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EFFECT OF SAND AND WATER CONTENT ON SQUEEZING BEHAVIOR

by

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A thesis

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Committee Approval

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ABSTRACT

One of the most important requirements in the design of underground openings is prediction of ground behavior. In geotechnical engineering practice, there are a multiplicity of ground behaviors, one of the most important of which is squeezing conditions. Squeezing behavior is basically deformation without cracking in response to stress concentrations which develop around underground openings. Squeezing conditions are most common in tunnels driven through fault zones in rock or through soils containing mixed-face sand and clay. At present, the design approach is to compare the stress re-distribution around the opening with the intact strength of the soil/rock medium. To date, important index properties such as water and sand content have not been investigated in the assessment of squeezing ground conditions.

The present research is an extension of present practice and involves study of the squeezing mechanism in the laboratory and to determine the effect of sand and water content on squeezing behavior. The research utilized controlled sand-clay mixes in unconfined compression to investigate the squeezing process and by varying the sand and water content, the effect of the soil constituents on the squeezing stresses and strains that can development at the edge of a tunnel opening.

CHAPTER ONE - INTRODUCTION

1.1 Introduction

One of the most important goals of this study is investigation of the ground behavior specifically squeezing ground in faulted rock and soft ground tunnels. Reliable prediction of ground behavior induced during construction of tunnel openings is important because of the need to create stable opening both during construction and the long-term performance of the project. Ground behavior depends on number of factors such as geological and hydro-geological conditions, tunnel geometry, excavation depth and method, and the quality of workmanship. The relationship between the ground movement and the geotechnical geometry factors is not simple nor linear.

There are several types of ground behavior one of which is squeezing conditions:

Squeezing: Ground slowly advances into tunnel without any signs of fracturing. The loss of ground caused by squeeze and the resulting settlement of the ground surface can be substantial.

Very soft squeezing: Ground advances rapidly into tunnel in a plastic flow mode.

In geotechnical engineering practice, squeezing ground behavior in tunnels most commonly occurs in very soft to medium stiff, cohesive soils (clay). Squeezing behavior is predicated on stress concentrations around the opening exceeding the intact strength of the clay. Thus, the unconfined compressive strength to in-situ stress ratio is an important parameter in predicting the behavior of sheared rock and soils in tunnels. Methods for classifying and/or predicting squeezing behavior used in geotechnical practice include:

- Strain index: prediction based on ratio of tangential strain/elastic strain
- Radial closure: classification based on radial strain
- Overstress ratio: prediction based on rock/soil mass strength/free field stress
- Radial tunnel strain: classification based on radial strain
- Squeezing index: prediction based on tangential strain /critical strain
- Competency factor: prediction based on rock/soil mass strength and circumferential stress.

In all of these methods, the unconfined compressive strength is one (if not the only one) of the main parameters used to predict soil/rock strength.

In tunnels subjected to squeezing behavior, soils and sheared rock are not always pure clay but more commonly are combinations of granular and cohesive soils. In present practice, the gradation, plasticity and natural water content of soils/rocks are not used to predict squeezing ground conditions even they are very important parameters that impact the behavior of ductile materials.

In this study, prepared sand-clay mixes were used to extend the practical knowledge of squeezing ground behavior and to evaluate the effects of soil/sheared rock composition and water content on squeezing conditions. Using unconfined compressive strength tests, measurements of stress and strain first crack at for various sand-clay mixes at moisture contents close to the plastic limit formed the experimental portion of the investigation. The overall intent is to understand the progressive change from ductile to brittle behavior and to be able to predict potential squeezing conditions in faulted rock and soft ground tunnels. It is not the intent to predict the magnitude of squeezing strain and stress, rather this effort would be part of a more advanced study.

1.2 Research Goals

The goal is to understand and develop criteria on the behavior of sand-clay mixes (crushed quartz sand and kaolin clay) in geotechnical engineering design applications such as

- Design of impervious cores in zoned earth dams
- Evaluation of potential piping conditions in zoned earth dams
- Design of barriers to contain contaminated ground water
- Prediction of squeezing ground conditions in tunnels
- Assessment of flowing ground behavior of non-stratified clayey-sand layers in soft ground shafts and tunnel excavations
- Liquefaction potential of clayey sands during seismic events.

The focus of this research study is on squeezing conditions in soft ground and rock tunnels. Squeezing conditions in rock tunnels can occur where the opening is intersected by fault zones containing clay and crushed rock. At present, there are no criteria on water content or percent granular particles associated with squeezing conditions. In order to assess the squeezing behavior of sand-clay mixes in tunnels, a series of unconfined compressive strength tests on several sand-clay mixes were performed in the ISU soil mechanics laboratory. The results of these studies are presented in this thesis.

CHAPTER TWO - LITERATURE REVIEW

2.1 Classification and Behavior of Sand-Clay Mixes

2.1.2 USCS Classification of Soils

In geotechnical engineering practice, soils are classified as granular or cohesive depending on gradation and plasticity. In the Unified Soil Classification System (USCS), granular soils are predominantly gravel and sand with and without silt/clay (see Figure 2.1). Cohesive soils are primarily silt and clay with less than 50% sand and gravel-sized particles. The plasticity chart is used in the USCS to classify silt and clay soils (see Figure 2.2). Cohesive soils typically exhibit at least some plasticity (ASTM D-1487). (Plasticity is a geotechnical index property in which a soil can be deformed without disintegration. Peck, et al. 1974.) Granular soils behave as frictional materials: shear strength along soil grain interfaces, whereas the strength of cohesive soils depends on some type of bond between the particles. It is the cohesive nature of the soils which is responsible for the squeezing behavior in underground openings.

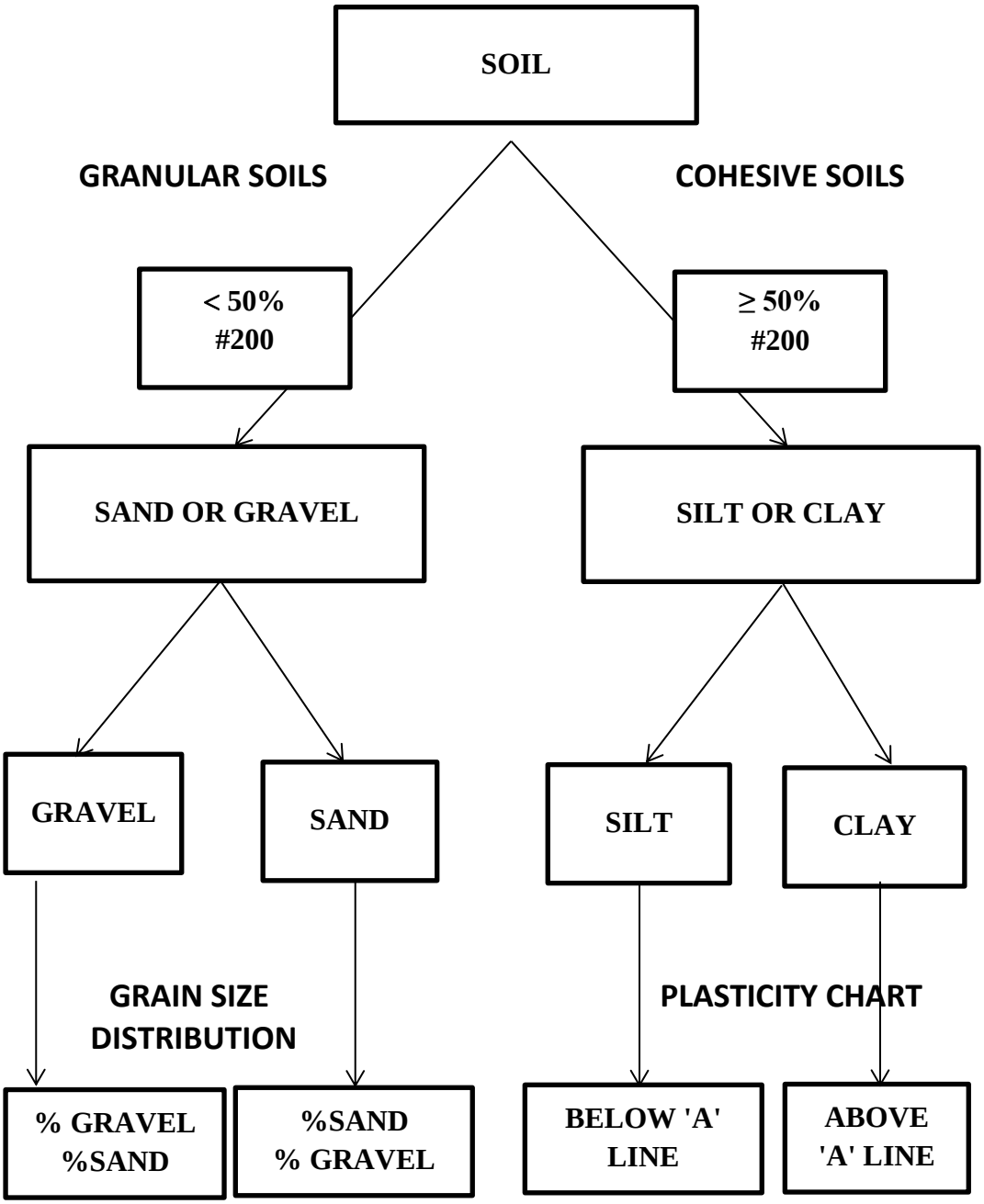

Figure 2.1 Generalized concept of USCS classification of granular and cohesive soils

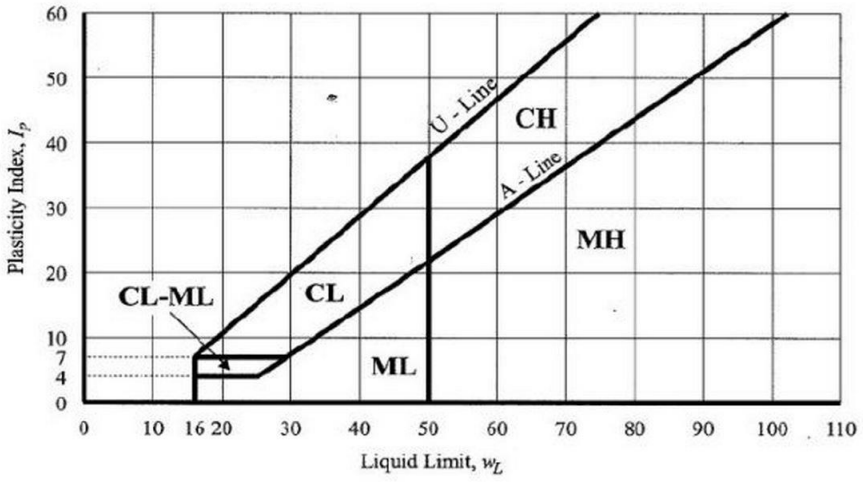

Figure 2.2 Plasticity chart used to classify silt and clay in Unified Soil Classification System (USCS)

Since plasticity is soil/altered rock deformation without cracking, plasticity is an index of the squeezing behavior in tunnels. In geotechnical engineering practice, Atterberg Limits are used to determine the plasticity of a soil as well as the moisture content at which the soil cracks in response to deformation. Two basic tests are used to establish the plasticity of a soil: liquid limit and plastic limit. These tests were developed by Albert Atterberg, a Swedish agriculturist and later refined by Arthur Casagrande (Brief History of Swedish Soil Mechanics, 2007).

The liquid limit is the water content above which the soil behaves as a liquid. The test to determine the liquid limit consists of subjecting a series of soil specimens at different water contents to dynamic loads that generate positive pore pressures which in turn causes the soil to flow. The liquid limit test is performed in accordance with ASTM D-4318 (Determination of Liquid and Plastic Limits and Plasticity Index). The plastic limit is the water content below which the soil behaves as a semi-solid (McCarthy 2007). In the plastic limit test, a specimen of soil is rolled in a thread until its water content is lowered to the point where cracks develop along the thread. Details of the Atterberg Limit tests performed in this study are given in Chapter 3.

Prior to this study, Atterberg limits tests have not been utilized to predict or evaluate squeezing conditions in tunnels. By definition, squeezing ground conditions would be expected in overstressed soil/rock where the water content is above the plastic limit. The intent of this study is to evaluate the use of the plasticity limit as an index for squeezing behavior and the effect of sand content on squeezing conditions in tunnels.

2.2 Squeezing Ground Conditions

One of the first practitioners to study squeezing ground in tunnels was Karl Terzaghi. According to Terzaghi (1946), the mechanical properties of metamorphic rocks altered to a clay can differ from sedimented clay. Every soft clay and many stiff clays tend to squeeze into a tunnel wherever the opening is not supported. Therefore, decomposed metamorphic rocks with clay are commonly referred to as squeezing rock or squeezing ground. However, the manifestations and the causes of the squeeze can be very different for different types of clays and decomposed rocks.

In squeezing behavior, the ground squeezes or extrudes plastically into tunnel opening, without visible fracturing or loss of continuity, and without perceptible increase in water content (Heuer 1974). Heuer also uses the terms ductile, plastic yield and flow in overstressed ground to characterize squeezing behavior. Typically, squeezing behavior occurs in materials with low frictional strength. There is a very strong correlation between rate of squeezing and degree of overstress. Heuer (1974) reports that squeezing conditions typically occur in tunnels at shallow to medium depth in clay of very soft to medium consistency (0 to 1.0 tsf) (see Table 2.1). In addition, squeezing conditions can also take place in stiff to hard clay under high cover where raveling conditions develop at the excavation surface and squeezing occurs at depth beyond the tunnel opening where the clay is confined.

Table 2.1 Consistency of soils based on unconfined compressive strength (ASTM 2166-06)

CONSISTENCY	q_u (TSF)
VERY SOFT	0 TO 0.25
SOFT	0.25 TO 0.5
MEDIUM	0.5 TO 1.0
STIFF	1.0 TO 2.0
VERY STIFF	2.0 TO 4.0
HARD	>4.0

During mining through squeezing ground, the ground exerts pressure onto the tunnel support from the one or more areas of the tunnel perimeter. Therefore, if such ground is encountered, it is highly desirable to utilize a full circle cross-section even if it means significant enlargement to maintain the internal clearances (Terzaghi 1946) (see Figure 2.3).

Figure 2.3 Squeezing behavior in underground opening (Huy Tran-Manh, 2014)

In literature on squeezing ground, there is no information on grain size distribution (such as sand content), clay mineralogy and plasticity index/water content.

2.3 Classification of Squeezing Ground

The classification of squeezing ground is based on experience in tunnels. Several parameters such as strain/closure indexes, overstress ratio, Squeezing Index (SI) and Competency Factor (Cg) are used to evaluate the level of squeezing in underground openings. The strain/closure indexes are not models to predict squeezing behavior in tunnels but rather criteria to evaluate squeezing conditions during tunnel advance. The remaining classification systems are empirically derived and can be used to predict potential squeezing conditions prior to construction.

2.3.1 Strain/Closure Indexes

The strain index developed by Aydan et al. (1993) has been used to evaluate different levels of squeezing conditions in tunnels. The index is the ratio of the peak tangential strain(ε_θ^a) divided by the predicted elastic strain (ε_θ^e). The peak tangential strain at the periphery of the tunnel is defined as $\frac{u_a}{a}$ where u_a is radial closure and a is radius of opening. The elastic strain ε_θ^e is determined using closed-formed solutions or finite element models to predict stresses and strains around a tunnel opening. The classification developed by Aydan is given in Table 2.2. The maximum value of $\varepsilon_\theta^a/\varepsilon_\theta^e$ is 5 which in Aydan's classification, indicates very heavy squeezing conditions.

Table 2.2 Squeezing Classification based on tangential strain and elastic strain by Aydan et al (1993)

SQUEEZING LEVEL	**TUNNEL STRAIN**
No squeezing	$\varepsilon_\theta^a/\varepsilon_\theta^e \leq 1$
Light squeezing	$1<\varepsilon_\theta^a/\varepsilon_\theta^e \leq 2$
Fair squeezing	$2<\varepsilon_\theta^a/\varepsilon_\theta^e \leq 3$
Heavy squeezing	$3<\varepsilon_\theta^a/\varepsilon_\theta^e \leq 5$
Very heavy squeezing	$\varepsilon_\theta^a/\varepsilon_\theta^e > 5$

A second classification of squeezing behavior based on measured radial closure was developed in 1995 by Singh, Jethwa, and Dube (Table 2.3). The ranges are very similar to those published by Aydan et al. in 1993.

Table 2.3 Squeezing classification based on radial closure by Singh et al. (1995)

SQUEEZING LEVEL	**CLOSURE OF TUNNEL DIAMETER**
Mild or minor squeezing	$1\% < closure \leq 3\%$
Moderate to severe squeezing	$3\% < closure \leq 5\%$
High or very severe	$closure > 5\%$

2.3.2 Overstress Ratio

Hoek and Marinos (2000) classified squeezing ground levels based on radial strain and overstress ratio (see Figure 2.4 and Table 2.4). The overstress ratio is the rock mass strength divided by the free field stress ($p_o = \sigma v \cdot D$ where σv is the total vertical stress and D is the depth of the tunnel below the ground surface). Hoek and Marinos present the methodology based on previous work by Hoek and Brown (1997) for estimating the rock mass strength. The methodology was developed for isotropic rock masses. Three parameters are required in the rock mass strength analysis as follows:

1. The uniaxial compressive strength (σ_{ci}) of the intact rock samples. Values can be obtained by performing unconfined compressive strength tests on rock cores or can be estimated, with a reasonable level of accuracy, by performing point load index (I_s) tests. The typical relationship between compressive strength on NX rock cores and point load index is

$$\sigma_{ci} = 24\, Is$$

Where: $I_s = P/D^2$.

P is the load on the conical points and D is the distance between the points.

2. A constant m_i which is the frictional property of the component minerals in the intact rock. The value of m_i can only be determined by triaxial tests on core samples or can be estimated from qualitative descriptions of rock materials as described by Hoek and Brown (1997). This parameter has a significant influence on the strength characteristics of rock mass.
3. The Geologic Strength Index (GSI) relates the properties of the intact rock elements to the overall rock mass strength. The index is based on an assessment of the lithology, structure and condition of discontinuity surfaces in the rock mass and it is estimated from visual examination of the rock mass exposed in tunnel faces or surface excavations such as in road cuts and in rock cores (Hoek and Marinos 2000).

The rock mass strength (σ_{cm}) is used to evaluate potential tunnel squeezing problems and can be determined using the equation:

$$\sigma_{cm} = (0.0034_i^{0.8})\sigma_{ci}[1.029 + 0.025e^{(-0.1m_i)}]^{\mathrm{GSI}}$$

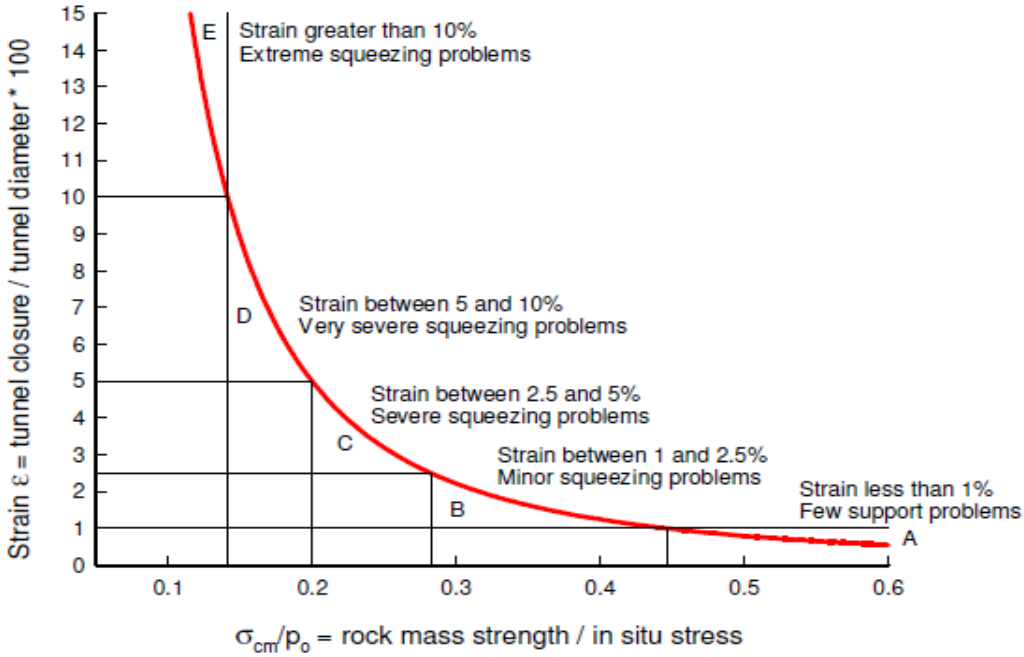

Figure 2.4 Squeezing ranges based on strain and overstress ratio (Hoek and Marinos, 2000)

Tunnel conditions, design approaches and support methods in squeezing ground are presented in part of the Hoek and Marinos (2000) paper. The observations and recommendations are given in Table 2.4.

Table 2.4 Summary of Squeezing Ground Behavior and Impact on Tunnel Support (Hoek and Marinos, 2000)

	Strain ε %	Geotechnical issues	Support types
A	Less than 1	Few stability problems and very simple tunnel support design methods can be used. Tunnel support recommendations based upon rock mass classifications provide an adequate basis for design.	Very simple tunnelling conditions, with rockbolts and shotcrete typically used for support.
B	1 to 2.5	Convergence confinement methods are used to predict the formation of a 'plastic' zone in the rock mass surrounding a tunnel and of the interaction between the progressive development of this zone and different types of support.	Minor squeezing problems which are generally dealt with by rockbolts and shotcrete; sometimes with light steel sets or lattice girders are added for additional security.
C	2.5 to 5	Two-dimensional finite element analysis, incorporating support elements and excavation sequence, are normally used for this type of problem. Face stability is generally not a major problem.	Severe squeezing problems requiring rapid installation of support and careful control of construction quality. Heavy steel sets embedded in shotcrete are generally required.
D	5 to 10	The design of the tunnel is dominated by face stability issues and, while two-dimensional finite analyses are generally carried out, some estimates of the effects of forepoling and face reinforcement are required.	Very severe squeezing and face stability problems. Forepoling and face reinforcement with steel sets embedded in shotcrete are usually necessary.
E	More than 10	Severe face instability as well as squeezing of the tunnel make this an extremely difficult three-dimensional problem for which no effective design methods are currently available. Most solutions are based on experience.	Extreme squeezing problems. Forepoling and face reinforcement are usually applied and yielding support may be required in extreme cases.

In 2001, Hoek published the same classification of squeezing levels and associated tunnel strain previously given in his 2000 article (see Figure 2.4 and Table 2.5).

Table 2.5 Squeezing classification based on radial tunnel strain by Hoek (2001)

SQUEEZING LEVEL	**TUNNEL STRAIN**
Few support problems	$\varepsilon_t < 1\%$
Minor squeezing problems	$1\% < \varepsilon_t < 2.5\%$
Severe squeezing problems	$2.5\% < \varepsilon_t < 5\%$
Very severe squeezing problems	$5\% < \varepsilon_t < 10\%$
Extreme squeezing problem	$\varepsilon_t > 10\%$

The analysis by Hoek shows some but few support problems even where the tunnel strain is less than 1%. Very severe squeezing problems starts at 5% radial strain. In addition, Hoek's 2000-2001 classification was expanded to include higher levels of tunnel strain. The squeezing level classification given in Table 2.5 appears to be a refinement of the previous work carried out by Aydan and Singh on squeezing behavior but was developed based on a series of case history studies in Taiwan, India and Venezuela (see Table 2.6)

Table 2.6 Series of squeezing case histories used by Hoek in his squeezing classification system (Hoek 2001)

Tunnel name, location and rock type	Depth H - m	σ_{cm} - MPa	σ_{cm}/H	Tunnel span - m	Closure - m	Strain ε %	Comments
1. Yacambu-Quibor, Venezuela (graphitic phyllite)	600	1.0	0.06	5.5	5	>30	Extreme squeezing, stability controlled by yielding steel sets (Sánchez Fernándes and Terán Benítez, 1994).
2. Nathpa Jhakri headrace tunnel, India (fault zone)	300	0.6	0.25	10	2	20	Severe squeezing, stability controlled by forepole umbrella (Hoek, 1999)
3. Maan headrace tunnel, Taiwan (sandstone / shale)	200	1.6	0.33	6.5	0.1	1.5	Mild squeezing with local shotcrete damage (Chern et al, 1998)
4. Maan project, Adit A, Taiwan (sandstone / shale)	200	0.7	0.14	6	0.22	3.7	Large squeezing with severe support damage (Chern et al, 1998)
5. New Tienlun headrace tunnel, Taiwan (fault zone)	400	0.7	0.07	6.5	0.9	14	Severe squeezing with local tunnel collapse (Chern et al, 1998)
6. Mucha tunnel, Taiwan (sandstone / shale)	110	1.4	0.49	16	0.16	1	Stable tunnel (Chern et al, 1998)
7. Mucha tunnel, Taiwan (fault zone)	120	0.28	0.09	16	2.4	15	Severe squeezing with local tunnel collapse (Chern et al, 1998)
8. Pengshan tunnel, Taiwan (sandstone / shale)	140	1.9	0.55	12	0.01	0.11	Stable tunnel (Chern et al, 1998)
9. Maneri-Uttarkashi power tunnel, India (metabasics)	800	2*	0.1	4.75	0.43	9	Severe squeezing, damage to sets and concrete lining (Goel et al, 1995)
10. Chibro-Khodri tunnel, India (crushed red shale)	280	0.7*	0.1	3	0.01	2.8	Moderate squeezing, stabilized by circular steel sets (Singh et al, 1992)
11. Giri-Bata tunnel, India (slates)	380	0.8*	0.08	4.2	0.3	7.6	Large squeezing with deformation of steel sets (Singh et al, 1992)
12. Giri-Bate tunnel, India (phyllites)	240	0.7*	0.1	4.2	0.38	9	Severe squeezing with buckling of steel sets (Singh et al, 1992)
13. Loktak tunnel, India (shale)	300	0.7*	0.1	4.8	0.34	7	Large squeezing, supported by rock bolts, shotcrete and sets (Singh et al, 1992)
14. Maneri Bhali Stage I, India (fractured quartzite)	350	1*	0.1	4.8	0.38	7.9	Large squeezing with buckling of steel sets (Singh et al, 1992)
15. Maneri Bhali Stage II, India (sheared metabasics)	410	3*	0.28	7	0.2	3	Mild squeezing (Singh et al, 1992)
16. Maneri Bhali Stage II, India (Metabasic rocks)	480	3*	0.24	2.5	0.06	2.5	Mild squeezing (Singh et al, 1992)

2.3.3 Squeezing Index

Singh et al. (2007) suggested another classification for squeezing level based on the expected/measured radial strain and the critical strain. The classification was named the squeezing index (SI) which is defined as:

$$SI = \frac{Observed\ or\ expected\ strain}{Critical\ strain} = \frac{u_a/a}{\varepsilon_{cr}}$$

where: u_a is radial closure

a is radius of opening.

The critical strain parameter is the strain level at the tunnel periphery above which instability and squeezing problems are likely to occur. The critical strain of 1% is used in most analyses. In the Singh et al study, the critical strain is an anisotropic property that depends on the properties of the intact rock and the joints in the rock mass. A correlation of critical strain with the uniaxial compressive strength, tangent modulus of intact rock and the field modulus of the jointed mass is suggested by Singh et al. (2007).

Table 2.7 Squeezing Classification based on Squeezing Index by Singh et al. (2007)

SQUEEZING LEVEL	**SI**
No squeezing	$SI < 1$
Light squeezing	$1 < SI \leq 2$
Fair squeezing	$2 < SI \leq 3$
Heavy squeezing	$3 < SI \leq 5$
Very heavy squeezing	$SI > 5$

2.3.4 Competency Factor

In 1995, Palmstrom describes squeezing ground as overstressed behavior in massive, weak and deformable rocks and highly jointed rock masses. In fact, he portrays squeezing conditions as yielding of rock in response to redistribution of stresses around an excavated opening (see Figure 2.5). The cases of squeezing conditions shown by Palmstrom are brittle and not ductile behavior characteristic of squeezing ground. Palmstrom formulated a parameter called the competency factor which is the ratio of the rock mass strength and circumferential stress around a tunnel opening. The equation to calculate the competency factor (Cg) is given as follows:

$$Cg = RMi/\sigma\theta$$

where: RMi is rock mass index

$\sigma\theta$ is tangential stress.

In essence, the competency factor is used to indicate whether the ground behaves elastically or is over stressed. The tangential stress ($\sigma\theta$) can be estimated using the vertical overburden pressure, the ground water pressure and the geometry of opening as outlined by Hoek and Brown (1980).

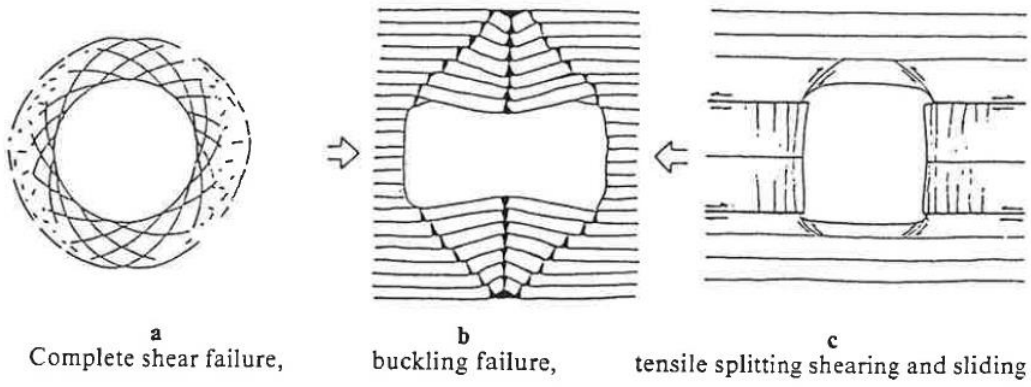

Figure 2.5 Main failure modes in overstressed ground in tunnels (Aydan et al. 1993)

The rock mass index in sheared and faulted ground is estimated using the following equation:

$$RMi = \sigma_c \cdot \quad JP$$

where: JP is joint intensity

σ_c is the compressive strength of intact rock.

The joint intensity is given as block size in outcrop or a tunnel opening and the engineering properties of the joints (Palmstrom 1995).

Palmstrom developed a relationship between the competency factor and the level of squeezing based on the observations by Aydan et al (1993). The classification is given in Table 2.7 of this thesis. Unfortunately, Table 2.8 is for low strength, ductile massive rock such as mudstones, tuffs and shale and not for highly jointed or crushed rock such as that encountered in fault zones.

Table 2.8 Squeezing classification based on competency factor (Palmstrom, 1995)

SQUEEZING CLASS	**COMPETENCY FACTOR**
No squeezing	$RMi/\sigma\theta > 1$
Light squeezing	$RMi/\sigma\theta$ = 0.7-1
Fair squeezing	$RMi/\sigma\theta$ =0.5-0.7
Heavy squeezing	$RMi/\sigma\theta$ =0.35-0.5
Very heavy squeezing	$RMi/\sigma\theta < 0.35$

2.4 Case Histories on Tunnels in Squeezing Ground

In addition to the literature study on squeezing ground classifications and parameters, this thesis includes case histories of squeezing conditions in tunnels located in different geologic settings. Squeezing behavior is most commonly associated deep tunnels where the intact rock is weak and/or where the ground is faulted.

2.4.1 Straight Creek Tunnel, Colorado

Straight Creek Tunnel (renamed Eisenhower Tunnel) is a twin-bore vehicular tunnel (Robinson and Lee, 1974). The tunnel is located approximately 60 miles west of Denver, Colorado and is part of the I-70 Interstate System. The Straight Creek tunnel area is at the crest of Front Range of the Colorado Rocky Mountains (see Figure 2.6). Severe squeezing conditions developed where the twin tunnels passed into and through the Loveland Fault Zone. The following information was taken from Robinson and Lee (1974).

- Approximate Length: 8949 feet
- Height: 48 feet
- Width: 40 feet
- Approximate Cover: 1470 ft
- Approximate Elevation: 11102 feet above sea level
- Rock types: predominantly Precambrian metasedimentary and igneous rocks
- Unconfined compressive strength range: 1,400 to 33,300 psi
- Confined compressive strength range: 8600 psi at 1500 psi confining pressure, 65,000 psi at 4000 psi confining pressure
- Geologic Structures: faults, veins, joints and contacts between rock units
  - Faults: Larmide and Tertiary Faulting and Precambrian Faulting

- Squeezing station interval: 44 to 110 (6600 feet)

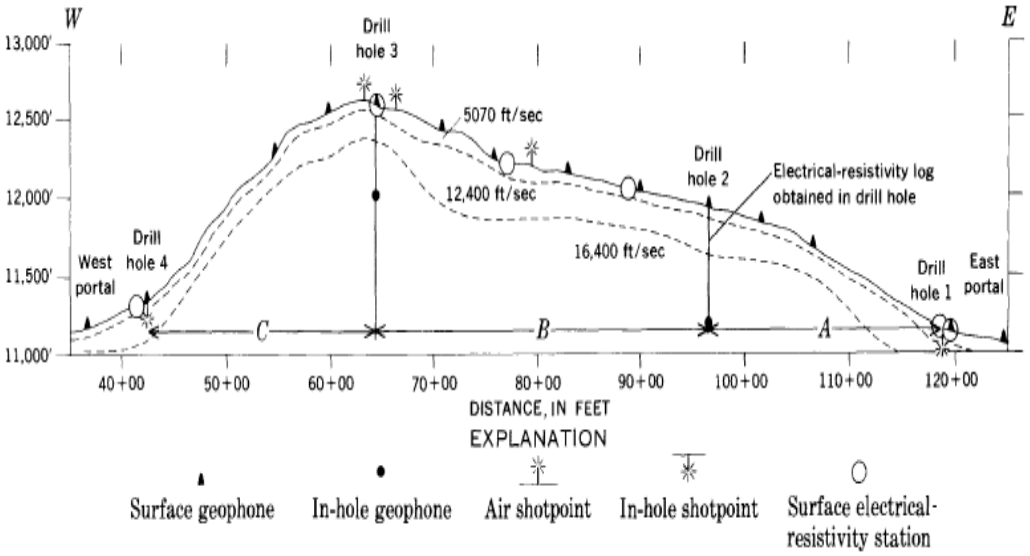

Figure 2.6 Profile along Straight Creek Tunnel (Robinson and Lee 1974)

There was no information on the nature (gradation or plasticity) of the soils and rocks in the squeeze zone.

2.4.2 Chameliya Hydroelectric Project

The Chameliya tunnel was built in the western region of Nepal (Basnet et al. 2013). The tunnel was driven almost parallel with and on the northwest side of the Chameliya River (Figure 2.7). The only station interval in which severe squeezing ground behavior was reported is between Stations 3+100m to 3+900m where the rock was crushed during geologic time (Figures 2.8 and 2.9). The squeezing behavior occurred in a talc phyllite. Because of the severe squeezing problems, the tunnel cross-section was reduced along this 800m reach of the opening. The following summary of the Chameliya Tunnel Project is taken from a paper by Basnet et al. (2013):

- Rock Types:
  - dolomite, dolomite with slate, talc phyllite and dolomite with phyllite
- Trend of bedding/foliation: east to west
- Intact unconfined compressive strength: 10 to 15 Mpa (1450 to 2176 psi)
- Tectonic stress: 3.5 Mpa (508 psi)
- Length: 4067 meters (13,343 feet)
- Diameter: 4.2 to 5.2 meters (13.8 to 17 feet)
- Overburden cover in squeezing reach: 199 to 285 meters (652 to 933 feet)
- Shear zone: 0+911m to 1+557m
  - encountered in slate
  - thin crushed zone on east end
  - overburden elevation between 110 to 1330 meters (360 to 4363 feet)
- Crushed zones:

STATION	MAXIMUM OVERBURDEN ELEVATION
0+871m to 0+911m	180 m (591 feet)
2+662m to 2+822m	160 m (525 feet)
3+100m to 3+300m	260 m (853 feet)

- Faults
  - along contact between dolomite and sandstone
  - along contact between dolomite and slate
- Tunnel wall closure as a result of squeezing: 1 to 2 meters (3 to 6.5 feet)

The reason for development of squeezing conditions in the crushed zone between Stations 3+100 to 3+300 appears to be related to the greater overburden cover (260 m 853 feet) compared with the other two crushed zone intervals. The diametric tunnel strain 7.14 and 11.7% associated with conditions described as severe squeezing ground falls into the very severe to extremely severe classification proposed by Hoek (2001) (see Section 2.3.2).

Figure 2.7 Location map of the Chameliya tunnel project (Basnet et al. 2013)

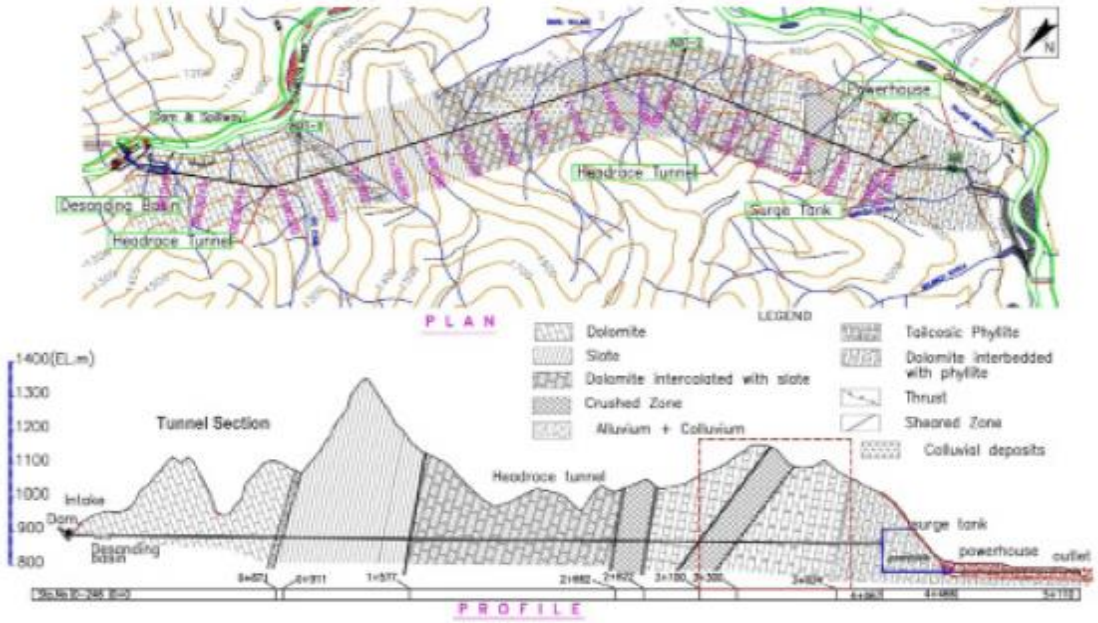

Figure 2.8 Geologic plan and profile along headrace tunnel (Basnet et al. 2013)

Figure 2.9 Squeezing conditions in headrace tunnel of Chameliya Project: significant floor heave (left) and wall closure in hill side (right) (Basnet et al. 2013)

2.4.3 Kaligandaki Hydroelectric Project

Kaligandaki is a hydroelectric project located in western region of Nepal (west of Kathmandu) (Basnet 2013). The owner is the Nepal Electricity Authority (NEA). Construction of the tunnel began in 1996 and it was completed in 2002. One of main stability problems that developed during tunnel construction was severe squeezing conditions which were encountered in many locations along the alignment. The reasons for the squeezing problems were the overburden stress (see Figure 2.10) and low compressive strength the graphitic phyllite (see Figure 2.11).

One of the documented locations where severe squeezing conditions were encountered was at Station 0+726 (Figure 2.12). The photograph shows cracks in the shotcrete lining which were attributed by Panthi (2006) to high squeezing pressure. The tunnel deformation is in a fault zone along the contact between graphite and siliceous phyllite. At this location, the tunnel is at an approximate depth of 200 meters (656 feet). Based

on the granular nature on the rock and its angle of repose, the fallout on the right side of the tunnel at Station 0+726 appears to be raveling (when the chunks of material start to drop of the arch or walls because of loosening or overstress and brittle fracture (Heuer 1974)) and not squeezing behavior. The measured strain in the central portion of the tunnel is provided by Panthi (2006) and is given in Figure 2.10 in this thesis.

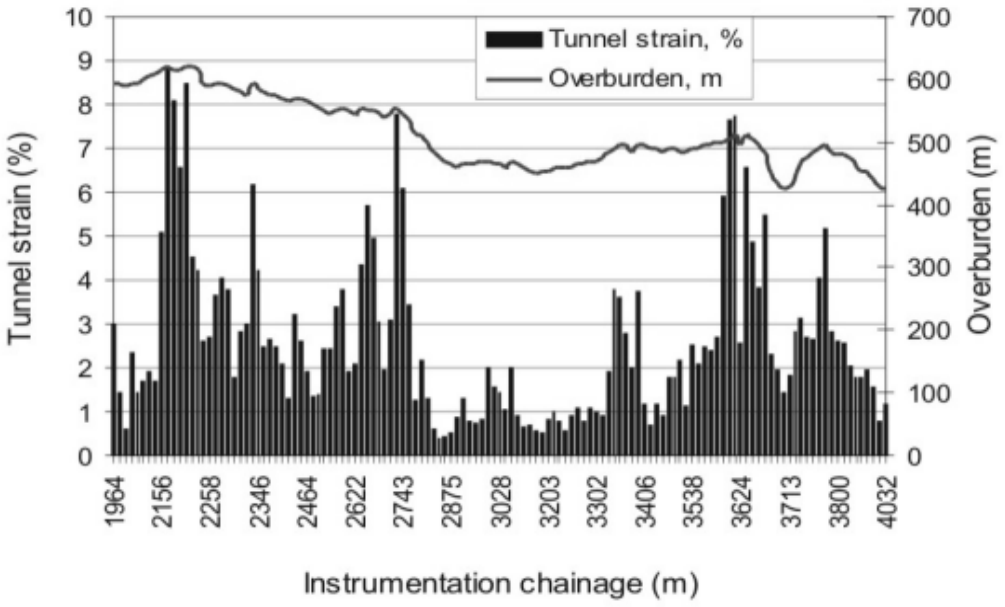

Figure 2.10 Level of overburden (Panthi, 2006)

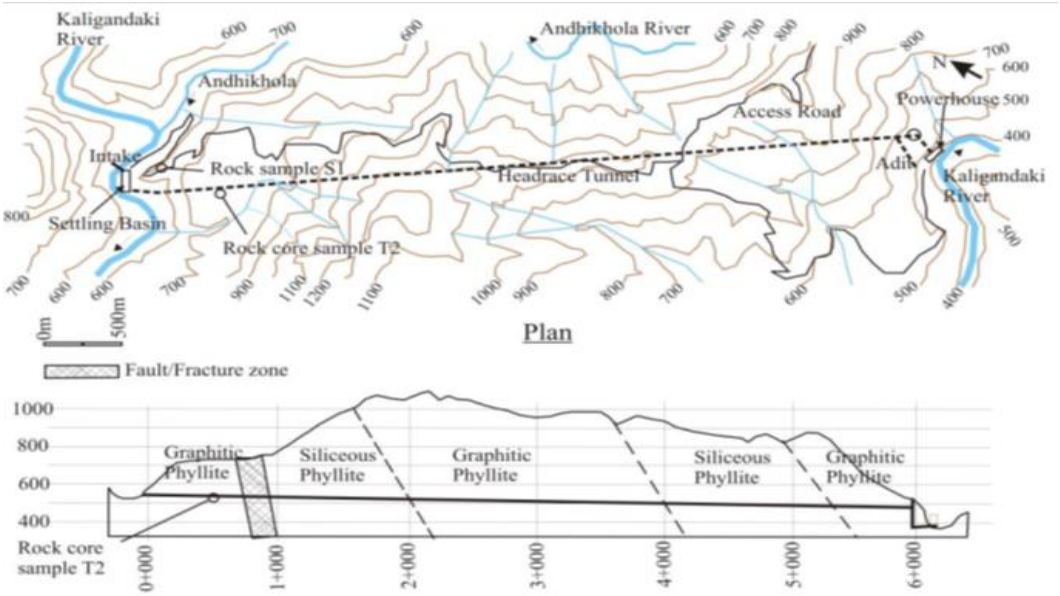

Figure 2.11 Geologic map and profile (Panthi, 2006)

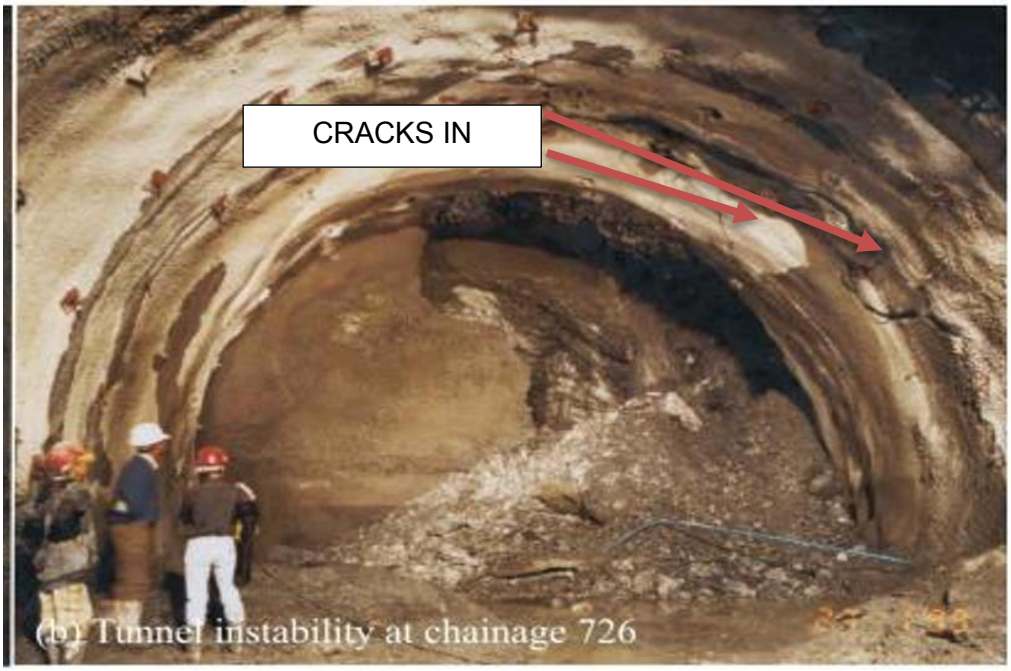

Figure 2.12 Cracks in shotcrete tunnel lining caused by high squeezing pressure (Panthi 2006)

Some of the general features in the Kaligandaki Headrace Tunnel taken from Basnet's thesis (2013) are:

- Rock Type: Graphitic phyllite, Siliceous phyllite, Siliceous dolomite
- Length: 6 km
- Size: 8.4 to 7.4 m
- Faults: small faults in graphitic phyllite
- Foliation joints: N85E TO S40E
- Dip angles: 25º to 55º.

