9.0	-8.0	Flexure	Nos. 5 and 6
1830	21	7	295	--	7	1	3	2-1/2	20	18	4	2	0.430	Uniform	0.85	1.01	0.013	0.250	3.40	-9.0	-8.0	Flexure	No. 5
1831	21	8	295	--	7	1	3	2-1/2	20	18	4	2	0.434	Uniform	0.91	1.08	0.010	1.510	0.60	-9.0	-8.0	Flexure	Nos. 4 and 5
1832	21	9	295	--	7	1	3	2-3/4	20	18	4	2	0.452	Uniform	1.33	1.57	0.022	0.604	2.20	-9.0	-8.0	Flexure	Nos. 4 and 5
1833	22	31	28	13	1	0	6	3	20	18	4-1/8	2	0.497	Uniform	0.85	1.00	0.020	0.426	1.99	-9.0	-11.0	Flexure	No. 5
1834	22	32	28	13	1	0	6	3	20	18	4-1/8	2	0.487	Uniform	0.85	1.00	0.021	0.451	1.88	-9.0	-11.0	Flexure	No. 5
1835	22	33	28	13	1	0	6	3	20	18	4-1/8	2	0.502	Uniform	0.73	0.86	0.013	1.275	0.57	-9.0	-11.0	Flexure	Nos. 2 and 3
1836	22	34	28	13-1/4	1	0	6	3-1/4	20	18	4-1/8	2	0.485	Uniform	0.85	1.00	0.008	0.923	0.92	-9.0	-11.0	Flexure	Between Nos. 3 and 4

(Continued)

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TABLE B.4 (CONTINUED)

Item No.	Material No.	Test No.	Snow Age		Rough Sample Age		Specimen Age		Overall Length in.	Unsupported Length in.	Depth in.	Width in.	Specific Weight kg/cm^3	Load Geometry	Line Pressure psi	Applied Pressure psi	Deflection at Center Line, in.	Load Rate psi/sec	Time to Failure sec	Temperature $^{\circ}\text{C}$	Type of Failure	Remarks	
			days	hr	days	hr	days	hr															
1837	22	35	28	13-1/4	1	0	6	3-1/4	20	18	4-1/8	2	0.496	Uniform	0.42	0.50	0.024	0.300	1.41	-9.0	-11.0	Flexure	Between Nos. 3 and 4
1838	22	36	28	13-1/4	1	0	6	3-1/4	20	18	4-1/8	2	0.500	Uniform	0.85	1.00	0.024	0.808	1.05	-9.0	-11.0	Flexure	Between Nos. 3 and 4
1839	22	37	28	13-1/4	1	0	6	3-1/4	20	18	4-1/8	2	0.484	Uniform	1.40	1.66	0.022	0.978	1.43	-9.0	-11.0	Flexure	Between Nos. 4 and 5
1840	22	38	28	13-1/4	1	0	6	3-1/4	20	18	4-1/8	2	0.495	Uniform	1.27	1.50	0.022	0.846	1.50	-9.0	-11.0	Flexure	No. 3
1841	22	96	43	12-3/4	7	4	11	18-3/4	20	18	4-1/4	2	0.393	Uniform	0.54	0.64	0.019	0.991	0.55	-3.0	-9.0	Flexure	No. 6
1842	22	97	43	12-3/4	7	4	11	20-3/4	20	18	4-1/4	2	0.452	Uniform	1.33	1.57	0.014	1.770	0.75	-3.0	-9.0	Flexure	No. 4
1843	22	98	43	13	7	4	11	21	20	18	4-1/4	2	0.468	Uniform	1.21	1.43	0.017	0.183	6.60	-3.0	-9.0	Flexure	Between Nos. 2 and 3
1844	22	99	43	13	7	4	11	21	20	18	4-1/4	2	0.474	Uniform	1.82	2.15	0.018	0.479	3.80	-3.0	-9.0	Flexure	No. 5
1845	22	100	43	13	7	4	11	21	20	18	4-1/4	2	0.494	Uniform	1.33	1.57	0.008	2.220	0.60	-3.0	-5.0	Flexure	Between Nos. 4 and 5
1846	22	101	43	13-1/4	7	4	11	21-1/4	20	18	4-1/4	2	0.477	Uniform	0.97	1.15	0.012	0.388	0.60	-3.0	-5.0	Flexure	No. 3
1847	22	102	43	13-1/4	7	4	11	21-1/4	20	18	4-1/4	2	0.402	Uniform	0.42	0.50	0.015	1.060	0.20	-3.0	-5.0	Flexure	Between Nos. 4 and 5
1848	22	103	43	13-1/4	7	4	11	21-1/4	20	18	4-1/4	2	0.459	Uniform	1.64	1.94	0.022	0.631	2.60	-3.0	-5.0	Flexure	Between Nos. 4 and 5
1849	22	192	54	13-3/4	1	4-1/2	6	23-1/4	23	18	4-1/4	2	0.505	Uniform	2.76	3.26	--	0.850	3.25	-7.0	-7.0	Flexure	No. 2
1850	22	92	43	12-1/2	7	21	11	3-1/2	20	18	4-3/4	2	0.473	Uniform	1.27	1.50	0.014(3)	1.410	0.90	-3.0	-9.0	Flexure	No. 4
1851	22	180	54	13-1/2	1	6-1/2	6	21	20	18	5	2	0.467	Uniform	2.27	3.69	0.013	2.840	0.80	-7.0	-7.0	Flexure	No. 3
1852	22	182	54	13-1/2	1	6-1/2	6	21	20	18	5	2	0.503	Uniform	1.16	1.37	--	1.189	0.98	-7.0	-7.0	Flexure	Between Nos. 2 and 3
1853	22	183	54	13-1/2	1	6-1/2	6	21	20	18	5	2	0.488	Uniform	1.90	2.25	--	1.520	1.25	-7.0	-7.0	Flexure	No. 5
1854	22	185	54	13-1/2	1	6-1/2	6	21	20	18	5	2	0.523	Uniform	1.61	1.90	0.012	1.340	1.20	-7.0	-7.0	Flexure	No. 5
1855	22	186	54	13-3/4	1	6-1/2	6	21-1/4	20	18	5	2	0.514	Uniform	1.94	2.30	--	1.276	1.52	-7.0	-7.0	Flexure	No. 5
1856	22	187	54	13-3/4	1	6-1/2	6	21-1/4	20	18	5	2	0.532	Uniform	2.11	2.50	0.009	1.280	1.65	-7.0	-7.0	Flexure	Between No. 4 and 5
1857	22	188	54	13-3/4	1	6-1/2	6	21-1/4	20	18	5	2	0.509	Uniform	1.07	1.27	--	1.070	1.00	-7.0	-7.0	Flexure	No. 3
1858	22	189	54	13-3/4	1	6-1/2	6	21-1/4	20	18	5	2	0.513	Uniform	1.77	2.09	0.013	1.150	1.54	-7.0	-7.0	Flexure	No. 3
1859	22	240	54	16-1/4	1	6-1/2	6	23-3/4	20	18	5	2	0.516	Uniform	1.13	1.34	--	1.850	0.61	-8.0	-8.0	Flexure	Nos. 5 and 6
1860	22	241	54	16-1/4	1	6-1/2	6	23-3/4	20	18	5	2	0.530	Uniform	1.27	1.50	--	0.835	1.52	-8.0	-8.0	Flexure	Nos. 5 and 6
1861	22	242	54	16-1/4	1	6-1/2	6	23-3/4	20	18	5	2	0.553	Uniform	2.08	2.46	--	1.095	1.95	-8.0	-8.0	Flexure	Nos. 5 and 6
1862	22	243	54	16-1/4	1	6-1/2	6	23-3/4	20	18	5	2	0.543	Uniform	2.31	2.73	--	1.850	1.25	-8.0	-8.0	Flexure	Nos. 3 and 5
1863	22	244	54	16-1/2	1	6-1/2	7	0	20	18	5	2	0.524	Uniform	1.33	1.57	--	2.045	0.65	-8.0	-8.0	Flexure	No. 2
1864	22	246	54	16-1/2	1	6-1/2	7	0	21	18	5	2	0.513	Uniform	1.22	1.44	--	1.630	0.75	-8.0	-8.0	Flexure	Nos. 3 and 5
1865	22	247	54	16-1/2	1	6-1/2	7	0	20	18	5	2	0.520	Uniform	--	--	--	--	-8.0	--	--	Broke placing	
1866	22	248	54	16-1/2	1	6-1/2	7	0	21	18	5	2	0.512	Uniform	2.69	3.13	0.020	1.580	1.70	-8.0	-8.0	Flexure	Nos. 2 and 3
1867	22	249	54	16-1/2	1	6-1/2	7	0	20	18	5	2	0.529	Uniform	2.26	2.67	0.018	1.330	1.70	-8.0	-8.0	Flexure	Nos. 3 and 5
1868	22	251	54	16-3/4	1	6-1/2	7	1/4	20	18	5	2	0.536	Uniform	1.60	1.89	0.009	1.880	0.85	-8.0	-8.0	Flexure	Nos. 3 and 5
1869	22	252	54	16-3/4	1	6-1/2	7	1/4	20	18	5	2	0.501	Uniform	1.23	1.46	0.009	1.810	0.68	-8.0	-8.0	Flexure	No. 5
1870	22	253	54	16-3/4	1	6-1/2	7	1/4	21	18	5	2	0.487	Uniform	1.53	1.81	--	1.720	0.89	-8.0	-8.0	Flexure	No. 5
1871	22	254	54	16-3/4	1	6-1/2	7	1/4	20	18	5	2	0.534	Uniform	1.62	1.92	0.009(2)	1.800	0.90	-8.0	-8.0	Flexure	No. 5
1872	22	255	54	16-3/4	1	6-1/2	7	1/4	20	18	5	2	0.528	Uniform	1.97	2.33	0.020	1.440	1.37	-8.0	-8.0	Flexure	Nos. 3 and 5
1873	22	256	54	16-3/4	1	6-1/2	7	1/4	21	18	5	2	0.520	Uniform	1.37	1.62	--	1.000	1.37	-8.0	-8.0	Flexure	No. 3
1874	22	257	54	17	1	6-1/2	7	1/2	21	18	5	2	0.516	Uniform	1.60	1.89	--	1.330	1.20	-8.0	-8.0	Flexure	No. 2
1875	22	258	54	17	1	6-1/2	7	1/2	21	18	5	2	0.453	Uniform	1.33	1.57	0.011	1.130	1.18	-8.0	-8.0	Flexure	Nos. 1 and 2
1876	22	259	54	17	1	6-1/2	7	1/2	21	18	5	2	0.481	Uniform	1.06	1.28	0.283(2)	1.230	0.88	-8.0	-8.0	Flexure	Nos. 2 and 3
1877	22	43	28	13-1/2	0	22	6	5-1/2	20	18	5-1/2	2	0.478	Uniform	0.61	0.72	0.092	2.420	0.25	-9.0	-11.0	Flexure	No. 5
1878	22	44	28	13-3/4	0	22	6	15-3/4	20	18	5-1/2	2	0.483	Uniform	1.27	1.50	0.196	0.635	2.00	-9.0	-11.0	Flexure	No. 4
1879	22	45	28	13-3/4	0	22	6	5-3/4	20	18	5-1/2	2	0.472	Uniform	1.76	2.08	0.010	0.978	1.80	-9.0	-11.0	Flexure	No. 4
1880	22	46	28	13-3/4	0	22	6	5-3/4	20	18	5-1/2	2	0.485	Uniform	1.33	1.57	0.026	0.665	2.00	-9.0	-11.0	Flexure	No. 3