2.4.4 Yacambu-Quibor, Venezuela

The Yacambu-Quibor dam project is located in northwest Venezuela (see Figure 2.13) (Rocnews, 2009). During construction, severe squeezing conditions developed at several locations along the alignment (Figure 2.14). The tunnel was driven in a very weak graphitic phyllite at depths of up to 1270 meters (4166 feet). Because of the severity of the squeezing conditions, it took 32 years to complete the tunnel project.

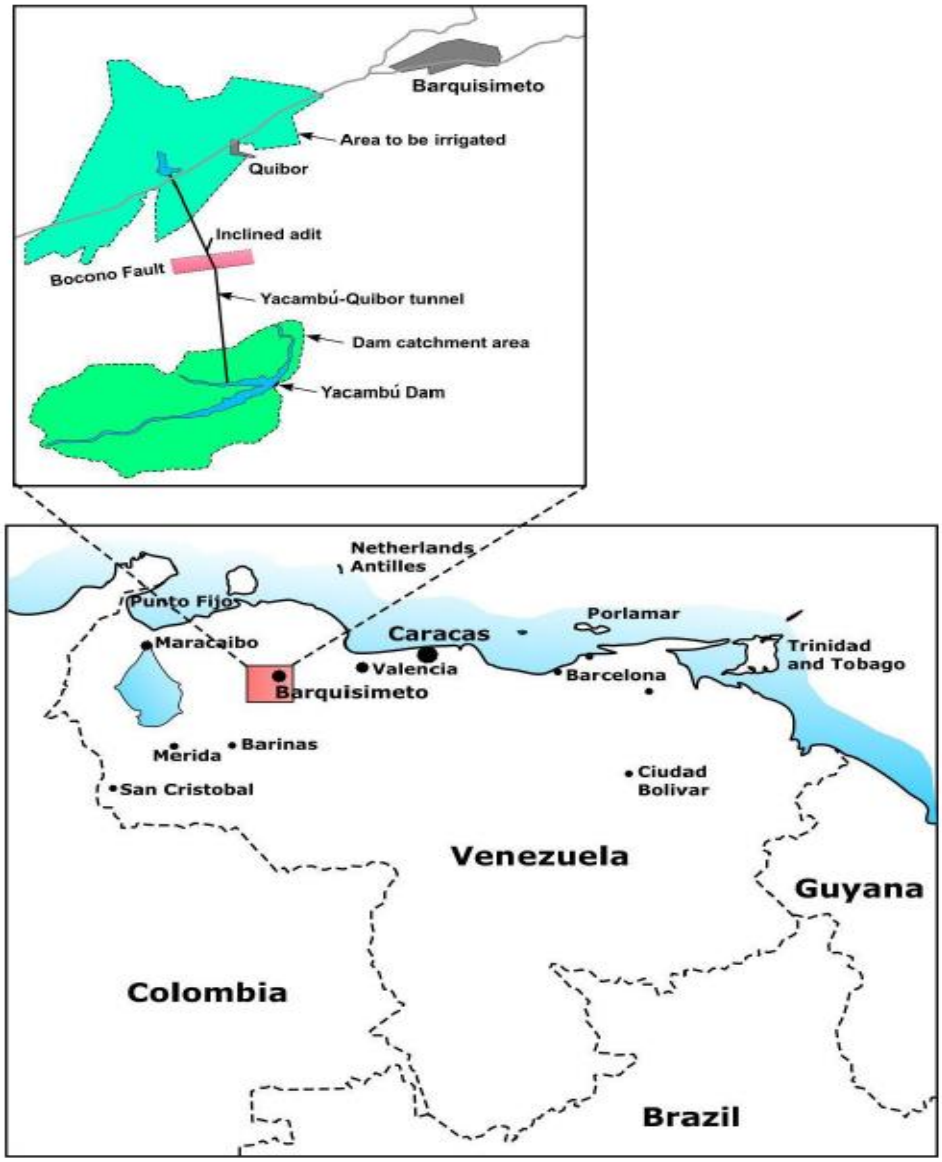

Figure 2.13 Yacambu-Quibor Project Location
(RocNews, 2009)

Figure 2.14 Severe squeezing conditions encountered in Yacambu-Quibor Pressure Tunnel (Basnet 2013)

The phyllite was tectonically deformed during past geologic time in a compressive stress field. Moreover, the project is located in a tectonically active region near the intersection of one continental and three oceanic plates (and South American, Cocos, Carribbean and Nazca). (A photograph of a graphitic phyllite not associated with the Yacambu-Quibor Project is given in Figure 2.15).

Figure 2.15 Tectonically deformed graphitic phyllite at tunnel face (RocNews, 2009)

Important features of the Yacambu-Quibor Tunnel are given as follows:

- Rock type: Graphitic Phyllite
- Length: 23.3 km
- Diameter: 4.0 meters (13.1 feet)
- Closure: 5m
- Strain: up to more than 30 %
- Uniaxial unconfined strength: 15 to 100 Mpa (2175 to 14500 psi)

The uniaxial compressive strength of intact graphitic phyllite (σ_{ci}) is 15 to 100 Mpa (2175 to 14500 psi) depending on the orientation of the schistosity. The highest strength was obtained when the axial load was perpendicular to the schistosity, whereas the minimum strength was measured when the schistosity was inclined at an angle of 30^o from the axial load. In the fault zones (such as the Bocono Fault in Figure 2.16), the rock is described as fragmented containing clay gouge (Basnet 2013). The behavior is described in Basnet Table 5-1 as

"(H)ighly plastic deformation with zero volume change."

The description of the rock/soil in the fault zones is close to the type of materials tested in this thesis.

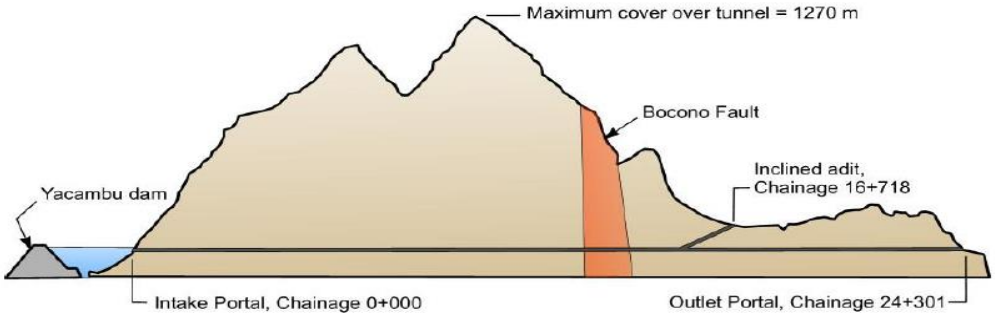

Figure 2.16 Profile along Yacambu-Quibor tunnel alignment (RocNews, 2009)

The maximum squeezing strain was more than 30% and was assigned an extreme squeezing value by Hoek (2001). According to Hoek and Guevera (2009) referenced

in Basnet's thesis, the invert heave started to occur at a distance of approximately 100 meters (360 feet) behind the TBM cutter head (Figure 2.17). At this location, the tunnel was at a depth of 400 to 425 meters (1312 to 1394 feet) below the ground surface.

Figure 2.17 Invert heave in Yacambu-Quibor tunnel (Basnet 2013)

Figure 2.18 shows the tunnel strain as well as development of the plastic zone/tunnel diameter along the Yacambu-Quibor tunnel alignment. The plot shows significant variation in strain in the deepest section of the alignment (greater than 600 meters [1968 feet]). The maximum measured strain is approximately 16.5% below the greatest overburden cover (approximately 1266 meters [4153.5feet]). The percent strain in the Bocono Fault was about 3% which falls in the severe squeezing range (see Table 2.5).

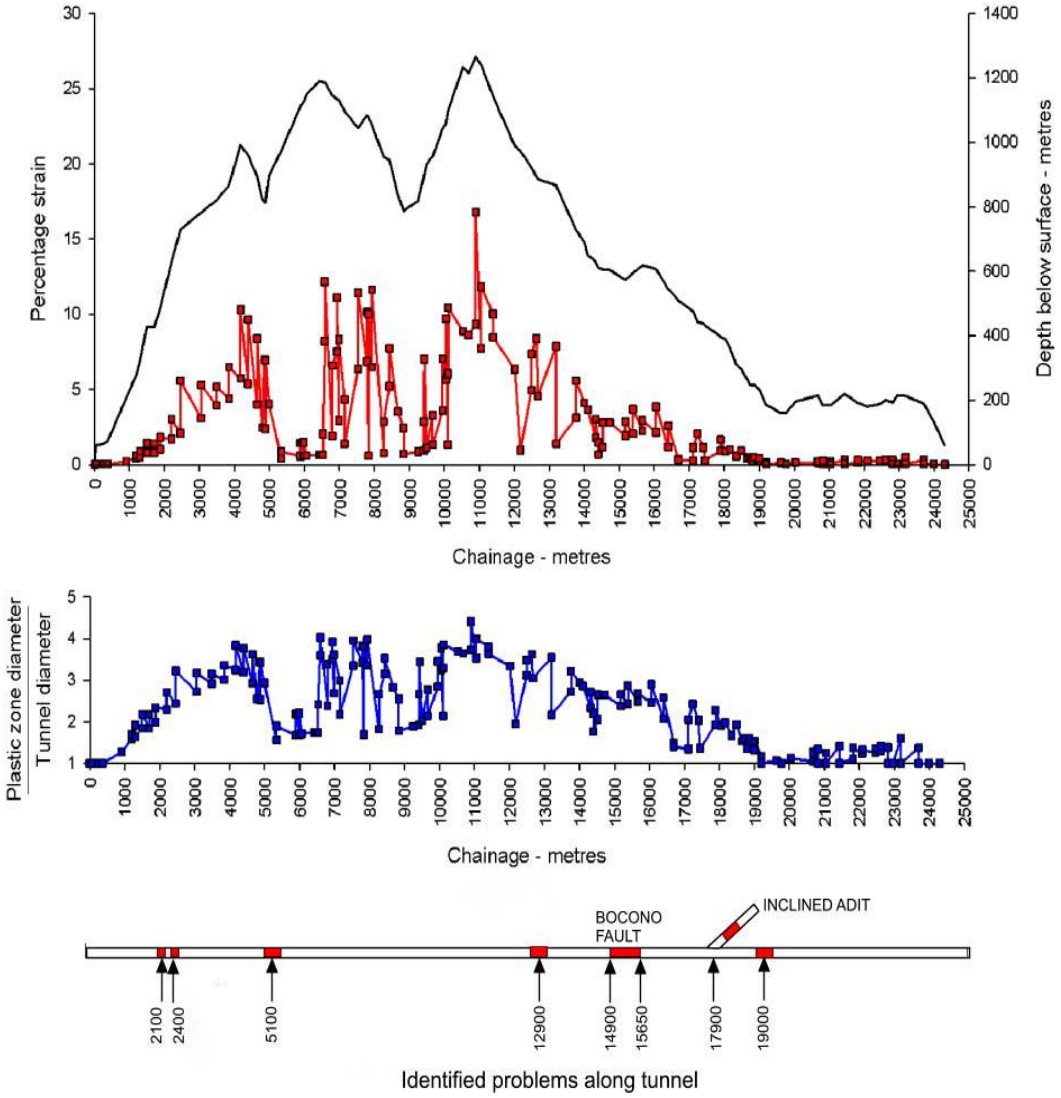

Figure 2.18 Percent strain and depth of yield/tunnel diameter in Yacambu-Quibor tunnel
(RocNews, 2009)

Ten years after completion, the pressure tunnel collapsed near the upstream portal at chainage 2+100 (RocNews, 2009). According to the studies by Basnet (2013), the main reason for the collapse was severe squeezing in the graphitic phyllite (Figure 2.19), even though the closure during tunneling was roughly 2%.

Figure 2.19 Collapse zone and reconstruction of Yacambu-Quibor tunnel attributed to squeezing ground (RocNews, 2009)

Other than rock type and ranges of unconfined compressive strength tests, there is no specific information on the nature or deformation characteristics of the materials in the squeeze zones. The Yacambu-Quibor tunnel project was the only case in which the sheared rock with clay gouge were identified in the fault zones. Moreover, there are no engineering property data in the numerous case histories studied as part of this thesis.

CHAPTER THREE - Methodology Used in This Study

3.1 Introduction

In this study, a series of Atterberg Limit tests (liquid limit and plastic limit) were conducted in the ISU soil mechanics laboratory on prepared mixes of quartz sand and commercial clay (Kaolin) to determine the relationship between sand/water content and ductility of soils in predicting squeezing behavior in soft ground and rock tunnels. In theory, the Plastic Limit is the minimum water content at which clay exhibits ductile behavior. Moreover, the plastic limit test is the water content below which the soil cracks when rolled on hard surface. It is the water content transition between ductile (water content above) and brittle (water content below) behavior. The prepared mixes had variable percentages of sand ranging between 10 and 90% by weight and water contents ranging between 8% above and fell within 5% below the plastic limit.

The ductility of sand-clay mixes was further investigated by performing unconfined compressive strength (UCS) tests on the specific sand-clay mixes. The samples were prepared at water contents near the plastic limit. Squeezing behavior in unconfined compression is expected when the water content is above plastic limit. Conversely, brittle behavior is anticipated when the water content is below the Plastic Limit.

All Atterberg Limit and Unconfined Compressive Strength Tests were performed in accordance with the American Society of Testing Materials (ASTM) specifications (D-4318 and D-2166, respectively).

3.2 Experimental Work

3.2.1 Materials

Both sand and clay are soil minerals which are distinguished by grain size and plasticity. The Unified Soil Classification System (USCS) grain size range for sand is 4.75 to 0.075 millimeters, whereas clay minerals are flat and elongate particles with a maximum size of 0.002 millimeters (ASTM 2487 and McCarthy 2007). Because of their small size and electrostatic surface charges, clay minerals absorb water which is responsible for the plasticity of clay. Plasticity is the ability of a soil to be remolded without cracking. In contrast, sand has no plasticity. When sand and clay are mixed together, the clay between and around the sand gains provides ductility.

Clay minerals are subdivided into three basic groups: Kaolinite, Illite and Montmorillonite. According to Terzaghi (1946) one if the most important physical properties of clay is swelling behavior associated with addition of water or removal of pressure. Swelling conditions in which soil/rock undergo a volume increase in response to wetting or a reduction in ground pressure during excavation can occur in tunnels containing active clay minerals. It is the intention of this study to investigate squeezing conditions without significant swelling. Thus, kaolin clay was chosen for all of the experiments performed in this investigation (Figure 3.1).

The American Geological Institute (AGI 1997) describes kaolin [econ geol] as

> "(A) soft, relatively non-plastic but dispersible, usually white or nearly white claystone composed primarily of the kaolin group principally kaolinite but often containing a variable proportion of, e.g. mica or quartz."

Under the AGI (1997) mineralogic description of kaolin

> "(T)he kaolin minerals are generally derived from alteration of alkali feldspars and micas. The have lower base-exchange capacities than montmorillonite and illite, and they absorb less water and thus have lower plasticity indexes, lower liquid limits and less shrinkage when drying from a wet state."

The kaolin clay was purchased from a commercial vender: Bulk Apothecary Company of Aurora, Ohio.

The specific physical properties of the kaolin clay provided by the supplier are outlined as follows:

Average article size: 0.8 microns
Brightness: 82 to 84%
Specific gravity: 2.58%
pH: 6.0%
Refractive Index: 1.57%
Color: White
Streak: White
Hardness (Mohs): 2 - 2½
Cleavage: Perfect on {001}.
Fracture: Irregular/Uneven, Conchoidal or Sub-Conchoidal
Loose density: 25 lb/cu.ft
Packed density: 45 lb/cu.ft.

Bulk Apothecary Company (2017) provided the following chemical analysis of the kaolin clay by weight:

SiO_2: 44.5%
Al_2O_3: 39.5%
TiO_2: 1.5%
Fe_2O_3: 1.0%
CaO: 0.25%
Na_2O: 0.04%
Moisture: 0% - measured in ISU Soils Laboratory
Loss on Ignition (L.O.I.): 14.0%

Figure 3.1 Photograph of kaolin clay used in this investigation

The sand used in this investigation is crushed quartz manufactured by Unimin Company of New Canaan, Connecticut. Manufactured sand was used to provide homogeneity and minimize impurities in the test materials (Figures 3.2 and 3.3). Two grain size distribution tests were performed to verify the uniformity of the crushed sand. Gradation curves for the sand are given in Figures 3.4 and 3.5. The grain size falls within the medium sand range (No. 10 and No. 40 sieves). The fines (silt and clay) content is zero, the uniformity coefficient (C_U) is 1.86 and 1.9 and the coefficient of curvature (C_C) is 0.78 and 0.8. The sand is classified as an SP (poorly graded) in the Unified Soil Classification System (USCS). The individual sand particles are angular to sub-angular in shape and will tend to break under slight hammer pressure. Breakdown of the sand grains which changes the gradation is not an issue in the Atterberg Limit and unconfined compressive strength tests. The maximum particle size of the sand is less than 2 mm which is at least 12 times finer than the diameter of the compression samples (25.4 mm). Thus, particle size should not impact the compressive strength test results.

The physical properties of quartz sand are given by Unimin (2017) as follows:

Shape: sub-angular to angular particles
Lustre: Vitreous
Transparency: Transparent to Translucent
Color: clear, white, gray and brown

Streak: Colorless - harder than the streak plate
Hardness (Mohs): 7.0
Cleavage: none to typically breaks in conchoidal fracture
Specific Gravity: 2.65 g/cm^3
Moisture Content: < 0.1%
Bulk Density, Loose: 92-95 lb/ft^3
Bulk Density, compacted: 98-100 lb/ft^3.

Unimin (2017) provided the following chemical analysis of the sand by weight:

Silicon Dioxide (SiO2): 87.3 to 90.48%
Iron Oxide (Fe2O3): 0.1 to 0.11%
Aluminum Oxide (Al2O3): 5.45 to 7.24%
Calcium Oxide (CaO): 0.36 to 0.61%
Titanium Dioxide (TiO2): 0.02%
Magnesium Oxide (MgO): 0.02%
Potassium Oxide (K2O): 2.5 to 2.8%
Sodium Oxide (Na2O): 0.7 to 1.7 0.02%
Loss on Ignition (L.O.I.): 0.25 to 0.3 0.02%

Figure 3.2 Crushed quartz sand

Figure 3.3 Close-up of crushed quartz sand used in this study

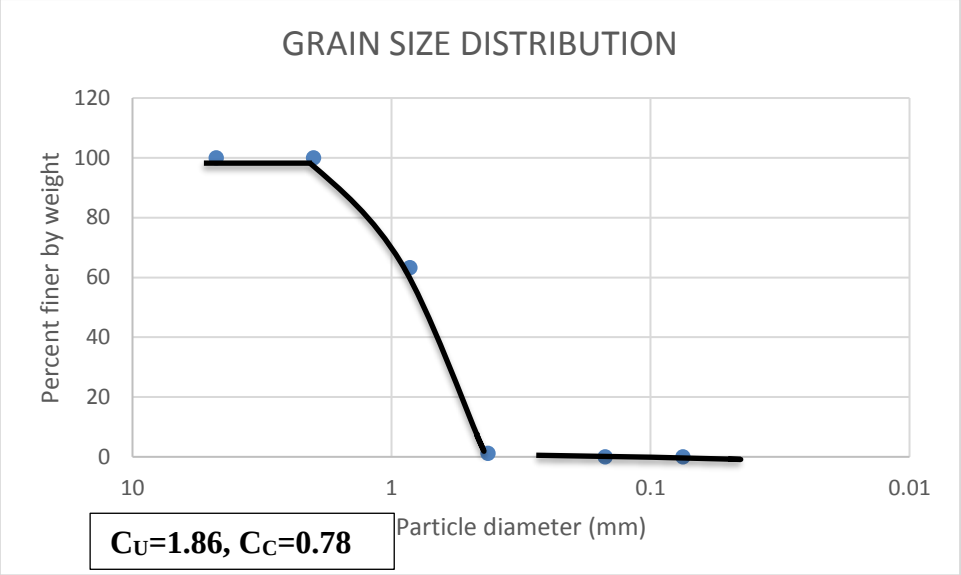

Figure 3.4 First gradation curve of crushed sand used in this study

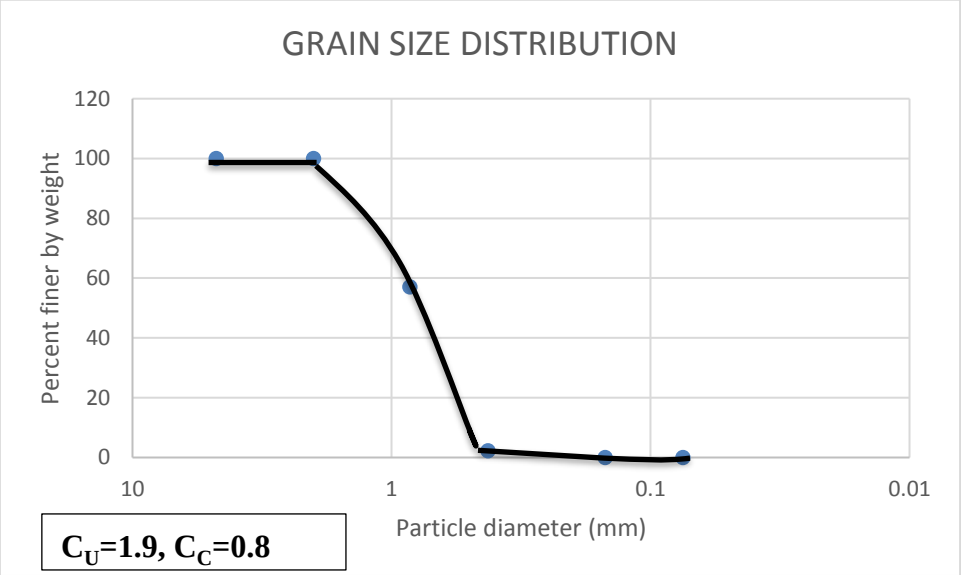

Figure 3.5 Second gradation curves of crushed sand used in this study

3.2.2 Sand/Clay Mixes

In this study, different mixtures of sand and clay were made to determine the effect of sand content on Atterberg Limits and ductility. The sand content varied between 10 and 95% of total dry weight. After the components were measured out, the sand, clay and water were thoroughly mixed and placed in plastic, air-tight containers (Figure 3.6).

The design mixes used in the Atterberg Limit and unconfined compressions strength tests are given in Table 3.1 and 3.2, respectively. Above sand contents of 80%, sand/clay mixes were non-plastic. Thus, no unconfined compression tests to study ductility were performed on samples with more than 80% sand by weight.

Table 3.1 Mass and percentage of sand and clay used in Atterberg limit tests

SAND (%)	**CLAY (%)**	**SAND[1] (gm)**	**CLAY[1] (gm)**
0	**100**	**0**	**200**
10	**90**	**20**	**180**
20	**80**	**40**	**160**
40	**60**	**80**	**120**
50	**50**	**100**	**100**
70	**30**	**140**	**60**
80	**20**	**160**	**40**
82.5	**17.5**	**165**	**35**
85	**15**	**170**	**30**
90	**10**	**180**	**20**
95	**5**	**190**	**10**

[1] Total Dry Weight

Table 3.2 Mass and percentage of sand and clay used in unconfined compression tests

SAND (%)	CLAY (%)	SAND[1] (gm)	CLAY[1] (gm)
0	100	0	200
10	90	20	180
20	80	40	160
40	60	80	120
50	50	100	100
70	30	140	60
80	20	160	40

[1] Total Dry Weight

Figure 3.6 Storage of prepared sand-clay specimens in plastic containers

3.2.3 Atterberg Limit Tests

The Atterberg limit tests are engineering property tests used to estimate the behavior of cohesive soils at different water contents. Depending on the water content of a soil, it may be present in one of four states: solid, semi-solid, plastic and liquid (McCarthy 2007). The liquid limit is the water content above which the soil behaves as a liquid, whereas the plastic limit is the water content below which the soil behaves as a semi-solid or a solid. As an index of squeezing behavior, the plastic limit test is most useful since this test provides the water content at which clay changes from plastic to brittle behavior. At water contents above the plastic limit, the clay will exhibit ductile behavior until some water content above the liquid limit where the soil will behave as a slurry. The range of water content over which the soil behaves as a ductile material is the plasticity index (numerical difference between the liquid and plastic limit).

3.2.3.1 Liquid Limit Tests

In this study, the liquid limit test was performed to classify sand-clay mixes based on UCSC. To prepare the samples, the first step was to calculate the relative percentages of sand and clay based on total dry weight. The next step was measure out the proportions to the components nearest gram. After mixing the sand and clay, the tap water was added to achieve various water contents. The samples were allowed to mellow at least 48 hours in order to provide sufficient time to completely hydrate the clay. The samples were stored in the plastic containers and during the hydration period. They were checked and mixed to obtain a uniform consistency with no visible clay nodules.

After the curing period, the liquid limit tests were performed by placing a soil pat about 1 cm thick in the liquid limit device (Figures. 3.7 and 3.8). A 1/8-in. wide groove was then cut using a standard grooving tool in the middle of the sample. The cup is raised to a height of 1 cm and then dropped onto a hard rubber surface to apply a dynamic load to the specimen. The number of blows are recorded until the groove closes approximately 1/2 in. at which time the dynamic portion of the test is terminated (Figure 3.9). A portion of sample is extracted from the closed portion of the groove and the water content is measured (Figure 3.10). Multiple liquid limit tests are performed at the same sand-clay ratio but at different water contents. The water content and number of blows for each test are plotted on a semi-log graph. By definition, the liquid limit is water content at which groove closes 1/2 in. with 25 blows in liquid limit device.

Figure 3.7 Liquid limit device

Figure 3.8 Groove 1/8-in. wide cut in sand-clay specimen

Figure 3.9 Groove closed in response to dynamic load

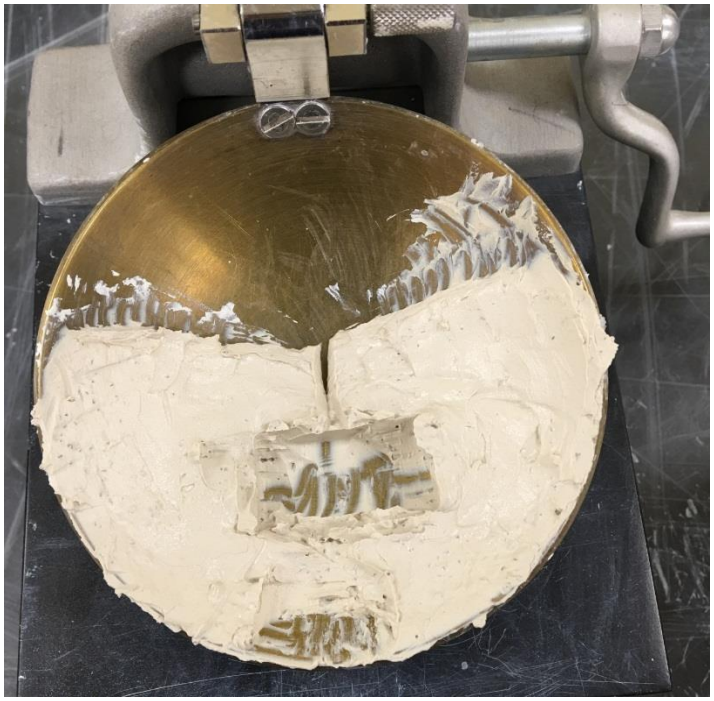

Figure 3.10 Portion of sample extracted for water content test

3.2.3.2 Plastic Limit Tests

In the plastic limit test, a portion of a sand-clay sample is rolled on a hard surface into a 1/8-in thick thread until it breaks into the sausage-shaped cylinders roughly 1/2- in. long (Figures 3.11 and 3.12). The cylinders are then placed into a container to determine the water content. Multiple tests are performed on each same sand-clay mix until water contents are within 1% at the plastic limit. The unused portions of the samples left over from the liquid limit tests were used in the plastic limit tests.

In order to classify the sand-clay mixes, the plasticity index must be calculated using the numerical difference between the liquid and plastic limits.

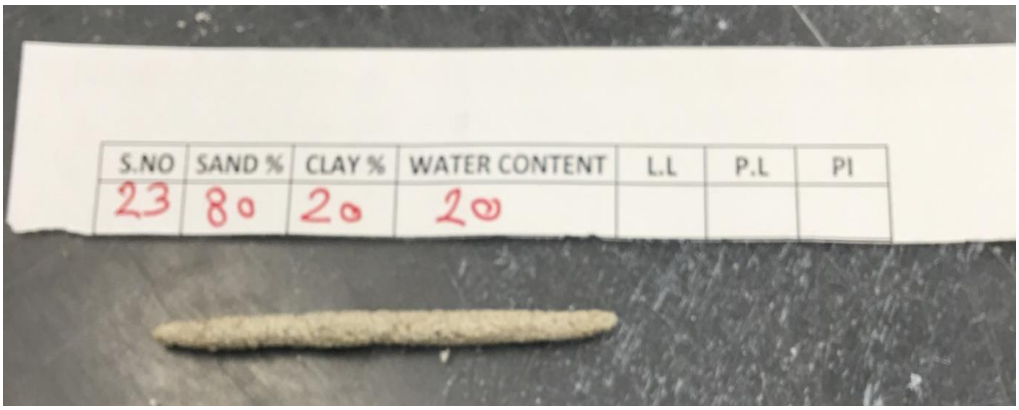

Figure 3.11 Plastic limit 1/8-in. thread

Figure 3.12 Crumbled sausages placed in cup to determine water content

3.2.4 Unconfined Compressive Strength Tests

The unconfined compression strength tests (UCS) were performed to study the behavior and strength of the sand-clay mixes. This test is well-suited to study squeezing behavior in tunnels because the samples in the unconfined tests have zero confining pressure similar to conditions at the perimeter of the opening. In the absence of confining pressure, sand-clay mixes undergo changes from ductile to brittle behavior at lower stress-strain levels than in confined samples in triaxial tests. Thus, the test results in this investigation should provide limiting values of strain and consistency (strength) in of sand-clay mixes in tunnels subjected to squeezing conditions.

The process for preparation of the sand-clay-water mixes was the same as in the Atterberg limit tests. The samples were allowed to mellow (cure) for a minimum of 96 hrs, to allow the clay to fully hydrate before the cylinders were made. Four series of

unconfined compressive strength tests were performed on each mix in Table 3.2 at water contents above, at and below the plastic limit.

The test cylinders were prepared using the extraction portion of the Harvard Minature Compactor (see Figure 3.13). (The compaction ram could not be used because the mixes did not have sufficient strength to be properly compacted the samples at water contents near the plastic limit.) Prior to compaction, the inside surface of the mold was lubricated with a thin layer of oil to facilitate extraction of the soil cylinder from the mold. The samples were compacted in three to eight layers depending on the consistency of the mix. Each layer was compacted with twenty blows of the extraction ram. The surface between each layer was scarified with spatula to facilitate the bond between the lifts. The soil cylinders were placed in the labeled plastic bags and stored two to seven days in a separate, large plastic container prior to performing the compression tests (Figure 3.14). Compaction water contents were
measured using remnants of the samples and/or from soils trimmed for the cylinders. The
diameter, length and mass of each sample were measured in order to determine the wet and dry unit weight.

The unconfined compressive strength tests were carried out using a Durham Geo Slope Indicator compression machine (Figure 3.15). The load cell and the LDT were sent to the supplier for calibration on November 2016 prior to performing the tests. The LDT unit is an E-311 linear displacement transducer capable of a measurement range of 0.00 to 1.00 inch with an accuracy of 0.001-inch. The load cell is an E-212 which is S-type cell with a load capacity of 2500.00 lbf (11 KN). The load/displacement readout is model E-40520 which has dual smart digital indicators with 5 digits. The rate of loading is each test was constant: 0.5 in./minute consistent with ASTM D-2166.

The outputs from the load cell and LDT were displayed on the digital monitors and the displacement, load and time data recorded on a computer using Win-Sas software (Version 1.17). This version of the software is capable of recording the data at least every two seconds and produces a load displacement graph on the computer screen. The user only needs to log-in the trigger measurement, failure measurement and start time prior to performing the test.

All tests were photographically recorded using a digital camera. One of the most important parts of the study was the visual observations of the behavior of the sand-clay mixes during the compression tests. Records were made of strains at sample bulging, development of the first extension cracks and ultimate formation of shear failure surfaces. After the tests, the widths and heights of the deformed samples were recorded. The samples were then photographed and placed in containers to measure water contents. In several tests where shear failures developed, the water content was determined inside and outside the sheared sections of the sample.

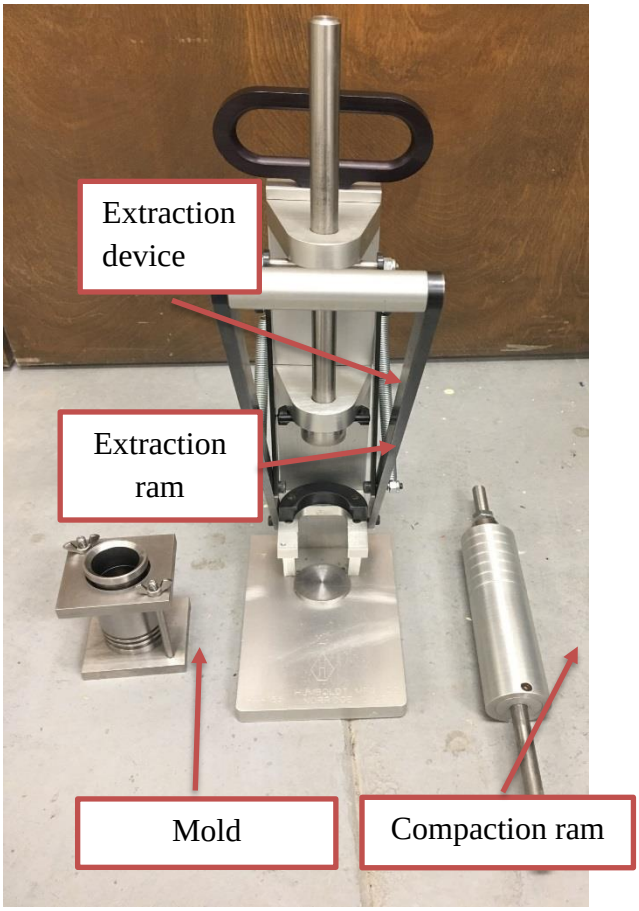

Figure 3.13 Harvard Minature Compactor used to prepare test samples

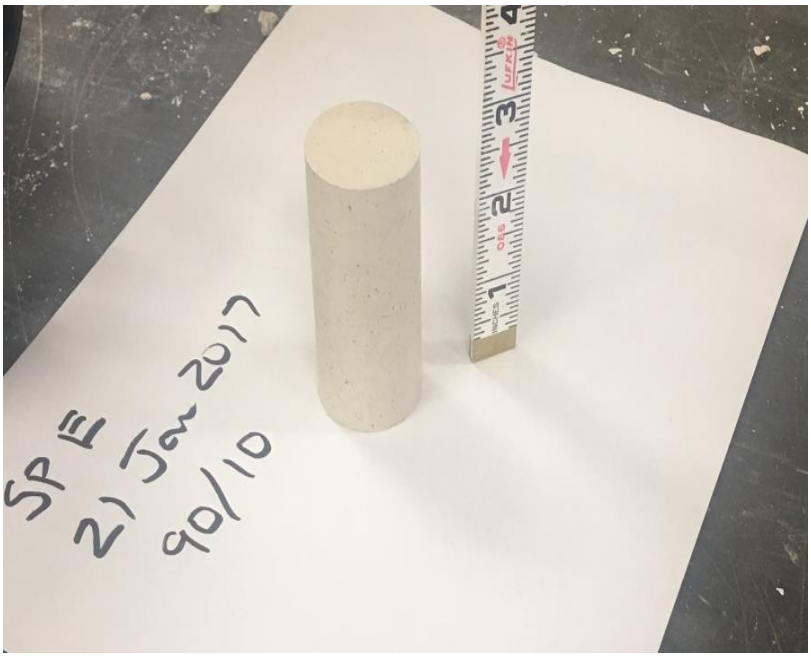

Figure 3.14 Typical unconfined compressive strength test sample

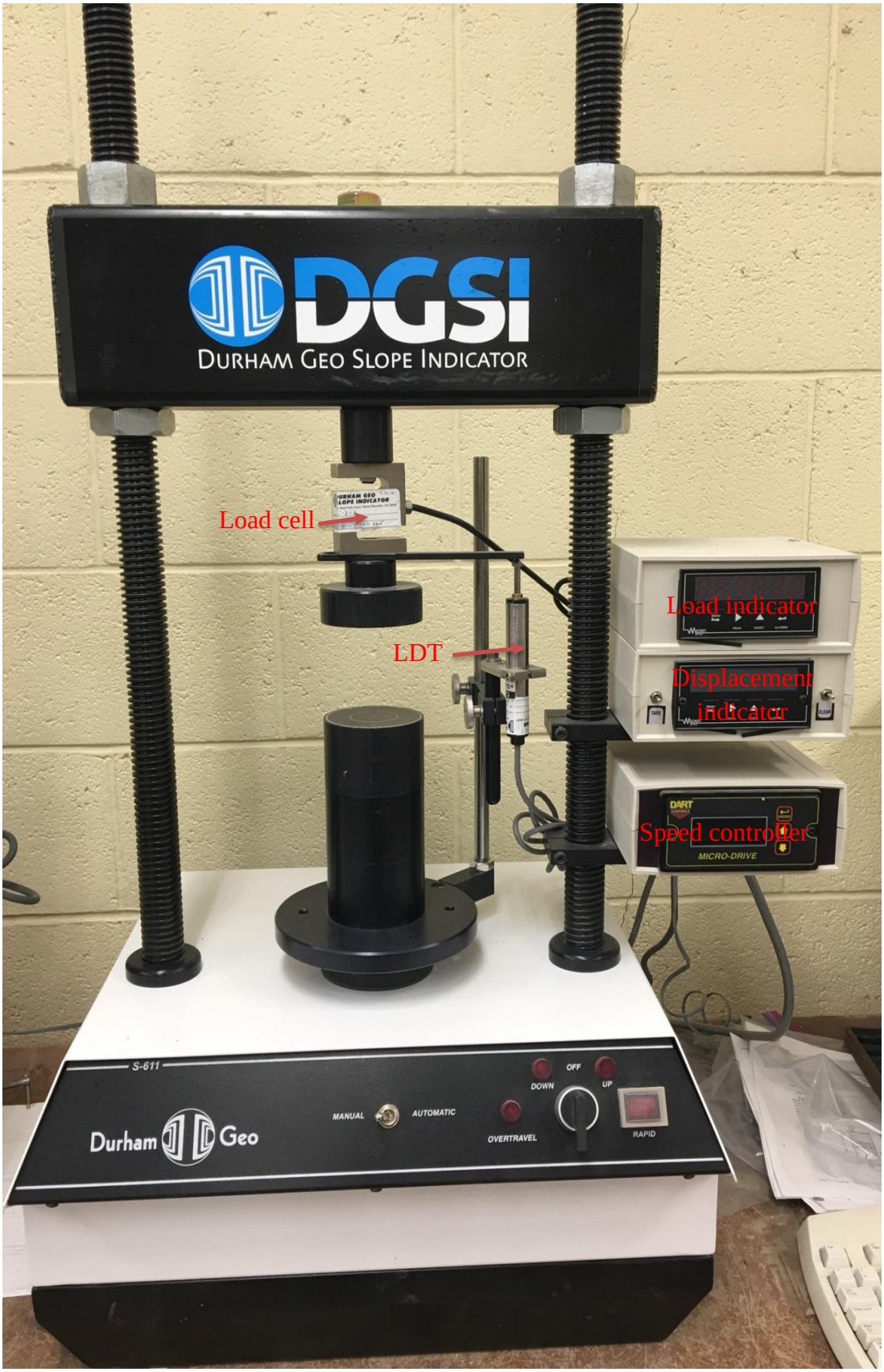

Figure 3.15 Durham Geo Slope Indicator compression machine

CHAPTER FOUR - Results of the study

This chapter presents the result of this investigation. A total of 67 liquid limit, 30 plastic limit and 21 unconfined compressive strength tests were performed in the study of squeezing behavior using the methodology criteria explained in Chapter 3.

4. 1 Atterberg Limits

In this study, liquid limit (W_L) and plastic limit (W_P) tests were performed on eleven mixtures of the commercial quartz sand and kaolin clay (Table 4.1). The plasticity index (PI) given in the table is the difference between the liquid and plastic limits and is the range in water content over which the soil behaves as a plastic material. Plastic limit values were obtained for 0 to 80% sand content. Above 80% sand the samples could not be rolled into threads to obtain a plastic limit value. The samples above 80% sand are non-plastic and would not be expected to exhibit squeezing behavior. Neither liquid nor plastic limit values could be obtained for samples with 95% sand. Based on the Atterberg Limit test results, the limiting sand content for development of squeezing conditions in tunnels in non-expansive clays in approximately 80% by dry weight.

Table 4.1 Atterberg limit test results

SAND (%)	CLAY (%)	W_L (%)	W_P (%)	PI (%)	USCS
0	100	68	38.7	29.3	MH
10	90	58	30.2	27.8	MH
20	80	50	28.1	21.9	CH
40	60	40	18.3	21.7	CL
50	50	32	16.9	15.1	CL
70	30	24	17.8	6.2	SC
80	20	20	15.9	4.1	SC
82.5	17.5	19	N/A	N/A	SC
85	15	18.5	N/A	N/A	SC
90	10	17.5	N/A	N/A	SP-SC
95	5	N/A	N/A	N/A	SP-SC

The sand-clay mixes were classified based on the USC System. Mixes with 0 to 20/40% sand the mixes are classified as high plasticity silt (MH) and clay (CH). Between 20/40 and 50/70% sand, the mixes are low plasticity clay and between 50/70 and 80% sand are classified as sandy clay. General descriptions of the soil classes found in this study are provided in Table 4.2.

Table 4.2 USCS symbols and general descriptions of soil types used in this study of squeezing behavior in tunnels (California Department of Transportation 2017)

MH	Inorganic silts, micaceous or diatomaceous fine sandy or silty soils: elastic silts
CH	Inorganic clays of high plasticity: fat clays
CL	Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays: lean clays
SC	Clayey sands and sand-clay mixtures

As expected, as the sand content increases the plasticity of the mix decreases (Figure 4.1). The reduction in plasticity is the combined effect of decreases in both the liquid and plastic limits (Table 4.2).

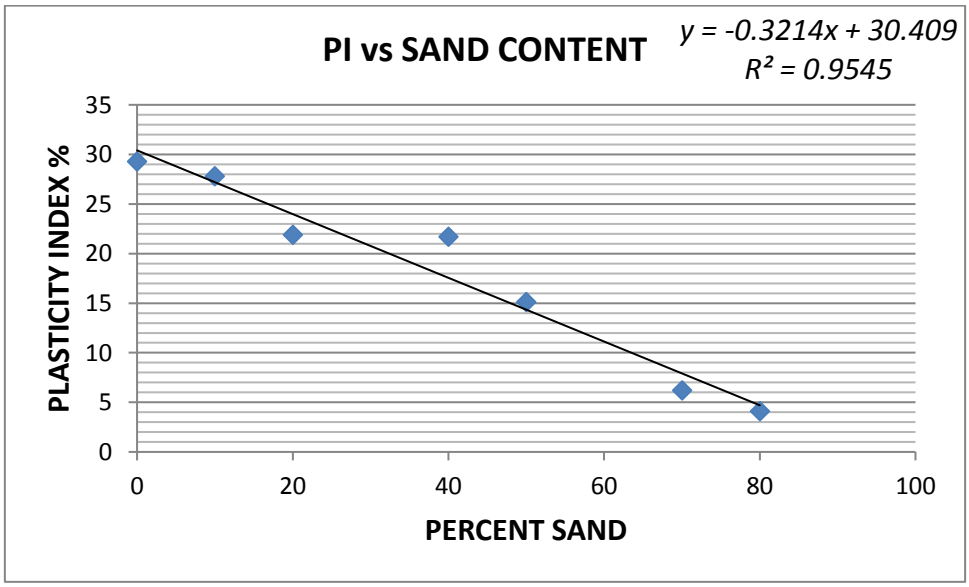

Figure 4.1 Relationship between plasticity index and sand content obtained in this study

The plastic limit water contents for each mix were used to prepare the samples for study of squeezing behavior in unconfined compression. As the sand content increases, the compaction water content for the sand-clay mixes decreases for the compression tests decreases (Figure 4.2).

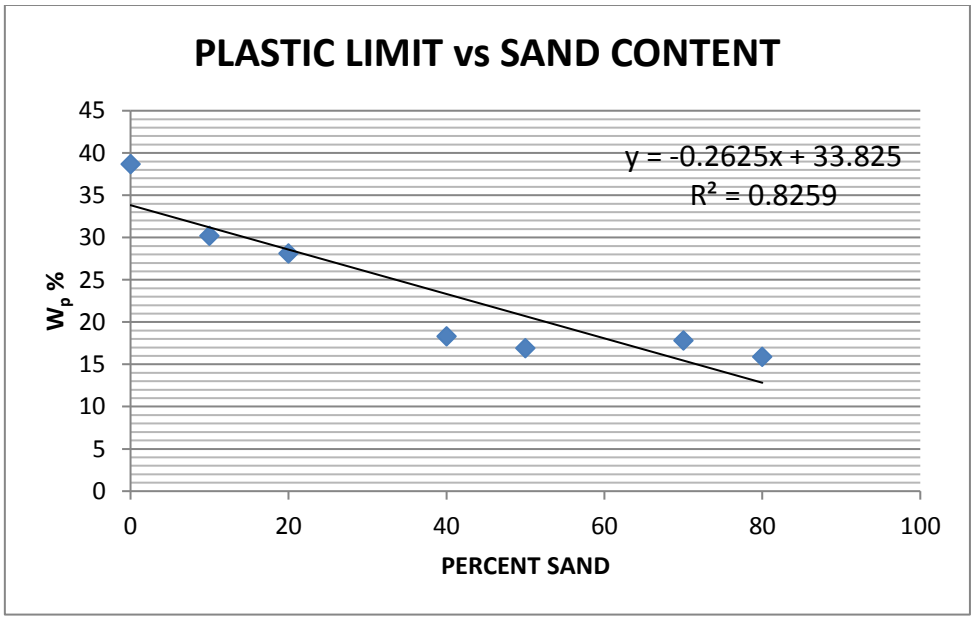

Figure 4.2 Reduction in plastic limit values related to increased sand content

4.2 Unit Weight of Sand-Clay Mixes

After making cylinders of the sand-clay mixes, each sample was weighed and measured to determine the total (γ_T) and dry unit (γ_d) weights. Total unit weight is weight or mass per unit volume (γ=W/V), whereas dry unit weight is dry weight or mass per unit volume ($\gamma_{d=}$ W_S/V).

The dry unit weights of nearly all of the samples ranged between 80 and 120 lb/ft^3. The dry unit weights were lowest (less than 100 lb/ft^3) for mixes with the highest clay contents (0 to 20% sand). The dry unit weight increases with increasing percentage of sand (Figure 4.3). Because of the compositional differences of the sand-clay mixes, there is no correlation between dry unit weight and the ultimate unconfined compressive strength.

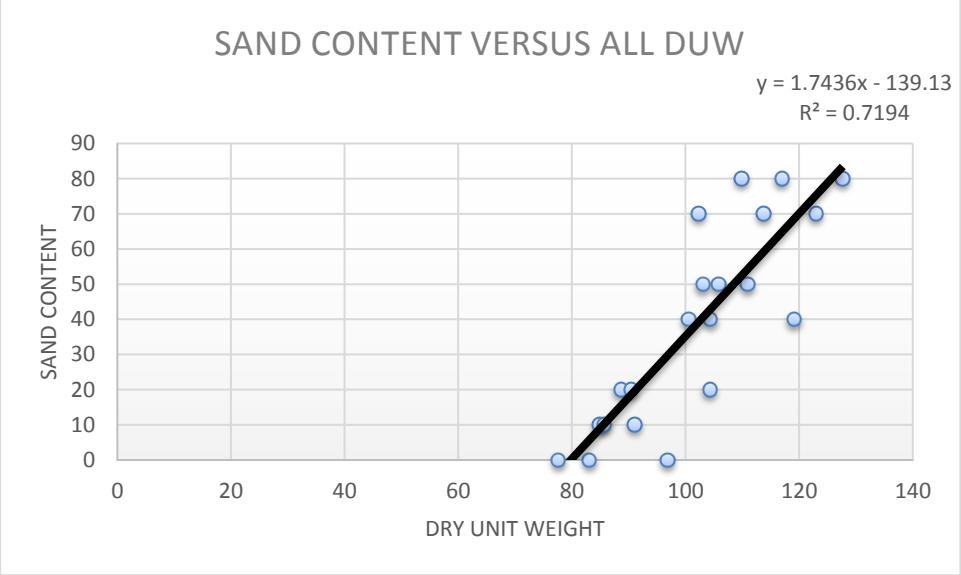

Figure 4.3. Relationship between dry unit weight and percent san

4.3 Unconfined Compressive Strength Test Results

In this study, three series of unconfined compressive strength (UCS) tests on different sand-clay mixes were conducted at water contents at and near the plastic limit. The test results provide the basic data on stress and strain levels at initiation of first visual crack and the maximum unconfined compressive strength of the sand-clay mixes. The stress/ deformation performance up to crack initiation is in the realm of squeezing behavior. After the development of the first extension cracks, the behavior is a combination of brittle/ductile deformation (crack formation on the outside and plastic bulging in the interior of the sample similar to observations in tunnels) (Mahar 2017). Once the shear crack(s) form, the behavior is no longer squeezing but rather brittle deformation (see Figure 2.5a).

Strain and stress in the sand-clay mixes were calculated using following equations:

$$\varepsilon_v = \frac{\Delta L}{L_0}$$

where: ε is axial strain

L_0 is original length

ΔL is change in length

$$\sigma = \frac{LOAD}{A_C}$$

where: σ is axial stress

A_C is corrected area

The corrected area (AC) is based on ASTM D-2166 and is calculated using the following equation:

$$A_C = \frac{A_0}{1 - \varepsilon_v}$$

where: A_0 original cross-sectional area of the sample.

Clay with 0% sand was used as the control in evaluating squeezing behavior in unconfined compressive. The results on the samples made entire of clay are summarized in Table 4.3.

Table 4.3 Results of unconfined compressive strength tests on control samples

Clay (%)	Sand (%)	WP (%)	POST WATER CONTENT (%)	STRESS AT FIRST CRACK (tsf)	STRAIN AT FIRST CRACK (%)	MAXIMUM STRESS (tsf)	UNIT WEIGHT	DRY UNUIT WEIGHT
100	0	38.7	37.0	0.6	12.4	0.6	116.9	83.1
100	0	38.7	37.7	0.3	13.1	0.4	106.9	77.6
100	0	38.7	42.7	0.2	12.2	0.2	137.8	96.9

The percent strain to first crack (12.2 to 13.1%) is consistent in all tests given the limited range in post-test water content of 1.7 below and 4.0% above the plastic limit. The unconfined compressive strength of the clay at first crack increases from 0.2 tsf to 0.6 tsf consistent with the reduction in post-test water content (from 42.7 to 37.0%). The sand-clay samples were prepared using the same procedures as for the control clay samples.

4.3.1 Squeezing Behavior at Water Contents above Plastic Limit

A series of six UCS tests were performed on sand-clay mixes at water contents of 0.9 and 5.4% above the plastic limit (Table 4.4). At these water contents, squeezing behavior is expected in all of the sand-clay mixes since the soil moisture is above the limiting value where cracks develop in response to stress-induced rolling of the sample. Moreover, the compression tests above the plastic limit show ductile behavior similar to squeezing behavior in soft to medium stiff cohesive soils adjacent to an underground opening.

The ductile strains at first crack ranged between 4.1 and more than 17.5%. In Hoek's (2001) classification, the measured axial strains range between severe squeezing and extreme squeezing conditions (see Table 2.5). The stress at first crack is typically in the range of 0.1 to 0.7 tsf. Thus, the unconfined strength is in the range of very soft to medium stiff consistent with the geotechnical literature for shallow tunnels (Heuer, 1974). The one exception is the 50/50 sand-clay mix where the measured strength was 2.6 tsf. This strength is equivalent to a very stiff cohesive soil and relates more to a deep tunnel in a low shear strength clay at depths beyond the brittle raveling zone (Heuer, 1974).

The effect of sand content on the axial stress at first crack during squeezing behavior is illustrated in Table 4.4 and Figure 4.4. The data reveal an increase in compressive strength from 10 to 50% sand and then a decrease in strength to a minimum value of 0.1 tsf at sand contents above 70%. Above the plastic limit, the ductile strain at first crack follows the same trend as the axial stress (Figure 4.5). Above the plastic limit at least to some level of strain, the behavior to the sand-clay mixes in entirely ductile.

From 10 to 50 % sand, the strain increases from 4.1% at a sand content of 10%, to a maximum value of more than 17.5% at 50% sand and then decreases to 8.7% at 80% sand. The distribution is parabolic and reflects the interaction of the sand and the clay and their respective effects on the strain to first crack. At 50%, the frictional sand and clay binder act together and appear to be in optimal proportions for the maximum unconfined compressive strength and greatest strain prior to first cracking.

Table 4.4 Results of UCS test: water content slightly above plastic limit

CLAY (%)	SAND (%)	W_P ((%)%)	POST-TEST WATER CONTENT (%)	STRESS AT FIRST CRACK (tsf)	STRAIN AT FIRST CRACK (%)	ULTIMATE STRENGTH (tsf)	UNIT WEIGHT	DRY UNIT WEIGHT
100	0	38.7	42.7	0.2	12.2	0.2	137.8	96.9
90	10	30.2	34	0.3	4.1	0.6	114.9	85.8
80	20	28.1	33.5	0.3	4.7	0.6	120.7	90.4
60	40	18.3	22.30	0.7	14.6	0.8	123	100.6
50	50	16.9	21.40	2.6	≥17.5	2.6	134.5	103.1
30	70	17.8	18.70	0.1	15.4	0.14	121.5	102.4
20	80	15.9	20.0	0.1	8.7	0.1	140.4	117

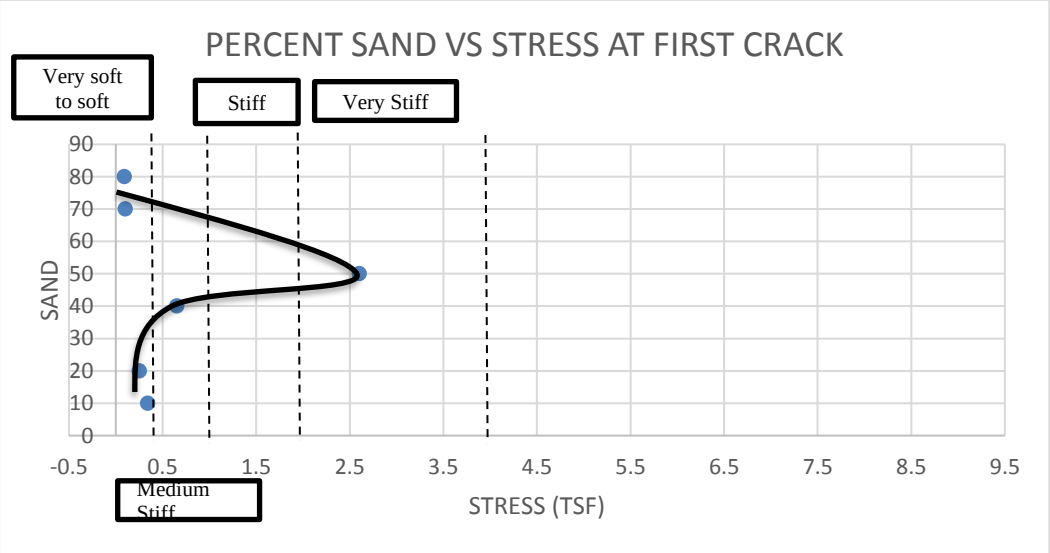

Figure 4.4 Percent sand versus stress at first crack: water content above plastic limit

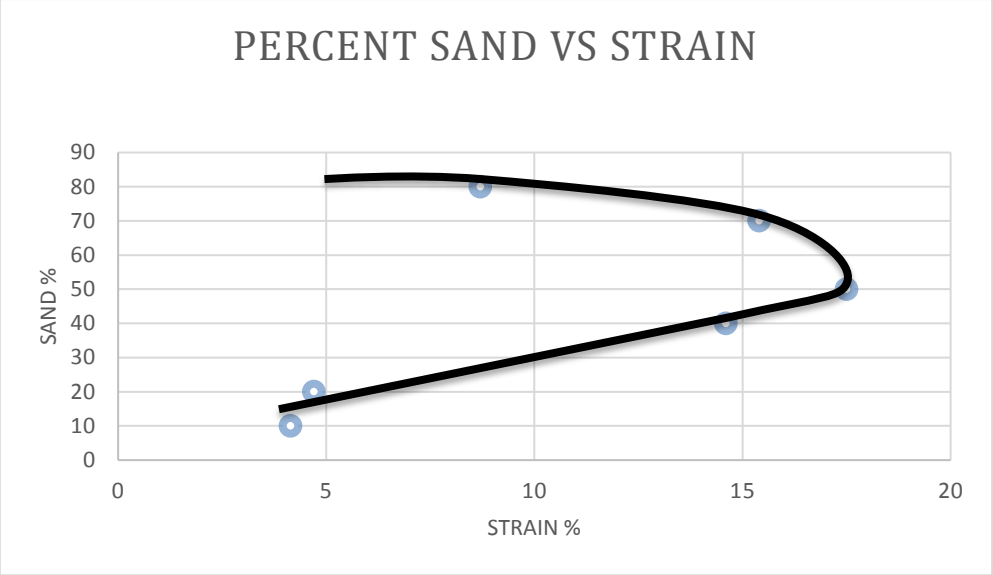

Figure 4.5 Percent sand versus strain at first crack: water content above plastic limit

4.3.2 Squeezing Behavior at Plastic Limit

The second series of UCS tests were performed on the same sand-clay mixes but at water contents within 0.3 to 1.5% of the plastic limit (Table 4.5). Borderline squeezing behavior was expected at this range in water contents.

The strain at first crack was between 4.3 and 17.1%. According to 2001 classification by Hoek, the squeezing behavior at these strain levels is severe to extreme (see Table 2.5). The equivalent stress at first crack ranges between 0.17 and 3.2 tsf. Four of the six sand-clay mixes had very soft to medium stiff consistencies. The remaining two samples at 40 and 50% sand were stiff to very stiff yet clearly showed squeezing behavior with no confinement (axial strain of 14.4 and 16.9% to first crack, respectively).

Based on a plot of stress against sand content, the axial stress at first crack increases from 0.7 tsf at 10% sand to 3. tsf at 50% sand and then decreases to 0.2 tsf at 80% sand (Figure 4.5). The approximate parabolic trend of the stress at first crack to sand content

is similar to the results where the water content is above the plastic limit (see Figure 4.4). The strain at first crack increase at 10% sand (7.4%) plateaus between 14.4 and 17.1% at sand contents of 20 and 70 % and then decreases sharply to 4.3% at 80% sand. The pattern of strain between 20 and 70% sand is more variable than the strain to first crack where the water content is above the plastic limit (Tables 4.4 and 4.5).

Table 4.5 Results of UCS test for water content at plastic limit

CLAY (%)	SAND (%)	W_{pP} (%)	POST WATER CONTENT (%)	STRESS AT FIRST CRACK (tsf)	STRAIN AT FIRST CRACK (%)	ULTIMATE STRENGTH (tsf)	TOTAL UNIT WEIGHT	DRY UNIT WEIGHT
100	0	38.7	37.7	0.3	13.1	0.4	106.9	77.6
90	10	30.2	30.7	0.7	7.4	1.0	110.9	84.9
80	20	28.1	29.6	0.3	17.1	0.3	114.9	88.7
60	40	18.3	19.7	1.6	14.4	1.8	124.9	104.4
50	50	16.9	16.3	3.2	16.9	3.3	128.2	110.9
30	70	17.8	17.2	0.5	16.5	0.6	132	113.8
20	80	15.9	15.6	0.2	4.3	0.2	127	109.9

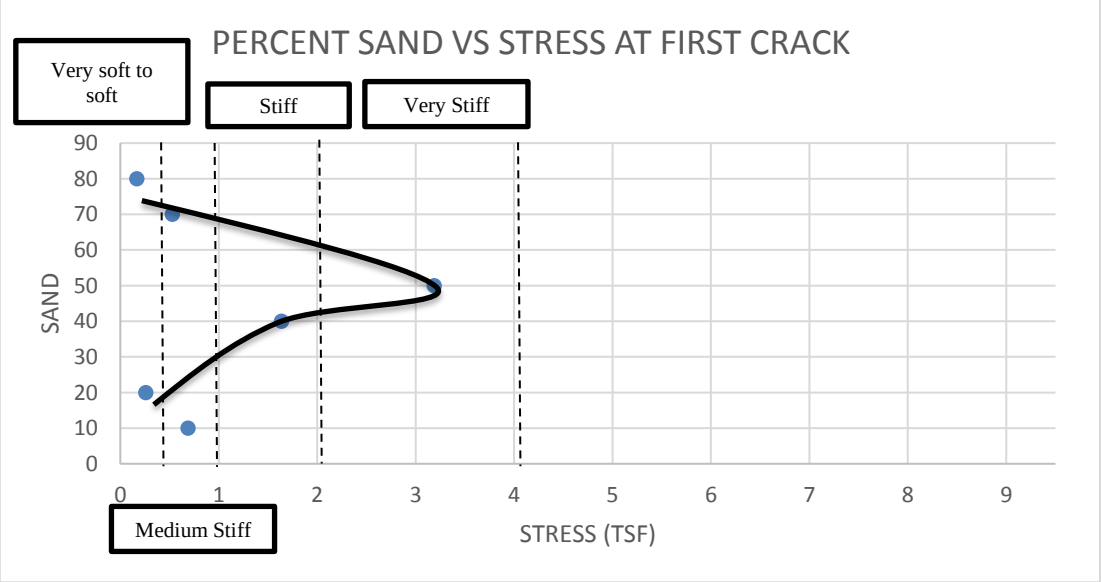

Figure 4.6 Percent sand versus stress at first crack: water content at plastic limit

4.3.3 Squeezing behavior at Water Contents Below Plastic Limit

The last series of UCS tests were carried out on the sand-clay mixtures in which the water content is 1.7 to 5.4% below the plastic limit (Table 4.6). Based on the significance of the plasticity test (water content at initiation of cracking), the samples were expected to exhibit brittle rather than squeezing behavior. Contrary to the expected behavior, sand-clay mixes underwent significant squeezing behavior with strains to first crack as great as 9.3%. Even with 80% sand, the strain at first crack was 4.1% at a water content of 3.7% below the plastic limit. Except at a sand content of 50%, the strains fall in the severe to very severe squeezing conditions (Hoek 2001). At 50% sand-clay content, the tunnel ground is expected to cause few support problems provided the behavior is entirely squeezing conditions (see Table 2.5).

The stress at first crack ranges between of 0.5 to 8.9 tsf. Only two of the six sand-clay mixes have soft to medium stiff consistency. The remaining samples were stiff to hard (1.5 to 8.9 tsf) and were much higher than values given in the literature for clayey soils at the tunnel perimeter. Even hard clay exhibits squeezing conditions in an unconfined condition.

The parabolic distribution of stress to first crack and sand content at soil moistures below the plastic limit is illustrated in Figure 4.6. The stress at first crack increases from 1.5 tsf at 10% sand to 8.9 tsf at 40% sand and then decreases to 0.5 tsf at 20% sand. The trend is consistent with the behavior of the sand-clay mixes at higher water contents. The strains at first crack show no consistent trend with sand content. The reason for the lack of a trend is that the water content is approaching the limiting value of ductile behavior similar to the behavior in the plastic limit test.

Table 4.6 Results of UCS test: water content below plastic limit

CLAY (%)	SAND (%)	W_P (%)	POST TEST WATER CONTENT (%)	STRESS AT FIRST CRACK (tsf)	STRAIN AT FIRST CRACK (%)	ULTIMATE STRENGTH (tsf)	TOTAL UNIT WEIGHT	DRY UNIT WEIGHT
100	0	38.7	37	0.6	12.4	0.6	116.9	83.1
90	10	30.2	28.4	1.5	7.2	1.9	127.5	91.1
80	20	28.1	24.7	3.5	9.3	3.4	123.5	104.3
60	40	18.3	16.1	8.9	4.3	9.0	144.4	119.1
50	50	16.9	11.4	1.8	0.8	1.8	133.5	105.8
30	70	17.8	13.9	0.7	7.5	0.95	144.4	123
20	80	15.9	12.2	0.5	4.1	1.1	146.5	127.7

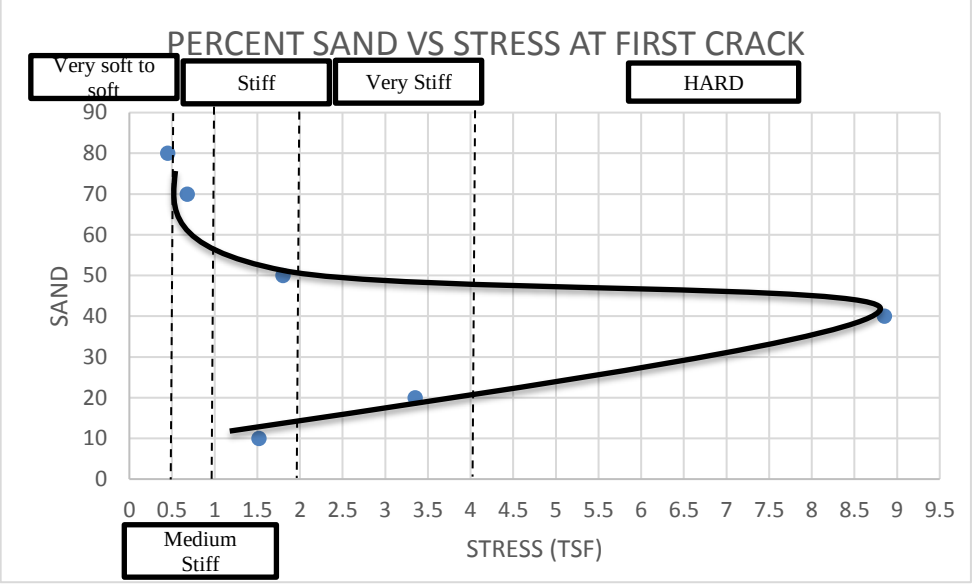

Figure 4.7 Percent sand versus stress at first crack: water content below plastic limit

4.3.4 Comparison of squeezing behavior and post-test water content

A summary of stress and strain at first crack with increasing post-test water content for each sand-clay mix is provided in Table 4.7.

Table 4.7 Stress/strain at first crack and post-test water content

SAMPLES		ABOVE PLASTIC LIMIT			AT PLASTIC LIMIT			BELOW PLASTIC LIMIT		
Clay (%)	**Sand (%)**	**POST WATER CONTENT (%)**	**STRESS AT FIRST CRACK (tsf)**	**STRAIN AT FIRST CRACK (%)**	**POST WATER CONTENT (%)**	**STRESS AT FIRST CRACK (tsf)**	**STRAIN AT FIRST CRACK (%)**	**POST WATER CONTENT (%)**	**STRESS AT FIRST CRACK (tsf)**	**STRAIN AT FIRST CRACK (%)**
100	0	42.7	0.2	12.2	37.7	0.3	13.1	37	0.6	12.4
90	10	34	0.3	4.1	30.7	0.7	7.4	28.4	1.5	7.2
80	20	33.5	0.3	4.7	29.6	0.3	17.1	24.7	3.4	9.3
60	40	22.3	0.7	14.6	19.7	1.6	14.4	16.1	8.9	4.3
50	50	21.4	2.6	≥17.5	16.3	3.2	16.9	11.4	1.8	0.8
30	70	18.7	0.1	15.4	17.2	0.5	16.5	13.9	0.7	7.5
20	80	20	0.1	8.7	15.6	0.2	4.3	12.2	0.5	4.1

As expected, the stress (strength) at first crack increases with decreasing water content for all sand-clay mixes except for 50% sand. For example, at a sand content of 40% the strength increases from 0.7 to 1.6 to 8.9 tsf with a 5.9% decrease in water content. Where the sand content is 50%, the strength at first crack increases by 0.8 tsf and then decreases by 1.4 tsf. The reason for this pattern may be that at 50% sand and a moisture content of 5.5% below the plastic limit, the mix is closer to brittle behavior (0.8% strain) compared with the greater squeezing behavior in the other sand-clay mixes (4.1 to 9.3% strain to first crack).

Above 20 to 40% sand, the general trend is a reduction in strain at first crack with decreasing water content. For example, at 40% sand the strain decreases from 14.6% to 14.4% to 4.3%. Below 20 to 40% sand, the strain increases and then decreases with increasing water content.

As expected, the lowest stress at first crack (0.1 to 0.2 to 0.5 tsf) occurred in the mix with the highest sand content (80%). Eighty percent sand is the limit for performing plastic limit tests. The corresponding change in water content was 20.0%, 15.6% and 12.2% or an overall reduction of 7.8%, respectively.

4.3.5 Comparison of stress at first crack and ultimate strength

The stress at first crack and the ultimate strength of the sand-clay mixes are summarized in Table 4.8.

Table 4.8 Ultimate strength and stress at first crack

SAMPLES		ABOVE PLASTIC LIMIT		AT PLASTIC LIMIT		BELOW PLASTIC LIMIT	
Clay (%)	**Sand (%)**	**STRESS AT FIRST CRACK (tsf)**	**ULTIMATE STRENGTH (tsf)**	**STRESS AT FIRST CRACK (tsf)**	**ULTIMATE STRENGTH (tsf)**	**STRESS AT FIRST CRACK (tsf)**	**ULTIMATE STRENGTH (tsf)**
100	0	0.2	0.2	0.3	0.4	0.6	0.6
90	10	0.3	0.6	0.7	1	1.5	1.9
80	20	0.3	0.6	0.3	0.3	3.4	3.4
60	40	0.7	0.8	1.6	1.8	8.9	9
50	50	2.6	2.6	3.2	3.3	1.8	1.8
30	70	0.1	0.1	0.5	0.6	0.7	1
20	80	0.1	0.1	0.2	0.2	0.5	1.1

In all mixes and at all water contents, the ultimate strength is equal to or slightly greater than the stress at first crack (0.1 to 0.6 tsf). The visual observations of the stress at first crack correspond very well with the maximum strengths of the sand-clay mixes.

CHAPTER FIVE -Summary and Conclusions

5.1 Summary

The purpose of this study was to evaluate squeezing behavior in soft ground and sheared rock tunnels. Based on the literature review, there is no information on the effect of sand con-tent, water content, plastic limit of soil-rock mixtures on squeezing behavior in tunnels. In this study, unconfined compression strength tests which replicate stress and strain behavior at the perimeter of an unlined tunnel were performed on six sand-clay mixes prepared in the laboratory. The purpose of the tests was to study the progressive transition from ductile to brittle behavior, to determine the impact of sand and water content on squeezing conditions and to refine the existing procedures for predicting squeezing ground in sheared rock and soft ground tunnels.

Based on the Atterberg Limit test results, the limiting sand content for determining the plastic limit is 80% by dry weight. The plastic limit test values were used to establish the water contents for preparing the samples to carry out the unconfined compression tests. The soils used in this study were classified in the USC System as MH, CH, CL and SC. Both the plastic limit and plasticity index decreased with increasing sand content. The dry unit weight increased with increasing sand content. For 10 to 80% sand, the range in dry unit weight is 84.9 to127.7 lb/ft^3.

Ductile behavior in varying degrees was observed in all of the sand-clay mixes depending on the sand and water content. As the sand content increased from 10 to 80%, the stress at first crack increased and then decreased in a semi-parabolic distribution. The maximum and minimum ductile stresses were in the range of 0.1 to 8.9 tsf. In 14 of the 21 tests, the consistency of the sand-clay mixes was very soft to

medium stiff consistent with geotechnical practice (Heuer 1974). However, this study reveals that stiff to hard sand-clay mixes can exhibit significant squeezing behavior in unconfined conditions. This finding has not been reported in the geotechnical literature except in deep tunnels at distances beyond the de-stressed zone. In all mixes and at all water contents, the ultimate strength is equal to or slightly greater than the stress at first crack (difference of 0.1 to 0.6 tsf). Thus, the visual observations of the stress at first crack correspond very well with the maximum strengths of the sand-clay mixes.

The strain at first crack and the corresponding sand content have the same semi-parabolic relationship as the sand content and stress at first crack. Moreover, the strain at first crack in the sand-clay mixes increases (4.1% strain at 10% sand), levels off (≥17.5% strain at 50% sand) and then decreases (8.7% strain at 80% sand) at water contents slightly above the plastic limit. Above the plastic limit, the behavior of the sand-clay mixes at least up to some strain level is entirely ductile.

In general, as the water content decreases both the ultimate strength and the stress at first crack increase consistent with soil mechanics principles. Except for 50% sand, the stress at first crack increased with decreasing water content in all sand-clay mixes consistent with soil mechanics principles. At 50% sand, the stress increased and then decreased with increasing water content. The water content was 5.5% below the plastic and the sample reached brittle behavior at a lower stress (3.2 → 1.8 tsf) and strain (16.9% → 0.8%) than when the mix was at the plastic limit. Similar trends were found in the relationship between water content and ultimate strength. Above 20 to 40% sand, the general trend is a reduction in strain at first crack with decreasing water content.

The mechanics of squeezing behavior were observed in the unconfined compressions tests. Starting with the initial load, as the stressed increased such as during tunnel advance the sand-clay samples underwent deformation without cracking up to some

stress level. This condition ductile behavior in the test sample and squeezing conditions in a tunnel. After first crack, the behavior progresses to a combined brittle (extension cracks on the outside) and squeezing condition (bulging on the inside condition). In some of the samples, the behavior reached the brittle condition when the shear crack(s) propagated through the entire sample.

5.2 Conclusions

Atterberg Limits, gradation and natural water content are important parameters in squeezing behavior in tunnels. Plastic limit, gradation, water content and unconfined strength should be part of geotechnical investigations for evaluating potential squeezing conditions in sheared rock and soft ground tunnels.

Depending on the state of stress, sand and non-expansive clay in fault zones and in soft ground tunnels with even up to 80% sand (dry weight) can undergo squeezing conditions at water contents up to 3.7% below the plastic limit. Moreover, squeezing behavior should be expected where sand contents are less than 80% and water contents are at and above the plastic limit. Squeezing ground can also develop in very stiff to hard sand-clay mixes at very low confining pressures near the tunnel perimeter.

Where the circumferential stress exceeds the unconfined strength of sand-clay mixes in fault zone or soft ground tunnels, the strain levels are expected to more than 5% and the tunnel anticipated to encounter severe to extreme squeezing conditions (Hoek 2001).

Ductile behavior occurred in all of the sand-clay mixes (up to 80% sand) where the water content was near the plastic limit. Prior to this investigation, ductile behavior with strains of 7.5 to 16.5% was not expected at sand contents of more than 50% by dry

weight. In soil mechanics, soils with less than 50% fines such as classified as SC in the Unified Classification System are expected to behavior primarily as granular, frictional materials.

Based on this research, the limiting values for squeezing conditions in sand-clay mixes are summarized as follows:

- sand content: equal to or less than 80%
- natural water contents: above, at and as much as 5.5% below the plastic limit
- very soft to medium stiff cohesive soil/sheared rock
- can occur in stiff to hard cohesive soils at tunnel perimeter.

Based on this study, the optimum sand content for strength and ductility for use of sand-clay mixes in other engineering applications (such as slurry walls for embankment dams) is in the range of 30 to 50% sand.