(Continued)

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TABLE B.4 (CONTINUED)

Item No.	Material No.	Test No.	Snow Age		Rough Sample Age		Specimen Arc	Overall Length in.	Unsupported Length in.	Depth, in.	Width, in.	Specific Weight g/cm ³	Load Geometry	Line Pressure psi	Applied Pressure psi	Deflection at Center Line, in.	Load Rate psi/sec	Time to Failure sec	Temperature °C	Type of Failure	Remarks		
			days	hr	days	hr																	
1881	22	47	28	13-3/4	0	22	6	5-3/4	20	18	5-1/2	2	0.485	Uniform	0.42	0.50	0.006(3)	0.530	0.80	-9.0	-11.0	Flexure	Nos. 4 and 5
1882	22	48	28	14	0	22	6	6	20	18	5-1/2	2	0.491	Uniform	0.42	0.50	0.012	0.353	1.20	-9.0	-11.0	Flexure	No. 5
1883	22	49	28	14	0	22	6	6	20	18	5-1/2	2	0.482	Uniform	2.00	2.37	0.065	1.025	1.95	-9.0	-11.0	Flexure	Nos. 5 and 6
1884	22	50	28	1'	0	22	6	6	20	18	5-1/2	2	0.490	Uniform	2.48	2.93	0.021	0.886	2.80	-9.0	-11.0	Flexure	Nos. 2 and 3
1885	22	56	43	11	7	21	11	2	20	18	5-1/2	2	0.468	Uniform	1.39	1.64	0.024	0.868	1.60	-4.0	-4.0	Flexure	Between Nos. 2 and 3
1886	22	87	43	11-1/4	7	21	11	2-1/4	20	18	5-1/4	2	0.467	Uniform	1.33	1.57	0.008	2.210	0.60	-4.0	-4.0	Flexure	No. 5
1887	22	88	43	11-1/4	7	21	11	2-1/4	20	18	5-1/4	2	0.451	Uniform	1.33	1.57	0.011	1.330	1.00	-4.0	-7.0	Flexure	Between Nos. 5 and 6
1888	22	89	43	11-1/4	7	21	11	2-1/4	20	18	5-1/4	2	0.488	Uniform	1.39	1.64	0.017(3)	0.868	1.60	-4.0	-7.0	Flexure	No. 4
1889	22	90	43	11-1/4	7	21	11	2-1/4	20	18	5-1/4	2	0.470	Uniform	1.33	1.57	0.010	1.330	1.00	-4.0	-7.0	Flexure	Between Nos. 4 and 5
1890	22	91	43	12-1/2	7	21	11	3-1/2	20	18	5-1/4	2	0.413	Uniform	0.85	1.01	0.012(3)	0.654	1.30	-4.0	-7.0	Flexure	Between Nos. 4 and 5
1891	22	93	43	12-1/2	7	21	11	3-1/2	20	18	5-1/4	2	0.460	Uniform	0.85	1.01	0.011(5)	2.120	0.40	-3.0	-9.0	Flexure	No. 4
1892	22	94	43	12-1/2	7	21	11	3-1/2	20	18	5-1/4	2	0.464	Uniform	1.27	1.50	0.010(3)	1.950	0.65	-3.0	-9.0	Flexure	Between Nos. 3 and 4
1893	22	95	43	12-3/4	7	21	11	3-3/4	20	18	5-1/4	2	0.455	Uniform	0.48	0.57	0.011	1.210	0.40	-3.0	-9.0	Flexure	No. 5
1894	22	228	54	15-3/4	0	1-1/2	7	5-3/4	20	18	5-3/5	2	0.501	Uniform	2.13	2.52	0.013	3.550	0.60	-8.0	-8.0	Flexure	Between Nos. 3 and 5
1895	22	229	54	15-3/4	0	1-1/2	7	5-3/4	20	18	5-7/10	1-9/10	0.513	Uniform	1.80	2.13	--	3.420	0.52	-8.0	-8.0	Flexure	Between Nos. 2 and 3
1896	22	170	54	13	0	1-1/2	7	3	20	18	5-4/5	2	0.431	Uniform	1.56	1.84	--	0.743	2.10	-7.0	-7.0	Flexure	No. 3
1897	22	171	54	13	0	1-1/2	7	3	20	18	5-4/5	2	0.484	Uniform	2.63	3.11	--	0.974	2.70	-7.0	-7.0	Flexure	Between Nos. 2 and 3
1898	22	172	54	13-1/4	0	1-1/2	7	3-1/4	20	18	5-4/5	2	0.457	Uniform	1.87	2.21	0.011(5)	1.336	1.40	-7.0	-7.0	Flexure	Left of No. 2
1899	22	173	54	13	0	1-1/2	7	3	20	18	5-4/5	2	0.464	Uniform	2.96	3.50	0.021	0.133	22.30	-7.0	-7.0	Flexure	No. 3
1900	22	174	54	13-1/4	0	1-1/2	7	3-1/4	20	18	5-4/5	2	0.477	Uniform	1.84	2.18	0.012	0.681	2.70	-7.0	-7.0	Flexure	No. 6
1901	22	175	54	13-1/4	0	1-1/2	7	3-1/4	20	18	5-4/5	2	0.477	Uniform	1.74	2.06	--	0.870	2.00	-7.0	-7.0	Flexure	No. 3
1902	22	176	54	13-1/4	0	1-1/2	7	3-1/4	20	18	5-4/5	2	0.459	Uniform	2.36	2.79	0.016	0.722	3.30	-7.0	-7.0	Flexure	Between Nos. 2 and 3
1903	22	178	54	13-1/2	0	1-1/2	7	3-1/2	20	18	5-4/5	2	0.372	Uniform	1.89	2.24	0.009	0.756	2.50	-7.0	-7.0	Flexure	No. 3
1904	22	179	54	13-1/2	0	1-1/2	7	3-1/2	20	18	5-4/5	2	0.464	Uniform	1.77	2.09	0.007(5)	1.040	1.70	-7.0	-7.0	Flexure	No. 3
1905	22	231	54	16	0	1-1/2	7	6	20	18	5-4/5	1-4/5	0.528	Uniform	2.71	3.21	0.014	2.970	0.91	-8.0	-8.0	Flexure	Between Nos. 1 and 2
1906	22	1	28	7-3/4	--	4	6	17-3/4	20	18	6	2	0.467	Uniform	2.54	3.00	0.009	1.010	2.50	-10.0	-13.0	Flexure	No. 4
1907	22	2	28	7-3/4	--	4	6	17-3/4	20	18	6	2	0.474	Uniform	3.28	3.88	0.022	0.410	8.00	-10.0	-13.0	Flexure	Between Nos. 3 and 4
1908	22	3	28	8	0	4	6	18	20	18	6	2	0.475	Uniform	2.42	2.86	0.014	0.427	5.90	-10.0	-13.0	Flexure	Between Nos. 5 and 6
1909	22	4	28	8	0	4	6	18	20	18	6	2	0.485	Uniform	4.43	5.24	0.028	0.561	7.90	-10.0	-13.0	Flexure	No. 6
1910	22	5	28	8-1/4	0	4	6	18-1/4	20	18	6	2	0.461	Uniform	1.70	2.01	0.013	0.415	4.10	-10.0	-13.0	Flexure	Between Nos. 3 and 4
1911	22	6	28	8-1/4	0	4	6	18-1/4	20	18	6	2	0.474	Uniform	2.30	2.72	0.020	0.418	5.50	-10.0	-13.0	Flexure	No. 4
1912	22	7	28	8-1/4	0	4	6	18-1/4	20	18	6	2	0.468	Uniform	1.58	1.86	0.013	0.375	4.20	-10.0	-13.0	Flexure	Between Nos. 3 and 4
1913	22	8	28	8-1/2	0	4	6	18-1/2	20	18	6	2	0.468	Uniform	1.94	2.30	0.033	0.366	5.30	-10.0	-13.0	Flexure	No. 4
1914	22	9	28	8-1/2	0	4	6	18-1/2	20	18	6	2	0.462	Uniform	0.48	0.57	0.009	0.255	1.90	-10.0	-13.0	Flexure	Between Nos. 3 and 4
1915	22	10	28	8-3/4	0	4	6	18-3/4	20	18	6	2	0.460	Uniform	2.18	2.58	0.024	0.415	5.20	-10.0	-13.0	Flexure	Broke through a hole under No. 4 gage then slanted off to the right
1916	22	76	43	10-1/4	7	22	11	1/4	20	18	6	2	0.476	Uniform	1.69	2.00	0.007(3)	1.100	1.50	-4.0	-7.0	Flexure	Nos. 4 and 5
1917	22	77	43	10-1/4	7	22	11	1/4	20	18	6	2	0.488	Uniform	1.34	1.58	0.015	0.780	1.70	-4.0	-7.0	Flexure	Nos. 4 and 5
1918	22	78	43	10-1/2	7	22	11	1/2	20	18	6	2	0.486	Uniform	2.36	2.79	0.010	0.819	2.90	-4.0	-7.0	Flexure	Nos. 4 and 5
1919	22	79	43	10-1/2	7	22	11	1/2	20	18	6	2	0.490	Uniform	1.45	1.72	0.010(3)	1.040	1.40	--	--	Flexure	Between Nos. 3 and 4
1920	22	80	43	10-1/2	7	22	11	1/2	20	18	6	2	0.476	Uniform	2.24	2.65	0.017	0.933	2.40	--	--	Flexure	Between Nos. 4 and 5
1921	22	81	43	10-1/2	7	22	11	1/2	20	18	6	2	0.486	Uniform	2.12	2.51	0.017	1.100	1.90	--	--	Flexure	No. 3
1922	22	82	43	10-3/4	7	22	11	3/4	20	18	6	2	0.472	Uniform	2.24	2.65	0.010	0.973	2.30	--	--	Flexure	Between Nos. 3 and 4
1923	22	83	43	10-3/4	7	22	11	3/4	20	18	6	2	0.472	Uniform	2.00	2.37	0.011(5)	1.250	1.60	--	--	Flexure	Between Nos. 3 and 4

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TABLE B.4 (CONTINUED)

Item No.	Mate-rial No.	Test No.		Snow Age		Rough Sample Age		Specimen Age		Overall Length in.	Unsup-ported Length in.	Depth in.	Width in.	Specific Weight g/cm³	Load Geometry	Line Pressure psi	Applied Pressure psi	Deflection at Center Line, in.	Load Rate psi/sec	Time to Failure sec	Temperature °C	Type of Failure	Remarks	
		days	hr	days	hr	days	hr	days	hr															
1924	22	84	43	10-3/4	7	22	11	3/4	20	15	6	2	0.466	Uniform	1.52	1.80	0.022	0.840	1.80	--	--	Shear	No. 6	
1925	22	85	43	10-3/4	7	22	11	3/4	20	15	6	2	0.503	Uniform	2.30	2.72	0.010(3)	1.095	2.10	-4.0	-4.0	Shear	No. 2	
1926	22	220	54	15-1/2	c	1-1/2	7	5-1/2	20	15	6	2	0.463	Uniform	3.30	3.90	0.029	0.046	70.90	-7.0	-7.0	Flexure	Between Nos. 5 and 6	
1927	22	221	54	15-3/4	c	1-1/2	7	5-3/4	20	15	6	2	0.497	Uniform	2.26	2.67	--	2.500	0.90	-8.0	-8.0	Flexure	No. 2	
1928	22	222	54	15-3/4	c	1-1/2	7	5-3/4	20	15	6	2	0.472	Uniform	3.06	3.62	0.024	3.230	0.95	-8.0	-8.0	Flexure	No. 3	
1929	22	223	54	15-3/4	c	1-1/2	7	5-3/4	20	15	6	2	0.482	Uniform	2.30	2.72	0.014(2)	3.540	0.65	-8.0	-8.0	Flexure	No. 6	
1930	22	224	54	15-3/4	c	1-1/2	7	5-3/4	20	15	6	1-4/5	0.515	Uniform	2.71	3.21	0.016	3.390	0.80	-8.0	-8.0	Flexure	Between Nos. 1 and 2	
1931	22	225	54	15-3/4	c	1-1/2	7	5-3/4	20	15	6	1-4/5	0.514	Uniform	2.11	2.50	0.010(5)	4.220	0.50	-8.0	-8.0	Flexure	No. 5	
1932	22	226	54	15-3/4	c	1-1/2	7	5-3/4	20	15	6	1-9/10	0.499	Uniform	2.16	2.56	--	3.450	0.62	-8.0	-8.0	Flexure	Between Nos. 5 and 6	
1933	22	227	54	15-3/4	c	1-1/2	7	5-3/4	20	15	6	2	0.493	Uniform	2.92	3.45	0.013	4.170	0.70	-8.0	-8.0	Flexure	Between Nos. 1 and 2	
1934	22	230	54	16	c	1-1/2	7	6	20	15	6	1-9/10	0.504	Uniform	2.50	2.96	0.010(3)	1.145	2.18	-8.0	-8.0	Flexure	Between Nos. 2 and 3	
1935	22	233	54	16	c	1-1/2	7	6	20	15	6	1-9/10	0.514	Uniform	2.60	3.08	--	2.418	1.08	-8.0	-8.0	Flexure	Between Nos. 1 and 2	
1936	22	234	54	16	c	1-1/2	7	6	20	15	6	1-4/5	0.527	Uniform	1.87	2.21	0.011	2.770	0.68	-8.0	-8.0	Flexure	Between Nos. 3 and 5	
1937	22	235	54	16	c	1-1/2	7	6	20	15	6	6-1/10	2	0.485	Uniform	2.19	2.59	0.012	2.570	0.85	-8.0	-8.0	Flexure	Between Nos. 1 and 2
1938	22	237	54	16-1/4	c	1-1/2	7	6-1/4	20	15	6	6-1/10	2	0.495	Uniform	1.88	2.22	0.014	2.030	0.92	-8.0	-8.0	Flexure	No. 5
1939	22	232	54	16	c	1-1/2	7	6	20	15	6	6-1/5	1-4/5	0.520	Uniform	2.88	3.40	0.011(5)	1.828	1.98	-8.0	-8.0	Flexure	No. 5
1940	22	238	54	16-1/4	c	1-1/2	7	6-1/4	20	15	6	6-1/5	2	0.486	Uniform	1.48	1.75	--	2.370	0.62	-8.0	-8.0	Flexure	Between Nos. 3 and 5
1941	22	239	54	16-1/4	c	1-1/2	7	6-1/4	20	15	6	6-1/5	1-9/10	0.501	Uniform	2.64	3.12	0.017	2.290	1.15	-8.0	-8.0	Flexure	No. 5
1942	22	157	53	14-1/2	1	1	6	3-1/2	50	42	5	5	0.508	Uniform	0.15	0.16	0.033	0.029	5.10	-2.0	-4.0	Flexure	No. 5	
1943	22	158	53	14-3/4	1	1	6	3-3/4	50	42	5	5	0.382	Uniform	0.33	0.34	0.091(3)	0.059	5.60	-2.0	-4.0	Flexure	No. 4	
1944	22	155	53	14	1	1	6	3-1/4	48	42	7-1/2	5	0.502	Uniform	0.61	0.64	--	0.073	8.30	-2.0	-4.0	Flexure	No. 5	
1945	22	156	53	14-1/4	1	1	6	3-1/4	48	42	7-1/2	5	0.564	Uniform	0.54	0.56	0.020(3)	0.081	6.80	-2.0	-4.0	Flexure	No. 4	
1946	22	153	53	14	1	1	6	3	48	42	10	5	0.472	Uniform	0.78	0.82	0.019(3)	0.173	4.50	-2.0	-4.0	Flexure	No. 5	
1947	22	154	53	14-1/4	1	1	6	3-1/4	48	42	10	5	0.545	Uniform	1.02	1.07	0.034(3)	0.142	7.20	-2.0	-4.0	Flexure	No. 5	
1948	22	153	53	13-3/4	1	1	6	2-3/4	50	42	10-1/2	4-3/4	0.536	Uniform	0.96	1.00	0.031(3)	0.213	4.50	-2.0	-4.0	Flexure	No. 5	
1949	22	160	53	15	1	1	6	4	50	42	12-1/2	5	0.534	Uniform	1.42	1.48	0.037(5)	0.142	10.0	-2.0	-4.0	Flexure	Nos. 2 and 3	
1950	22	161	53	15	1	1	6	4	50	42	12-1/2	5	0.519	Uniform	1.70	1.78	0.057	0.163	10.40	-2.0	-4.0	Flexure	No. 2	
1951	22	162	53	15-1/4	1	1	6	4-1/2	45-1/2	42	12-1/2	5	0.510	Uniform	2.07	2.17	0.033	0.198	10.50	-2.0	-4.0	Flexure	No. 5	
1952	22	163	53	15-1/2	1	1	6	4-1/2	50	42	12-1/2	5	0.560	Uniform	1.38	1.44	0.033	0.153	9.00	-2.0	-4.0	Flexure	No. 2	
1953	22	164	53	15-3/4	1	1	6	4-3/4	50	42	12-1/2	5	0.495	Uniform	2.66	2.78	0.086	0.268	19.00	-2.0	-4.0	Flexure	No. 3	
1954	22	166	53	16	1	1	6	6	50	42	15	5	0.487	Uniform	3.66	3.82	0.059	0.209	17.50	-2.0	-4.0	Flexure	No. 3	
1955	22	167	53	16	1	1	6	5	50	42	15	5	0.520	Uniform	2.62	2.73	0.041(5)	0.170	15.40	-2.0	-4.0	Flexure	Between Nos. 3 and 5	
1956	22	168	53	16-1/4	1	1	6	5-1/4	50	42	15	5	0.486	Uniform	1.66	1.74	0.018(5)	0.172	9.65	-2.0	-4.0	Flexure	No. 3	
1957	22	169	53	16-1/4	1	1	6	5-1/4	50	42	15	5	0.501	Uniform	2.16	2.26	0.031	0.198	10.84	-2.0	-4.0	Flexure	No. 3	
1958	22	126	44	9	0	23	11	20	50	45	5	5	0.487	Uniform	1.15	1.20	0.121	0.088	13.10	-5.0	-9.0	Flexure	Between Nos. 2 and 3	
1959	22	127	44	9	c	23	11	20	50	45	5	5	0.452	Uniform	0.92	0.96	0.080	0.328	2.80	-5.0	-9.0	Flexure	No. 6. Photo was No. 126	
1960	22	56	31	5-3/4	2	0	4	20-3/4	50	45	7-1/2	5	0.504	Uniform	0.24	0.25	0.032(3)	0.202	1.20	-5.0	-9.0	Flexure	Possible shear No. 2	
1961	22	57	31	9	2	0	4	21	50	45	7-1/2	5	0.569	Uniform	0.36	0.38	0.022	0.303	1.20	-5.0	-9.0	Flexure	Nos. 5 and 6	
1962	22	58	31	9-1/2	2	0	4	21-1/2	50	45	7-1/2	5	0.564	Uniform	0.73	0.76	0.017	0.303	2.40	-5.0	-9.0	Flexure	Nos. 5 and 6	
1963	22	133	41	9-1/2	c	3	11	20-1/2	50	45	7-1/2	5	0.502	Uniform	0.54	0.57	0.041	0.606	0.90	-5.0	-9.0	Flexure	Between Nos. 2 and 3	
1964	22	135	41	9-3/4	c	3	11	20-3/4	50	45	7-1/2	5	0.476	Uniform	1.03	1.08	0.029	0.412	2.50	-5.0	-9.0	Flexure	No. 5	
1965	20	2	289	--	--	--	1	3	50	45	9-3/4	5	0.462	Uniform	0.70	0.74	0.028	0.320	2.20	-8.0	-10.0	Flexure	No. 4	