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Appendix A

Atterberg Limit Test Results

- Sample: 0% Sand and 100% Clay

Table A-1: Liquid limit test results

WATER CONTENT	NUMBER OF BLOWS
96	6
77.83	21
57.23	25
55	27
53	78

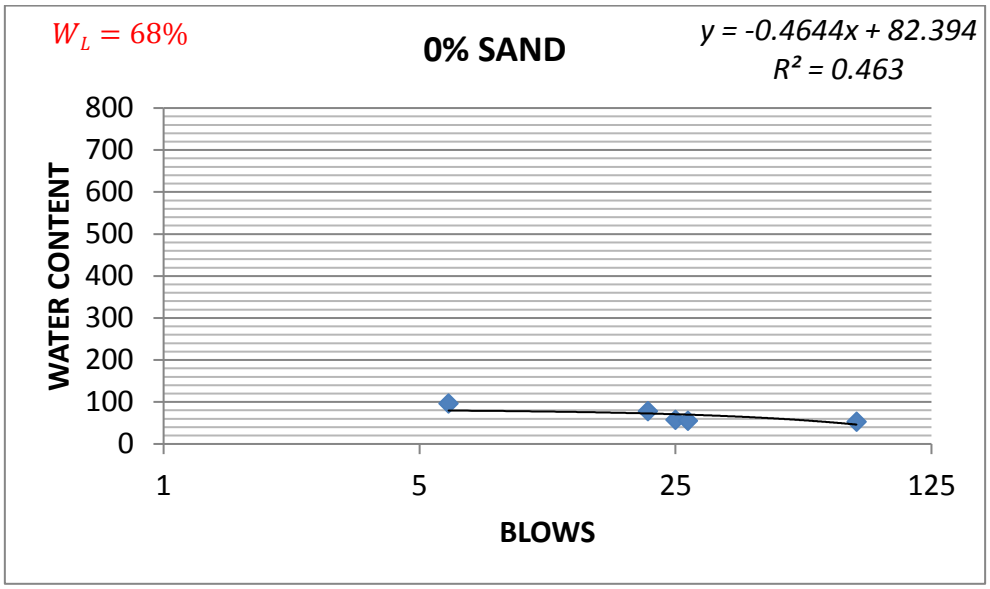

Figure A-1: Liquid limit graph

Table A-2: Final results of liquid limit and plastic limit

W_L %	W_P %
68	38.7

- Sample: 10% Sand and 90% Clay

Table A-3: Liquid limit test results

WATER CONTENT	NUMBER OF BLOWS
77.3	4
70.52	6
52.46	29

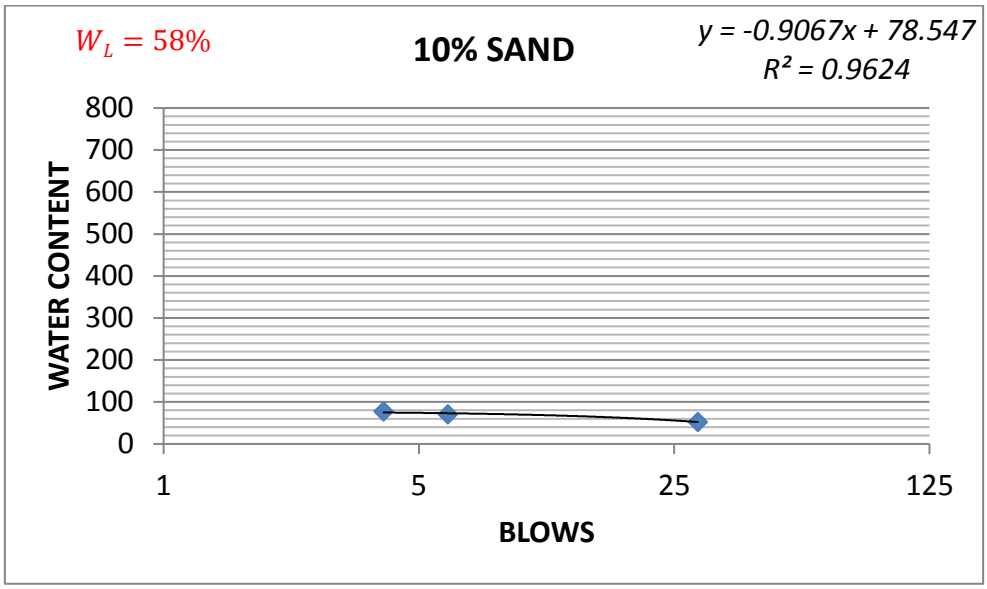

Figure A-2: Liquid limit graph

Table A-4: Final results of liquid limit and plastic limit

W_L %	W_P %
58	30.2

- Sample: 20% Sand and 80% Clay

Table A-5: Liquid limit test results

WATER CONTENT	NUMBER OF BLOWS
66.16	5
56.1	13
38.15	110

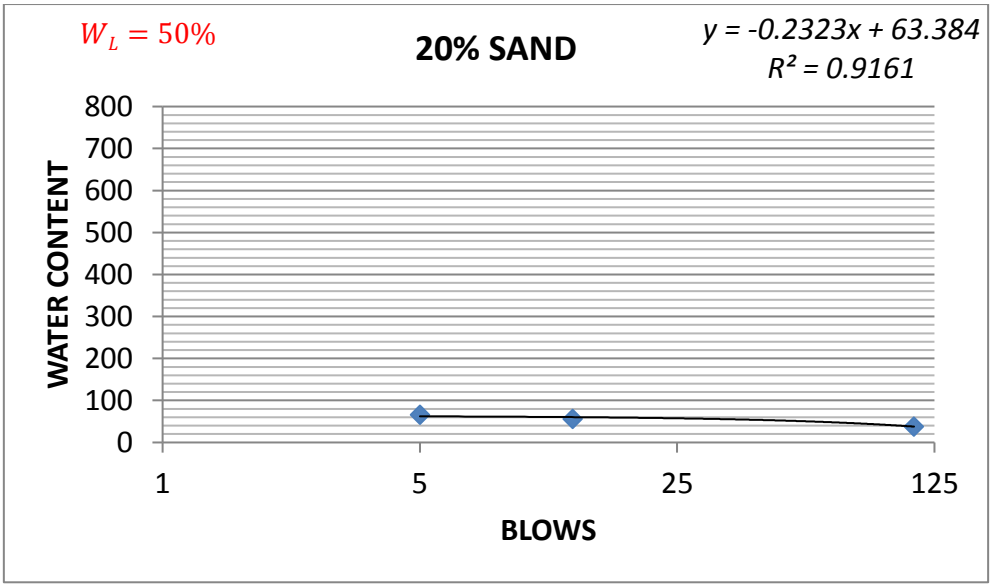

Figure A-3: Liquid limit graph

Table A-6: Final results of liquid limit and plastic limit

W_L %	W_P %
50	28.1

- Sample: 40% Sand and 60% Clay

Table A-7: Liquid limit test results

WATER CONTENT	NUMBER OF BLOWS
50	4
43.25	17
33.74	47

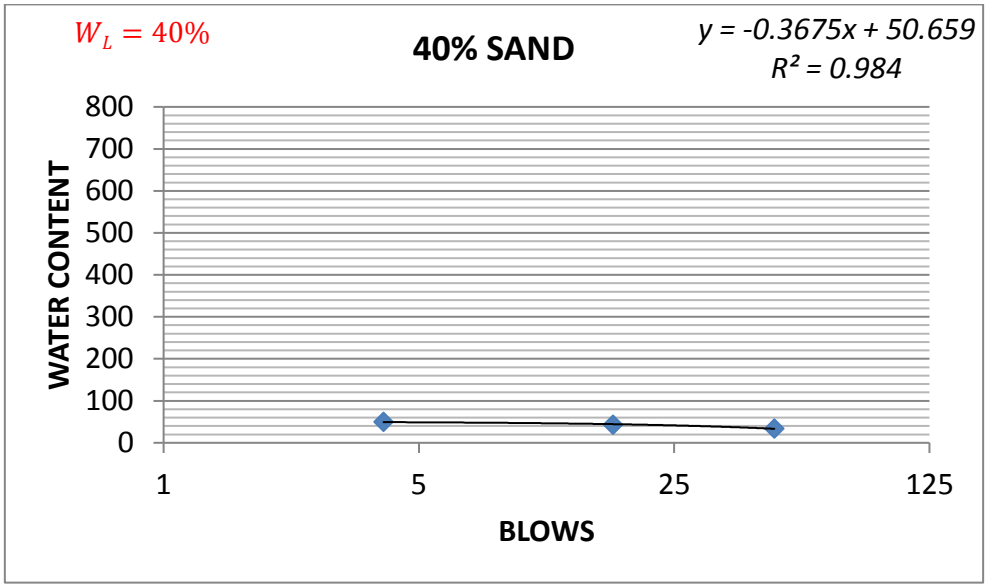

Figure A-4: Liquid limit graph

Table A-8: Final results of liquid limit and plastic limit

W_L %	W_P %
40	18.3

- Sample: 50% Sand and 50% Clay

Table A-9: Liquid limit test results

WATER CONTENT	NUMBER OF BLOWS
51.14	2
38	7
27.97	44

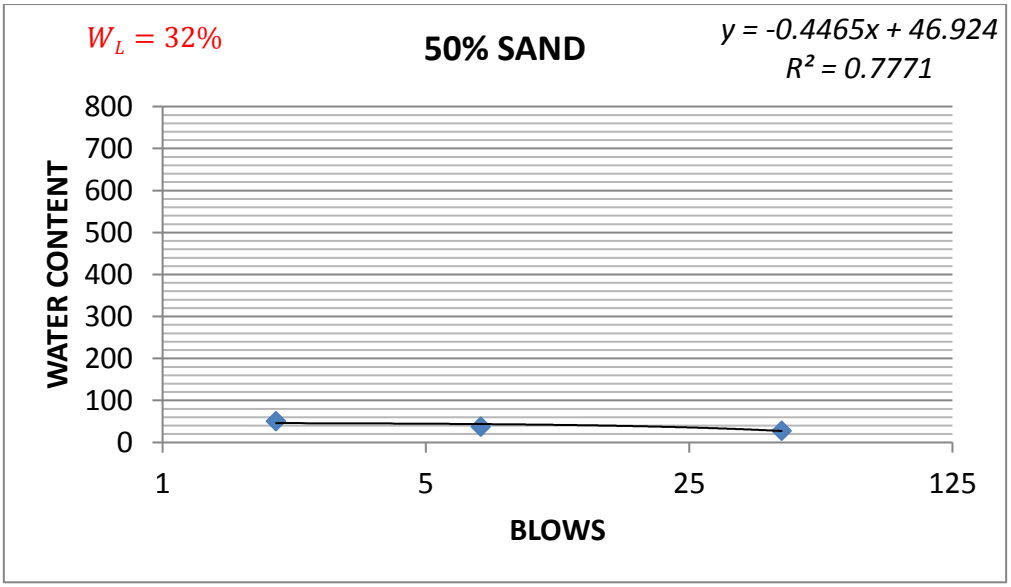

Figure A-5: Liquid limit graph

Table A-10: Final results of liquid limit and plastic limit

W_L %	W_P %
32	16.9

- Sample: 70% Sand, 305 Clay

Table A-11: Liquid limit test results

WATER CONTENT	NUMBER OF BLOWS
35.57	4
26.16	13
21.91	50

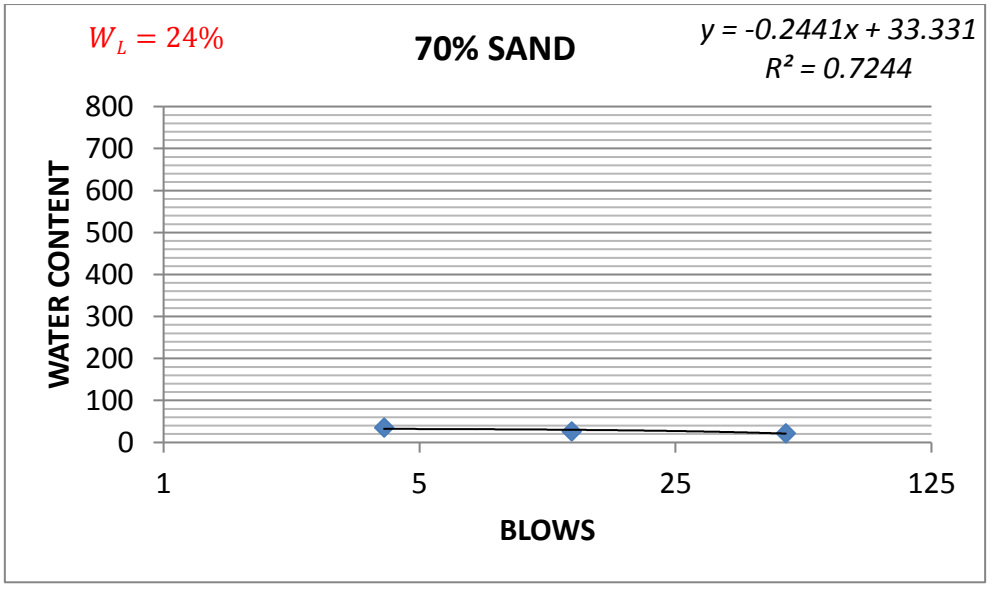

Figure A-6: Liquid limit graph

Table A-12: Final results of liquid limit and plastic limit

W_L %	W_P %
24	17.8

- Sample: 80% Sand and 20% Clay

Table A-13: Liquid limit test results

WATER CONTENT	NUMBER OF BLOWS
29.08	3
26.6	5
19.7	11
16.5	52

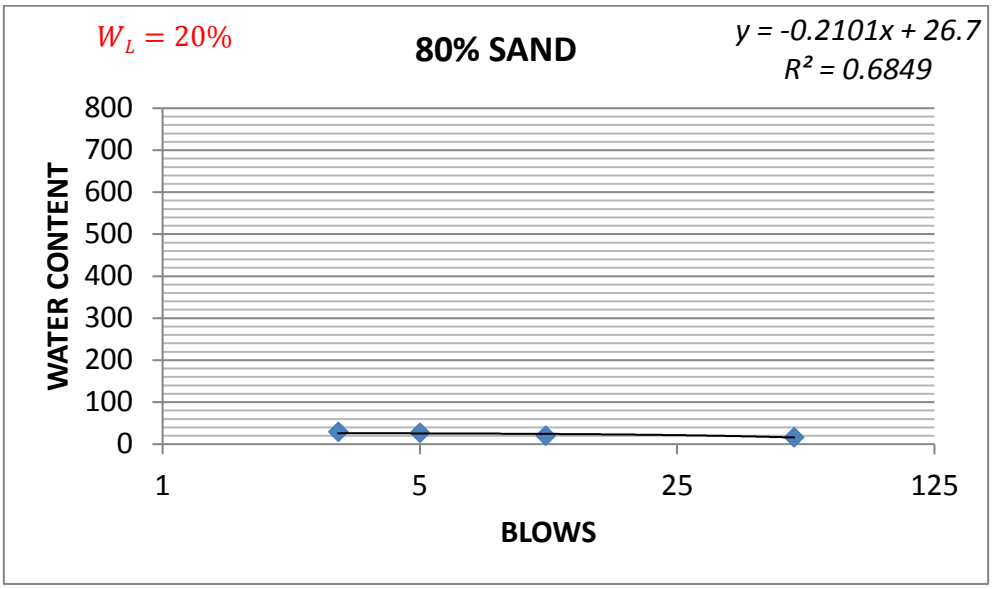

Figure A-7: Liquid limit graph

Table A-14: Final results of liquid limit and plastic limit

W_L %	W_P %
20	15.9

- Sample: 82.5% Sand and 17.5% Clay

Table A-15: Liquid limit test results

WATER CONTENT	NUMBER OF BLOWS
22.95	7
19.38	15
16.4	44

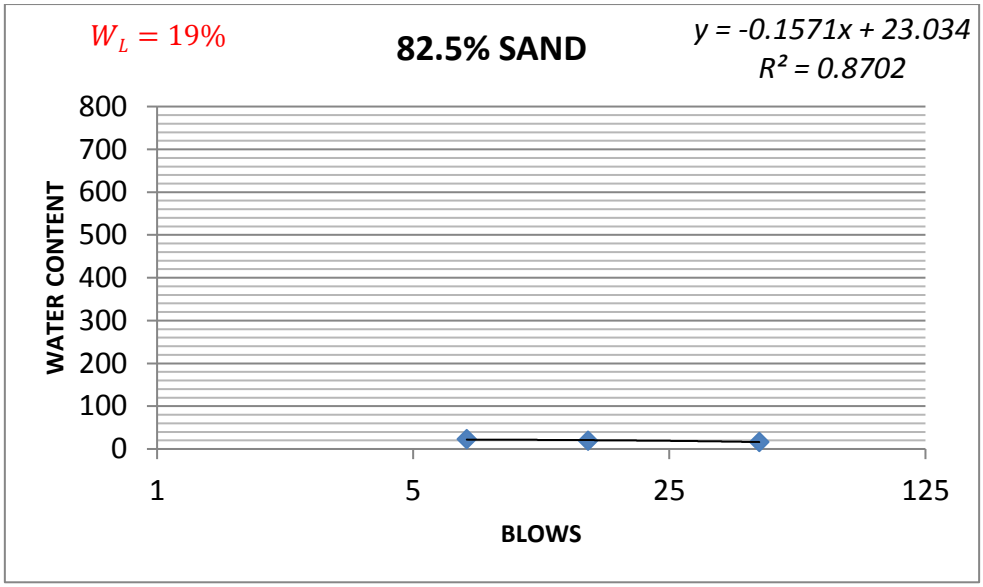

Figure A-8: Liquid limit graph

Table A-16: Final results of liquid limit and plastic limit

W_L %	W_P %
19	NP

- Sample: 85% Sand and 15% Clay

Table A-17: Liquid limit test results

WATER CONTENT	NUMBER OF BLOWS
23.65	6
18.83	33
13.9	47

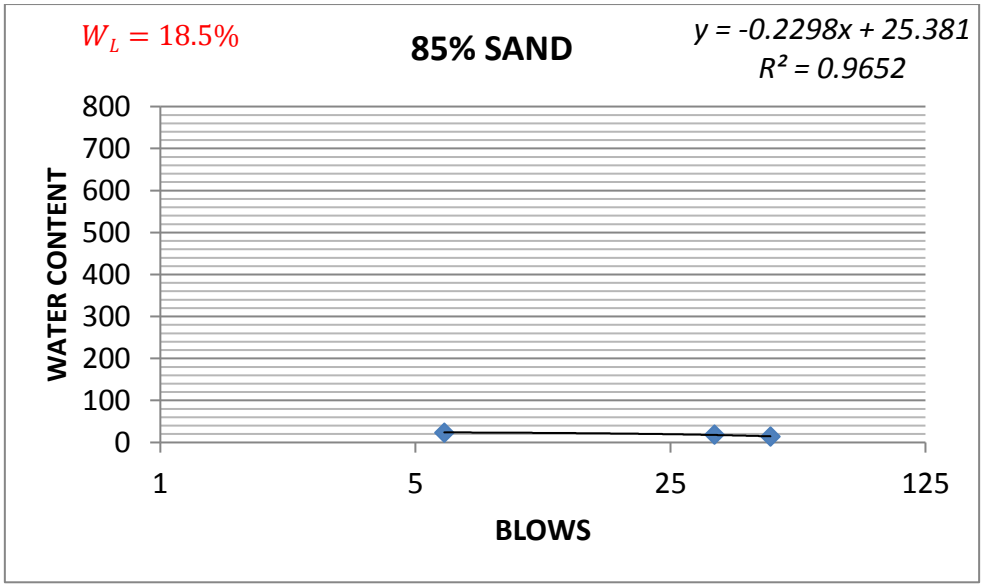

Figure A-9: Liquid limit graph

Table A-18: Final results of liquid limit and plastic limit

W_L %	W_P %
18.5	NP

- Sample: 90% Sand and 10% Clay

Table A-19: Liquid limit test results

WATER CONTENT	NUMBER OF BLOWS
20.88	5
17.48	30
15.43	40

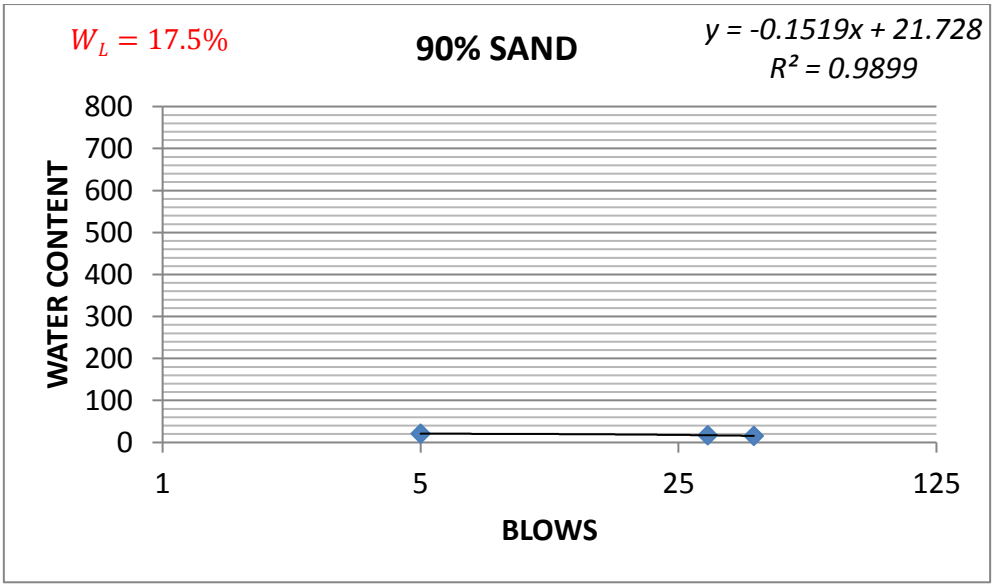

Figure A-10: Liquid limit graph

Table A-20: Final results of liquid limit and plastic limit

W_L %	W_P %
17.5	NP

- All liquid limit tests

Table A-21: Summary of all liquid limit tests

TEST NUMBER	SAND CONTENT (%)	WATER CONTENT (%)	NUMBER OF BLOWS
1	0	96.2	6
2	0	53.4	78
3	0	77.8	21
4	0	55	27
5	0	57.2	25
6	10	77.3	4
7	20	66.2	5
8	40	50	4
9	50	51.1	2
10	70	35.6	4
11	10	52.5	29
12	20	38.15	110
13	40	33.7	47
14	50	28	44
15	10	70.5	6
16	20	56.1	13
17	40	43.3	17
18	50	38	7
19	70	26.2	13
20	70	21.9	50
21	80	29.1	3
22	80	26.7	5
23	80	19.8	11
24	80	18.8	52
25	90	20.9	5
26	90	17.5	30
27	90	15.4	40
28	95	19.3	10
29	95	15.3	5
30	95	13.2	3
31	95	14	8
32	85	24.5	4
33	85	19.5	30

34	85	15	40
35	82.5	23	7
36	82.5	19.4	15
37	82.5	16.4	44

- All plastic limit tests

Table A-22: Summary of all plastic limit tests

TEST NUMBER	SAND CONTENT (%)	WATER CONTENT (%)
1	0	55.22
2	0	53
3	0	50.87
4	10	70
5	10	33
6	10	37.9
7	10	38.5
8	10	30.3
9	10	30.1
10	20	28.5
11	20	27.8
12	40	18
13	40	18.7
14	50	17.1
15	50	16.6
16	80	15.7
17	80	16.1
18	70	17.7
19	70	18
20	90	N/A
21	85	N/A
22	82.5	N/A
23	95	N/A

- Gradation Tests Results on Sands

SIEVES NUMBER	OPENING (mm)	PERCENT FINER BY WEIGHT FIRST TEST	PERCENT FINER BY WEIGHT SECOND TEST
4	4.75	85.2	89.5
10	2	74.1	79.52
20	0.85	64.6	71.12
40	0.425	58.5	65.1
100	0.15	54.5	60.48

200	0.075	46	49.37

Appendix B

Unconfined Compressive Strength Test Results

Following the results of all UCS tests at different water contents for all samples provided.

- Sample with 0% sand, 100% clay

Table B-1: Results of test at water content above plastic limit

TIME	VERTICAL DEFLECTION (in)	LOAD (lb)	L_0 (in)	A_0 $(in)^2$	A_C $(in)^2$	STRESS (psi)	STRAIN (in/in)
000:00:00	0.001	0	2.9375	1.23	1.230418866	0	0.000340426
000:00:01	0.002	1	2.9375	1.23	1.230838017	0.812454593	0.000680851
000:00:02	0.003	1	2.9375	1.23	1.231257454	0.812177824	0.001021277
000:00:03	0.004	0	2.9375	1.23	1.231677177	0	0.001361702
000:00:04	0.005	0	2.9375	1.23	1.232097187	0	0.001702128
000:00:05	0.006	1	2.9375	1.23	1.232517483	0.811347518	0.002042553
000:00:06	0.007	1	2.9375	1.23	1.232938065	0.811070749	0.002382979
000:00:07	0.007	0	2.9375	1.23	1.232938065	0	0.002382979

000:00:08	0.008	0	2.9375	1.23	1.233358935	0	0.002723404
000:00:09	0.009	0	2.9375	1.23	1.233780092	0	0.00306383
000:00:10	0.01	0	2.9375	1.23	1.234201537	0	0.003404255
000:00:11	0.011	1	2.9375	1.23	1.23462327	0.809963674	0.003744681
000:00:12	0.012	1	2.9375	1.23	1.235045291	0.809686905	0.004085106
000:00:13	0.013	0	2.9375	1.23	1.235467601	0	0.004425532
000:00:14	0.013	1	2.9375	1.23	1.235467601	0.809410137	0.004425532
000:00:15	0.014	1	2.9375	1.23	1.2358902	0.809133368	0.004765957
000:00:16	0.015	0	2.9375	1.23	1.236313088	0	0.005106383
000:00:17	0.016	0	2.9375	1.23	1.236736266	0	0.005446809
000:00:18	0.017	1	2.9375	1.23	1.237159733	0.808303062	0.005787234
000:00:19	0.018	1	2.9375	1.23	1.23758349	0.808026293	0.00612766
000:00:20	0.019	1	2.9375	1.23	1.238007538	0.807749524	0.006468085
000:00:21	0.02	0	2.9375	1.23	1.238431877	0	0.006808511
000:00:22	0.021	1	2.9375	1.23	1.238856506	0.807195987	0.007148936
000:00:23	0.021	1	2.9375	1.23	1.238856506	0.807195987	0.007148936
000:00:24	0.022	1	2.9375	1.23	1.239281427	0.806919218	0.007489362
000:00:25	0.023	1	2.9375	1.23	1.239706639	0.806642449	0.007829787
000:00:26	0.024	1	2.9375	1.23	1.240132143	0.806365681	0.008170213
000:00:27	0.025	1	2.9375	1.23	1.24055794	0.806088912	0.008510638
000:00:28	0.026	1	2.9375	1.23	1.240984029	0.805812143	0.008851064
000:00:29	0.027	1	2.9375	1.23	1.241410411	0.805535375	0.009191489
000:00:30	0.027	1	2.9375	1.23	1.241410411	0.805535375	0.009191489
000:00:31	0.028	1	2.9375	1.23	1.241837085	0.805258606	0.009531915
000:00:32	0.029	1	2.9375	1.23	1.242264054	0.804981837	0.00987234
000:00:33	0.03	1	2.9375	1.23	1.242691316	0.804705068	0.010212766

000:00:34	0.031	1	2.9375	1.23	1.243118871	0.8044283	0.010553191
000:00:35	0.032	1	2.9375	1.23	1.243546722	0.804151531	0.010893617
000:00:36	0.033	1	2.9375	1.23	1.243974867	0.803874762	0.011234043
000:00:37	0.034	1	2.9375	1.23	1.244403306	0.803597993	0.011574468
000:00:38	0.035	1	2.9375	1.23	1.244832041	0.803321225	0.011914894
000:00:39	0.036	1	2.9375	1.23	1.245261072	0.803044456	0.012255319
000:00:40	0.036	0	2.9375	1.23	1.245261072	0	0.012255319
000:00:41	0.037	1	2.9375	1.23	1.245690398	0.802767687	0.012595745
000:00:42	0.038	1	2.9375	1.23	1.246120021	0.802490919	0.01293617
000:00:43	0.039	1	2.9375	1.23	1.24654994	0.80221415	0.013276596
000:00:44	0.04	1	2.9375	1.23	1.246980155	0.801937381	0.013617021
000:00:45	0.041	1	2.9375	1.23	1.247410668	0.801660612	0.013957447
000:00:46	0.042	1	2.9375	1.23	1.247841478	0.801383844	0.014297872
000:00:47	0.043	1	2.9375	1.23	1.248272586	0.801107075	0.014638298
000:00:48	0.043	1	2.9375	1.23	1.248272586	0.801107075	0.014638298
000:00:49	0.044	1	2.9375	1.23	1.248703992	0.800830306	0.014978723
000:00:50	0.045	1	2.9375	1.23	1.249135696	0.800553537	0.015319149
000:00:51	0.046	1	2.9375	1.23	1.249567698	0.800276769	0.015659574
000:00:52	0.047	1	2.9375	1.23	1.25	0.8	0.016
000:00:53	0.048	1	2.9375	1.23	1.250432601	0.799723231	0.016340426
000:00:54	0.049	1	2.9375	1.23	1.250865501	0.799446463	0.016680851
000:00:55	0.05	1	2.9375	1.23	1.251298701	0.799169694	0.017021277
000:00:56	0.051	1	2.9375	1.23	1.251732202	0.798892925	0.017361702
000:00:57	0.052	1	2.9375	1.23	1.252166002	0.798616156	0.017702128
000:00:58	0.052	1	2.9375	1.23	1.252166002	0.798616156	0.017702128
000:00:59	0.053	1	2.9375	1.23	1.252600104	0.798339388	0.018042553

000:01:00	0.054	0	2.9375	1.23	1.253034507	0	0.018382979
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000:01:02	0.056	1	2.9375	1.23	1.253904217	0.797509081	0.01906383
000:01:03	0.057	1	2.9375	1.23	1.254339524	0.797232313	0.019404255
000:01:04	0.058	1	2.9375	1.23	1.254775135	0.796955544	0.019744681
000:01:05	0.059	1	2.9375	1.23	1.255211047	0.796678775	0.020085106
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000:01:09	0.062	1	2.9375	1.23	1.256520605	0.795848469	0.021106383
000:01:10	0.063	1	2.9375	1.23	1.256957732	0.7955717	0.021446809
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000:01:16	0.068	1	2.9375	1.23	1.259147935	0.794187857	0.023148936
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000:01:19	0.071	1	2.9375	1.23	1.260465725	0.793357551	0.024170213
000:01:20	0.072	1	2.9375	1.23	1.260905601	0.793080782	0.024510638
000:01:21	0.073	1	2.9375	1.23	1.261345785	0.792804013	0.024851064
000:01:22	0.073	1	2.9375	1.23	1.261345785	0.792804013	0.024851064
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000:01:26	0.077	1	2.9375	1.23	1.263109596	0.791696938	0.026212766
000:01:27	0.078	1	2.9375	1.23	1.26355132	0.79142017	0.026553191
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000:01:29	0.079	1	2.9375	1.23	1.263993353	0.791143401	0.026893617
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000:01:34	0.084	1	2.9375	1.23	1.266208165	0.789759557	0.028595745
000:01:35	0.085	1	2.9375	1.23	1.26665206	0.789482788	0.02893617
000:01:36	0.086	1	2.9375	1.23	1.267096265	0.78920602	0.029276596
000:01:37	0.086	1	2.9375	1.23	1.267096265	0.78920602	0.029276596
000:01:38	0.087	1	2.9375	1.23	1.267540782	0.788929251	0.029617021
000:01:39	0.088	1	2.9375	1.23	1.267985612	0.788652482	0.029957447
000:01:41	0.09	1	2.9375	1.23	1.268876207	0.788098945	0.030638298
000:01:43	0.092	1	2.9375	1.23	1.269768055	0.787545407	0.031319149
000:01:45	0.093	1	2.9375	1.23	1.270214449	0.787268639	0.031659574
000:01:47	0.095	1	2.9375	1.23	1.271108179	0.786715101	0.032340426
000:01:49	0.097	1	2.9375	1.23	1.272003168	0.786161564	0.033021277
000:01:51	0.099	1	2.9375	1.23	1.272899419	0.785608026	0.033702128
000:01:53	0.1	1	2.9375	1.23	1.273348018	0.785331258	0.034042553
000:01:55	0.102	1	2.9375	1.23	1.274246165	0.78477772	0.034723404
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000:02:01	0.107	1	2.9375	1.23	1.276497085	0.783393876	0.036425532
000:02:03	0.109	1	2.9375	1.23	1.277399682	0.782840339	0.037106383

000:02:05	0.111	1	2.9375	1.23	1.278303556	0.782286802	0.037787234
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000:02:09	0.114	1	2.9375	1.23	1.279661767	0.781456495	0.038808511
000:02:11	0.116	1	2.9375	1.23	1.280568846	0.780902958	0.039489362
000:02:13	0.118	1	2.9375	1.23	1.281477212	0.780349421	0.040170213
000:02:15	0.119	1	2.9375	1.23	1.281931879	0.780072652	0.040510638
000:02:17	0.121	1	2.9375	1.23	1.28284218	0.779519114	0.041191489
000:02:19	0.123	1	2.9375	1.23	1.283753775	0.778965577	0.04187234
000:02:21	0.124	1	2.9375	1.23	1.284210059	0.778688808	0.042212766
000:02:23	0.126	1	2.9375	1.23	1.2851236	0.778135271	0.042893617
000:02:25	0.128	1	2.9375	1.23	1.286038441	0.777581733	0.043574468
000:02:27	0.129	1	2.9375	1.23	1.28649635	0.777304965	0.043914894
000:02:29	0.131	1	2.9375	1.23	1.287413148	0.776751427	0.044595745
000:02:31	0.133	1	2.9375	1.23	1.288331253	0.77619789	0.045276596
000:02:33	0.134	1	2.9375	1.23	1.288790797	0.775921121	0.045617021
000:02:35	0.136	1	2.9375	1.23	1.289710869	0.775367583	0.046297872
000:02:37	0.138	1	2.9375	1.23	1.290632256	0.774814046	0.046978723
000:02:39	0.14	1	2.9375	1.23	1.29155496	0.774260509	0.047659574
000:02:41	0.141	1	2.9375	1.23	1.292016807	0.77398374	0.048
000:02:43	0.143	2	2.9375	1.23	1.292941492	1.546860405	0.048680851
000:02:45	0.145	1	2.9375	1.23	1.293867502	0.772876665	0.049361702
000:02:47	0.146	2	2.9375	1.23	1.294331005	1.545199792	0.049702128
000:02:49	0.148	1	2.9375	1.23	1.295259007	0.772046359	0.050382979
000:02:51	0.15	2	2.9375	1.23	1.296188341	1.542985643	0.05106383
000:02:53	0.151	1	2.9375	1.23	1.296653508	0.771216053	0.051404255
000:02:55	0.153	1	2.9375	1.23	1.297584845	0.770662515	0.052085106

000:02:57	0.155	1	2.9375	1.23	1.29851752	0.770108978	0.052765957
000:02:59	0.157	2	2.9375	1.23	1.299451537	1.53911088	0.053446809
000:03:01	0.158	2	2.9375	1.23	1.29991905	1.538557343	0.053787234
000:03:03	0.16	2	2.9375	1.23	1.300855086	1.537450268	0.054468085
000:03:05	0.162	2	2.9375	1.23	1.30179247	1.536343193	0.055148936
000:03:07	0.163	2	2.9375	1.23	1.302261669	1.535789656	0.055489362
000:03:09	0.165	2	2.9375	1.23	1.303201082	1.534682581	0.056170213
000:03:11	0.167	1	2.9375	1.23	1.304141852	0.766787753	0.056851064
000:03:13	0.168	2	2.9375	1.23	1.304612746	1.533021969	0.057191489
000:03:15	0.17	1	2.9375	1.23	1.305555556	0.765957447	0.05787234
000:03:17	0.172	2	2.9375	1.23	1.306499729	1.530807819	0.058553191
000:03:19	0.174	2	2.9375	1.23	1.307445269	1.529700744	0.059234043
000:03:49	0.2	2	2.9375	1.23	1.319863014	1.51530877	0.068085106
000:04:19	0.226	2	2.9375	1.23	1.332518901	1.500916796	0.07693617
000:04:49	0.252	2	2.9375	1.23	1.345419847	1.486524823	0.085787234
000:05:19	0.278	3	2.9375	1.23	1.35857304	2.208199273	0.094638298
000:05:49	0.304	2	2.9375	1.23	1.37198595	1.457740875	0.103489362
000:06:19	0.33	3	2.9375	1.23	1.385666347	2.165023352	0.112340426
000:06:49	0.355	3	2.9375	1.23	1.399080348	2.144265698	0.120851064
000:07:19	0.381	3	2.9375	1.23	1.413309212	2.122677737	0.129702128
000:07:49	0.407	4	2.9375	1.23	1.427830468	2.801453036	0.138553191
000:08:19	0.433	3	2.9375	1.23	1.442653224	2.079501816	0.147404255
000:08:49	0.459	3	2.9375	1.23	1.457786968	2.057913856	0.156255319
000:09:19	0.485	4	2.9375	1.23	1.47324159	2.715101194	0.165106383
000:09:49	0.511	4	2.9375	1.23	1.489027406	2.686317246	0.173957447
000:10:19	0.537	4	2.9375	1.23	1.505155176	2.657533299	0.182808511

000:10:49	0.562	4	2.9375	1.23	1.52099558	2.629856426	0.191319149
000:11:19	0.587	4	2.9375	1.23	1.537172942	2.602179554	0.199829787
000:11:49	0.614	4	2.9375	1.23	1.555035507	2.572288531	0.209021277
000:12:19	0.64	4	2.9375	1.23	1.572633297	2.543504584	0.21787234
000:12:49	0.666	4	2.9375	1.23	1.590633942	2.514720637	0.226723404
000:13:19	0.692	4	2.9375	1.23	1.609051436	2.485936689	0.235574468
000:13:49	0.718	4	2.9375	1.23	1.627900428	2.457152742	0.244425532

Table B-2: Results of test at water content at plastic limit

TIME	**VERTICAL DEFLECTION (in)**	**LOAD (lb)**	**L_0 (in)**	**A_0 $(in)^2$**	**A_C $(in)^2$**	**STRESS (psi)**	**STRAIN (in/in)**
000:00:00	0.001	0	2.8125	1.35	1.350480171	0	0.000355556
000:00:01	0.002	0	2.8125	1.35	1.350960683	0	0.000711111
000:00:02	0.003	0	2.8125	1.35	1.351441538	0	0.001066667
000:00:03	0.004	0	2.8125	1.35	1.351922735	0	0.001422222
000:00:04	0.004	0	2.8125	1.35	1.351922735	0	0.001422222
000:00:05	0.005	0	2.8125	1.35	1.352404274	0	0.001777778
000:00:06	0.006	1	2.8125	1.35	1.352886157	0.739160494	0.002133333
000:00:07	0.007	0	2.8125	1.35	1.353368384	0	0.002488889
000:00:08	0.008	0	2.8125	1.35	1.353850954	0	0.002844444
000:00:09	0.009	1	2.8125	1.35	1.354333868	0.73837037	0.0032
000:00:10	0.01	1	2.8125	1.35	1.354817128	0.738106996	0.003555556

000:00:11	0.01	1	2.8125	1.35	1.354817128	0.738106996	0.003555556
000:00:12	0.011	1	2.8125	1.35	1.355300732	0.737843621	0.003911111
000:00:13	0.012	1	2.8125	1.35	1.355784681	0.737580247	0.004266667
000:00:14	0.013	1	2.8125	1.35	1.356268977	0.737316872	0.004622222
000:00:15	0.014	1	2.8125	1.35	1.356753618	0.737053498	0.004977778
000:00:16	0.015	1	2.8125	1.35	1.357238606	0.736790123	0.005333333
000:00:17	0.016	1	2.8125	1.35	1.357723941	0.736526749	0.005688889
000:00:18	0.016	1	2.8125	1.35	1.357723941	0.736526749	0.005688889
000:00:19	0.017	1	2.8125	1.35	1.358209623	0.736263374	0.006044444
000:00:20	0.018	1	2.8125	1.35	1.358695652	0.736	0.0064
000:00:21	0.019	1	2.8125	1.35	1.35918203	0.735736626	0.006755556
000:00:22	0.02	1	2.8125	1.35	1.359668756	0.735473251	0.007111111
000:00:23	0.021	1	2.8125	1.35	1.36015583	0.735209877	0.007466667
000:00:24	0.022	1	2.8125	1.35	1.360643254	0.734946502	0.007822222
000:00:25	0.023	1	2.8125	1.35	1.361131027	0.734683128	0.008177778
000:00:26	0.023	1	2.8125	1.35	1.361131027	0.734683128	0.008177778
000:00:27	0.024	1	2.8125	1.35	1.36161915	0.734419753	0.008533333
000:00:28	0.025	1	2.8125	1.35	1.362107623	0.734156379	0.008888889
000:00:29	0.026	1	2.8125	1.35	1.362596447	0.733893004	0.009244444
000:00:30	0.027	2	2.8125	1.35	1.363085622	1.467259259	0.0096
000:00:31	0.028	1	2.8125	1.35	1.363575148	0.733366255	0.009955556
000:00:32	0.029	1	2.8125	1.35	1.364065026	0.733102881	0.010311111
000:00:33	0.03	1	2.8125	1.35	1.364555256	0.732839506	0.010666667
000:00:34	0.031	1	2.8125	1.35	1.365045839	0.732576132	0.011022222
000:00:35	0.031	1	2.8125	1.35	1.365045839	0.732576132	0.011022222
000:00:36	0.032	1	2.8125	1.35	1.365536774	0.732312757	0.011377778

000:00:37	0.033	1	2.8125	1.35	1.366028063	0.732049383	0.011733333
000:00:38	0.034	1	2.8125	1.35	1.366519705	0.731786008	0.012088889
000:00:39	0.035	1	2.8125	1.35	1.367011701	0.731522634	0.012444444
000:00:40	0.036	2	2.8125	1.35	1.367504052	1.462518519	0.0128
000:00:41	0.037	1	2.8125	1.35	1.367996757	0.730995885	0.013155556
000:00:42	0.038	1	2.8125	1.35	1.368489818	0.73073251	0.013511111
000:00:43	0.039	1	2.8125	1.35	1.368983234	0.730469136	0.013866667
000:00:44	0.039	1	2.8125	1.35	1.368983234	0.730469136	0.013866667
000:00:45	0.04	1	2.8125	1.35	1.369477006	0.730205761	0.014222222
000:00:46	0.041	1	2.8125	1.35	1.369971135	0.729942387	0.014577778
000:00:47	0.042	1	2.8125	1.35	1.37046562	0.729679012	0.014933333
000:00:48	0.043	1	2.8125	1.35	1.370960462	0.729415638	0.015288889
000:00:49	0.044	2	2.8125	1.35	1.371455662	1.458304527	0.015644444
000:00:50	0.045	2	2.8125	1.35	1.37195122	1.457777778	0.016
000:00:51	0.046	2	2.8125	1.35	1.372447135	1.457251029	0.016355556
000:00:52	0.047	2	2.8125	1.35	1.37294341	1.45672428	0.016711111
000:00:53	0.047	2	2.8125	1.35	1.37294341	1.45672428	0.016711111
000:00:54	0.048	2	2.8125	1.35	1.373440043	1.456197531	0.017066667
000:00:55	0.049	2	2.8125	1.35	1.373937036	1.455670782	0.017422222
000:00:56	0.05	2	2.8125	1.35	1.374434389	1.455144033	0.017777778
000:00:57	0.051	2	2.8125	1.35	1.374932102	1.454617284	0.018133333
000:00:58	0.052	2	2.8125	1.35	1.375430176	1.454090535	0.018488889
000:00:59	0.053	2	2.8125	1.35	1.37592861	1.453563786	0.018844444
000:01:00	0.054	2	2.8125	1.35	1.376427406	1.453037037	0.0192
000:01:01	0.055	2	2.8125	1.35	1.376926564	1.452510288	0.019555556
000:01:02	0.056	2	2.8125	1.35	1.377426084	1.451983539	0.019911111

000:01:03	0.057	2	2.8125	1.35	1.377925966	1.45145679	0.020266667
000:01:04	0.057	2	2.8125	1.35	1.377925966	1.45145679	0.020266667
000:01:05	0.058	2	2.8125	1.35	1.378426212	1.450930041	0.020622222
000:01:06	0.059	2	2.8125	1.35	1.37892682	1.450403292	0.020977778
000:01:07	0.06	2	2.8125	1.35	1.379427793	1.449876543	0.021333333
000:01:08	0.061	2	2.8125	1.35	1.37992913	1.449349794	0.021688889
000:01:09	0.062	2	2.8125	1.35	1.380430831	1.448823045	0.022044444
000:01:10	0.063	2	2.8125	1.35	1.380932897	1.448296296	0.0224
000:01:11	0.064	3	2.8125	1.35	1.381435328	2.171654321	0.022755556
000:01:12	0.064	2	2.8125	1.35	1.381435328	1.447769547	0.022755556
000:01:13	0.065	2	2.8125	1.35	1.381938126	1.447242798	0.023111111
000:01:14	0.066	2	2.8125	1.35	1.382441289	1.446716049	0.023466667
000:01:15	0.067	2	2.8125	1.35	1.382944819	1.4461893	0.023822222
000:01:16	0.068	2	2.8125	1.35	1.383448716	1.445662551	0.024177778
000:01:17	0.069	2	2.8125	1.35	1.38395298	1.445135802	0.024533333
000:01:18	0.07	3	2.8125	1.35	1.384457612	2.16691358	0.024888889
000:01:19	0.071	3	2.8125	1.35	1.384962612	2.166123457	0.025244444
000:01:20	0.072	2	2.8125	1.35	1.38546798	1.443555556	0.0256
000:01:21	0.072	2	2.8125	1.35	1.38546798	1.443555556	0.0256
000:01:22	0.073	3	2.8125	1.35	1.385973718	2.16454321	0.025955556
000:01:23	0.074	3	2.8125	1.35	1.386479825	2.163753086	0.026311111
000:01:24	0.075	3	2.8125	1.35	1.386986301	2.162962963	0.026666667
000:01:25	0.076	3	2.8125	1.35	1.387493148	2.16217284	0.027022222
000:01:26	0.077	3	2.8125	1.35	1.388000366	2.161382716	0.027377778
000:01:27	0.078	3	2.8125	1.35	1.388507954	2.160592593	0.027733333
000:01:28	0.078	3	2.8125	1.35	1.388507954	2.160592593	0.027733333

000:01:29	0.079	3	2.8125	1.35	1.389015914	2.159802469	0.028088889
000:01:30	0.08	3	2.8125	1.35	1.389524245	2.159012346	0.028444444
000:01:31	0.081	3	2.8125	1.35	1.390032949	2.158222222	0.0288
000:01:32	0.082	3	2.8125	1.35	1.390542025	2.157432099	0.029155556
000:01:33	0.083	3	2.8125	1.35	1.391051475	2.156641975	0.029511111
000:01:34	0.084	3	2.8125	1.35	1.391561297	2.155851852	0.029866667
000:01:35	0.085	3	2.8125	1.35	1.392071494	2.155061728	0.030222222
000:01:36	0.085	3	2.8125	1.35	1.392071494	2.155061728	0.030222222
000:01:37	0.086	3	2.8125	1.35	1.392582065	2.154271605	0.030577778
000:01:38	0.087	3	2.8125	1.35	1.39309301	2.153481481	0.030933333
000:01:39	0.088	3	2.8125	1.35	1.393604331	2.152691358	0.031288889
000:01:41	0.09	3	2.8125	1.35	1.394628099	2.151111111	0.032
000:01:43	0.091	3	2.8125	1.35	1.395140547	2.150320988	0.032355556
000:01:45	0.093	4	2.8125	1.35	1.396166575	2.864987654	0.033066667
000:01:47	0.095	3	2.8125	1.35	1.397194112	2.147160494	0.033777778
000:01:49	0.097	3	2.8125	1.35	1.398223163	2.145580247	0.034488889
000:01:51	0.098	3	2.8125	1.35	1.398738258	2.144790123	0.034844444
000:01:53	0.1	3	2.8125	1.35	1.399769585	2.143209877	0.035555556
000:01:55	0.102	3	2.8125	1.35	1.400802435	2.14162963	0.036266667
000:01:57	0.104	4	2.8125	1.35	1.40183681	2.853399177	0.036977778
000:01:59	0.105	3	2.8125	1.35	1.402354571	2.139259259	0.037333333
000:02:01	0.107	3	2.8125	1.35	1.40339124	2.137679012	0.038044444
000:02:03	0.109	4	2.8125	1.35	1.404429443	2.848131687	0.038755556
000:02:05	0.11	3	2.8125	1.35	1.404949121	2.135308642	0.039111111
000:02:07	0.112	4	2.8125	1.35	1.405989632	2.844971193	0.039822222
000:02:09	0.114	3	2.8125	1.35	1.407031684	2.132148148	0.040533333

000:02:11	0.116	4	2.8125	1.35	1.408075283	2.840757202	0.041244444
000:02:13	0.117	3	2.8125	1.35	1.408597663	2.129777778	0.0416
000:02:15	0.119	4	2.8125	1.35	1.409643586	2.837596708	0.042311111
000:02:17	0.121	4	2.8125	1.35	1.410691064	2.835489712	0.043022222
000:02:19	0.123	4	2.8125	1.35	1.4117401	2.833382716	0.043733333
000:02:21	0.124	4	2.8125	1.35	1.412265204	2.832329218	0.044088889
000:02:23	0.126	4	2.8125	1.35	1.413316583	2.830222222	0.0448
000:02:25	0.128	4	2.8125	1.35	1.414369529	2.828115226	0.045511111
000:02:27	0.129	4	2.8125	1.35	1.41489659	2.827061728	0.045866667
000:02:29	0.131	4	2.8125	1.35	1.415951893	2.824954733	0.046577778
000:02:31	0.132	4	2.8125	1.35	1.416480134	2.823901235	0.046933333
000:02:33	0.134	4	2.8125	1.35	1.417537801	2.821794239	0.047644444
000:02:35	0.136	4	2.8125	1.35	1.418597048	2.819687243	0.048355556
000:02:37	0.137	4	2.8125	1.35	1.419127266	2.818633745	0.048711111
000:02:39	0.139	4	2.8125	1.35	1.420188891	2.816526749	0.049422222
000:02:41	0.141	4	2.8125	1.35	1.421252106	2.814419753	0.050133333
000:02:43	0.142	4	2.8125	1.35	1.42178431	2.813366255	0.050488889
000:02:45	0.144	4	2.8125	1.35	1.422849916	2.811259259	0.0512
000:02:47	0.146	4	2.8125	1.35	1.42391712	2.809152263	0.051911111
000:02:49	0.148	4	2.8125	1.35	1.424985926	2.807045267	0.052622222
000:02:51	0.149	4	2.8125	1.35	1.425520931	2.80599177	0.052977778
000:02:53	0.151	4	2.8125	1.35	1.426592147	2.803884774	0.053688889
000:02:55	0.153	4	2.8125	1.35	1.427664975	2.801777778	0.0544
000:02:57	0.154	4	2.8125	1.35	1.428201994	2.80072428	0.054755556
000:02:59	0.156	4	2.8125	1.35	1.429277244	2.798617284	0.055466667
000:03:01	0.158	5	2.8125	1.35	1.430354116	3.49563786	0.056177778

000:03:03	0.16	4	2.8125	1.35	1.431432611	2.794403292	0.056888889
000:03:05	0.161	5	2.8125	1.35	1.431972468	3.491687243	0.057244444
000:03:07	0.163	4	2.8125	1.35	1.433053406	2.791242798	0.057955556
000:03:09	0.165	4	2.8125	1.35	1.434135977	2.789135802	0.058666667
000:03:11	0.166	5	2.8125	1.35	1.434677876	3.485102881	0.059022222
000:03:13	0.168	5	2.8125	1.35	1.435762904	3.482469136	0.059733333
000:03:15	0.17	5	2.8125	1.35	1.436849574	3.479835391	0.060444444
000:03:17	0.172	5	2.8125	1.35	1.437937891	3.477201646	0.061155556
000:03:19	0.173	5	2.8125	1.35	1.438482667	3.475884774	0.061511111
000:03:49	0.199	5	2.8125	1.35	1.452793189	3.441646091	0.070755556
000:04:19	0.226	5	2.8125	1.35	1.467958631	3.406090535	0.080355556
000:04:49	0.252	6	2.8125	1.35	1.482864675	4.046222222	0.0896
000:05:19	0.278	6	2.8125	1.35	1.498076544	4.005135802	0.098844444
000:05:49	0.304	6	2.8125	1.35	1.513603747	3.964049383	0.108088889
000:06:19	0.33	7	2.8125	1.35	1.529456193	4.576790123	0.117333333
000:06:49	0.355	7	2.8125	1.35	1.545015259	4.530699588	0.126222222
000:07:19	0.381	7	2.8125	1.35	1.561536089	4.482765432	0.135466667
000:07:49	0.407	8	2.8125	1.35	1.578414051	5.068378601	0.144711111
000:08:19	0.433	8	2.8125	1.35	1.595660853	5.013596708	0.153955556
000:08:49	0.459	8	2.8125	1.35	1.613288719	4.958814815	0.1632
000:09:19	0.485	8	2.8125	1.35	1.631310419	4.904032922	0.172444444
000:09:49	0.511	8	2.8125	1.35	1.6497393	4.849251029	0.181688889
000:10:19	0.537	8	2.8125	1.35	1.668589321	4.794469136	0.190933333
000:10:49	0.562	8	2.8125	1.35	1.687125083	4.741794239	0.199822222
000:11:19	0.587	8	2.8125	1.35	1.706077286	4.689119342	0.208711111
000:11:49	0.613	7	2.8125	1.35	1.726244601	4.055045267	0.217955556