(Continued)

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TABLE B.4 (CONCLUDED)

Item No.	Mat- erial No.	Test No.	Snow Age		Rough Sample Age		Specimen Age		Overall Length in.	Unsup- ported Length in.	Depth in.	Width in.	Specific Weight g/cm ³	Load Geometry	Line Pressure psi	Applied Pressure psi	Deflection at Center Line, in.	Load Rate psi/sec	Time to Failure sec	Temperature °C	Type of Failure	Remarks	
			days	hr	days	hr	days	hr															
1966	20	1	289	0	--	--	1	19-3/4	50	45	10	5	0.459	Uniform	1.41	1.47	--	2.100	0.67	-9.0	-9.0	--	Collins gages not connected
1967	22	61	31	10	2	0	4	22	50	45	10	5	0.487	Uniform	1.15	1.20	0.305	0.153	7.50	-5.0	-9.0	Flexure	Nos. 3 and 4
1968	22	62	31	10-1/4	2	0	4	22-1/4	50	45	10	5	0.492	Uniform	0.36	0.38	0.022(3)	0.364	1.00	-5.0	-9.0	Flexure	Nos. 3 and 4
1969	22	64	31	10-1/2	2	0	4	22-1/2	50	45	10	5	0.472	Uniform	0.48	0.51	0.028	0.110	4.40	-5.0	-9.0	Flexure	Nos. 5 and 6
1970	22	65	31	10-1/2	2	0	4	22-1/2	50	45	10	5	0.531	Uniform	0.91	0.95	0.017	0.303	3.00	-5.0	-9.0	Flexure	Nos. 4 and 5
1971	22	137	44	10-1/4	1	0	11	1/4	50	45	10	5	0.472	Uniform	1.69	1.77	0.046	0.376	4.50	-5.0	-9.0	Flexure	Between Nos. 3 and 4
1972	22	138	44	10-1/4	1	0	11	1/4	50	45	10	5	0.499	Uniform	0.18	0.19	0.022	0.457	4.00	-5.0	-9.0	Flexure	Between Nos. 5 and 6
1973	22	139	44	10-1/2	2	0	10	1/2	50	45	10	5	0.465	Uniform	0.85	0.89	0.096	0.303	2.80	-5.0	-9.0	Flexure	Between Nos. 4 and 5
1974	22	66	31	10-3/4	2	0	4	22-3/4	50	45	12-1/2	5	0.461	Uniform	0.97	1.01	0.012	0.605	1.60	-5.0	-9.0	Flexure	No. 6
1975	22	67	31	10-3/4	2	0	4	22-3/4	50	45	12-1/2	5	0.464	Uniform	0.24	0.25	0.004	0.806	3.00	-5.0	-9.0	Flexure	No. 5
1976	22	69	31	11	2	0	4	23	50	45	12-1/2	5	0.495	Uniform	1.58	1.65	0.044	0.162	9.70	-5.0	-8.0	Flexure	No. 4
1977	22	70	31	11-1/4	2	0	4	23-1/4	50	45	12-1/2	5	0.503	Uniform	1.70	1.78	0.036	0.283	6.00	-5.0	-8.0	Flexure	No. 3
1978	22	141	44	10-1/2	0	4	11	20-1/2	50	45	12-1/2	5	0.439	Uniform	0.20	0.21	0.054	0.023	8.60	-5.0	-9.0	Flexure	Between Nos. 3 and 4
1979	22	142	44	11	0	4	11	21	50	45	12-1/2	5	0.497	Uniform	0.17	0.18	0.026	0.047	3.60	-5.0	-9.0	Flexure	Between Nos. 3 and 4. Marked as 10-in. depth on photo
1980	22	143	44	11	1	1	11	--	50	45	12-1/2	5	0.571	Uniform	0.21	0.22	0.043	0.045	4.60	-5.0	-9.0	Flexure	Between Nos. 4 and 5
1981	22	144	44	11-1/4	1	1	11	1/4	50	45	12-1/2	5	0.476	Uniform	0.17	0.18	0.079	0.041	4.10	-5.0	-9.0	Flexure	Between Nos. 3 and 4. Elastic failure
1982	22	71	31	12-3/4	2	0	5	3/4	50	45	15	5	0.516	Uniform	3.82	3.99	0.030(3)	0.308	12.40	-4.0	-7.0	Flexure	No. 5
1983	22	72	31	12-3/4	2	0	5	3/4	50	45	15	5	0.559	Uniform	4.12	4.30	0.038(3)	0.425	9.70	-4.0	-7.0	Flexure	No. 5
1984	22	73	31	13	2	0	5	1	50	45	15	5	0.528	Uniform	4.12	4.30	0.034	0.420	9.80	-4.0	-7.0	Flexure	Nos. 4 and 5
1985	22	74	31	13	2	0	5	1	50	45	15	5	0.506	Uniform	3.70	3.87	0.026	0.481	7.70	-4.0	-7.0	Flexure	Nos. 5 and 6
1986	22	146	44	11-1/4	0	5	11	20-1/4	50	45	15	5	0.442	Uniform	--	--	0.011	--	4.10	-5.0	-9.0	Flexure	Pressure equipment not on. Broke under No. 4
1987	22	147	44	11-1/2	0	5	11	20-1/2	50	45	15	5	0.505	Uniform	1.87	1.95	0.026	0.402	4.65	-5.0	-9.0	Flexure	No. 6
1988	22	148	44	11-1/2	0	5	11	20-1/2	50	45	15	5	0.515	Uniform	1.69	1.77	0.025	0.528	3.20	-5.0	-9.0	Flexure	No. 3
1989	22	149	44	11-1/2	0	5	11	20-1/2	50	45	15	5	0.463	Uniform	1.64	1.71	0.026	0.421	3.90	-5.0	-9.0	Flexure	No. 5
1990	22	150	44	11-3/4	0	5	11	20-3/4	50	45	15	5	0.436	Uniform	2.79	2.92	0.047	0.754	3.70	-5.0	-9.0	Flexure	Between Nos. 3 and 4
1991	31	--	33	23	33	23	33	23	120	108	24	12	0.492	1	6.93	0.05	0.294	0.693	10.00	-2.0	-4.0	Flexure	No. 5 cylinder

TABLE B.5 ARCH TESTS; GREENLAND, 1961 AND 1962

Item No.	Material No.	Test No.	Rough Sample Age				Specimen Age	Overall Length in.	Arch Radius in.	Width in.	Total Depth in.	Crown in.	Specific Weight g/cm³	Load Geometry	Line Pressure psi	Applied Pressure psi	Deflection at Center in.	Temperature °C	Type of Failure	Remarks	
			Snow days	Age hr	days	hr															
1994	11	30	27	4	20	--	7	4	24	4	2	9	5	0.542	3	33.9	13.0	0.010	-10.6	--	Punching
1995	11	31	32	--	23	--	9	--	24	4	2-1/4	9	5	0.447	3	1.36	0.077	--	-16.2	--	Punching
1996	11	32	32	--	23	--	9	--	24	4	2	9	5	0.748	9	105.1	46.4	--	-16.2	--	Punching
1997	16	53	8	22	8	22	8	22	18	4	2	9	5	0.518	3	33.9	13.0	0.123	-11.1	--	Haunch shear
1998	16	55	8	23	8	23	8	23	18	4	2	9	5	0.469	3	28.3	10.3	0.170	-11.1	--	Crown flexure
1999	20	2	285	11	--	3	--	3	23	4	2	9	5	0.426	Uniform	6.54	7.737	0.062	-9	-12	Punching
2000	22	61	48	11	--	--	2	2	23-1/4	4	2	9	5	0.514	Uniform	11.60	13.723	0.031	-6	-8	Left and right support crushing, crown shear
2001	22	62	48	11	--	--	2	2	23-1/4	4	2	9	5	0.521	Uniform	13.04	15.426	0.050	-6	-8	Left haunch shear
2002	22	63	48	11-1/4	--	--	2	2-1/4	23-1/4	4	2	9	5	0.508	Uniform	14.80	17.508	0.077	-6	-8	Punching
2003	22	64	48	11-1/4	--	--	2	2-1/4	23-1/4	4	2	9	5	0.515	Uniform	8.64	10.221	0.072	-6	-8	Right haunch shear, crown shear
2004	22	65	48	11-1/4	--	--	2	2-1/4	23-1/4	4	2	9	5	0.522	Uniform	4.96	5.868	0.020	-6	-8	Right support crushing
2005	22	66	48	11-1/4	--	--	2	2-1/4	23-1/4	4	2	9	5	0.486	Uniform	5.68	6.719	0.090	-6	-8	Left and right support crushing
2006	22	67	48	11-1/2	--	--	2	2-1/2	23-1/4	4	2	9	5	0.527	Uniform	4.8	5.678	0.038	-6	-8	Left support punching
2007	22	68	48	11-1/2	--	--	2	2-1/2	23-1/4	4	2	9	5	0.529	Uniform	10.4	12.303	0.065	-6	-8	Left and right support crushing
2008	22	69	48	11-1/2	--	--	2	2-1/2	23-1/4	4	2	9	5	0.525	Uniform	4.56	5.394	0.026	-6	-8	Left and right support crushing, crown shear
2009	22	125	52	10-1/2	--	1	6	1-1/2	23-1/4	4	1-9/10	9	5	0.468	Uniform	6.56	7.760	0.030	-7	-8	Left and right support crushing, crown shear
2010	22	126	52	10	--	1	6	1-1/2	22-1/2	4	1-9/10	9	5	0.514	Uniform	15.52	18.360	0.061	-7	-8	Right support crushing, crown shear
2011	22	127	52	10-3/4	--	1	6	1-3/4	22-1/2	4	1-9/10	8-1/2	5	0.511	Uniform	9.44	11.168	0.122	-7	-8	Right and left support crushing, crown shear
2012	22	128	52	10-3/4	--	1	6	1-3/4	22-1/2	4	2-1/10	9	5	0.511	Uniform	29.9	35.372	0.197	-7	-8	Left support crushing, right haunch shear, crown shear
2013	22	130	52	10-3/4	--	1	6	1-3/4	22-1/2	4	2-1/10	9	5	0.522	Uniform	27.8	32.887	0.114	-7	-8	Right and left support crushing, crown shear
2014	22	131	52	11	--	1	6	2	23-1/4	4	2	9	5	0.538	Uniform	12.48	14.764	0.027	-7	-8	Crown shear
2015	22	132	52	11	--	1	6	2	23-1/3	4	1-9/10	9	5	0.535	Uniform	8.88	10.505	0.068	-7	-8	Right and left support crushing, crown shear
2016	22	133	52	11	--	1	6	2	23-1/4	4	1-95/100	9	5	0.534	Uniform	9.1	10.765	0.070	-7	-8	Right and left support crushing
2017	22	134	52	11-1/4	--	1	6	2-1/4	23-1/4	4	2	9	5	0.519	Uniform	9.28	10.978	0.072	-7	-8	Right and left support crushing, left haunch shear
2018	26	32	36	19-3/4	14	22-1/4	14	22-1/4	23-1/8	4	2	8-3/4	4-3/4	0.461	Uniform	15.17	17.946	0.057	-4	-6	Right and left support crushing
2019	26	33	36	19-3/4	14	23-1/2	14	23-1/2	23-1/4	4	2	8-7/8	4-7/8	0.502	Uniform	21.75	25.730	0.167	-4	-6	Punching
2020	26	34	36	21	14	23-1/2	14	23-1/2	23-1/4	4	2	8-3/4	4-3/4	0.470	Uniform	12.37	14.634	0.074	-4	-6	Crown shear
2021	26	35	36	21-1/4	14	23-3/4	14	23-3/4	23-1/4	4	1-7/8	9	5	0.453	Uniform	6.6	7.808	0.068	-4	-6	Right support crushing
2022	26	36	36	21-1/4	14	23-3/4	14	23-3/4	23-1/4	4	2	9	5	0.481	Uniform	12.12	14.338	0.006	-4	-6	Crown shear, left support crushing
2023	26	37	36	21-1/2	15	--	15	--	23	4	2	8-3/4	4-3/4	0.510	Uniform	15.2	17.982	0.117	-4	-6	Punching
2024	26	38	36	21-1/2	15	--	15	--	23-1/4	4	2	8-7/8	4-7/8	0.502	Uniform	20.00	23.660	0.088	-4	-6	Punching

(Continued)

(1 of 7 Sheets)

TABLE B.5 (CONTINUED)

Item No.	Material No.	Rough Sample Age				Specimen Age				Overall Length in.	Arch Radius in.	Width in.	Total Depth in.	Crown in.	Specific Weight g/cm³	Load Geometry	Line Pressure psi	Applied Pressure psi	Deflection at Center in.	Temperature °C	Type of Failure	Remarks
		Test No.	Snow days	Age hr	days	hr	days	hr	days													
2025	26	39	36	21-3/4	15	1/4	15	1/4	23-1/2	4	2	9	5	0.500	Uniform	11.35	13.427	0.070	-4	-6	Crown shear, left support crushing	
2026	26	40	36	21-3/4	15	1/4	15	1/4	23-1/2	4	2	9	5	0.501	Uniform	12.5	14.788	0.047	-4	-6	Punching	
2027	26	41	36	22	15	1/2	15	1/2	23-1/4	4	2	8-7/8	4-7/8	0.494	Uniform	13.80	16.325	0.020	-4	-6	Left and right support crushing, then crown shear	
2028	26	42	36	22-1/4	15	3/4	15	3/4	23-1/4	4	2	9	5	0.479	Uniform	11.2	13.250	0.035	-4	-6	Right support crushing	
2029	26	43	36	22-1/4	15	3/4	15	3/4	23-1/4	4	1-7/8	9	5	0.475	Uniform	16.25	19.234	0.093	-4	-6	Right support crushing	
2030	26	44	36	22-1/2	15	1	15	1	23-1/4	4	1-7/8	9	5	0.471	Uniform	9.81	11.605	0.007	-4	-6	Crown shear, left and right support crushing	
2031	26	45	36	22-1/2	15	1	15	1	23-1/4	4	2	8-7/8	4-7/8	0.513	Uniform	13.21	15.62	0.047	-4	-6	Left and right support crushing	
2032	26	46	36	22-3/4	15	1-1/4	15	1-1/4	23-1/4	4	2	8-7/8	4-7/8	0.501	Uniform	15.30	18.100	0.128	-4	-6	Right support crushing, crown shear	
2033	26	47	36	22-3/4	15	1-1/4	15	1-1/4	23-1/4	4	2	9	5	0.481	Uniform	12.85	15.202	0.051	-4	-6	Crown shear, right support crushing	
2034	32	9	29	6	3	3	3	5-1/2	23	4	2	9	5	0.488	Uniform	8.44	9.985	0.109	-5	-9	Crown shear, left support crushing	
2035	32	10	29	6	3	3	3	5-1/2	23	4	2	9	5	0.526	Uniform	10.08	11.924	0.026	-5	-9	Crown shear, right support crushing	
2036	32	11	29	6	3	3	3	5-1/2	23	4	2	9	5	0.524	Uniform	8.88	10.505	0.061	-5	-9	Crown shear, left support crushing	
2037	11	33	27	4	20	--	7	4	18	5	2	9	4	0.650	3	197.8	90.0	0.018	-12.2	--	Flexure	
2038	11	34	27	4	20	--	7	4	24	5	1-5/8	9	4	0.595	3	109.6	48.6	0.018	-12.2	--	Punching	
2039	15	50	4	--	4	--	4	--	18	5	2	9	4	0.427	3	21.74	7.26	--	-11.7	--	Punching	
2040	15	51	4	--	4	--	4	--	18	5	2	9	4	0.420	1	13.27	3.29	0.003	-11.7	--	Punching	
2041	15	52	4	2	4	2	4	2	18	5	2	9	4	0.470	3	9.04	1.66	0.005	-11.7	--	Punching	
2042	19	56	3	20	3	20	3	20	18	5	2	9	4	0.449	3	31.4	11.8	0.052	-16.7	--	Support crushing	
2043	19	57	3	20	3	20	3	20	18	5	2	9	4	0.451	3	47.5	19.4	0.074	-16.7	--	Support crushing	
2044	19	58	3	21	3	21	3	21	18	5	2	9	4	0.442	3	20.3	6.6	0.030	-16.7	--	Punching	
2045	20	3	285	11-1/4	--	1/2	--	1/2	23	5	2	9	4	0.419	Uniform	3.99	4.720	0.076	-9	-12	Crushing left to right	
2046	22	21	45	16-3/4	9	4	12	3/4	23-1/2	5	2-1/8	8-1/2	3-1/2	0.501	Unifcrm	19.40	22.950	0.137	-3	-6	Crown shear, right support crushing	
2047	22	22	45	16-3/4	9	4	12	3/4	23-1/2	5	2	8-3/4	3-3/4	0.501	Uniform	10.12	11.972	0.060	-3	-6	Left and right support crushing, crown shear	
2048	22	23	45	17	9	4	12	1	23-1/2	5	2	8-3/4	3-3/4	0.555	Uniform	11.32	13.392	0.230	-3	-6	Left haunch shear	Cracked through No. 2 Collins gage
2049	22	24	45	17	9	4	12	1	23-1/2	5	2	8-1/2	3-1/2	0.515	Uniform	7.39	8.67	0.045	-3	-6	Left and right support crushing	Cracked through No. 4 gage before test
2050	22	25	45	17	9	4	12	1	23	5	2	8-1/2	3-1/2	0.561	Uniform	7.52	8.896	0.030	-3	-6	Left and right support crushing	
2051	22	26	45	17	9	4	12	1	23	5	2	8-1/2	3-1/2	0.509	Uniform	10.42	12.327	0.230	-3	-6	Left and right haunch shear	
2052	22	28	45	17	9	4	12	1	23	5	1-7/8	8-1/2	3-1/2	0.523	Uniform	6.67	7.891	0.037	-3	-6	Left haunch shear	
2053	22	29	45	17	9	4	12	1	23-1/4	5	2	8-1/4	3-1/4	0.483	Uniform	14.42	17.058	0.185	-3	-6	Left and right haunch shear	
2054	22	30	45	17	9	4	12	1	23-1/4	5	2	8	3	0.476	Uniform	12.8	15.142	0.092	-3	-6	Right haunch shear	
2055	22	51	48	10-1/2	--	2	1	23-1/2	23-1/4	5	2-1/4	9	4	0.494	Uniform	6.84	8.092	0.006	-6	-8	Left and right support crushing shear	

(continued)

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TABLE B.5 (CONTINUED)