000:12:19	0.64	7	2.8125	1.35	1.747698504	4.00526749	0.227555556
000:12:49	0.666	7	2.8125	1.35	1.768867925	3.957333333	0.2368
000:13:19	0.692	8	2.8125	1.35	1.790556473	4.467884774	0.246044444

Table B-3: Results of test at water content below plastic limit

TIME	**VERTICAL DEFLECTION (in)**	**LOAD (lb)**	**L_0 (in)**	**A_0 $(in)^2$**	**A_C $(in)^2$**	**STRESS (psi)**	**STRAIN (in/in)**
			2.75	1.23			
000:00:00	0	1	2.75	1.23	1.23	0.81300813	0
000:00:01	0	1	2.75	1.23	1.23	0.81300813	0
000:00:02	0.001	1	2.75	1.23	1.230447435	0.812712491	0.000363636
000:00:03	0.002	1	2.75	1.23	1.230895197	0.812416851	0.000727273
000:00:04	0.003	1	2.75	1.23	1.231343284	0.812121212	0.001090909
000:00:05	0.003	1	2.75	1.23	1.231343284	0.812121212	0.001090909
000:00:06	0.004	1	2.75	1.23	1.231791697	0.811825573	0.001454545
000:00:07	0.005	1	2.75	1.23	1.232240437	0.811529933	0.001818182
000:00:08	0.006	1	2.75	1.23	1.232689504	0.811234294	0.002181818
000:00:09	0.007	2	2.75	1.23	1.233138899	1.62187731	0.002545455
000:00:10	0.008	2	2.75	1.23	1.233588621	1.621286031	0.002909091
000:00:11	0.009	2	2.75	1.23	1.234038672	1.620694752	0.003272727
000:00:12	0.009	2	2.75	1.23	1.234038672	1.620694752	0.003272727

000:00:13	0.01	2	2.75	1.23	1.234489051	1.620103474	0.003636364
000:00:14	0.011	2	2.75	1.23	1.234939759	1.619512195	0.004
000:00:15	0.012	2	2.75	1.23	1.235390796	1.618920916	0.004363636
000:00:16	0.013	2	2.75	1.23	1.235842163	1.618329638	0.004727273
000:00:17	0.014	2	2.75	1.23	1.23629386	1.617738359	0.005090909
000:00:18	0.015	2	2.75	1.23	1.236745887	1.617147081	0.005454545
000:00:19	0.016	2	2.75	1.23	1.237198244	1.616555802	0.005818182
000:00:20	0.016	2	2.75	1.23	1.237198244	1.616555802	0.005818182
000:00:21	0.017	2	2.75	1.23	1.237650933	1.615964523	0.006181818
000:00:22	0.018	2	2.75	1.23	1.238103953	1.615373245	0.006545455
000:00:23	0.019	2	2.75	1.23	1.238557305	1.614781966	0.006909091
000:00:24	0.02	2	2.75	1.23	1.239010989	1.614190687	0.007272727
000:00:25	0.021	2	2.75	1.23	1.239465005	1.613599409	0.007636364
000:00:26	0.022	2	2.75	1.23	1.239919355	1.61300813	0.008
000:00:27	0.023	2	2.75	1.23	1.240374037	1.612416851	0.008363636
000:00:28	0.023	2	2.75	1.23	1.240374037	1.612416851	0.008363636
000:00:29	0.024	3	2.75	1.23	1.240829054	2.417738359	0.008727273
000:00:30	0.025	2	2.75	1.23	1.241284404	1.611234294	0.009090909
000:00:31	0.026	3	2.75	1.23	1.241740088	2.415964523	0.009454545
000:00:32	0.027	3	2.75	1.23	1.242196107	2.415077605	0.009818182
000:00:33	0.028	3	2.75	1.23	1.242652461	2.414190687	0.010181818
000:00:34	0.029	3	2.75	1.23	1.243109151	2.413303769	0.010545455
000:00:35	0.029	3	2.75	1.23	1.243109151	2.413303769	0.010545455
000:00:36	0.03	3	2.75	1.23	1.243566176	2.412416851	0.010909091
000:00:37	0.031	3	2.75	1.23	1.244023538	2.411529933	0.011272727
000:00:38	0.032	3	2.75	1.23	1.244481236	2.410643016	0.011636364

000:00:39	0.033	3	2.75	1.23	1.244939271	2.409756098	0.012
000:00:40	0.034	3	2.75	1.23	1.245397644	2.40886918	0.012363636
000:00:41	0.035	3	2.75	1.23	1.245856354	2.407982262	0.012727273
000:00:42	0.036	4	2.75	1.23	1.246315402	3.209460458	0.013090909
000:00:43	0.036	3	2.75	1.23	1.246315402	2.407095344	0.013090909
000:00:44	0.037	4	2.75	1.23	1.246774788	3.208277901	0.013454545
000:00:45	0.038	3	2.75	1.23	1.247234513	2.405321508	0.013818182
000:00:46	0.039	4	2.75	1.23	1.247694578	3.205912786	0.014181818
000:00:47	0.04	4	2.75	1.23	1.248154982	3.204730229	0.014545455
000:00:48	0.041	4	2.75	1.23	1.248615725	3.203547672	0.014909091
000:00:49	0.042	4	2.75	1.23	1.249076809	3.202365115	0.015272727
000:00:50	0.042	4	2.75	1.23	1.249076809	3.202365115	0.015272727
000:00:51	0.043	4	2.75	1.23	1.249538234	3.201182557	0.015636364
000:00:52	0.044	4	2.75	1.23	1.25	3.2	0.016
000:00:53	0.045	4	2.75	1.23	1.250462107	3.198817443	0.016363636
000:00:54	0.046	4	2.75	1.23	1.250924556	3.197634885	0.016727273
000:00:55	0.047	4	2.75	1.23	1.251387347	3.196452328	0.017090909
000:00:56	0.048	4	2.75	1.23	1.251850481	3.195269771	0.017454545
000:00:57	0.049	4	2.75	1.23	1.252313958	3.194087214	0.017818182
000:00:58	0.049	4	2.75	1.23	1.252313958	3.194087214	0.017818182
000:00:59	0.05	5	2.75	1.23	1.252777778	3.99113082	0.018181818
000:01:00	0.051	5	2.75	1.23	1.253241941	3.989652624	0.018545455
000:01:01	0.052	4	2.75	1.23	1.253706449	3.190539542	0.018909091
000:01:02	0.053	5	2.75	1.23	1.254171301	3.986696231	0.019272727
000:01:03	0.054	5	2.75	1.23	1.254636499	3.985218034	0.019636364
000:01:04	0.055	5	2.75	1.23	1.255102041	3.983739837	0.02

000:01:05	0.056	5	2.75	1.23	1.255567929	3.982261641	0.020363636
000:01:06	0.056	5	2.75	1.23	1.255567929	3.982261641	0.020363636
000:01:07	0.057	6	2.75	1.23	1.256034163	4.776940133	0.020727273
000:01:08	0.058	5	2.75	1.23	1.256500743	3.979305248	0.021090909
000:01:09	0.059	5	2.75	1.23	1.25696767	3.977827051	0.021454545
000:01:10	0.06	5	2.75	1.23	1.257434944	3.976348854	0.021818182
000:01:11	0.061	5	2.75	1.23	1.257902566	3.974870658	0.022181818
000:01:12	0.062	5	2.75	1.23	1.258370536	3.973392461	0.022545455
000:01:13	0.063	5	2.75	1.23	1.258838854	3.971914265	0.022909091
000:01:14	0.063	5	2.75	1.23	1.258838854	3.971914265	0.022909091
000:01:15	0.064	5	2.75	1.23	1.25930752	3.970436068	0.023272727
000:01:16	0.065	5	2.75	1.23	1.259776536	3.968957871	0.023636364
000:01:17	0.066	5	2.75	1.23	1.260245902	3.967479675	0.024
000:01:18	0.067	6	2.75	1.23	1.260715617	4.759201774	0.024363636
000:01:19	0.068	6	2.75	1.23	1.261185682	4.757427938	0.024727273
000:01:20	0.069	5	2.75	1.23	1.261656098	3.963045085	0.025090909
000:01:21	0.07	6	2.75	1.23	1.262126866	4.753880266	0.025454545
000:01:22	0.07	6	2.75	1.23	1.262126866	4.753880266	0.025454545
000:01:23	0.071	6	2.75	1.23	1.262597984	4.75210643	0.025818182
000:01:24	0.072	6	2.75	1.23	1.263069455	4.750332594	0.026181818
000:01:25	0.073	6	2.75	1.23	1.263541278	4.748558758	0.026545455
000:01:26	0.074	6	2.75	1.23	1.264013453	4.746784922	0.026909091
000:01:27	0.075	6	2.75	1.23	1.264485981	4.745011086	0.027272727
000:01:28	0.076	6	2.75	1.23	1.264958863	4.743237251	0.027636364
000:01:29	0.076	6	2.75	1.23	1.264958863	4.743237251	0.027636364
000:01:30	0.077	6	2.75	1.23	1.265432099	4.741463415	0.028

000:01:31	0.078	6	2.75	1.23	1.265905689	4.739689579	0.028363636
000:01:32	0.079	6	2.75	1.23	1.266379633	4.737915743	0.028727273
000:01:33	0.08	6	2.75	1.23	1.266853933	4.736141907	0.029090909
000:01:34	0.081	6	2.75	1.23	1.267328587	4.734368071	0.029454545
000:01:35	0.082	7	2.75	1.23	1.267803598	5.521359941	0.029818182
000:01:36	0.083	7	2.75	1.23	1.268278965	5.519290466	0.030181818
000:01:37	0.084	6	2.75	1.23	1.268754689	4.729046563	0.030545455
000:01:38	0.084	6	2.75	1.23	1.268754689	4.729046563	0.030545455
000:01:39	0.085	6	2.75	1.23	1.269230769	4.727272727	0.030909091
000:01:41	0.087	7	2.75	1.23	1.270184003	5.511012565	0.031636364
000:01:43	0.089	7	2.75	1.23	1.27113867	5.506873614	0.032363636
000:01:45	0.091	7	2.75	1.23	1.272094772	5.502734664	0.033090909
000:01:47	0.092	7	2.75	1.23	1.272573363	5.500665188	0.033454545
000:01:49	0.094	7	2.75	1.23	1.273531627	5.496526238	0.034181818
000:01:51	0.096	7	2.75	1.23	1.274491334	5.492387288	0.034909091
000:01:53	0.098	7	2.75	1.23	1.275452489	5.488248337	0.035636364
000:01:55	0.099	7	2.75	1.23	1.27593361	5.486178862	0.036
000:01:57	0.101	7	2.75	1.23	1.276896942	5.482039911	0.036727273
000:01:59	0.103	7	2.75	1.23	1.27786173	5.477900961	0.037454545
000:02:01	0.105	7	2.75	1.23	1.278827977	5.47376201	0.038181818
000:02:03	0.106	7	2.75	1.23	1.279311649	5.471692535	0.038545455
000:02:05	0.108	7	2.75	1.23	1.280280091	5.467553585	0.039272727
000:02:07	0.11	7	2.75	1.23	1.28125	5.463414634	0.04
000:02:09	0.112	7	2.75	1.23	1.28222138	5.459275684	0.040727273
000:02:11	0.113	8	2.75	1.23	1.282707622	6.236807095	0.041090909
000:02:13	0.115	8	2.75	1.23	1.283681214	6.232076866	0.041818182

000:02:15	0.117	8	2.75	1.23	1.284656286	6.227346637	0.042545455
000:02:17	0.118	8	2.75	1.23	1.285144377	6.224981523	0.042909091
000:02:19	0.12	8	2.75	1.23	1.286121673	6.220251293	0.043636364
000:02:21	0.122	8	2.75	1.23	1.287100457	6.215521064	0.044363636
000:02:23	0.124	8	2.75	1.23	1.288080731	6.210790835	0.045090909
000:02:25	0.125	8	2.75	1.23	1.288571429	6.208425721	0.045454545
000:02:27	0.127	8	2.75	1.23	1.289553946	6.203695492	0.046181818
000:02:29	0.129	8	2.75	1.23	1.290537963	6.198965262	0.046909091
000:02:31	0.131	8	2.75	1.23	1.291523482	6.194235033	0.047636364
000:02:33	0.132	8	2.75	1.23	1.292016807	6.191869919	0.048
000:02:35	0.134	8	2.75	1.23	1.293004587	6.18713969	0.048727273
000:02:37	0.136	8	2.75	1.23	1.293993879	6.18240946	0.049454545
000:02:39	0.137	8	2.75	1.23	1.294489093	6.180044346	0.049818182
000:02:41	0.139	8	2.75	1.23	1.295480659	6.175314117	0.050545455
000:02:43	0.141	8	2.75	1.23	1.296473745	6.170583888	0.051272727
000:02:45	0.143	8	2.75	1.23	1.297468354	6.165853659	0.052
000:02:47	0.144	8	2.75	1.23	1.297966232	6.163488544	0.052363636
000:02:49	0.146	8	2.75	1.23	1.298963134	6.158758315	0.053090909
000:02:51	0.148	9	2.75	1.23	1.299961568	6.923281596	0.053818182
000:02:53	0.15	9	2.75	1.23	1.300961538	6.917960089	0.054545455
000:02:55	0.151	9	2.75	1.23	1.301462101	6.915299335	0.054909091
000:02:57	0.153	9	2.75	1.23	1.302464382	6.909977827	0.055636364
000:02:59	0.154	9	2.75	1.23	1.302966102	6.907317073	0.056
000:03:01	0.156	9	2.75	1.23	1.303970702	6.901995565	0.056727273
000:03:03	0.159	9	2.75	1.23	1.305480509	6.894013304	0.057818182
000:03:05	0.16	9	2.75	1.23	1.305984556	6.89135255	0.058181818

000:03:07	0.161	9	2.75	1.23	1.306488992	6.888691796	0.058545455
000:03:09	0.163	9	2.75	1.23	1.307499034	6.883370288	0.059272727
000:03:11	0.165	9	2.75	1.23	1.308510638	6.87804878	0.06
000:03:13	0.166	9	2.75	1.23	1.309017028	6.875388027	0.060363636
000:03:15	0.168	9	2.75	1.23	1.310030984	6.870066519	0.061090909
000:03:17	0.17	9	2.75	1.23	1.311046512	6.864745011	0.061818182
000:03:19	0.171	9	2.75	1.23	1.311554866	6.862084257	0.062181818
000:03:49	0.198	9	2.75	1.23	1.325431034	6.790243902	0.072
000:04:19	0.224	10	2.75	1.23	1.339073634	7.467849224	0.081454545
000:04:49	0.25	11	2.75	1.23	1.353	8.130081301	0.090909091
000:05:19	0.275	11	2.75	1.23	1.366666667	8.048780488	0.1
000:05:49	0.301	12	2.75	1.23	1.38117599	8.688248337	0.109454545
000:06:19	0.327	12	2.75	1.23	1.395996698	8.596008869	0.118909091
000:06:49	0.353	12	2.75	1.23	1.411138924	8.503769401	0.128363636
000:07:19	0.379	12	2.75	1.23	1.426613243	8.411529933	0.137818182
000:07:49	0.405	12	2.75	1.23	1.442430704	8.319290466	0.147272727
000:08:19	0.43	12	2.75	1.23	1.457974138	8.23059867	0.156363636
000:08:49	0.456	12	2.75	1.23	1.474498692	8.138359202	0.165818182
000:09:19	0.482	12	2.75	1.23	1.491402116	8.046119734	0.175272727
000:09:49	0.508	12	2.75	1.23	1.508697591	7.953880266	0.184727273

- Sample with 10% sand, 90% clay

Table B-4: Results of test at water content above plastic limit

TIME	VERTICAL DEFLECTION (in)	LOAD (lb)	L_0 (in)	A_0 $(in)^2$	A_C $(in)^2$	STRESS (psi)	STRAIN (in/in)
000:00:00	0.001	1	2.75	1.23	1.230447435	0.812712491	0.000363636
000:00:01	0.002	1	2.75	1.23	1.230895197	0.812416851	0.000727273
000:00:02	0.003	0	2.75	1.23	1.231343284	0	0.001090909
000:00:03	0.004	0	2.75	1.23	1.231791697	0	0.001454545
000:00:04	0.005	1	2.75	1.23	1.232240437	0.811529933	0.001818182
000:00:05	0.005	1	2.75	1.23	1.232240437	0.811529933	0.001818182
000:00:06	0.006	1	2.75	1.23	1.232689504	0.811234294	0.002181818
000:00:07	0.007	1	2.75	1.23	1.233138899	0.810938655	0.002545455
000:00:08	0.008	1	2.75	1.23	1.233588621	0.810643016	0.002909091
000:00:09	0.009	1	2.75	1.23	1.234038672	0.810347376	0.003272727
000:00:10	0.01	1	2.75	1.23	1.234489051	0.810051737	0.003636364
000:00:11	0.011	1	2.75	1.23	1.234939759	0.809756098	0.004
000:00:12	0.012	1	2.75	1.23	1.235390796	0.809460458	0.004363636
000:00:13	0.012	1	2.75	1.23	1.235390796	0.809460458	0.004363636
000:00:14	0.013	1	2.75	1.23	1.235842163	0.809164819	0.004727273
000:00:15	0.014	2	2.75	1.23	1.23629386	1.617738359	0.005090909
000:00:16	0.015	2	2.75	1.23	1.236745887	1.617147081	0.005454545
000:00:17	0.016	2	2.75	1.23	1.237198244	1.616555802	0.005818182

000:00:18	0.017	2	2.75	1.23	1.237650933	1.615964523	0.006181818
000:00:19	0.018	2	2.75	1.23	1.238103953	1.615373245	0.006545455
000:00:20	0.018	2	2.75	1.23	1.238103953	1.615373245	0.006545455
000:00:21	0.019	2	2.75	1.23	1.238557305	1.614781966	0.006909091
000:00:22	0.02	2	2.75	1.23	1.239010989	1.614190687	0.007272727
000:00:23	0.021	3	2.75	1.23	1.239465005	2.420399113	0.007636364
000:00:24	0.022	3	2.75	1.23	1.239919355	2.419512195	0.008
000:00:25	0.023	2	2.75	1.23	1.240374037	1.612416851	0.008363636
000:00:26	0.024	3	2.75	1.23	1.240829054	2.417738359	0.008727273
000:00:27	0.025	3	2.75	1.23	1.241284404	2.416851441	0.009090909
000:00:28	0.026	3	2.75	1.23	1.241740088	2.415964523	0.009454545
000:00:29	0.026	3	2.75	1.23	1.241740088	2.415964523	0.009454545
000:00:30	0.027	3	2.75	1.23	1.242196107	2.415077605	0.009818182
000:00:31	0.028	3	2.75	1.23	1.242652461	2.414190687	0.010181818
000:00:32	0.029	3	2.75	1.23	1.243109151	2.413303769	0.010545455
000:00:33	0.03	3	2.75	1.23	1.243566176	2.412416851	0.010909091
000:00:34	0.031	3	2.75	1.23	1.244023538	2.411529933	0.011272727
000:00:35	0.032	3	2.75	1.23	1.244481236	2.410643016	0.011636364
000:00:36	0.033	3	2.75	1.23	1.244939271	2.409756098	0.012
000:00:37	0.033	3	2.75	1.23	1.244939271	2.409756098	0.012
000:00:38	0.034	3	2.75	1.23	1.245397644	2.40886918	0.012363636
000:00:39	0.035	3	2.75	1.23	1.245856354	2.407982262	0.012727273
000:00:40	0.036	3	2.75	1.23	1.246315402	2.407095344	0.013090909
000:00:41	0.037	3	2.75	1.23	1.246774788	2.406208426	0.013454545
000:00:42	0.038	3	2.75	1.23	1.247234513	2.405321508	0.013818182
000:00:43	0.039	3	2.75	1.23	1.247694578	2.40443459	0.014181818

000:00:44	0.04	3	2.75	1.23	1.248154982	2.403547672	0.014545455
000:00:45	0.04	3	2.75	1.23	1.248154982	2.403547672	0.014545455
000:00:46	0.041	3	2.75	1.23	1.248615725	2.402660754	0.014909091
000:00:47	0.042	3	2.75	1.23	1.249076809	2.401773836	0.015272727
000:00:48	0.043	3	2.75	1.23	1.249538234	2.400886918	0.015636364
000:00:49	0.044	3	2.75	1.23	1.25	2.4	0.016
000:00:50	0.045	4	2.75	1.23	1.250462107	3.198817443	0.016363636
000:00:51	0.046	3	2.75	1.23	1.250924556	2.398226164	0.016727273
000:00:52	0.047	4	2.75	1.23	1.251387347	3.196452328	0.017090909
000:00:53	0.048	3	2.75	1.23	1.251850481	2.396452328	0.017454545
000:00:54	0.048	3	2.75	1.23	1.251850481	2.396452328	0.017454545
000:00:55	0.049	4	2.75	1.23	1.252313958	3.194087214	0.017818182
000:00:56	0.05	4	2.75	1.23	1.252777778	3.192904656	0.018181818
000:00:57	0.051	4	2.75	1.23	1.253241941	3.191722099	0.018545455
000:00:58	0.052	4	2.75	1.23	1.253706449	3.190539542	0.018909091
000:00:59	0.053	4	2.75	1.23	1.254171301	3.189356984	0.019272727
000:01:00	0.054	4	2.75	1.23	1.254636499	3.188174427	0.019636364
000:01:01	0.055	4	2.75	1.23	1.255102041	3.18699187	0.02
000:01:02	0.056	4	2.75	1.23	1.255567929	3.185809313	0.020363636
000:01:03	0.056	4	2.75	1.23	1.255567929	3.185809313	0.020363636
000:01:04	0.057	4	2.75	1.23	1.256034163	3.184626755	0.020727273
000:01:05	0.058	4	2.75	1.23	1.256500743	3.183444198	0.021090909
000:01:06	0.059	4	2.75	1.23	1.25696767	3.182261641	0.021454545
000:01:07	0.06	5	2.75	1.23	1.257434944	3.976348854	0.021818182
000:01:08	0.061	4	2.75	1.23	1.257902566	3.179896526	0.022181818
000:01:09	0.062	4	2.75	1.23	1.258370536	3.178713969	0.022545455

000:01:10	0.062	4	2.75	1.23	1.258370536	3.178713969	0.022545455
000:01:11	0.063	4	2.75	1.23	1.258838854	3.177531412	0.022909091
000:01:12	0.064	4	2.75	1.23	1.25930752	3.176348854	0.023272727
000:01:13	0.065	4	2.75	1.23	1.259776536	3.175166297	0.023636364
000:01:14	0.066	4	2.75	1.23	1.260245902	3.17398374	0.024
000:01:15	0.067	4	2.75	1.23	1.260715617	3.172801183	0.024363636
000:01:16	0.068	4	2.75	1.23	1.261185682	3.171618625	0.024727273
000:01:17	0.068	4	2.75	1.23	1.261185682	3.171618625	0.024727273
000:01:18	0.069	4	2.75	1.23	1.261656098	3.170436068	0.025090909
000:01:19	0.07	5	2.75	1.23	1.262126866	3.961566888	0.025454545
000:01:20	0.071	5	2.75	1.23	1.262597984	3.960088692	0.025818182
000:01:21	0.072	5	2.75	1.23	1.263069455	3.958610495	0.026181818
000:01:22	0.073	5	2.75	1.23	1.263541278	3.957132299	0.026545455
000:01:23	0.074	5	2.75	1.23	1.264013453	3.955654102	0.026909091
000:01:24	0.075	5	2.75	1.23	1.264485981	3.954175905	0.027272727
000:01:25	0.075	5	2.75	1.23	1.264485981	3.954175905	0.027272727
000:01:26	0.076	5	2.75	1.23	1.264958863	3.952697709	0.027636364
000:01:27	0.077	5	2.75	1.23	1.265432099	3.951219512	0.028
000:01:28	0.078	5	2.75	1.23	1.265905689	3.949741316	0.028363636
000:01:29	0.079	5	2.75	1.23	1.266379633	3.948263119	0.028727273
000:01:30	0.08	5	2.75	1.23	1.266853933	3.946784922	0.029090909
000:01:31	0.081	5	2.75	1.23	1.267328587	3.945306726	0.029454545
000:01:32	0.081	5	2.75	1.23	1.267328587	3.945306726	0.029454545
000:01:33	0.082	5	2.75	1.23	1.267803598	3.943828529	0.029818182
000:01:34	0.083	5	2.75	1.23	1.268278965	3.942350333	0.030181818
000:01:35	0.084	5	2.75	1.23	1.268754689	3.940872136	0.030545455

000:01:36	0.085	5	2.75	1.23	1.269230769	3.939393939	0.030909091
000:01:37	0.086	5	2.75	1.23	1.269707207	3.937915743	0.031272727
000:01:38	0.087	5	2.75	1.23	1.270184003	3.936437546	0.031636364
000:01:39	0.087	5	2.75	1.23	1.270184003	3.936437546	0.031636364
000:01:41	0.089	5	2.75	1.23	1.27113867	3.933481153	0.032363636
000:01:43	0.091	5	2.75	1.23	1.272094772	3.93052476	0.033090909
000:01:45	0.093	5	2.75	1.23	1.273052315	3.927568367	0.033818182
000:01:47	0.094	5	2.75	1.23	1.273531627	3.92609017	0.034181818
000:01:49	0.096	6	2.75	1.23	1.274491334	4.707760532	0.034909091
000:01:51	0.098	6	2.75	1.23	1.275452489	4.70421286	0.035636364
000:01:53	0.099	5	2.75	1.23	1.27593361	3.918699187	0.036
000:01:55	0.101	6	2.75	1.23	1.276896942	4.698891353	0.036727273
000:01:57	0.103	6	2.75	1.23	1.27786173	4.695343681	0.037454545
000:01:59	0.105	6	2.75	1.23	1.278827977	4.691796009	0.038181818
000:02:01	0.106	6	2.75	1.23	1.279311649	4.690022173	0.038545455
000:02:03	0.108	6	2.75	1.23	1.280280091	4.686474501	0.039272727
000:02:05	0.11	6	2.75	1.23	1.28125	4.682926829	0.04
000:02:07	0.112	6	2.75	1.23	1.28222138	4.679379157	0.040727273
000:02:09	0.113	6	2.75	1.23	1.282707622	4.677605322	0.041090909
000:02:11	0.115	6	2.75	1.23	1.283681214	4.67405765	0.041818182
000:02:13	0.117	6	2.75	1.23	1.284656286	4.670509978	0.042545455
000:02:15	0.118	6	2.75	1.23	1.285144377	4.668736142	0.042909091
000:02:17	0.12	6	2.75	1.23	1.286121673	4.66518847	0.043636364
000:02:19	0.122	6	2.75	1.23	1.287100457	4.661640798	0.044363636
000:02:21	0.124	6	2.75	1.23	1.288080731	4.658093126	0.045090909
000:02:23	0.125	7	2.75	1.23	1.288571429	5.432372506	0.045454545

000:02:25	0.127	6	2.75	1.23	1.289553946	4.652771619	0.046181818
000:02:27	0.129	7	2.75	1.23	1.290537963	5.424094605	0.046909091
000:02:29	0.13	7	2.75	1.23	1.291030534	5.422025129	0.047272727
000:02:31	0.132	6	2.75	1.23	1.292016807	4.643902439	0.048
000:02:33	0.133	7	2.75	1.23	1.292510508	5.415816704	0.048363636
000:02:35	0.135	7	2.75	1.23	1.293499044	5.411677753	0.049090909
000:02:37	0.137	7	2.75	1.23	1.294489093	5.407538803	0.049818182
000:02:39	0.139	7	2.75	1.23	1.295480659	5.403399852	0.050545455
000:02:41	0.14	6	2.75	1.23	1.295977011	4.629711752	0.050909091
000:02:43	0.142	6	2.75	1.23	1.296970859	4.62616408	0.051636364
000:02:45	0.144	7	2.75	1.23	1.297966232	5.393052476	0.052363636
000:02:47	0.145	7	2.75	1.23	1.298464491	5.390983001	0.052727273
000:02:49	0.147	7	2.75	1.23	1.299462159	5.38684405	0.053454545
000:02:51	0.149	7	2.75	1.23	1.300461361	5.3827051	0.054181818
000:02:53	0.151	7	2.75	1.23	1.301462101	5.378566149	0.054909091
000:02:55	0.152	7	2.75	1.23	1.301963048	5.376496674	0.055272727
000:02:57	0.154	7	2.75	1.23	1.302966102	5.372357724	0.056
000:02:59	0.156	7	2.75	1.23	1.303970702	5.368218773	0.056727273
000:03:01	0.157	7	2.75	1.23	1.304473583	5.366149298	0.057090909
000:03:03	0.159	7	2.75	1.23	1.305480509	5.362010347	0.057818182
000:03:05	0.161	7	2.75	1.23	1.306488992	5.357871397	0.058545455
000:03:07	0.163	8	2.75	1.23	1.307499034	6.118551367	0.059272727
000:03:09	0.164	8	2.75	1.23	1.30800464	6.116186253	0.059636364
000:03:11	0.166	7	2.75	1.23	1.309017028	5.347524021	0.060363636
000:03:13	0.168	8	2.75	1.23	1.310030984	6.106725795	0.061090909
000:03:15	0.169	8	2.75	1.23	1.310538551	6.10436068	0.061454545

000:03:17	0.171	8	2.75	1.23	1.311554866	6.099630451	0.062181818
000:03:19	0.173	8	2.75	1.23	1.312572759	6.094900222	0.062909091
000:03:49	0.199	8	2.75	1.23	1.325950608	6.033407243	0.072363636
000:04:19	0.225	9	2.75	1.23	1.33960396	6.718403548	0.081818182
000:04:49	0.251	10	2.75	1.23	1.353541417	7.388026608	0.091272727
000:05:19	0.278	10	2.75	1.23	1.368325243	7.308203991	0.101090909
000:05:49	0.303	11	2.75	1.23	1.382304863	7.957723577	0.110181818
000:06:19	0.329	11	2.75	1.23	1.397149938	7.873170732	0.119636364
000:06:49	0.354	11	2.75	1.23	1.41172788	7.791869919	0.128727273
000:07:19	0.379	12	2.75	1.23	1.426613243	8.411529933	0.137818182
000:07:49	0.406	12	2.75	1.23	1.443046075	8.315742794	0.147636364
000:08:19	0.432	12	2.75	1.23	1.459232097	8.223503326	0.157090909
000:08:49	0.458	12	2.75	1.23	1.47578534	8.131263858	0.166545455
000:09:19	0.484	12	2.75	1.23	1.492718447	8.03902439	0.176
000:09:49	0.51	13	2.75	1.23	1.510044643	8.609016999	0.185454545
000:10:19	0.536	13	2.75	1.23	1.527777778	8.509090909	0.194909091
000:10:49	0.561	12	2.75	1.23	1.545226131	7.765853659	0.204
000:11:19	0.586	12	2.75	1.23	1.563077634	7.677161863	0.213090909
000:11:49	0.612	12	2.75	1.23	1.582086062	7.584922395	0.222545455

Table B-5: Results of test at water content at plastic limit

TIME	VERTICAL DEFLECTION (in)	LOAD (lb)	L_0 (in)	A_0 $(in)^2$	A_C $(in)^2$	STRESS (psi)	STRAIN (in/in)
000:00:00	0.002	0	2.8125	1.35	1.350960683	0	0.000711111
000:00:01	0.003	0	2.8125	1.35	1.351441538	0	0.001066667
000:00:02	0.004	0	2.8125	1.35	1.351922735	0	0.001422222
000:00:03	0.005	1	2.8125	1.35	1.352404274	0.739423868	0.001777778
000:00:04	0.006	1	2.8125	1.35	1.352886157	0.739160494	0.002133333
000:00:05	0.007	1	2.8125	1.35	1.353368384	0.738897119	0.002488889
000:00:06	0.007	1	2.8125	1.35	1.353368384	0.738897119	0.002488889
000:00:07	0.008	1	2.8125	1.35	1.353850954	0.738633745	0.002844444
000:00:08	0.009	1	2.8125	1.35	1.354333868	0.73837037	0.0032
000:00:09	0.01	1	2.8125	1.35	1.354817128	0.738106996	0.003555556
000:00:10	0.011	2	2.8125	1.35	1.355300732	1.475687243	0.003911111
000:00:11	0.012	2	2.8125	1.35	1.355784681	1.475160494	0.004266667
000:00:12	0.013	2	2.8125	1.35	1.356268977	1.474633745	0.004622222
000:00:13	0.013	3	2.8125	1.35	1.356268977	2.211950617	0.004622222
000:00:14	0.014	2	2.8125	1.35	1.356753618	1.474106996	0.004977778
000:00:15	0.015	3	2.8125	1.35	1.357238606	2.21037037	0.005333333
000:00:16	0.016	3	2.8125	1.35	1.357723941	2.209580247	0.005688889
000:00:17	0.017	3	2.8125	1.35	1.358209623	2.208790123	0.006044444
000:00:18	0.018	3	2.8125	1.35	1.358695652	2.208	0.0064
000:00:19	0.019	3	2.8125	1.35	1.35918203	2.207209877	0.006755556

000:00:20	0.02	3	2.8125	1.35	1.359668756	2.206419753	0.007111111
000:00:21	0.02	3	2.8125	1.35	1.359668756	2.206419753	0.007111111
000:00:22	0.021	4	2.8125	1.35	1.36015583	2.940839506	0.007466667
000:00:23	0.022	4	2.8125	1.35	1.360643254	2.939786008	0.007822222
000:00:24	0.023	4	2.8125	1.35	1.361131027	2.93873251	0.008177778
000:00:25	0.024	5	2.8125	1.35	1.36161915	3.672098765	0.008533333
000:00:26	0.025	5	2.8125	1.35	1.362107623	3.670781893	0.008888889
000:00:27	0.026	4	2.8125	1.35	1.362596447	2.935572016	0.009244444
000:00:28	0.027	5	2.8125	1.35	1.363085622	3.668148148	0.0096
000:00:29	0.027	5	2.8125	1.35	1.363085622	3.668148148	0.0096
000:00:30	0.028	5	2.8125	1.35	1.363575148	3.666831276	0.009955556
000:00:31	0.029	5	2.8125	1.35	1.364065026	3.665514403	0.010311111
000:00:32	0.03	5	2.8125	1.35	1.364555256	3.664197531	0.010666667
000:00:33	0.031	5	2.8125	1.35	1.365045839	3.662880658	0.011022222
000:00:34	0.032	5	2.8125	1.35	1.365536774	3.661563786	0.011377778
000:00:35	0.033	5	2.8125	1.35	1.366028063	3.660246914	0.011733333
000:00:36	0.034	5	2.8125	1.35	1.366519705	3.658930041	0.012088889
000:00:37	0.034	5	2.8125	1.35	1.366519705	3.658930041	0.012088889
000:00:38	0.035	6	2.8125	1.35	1.367011701	4.389135802	0.012444444
000:00:39	0.036	5	2.8125	1.35	1.367504052	3.656296296	0.0128
000:00:40	0.037	6	2.8125	1.35	1.367996757	4.385975309	0.013155556
000:00:41	0.038	6	2.8125	1.35	1.368489818	4.384395062	0.013511111
000:00:42	0.039	6	2.8125	1.35	1.368983234	4.382814815	0.013866667
000:00:43	0.04	6	2.8125	1.35	1.369477006	4.381234568	0.014222222
000:00:44	0.041	6	2.8125	1.35	1.369971135	4.379654321	0.014577778
000:00:45	0.041	6	2.8125	1.35	1.369971135	4.379654321	0.014577778

000:00:46	0.042	6	2.8125	1.35	1.37046562	4.378074074	0.014933333
000:00:47	0.043	6	2.8125	1.35	1.370960462	4.376493827	0.015288889
000:00:48	0.044	6	2.8125	1.35	1.371455662	4.37491358	0.015644444
000:00:49	0.045	6	2.8125	1.35	1.37195122	4.373333333	0.016
000:00:50	0.046	7	2.8125	1.35	1.372447135	5.100378601	0.016355556
000:00:51	0.047	6	2.8125	1.35	1.37294341	4.37017284	0.016711111
000:00:52	0.048	7	2.8125	1.35	1.373440043	5.096691358	0.017066667
000:00:53	0.049	6	2.8125	1.35	1.373937036	4.367012346	0.017422222
000:00:54	0.049	7	2.8125	1.35	1.373937036	5.094847737	0.017422222
000:00:55	0.05	7	2.8125	1.35	1.374434389	5.093004115	0.017777778
000:00:56	0.051	7	2.8125	1.35	1.374932102	5.091160494	0.018133333
000:00:57	0.052	7	2.8125	1.35	1.375430176	5.089316872	0.018488889
000:00:58	0.053	7	2.8125	1.35	1.37592861	5.087473251	0.018844444
000:00:59	0.054	7	2.8125	1.35	1.376427406	5.08562963	0.0192
000:01:00	0.055	7	2.8125	1.35	1.376926564	5.083786008	0.019555556
000:01:01	0.056	7	2.8125	1.35	1.377426084	5.081942387	0.019911111
000:01:02	0.057	7	2.8125	1.35	1.377925966	5.080098765	0.020266667
000:01:03	0.057	7	2.8125	1.35	1.377925966	5.080098765	0.020266667
000:01:04	0.058	7	2.8125	1.35	1.378426212	5.078255144	0.020622222
000:01:05	0.059	7	2.8125	1.35	1.37892682	5.076411523	0.020977778
000:01:06	0.06	7	2.8125	1.35	1.379427793	5.074567901	0.021333333
000:01:07	0.061	8	2.8125	1.35	1.37992913	5.797399177	0.021688889
000:01:08	0.062	8	2.8125	1.35	1.380430831	5.795292181	0.022044444
000:01:09	0.063	8	2.8125	1.35	1.380932897	5.793185185	0.0224
000:01:10	0.064	8	2.8125	1.35	1.381435328	5.791078189	0.022755556
000:01:11	0.064	8	2.8125	1.35	1.381435328	5.791078189	0.022755556

000:01:12	0.065	8	2.8125	1.35	1.381938126	5.788971193	0.023111111
000:01:13	0.066	8	2.8125	1.35	1.382441289	5.786864198	0.023466667
000:01:14	0.067	8	2.8125	1.35	1.382944819	5.784757202	0.023822222
000:01:15	0.068	8	2.8125	1.35	1.383448716	5.782650206	0.024177778
000:01:16	0.069	8	2.8125	1.35	1.38395298	5.78054321	0.024533333
000:01:17	0.07	8	2.8125	1.35	1.384457612	5.778436214	0.024888889
000:01:18	0.07	8	2.8125	1.35	1.384457612	5.778436214	0.024888889
000:01:19	0.071	8	2.8125	1.35	1.384962612	5.776329218	0.025244444
000:01:20	0.072	8	2.8125	1.35	1.38546798	5.774222222	0.0256
000:01:21	0.073	8	2.8125	1.35	1.385973718	5.772115226	0.025955556
000:01:22	0.074	8	2.8125	1.35	1.386479825	5.77000823	0.026311111
000:01:23	0.075	9	2.8125	1.35	1.386986301	6.488888889	0.026666667
000:01:24	0.076	8	2.8125	1.35	1.387493148	5.765794239	0.027022222
000:01:25	0.077	9	2.8125	1.35	1.388000366	6.484148148	0.027377778
000:01:26	0.077	9	2.8125	1.35	1.388000366	6.484148148	0.027377778
000:01:27	0.078	9	2.8125	1.35	1.388507954	6.481777778	0.027733333
000:01:28	0.079	9	2.8125	1.35	1.389015914	6.479407407	0.028088889
000:01:29	0.08	9	2.8125	1.35	1.389524245	6.477037037	0.028444444
000:01:30	0.081	9	2.8125	1.35	1.390032949	6.474666667	0.0288
000:01:31	0.082	9	2.8125	1.35	1.390542025	6.472296296	0.029155556
000:01:32	0.083	9	2.8125	1.35	1.391051475	6.469925926	0.029511111
000:01:33	0.084	9	2.8125	1.35	1.391561297	6.467555556	0.029866667
000:01:34	0.084	9	2.8125	1.35	1.391561297	6.467555556	0.029866667
000:01:35	0.085	10	2.8125	1.35	1.392071494	7.183539095	0.030222222
000:01:36	0.086	9	2.8125	1.35	1.392582065	6.462814815	0.030577778
000:01:37	0.087	9	2.8125	1.35	1.39309301	6.460444444	0.030933333

000:01:38	0.088	9	2.8125	1.35	1.393604331	6.458074074	0.031288889
000:01:39	0.089	9	2.8125	1.35	1.394116027	6.455703704	0.031644444
000:01:41	0.091	10	2.8125	1.35	1.395140547	7.167736626	0.032355556
000:01:43	0.092	10	2.8125	1.35	1.395653373	7.165102881	0.032711111
000:01:45	0.094	10	2.8125	1.35	1.396680154	7.159835391	0.033422222
000:01:47	0.096	10	2.8125	1.35	1.397708448	7.154567901	0.034133333
000:01:49	0.097	10	2.8125	1.35	1.398223163	7.151934156	0.034488889
000:01:51	0.099	10	2.8125	1.35	1.399253731	7.146666667	0.0352
000:01:53	0.101	10	2.8125	1.35	1.40028582	7.141399177	0.035911111
000:01:55	0.103	10	2.8125	1.35	1.401319432	7.136131687	0.036622222
000:01:57	0.104	10	2.8125	1.35	1.40183681	7.133497942	0.036977778
000:01:59	0.106	10	2.8125	1.35	1.402872714	7.128230453	0.037688889
000:02:01	0.108	10	2.8125	1.35	1.40391015	7.122962963	0.0384
000:02:03	0.11	11	2.8125	1.35	1.404949121	7.829465021	0.039111111
000:02:05	0.111	10	2.8125	1.35	1.405469184	7.115061728	0.039466667
000:02:07	0.113	11	2.8125	1.35	1.406510465	7.820773663	0.040177778
000:02:09	0.115	11	2.8125	1.35	1.40755329	7.814979424	0.040888889
000:02:11	0.116	11	2.8125	1.35	1.408075283	7.812082305	0.041244444
000:02:13	0.118	11	2.8125	1.35	1.409120431	7.806288066	0.041955556
000:02:15	0.12	12	2.8125	1.35	1.410167131	8.50962963	0.042666667
000:02:17	0.121	11	2.8125	1.35	1.410691064	7.797596708	0.043022222
000:02:19	0.123	12	2.8125	1.35	1.4117401	8.500148148	0.043733333
000:02:21	0.125	12	2.8125	1.35	1.412790698	8.49382716	0.044444444
000:02:23	0.126	12	2.8125	1.35	1.413316583	8.490666667	0.0448
000:02:25	0.128	12	2.8125	1.35	1.414369529	8.484345679	0.045511111
000:02:27	0.13	12	2.8125	1.35	1.415424045	8.478024691	0.046222222