Item No.	Material No.	Test No.	Rough Sample Age				Specimen Age	Overall Length in.	Arch Radius in.	Width in.	Total Depth in.	Crown in.	Specific Weight g/cm³	Load Geometry	Line Pressure psi	Applied Pressure psi	Deflection at Center in.	Temperature °C	Type of Failure	Remarks	
			days	hrs	days	hrs															
2056	22	52	48	10-1/2	--	2	1	23-1/2	23-1/4	5	2	9	4	0.509	Uniform	18.0	2.129	0.110	-6	-8	Punching
2057	22	53	48	10-1/2	--	2	1	23-1/2	23-1/4	5	2	9	4	0.535	Uniform	14.8	17.508	0.116	-6	-8	Left haunch shear, crown shear
2058	22	54	48	10-1/2	--	2	1	23-1/2	23-1/4	5	2	9	4	0.491	Uniform	5.64	6.672	0.041	-6	-8	Left support crushing, crown shear
2059	22	55	48	10-3/4	--	2	1	23-3/4	23-1/4	5	2	9	4	0.515	Uniform	9.12	10.789	0.053	-6	-8	Left support crushing, crown shear
2060	22	56	48	10-3/4	--	2	1	23-3/4	23-1/4	5	2	9	4	0.524	Uniform	6.76	7.997	0.051	-6	-8	Right support crushing, crown shear
2061	22	57	48	10-3/4	--	2	1	23-3/4	23-1/4	5	2	9	4	0.513	Uniform	10.10	11.948	0.032	-6	-8	Right support crushing, crown shear
2062	22	58	48	10-3/4	--	2	1	23-3/4	23-1/4	5	2	9	4	0.503	Uniform	7.92	9.369	0.049	-6	-8	Left support crushing, right haunch shear
2063	22	59	48	10-3/4	--	2	1	23-3/4	23-1/4	5	2	9	4	0.531	Uniform	10.4	12.303	0.074	-6	-8	Left and right support crushing
2064	22	60	48	11	--	2	2	--	23-1/4	5	2	9	4	0.508	Uniform	12.96	15.331	0.076	-6	-8	Right support crushing, left haunch shear
2065	22	115	52	10	--	3	5	23	23-1/4	5	2-1/10	9	4	0.500	Uniform	5.2	6.152	0.017	-7	-8	Left and right haunch shear
2066	22	116	52	10	--	3	5	23	23-1/2	5	1-9/10	9	4	0.508	Uniform	7.76	9.180	0.061	-7	-8	Crown shear, left haunch shear
2067	22	117	52	10	--	3	5	23	23-1/4	5	2	9	4	0.503	Uniform	9.91	11.724	0.094	-7	-8	Right and left support crushing
2068	22	118	52	10-1/4	--	3	5	23-1/4	23-1/4	5	2	9	4	0.512	Uniform	10.15	12.007	0.074	-7	-8	Right and left support crushing, crown shear
2069	22	119	52	10-1/4	--	3	5	23-1/4	23-1/4	5	2-1/10	9	4	0.517	Uniform	15.88	18.313	0.073	-7	-8	Left support crushing, crown shear
2070	22	120	52	10-1/4	--	3	5	23-1/4	23-1/4	5	2-1/10	9	4	0.506	Uniform	19.8	23.423	0.102	-7	-8	Left and right haunch shear
2071	22	121	52	10-1/4	--	3	5	23-1/4	23-1/4	5	2-1/10	9	4	0.487	Uniform	11.04	13.060	0.058	-7	-8	Left haunch shear, crown shear, punching
2072	22	122	52	10-1/2	--	3	5	23-1/2	23-1/4	5	2-1/10	9	4	0.503	Uniform	8.08	9.559	0.052	-7	-8	Left haunch shear, right support crushing
2073	26	22	36	16-3/4	14	16-3/4	14	16-3/4	23	5	2-1/4	8-3/4	3-3/4	0.512	Uniform	24.7	29.220	0.215	-6	-8	Haunch shear
2074	26	23	36	18-1/2	14	18-1/2	14	18-1/2	23	5	2	8-3/4	3-3/4	0.510	Uniform	8.77	10.375	0.149	-5	-8	Right haunch shear
2075	26	24	36	18-3/4	14	18-3/4	14	18-3/4	23-1/4	5	2-1/4	8-1/2	3-1/2	0.481	Uniform	11.4	13.186	0.185	-6	-8	Right support crushing
2076	26	25	36	19	14	19	14	19	23-1/4	5	2	8-1/2	3-1/2	0.522	Uniform	15.30	18.100	0.310	-6	-8	Haunch shear
2077	26	26	36	19-1/4	14	19-1/4	14	19-1/4	23-1/4	5	2-1/4	9	4	0.511	Uniform	8.37	9.902	0.061	-4	-6	Crown shear
2078	26	27	36	19-1/4	14	19-1/4	14	19-1/4	23-1/4	5	2-1/8	9	4	0.493	Uniform	13.50	15.971	0.147	-4	-6	Left haunch shear, right support crushing
2079	26	28	36	19-1/2	14	19-1/2	14	19-1/2	23-1/4	5	2-1/4	8-1/2	3-1/2	0.533	Uniform	12.7	15.024	0.081	-4	-6	Left and right haunch shear
2080	26	29	36	19-1/2	14	19-1/2	14	19-1/2	23	5	2-1/8	8-1/2	3-1/2	0.506	Uniform	18.48	21.862	0.198	-4	-6	Crown shear
2081	26	30	36	19-1/2	14	19-1/2	14	19-1/2	23-1/4	5	2-1/8	8-3/4	3-3/4	0.507	Uniform	13.00	15.379	0.058	-4	-6	Left haunch shear
2082	26	31	36	19-3/4	14	19-3/4	14	19-3/4	23-1/4	5	2-1/10	8-1/4	3-1/4	0.495	Uniform	10.85	12.836	0.133	-4	-6	Left and right support crushing
2083	32	6	29	5-3/4	3	3	3	5-1/4	23	5	2	9	4	0.427	Uniform	3.2	3.78	0.046	-5	-9	Left and right haunch shear
2084	32	7	29	5-3/4	3	3	3	5-1/4	23	5	2	9	4	0.462	Uniform	3.6	4.259	0.025	-5	-9	Right haunch shear, left support crushing

(Continued)

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TABLE B-5 (CONTINUED)

Item No.	Matеrial No.	Test No.	Rough Sample Age			Specimen Age			Overall Length in.	Arch Radius in.	Width in.	Total Depth in.	Crown in.	Specific Weight g/cm³	Load Geometry	Line Pressure psi	Applied Pressure psi	Deflection at Center in.	Temperature °C		Type of Failure	Remarks	
			days	snow hr	5-3/4	days	hrs	3											Air -5	Snow -9			
2085	32	8	29	5-3/4	3	3		3	5-1/4	23	5	2	9	4	0.510	Uniform	6.0	7.098	0.058	-5	-9	Crown shear, right haunch shear, left support crushing	
2086	11	35	25	2	20	--	5	2	24	6	2-1/2	9	3	0.771	1	135.6	60.8	0.113	-10.6	--	No failure	Run No. 1	
2087	11	36	25	2	20	--	5	2	24	6	2-1/2	9	3	0.771	1	276.8	127.1	0.048	-10.6	--	Haunch shear	Run No. 2	
2088	11	37	25	3	20	--	5	3	24	6	1-3/4	9	3	0.557	1	130.0	58.2	0.175	-10.6	--	Punching		
2089	11	38	25	3	20	--	5	3	24	6	1-3/4	9	3	0.542	1	119.8	53.4	0.130	-10.6	--	Punching		
2090	11	39	31	23	20	--	11	23	24	6	2	9	3	0.600	9	54.2	22.5	--	-16.2	--	Haunch shear		
2091	22	11	45	15-3/4	9	2-3/4	12	1	23-1/2	6	2	8-3/4	2-3/4	0.536	Uniform	11.43	13.522	0.125	-3	-6	Crown shear, right support crushing		
2092	22	12	45	16	9	2-3/4	12	1-1/4	23	6	2-1/4	9	3	0.538	Uniform	13.75	16.266	0.268	-3	-6	Left and right haunch shear, crown shear	Right haunch shattered	
2093	22	13	45	16-1/4	9	2-3/4	12	1-1/4	23-1/2	6	2	8-3/4	2-3/4	0.501	Uniform	16.5	19.520	0.144	-3	-6	Left and right haunch shear		
2094	22	14	45	16-1/4	9	2-3/4	12	1-1/2	23-1/2	6	2	9	3	0.532	Uniform	23.3	28.747	0.325	-3	-6	Left haunch shear, right support crushing		
2095	22	15	45	16-1/4	9	2-3/4	12	1-1/2	23-1/2	6	2	9	3	0.532	Uniform	20.2	23.897	0.075	-3	-6		Deflection at No. 3	
2096	22	16	45	16-1/2	9	2-3/4	12	1-1/2	23-1/4	6	2	9	3	0.543	Uniform	18.45	21.826	0.072	-3	-6	Left and right support crushing	Deflection at No. 5	
2097	22	17	45	16-1/2	9	2-3/4	12	1-3/4	23	6	2	9	3	0.541	Uniform	11.4	13.486	0.078	-3	-6	Right support crushing, crown shear		
2098	22	18	45	16-1/2	9	2-3/4	12	1-3/4	23-1/2	6	2	9-1/4	3-1/4	0.488	Uniform	5.93	7.015	0.086	-3	-6	Right support crushing, right haunch shear	Broken in crown before test	
2099	22	19	45	16-3/4	9	2-3/4	12	1-3/4	23-1/2	6	2-1/8	9	3	0.539	Uniform	12.96	15.33	0.108	-3	-6	Right haunch shear, crown shear	Cracked crown before test	
2100	22	41	48	9-1/2	--	5	1	19-1/2	23-1/4	6	2	9	3	0.546	Uniform	8.6	10.174	0.040	-7	-11	Left and right haunch shear, crown shear		
2101	22	42	48	9-3/4	--	5	1	19-3/4	23-1/4	6	2	9	3	0.534	Uniform	13.2	13.616	0.162	-7	-11	Left and right haunch shear, crown shear		
2102	22	43	48	9-3/4	--	5	1	19-3/4	23-1/4	6	2	9	3	0.535	Uniform	7.2	8.518	0.054	-7	-11	Left haunch shear, right support crushing		
2103	22	44	48	10	--	5	1	20	23-1/4	6	2	9	3	0.497	Uniform	3.92	4.637	0.051	-7	-11	Right support crushing, crown shear	Cracked through crown before test	
2104	22	45	48	10	--	5	1	20	23-1/4	6	2	9	3	0.511	Uniform	8.48	10.032	0.036	-7	-11	Left support crushing, crown shear		
2105	22	46	48	10	--	5	1	20	23-1/4	6	2	9	3	0.539	Uniform	5.24	6.199	0.054	-7	-11	Left and right haunch shear	Cracked through crown	
2106	22	47	48	10	--	5	1	20	23-1/4	6	2	9	3	0.533	Uniform	7.64	9.038	0.088	-7	-11	Left haunch shear	Cracked through crown	
2107	22	48	48	10-1/4	--	5	1	20-1/4	23-1/4	6	2	9	3	0.475	Uniform	7.40	8.754	0.057	-7	-11	Left support crushing, crown shear		
2108	22	49	48	10-1/4	--	5	1	20-1/4	23-1/4	6	2	9	3	0.523	Uniform	6.00	7.098	0.119	-7	-11	Crown shear		
2109	22	50	48	10-1/4	--	5	1	20-1/4	23-1/4	6	2-1/4	9	3	0.536	Uniform	4.64	5.489	0.035	-7	-11	Left and right support crushing, crown shear		
2110	22	95	52	8	--	6	5	18	23-1/4	6	1-8/10	9	3	0.557	Uniform	33.7	39.867	0.365	-7	-8	Left and right haunch shear		
2111	22	96	52	8-1/4	--	6	5	18-1/4	23-1/4	6	1-9/10	9	3	0.513	Uniform	12.8	15.142	0.070	-7	-8	Left and right haunch shear, left and right support crushing		
2112	22	97	52	8-1/2	--	6	5	18-1/2	23-1/4	6	2	9	3	0.503	Uniform	6.24	7.382	0.123	-7	-8	Haunch shear		

(Continued)

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TABLE E.5 (CONTINUED)

Item No.	Material No.	Test No.	Rough Sample		Specimen Age	Overall Length	Arch Radius	Width	Total Depth	Crown in.	Specific Weight g/cm³	Load Geometry	Line Pressure psi	Applied Pressure psi	Deflection at Center in.	Temperature °C		Type of Failure	Remarks		
			Snow days	Age hr												Air	Snow				
2113	22	98	52	8-1/2	--	6	5	18-1/2	23-1/4	6	2	9	3	0.494	Uniform	9.44	11.168	0.109	-7	-8	Crown shear
2114	22	99	52	8-3/4	--	6	5	18-3/4	23-1/4	6	2-1/10	9	3	0.461	Uniform	5.61	6.637	0.092	-7	-8	Left haunch shear, left and right support crushing
2115	22	100	52	8-3/4	--	6	5	18-3/4	23-1/4	6	2	9	3	0.471	Uniform	5.76	6.814	0.067	-7	-8	Right and left support crushing
2116	26	12	36	--	13	23	13	23	24	6	2	9	3	0.461	Uniform	7.35	8.695	0.128	-3	-6	Support crushing
2117	26	13	36	--	13	23	13	23	24	6	2	9	3	0.505	Uniform	8.85	10.470	0.047	-3	-6	Haunch shear
2118	26	15	36	3/4	13	23-3/4	13	23-3/4	24	6	2	8-3/4	2-3/4	0.498	Uniform	12.35	14.610	0.276	-4	-6	Broke at crack and right support
2119	26	16	36	3/4	13	23-3/4	13	23-3/4	24	6	2	9	3	0.418	Uniform	5.22	6.175	0.018	-4	-6	Support crushing
2120	26	17	36	1	14	--	14	--	24	6	2	8-7/8	2-7/8	0.506	Uniform	7.34	8.683	0.040	-4	-6	Haunch shear
2121	26	18	36	1	14	--	14	--	24	6	2	8-1/2	2-1/2	0.498	Uniform	8.25	9.760	0.142	-4	-6	Haunch shear
2122	26	19	36	1	14	--	14	--	24	6	2	8-1/4	2-1/4	0.445	Uniform	7.52	8.896	0.072	-4	-6	Crown shear, right haunch shear, left support crushing
2123	26	20	36	1-1/4	14	1/4	14	1/4	24	6	2	9	3	0.476	Uniform	9.20	10.884	0.117	-4	-6	Crown shear, left haunch shear
2124	26	21	36	1-1/4	14	1-1/4	14	1-1/4	24	6	2	9	3	0.505	Uniform	12.9	15.261	0.150	-4	-6	Haunch shear
2125	32	3	29	5-1/4	3	3	3	4-3/4	23	6	2	8-3/4	2-3/4	0.443	Uniform	4.68	5.536	0.093	-5	-9	Right support crushing
2126	32	4	29	5-1/2	3	3	3	5	23	6	2	8-3/4	2-3/4	0.476	Uniform	6.36	7.524	0.043	-5	-9	Crown shear, right haunch shear, left support crushing
2127	32	5	29	5-1/2	3	3	3	5	23	6	2	8-3/4	2-3/4	0.457	Uniform	5.28	6.246	0.086	-5	-9	Right haunch shear, left support crushing
2128	11	42	25	2	20	--	5	2	24	7	2-5/16	9	2	0.581	1	97.2	42.7	0.129	-11.1	-6	Haunch shear
2129	22	1	45	14-1/2	9	1-3/4	12	3/4	23-1/4	7	2	8-1/2	1-1/2	0.525	Uniform	4.00	4.732	0.046	-3	-6	Left and right haunch shear
2130	22	2	45	14-3/4	9	1-3/4	12	1	23-1/2	7	2	8-1/2	1-1/2	0.526	Uniform	6.54	7.737	0.092	-3	-6	Left haunch shear, right support crushing
2131	22	3	45	15	9	1-3/4	12	1	24	7	2	8-3/4	1-3/4	0.493	Uniform	6.54	7.737	0.281	-3	-6	Left and right haunch shear
2132	22	4	45	15	9	1-3/4	12	1-1/4	23-3/4	7	2	8-3/4	1-3/4	0.498	Uniform	2.2	2.603	0.034	-3	-6	Left haunch shear
2133	22	5	45	15-1/4	9	1-3/4	12	1-1/4	23-1/4	7	2-3/8	9	2	0.489	Uniform	5.57	6.58	0.044	-3	-6	Left and right haunch shear, crown shear
2134	22	6	45	15-1/4	9	1-3/4	12	1-1/2	23-1/2	7	2	9	2	0.473	Uniform	7.15	8.458	0.264	-3	-6	Left and right haunch shear
2135	22	7	45	15-1/2	9	1-3/4	12	1-3/4	23-1/2	7	2	8-7/8	1-7/8	0.485	Uniform	7.35	8.695	0.061	-3	-6	Left and right haunch shear, crown shear
2136	22	8	45	15-1/2	9	1-3/4	12	1-3/4	23-1/2	7	2	9-1/4	2-1/4	0.495	Uniform	4.97	5.880	0.115	-3	-6	Left and right haunch shear, crown shear
2137	22	9	45	15-3/4	9	1-3/4	12	1-3/4	23-1/2	7	2	9	2	0.487	Uniform	4.55	5.383	0.253	-3	-6	Left and right haunch shear
2138	22	31	48	8-1/2	--	7	1	16-1/2	23-1/4	7	2	9	2	0.517	Uniform	9.6	11.357	0.178	-8	-9	Right haunch shear, crown shear
2139	22	32	48	8-1/2	--	7	1	16-1/2	23-1/4	7	2	9	2	0.509	Uniform	13.45	15.911	0.378	-8	-9	Left haunch shear, crown shear
2140	22	33	48	8-3/4	--	7	1	16-3/4	23-1/4	7	2	9	2	0.509	Uniform	6.52	7.713	0.076	-8	-9	Right haunch shear, support crushing

(Continued)

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TABLE B.5 (CONTINUED)

Item No.	Material No.	Test No.	Rough Sample Age				Specimen Age	Overall Length	Arch Radius	Width	Total Depth	Crown in.	Specific Weight	Load Geometry	Line Pressure	Applied Pressure	Deflection at Center	Temperature	Type of Failure	Remarks		
			days	hrs	days	hrs																
2141	22	34	48	8-3/4	--	7	1	16-3/4	23-1/4	7	2	9	2	0.502	Uniform	6.96	8.234	0.088	-8	-9	Left then right haunch shear, right support crushing	
2142	22	35	48	8-3/4	--	7	1	16-3/4	23-1/4	7	2	9	2	0.503	Uniform	8.8	10.410	0.010	-8	-9	Haunch shear	Deflection at No. 3
2143	22	36	48	9	--	7	1	17	23-1/4	7	2	9	2	0.528	Uniform	11.28	13.344	0.104	-8	-9	Right haunch shear, left support crushing	
2144	22	37	48	9	--	7	1	17	23-1/4	7	2	9	2	0.522	Uniform	11.68	13.817	0.081	-8	-9	Haunch shear	
2145	22	38	48	9	--	7	1	17	23-1/4	7	2	9	2	0.506	Uniform	8.00	9.464	0.076	-8	-9	Haunch shear	Cracked through crown
2146	22	39	48	9-1/4	--	7	1	17-1/4	23-1/4	7	2	9	2	0.513	Uniform	5.40	6.388	0.102	-8	-9	Right haunch shear, crown shear, support crushing	Cracked through crown
2147	22	40	48	9-1/4	--	7	1	17-1/4	23-1/4	7	2	9	2	0.499	Uniform	6.24	7.382	0.042	-8	-9	Left haunch shear, right support crushing	Crown shear
2148	22	105	52	8-3/4	--	8	5	16-3/4	23-1/4	7	1-9/10	9	2	0.469	Uniform	5.76	6.814	0.038	-7	-8	Left and right haunch shear	Crown cracked before test
2149	22	106	52	9	--	8	5	17	23-1/4	7	1-75/100	9	2	0.543	Uniform	8.95	10.588	0.319	-7	-8	Left and right haunch shear	Crown cracked before test
2150	22	107	52	9	--	8	5	17	23-1/4	7	1-9/10	9	2	0.525	Uniform	9.12	10.789	0.102	-7	-8	Left and right haunch shear	Crown cracked before test
2151	22	108	52	9	--	8	5	17	22-1/2	7	1-9/10	9	2	0.543	Uniform	5.44	6.436	0.253	-7	-8	Left haunch shear	Crown cracked before test
2152	22	109	52	9-1/4	--	8	5	17-1/4	22-1/2	7	2	9	2	0.530	Uniform	4.77	5.643	0.087	-7	-8	Right then left haunch shear	Cracked through right haunch before test
2153	22	110	52	9-1/4	--	8	5	17-1/4	22-1/2	7	1-9/10	9	2	0.503	Uniform	3.68	4.353	0.152	-7	-8	Left and right haunch shear	
2154	22	111	52	9-1/4	--	8	5	17-1/4	23-1/4	7	1-9/10	9	2	0.542	Uniform	8.13	9.618	0.184	-7	-8	Left haunch shear	Crown cracked before test
2155	22	112	52	9-1/2	--	8	5	17-1/2	23-1/4	7	1-8/10	9	2	0.529	Uniform	8.98	10.623	0.235	-7	-8		
2156	26	1	35	22-3/4	13	21-3/4	13	21-3/4	24	7	2	8-3/4	1-3/4	0.496	Uniform	Pressure cell not on	--	0.348	-3	-7	Right support crushing, crown shear	Cracked through No. 4 gage, broke through crown
2157	26	2	35	23	13	22	13	22	24	7	2	9	2	0.476	Uniform	12.12	14.338	0.338	-3	-7	Haunch shear on both sides	
2158	26	3	35	23	13	22	13	22	24	7	2	8-7/8	1-7/8	0.471	Uniform	11.45	13.545	0.246	-3	-7	Haunch shear	
2159	26	4	35	23	13	22	13	22	24	7	2	9	2	0.491	Uniform	7.27	8.600	0.082	-3	-7	Left support crushing, right haunch shear	Cracked through No. 5 Collins gage
2160	26	5	35	23-1/4	13	22-1/4	13	22-1/4	24	7	2	8-7/8	1-7/8	0.464	Uniform	3.39	4.010	0.060	-3	-6	Left haunch shear, right crown shear	Right support gave a little
2161	26	6	35	23-1/4	13	22-1/4	13	22-1/4	24	7	2	8-3/4	1-3/4	0.488	Uniform	5.34	6.317	0.100	-3	-6	Right haunch shear	Cracked through No. 3 gage
2162	26	7	35	23-1/2	13	22-1/2	13	22-1/2	24	7	2	8-7/8	1-7/8	0.469	Uniform	7.45	8.813	0.072	-3	-6	Center section between No. 3 and No. 5 gages broke	
2163	26	8	35	23-1/2	13	22-1/2	13	22-1/2	24	7	2	9	2	0.465	Uniform	7.63	9.026	0.075	-3	-6	Crown shear, haunch shear	
2164	26	9	35	23-1/2	13	22-1/2	13	22-1/2	24	7	2	9-1/8	2-1/8	0.460	Uniform	8.30	9.819	0.178	-3	-6	Left haunch shear, right support crushing	