000:02:29	0.131	12	2.8125	1.35	1.415951893	8.474864198	0.046577778
000:02:31	0.133	12	2.8125	1.35	1.41700877	8.46854321	0.047288889
000:02:33	0.135	12	2.8125	1.35	1.418067227	8.462222222	0.048
000:02:35	0.136	12	2.8125	1.35	1.418597048	8.459061728	0.048355556
000:02:37	0.138	12	2.8125	1.35	1.41965788	8.452740741	0.049066667
000:02:39	0.14	12	2.8125	1.35	1.420720299	8.446419753	0.049777778
000:02:41	0.142	12	2.8125	1.35	1.42178431	8.440098765	0.050488889
000:02:43	0.143	13	2.8125	1.35	1.422316913	9.140016461	0.050844444
000:02:45	0.145	13	2.8125	1.35	1.423383318	9.133168724	0.051555556
000:02:47	0.147	13	2.8125	1.35	1.424451322	9.126320988	0.052266667
000:02:49	0.148	13	2.8125	1.35	1.424985926	9.122897119	0.052622222
000:02:51	0.15	13	2.8125	1.35	1.426056338	9.116049383	0.053333333
000:02:53	0.152	13	2.8125	1.35	1.427128359	9.109201646	0.054044444
000:02:55	0.153	13	2.8125	1.35	1.427664975	9.105777778	0.0544
000:02:57	0.155	13	2.8125	1.35	1.428739417	9.098930041	0.055111111
000:02:59	0.157	13	2.8125	1.35	1.429815477	9.092082305	0.055822222
000:03:01	0.159	13	2.8125	1.35	1.43089316	9.085234568	0.056533333
000:03:03	0.16	14	2.8125	1.35	1.431432611	9.780411523	0.056888889
000:03:05	0.162	14	2.8125	1.35	1.432512733	9.773037037	0.0576
000:03:07	0.164	14	2.8125	1.35	1.433594487	9.765662551	0.058311111
000:03:09	0.165	14	2.8125	1.35	1.434135977	9.761975309	0.058666667
000:03:11	0.167	14	2.8125	1.35	1.435220185	9.754600823	0.059377778
000:03:13	0.169	14	2.8125	1.35	1.436306034	9.747226337	0.060088889
000:03:15	0.17	14	2.8125	1.35	1.436849574	9.743539095	0.060444444
000:03:17	0.172	14	2.8125	1.35	1.437937891	9.736164609	0.061155556
000:03:19	0.174	14	2.8125	1.35	1.439027857	9.728790123	0.061866667

000:03:49	0.2	16	2.8125	1.35	1.453349282	11.0090535	0.071111111
000:04:19	0.226	17	2.8125	1.35	1.467958631	11.58070782	0.080355556
000:04:49	0.253	18	2.8125	1.35	1.483444032	12.13392593	0.089955556
000:05:19	0.279	19	2.8125	1.35	1.498667851	12.67792593	0.0992
000:05:49	0.304	20	2.8125	1.35	1.513603747	13.21349794	0.108088889
000:06:19	0.33	21	2.8125	1.35	1.529456193	13.73037037	0.117333333
000:06:49	0.355	21	2.8125	1.35	1.545015259	13.59209877	0.126222222
000:07:19	0.38	22	2.8125	1.35	1.560894142	14.0944856	0.135111111
000:07:49	0.407	22	2.8125	1.35	1.578414051	13.93804115	0.144711111
000:08:19	0.433	22	2.8125	1.35	1.595660853	13.78739095	0.153955556
000:08:49	0.459	22	2.8125	1.35	1.613288719	13.63674074	0.1632
000:09:19	0.485	21	2.8125	1.35	1.631310419	12.87308642	0.172444444
000:09:49	0.511	20	2.8125	1.35	1.6497393	12.12312757	0.181688889
000:10:19	0.536	20	2.8125	1.35	1.667856358	11.99144033	0.190577778
000:10:49	0.562	18	2.8125	1.35	1.687125083	10.66903704	0.199822222
000:11:19	0.587	17	2.8125	1.35	1.706077286	9.964378601	0.208711111

Table B-6: Results of test at water content below plastic limit

TIME	**VERTICAL DEFLECTION (in)**	**LOAD (lb)**	**L_0 (in)**	**A_0 $(in)^2$**	**A_C $(in)^2$**	**STRESS (psi)**	**STRAIN (in/in)**
			2.875	1.23			
000:00:00	0	0	2.875	1.23	1.23	0	0

000:00:01	0	0	2.875	1.23	1.23	0	0
000:00:02	0	0	2.875	1.23	1.23	0	0
000:00:03	0.001	0	2.875	1.23	1.230427975	0	0.000347826
000:00:04	0.002	0	2.875	1.23	1.230856248	0	0.000695652
000:00:05	0.003	0	2.875	1.23	1.231284819	0	0.001043478
000:00:06	0.003	0	2.875	1.23	1.231284819	0	0.001043478
000:00:07	0.004	1	2.875	1.23	1.231713689	0.811876988	0.001391304
000:00:08	0.005	1	2.875	1.23	1.232142857	0.811594203	0.00173913
000:00:09	0.006	1	2.875	1.23	1.232572325	0.811311417	0.002086957
000:00:10	0.007	2	2.875	1.23	1.233002092	1.622057264	0.002434783
000:00:11	0.008	2	2.875	1.23	1.233432159	1.621491693	0.002782609
000:00:12	0.009	2	2.875	1.23	1.233862526	1.620926122	0.003130435
000:00:13	0.009	3	2.875	1.23	1.233862526	2.431389183	0.003130435
000:00:14	0.01	3	2.875	1.23	1.234293194	2.430540827	0.003478261
000:00:15	0.011	4	2.875	1.23	1.234724162	3.239589961	0.003826087
000:00:16	0.012	4	2.875	1.23	1.235155431	3.238458819	0.004173913
000:00:17	0.013	4	2.875	1.23	1.235587002	3.237327678	0.004521739
000:00:18	0.014	4	2.875	1.23	1.236018875	3.236196536	0.004869565
000:00:19	0.015	5	2.875	1.23	1.236451049	4.043831743	0.005217391
000:00:20	0.015	5	2.875	1.23	1.236451049	4.043831743	0.005217391
000:00:21	0.016	5	2.875	1.23	1.236883526	4.042417815	0.005565217
000:00:22	0.017	6	2.875	1.23	1.237316305	4.849204666	0.005913043
000:00:23	0.018	6	2.875	1.23	1.237749387	4.847507953	0.00626087
000:00:24	0.019	7	2.875	1.23	1.238182773	5.653446448	0.006608696
000:00:25	0.02	7	2.875	1.23	1.238616462	5.651466949	0.006956522
000:00:26	0.021	7	2.875	1.23	1.239050456	5.649487451	0.007304348

000:00:27	0.021	7	2.875	1.23	1.239050456	5.649487451	0.007304348
000:00:28	0.022	8	2.875	1.23	1.239484753	6.454294804	0.007652174
000:00:29	0.023	8	2.875	1.23	1.239919355	6.45203252	0.008
000:00:30	0.024	8	2.875	1.23	1.240354262	6.449770237	0.008347826
000:00:31	0.025	9	2.875	1.23	1.240789474	7.253446448	0.008695652
000:00:32	0.025	9	2.875	1.23	1.240789474	7.253446448	0.008695652
000:00:33	0.026	9	2.875	1.23	1.241224991	7.250901379	0.009043478
000:00:34	0.027	10	2.875	1.23	1.241660815	8.053729233	0.009391304
000:00:35	0.028	10	2.875	1.23	1.242096944	8.050901379	0.00973913
000:00:36	0.029	10	2.875	1.23	1.24253338	8.048073524	0.010086957
000:00:37	0.03	10	2.875	1.23	1.242970123	8.04524567	0.010434783
000:00:38	0.031	10	2.875	1.23	1.243407173	8.042417815	0.010782609
000:00:39	0.031	10	2.875	1.23	1.243407173	8.042417815	0.010782609
000:00:40	0.032	11	2.875	1.23	1.24384453	8.843548957	0.011130435
000:00:41	0.033	11	2.875	1.23	1.244282196	8.840438317	0.011478261
000:00:42	0.034	11	2.875	1.23	1.244720169	8.837327678	0.011826087
000:00:43	0.035	12	2.875	1.23	1.245158451	9.637327678	0.012173913
000:00:44	0.036	12	2.875	1.23	1.245597041	9.633934252	0.012521739
000:00:45	0.036	12	2.875	1.23	1.245597041	9.633934252	0.012521739
000:00:46	0.037	12	2.875	1.23	1.246035941	9.630540827	0.012869565
000:00:47	0.038	12	2.875	1.23	1.24647515	9.627147402	0.013217391
000:00:48	0.039	12	2.875	1.23	1.246914669	9.623753977	0.013565217
000:00:49	0.04	13	2.875	1.23	1.247354497	10.42205726	0.013913043
000:00:50	0.041	12	2.875	1.23	1.247794637	9.616967126	0.01426087
000:00:51	0.042	13	2.875	1.23	1.248235086	10.41470484	0.014608696
000:00:52	0.042	13	2.875	1.23	1.248235086	10.41470484	0.014608696

000:00:53	0.043	13	2.875	1.23	1.248675847	10.41102863	0.014956522
000:00:54	0.044	13	2.875	1.23	1.24911692	10.40735242	0.015304348
000:00:55	0.045	13	2.875	1.23	1.249558304	10.40367621	0.015652174
000:00:56	0.046	13	2.875	1.23	1.25	10.4	0.016
000:00:57	0.047	13	2.875	1.23	1.250442008	10.39632379	0.016347826
000:00:58	0.047	13	2.875	1.23	1.250442008	10.39632379	0.016347826
000:00:59	0.048	14	2.875	1.23	1.25088433	11.19208201	0.016695652
000:01:00	0.049	14	2.875	1.23	1.251326964	11.18812301	0.017043478
000:01:01	0.05	14	2.875	1.23	1.251769912	11.18416402	0.017391304
000:01:02	0.051	14	2.875	1.23	1.252213173	11.18020502	0.01773913
000:01:03	0.052	14	2.875	1.23	1.252656748	11.17624602	0.018086957
000:01:04	0.053	14	2.875	1.23	1.253100638	11.17228703	0.018434783
000:01:05	0.053	14	2.875	1.23	1.253100638	11.17228703	0.018434783
000:01:06	0.054	15	2.875	1.23	1.253544842	11.96606575	0.018782609
000:01:07	0.055	14	2.875	1.23	1.253989362	11.16436903	0.019130435
000:01:08	0.056	15	2.875	1.23	1.254434197	11.95758218	0.019478261
000:01:09	0.057	15	2.875	1.23	1.254879347	11.9533404	0.019826087
000:01:10	0.058	15	2.875	1.23	1.255324814	11.94909862	0.020173913
000:01:11	0.058	15	2.875	1.23	1.255324814	11.94909862	0.020173913
000:01:12	0.059	15	2.875	1.23	1.255770597	11.94485684	0.020521739
000:01:13	0.06	16	2.875	1.23	1.256216696	12.73665606	0.020869565
000:01:14	0.061	15	2.875	1.23	1.256663113	11.93637328	0.021217391
000:01:15	0.062	15	2.875	1.23	1.257109847	11.9321315	0.021565217
000:01:16	0.063	15	2.875	1.23	1.257556899	11.92788971	0.021913043
000:01:17	0.064	15	2.875	1.23	1.258004269	11.92364793	0.02226087
000:01:18	0.064	16	2.875	1.23	1.258004269	12.71855779	0.02226087

000:01:19	0.065	16	2.875	1.23	1.258451957	12.71403323	0.022608696
000:01:20	0.066	16	2.875	1.23	1.258899964	12.70950866	0.022956522
000:01:21	0.067	16	2.875	1.23	1.259348291	12.70498409	0.023304348
000:01:22	0.068	16	2.875	1.23	1.259796936	12.70045953	0.023652174
000:01:23	0.069	16	2.875	1.23	1.260245902	12.69593496	0.024
000:01:24	0.069	16	2.875	1.23	1.260245902	12.69593496	0.024
000:01:25	0.07	16	2.875	1.23	1.260695187	12.69141039	0.024347826
000:01:26	0.071	16	2.875	1.23	1.261144793	12.68688583	0.024695652
000:01:27	0.072	16	2.875	1.23	1.26159472	12.68236126	0.025043478
000:01:28	0.073	16	2.875	1.23	1.262044968	12.67783669	0.025391304
000:01:29	0.074	17	2.875	1.23	1.262495537	13.46539413	0.02573913
000:01:30	0.074	17	2.875	1.23	1.262495537	13.46539413	0.02573913
000:01:31	0.075	17	2.875	1.23	1.262946429	13.46058678	0.026086957
000:01:32	0.076	17	2.875	1.23	1.263397642	13.45577943	0.026434783
000:01:33	0.077	17	2.875	1.23	1.263849178	13.45097207	0.026782609
000:01:34	0.078	17	2.875	1.23	1.264301037	13.44616472	0.027130435
000:01:35	0.079	17	2.875	1.23	1.264753219	13.44135737	0.027478261
000:01:36	0.079	17	2.875	1.23	1.264753219	13.44135737	0.027478261
000:01:37	0.08	17	2.875	1.23	1.265205725	13.43655002	0.027826087
000:01:38	0.081	17	2.875	1.23	1.265658554	13.43174267	0.028173913
000:01:39	0.082	18	2.875	1.23	1.266111708	14.21675504	0.028521739
000:01:41	0.084	18	2.875	1.23	1.26701899	14.20657476	0.029217391
000:01:43	0.086	18	2.875	1.23	1.267927573	14.19639449	0.029913043
000:01:45	0.087	18	2.875	1.23	1.268382353	14.19130435	0.03026087
000:01:47	0.089	19	2.875	1.23	1.269292893	14.9689643	0.030956522
000:01:49	0.091	19	2.875	1.23	1.270204741	14.95821845	0.031652174

000:01:51	0.093	19	2.875	1.23	1.271117901	14.94747261	0.032347826
000:01:53	0.094	19	2.875	1.23	1.271574973	14.94209968	0.032695652
000:01:55	0.096	19	2.875	1.23	1.272490104	14.93135384	0.033391304
000:01:57	0.098	19	2.875	1.23	1.273406554	14.92060799	0.034086957
000:01:59	0.1	20	2.875	1.23	1.274324324	15.69459173	0.034782609
000:02:01	0.101	19	2.875	1.23	1.274783706	14.90448922	0.035130435
000:02:03	0.103	20	2.875	1.23	1.275703463	15.6776246	0.035826087
000:02:05	0.105	20	2.875	1.23	1.276624549	15.66631318	0.036521739
000:02:07	0.107	20	2.875	1.23	1.277546965	15.65500177	0.037217391
000:02:09	0.108	20	2.875	1.23	1.278008674	15.64934606	0.037565217
000:02:11	0.11	20	2.875	1.23	1.278933092	15.63803464	0.03826087
000:02:13	0.112	20	2.875	1.23	1.279858849	15.62672322	0.038956522
000:02:15	0.114	20	2.875	1.23	1.280785947	15.61541181	0.039652174
000:02:17	0.115	21	2.875	1.23	1.28125	16.3902439	0.04
000:02:19	0.117	21	2.875	1.23	1.282179115	16.37836691	0.040695652
000:02:21	0.119	21	2.875	1.23	1.283109579	16.36648993	0.041391304
000:02:23	0.121	22	2.875	1.23	1.284041394	17.13340403	0.042086957
000:02:25	0.123	22	2.875	1.23	1.284974564	17.12096147	0.042782609
000:02:27	0.124	22	2.875	1.23	1.285441658	17.11474019	0.043130435
000:02:29	0.126	22	2.875	1.23	1.286376864	17.10229763	0.043826087
000:02:31	0.128	22	2.875	1.23	1.287313433	17.08985507	0.044521739
000:02:33	0.13	22	2.875	1.23	1.288251366	17.07741251	0.045217391
000:02:35	0.131	22	2.875	1.23	1.288720845	17.07119123	0.045565217
000:02:37	0.133	22	2.875	1.23	1.289660832	17.05874867	0.04626087
000:02:39	0.135	23	2.875	1.23	1.29060219	17.82113821	0.046956522
000:02:41	0.137	23	2.875	1.23	1.291544923	17.80813008	0.047652174

000:02:43	0.138	23	2.875	1.23	1.292016807	17.80162602	0.048
000:02:45	0.14	23	2.875	1.23	1.292961609	17.78861789	0.048695652
000:02:47	0.142	23	2.875	1.23	1.293907794	17.77560976	0.049391304
000:02:49	0.144	23	2.875	1.23	1.294855364	17.76260163	0.050086957
000:02:51	0.146	24	2.875	1.23	1.295804324	18.52131495	0.050782609
000:02:53	0.147	24	2.875	1.23	1.296279326	18.5145281	0.051130435
000:02:55	0.149	24	2.875	1.23	1.297230374	18.5009544	0.051826087
000:02:57	0.151	24	2.875	1.23	1.298182819	18.4873807	0.052521739
000:02:59	0.152	24	2.875	1.23	1.298659567	18.48059385	0.052869565
000:03:01	0.154	24	2.875	1.23	1.299614112	18.46702015	0.053565217
000:03:03	0.156	24	2.875	1.23	1.300570063	18.45344645	0.05426087
000:03:05	0.158	24	2.875	1.23	1.30152742	18.43987275	0.054956522
000:03:07	0.159	25	2.875	1.23	1.302006627	19.20113114	0.055304348
000:03:09	0.161	25	2.875	1.23	1.302966102	19.18699187	0.056
000:03:11	0.163	25	2.875	1.23	1.303926991	19.1728526	0.056695652
000:03:13	0.165	25	2.875	1.23	1.304889299	19.15871333	0.057391304
000:03:15	0.166	25	2.875	1.23	1.305370986	19.15164369	0.05773913
000:03:17	0.168	26	2.875	1.23	1.306335427	19.9030046	0.058434783
000:03:19	0.17	26	2.875	1.23	1.307301294	19.88829975	0.059130435
000:03:49	0.196	28	2.875	1.23	1.319988802	21.21230117	0.068173913
000:04:19	0.222	30	2.875	1.23	1.332924991	22.5068929	0.077217391
000:04:49	0.248	32	2.875	1.23	1.346117244	23.77207494	0.08626087
000:05:19	0.273	34	2.875	1.23	1.35905073	25.017462	0.094956522
000:05:49	0.298	36	2.875	1.23	1.372235157	26.23457052	0.103652174
000:06:19	0.324	37	2.875	1.23	1.38622109	26.691269	0.112695652
000:06:49	0.351	36	2.875	1.23	1.401049921	25.69501591	0.122086957

000:07:19	0.377	35	2.875	1.23	1.415632506	24.72393072	0.131130435
000:07:49	0.403	30	2.875	1.23	1.430521845	20.97136797	0.140173913

- Sample with 20% sand, 80% clay

Table B-7: Results of test at water content above plastic limit

TIME	**VERTICAL DEFLECTION (in)**	**LOAD (lb)**	**L_0 (in)**	**A_0 $(in)^2$**	**A_C $(in)^2$**	**STRESS (psi)**	**STRAIN (in/in)**
000:00:00	0.001	0	2.8125	1.35	1.350480171	0	0.000355556
000:00:01	0.002	0	2.8125	1.35	1.350960683	0	0.000711111
000:00:02	0.003	0	2.8125	1.35	1.351441538	0	0.001066667
000:00:03	0.004	0	2.8125	1.35	1.351922735	0	0.001422222
000:00:04	0.005	0	2.8125	1.35	1.352404274	0	0.001777778
000:00:05	0.005	0	2.8125	1.35	1.352404274	0	0.001777778
000:00:06	0.006	0	2.8125	1.35	1.352886157	0	0.002133333
000:00:07	0.007	0	2.8125	1.35	1.353368384	0	0.002488889
000:00:08	0.008	0	2.8125	1.35	1.353850954	0	0.002844444
000:00:09	0.009	0	2.8125	1.35	1.354333868	0	0.0032
000:00:10	0.01	0	2.8125	1.35	1.354817128	0	0.003555556
000:00:11	0.011	0	2.8125	1.35	1.355300732	0	0.003911111
000:00:12	0.012	0	2.8125	1.35	1.355784681	0	0.004266667

000:00:13	0.013	0	2.8125	1.35	1.356268977	0	0.004622222
000:00:14	0.013	0	2.8125	1.35	1.356268977	0	0.004622222
000:00:15	0.014	1	2.8125	1.35	1.356753618	0.737053498	0.004977778
000:00:16	0.015	1	2.8125	1.35	1.357238606	0.736790123	0.005333333
000:00:17	0.016	1	2.8125	1.35	1.357723941	0.736526749	0.005688889
000:00:18	0.017	1	2.8125	1.35	1.358209623	0.736263374	0.006044444
000:00:19	0.018	0	2.8125	1.35	1.358695652	0	0.0064
000:00:20	0.019	1	2.8125	1.35	1.35918203	0.735736626	0.006755556
000:00:21	0.019	1	2.8125	1.35	1.35918203	0.735736626	0.006755556
000:00:22	0.02	1	2.8125	1.35	1.359668756	0.735473251	0.007111111
000:00:23	0.021	1	2.8125	1.35	1.36015583	0.735209877	0.007466667
000:00:24	0.022	1	2.8125	1.35	1.360643254	0.734946502	0.007822222
000:00:25	0.023	1	2.8125	1.35	1.361131027	0.734683128	0.008177778
000:00:26	0.024	1	2.8125	1.35	1.36161915	0.734419753	0.008533333
000:00:27	0.025	1	2.8125	1.35	1.362107623	0.734156379	0.008888889
000:00:28	0.026	1	2.8125	1.35	1.362596447	0.733893004	0.009244444
000:00:29	0.027	1	2.8125	1.35	1.363085622	0.73362963	0.0096
000:00:30	0.027	1	2.8125	1.35	1.363085622	0.73362963	0.0096
000:00:31	0.028	1	2.8125	1.35	1.363575148	0.733366255	0.009955556
000:00:32	0.029	1	2.8125	1.35	1.364065026	0.733102881	0.010311111
000:00:33	0.03	1	2.8125	1.35	1.364555256	0.732839506	0.010666667
000:00:34	0.031	1	2.8125	1.35	1.365045839	0.732576132	0.011022222
000:00:35	0.032	1	2.8125	1.35	1.365536774	0.732312757	0.011377778
000:00:36	0.033	1	2.8125	1.35	1.366028063	0.732049383	0.011733333
000:00:37	0.034	1	2.8125	1.35	1.366519705	0.731786008	0.012088889
000:00:38	0.035	1	2.8125	1.35	1.367011701	0.731522634	0.012444444

000:00:39	0.036	2	2.8125	1.35	1.367504052	1.462518519	0.0128
000:00:40	0.036	2	2.8125	1.35	1.367504052	1.462518519	0.0128
000:00:41	0.037	2	2.8125	1.35	1.367996757	1.46199177	0.013155556
000:00:42	0.038	2	2.8125	1.35	1.368489818	1.461465021	0.013511111
000:00:43	0.039	1	2.8125	1.35	1.368983234	0.730469136	0.013866667
000:00:44	0.04	1	2.8125	1.35	1.369477006	0.730205761	0.014222222
000:00:45	0.041	2	2.8125	1.35	1.369971135	1.459884774	0.014577778
000:00:46	0.042	2	2.8125	1.35	1.37046562	1.459358025	0.014933333
000:00:47	0.043	2	2.8125	1.35	1.370960462	1.458831276	0.015288889
000:00:48	0.044	2	2.8125	1.35	1.371455662	1.458304527	0.015644444
000:00:49	0.044	2	2.8125	1.35	1.371455662	1.458304527	0.015644444
000:00:50	0.045	2	2.8125	1.35	1.37195122	1.457777778	0.016
000:00:51	0.046	2	2.8125	1.35	1.372447135	1.457251029	0.016355556
000:00:52	0.047	2	2.8125	1.35	1.37294341	1.45672428	0.016711111
000:00:53	0.048	2	2.8125	1.35	1.373440043	1.456197531	0.017066667
000:00:54	0.049	2	2.8125	1.35	1.373937036	1.455670782	0.017422222
000:00:55	0.05	2	2.8125	1.35	1.374434389	1.455144033	0.017777778
000:00:56	0.051	2	2.8125	1.35	1.374932102	1.454617284	0.018133333
000:00:57	0.052	2	2.8125	1.35	1.375430176	1.454090535	0.018488889
000:00:58	0.053	2	2.8125	1.35	1.37592861	1.453563786	0.018844444
000:00:59	0.053	2	2.8125	1.35	1.37592861	1.453563786	0.018844444
000:01:00	0.054	2	2.8125	1.35	1.376427406	1.453037037	0.0192
000:01:01	0.055	2	2.8125	1.35	1.376926564	1.452510288	0.019555556
000:01:02	0.056	3	2.8125	1.35	1.377426084	2.177975309	0.019911111
000:01:03	0.057	2	2.8125	1.35	1.377925966	1.45145679	0.020266667
000:01:04	0.058	3	2.8125	1.35	1.378426212	2.176395062	0.020622222

000:01:05	0.059	3	2.8125	1.35	1.37892682	2.175604938	0.020977778
000:01:06	0.06	3	2.8125	1.35	1.379427793	2.174814815	0.021333333
000:01:07	0.06	3	2.8125	1.35	1.379427793	2.174814815	0.021333333
000:01:08	0.061	3	2.8125	1.35	1.37992913	2.174024691	0.021688889
000:01:09	0.062	3	2.8125	1.35	1.380430831	2.173234568	0.022044444
000:01:10	0.063	3	2.8125	1.35	1.380932897	2.172444444	0.0224
000:01:11	0.064	3	2.8125	1.35	1.381435328	2.171654321	0.022755556
000:01:12	0.065	3	2.8125	1.35	1.381938126	2.170864198	0.023111111
000:01:13	0.066	3	2.8125	1.35	1.382441289	2.170074074	0.023466667
000:01:14	0.067	3	2.8125	1.35	1.382944819	2.169283951	0.023822222
000:01:15	0.068	3	2.8125	1.35	1.383448716	2.168493827	0.024177778
000:01:16	0.068	3	2.8125	1.35	1.383448716	2.168493827	0.024177778
000:01:17	0.069	3	2.8125	1.35	1.38395298	2.167703704	0.024533333
000:01:18	0.07	3	2.8125	1.35	1.384457612	2.16691358	0.024888889
000:01:19	0.071	3	2.8125	1.35	1.384962612	2.166123457	0.025244444
000:01:20	0.072	3	2.8125	1.35	1.38546798	2.165333333	0.0256
000:01:21	0.073	3	2.8125	1.35	1.385973718	2.16454321	0.025955556
000:01:22	0.074	3	2.8125	1.35	1.386479825	2.163753086	0.026311111
000:01:23	0.074	3	2.8125	1.35	1.386479825	2.163753086	0.026311111
000:01:24	0.075	4	2.8125	1.35	1.386986301	2.883950617	0.026666667
000:01:25	0.076	3	2.8125	1.35	1.387493148	2.16217284	0.027022222
000:01:26	0.077	4	2.8125	1.35	1.388000366	2.881843621	0.027377778
000:01:27	0.078	3	2.8125	1.35	1.388507954	2.160592593	0.027733333
000:01:28	0.079	3	2.8125	1.35	1.389015914	2.159802469	0.028088889
000:01:29	0.08	4	2.8125	1.35	1.389524245	2.878683128	0.028444444
000:01:30	0.081	4	2.8125	1.35	1.390032949	2.87762963	0.0288

000:01:31	0.081	4	2.8125	1.35	1.390032949	2.87762963	0.0288
000:01:32	0.082	4	2.8125	1.35	1.390542025	2.876576132	0.029155556
000:01:33	0.083	4	2.8125	1.35	1.391051475	2.875522634	0.029511111
000:01:34	0.084	4	2.8125	1.35	1.391561297	2.874469136	0.029866667
000:01:35	0.085	4	2.8125	1.35	1.392071494	2.873415638	0.030222222
000:01:36	0.086	4	2.8125	1.35	1.392582065	2.87236214	0.030577778
000:01:37	0.087	4	2.8125	1.35	1.39309301	2.871308642	0.030933333
000:01:38	0.088	4	2.8125	1.35	1.393604331	2.870255144	0.031288889
000:01:39	0.088	4	2.8125	1.35	1.393604331	2.870255144	0.031288889
000:01:41	0.09	4	2.8125	1.35	1.394628099	2.868148148	0.032
000:01:43	0.092	4	2.8125	1.35	1.395653373	2.866041152	0.032711111
000:01:45	0.093	4	2.8125	1.35	1.396166575	2.864987654	0.033066667
000:01:47	0.095	4	2.8125	1.35	1.397194112	2.862880658	0.033777778
000:01:49	0.097	4	2.8125	1.35	1.398223163	2.860773663	0.034488889
000:01:51	0.099	4	2.8125	1.35	1.399253731	2.858666667	0.0352
000:01:53	0.1	4	2.8125	1.35	1.399769585	2.857613169	0.035555556
000:01:55	0.102	5	2.8125	1.35	1.400802435	3.569382716	0.036266667
000:01:57	0.104	4	2.8125	1.35	1.40183681	2.853399177	0.036977778
000:01:59	0.106	5	2.8125	1.35	1.402872714	3.564115226	0.037688889
000:02:01	0.107	4	2.8125	1.35	1.40339124	2.850238683	0.038044444
000:02:03	0.109	5	2.8125	1.35	1.404429443	3.560164609	0.038755556
000:02:05	0.111	5	2.8125	1.35	1.405469184	3.557530864	0.039466667
000:02:07	0.113	5	2.8125	1.35	1.406510465	3.554897119	0.040177778
000:02:09	0.114	5	2.8125	1.35	1.407031684	3.553580247	0.040533333
000:02:11	0.116	5	2.8125	1.35	1.408075283	3.550946502	0.041244444
000:02:13	0.118	5	2.8125	1.35	1.409120431	3.548312757	0.041955556

000:02:15	0.119	5	2.8125	1.35	1.409643586	3.546995885	0.042311111
000:02:17	0.121	5	2.8125	1.35	1.410691064	3.54436214	0.043022222
000:02:19	0.123	5	2.8125	1.35	1.4117401	3.541728395	0.043733333
000:02:21	0.124	5	2.8125	1.35	1.412265204	3.540411523	0.044088889
000:02:23	0.126	5	2.8125	1.35	1.413316583	3.537777778	0.0448
000:02:25	0.128	5	2.8125	1.35	1.414369529	3.535144033	0.045511111
000:02:27	0.129	5	2.8125	1.35	1.41489659	3.53382716	0.045866667
000:02:29	0.131	5	2.8125	1.35	1.415951893	3.531193416	0.046577778
000:02:31	0.133	5	2.8125	1.35	1.41700877	3.528559671	0.047288889
000:02:33	0.134	6	2.8125	1.35	1.417537801	4.232691358	0.047644444
000:02:35	0.136	6	2.8125	1.35	1.418597048	4.229530864	0.048355556
000:02:37	0.138	6	2.8125	1.35	1.41965788	4.22637037	0.049066667
000:02:39	0.139	6	2.8125	1.35	1.420188891	4.224790123	0.049422222
000:02:41	0.141	6	2.8125	1.35	1.421252106	4.22162963	0.050133333
000:02:43	0.143	6	2.8125	1.35	1.422316913	4.218469136	0.050844444
000:02:45	0.144	6	2.8125	1.35	1.422849916	4.216888889	0.0512
000:02:47	0.146	6	2.8125	1.35	1.42391712	4.213728395	0.051911111
000:02:49	0.148	6	2.8125	1.35	1.424985926	4.210567901	0.052622222
000:02:51	0.15	6	2.8125	1.35	1.426056338	4.207407407	0.053333333
000:02:53	0.151	6	2.8125	1.35	1.426592147	4.20582716	0.053688889
000:02:55	0.153	6	2.8125	1.35	1.427664975	4.202666667	0.0544
000:02:57	0.155	6	2.8125	1.35	1.428739417	4.199506173	0.055111111
000:02:59	0.157	6	2.8125	1.35	1.429815477	4.196345679	0.055822222
000:03:01	0.158	6	2.8125	1.35	1.430354116	4.194765432	0.056177778
000:03:03	0.16	6	2.8125	1.35	1.431432611	4.191604938	0.056888889
000:03:05	0.162	7	2.8125	1.35	1.432512733	4.886518519	0.0576

000:03:07	0.163	7	2.8125	1.35	1.433053406	4.884674897	0.057955556
000:03:09	0.165	6	2.8125	1.35	1.434135977	4.183703704	0.058666667
000:03:11	0.167	7	2.8125	1.35	1.435220185	4.877300412	0.059377778
000:03:13	0.169	7	2.8125	1.35	1.436306034	4.873613169	0.060088889
000:03:15	0.17	7	2.8125	1.35	1.436849574	4.871769547	0.060444444
000:03:17	0.172	7	2.8125	1.35	1.437937891	4.868082305	0.061155556
000:03:19	0.174	7	2.8125	1.35	1.439027857	4.864395062	0.061866667
000:03:49	0.2	8	2.8125	1.35	1.453349282	5.504526749	0.071111111
000:04:19	0.226	8	2.8125	1.35	1.467958631	5.449744856	0.080355556
000:04:49	0.253	9	2.8125	1.35	1.483444032	6.066962963	0.089955556
000:05:19	0.279	9	2.8125	1.35	1.498667851	6.005333333	0.0992
000:05:49	0.304	10	2.8125	1.35	1.513603747	6.606748971	0.108088889
000:06:19	0.33	10	2.8125	1.35	1.529456193	6.538271605	0.117333333
000:06:49	0.355	11	2.8125	1.35	1.545015259	7.119670782	0.126222222
000:07:19	0.38	11	2.8125	1.35	1.560894142	7.047242798	0.135111111
000:07:49	0.407	12	2.8125	1.35	1.578414051	7.602567901	0.144711111
000:08:19	0.433	12	2.8125	1.35	1.595660853	7.520395062	0.153955556
000:08:49	0.459	12	2.8125	1.35	1.613288719	7.438222222	0.1632
000:09:19	0.485	13	2.8125	1.35	1.631310419	7.969053498	0.172444444
000:09:49	0.511	13	2.8125	1.35	1.6497393	7.880032922	0.181688889
000:10:19	0.537	14	2.8125	1.35	1.668589321	8.390320988	0.190933333
000:10:49	0.562	14	2.8125	1.35	1.687125083	8.298139918	0.199822222
000:11:19	0.587	14	2.8125	1.35	1.706077286	8.205958848	0.208711111
000:11:49	0.613	14	2.8125	1.35	1.726244601	8.110090535	0.217955556
000:12:19	0.64	14	2.8125	1.35	1.747698504	8.010534979	0.227555556
000:12:49	0.666	14	2.8125	1.35	1.768867925	7.914666667	0.2368

000:13:19	0.692	15	2.8125	1.35	1.790556473	8.377283951	0.246044444

Table B-8: Results of test at water content at plastic limit

TIME	**VERTICAL DEFLECTION (in)**	**LOAD (lb)**	**L_0 (in)**	**A_0 $(in)^2$**	**A_C $(in)^2$**	**STRESS (psi)**	**STRAIN (in/in)**
			2.8125	1.35			
000:00:00	0.003	0	2.8125	1.35	1.351441538	0	0.001066667
000:00:01	0.003	0	2.8125	1.35	1.351441538	0	0.001066667
000:00:02	0.004	0	2.8125	1.35	1.351922735	0	0.001422222
000:00:03	0.005	-1	2.8125	1.35	1.352404274	-0.739423868	0.001777778
000:00:04	0.006	0	2.8125	1.35	1.352886157	0	0.002133333
000:00:05	0.007	0	2.8125	1.35	1.353368384	0	0.002488889
000:00:06	0.008	0	2.8125	1.35	1.353850954	0	0.002844444
000:00:07	0.008	0	2.8125	1.35	1.353850954	0	0.002844444
000:00:08	0.009	0	2.8125	1.35	1.354333868	0	0.0032
000:00:09	0.01	0	2.8125	1.35	1.354817128	0	0.003555556
000:00:10	0.011	0	2.8125	1.35	1.355300732	0	0.003911111
000:00:11	0.012	0	2.8125	1.35	1.355784681	0	0.004266667
000:00:12	0.013	0	2.8125	1.35	1.356268977	0	0.004622222
000:00:13	0.014	0	2.8125	1.35	1.356753618	0	0.004977778
000:00:14	0.015	0	2.8125	1.35	1.357238606	0	0.005333333

000:00:15	0.015	0	2.8125	1.35	1.357238606	0	0.005333333
000:00:16	0.016	0	2.8125	1.35	1.357723941	0	0.005688889
000:00:17	0.017	0	2.8125	1.35	1.358209623	0	0.006044444
000:00:18	0.018	0	2.8125	1.35	1.358695652	0	0.0064
000:00:19	0.019	0	2.8125	1.35	1.35918203	0	0.006755556
000:00:20	0.02	0	2.8125	1.35	1.359668756	0	0.007111111
000:00:21	0.021	0	2.8125	1.35	1.36015583	0	0.007466667
000:00:22	0.022	0	2.8125	1.35	1.360643254	0	0.007822222
000:00:23	0.022	0	2.8125	1.35	1.360643254	0	0.007822222
000:00:24	0.023	0	2.8125	1.35	1.361131027	0	0.008177778
000:00:25	0.024	0	2.8125	1.35	1.36161915	0	0.008533333
000:00:26	0.025	0	2.8125	1.35	1.362107623	0	0.008888889
000:00:27	0.026	0	2.8125	1.35	1.362596447	0	0.009244444
000:00:28	0.027	0	2.8125	1.35	1.363085622	0	0.0096
000:00:29	0.028	0	2.8125	1.35	1.363575148	0	0.009955556
000:00:30	0.028	0	2.8125	1.35	1.363575148	0	0.009955556
000:00:31	0.029	0	2.8125	1.35	1.364065026	0	0.010311111
000:00:32	0.03	0	2.8125	1.35	1.364555256	0	0.010666667
000:00:33	0.031	0	2.8125	1.35	1.365045839	0	0.011022222
000:00:34	0.032	0	2.8125	1.35	1.365536774	0	0.011377778
000:00:35	0.033	0	2.8125	1.35	1.366028063	0	0.011733333
000:00:36	0.034	0	2.8125	1.35	1.366519705	0	0.012088889
000:00:37	0.035	0	2.8125	1.35	1.367011701	0	0.012444444
000:00:38	0.035	0	2.8125	1.35	1.367011701	0	0.012444444
000:00:39	0.036	0	2.8125	1.35	1.367504052	0	0.0128
000:00:40	0.037	0	2.8125	1.35	1.367996757	0	0.013155556

000:00:41	0.038	1	2.8125	1.35	1.368489818	0.73073251	0.013511111
000:00:42	0.039	1	2.8125	1.35	1.368983234	0.730469136	0.013866667
000:00:43	0.04	0	2.8125	1.35	1.369477006	0	0.014222222
000:00:44	0.041	1	2.8125	1.35	1.369971135	0.729942387	0.014577778
000:00:45	0.041	0	2.8125	1.35	1.369971135	0	0.014577778
000:00:46	0.042	0	2.8125	1.35	1.37046562	0	0.014933333
000:00:47	0.043	0	2.8125	1.35	1.370960462	0	0.015288889
000:00:48	0.044	1	2.8125	1.35	1.371455662	0.729152263	0.015644444
000:00:49	0.045	1	2.8125	1.35	1.37195122	0.728888889	0.016
000:00:50	0.046	1	2.8125	1.35	1.372447135	0.728625514	0.016355556
000:00:51	0.047	1	2.8125	1.35	1.37294341	0.72836214	0.016711111
000:00:52	0.048	1	2.8125	1.35	1.373440043	0.728098765	0.017066667
000:00:53	0.048	1	2.8125	1.35	1.373440043	0.728098765	0.017066667
000:00:54	0.049	1	2.8125	1.35	1.373937036	0.727835391	0.017422222
000:00:55	0.05	0	2.8125	1.35	1.374434389	0	0.017777778
000:00:56	0.051	0	2.8125	1.35	1.374932102	0	0.018133333
000:00:57	0.052	1	2.8125	1.35	1.375430176	0.727045267	0.018488889
000:00:58	0.053	1	2.8125	1.35	1.37592861	0.726781893	0.018844444
000:00:59	0.054	1	2.8125	1.35	1.376427406	0.726518519	0.0192
000:01:00	0.054	1	2.8125	1.35	1.376427406	0.726518519	0.0192
000:01:01	0.055	1	2.8125	1.35	1.376926564	0.726255144	0.019555556
000:01:02	0.056	1	2.8125	1.35	1.377426084	0.72599177	0.019911111
000:01:03	0.057	1	2.8125	1.35	1.377925966	0.725728395	0.020266667
000:01:04	0.058	1	2.8125	1.35	1.378426212	0.725465021	0.020622222
000:01:05	0.059	1	2.8125	1.35	1.37892682	0.725201646	0.020977778
000:01:06	0.06	1	2.8125	1.35	1.379427793	0.724938272	0.021333333

000:01:07	0.061	1	2.8125	1.35	1.37992913	0.724674897	0.021688889
000:01:08	0.061	1	2.8125	1.35	1.37992913	0.724674897	0.021688889
000:01:09	0.062	1	2.8125	1.35	1.380430831	0.724411523	0.022044444
000:01:10	0.063	1	2.8125	1.35	1.380932897	0.724148148	0.0224
000:01:11	0.064	1	2.8125	1.35	1.381435328	0.723884774	0.022755556
000:01:12	0.065	1	2.8125	1.35	1.381938126	0.723621399	0.023111111
000:01:13	0.066	1	2.8125	1.35	1.382441289	0.723358025	0.023466667
000:01:14	0.067	1	2.8125	1.35	1.382944819	0.72309465	0.023822222
000:01:15	0.067	1	2.8125	1.35	1.382944819	0.72309465	0.023822222
000:01:16	0.068	1	2.8125	1.35	1.383448716	0.722831276	0.024177778
000:01:17	0.069	1	2.8125	1.35	1.38395298	0.722567901	0.024533333
000:01:18	0.07	1	2.8125	1.35	1.384457612	0.722304527	0.024888889
000:01:19	0.071	1	2.8125	1.35	1.384962612	0.722041152	0.025244444
000:01:20	0.072	1	2.8125	1.35	1.38546798	0.721777778	0.0256
000:01:21	0.073	1	2.8125	1.35	1.385973718	0.721514403	0.025955556
000:01:22	0.073	1	2.8125	1.35	1.385973718	0.721514403	0.025955556
000:01:23	0.074	1	2.8125	1.35	1.386479825	0.721251029	0.026311111
000:01:24	0.075	1	2.8125	1.35	1.386986301	0.720987654	0.026666667
000:01:25	0.076	1	2.8125	1.35	1.387493148	0.72072428	0.027022222
000:01:26	0.077	2	2.8125	1.35	1.388000366	1.440921811	0.027377778
000:01:27	0.078	1	2.8125	1.35	1.388507954	0.720197531	0.027733333
000:01:28	0.079	1	2.8125	1.35	1.389015914	0.719934156	0.028088889
000:01:29	0.079	1	2.8125	1.35	1.389015914	0.719934156	0.028088889
000:01:30	0.08	1	2.8125	1.35	1.389524245	0.719670782	0.028444444
000:01:31	0.081	1	2.8125	1.35	1.390032949	0.719407407	0.0288
000:01:32	0.082	2	2.8125	1.35	1.390542025	1.438288066	0.029155556

000:01:33	0.083	2	2.8125	1.35	1.391051475	1.437761317	0.029511111
000:01:34	0.084	1	2.8125	1.35	1.391561297	0.718617284	0.029866667
000:01:35	0.084	2	2.8125	1.35	1.391561297	1.437234568	0.029866667
000:01:36	0.085	1	2.8125	1.35	1.392071494	0.718353909	0.030222222
000:01:37	0.086	2	2.8125	1.35	1.392582065	1.43618107	0.030577778
000:01:38	0.087	1	2.8125	1.35	1.39309301	0.71782716	0.030933333
000:01:39	0.088	2	2.8125	1.35	1.393604331	1.435127572	0.031288889
000:01:41	0.09	2	2.8125	1.35	1.394628099	1.434074074	0.032
000:01:43	0.091	1	2.8125	1.35	1.395140547	0.716773663	0.032355556
000:01:45	0.093	2	2.8125	1.35	1.396166575	1.432493827	0.033066667
000:01:47	0.095	2	2.8125	1.35	1.397194112	1.431440329	0.033777778
000:01:49	0.096	2	2.8125	1.35	1.397708448	1.43091358	0.034133333
000:01:51	0.098	2	2.8125	1.35	1.398738258	1.429860082	0.034844444
000:01:53	0.1	2	2.8125	1.35	1.399769585	1.428806584	0.035555556
000:01:55	0.102	2	2.8125	1.35	1.400802435	1.427753086	0.036266667
000:01:57	0.104	2	2.8125	1.35	1.40183681	1.426699588	0.036977778
000:01:59	0.106	2	2.8125	1.35	1.402872714	1.425646091	0.037688889
000:02:01	0.107	2	2.8125	1.35	1.40339124	1.425119342	0.038044444
000:02:03	0.109	2	2.8125	1.35	1.404429443	1.424065844	0.038755556
000:02:05	0.111	2	2.8125	1.35	1.405469184	1.423012346	0.039466667
000:02:07	0.112	2	2.8125	1.35	1.405989632	1.422485597	0.039822222
000:02:09	0.114	2	2.8125	1.35	1.407031684	1.421432099	0.040533333
000:02:11	0.116	2	2.8125	1.35	1.408075283	1.420378601	0.041244444
000:02:13	0.118	2	2.8125	1.35	1.409120431	1.419325103	0.041955556
000:02:15	0.119	2	2.8125	1.35	1.409643586	1.418798354	0.042311111
000:02:17	0.121	2	2.8125	1.35	1.410691064	1.417744856	0.043022222