(Continued)

(6 of 7 Sheets)

TABLE B.5 (CONTINUED)

Item No.	Material No.	Rough Sample Age				Specimen Age				Overall Length in.	Arch Radius in.	Width in.	Total Depth in.	Crown in.	Specific Weight g/cm³	Load Geometry	Line Pressure psi	Applied Pressure psi	Deflection at Center in.	Temperature °C		Type of Failure	Remarks
		Test No.	days	Snow Age hr	days	days	hr	days	days											Air -3	Snow -6		
2165	26	10	35	23-3/4	13	22-3/4	13	22-3/4	13	24	7	2	9-1/8	2-1/8	0.519	Uniform	7.86	9.298	0.147	-3	-6	Left haunch shear, right support crushing	
2166	26	11	35	23-3/4	13	22-3/4	13	22-3/4	13	24	7	2	9	2	0.452	Uniform	7.27	8.600	0.143	-3	-6	Left haunch shear, right support crushing	
2167	26	14	36	1/2	13	23-1/2	13	23-1/2	13	24	7	2	9	2	0.451	Uniform	9.34	11.049	0.106	-4	-6	Right haunch shear, left support crushing	
2168	32	1	29	5	3	3	3	4-1/2	24	7	1-1/2	8-3/4	1-3/4	0.451	Uniform	2.00	2.366	0.073	-5	-9	Crown shear, left and right haunch shear	Cracked crown before test	
2169	32	2	29	5-1/4	3	3	3	4-3/4	23	7	2	8-3/4	1-3/4	0.483	Uniform	5.84	6.909	0.066	-5	-9	Left and right haunch shear	Crown broken before test	
2170	19	59	6	20	6	20	6	20	45	10	5	22-1/2	12-1/2	0.434	3	116.9	13.5	0.031	-11.1	--	Support crushing		
2171	19	60	6	21	6	21	6	21	45	10	5	22-1/2	12-1/2	0.386	3	189.2	22.6	0.164	-11.1	--	Haunch shear		
2172	19	61	6	21	6	21	6	21	45	10	5	22-1/2	12-1/2	0.498	3	128.39	14.97	0.108	-11.1	--	Haunch shear		
2173	22	89	51	13-3/4	6	3-1/2	--	1/4	52-3/4	12-1/2	5	22-1/4	8-3/4	0.510	Uniform	11.6	12.122	0.134	-5	-8	Support crushing		
2174	22	90	51	14-1/4	6	4	--	1/4	51-3/4	12-1/2	5-1/4	22-1/4	9-3/4	0.480	Uniform	20.16	21.067	0.246	-6	-8	Support crushing		
2175	22	84	51	9	4	22-1/4	--	1	52-3/4	15	5	22	7	0.538	Uniform	7.21	7.534	0.303	-7	-8	No failure (1st run) flexure (2nd run)	Haunch cracks and open crown crack up	
2176	22	85	51	10-3/4	6	1/2	--	1/4	51-3/4	15	5-1/4	21-1/4	6-1/4	0.539	Uniform	9.73	10.168	0.227	-6	-8	Support crushing		
2177	22	93	51	15	6	5	--	1/4	51-1/2	15	4-3/4	21-1/2	6-1/2	0.509	Uniform	13.4	14.003	0.208	-5	-7	Right support and crown		
2178	22	87	51	13	6	2-3/4	--	1/4	53	17-1/2	4 1/2	21-3/4	4-1/4	0.464	Uniform	2.4	2.508	0.100	-6	-8	Support crushing		
2179	22	88	51	13-1/2	6	3-1/4	--	1/4	52-1/2	17-1/2	4-1/2	21	3-1/2	0.520	Uniform	2.76	2.884	0.110	-6	-8	Support crushing, then flexure		
2180	22	91	51	14-1/2	6	4-1/2	--	--	51-1/4	17-1/2	4-3/4	21-1/2	4	0.519	Uniform	8.7	9.092	0.230	-6	-8	Crown flexure		
2181	13	46	7	1	7	1	7	1	45	20	5	22-1/2	2-1/2	0.546	7	44.76	4.46	0.022	-10.6	--	Support crushing		
2182	13	47	7	1	7	1	7	1	45	20	5	22-1/2	2-1/2	0.546	7	49.45	5.05	0.017	-10.6	--	Haunch shear		
2183	13	48	7	1	7	1	7	1	45	20	5	22-1/2	2-1/2	0.442	5	41.58	4.06	0.022	-10.6	--	Crown shear		
2184	21	4	286	16-1/4	--	2-1/2	--	2-1/2	130	24	12	47	23	0.436	All	87.00	7.025	0.181	-8	-10	Support crushing	Evidence for voids, through out snow	
2185	31	4	31	1-1/2	--	1-1/2	--	1-1/2	129-1/2	24	12	50-1/2	26-1/2	0.455	All	135	11.215	0.301	-4	-7	Crushing near supports and large chunks out of right top	1000 psi electronics on top side only	
2186	21	3	286	15-1/2	--	1-3/4	--	1-3/4	130	30	12	47	17	0.414	All	62.0	4.84	0.144	-8	-9	Possible flexure, crown shear	Poor snow in right support	
2187	31	3	31	3/4	--	--	--	2-1/4	129-1/2	30	11-1/2	49-3/4	19-3/4	0.458	All	46.2	3.46	0.087	-4	-8	Crown cracked, haunches crushed	* See below	
2188	21	2	283	11	--	1-1/2	--	1-1/2	130	36	12	46	10	0.424	All	7.26	0.064	0.400	-9	-11	Crown flexure		
2189	31	2	30	22-1/4	--	1-3/4	--	1-3/4	129	36	11	50	14	0.483	All	33.6	2.36	0.087	-5	-8	Haunch crushed		
2190	31	1	30	20-1/4	--	19-1/4	--	19-1/4	130-1/2	42	12	50-1/2	8-1/2	0.502	All	23.6	1.49	0.091	-6	-8	Haunch crushed through weak area	Right support in poor shape, left haunch has several voids	
2191	11	27	32	--	--	--	--	32	--	--	--	--	--	0.595	9	63.3	26.8	0.190	-16.2	--	Crown shear		
2192	11	28	32	--	--	--	--	32	--	--	--	--	--	0.753	9	42.9	17.2	0.125	-16.2	--	Punching		

* Run No. 1 to 14.35 psi crack developed in crown at approximately 3.46 psi; run No. 2 to 23.50 psi caused crack to open, and run No. 3 caused crushing in haunches.

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13. ABSTRACT This report describes the modeling procedures and results of static loading of structural elements made of processed snow. The experiments were performed at Camp Century, Greenland, during the summers of 1961 and 1962 by the U. S. Army Engineer Waterways Experiment Station (WES) and were sponsored by the Defense Atomic Support Agency. The general objective of this investigation was to study the response of processed-snow beams and arches to static loads, and to formulate criteria that will make it possible to design processed-snow structures to resist the airblast effects of nuclear explosions. The primary objective of the study reported herein was to determine the response and verify the adequacy of the modeling procedures for snow structures subjected to static loadings. Calibration of the loading devices is discussed in Appendix A. Data obtained from static tests of 507 beam, 256 arch, and 1,758 cylinder specimens are presented in tabular form in Appendix B. The arches and beams were of three sizes, i.e. a prototype (length ratio n of 1) having a span length of 9 feet, a model (n of 2.4) having a span length of 3.75 feet, and another model (n of 6) having a span length of 1.5 feet. The test cylinders were 3 inches in diameter by 6 inches long. Because of the many variables involved, the modeling procedures for structures made of snow were not verified. However, the response of beams, arches, and cylinders made of processed snow is described and ranges of pressure that cause collapse have been determined, i.e. 0.25 to 8 psi for the beams, 2 to 60 psi for the arches, and 2 to 69 psi for the cylinders. The most significant results are curves that relate the strength of processed snow to such parameters as temperature, age, specific weight, and loading rate.		

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