000:02:19	0.123	2	2.8125	1.35	1.4117401	1.416691358	0.043733333
000:02:21	0.125	2	2.8125	1.35	1.412790698	1.41563786	0.044444444
000:02:23	0.126	3	2.8125	1.35	1.413316583	2.122666667	0.0448
000:02:25	0.128	3	2.8125	1.35	1.414369529	2.12108642	0.045511111
000:02:27	0.13	2	2.8125	1.35	1.415424045	1.413004115	0.046222222
000:02:29	0.132	2	2.8125	1.35	1.416480134	1.411950617	0.046933333
000:02:31	0.133	3	2.8125	1.35	1.41700877	2.117135802	0.047288889
000:02:33	0.135	2	2.8125	1.35	1.418067227	1.41037037	0.048
000:02:35	0.137	3	2.8125	1.35	1.419127266	2.113975309	0.048711111
000:02:37	0.139	2	2.8125	1.35	1.420188891	1.408263374	0.049422222
000:02:39	0.141	3	2.8125	1.35	1.421252106	2.110814815	0.050133333
000:02:41	0.142	3	2.8125	1.35	1.42178431	2.110024691	0.050488889
000:02:43	0.144	3	2.8125	1.35	1.422849916	2.108444444	0.0512
000:02:45	0.146	3	2.8125	1.35	1.42391712	2.106864198	0.051911111
000:02:47	0.148	3	2.8125	1.35	1.424985926	2.105283951	0.052622222
000:02:49	0.149	3	2.8125	1.35	1.425520931	2.104493827	0.052977778
000:02:51	0.151	3	2.8125	1.35	1.426592147	2.10291358	0.053688889
000:02:53	0.153	3	2.8125	1.35	1.427664975	2.101333333	0.0544
000:02:55	0.155	3	2.8125	1.35	1.428739417	2.099753086	0.055111111
000:02:57	0.156	3	2.8125	1.35	1.429277244	2.098962963	0.055466667
000:02:59	0.158	3	2.8125	1.35	1.430354116	2.097382716	0.056177778
000:03:01	0.16	3	2.8125	1.35	1.431432611	2.095802469	0.056888889
000:03:03	0.162	3	2.8125	1.35	1.432512733	2.094222222	0.0576
000:03:05	0.163	3	2.8125	1.35	1.433053406	2.093432099	0.057955556
000:03:07	0.165	3	2.8125	1.35	1.434135977	2.091851852	0.058666667
000:03:09	0.167	3	2.8125	1.35	1.435220185	2.090271605	0.059377778

000:03:11	0.169	3	2.8125	1.35	1.436306034	2.088691358	0.060088889
000:03:13	0.17	3	2.8125	1.35	1.436849574	2.087901235	0.060444444
000:03:15	0.172	3	2.8125	1.35	1.437937891	2.086320988	0.061155556
000:03:17	0.174	3	2.8125	1.35	1.439027857	2.084740741	0.061866667
000:03:19	0.175	3	2.8125	1.35	1.43957346	2.083950617	0.062222222
000:03:49	0.201	4	2.8125	1.35	1.453905801	2.751209877	0.071466667
000:04:19	0.227	4	2.8125	1.35	1.468526397	2.72381893	0.080711111
000:04:49	0.253	5	2.8125	1.35	1.483444032	3.370534979	0.089955556
000:05:19	0.278	4	2.8125	1.35	1.498076544	2.670090535	0.098844444
000:05:49	0.304	4	2.8125	1.35	1.513603747	2.642699588	0.108088889
000:06:19	0.329	5	2.8125	1.35	1.528840346	3.270452675	0.116977778
000:06:49	0.356	5	2.8125	1.35	1.545644209	3.234897119	0.126577778
000:07:19	0.382	5	2.8125	1.35	1.562178564	3.200658436	0.135822222
000:07:49	0.408	5	2.8125	1.35	1.579070493	3.166419753	0.145066667
000:08:19	0.434	6	2.8125	1.35	1.596331722	3.758617284	0.154311111
000:08:49	0.459	6	2.8125	1.35	1.613288719	3.719111111	0.1632
000:09:19	0.485	6	2.8125	1.35	1.631310419	3.678024691	0.172444444
	0.487	6	2.8125	1.35	1.632713395	3.674864198	0.173155556
	0.487	6	2.8125	1.35	1.632713395	3.674864198	0.173155556
	0.488	5	2.8125	1.35	1.633415788	3.061069959	0.173511111
	0.489	5	2.8125	1.35	1.634118786	3.059753086	0.173866667
	0.49	5	2.8125	1.35	1.63482239	3.058436214	0.174222222
	0.491	6	2.8125	1.35	1.635526599	3.66854321	0.174577778
	0.492	6	2.8125	1.35	1.636231416	3.666962963	0.174933333
	0.493	6	2.8125	1.35	1.63693684	3.665382716	0.175288889
	0.494	6	2.8125	1.35	1.637642873	3.663802469	0.175644444

	0.495	6	2.8125	1.35	1.638349515	3.662222222	0.176
	0.496	6	2.8125	1.35	1.639056767	3.660641975	0.176355556
	0.497	6	2.8125	1.35	1.63976463	3.659061728	0.176711111
	0.498	5	2.8125	1.35	1.640473104	3.047901235	0.177066667
	0.499	6	2.8125	1.35	1.641182191	3.655901235	0.177422222
	0.5	5	2.8125	1.35	1.641891892	3.04526749	0.177777778
	0.501	6	2.8125	1.35	1.642602206	3.652740741	0.178133333
	0.502	6	2.8125	1.35	1.643313136	3.651160494	0.178488889
	0.503	6	2.8125	1.35	1.644024681	3.649580247	0.178844444
	0.504	6	2.8125	1.35	1.644736842	3.648	0.1792
	0.505	6	2.8125	1.35	1.645449621	3.646419753	0.179555556
	0.506	5	2.8125	1.35	1.646163018	3.037366255	0.179911111
	0.507	5	2.8125	1.35	1.646877033	3.036049383	0.180266667
	0.508	5	2.8125	1.35	1.647591668	3.03473251	0.180622222
	0.509	6	2.8125	1.35	1.648306924	3.640098765	0.180977778
	0.51	5	2.8125	1.35	1.649022801	3.032098765	0.181333333
	0.511	5	2.8125	1.35	1.6497393	3.030781893	0.181688889
	0.512	6	2.8125	1.35	1.650456423	3.635358025	0.182044444
	0.513	5	2.8125	1.35	1.651174168	3.028148148	0.1824
	0.514	6	2.8125	1.35	1.651892539	3.632197531	0.182755556
	0.515	6	2.8125	1.35	1.652611534	3.630617284	0.183111111
	0.516	5	2.8125	1.35	1.653331156	3.024197531	0.183466667
	0.516	6	2.8125	1.35	1.653331156	3.629037037	0.183466667
	0.517	6	2.8125	1.35	1.654051405	3.62745679	0.183822222
	0.518	6	2.8125	1.35	1.654772282	3.625876543	0.184177778
	0.519	6	2.8125	1.35	1.655493787	3.624296296	0.184533333

	0.52	5	2.8125	1.35	1.656215921	3.018930041	0.184888889
	0.521	6	2.8125	1.35	1.656938686	3.621135802	0.185244444
	0.522	6	2.8125	1.35	1.657662083	3.619555556	0.1856
	0.523	5	2.8125	1.35	1.658386111	3.014979424	0.185955556
	0.524	6	2.8125	1.35	1.659110771	3.616395062	0.186311111
	0.525	6	2.8125	1.35	1.659836066	3.614814815	0.186666667
	0.526	6	2.8125	1.35	1.660561994	3.613234568	0.187022222
	0.527	6	2.8125	1.35	1.661288558	3.611654321	0.187377778
	0.528	6	2.8125	1.35	1.662015758	3.610074074	0.187733333
	0.529	6	2.8125	1.35	1.662743595	3.608493827	0.188088889
	0.53	6	2.8125	1.35	1.66347207	3.60691358	0.188444444
	0.531	6	2.8125	1.35	1.664201183	3.605333333	0.1888
	0.531	6	2.8125	1.35	1.664201183	3.605333333	0.1888
	0.532	6	2.8125	1.35	1.664930936	3.603753086	0.189155556
	0.533	6	2.8125	1.35	1.665661329	3.60217284	0.189511111
	0.534	6	2.8125	1.35	1.666392363	3.600592593	0.189866667
	0.535	6	2.8125	1.35	1.66712404	3.599012346	0.190222222
	0.536	6	2.8125	1.35	1.667856358	3.597432099	0.190577778
	0.537	6	2.8125	1.35	1.668589321	3.595851852	0.190933333
	0.538	6	2.8125	1.35	1.669322928	3.594271605	0.191288889
	0.538	6	2.8125	1.35	1.669322928	3.594271605	0.191288889
	0.539	6	2.8125	1.35	1.670057181	3.592691358	0.191644444
	0.54	6	2.8125	1.35	1.670792079	3.591111111	0.192
	0.541	6	2.8125	1.35	1.671527625	3.589530864	0.192355556
	0.542	6	2.8125	1.35	1.672263819	3.587950617	0.192711111
	0.543	7	2.8125	1.35	1.673000661	4.184098765	0.193066667

	0.544	6	2.8125	1.35	1.673738153	3.584790123	0.193422222
	0.544	6	2.8125	1.35	1.673738153	3.584790123	0.193422222
	0.545	6	2.8125	1.35	1.674476295	3.583209877	0.193777778
	0.546	7	2.8125	1.35	1.675215089	4.178567901	0.194133333
	0.547	6	2.8125	1.35	1.675954535	3.580049383	0.194488889
	0.548	6	2.8125	1.35	1.676694635	3.578469136	0.194844444
	0.549	6	2.8125	1.35	1.677435388	3.576888889	0.1952
	0.55	6	2.8125	1.35	1.678176796	3.575308642	0.195555556
	0.55	6	2.8125	1.35	1.678176796	3.575308642	0.195555556
	0.551	6	2.8125	1.35	1.678918859	3.573728395	0.195911111
	0.552	6	2.8125	1.35	1.679661579	3.572148148	0.196266667
	0.553	6	2.8125	1.35	1.680404957	3.570567901	0.196622222
	0.554	6	2.8125	1.35	1.681148993	3.568987654	0.196977778
	0.555	6	2.8125	1.35	1.681893688	3.567407407	0.197333333
	0.556	6	2.8125	1.35	1.682639043	3.56582716	0.197688889
	0.556	6	2.8125	1.35	1.682639043	3.56582716	0.197688889
	0.557	6	2.8125	1.35	1.683385059	3.564246914	0.198044444
	0.558	6	2.8125	1.35	1.684131737	3.562666667	0.1984
	0.559	6	2.8125	1.35	1.684879077	3.56108642	0.198755556
	0.56	6	2.8125	1.35	1.685627081	3.559506173	0.199111111
	0.561	6	2.8125	1.35	1.68637575	3.557925926	0.199466667
	0.562	6	2.8125	1.35	1.687125083	3.556345679	0.199822222
	0.563	6	2.8125	1.35	1.687875083	3.554765432	0.200177778
	0.564	6	2.8125	1.35	1.688625751	3.553185185	0.200533333
	0.565	6	2.8125	1.35	1.689377086	3.551604938	0.200888889
	0.566	6	2.8125	1.35	1.69012909	3.550024691	0.201244444

	0.567	7	2.8125	1.35	1.690881764	4.139851852	0.2016
	0.568	6	2.8125	1.35	1.691635108	3.546864198	0.201955556
	0.569	6	2.8125	1.35	1.692389124	3.545283951	0.202311111
	0.569	6	2.8125	1.35	1.692389124	3.545283951	0.202311111
	0.57	7	2.8125	1.35	1.693143813	4.134320988	0.202666667
	0.571	6	2.8125	1.35	1.693899175	3.542123457	0.203022222
	0.572	6	2.8125	1.35	1.694655211	3.54054321	0.203377778
	0.573	6	2.8125	1.35	1.695411922	3.538962963	0.203733333
	0.574	6	2.8125	1.35	1.69616931	3.537382716	0.204088889
	0.575	6	2.8125	1.35	1.696927374	3.535802469	0.204444444
	0.575	6	2.8125	1.35	1.696927374	3.535802469	0.204444444
	0.576	6	2.8125	1.35	1.697686117	3.534222222	0.2048
	0.578	6	2.8125	1.35	1.699205639	3.531061728	0.205511111
	0.58	6	2.8125	1.35	1.700727884	3.527901235	0.206222222
	0.581	6	2.8125	1.35	1.701490029	3.526320988	0.206577778
	0.583	6	2.8125	1.35	1.703016371	3.523160494	0.207288889
	0.585	6	2.8125	1.35	1.704545455	3.52	0.208
	0.587	6	2.8125	1.35	1.706077286	3.516839506	0.208711111
	0.588	6	2.8125	1.35	1.706844235	3.515259259	0.209066667
	0.59	6	2.8125	1.35	1.708380202	3.512098765	0.209777778
	0.592	6	2.8125	1.35	1.709918937	3.508938272	0.210488889
	0.593	6	2.8125	1.35	1.710689344	3.507358025	0.210844444
	0.595	6	2.8125	1.35	1.712232244	3.504197531	0.211555556
	0.597	6	2.8125	1.35	1.713777928	3.501037037	0.212266667
	0.598	6	2.8125	1.35	1.714551818	3.49945679	0.212622222
	0.6	6	2.8125	1.35	1.716101695	3.496296296	0.213333333

	0.602	6	2.8125	1.35	1.717654377	3.493135802	0.214044444
	0.604	7	2.8125	1.35	1.719209871	4.07163786	0.214755556
	0.605	6	2.8125	1.35	1.719988675	3.488395062	0.215111111
	0.607	6	2.8125	1.35	1.721548402	3.485234568	0.215822222
	0.609	6	2.8125	1.35	1.72311096	3.482074074	0.216533333
	0.61	7	2.8125	1.35	1.723893303	4.060576132	0.216888889
	0.612	6	2.8125	1.35	1.725460123	3.477333333	0.2176
	0.614	6	2.8125	1.35	1.727029793	3.47417284	0.218311111
	0.615	6	2.8125	1.35	1.7278157	3.472592593	0.218666667
	0.617	6	2.8125	1.35	1.729389661	3.469432099	0.219377778
	0.619	6	2.8125	1.35	1.730966492	3.466271605	0.220088889
	0.621	6	2.8125	1.35	1.732546201	3.463111111	0.2208
	0.622	6	2.8125	1.35	1.733337138	3.461530864	0.221155556
	0.624	6	2.8125	1.35	1.734921179	3.45837037	0.221866667
	0.626	6	2.8125	1.35	1.736508118	3.455209877	0.222577778
	0.628	6	2.8125	1.35	1.738097963	3.452049383	0.223288889
	0.629	6	2.8125	1.35	1.738893978	3.450469136	0.223644444
	0.631	6	2.8125	1.35	1.740488196	3.447308642	0.224355556
	0.633	6	2.8125	1.35	1.742085341	3.444148148	0.225066667
	0.634	6	2.8125	1.35	1.742885013	3.442567901	0.225422222
	0.636	6	2.8125	1.35	1.744486561	3.439407407	0.226133333
	0.638	6	2.8125	1.35	1.746091055	3.436246914	0.226844444
	0.639	6	2.8125	1.35	1.74689441	3.434666667	0.2272
	0.641	6	2.8125	1.35	1.748503339	3.431506173	0.227911111
	0.643	6	2.8125	1.35	1.750115234	3.428345679	0.228622222
	0.645	6	2.8125	1.35	1.751730104	3.425185185	0.229333333

	0.646	6	2.8125	1.35	1.752538657	3.423604938	0.229688889
	0.648	6	2.8125	1.35	1.754158004	3.420444444	0.2304
	0.65	7	2.8125	1.35	1.755780347	3.986831276	0.231111111
	0.651	6	2.8125	1.35	1.756592644	3.415703704	0.231466667
	0.653	6	2.8125	1.35	1.758219495	3.41254321	0.232177778
	0.655	6	2.8125	1.35	1.759849363	3.409382716	0.232888889
	0.656	7	2.8125	1.35	1.76066543	3.975769547	0.233244444
	0.658	6	2.8125	1.35	1.762299838	3.404641975	0.233955556
	0.66	6	2.8125	1.35	1.763937282	3.401481481	0.234666667
	0.662	6	2.8125	1.35	1.765577773	3.398320988	0.235377778
	0.688	6	2.8125	1.35	1.78718522	3.357234568	0.244622222
	0.714	6	2.8125	1.35	1.809328091	3.316148148	0.253866667
	0.74	6	2.8125	1.35	1.832026538	3.275061728	0.263111111

Table B-9: Results of test at water content below plastic limit

TIME	**VERTICAL DEFLECTION (in)**	**LOAD (lb)**	**L_0 (in)**	**A_0 $(in)^2$**	**A_C $(in)^2$**	**STRESS (psi)**	**STRAIN (in/in)**
000:00:01	0	0	2.8125	1.23	1.23	0	0
000:00:02	0	0	2.8125	1.23	1.23	0	0
000:00:03	0	0	2.8125	1.23	1.23	0	0
000:00:04	0.001	0	2.8125	1.23	1.230437489	0	0.000355556

000:00:05	0.002	0	2.8125	1.23	1.230875289	0	0.000711111
000:00:06	0.003	0	2.8125	1.23	1.231313401	0	0.001066667
000:00:07	0.004	0	2.8125	1.23	1.231751825	0	0.001422222
000:00:08	0.005	0	2.8125	1.23	1.232190561	0	0.001777778
000:00:09	0.006	0	2.8125	1.23	1.23262961	0	0.002133333
000:00:10	0.006	0	2.8125	1.23	1.23262961	0	0.002133333
000:00:11	0.007	0	2.8125	1.23	1.233068972	0	0.002488889
000:00:12	0.008	0	2.8125	1.23	1.233508647	0	0.002844444
000:00:13	0.009	1	2.8125	1.23	1.233948636	0.810406504	0.0032
000:00:14	0.01	2	2.8125	1.23	1.234388938	1.620234869	0.003555556
000:00:15	0.01	3	2.8125	1.23	1.234388938	2.430352304	0.003555556
000:00:16	0.011	4	2.8125	1.23	1.234829556	3.23931346	0.003911111
000:00:17	0.012	5	2.8125	1.23	1.235270487	4.047696477	0.004266667
000:00:18	0.013	7	2.8125	1.23	1.235711734	5.664751581	0.004622222
000:00:19	0.014	8	2.8125	1.23	1.236153296	6.47168925	0.004977778
000:00:20	0.015	9	2.8125	1.23	1.236595174	7.27804878	0.005333333
000:00:21	0.016	10	2.8125	1.23	1.237037368	8.083830172	0.005688889
000:00:22	0.017	11	2.8125	1.23	1.237479878	8.889033424	0.006044444
000:00:23	0.017	12	2.8125	1.23	1.237479878	9.697127371	0.006044444
000:00:24	0.018	13	2.8125	1.23	1.237922705	10.50146341	0.0064
000:00:25	0.019	14	2.8125	1.23	1.238365849	11.30522132	0.006755556
000:00:26	0.02	15	2.8125	1.23	1.238809311	12.10840108	0.007111111
000:00:27	0.021	16	2.8125	1.23	1.23925309	12.91100271	0.007466667
000:00:28	0.022	17	2.8125	1.23	1.239697187	13.7130262	0.007822222
000:00:29	0.023	17	2.8125	1.23	1.240141602	13.70811201	0.008177778
000:00:30	0.024	17	2.8125	1.23	1.240586337	13.70319783	0.008533333

000:00:31	0.025	18	2.8125	1.23	1.24103139	14.50406504	0.008888889
000:00:32	0.026	19	2.8125	1.23	1.241476763	15.30435411	0.009244444
000:00:33	0.027	20	2.8125	1.23	1.241922456	16.10406504	0.0096
000:00:34	0.027	20	2.8125	1.23	1.241922456	16.10406504	0.0096
000:00:35	0.028	21	2.8125	1.23	1.242368468	16.90319783	0.009955556
000:00:36	0.029	21	2.8125	1.23	1.242814802	16.89712737	0.010311111
000:00:37	0.03	22	2.8125	1.23	1.243261456	17.69539295	0.010666667
000:00:38	0.031	22	2.8125	1.23	1.243708431	17.68903342	0.011022222
000:00:39	0.032	23	2.8125	1.23	1.244155727	18.4864318	0.011377778
000:00:40	0.032	24	2.8125	1.23	1.244155727	19.2901897	0.011377778
000:00:41	0.033	24	2.8125	1.23	1.244603346	19.28325203	0.011733333
000:00:42	0.034	25	2.8125	1.23	1.245051287	20.07949413	0.012088889
000:00:43	0.035	25	2.8125	1.23	1.24549955	20.07226739	0.012444444
000:00:44	0.036	26	2.8125	1.23	1.245948136	20.86764228	0.0128
000:00:45	0.037	26	2.8125	1.23	1.246397046	20.86012647	0.013155556
000:00:46	0.037	27	2.8125	1.23	1.246397046	21.66243902	0.013155556
000:00:47	0.038	27	2.8125	1.23	1.246846279	21.65463415	0.013511111
000:00:48	0.039	27	2.8125	1.23	1.247295836	21.64682927	0.013866667
000:00:49	0.04	28	2.8125	1.23	1.247745717	22.44046974	0.014222222
000:00:50	0.041	29	2.8125	1.23	1.248195923	23.23353207	0.014577778
000:00:51	0.042	29	2.8125	1.23	1.248646454	23.22514905	0.014933333
000:00:52	0.043	29	2.8125	1.23	1.24909731	23.21676603	0.015288889
000:00:53	0.043	30	2.8125	1.23	1.24909731	24.01734417	0.015288889
000:00:54	0.044	30	2.8125	1.23	1.249548492	24.00867209	0.015644444
000:00:55	0.045	30	2.8125	1.23	1.25	24	0.016
000:00:56	0.046	31	2.8125	1.23	1.250451834	24.79103884	0.016355556

000:00:57	0.047	31	2.8125	1.23	1.250903996	24.78207769	0.016711111
000:00:58	0.048	32	2.8125	1.23	1.251356484	25.57224932	0.017066667
000:00:59	0.048	32	2.8125	1.23	1.251356484	25.57224932	0.017066667
000:01:00	0.049	32	2.8125	1.23	1.2518093	25.5629991	0.017422222
000:01:01	0.05	33	2.8125	1.23	1.252262443	26.35230352	0.017777778
000:01:02	0.051	33	2.8125	1.23	1.252715915	26.34276423	0.018133333
000:01:03	0.052	34	2.8125	1.23	1.253169716	27.13120145	0.018488889
000:01:04	0.053	34	2.8125	1.23	1.253623845	27.12137308	0.018844444
000:01:05	0.054	34	2.8125	1.23	1.254078303	27.11154472	0.0192
000:01:06	0.054	35	2.8125	1.23	1.254078303	27.90894309	0.0192
000:01:07	0.055	35	2.8125	1.23	1.254533092	27.89882565	0.019555556
000:01:08	0.056	35	2.8125	1.23	1.25498821	27.88870822	0.019911111
000:01:09	0.057	35	2.8125	1.23	1.255443658	27.87859079	0.020266667
000:01:10	0.058	35	2.8125	1.23	1.255899437	27.86847335	0.020622222
000:01:11	0.059	36	2.8125	1.23	1.256355547	28.65430894	0.020977778
000:01:12	0.06	36	2.8125	1.23	1.256811989	28.64390244	0.021333333
000:01:13	0.06	37	2.8125	1.23	1.256811989	29.4395664	0.021333333
000:01:14	0.061	37	2.8125	1.23	1.257268762	29.42887082	0.021688889
000:01:15	0.062	37	2.8125	1.23	1.257725868	29.41817525	0.022044444
000:01:16	0.063	38	2.8125	1.23	1.258183306	30.20227642	0.0224
000:01:17	0.064	38	2.8125	1.23	1.258641077	30.19129178	0.022755556
000:01:18	0.065	38	2.8125	1.23	1.259099181	30.18030714	0.023111111
000:01:19	0.065	38	2.8125	1.23	1.259099181	30.18030714	0.023111111
000:01:20	0.066	38	2.8125	1.23	1.259557619	30.16932249	0.023466667
000:01:21	0.067	38	2.8125	1.23	1.26001639	30.15833785	0.023822222
000:01:22	0.068	38	2.8125	1.23	1.260475496	30.14735321	0.024177778

000:01:23	0.069	39	2.8125	1.23	1.260934937	30.92943089	0.024533333
000:01:24	0.07	39	2.8125	1.23	1.261394713	30.91815718	0.024888889
000:01:25	0.07	40	2.8125	1.23	1.261394713	31.71093044	0.024888889
000:01:26	0.071	39	2.8125	1.23	1.261854824	30.90688347	0.025244444
000:01:27	0.072	40	2.8125	1.23	1.262315271	31.68780488	0.0256
000:01:28	0.073	40	2.8125	1.23	1.262776054	31.6762421	0.025955556
000:01:29	0.074	40	2.8125	1.23	1.263237174	31.66467931	0.026311111
000:01:30	0.075	41	2.8125	1.23	1.26369863	32.44444444	0.026666667
000:01:31	0.075	41	2.8125	1.23	1.26369863	32.44444444	0.026666667
000:01:32	0.076	41	2.8125	1.23	1.264160424	32.43259259	0.027022222
000:01:33	0.077	41	2.8125	1.23	1.264622555	32.42074074	0.027377778
000:01:34	0.078	41	2.8125	1.23	1.265085025	32.40888889	0.027733333
000:01:35	0.079	41	2.8125	1.23	1.265547832	32.39703704	0.028088889
000:01:36	0.08	41	2.8125	1.23	1.266010979	32.38518519	0.028444444
000:01:37	0.08	42	2.8125	1.23	1.266010979	33.17506775	0.028444444
000:01:38	0.081	42	2.8125	1.23	1.266474465	33.16292683	0.0288
000:01:39	0.082	42	2.8125	1.23	1.26693829	33.15078591	0.029155556
000:01:41	0.084	43	2.8125	1.23	1.26786696	33.91523035	0.029866667
000:01:43	0.085	43	2.8125	1.23	1.268331806	33.90280036	0.030222222
000:01:45	0.087	43	2.8125	1.23	1.269262521	33.87794038	0.030933333
000:01:47	0.089	44	2.8125	1.23	1.270194603	34.64036134	0.031644444
000:01:49	0.091	44	2.8125	1.23	1.271128054	34.61492322	0.032355556
000:01:51	0.092	45	2.8125	1.23	1.271595295	35.38861789	0.032711111
000:01:53	0.094	45	2.8125	1.23	1.272530807	35.36260163	0.033422222
000:01:55	0.096	45	2.8125	1.23	1.273467697	35.33658537	0.034133333
000:01:57	0.097	46	2.8125	1.23	1.27393666	36.10854562	0.034488889

000:01:59	0.099	46	2.8125	1.23	1.274875622	36.08195122	0.0352
000:02:01	0.101	46	2.8125	1.23	1.275815969	36.05535682	0.035911111
000:02:03	0.102	46	2.8125	1.23	1.276286663	36.04205962	0.036266667
000:02:05	0.104	47	2.8125	1.23	1.277229094	36.79841012	0.036977778
000:02:07	0.106	47	2.8125	1.23	1.278172917	36.77123758	0.037688889
000:02:09	0.108	47	2.8125	1.23	1.279118136	36.74406504	0.0384
000:02:11	0.109	47	2.8125	1.23	1.279591271	36.73047877	0.038755556
000:02:13	0.111	48	2.8125	1.23	1.28053859	37.48422764	0.039466667
000:02:15	0.113	48	2.8125	1.23	1.281487312	37.45647696	0.040177778
000:02:17	0.114	48	2.8125	1.23	1.281962201	37.44260163	0.040533333
000:02:19	0.116	48	2.8125	1.23	1.282913035	37.41485095	0.041244444
000:02:21	0.118	49	2.8125	1.23	1.283865281	38.16599819	0.041955556
000:02:23	0.119	49	2.8125	1.23	1.284341934	38.15183379	0.042311111
000:02:25	0.121	49	2.8125	1.23	1.285296303	38.12350497	0.043022222
000:02:27	0.123	50	2.8125	1.23	1.286252091	38.87262873	0.043733333
000:02:29	0.124	50	2.8125	1.23	1.286730519	38.85817525	0.044088889
000:02:31	0.126	50	2.8125	1.23	1.287688442	38.82926829	0.0448
000:02:33	0.128	51	2.8125	1.23	1.288647793	39.57636856	0.045511111
000:02:35	0.13	51	2.8125	1.23	1.289608574	39.54688347	0.046222222
000:02:37	0.131	51	2.8125	1.23	1.290089502	39.53214092	0.046577778
000:02:39	0.133	51	2.8125	1.23	1.291052435	39.50265583	0.047288889
000:02:41	0.135	51	2.8125	1.23	1.292016807	39.47317073	0.048
000:02:43	0.137	52	2.8125	1.23	1.29298262	40.21709124	0.048711111
000:02:45	0.139	52	2.8125	1.23	1.293949878	40.187028	0.049422222
000:02:47	0.14	52	2.8125	1.23	1.294434051	40.17199639	0.049777778
000:02:49	0.142	52	2.8125	1.23	1.295403482	40.14193315	0.050488889

000:02:51	0.144	53	2.8125	1.23	1.296374368	40.88325203	0.0512
000:02:53	0.145	53	2.8125	1.23	1.296860356	40.86793135	0.051555556
000:02:55	0.147	53	2.8125	1.23	1.297833427	40.83728997	0.052266667
000:02:57	0.149	53	2.8125	1.23	1.298807959	40.8066486	0.052977778
000:02:59	0.151	54	2.8125	1.23	1.299783956	41.54536585	0.053688889
000:03:01	0.152	54	2.8125	1.23	1.300272505	41.5297561	0.054044444
000:03:03	0.154	54	2.8125	1.23	1.301250705	41.49853659	0.054755556
000:03:05	0.156	54	2.8125	1.23	1.302230378	41.46731707	0.055466667
000:03:07	0.158	54	2.8125	1.23	1.303211528	41.43609756	0.056177778
000:03:09	0.159	54	2.8125	1.23	1.303702657	41.4204878	0.056533333
000:03:11	0.161	55	2.8125	1.23	1.304686027	42.15573622	0.057244444
000:03:13	0.163	55	2.8125	1.23	1.305670881	42.12393857	0.057955556
000:03:15	0.165	55	2.8125	1.23	1.306657224	42.09214092	0.058666667
000:03:17	0.166	55	2.8125	1.23	1.307150954	42.0762421	0.059022222
000:03:19	0.168	55	2.8125	1.23	1.308139535	42.04444444	0.059733333
000:03:49	0.194	58	2.8125	1.23	1.321128509	43.90186089	0.068977778
000:04:19	0.22	61	2.8125	1.23	1.334378014	45.71418248	0.078222222
000:04:49	0.246	63	2.8125	1.23	1.347895967	46.7395122	0.087466667
000:05:19	0.271	63	2.8125	1.23	1.36115483	46.28422764	0.096355556
000:05:49	0.296	61	2.8125	1.23	1.374677131	44.37405601	0.105244444

- Sample with 40% sand, 60% clay

Table B-10: Results of test at water content above plastic limit

TIME	VERTICAL DEFLECTION (in)	LOAD (lb)	L_0 (in)	A_0 $(in)^2$	A_C $(in)^2$	STRESS (psi)	STRAIN (in/in)
000:00:00	0.002	0	2.8125	1.23	1.230875289	0	0.000711111
000:00:01	0.003	0	2.8125	1.23	1.231313401	0	0.001066667
000:00:02	0.003	0	2.8125	1.23	1.231313401	0	0.001066667
000:00:03	0.004	0	2.8125	1.23	1.231751825	0	0.001422222
000:00:04	0.005	0	2.8125	1.23	1.232190561	0	0.001777778
000:00:05	0.006	0	2.8125	1.23	1.23262961	0	0.002133333
000:00:06	0.007	1	2.8125	1.23	1.233068972	0.810984643	0.002488889
000:00:07	0.008	0	2.8125	1.23	1.233508647	0	0.002844444
000:00:08	0.009	0	2.8125	1.23	1.233948636	0	0.0032
000:00:09	0.009	0	2.8125	1.23	1.233948636	0	0.0032
000:00:10	0.01	0	2.8125	1.23	1.234388938	0	0.003555556
000:00:11	0.011	0	2.8125	1.23	1.234829556	0	0.003911111
000:00:12	0.012	0	2.8125	1.23	1.235270487	0	0.004266667
000:00:13	0	0	2.8125	1.23	1.23	0	0
000:00:14	0.001	0	2.8125	1.23	1.230437489	0	0.000355556
000:00:15	0.002	1	2.8125	1.23	1.230875289	0.812429991	0.000711111

000:00:16	0.002	0	2.8125	1.23	1.230875289	0	0.000711111
000:00:17	0.003	0	2.8125	1.23	1.231313401	0	0.001066667
000:00:18	0.004	1	2.8125	1.23	1.231751825	0.811851852	0.001422222
000:00:19	0.005	0	2.8125	1.23	1.232190561	0	0.001777778
000:00:20	0.006	1	2.8125	1.23	1.23262961	0.811273713	0.002133333
000:00:21	0.007	1	2.8125	1.23	1.233068972	0.810984643	0.002488889
000:00:22	0.008	1	2.8125	1.23	1.233508647	0.810695574	0.002844444
000:00:23	0.008	1	2.8125	1.23	1.233508647	0.810695574	0.002844444
000:00:24	0.009	1	2.8125	1.23	1.233948636	0.810406504	0.0032
000:00:25	0.01	1	2.8125	1.23	1.234388938	0.810117435	0.003555556
000:00:26	0.011	1	2.8125	1.23	1.234829556	0.809828365	0.003911111
000:00:27	0.012	1	2.8125	1.23	1.235270487	0.809539295	0.004266667
000:00:28	0.013	1	2.8125	1.23	1.235711734	0.809250226	0.004622222
000:00:29	0.014	1	2.8125	1.23	1.236153296	0.808961156	0.004977778
000:00:30	0.015	1	2.8125	1.23	1.236595174	0.808672087	0.005333333
000:00:31	0.016	1	2.8125	1.23	1.237037368	0.808383017	0.005688889
000:00:32	0.016	1	2.8125	1.23	1.237037368	0.808383017	0.005688889
000:00:33	0.017	2	2.8125	1.23	1.237479878	1.616187895	0.006044444
000:00:34	0.018	2	2.8125	1.23	1.237922705	1.615609756	0.0064
000:00:35	0.019	2	2.8125	1.23	1.238365849	1.615031617	0.006755556
000:00:36	0.02	2	2.8125	1.23	1.238809311	1.614453478	0.007111111
000:00:37	0.021	2	2.8125	1.23	1.23925309	1.613875339	0.007466667
000:00:38	0.022	2	2.8125	1.23	1.239697187	1.6132972	0.007822222
000:00:39	0.023	2	2.8125	1.23	1.240141602	1.612719061	0.008177778
000:00:40	0.023	2	2.8125	1.23	1.240141602	1.612719061	0.008177778
000:00:41	0.024	3	2.8125	1.23	1.240586337	2.418211382	0.008533333

000:00:42	0.025	3	2.8125	1.23	1.24103139	2.417344173	0.008888889
000:00:43	0.026	3	2.8125	1.23	1.241476763	2.416476965	0.009244444
000:00:44	0.027	3	2.8125	1.23	1.241922456	2.415609756	0.0096
000:00:45	0.028	3	2.8125	1.23	1.242368468	2.414742547	0.009955556
000:00:46	0.029	3	2.8125	1.23	1.242814802	2.413875339	0.010311111
000:00:47	0.03	4	2.8125	1.23	1.243261456	3.217344173	0.010666667
000:00:48	0.031	3	2.8125	1.23	1.243708431	2.412140921	0.011022222
000:00:49	0.031	3	2.8125	1.23	1.243708431	2.412140921	0.011022222
000:00:50	0.032	3	2.8125	1.23	1.244155727	2.411273713	0.011377778
000:00:51	0.033	4	2.8125	1.23	1.244603346	3.213875339	0.011733333
000:00:52	0.034	4	2.8125	1.23	1.245051287	3.212719061	0.012088889
000:00:53	0.035	4	2.8125	1.23	1.24549955	3.211562782	0.012444444
000:00:54	0.036	4	2.8125	1.23	1.245948136	3.210406504	0.0128
000:00:55	0.037	4	2.8125	1.23	1.246397046	3.209250226	0.013155556
000:00:56	0.038	4	2.8125	1.23	1.246846279	3.208093948	0.013511111
000:00:57	0.039	4	2.8125	1.23	1.247295836	3.206937669	0.013866667
000:00:58	0.04	4	2.8125	1.23	1.247745717	3.205781391	0.014222222
000:00:59	0.04	4	2.8125	1.23	1.247745717	3.205781391	0.014222222
000:01:00	0.041	4	2.8125	1.23	1.248195923	3.204625113	0.014577778
000:01:01	0.042	4	2.8125	1.23	1.248646454	3.203468835	0.014933333
000:01:02	0.043	4	2.8125	1.23	1.24909731	3.202312556	0.015288889
000:01:03	0.044	5	2.8125	1.23	1.249548492	4.001445348	0.015644444
000:01:04	0.045	4	2.8125	1.23	1.25	3.2	0.016
000:01:05	0.046	5	2.8125	1.23	1.250451834	3.998554652	0.016355556
000:01:06	0.047	4	2.8125	1.23	1.250903996	3.197687444	0.016711111
000:01:07	0.047	5	2.8125	1.23	1.250903996	3.997109304	0.016711111

000:01:08	0.048	5	2.8125	1.23	1.251356484	3.995663957	0.017066667
000:01:09	0.049	5	2.8125	1.23	1.2518093	3.994218609	0.017422222
000:01:10	0.05	5	2.8125	1.23	1.252262443	3.992773261	0.017777778
000:01:11	0.051	5	2.8125	1.23	1.252715915	3.991327913	0.018133333
000:01:12	0.052	5	2.8125	1.23	1.253169716	3.989882565	0.018488889
000:01:13	0.053	5	2.8125	1.23	1.253623845	3.988437218	0.018844444
000:01:14	0.054	5	2.8125	1.23	1.254078303	3.98699187	0.0192
000:01:15	0.054	5	2.8125	1.23	1.254078303	3.98699187	0.0192
000:01:16	0.055	5	2.8125	1.23	1.254533092	3.985546522	0.019555556
000:01:17	0.056	5	2.8125	1.23	1.25498821	3.984101174	0.019911111
000:01:18	0.057	5	2.8125	1.23	1.255443658	3.982655827	0.020266667
000:01:19	0.058	5	2.8125	1.23	1.255899437	3.981210479	0.020622222
000:01:20	0.059	5	2.8125	1.23	1.256355547	3.979765131	0.020977778
000:01:21	0.06	6	2.8125	1.23	1.256811989	4.77398374	0.021333333
000:01:22	0.061	5	2.8125	1.23	1.257268762	3.976874435	0.021688889
000:01:23	0.061	6	2.8125	1.23	1.257268762	4.772249322	0.021688889
000:01:24	0.062	5	2.8125	1.23	1.257725868	3.975429088	0.022044444
000:01:25	0.063	5	2.8125	1.23	1.258183306	3.97398374	0.0224
000:01:26	0.064	5	2.8125	1.23	1.258641077	3.972538392	0.022755556
000:01:27	0.065	5	2.8125	1.23	1.259099181	3.971093044	0.023111111
000:01:28	0.066	5	2.8125	1.23	1.259557619	3.969647696	0.023466667
000:01:29	0.067	6	2.8125	1.23	1.26001639	4.761842818	0.023822222
000:01:30	0.068	5	2.8125	1.23	1.260475496	3.966757001	0.024177778
000:01:31	0.068	5	2.8125	1.23	1.260475496	3.966757001	0.024177778
000:01:32	0.069	6	2.8125	1.23	1.260934937	4.758373984	0.024533333
000:01:33	0.07	6	2.8125	1.23	1.261394713	4.756639566	0.024888889

000:01:34	0.071	6	2.8125	1.23	1.261854824	4.754905149	0.025244444
000:01:35	0.072	6	2.8125	1.23	1.262315271	4.753170732	0.0256
000:01:36	0.073	6	2.8125	1.23	1.262776054	4.751436314	0.025955556
000:01:37	0.074	6	2.8125	1.23	1.263237174	4.749701897	0.026311111
000:01:38	0.075	6	2.8125	1.23	1.26369863	4.74796748	0.026666667
000:01:39	0.075	6	2.8125	1.23	1.26369863	4.74796748	0.026666667
000:01:41	0.077	6	2.8125	1.23	1.264622555	4.744498645	0.027377778
000:01:43	0.079	6	2.8125	1.23	1.265547832	4.74102981	0.028088889
000:01:45	0.081	6	2.8125	1.23	1.266474465	4.737560976	0.0288
000:01:47	0.082	6	2.8125	1.23	1.26693829	4.735826558	0.029155556
000:01:49	0.084	6	2.8125	1.23	1.26786696	4.732357724	0.029866667
000:01:51	0.086	6	2.8125	1.23	1.268796992	4.728888889	0.030577778
000:01:53	0.087	6	2.8125	1.23	1.269262521	4.727154472	0.030933333
000:01:55	0.089	7	2.8125	1.23	1.270194603	5.510966576	0.031644444
000:01:57	0.091	7	2.8125	1.23	1.271128054	5.506919603	0.032355556
000:01:59	0.093	7	2.8125	1.23	1.272062879	5.502872629	0.033066667
000:02:01	0.094	7	2.8125	1.23	1.272530807	5.500849142	0.033422222
000:02:03	0.096	7	2.8125	1.23	1.273467697	5.496802168	0.034133333
000:02:05	0.098	7	2.8125	1.23	1.274405968	5.492755194	0.034844444
000:02:07	0.1	7	2.8125	1.23	1.275345622	5.48870822	0.035555556
000:02:09	0.101	7	2.8125	1.23	1.275815969	5.486684734	0.035911111
000:02:11	0.103	7	2.8125	1.23	1.276757704	5.48263776	0.036622222
000:02:13	0.105	7	2.8125	1.23	1.277700831	5.478590786	0.037333333
000:02:15	0.106	7	2.8125	1.23	1.278172917	5.476567299	0.037688889
000:02:17	0.108	7	2.8125	1.23	1.279118136	5.472520325	0.0384
000:02:19	0.11	7	2.8125	1.23	1.280064755	5.468473351	0.039111111

000:02:21	0.111	7	2.8125	1.23	1.28053859	5.466449864	0.039466667
000:02:23	0.113	7	2.8125	1.23	1.281487312	5.462402891	0.040177778
000:02:25	0.115	7	2.8125	1.23	1.282437442	5.458355917	0.040888889
000:02:27	0.116	7	2.8125	1.23	1.282913035	5.45633243	0.041244444
000:02:29	0.118	8	2.8125	1.23	1.283865281	6.231183379	0.041955556
000:02:31	0.119	8	2.8125	1.23	1.284341934	6.228870822	0.042311111
000:02:33	0.121	8	2.8125	1.23	1.285296303	6.224245709	0.043022222
000:02:35	0.123	7	2.8125	1.23	1.286252091	5.442168022	0.043733333
000:02:37	0.125	7	2.8125	1.23	1.287209302	5.438121048	0.044444444
000:02:39	0.126	8	2.8125	1.23	1.287688442	6.212682927	0.0448
000:02:41	0.128	8	2.8125	1.23	1.288647793	6.208057814	0.045511111
000:02:43	0.13	7	2.8125	1.23	1.289608574	5.428003613	0.046222222
000:02:45	0.131	8	2.8125	1.23	1.290089502	6.201120145	0.046577778
000:02:47	0.133	8	2.8125	1.23	1.291052435	6.196495032	0.047288889
000:02:49	0.135	7	2.8125	1.23	1.292016807	5.417886179	0.048
000:02:51	0.136	8	2.8125	1.23	1.292499533	6.189557362	0.048355556
000:02:53	0.138	7	2.8125	1.23	1.293466068	5.411815718	0.049066667
000:02:55	0.14	8	2.8125	1.23	1.294434051	6.180307136	0.049777778
000:02:57	0.142	8	2.8125	1.23	1.295403482	6.175682023	0.050488889
000:02:59	0.143	8	2.8125	1.23	1.295888743	6.173369467	0.050844444
000:03:01	0.145	8	2.8125	1.23	1.296860356	6.168744354	0.051555556
000:03:03	0.147	8	2.8125	1.23	1.297833427	6.164119241	0.052266667
000:03:05	0.148	8	2.8125	1.23	1.29832051	6.161806685	0.052622222
000:03:07	0.15	8	2.8125	1.23	1.299295775	6.157181572	0.053333333
000:03:09	0.152	8	2.8125	1.23	1.300272505	6.152556459	0.054044444
000:03:11	0.154	8	2.8125	1.23	1.301250705	6.147931346	0.054755556

000:03:13	0.155	9	2.8125	1.23	1.301740357	6.913821138	0.055111111
000:03:15	0.157	8	2.8125	1.23	1.302720768	6.140993677	0.055822222
000:03:17	0.159	8	2.8125	1.23	1.303702657	6.136368564	0.056533333
000:03:19	0.16	9	2.8125	1.23	1.304194156	6.900813008	0.056888889
000:03:49	0.187	10	2.8125	1.23	1.31760617	7.589521229	0.066488889
000:04:19	0.213	10	2.8125	1.23	1.330784766	7.514363144	0.075733333
000:04:49	0.24	10	2.8125	1.23	1.344752187	7.436314363	0.085333333
000:05:19	0.266	11	2.8125	1.23	1.358482231	8.097271906	0.094577778
000:05:49	0.291	11	2.8125	1.23	1.37195122	8.017777778	0.103466667
000:06:19	0.317	12	2.8125	1.23	1.386245241	8.656476965	0.112711111
000:06:49	0.342	13	2.8125	1.23	1.400273224	9.283902439	0.1216
000:07:19	0.368	13	2.8125	1.23	1.415166701	9.186196929	0.130844444
000:07:49	0.394	14	2.8125	1.23	1.430380401	9.787606143	0.140088889
000:08:19	0.42	14	2.8125	1.23	1.445924765	9.682384824	0.149333333
000:08:49	0.446	14	2.8125	1.23	1.461810691	9.577163505	0.158577778
000:09:19	0.472	14	2.8125	1.23	1.478049562	9.471942186	0.167822222
000:09:49	0.498	15	2.8125	1.23	1.494653273	10.03577236	0.177066667
000:10:19	0.523	15	2.8125	1.23	1.510974012	9.927371274	0.185955556
000:10:49	0.549	16	2.8125	1.23	1.52833002	10.46894309	0.1952
000:11:19	0.574	16	2.8125	1.23	1.545398704	10.35331527	0.204088889
000:11:49	0.601	16	2.8125	1.23	1.564266335	10.22843722	0.213688889
000:12:19	0.627	17	2.8125	1.23	1.582875772	10.7399458	0.222933333
000:12:49	0.653	16	2.8125	1.23	1.601933318	9.987931346	0.232177778
000:13:19	0.679	17	2.8125	1.23	1.621455355	10.48440831	0.241422222

Table B-11: Results of test at water content at plastic limit

TIME	VERTICAL DEFLECTION (in)	LOAD (lb)	L_0 (in)	A_0 $(in)^2$	A_C $(in)^2$	STRESS (psi)	STRAIN (in/in)
000:00:00	0.001	1	2.8125	1.35	1.350480171	0.740477366	0.000355556
000:00:01	0.002	0	2.8125	1.35	1.350960683	0	0.000711111
000:00:02	0.003	0	2.8125	1.35	1.351441538	0	0.001066667
000:00:03	0.004	0	2.8125	1.35	1.351922735	0	0.001422222
000:00:04	0.005	0	2.8125	1.35	1.352404274	0	0.001777778
000:00:05	0.005	0	2.8125	1.35	1.352404274	0	0.001777778
000:00:06	0.006	0	2.8125	1.35	1.352886157	0	0.002133333
000:00:07	0.007	0	2.8125	1.35	1.353368384	0	0.002488889
000:00:08	0.008	0	2.8125	1.35	1.353850954	0	0.002844444
000:00:09	0.009	0	2.8125	1.35	1.354333868	0	0.0032
000:00:10	0.01	0	2.8125	1.35	1.354817128	0	0.003555556
000:00:11	0.011	0	2.8125	1.35	1.355300732	0	0.003911111
000:00:12	0.011	1	2.8125	1.35	1.355300732	0.737843621	0.003911111
000:00:13	0.012	0	2.8125	1.35	1.355784681	0	0.004266667
000:00:14	0.013	1	2.8125	1.35	1.356268977	0.737316872	0.004622222
000:00:15	0.014	1	2.8125	1.35	1.356753618	0.737053498	0.004977778
000:00:16	0.015	2	2.8125	1.35	1.357238606	1.473580247	0.005333333
000:00:17	0.016	2	2.8125	1.35	1.357723941	1.473053498	0.005688889

000:00:18	0.017	2	2.8125	1.35	1.358209623	1.472526749	0.006044444
000:00:19	0.017	3	2.8125	1.35	1.358209623	2.208790123	0.006044444
000:00:20	0.018	3	2.8125	1.35	1.358695652	2.208	0.0064
000:00:21	0.019	4	2.8125	1.35	1.35918203	2.942946502	0.006755556
000:00:22	0.02	4	2.8125	1.35	1.359668756	2.941893004	0.007111111
000:00:23	0.021	4	2.8125	1.35	1.36015583	2.940839506	0.007466667
000:00:24	0.022	4	2.8125	1.35	1.360643254	2.939786008	0.007822222
000:00:25	0.023	4	2.8125	1.35	1.361131027	2.93873251	0.008177778
000:00:26	0.024	4	2.8125	1.35	1.36161915	2.937679012	0.008533333
000:00:27	0.024	5	2.8125	1.35	1.36161915	3.672098765	0.008533333
000:00:28	0.025	5	2.8125	1.35	1.362107623	3.670781893	0.008888889
000:00:29	0.026	5	2.8125	1.35	1.362596447	3.669465021	0.009244444
000:00:30	0.027	5	2.8125	1.35	1.363085622	3.668148148	0.0096
000:00:31	0.028	5	2.8125	1.35	1.363575148	3.666831276	0.009955556
000:00:32	0.029	6	2.8125	1.35	1.364065026	4.398617284	0.010311111
000:00:33	0.03	6	2.8125	1.35	1.364555256	4.397037037	0.010666667
000:00:34	0.031	6	2.8125	1.35	1.365045839	4.39545679	0.011022222
000:00:35	0.031	6	2.8125	1.35	1.365045839	4.39545679	0.011022222
000:00:36	0.032	6	2.8125	1.35	1.365536774	4.393876543	0.011377778
000:00:37	0.033	6	2.8125	1.35	1.366028063	4.392296296	0.011733333
000:00:38	0.034	6	2.8125	1.35	1.366519705	4.390716049	0.012088889
000:00:39	0.035	7	2.8125	1.35	1.367011701	5.120658436	0.012444444
000:00:40	0.036	6	2.8125	1.35	1.367504052	4.387555556	0.0128
000:00:41	0.037	7	2.8125	1.35	1.367996757	5.116971193	0.013155556
000:00:42	0.038	7	2.8125	1.35	1.368489818	5.115127572	0.013511111
000:00:43	0.038	7	2.8125	1.35	1.368489818	5.115127572	0.013511111

000:00:44	0.039	7	2.8125	1.35	1.368983234	5.113283951	0.013866667
000:00:45	0.04	7	2.8125	1.35	1.369477006	5.111440329	0.014222222
000:00:46	0.041	7	2.8125	1.35	1.369971135	5.109596708	0.014577778
000:00:47	0.042	7	2.8125	1.35	1.37046562	5.107753086	0.014933333
000:00:48	0.043	8	2.8125	1.35	1.370960462	5.835325103	0.015288889
000:00:49	0.044	7	2.8125	1.35	1.371455662	5.104065844	0.015644444
000:00:50	0.045	8	2.8125	1.35	1.37195122	5.831111111	0.016
000:00:51	0.046	8	2.8125	1.35	1.372447135	5.829004115	0.016355556
000:00:52	0.047	8	2.8125	1.35	1.37294341	5.826897119	0.016711111
000:00:53	0.047	8	2.8125	1.35	1.37294341	5.826897119	0.016711111
000:00:54	0.048	8	2.8125	1.35	1.373440043	5.824790123	0.017066667
000:00:55	0.049	8	2.8125	1.35	1.373937036	5.822683128	0.017422222
000:00:56	0.05	9	2.8125	1.35	1.374434389	6.548148148	0.017777778
000:00:57	0.051	9	2.8125	1.35	1.374932102	6.545777778	0.018133333
000:00:58	0.052	9	2.8125	1.35	1.375430176	6.543407407	0.018488889
000:00:59	0.053	9	2.8125	1.35	1.37592861	6.541037037	0.018844444
000:01:00	0.054	9	2.8125	1.35	1.376427406	6.538666667	0.0192
000:01:01	0.055	9	2.8125	1.35	1.376926564	6.536296296	0.019555556
000:01:02	0.055	9	2.8125	1.35	1.376926564	6.536296296	0.019555556
000:01:03	0.056	9	2.8125	1.35	1.377426084	6.533925926	0.019911111
000:01:04	0.057	9	2.8125	1.35	1.377925966	6.531555556	0.020266667
000:01:05	0.058	10	2.8125	1.35	1.378426212	7.254650206	0.020622222
000:01:06	0.059	10	2.8125	1.35	1.37892682	7.252016461	0.020977778
000:01:07	0.06	10	2.8125	1.35	1.379427793	7.249382716	0.021333333
000:01:08	0.061	10	2.8125	1.35	1.37992913	7.246748971	0.021688889
000:01:09	0.062	10	2.8125	1.35	1.380430831	7.244115226	0.022044444

000:01:10	0.062	10	2.8125	1.35	1.380430831	7.244115226	0.022044444
000:01:11	0.063	10	2.8125	1.35	1.380932897	7.241481481	0.0224
000:01:12	0.064	10	2.8125	1.35	1.381435328	7.238847737	0.022755556
000:01:13	0.065	10	2.8125	1.35	1.381938126	7.236213992	0.023111111
000:01:14	0.066	10	2.8125	1.35	1.382441289	7.233580247	0.023466667
000:01:15	0.067	11	2.8125	1.35	1.382944819	7.954041152	0.023822222
000:01:16	0.068	11	2.8125	1.35	1.383448716	7.951144033	0.024177778
000:01:17	0.069	11	2.8125	1.35	1.38395298	7.948246914	0.024533333
000:01:18	0.069	11	2.8125	1.35	1.38395298	7.948246914	0.024533333
000:01:19	0.07	11	2.8125	1.35	1.384457612	7.945349794	0.024888889
000:01:20	0.071	11	2.8125	1.35	1.384962612	7.942452675	0.025244444
000:01:21	0.072	11	2.8125	1.35	1.38546798	7.939555556	0.0256
000:01:22	0.073	11	2.8125	1.35	1.385973718	7.936658436	0.025955556
000:01:23	0.074	11	2.8125	1.35	1.386479825	7.933761317	0.026311111
000:01:24	0.075	11	2.8125	1.35	1.386986301	7.930864198	0.026666667
000:01:25	0.075	11	2.8125	1.35	1.386986301	7.930864198	0.026666667
000:01:26	0.076	11	2.8125	1.35	1.387493148	7.927967078	0.027022222
000:01:27	0.077	12	2.8125	1.35	1.388000366	8.645530864	0.027377778
000:01:28	0.078	12	2.8125	1.35	1.388507954	8.64237037	0.027733333
000:01:29	0.079	12	2.8125	1.35	1.389015914	8.639209877	0.028088889
000:01:30	0.08	12	2.8125	1.35	1.389524245	8.636049383	0.028444444
000:01:31	0.081	12	2.8125	1.35	1.390032949	8.632888889	0.0288
000:01:32	0.082	12	2.8125	1.35	1.390542025	8.629728395	0.029155556
000:01:33	0.082	13	2.8125	1.35	1.390542025	9.348872428	0.029155556
000:01:34	0.083	12	2.8125	1.35	1.391051475	8.626567901	0.029511111
000:01:35	0.084	13	2.8125	1.35	1.391561297	9.342024691	0.029866667

000:01:36	0.085	12	2.8125	1.35	1.392071494	8.620246914	0.030222222
000:01:37	0.086	13	2.8125	1.35	1.392582065	9.335176955	0.030577778
000:01:38	0.087	13	2.8125	1.35	1.39309301	9.331753086	0.030933333
000:01:39	0.088	13	2.8125	1.35	1.393604331	9.328329218	0.031288889
000:01:41	0.089	13	2.8125	1.35	1.394116027	9.32490535	0.031644444
000:01:43	0.091	13	2.8125	1.35	1.395140547	9.318057613	0.032355556
000:01:45	0.093	13	2.8125	1.35	1.396166575	9.311209877	0.033066667
000:01:47	0.094	13	2.8125	1.35	1.396680154	9.307786008	0.033422222
000:01:49	0.096	14	2.8125	1.35	1.397708448	10.01639506	0.034133333
000:01:51	0.098	14	2.8125	1.35	1.398738258	10.00902058	0.034844444
000:01:53	0.1	14	2.8125	1.35	1.399769585	10.00164609	0.035555556
000:01:55	0.101	14	2.8125	1.35	1.40028582	9.997958848	0.035911111
000:01:57	0.103	14	2.8125	1.35	1.401319432	9.990584362	0.036622222
000:01:59	0.105	14	2.8125	1.35	1.402354571	9.983209877	0.037333333
000:02:01	0.107	14	2.8125	1.35	1.40339124	9.975835391	0.038044444
000:02:03	0.108	15	2.8125	1.35	1.40391015	10.68444444	0.0384
000:02:05	0.11	15	2.8125	1.35	1.404949121	10.67654321	0.039111111
000:02:07	0.112	15	2.8125	1.35	1.405989632	10.66864198	0.039822222
000:02:09	0.113	16	2.8125	1.35	1.406510465	11.37567078	0.040177778
000:02:11	0.115	16	2.8125	1.35	1.40755329	11.3672428	0.040888889
000:02:13	0.117	16	2.8125	1.35	1.408597663	11.35881481	0.0416
000:02:15	0.119	16	2.8125	1.35	1.409643586	11.35038683	0.042311111
000:02:17	0.12	16	2.8125	1.35	1.410167131	11.34617284	0.042666667
000:02:19	0.122	16	2.8125	1.35	1.411215387	11.33774486	0.043377778
000:02:21	0.124	17	2.8125	1.35	1.412265204	12.03739918	0.044088889
000:02:23	0.125	16	2.8125	1.35	1.412790698	11.32510288	0.044444444

000:02:25	0.127	17	2.8125	1.35	1.41384286	12.02396708	0.045155556
000:02:27	0.128	17	2.8125	1.35	1.414369529	12.01948971	0.045511111
000:02:29	0.13	17	2.8125	1.35	1.415424045	12.01053498	0.046222222
000:02:31	0.132	17	2.8125	1.35	1.416480134	12.00158025	0.046933333
000:02:33	0.133	18	2.8125	1.35	1.41700877	12.70281481	0.047288889
000:02:35	0.135	17	2.8125	1.35	1.418067227	11.98814815	0.048
000:02:37	0.137	18	2.8125	1.35	1.419127266	12.68385185	0.048711111
000:02:39	0.138	18	2.8125	1.35	1.41965788	12.67911111	0.049066667
000:02:41	0.14	18	2.8125	1.35	1.420720299	12.66962963	0.049777778
000:02:43	0.142	18	2.8125	1.35	1.42178431	12.66014815	0.050488889
000:02:45	0.144	18	2.8125	1.35	1.422849916	12.65066667	0.0512
000:02:47	0.145	19	2.8125	1.35	1.423383318	13.34847737	0.051555556
000:02:49	0.147	18	2.8125	1.35	1.424451322	12.63644444	0.052266667
000:02:51	0.149	18	2.8125	1.35	1.425520931	12.62696296	0.052977778
000:02:53	0.15	19	2.8125	1.35	1.426056338	13.32345679	0.053333333
000:02:55	0.152	19	2.8125	1.35	1.427128359	13.31344856	0.054044444
000:02:57	0.154	19	2.8125	1.35	1.428201994	13.30344033	0.054755556
000:02:59	0.156	19	2.8125	1.35	1.429277244	13.2934321	0.055466667
000:03:01	0.157	20	2.8125	1.35	1.429815477	13.98781893	0.055822222
000:03:03	0.159	20	2.8125	1.35	1.43089316	13.97728395	0.056533333
000:03:05	0.161	20	2.8125	1.35	1.431972468	13.96674897	0.057244444
000:03:07	0.162	20	2.8125	1.35	1.432512733	13.96148148	0.0576
000:03:09	0.164	20	2.8125	1.35	1.433594487	13.9509465	0.058311111
000:03:11	0.166	21	2.8125	1.35	1.434677876	14.6374321	0.059022222
000:03:13	0.167	21	2.8125	1.35	1.435220185	14.63190123	0.059377778
000:03:15	0.169	21	2.8125	1.35	1.436306034	14.62083951	0.060088889

000:03:17	0.171	21	2.8125	1.35	1.437393526	14.60977778	0.0608
000:03:19	0.173	21	2.8125	1.35	1.438482667	14.59871605	0.061511111
000:03:49	0.199	23	2.8125	1.35	1.452793189	15.83157202	0.070755556
000:04:19	0.225	25	2.8125	1.35	1.467391304	17.03703704	0.08
000:04:49	0.252	27	2.8125	1.35	1.482864675	18.208	0.0896
000:05:19	0.278	29	2.8125	1.35	1.498076544	19.35815638	0.098844444
000:05:49	0.303	31	2.8125	1.35	1.513000598	20.48908642	0.107733333
000:06:19	0.329	32	2.8125	1.35	1.528840346	20.93089712	0.116977778
000:06:49	0.354	33	2.8125	1.35	1.544386821	21.3677037	0.125866667
000:07:19	0.379	35	2.8125	1.35	1.560252722	22.43226337	0.134755556
000:07:49	0.405	36	2.8125	1.35	1.577102804	22.82666667	0.144
000:08:19	0.432	38	2.8125	1.35	1.594990548	23.82459259	0.1536
000:08:49	0.458	38	2.8125	1.35	1.612603525	23.5643786	0.162844444
000:09:19	0.484	39	2.8125	1.35	1.630609835	23.9174321	0.172088889
000:09:49	0.51	40	2.8125	1.35	1.649022801	24.25679012	0.181333333
000:10:19	0.535	41	2.8125	1.35	1.66712404	24.59325103	0.190222222
000:10:49	0.56	42	2.8125	1.35	1.685627081	24.91654321	0.199111111
000:11:19	0.586	42	2.8125	1.35	1.705311026	24.62893827	0.208355556
000:11:49	0.612	43	2.8125	1.35	1.725460123	24.92088889	0.2176
000:12:19	0.639	43	2.8125	1.35	1.74689441	24.61511111	0.2272
000:12:49	0.665	43	2.8125	1.35	1.768044237	24.32065844	0.236444444
000:13:19	0.69	44	2.8125	1.35	1.788869258	24.59654321	0.245333333

Table B-12: Results of test at water content below plastic limit

TIME	VERTICAL DEFLECTION (in)	LOAD (lb)	L_0 (in)	A_0 $(in)^2$	A_C $(in)^2$	STRESS (psi)	STRAIN (in/in)
000:00:00	0	0	2.875	1.23	1.23	0	0
000:00:01	-0.001	0	2.875	1.23	1.229572323	0	-0.000347826
000:00:02	0	0	2.875	1.23	1.23	0	0
000:00:03	0	4	2.875	1.23	1.23	3.25203252	0
000:00:04	0.001	12	2.875	1.23	1.230427975	9.752704136	0.000347826
000:00:05	0.001	19	2.875	1.23	1.230427975	15.44178155	0.000347826
000:00:06	0.002	27	2.875	1.23	1.230856248	21.9359491	0.000695652
000:00:07	0.003	34	2.875	1.23	1.231284819	27.61343231	0.001043478
000:00:08	0.004	41	2.875	1.23	1.231713689	33.28695652	0.001391304
000:00:09	0.004	48	2.875	1.23	1.231713689	38.97009544	0.001391304
000:00:10	0.005	54	2.875	1.23	1.232142857	43.82608696	0.00173913
000:00:11	0.006	60	2.875	1.23	1.232572325	48.67868505	0.002086957
000:00:12	0.007	66	2.875	1.23	1.233002092	53.52788971	0.002434783

000:00:13	0.007	71	2.875	1.23	1.233002092	57.58303287	0.002434783
000:00:14	0.008	77	2.875	1.23	1.233432159	62.42743019	0.002782609
000:00:15	0.009	81	2.875	1.23	1.233862526	65.64750795	0.003130435
000:00:16	0.01	85	2.875	1.23	1.234293194	68.86532344	0.003478261
000:00:17	0.01	89	2.875	1.23	1.234293194	72.10604454	0.003478261
000:00:18	0.011	92	2.875	1.23	1.234724162	74.51056911	0.003826087
000:00:19	0.012	95	2.875	1.23	1.235155431	76.91339696	0.004173913
000:00:20	0.013	97	2.875	1.23	1.235587002	78.50519618	0.004521739
000:00:21	0.014	99	2.875	1.23	1.236018875	80.09586426	0.004869565
000:00:22	0.015	101	2.875	1.23	1.236451049	81.6854012	0.005217391
000:00:23	0.016	102	2.875	1.23	1.236883526	82.46532344	0.005565217
000:00:24	0.016	103	2.875	1.23	1.236883526	83.273807	0.005565217
000:00:25	0.017	105	2.875	1.23	1.237316305	84.86108165	0.005913043
000:00:26	0.018	106	2.875	1.23	1.237749387	85.63930718	0.00626087
000:00:27	0.019	106	2.875	1.23	1.238182773	85.60933192	0.006608696
000:00:28	0.02	108	2.875	1.23	1.238616462	87.19406151	0.006956522
000:00:29	0.021	109	2.875	1.23	1.239050456	87.97059031	0.007304348
000:00:30	0.021	110	2.875	1.23	1.239050456	88.77765995	0.007304348
000:00:31	0.022	111	2.875	1.23	1.239484753	89.5533404	0.007652174
000:00:32	0.023	111	2.875	1.23	1.239919355	89.52195122	0.008
000:00:33	0.024	112	2.875	1.23	1.240354262	90.29678332	0.008347826
000:00:34	0.025	113	2.875	1.23	1.240789474	91.07104984	0.008695652
000:00:35	0.026	114	2.875	1.23	1.241224991	91.8447508	0.009043478
000:00:36	0.027	115	2.875	1.23	1.241660815	92.61788618	0.009391304
000:00:37	0.028	115	2.875	1.23	1.242096944	92.58536585	0.00973913
000:00:38	0.028	116	2.875	1.23	1.242096944	93.39045599	0.00973913

000:00:39	0.029	117	2.875	1.23	1.24253338	94.16246023	0.010086957
000:00:40	0.03	117	2.875	1.23	1.242970123	94.12937434	0.010434783
000:00:41	0.031	118	2.875	1.23	1.243407173	94.90053022	0.010782609
000:00:42	0.032	119	2.875	1.23	1.24384453	95.67112054	0.011130435
000:00:43	0.033	120	2.875	1.23	1.244282196	96.44114528	0.011478261
000:00:44	0.034	120	2.875	1.23	1.244720169	96.40721103	0.011826087
000:00:45	0.035	121	2.875	1.23	1.245158451	97.17638742	0.012173913
000:00:46	0.035	121	2.875	1.23	1.245158451	97.17638742	0.012173913
000:00:47	0.036	122	2.875	1.23	1.245597041	97.94499823	0.012521739
000:00:48	0.037	122	2.875	1.23	1.246035941	97.91049841	0.012869565
000:00:49	0.038	123	2.875	1.23	1.24647515	98.67826087	0.013217391
000:00:50	0.039	124	2.875	1.23	1.246914669	99.44545776	0.013565217
000:00:51	0.04	124	2.875	1.23	1.247354497	99.41039236	0.013913043
000:00:52	0.041	125	2.875	1.23	1.247794637	100.1767409	0.01426087
000:00:53	0.042	125	2.875	1.23	1.248235086	100.1413927	0.014608696
000:00:54	0.043	126	2.875	1.23	1.248675847	100.9068929	0.014956522
000:00:55	0.043	126	2.875	1.23	1.248675847	100.9068929	0.014956522
000:00:56	0.044	127	2.875	1.23	1.24911692	101.6718275	0.015304348
000:00:57	0.045	128	2.875	1.23	1.249558304	102.4361965	0.015652174
000:00:58	0.046	128	2.875	1.23	1.25	102.4	0.016
000:00:59	0.047	129	2.875	1.23	1.250442008	103.1635207	0.016347826
000:01:00	0.048	129	2.875	1.23	1.25088433	103.1270414	0.016695652
000:01:01	0.049	130	2.875	1.23	1.251326964	103.8897137	0.017043478
000:01:02	0.05	130	2.875	1.23	1.251769912	103.8529516	0.017391304
000:01:03	0.051	131	2.875	1.23	1.252213173	104.6147755	0.01773913
000:01:04	0.051	131	2.875	1.23	1.252213173	104.6147755	0.01773913

000:01:05	0.052	131	2.875	1.23	1.252656748	104.5777306	0.018086957
000:01:06	0.053	132	2.875	1.23	1.253100638	105.3387063	0.018434783
000:01:07	0.054	132	2.875	1.23	1.253544842	105.3013786	0.018782609
000:01:08	0.055	133	2.875	1.23	1.253989362	106.0615058	0.019130435
000:01:09	0.056	133	2.875	1.23	1.254434197	106.0238954	0.019478261
000:01:10	0.057	134	2.875	1.23	1.254879347	106.7831743	0.019826087
000:01:11	0.058	134	2.875	1.23	1.255324814	106.745281	0.020173913
000:01:12	0.059	135	2.875	1.23	1.255770597	107.5037116	0.020521739
000:01:13	0.06	135	2.875	1.23	1.256216696	107.4655355	0.020869565
000:01:14	0.06	136	2.875	1.23	1.256216696	108.2615765	0.020869565
000:01:15	0.061	136	2.875	1.23	1.256663113	108.2231177	0.021217391
000:01:16	0.062	136	2.875	1.23	1.257109847	108.1846589	0.021565217
000:01:17	0.063	137	2.875	1.23	1.257556899	108.9413927	0.021913043
000:01:18	0.064	137	2.875	1.23	1.258004269	108.9026511	0.02226087
000:01:19	0.065	138	2.875	1.23	1.258451957	109.6585366	0.022608696
000:01:20	0.066	138	2.875	1.23	1.258899964	109.6195122	0.022956522
000:01:21	0.067	138	2.875	1.23	1.259348291	109.5804878	0.023304348
000:01:22	0.068	139	2.875	1.23	1.259796936	110.3352421	0.023652174
000:01:23	0.069	139	2.875	1.23	1.260245902	110.295935	0.024
000:01:24	0.069	140	2.875	1.23	1.260245902	111.0894309	0.024
000:01:25	0.07	140	2.875	1.23	1.260695187	111.0498409	0.024347826
000:01:26	0.071	140	2.875	1.23	1.261144793	111.010251	0.024695652
000:01:27	0.072	140	2.875	1.23	1.26159472	110.970661	0.025043478
000:01:28	0.073	141	2.875	1.23	1.262044968	111.7234358	0.025391304
000:01:29	0.074	141	2.875	1.23	1.262495537	111.6835631	0.02573913
000:01:30	0.075	142	2.875	1.23	1.262946429	112.4354896	0.026086957

000:01:31	0.076	142	2.875	1.23	1.263397642	112.395334	0.026434783
000:01:32	0.077	143	2.875	1.23	1.263849178	113.1464122	0.026782609
000:01:33	0.078	143	2.875	1.23	1.264301037	113.1059738	0.027130435
000:01:34	0.078	143	2.875	1.23	1.264301037	113.1059738	0.027130435
000:01:35	0.079	143	2.875	1.23	1.264753219	113.0655355	0.027478261
000:01:36	0.08	144	2.875	1.23	1.265205725	113.8154825	0.027826087
000:01:37	0.081	145	2.875	1.23	1.265658554	114.5648639	0.028173913
000:01:38	0.082	145	2.875	1.23	1.266111708	114.52386	0.028521739
000:01:39	0.083	145	2.875	1.23	1.266565186	114.4828561	0.028869565
000:01:41	0.085	146	2.875	1.23	1.267473118	115.1898197	0.029565217
000:01:43	0.086	146	2.875	1.23	1.267927573	115.1485331	0.029913043
000:01:45	0.088	147	2.875	1.23	1.26883746	115.8540827	0.030608696
000:01:47	0.09	148	2.875	1.23	1.269748654	116.5585012	0.031304348
000:01:49	0.092	148	2.875	1.23	1.270661157	116.4747967	0.032
000:01:51	0.093	149	2.875	1.23	1.271117901	117.2196536	0.032347826
000:01:53	0.095	149	2.875	1.23	1.272032374	117.1353835	0.033043478
000:01:55	0.097	150	2.875	1.23	1.272948164	117.8366914	0.03373913
000:01:57	0.099	150	2.875	1.23	1.273865274	117.7518558	0.034434783
000:01:59	0.101	151	2.875	1.23	1.274783706	118.4514669	0.035130435
000:02:01	0.102	152	2.875	1.23	1.275243419	119.1929304	0.035478261
000:02:03	0.104	152	2.875	1.23	1.27616384	119.1069636	0.036173913
000:02:05	0.106	153	2.875	1.23	1.27708559	119.8040297	0.036869565
000:02:07	0.107	153	2.875	1.23	1.277546965	119.7607635	0.037217391
000:02:09	0.109	154	2.875	1.23	1.278470716	120.4564157	0.037913043
000:02:11	0.111	154	2.875	1.23	1.279395803	120.3693178	0.038608696
000:02:13	0.113	154	2.875	1.23	1.28032223	120.2822199	0.039304348

000:02:15	0.114	155	2.875	1.23	1.280785947	121.0194415	0.039652174
000:02:17	0.116	156	2.875	1.23	1.281714389	121.711983	0.040347826
000:02:19	0.118	156	2.875	1.23	1.282644178	121.623754	0.041043478
000:02:21	0.12	157	2.875	1.23	1.283575318	122.3145988	0.04173913
000:02:23	0.121	157	2.875	1.23	1.284041394	122.2702015	0.042086957
000:02:25	0.123	158	2.875	1.23	1.284974564	122.9596324	0.042782609
000:02:27	0.125	158	2.875	1.23	1.285909091	122.8702722	0.043478261
000:02:29	0.127	158	2.875	1.23	1.286844978	122.780912	0.044173913
000:02:31	0.128	159	2.875	1.23	1.287313433	123.5130435	0.044521739
000:02:33	0.13	159	2.875	1.23	1.288251366	123.4231177	0.045217391
000:02:35	0.132	160	2.875	1.23	1.289190667	124.1088724	0.045913043
000:02:37	0.134	160	2.875	1.23	1.290131339	124.0183811	0.046608696
000:02:39	0.135	160	2.875	1.23	1.29060219	123.9731354	0.046956522
000:02:41	0.137	161	2.875	1.23	1.291544923	124.6569106	0.047652174
000:02:43	0.139	161	2.875	1.23	1.292489035	124.5658537	0.048347826
000:02:45	0.141	161	2.875	1.23	1.293434528	124.4747967	0.049043478
000:02:47	0.142	162	2.875	1.23	1.293907794	125.2021209	0.049391304
000:02:49	0.144	161	2.875	1.23	1.294855364	124.3382114	0.050086957
000:02:51	0.146	162	2.875	1.23	1.295804324	125.0188759	0.050782609
000:02:53	0.147	162	2.875	1.23	1.296279326	124.9730647	0.051130435
000:02:55	0.149	162	2.875	1.23	1.297230374	124.8814422	0.051826087
000:02:57	0.151	162	2.875	1.23	1.298182819	124.7898197	0.052521739
000:02:59	0.152	162	2.875	1.23	1.298659567	124.7440085	0.052869565
000:03:01	0.154	163	2.875	1.23	1.299614112	125.4218452	0.053565217
000:03:03	0.155	163	2.875	1.23	1.300091912	125.3757511	0.053913043
000:03:05	0.157	163	2.875	1.23	1.301048565	125.2835631	0.054608696

000:03:07	0.159	163	2.875	1.23	1.302006627	125.191375	0.055304348
000:03:09	0.161	162	2.875	1.23	1.302966102	124.3317073	0.056
000:03:11	0.162	162	2.875	1.23	1.303446369	124.2858961	0.056347826
000:03:13	0.164	162	2.875	1.23	1.304407968	124.1942736	0.057043478
000:03:15	0.166	162	2.875	1.23	1.305370986	124.1026511	0.05773913
000:03:17	0.167	161	2.875	1.23	1.305853028	123.2910569	0.058086957
000:03:19	0.169	161	2.875	1.23	1.306818182	123.2	0.058782609
000:03:49	0.194	153	2.875	1.23	1.319004103	115.9966066	0.067478261
000:04:19	0.22	140	2.875	1.23	1.331920904	105.1113468	0.076521739
000:04:49	0.247	119	2.875	1.23	1.345605023	88.43605514	0.085913043
000:05:19	0.273	88	2.875	1.23	1.35905073	64.75107812	0.094956522
000:05:49	0.299	77	2.875	1.23	1.372767857	56.09105691	0.104
000:06:19	0.325	75	2.875	1.23	1.386764706	54.08271474	0.113043478
000:06:49	0.351	72	2.875	1.23	1.401049921	51.39003181	0.122086957
000:07:19	0.377	71	2.875	1.23	1.415632506	50.15425946	0.131130435
000:07:49	0.403	69	2.875	1.23	1.430521845	48.23414634	0.140173913

- Sample with 50% sand, 50% clay

Table B-13: Results of test at water content above plastic limit

TIME	VERTICAL DEFLECTION (in)	LOAD (lb)	L_0 (in)	A_0 (in)2	A_C (in)2	STRESS (psi)	STRAIN (in/in)
			2.75	1.23			
000:00:00	0	0	2.75	1.23	1.23	0	0
000:00:01	0	-1	2.75	1.23	1.23	-0.81300813	0
000:00:02	0.001	-1	2.75	1.23	1.230447435	-0.812712491	0.000363636
000:00:03	0.002	-1	2.75	1.23	1.230895197	-0.812416851	0.000727273
000:00:04	0.003	-1	2.75	1.23	1.231343284	-0.812121212	0.001090909
000:00:05	0.004	-1	2.75	1.23	1.231791697	-0.811825573	0.001454545
000:00:06	0.004	0	2.75	1.23	1.231791697	0	0.001454545
000:00:07	0.005	0	2.75	1.23	1.232240437	0	0.001818182
000:00:08	0.006	-1	2.75	1.23	1.232689504	-0.811234294	0.002181818
000:00:09	0.007	0	2.75	1.23	1.233138899	0	0.002545455
000:00:10	0.008	1	2.75	1.23	1.233588621	0.810643016	0.002909091
000:00:11	0.009	2	2.75	1.23	1.234038672	1.620694752	0.003272727
000:00:12	0.009	3	2.75	1.23	1.234038672	2.431042129	0.003272727
000:00:13	0.01	4	2.75	1.23	1.234489051	3.240206948	0.003636364

000:00:14	0.011	5	2.75	1.23	1.234939759	4.048780488	0.004
000:00:15	0.012	6	2.75	1.23	1.235390796	4.856762749	0.004363636
000:00:16	0.013	7	2.75	1.23	1.235842163	5.664153732	0.004727273
000:00:17	0.014	8	2.75	1.23	1.23629386	6.470953437	0.005090909
000:00:18	0.014	9	2.75	1.23	1.23629386	7.279822616	0.005090909
000:00:19	0.015	10	2.75	1.23	1.236745887	8.085735403	0.005454545
000:00:20	0.016	11	2.75	1.23	1.237198244	8.891056911	0.005818182
000:00:21	0.017	12	2.75	1.23	1.237650933	9.69578714	0.006181818
000:00:22	0.018	13	2.75	1.23	1.238103953	10.49992609	0.006545455
000:00:23	0.018	13	2.75	1.23	1.238103953	10.49992609	0.006545455
000:00:24	0.019	14	2.75	1.23	1.238557305	11.30347376	0.006909091
000:00:25	0.02	15	2.75	1.23	1.239010989	12.10643016	0.007272727
000:00:26	0.021	15	2.75	1.23	1.239465005	12.10199557	0.007636364
000:00:27	0.022	16	2.75	1.23	1.239919355	12.90406504	0.008
000:00:28	0.023	17	2.75	1.23	1.240374037	13.70554324	0.008363636
000:00:29	0.023	17	2.75	1.23	1.240374037	13.70554324	0.008363636
000:00:30	0.024	17	2.75	1.23	1.240829054	13.70051737	0.008727273
000:00:31	0.025	18	2.75	1.23	1.241284404	14.50110865	0.009090909
000:00:32	0.026	18	2.75	1.23	1.241740088	14.49578714	0.009454545
000:00:33	0.027	19	2.75	1.23	1.242196107	15.2954915	0.009818182
000:00:34	0.028	19	2.75	1.23	1.242652461	15.28987435	0.010181818
000:00:35	0.028	20	2.75	1.23	1.242652461	16.09460458	0.010181818
000:00:36	0.029	20	2.75	1.23	1.243109151	16.0886918	0.010545455
000:00:37	0.03	21	2.75	1.23	1.243566176	16.88691796	0.010909091
000:00:38	0.031	22	2.75	1.23	1.244023538	17.68455285	0.011272727
000:00:39	0.032	22	2.75	1.23	1.244481236	17.67804878	0.011636364

000:00:40	0.033	22	2.75	1.23	1.244939271	17.67154472	0.012
000:00:41	0.033	23	2.75	1.23	1.244939271	18.47479675	0.012
000:00:42	0.034	23	2.75	1.23	1.245397644	18.46799704	0.012363636
000:00:43	0.035	23	2.75	1.23	1.245856354	18.46119734	0.012727273
000:00:44	0.036	24	2.75	1.23	1.246315402	19.25676275	0.013090909
000:00:45	0.037	25	2.75	1.23	1.246774788	20.05173688	0.013454545
000:00:46	0.038	25	2.75	1.23	1.247234513	20.0443459	0.013818182
000:00:47	0.039	25	2.75	1.23	1.247694578	20.03695492	0.014181818
000:00:48	0.039	25	2.75	1.23	1.247694578	20.03695492	0.014181818
000:00:49	0.04	26	2.75	1.23	1.248154982	20.83074649	0.014545455
000:00:50	0.041	27	2.75	1.23	1.248615725	21.62394678	0.014909091
000:00:51	0.042	27	2.75	1.23	1.249076809	21.61596452	0.015272727
000:00:52	0.043	27	2.75	1.23	1.249538234	21.60798226	0.015636364
000:00:53	0.044	27	2.75	1.23	1.25	21.6	0.016
000:00:54	0.045	28	2.75	1.23	1.250462107	22.3917221	0.016363636
000:00:55	0.045	28	2.75	1.23	1.250462107	22.3917221	0.016363636
000:00:56	0.046	29	2.75	1.23	1.250924556	23.18285292	0.016727273
000:00:57	0.047	29	2.75	1.23	1.251387347	23.17427938	0.017090909
000:00:58	0.048	29	2.75	1.23	1.251850481	23.16570584	0.017454545
000:00:59	0.049	30	2.75	1.23	1.252313958	23.9556541	0.017818182
000:01:00	0.05	30	2.75	1.23	1.252777778	23.94678492	0.018181818
000:01:01	0.051	31	2.75	1.23	1.253241941	24.73584627	0.018545455
000:01:02	0.052	31	2.75	1.23	1.253706449	24.72668145	0.018909091
000:01:03	0.052	31	2.75	1.23	1.253706449	24.72668145	0.018909091
000:01:04	0.053	31	2.75	1.23	1.254171301	24.71751663	0.019272727
000:01:05	0.054	32	2.75	1.23	1.254636499	25.50539542	0.019636364

000:01:06	0.055	32	2.75	1.23	1.255102041	25.49593496	0.02
000:01:07	0.056	33	2.75	1.23	1.255567929	26.28292683	0.020363636
000:01:08	0.057	33	2.75	1.23	1.256034163	26.27317073	0.020727273
000:01:09	0.057	33	2.75	1.23	1.256034163	26.27317073	0.020727273
000:01:10	0.058	33	2.75	1.23	1.256500743	26.26341463	0.021090909
000:01:11	0.059	33	2.75	1.23	1.25696767	26.25365854	0.021454545
000:01:12	0.06	34	2.75	1.23	1.257434944	27.03917221	0.021818182
000:01:13	0.061	34	2.75	1.23	1.257902566	27.02912047	0.022181818
000:01:14	0.062	34	2.75	1.23	1.258370536	27.01906874	0.022545455
000:01:15	0.063	34	2.75	1.23	1.258838854	27.009017	0.022909091
000:01:16	0.063	35	2.75	1.23	1.258838854	27.80339985	0.022909091
000:01:17	0.064	35	2.75	1.23	1.25930752	27.79305248	0.023272727
000:01:18	0.065	35	2.75	1.23	1.259776536	27.7827051	0.023636364
000:01:19	0.066	36	2.75	1.23	1.260245902	28.56585366	0.024
000:01:20	0.067	36	2.75	1.23	1.260715617	28.55521064	0.024363636
000:01:21	0.068	36	2.75	1.23	1.261185682	28.54456763	0.024727273
000:01:22	0.069	36	2.75	1.23	1.261656098	28.53392461	0.025090909
000:01:23	0.07	37	2.75	1.23	1.262126866	29.31559497	0.025454545
000:01:24	0.07	37	2.75	1.23	1.262126866	29.31559497	0.025454545
000:01:25	0.071	37	2.75	1.23	1.262597984	29.30465632	0.025818182
000:01:26	0.072	37	2.75	1.23	1.263069455	29.29371766	0.026181818
000:01:27	0.073	38	2.75	1.23	1.263541278	30.07420547	0.026545455
000:01:28	0.074	38	2.75	1.23	1.264013453	30.06297118	0.026909091
000:01:29	0.075	38	2.75	1.23	1.264485981	30.05173688	0.027272727
000:01:30	0.076	38	2.75	1.23	1.264958863	30.04050259	0.027636364
000:01:31	0.077	38	2.75	1.23	1.265432099	30.02926829	0.028

000:01:32	0.077	39	2.75	1.23	1.265432099	30.8195122	0.028
000:01:33	0.078	39	2.75	1.23	1.265905689	30.80798226	0.028363636
000:01:34	0.079	39	2.75	1.23	1.266379633	30.79645233	0.028727273
000:01:35	0.08	39	2.75	1.23	1.266853933	30.78492239	0.029090909
000:01:36	0.081	39	2.75	1.23	1.267328587	30.77339246	0.029454545
000:01:37	0.082	40	2.75	1.23	1.267803598	31.55062823	0.029818182
000:01:38	0.083	40	2.75	1.23	1.268278965	31.53880266	0.030181818
000:01:39	0.083	40	2.75	1.23	1.268278965	31.53880266	0.030181818
000:01:41	0.085	41	2.75	1.23	1.269230769	32.3030303	0.030909091
000:01:43	0.087	41	2.75	1.23	1.270184003	32.27878788	0.031636364
000:01:45	0.089	41	2.75	1.23	1.27113867	32.25454545	0.032363636
000:01:47	0.091	42	2.75	1.23	1.272094772	33.01640798	0.033090909
000:01:49	0.092	41	2.75	1.23	1.272573363	32.21818182	0.033454545
000:01:51	0.094	42	2.75	1.23	1.273531627	32.97915743	0.034181818
000:01:53	0.096	42	2.75	1.23	1.274491334	32.95432373	0.034909091
000:01:55	0.098	42	2.75	1.23	1.275452489	32.92949002	0.035636364
000:01:57	0.099	43	2.75	1.23	1.27593361	33.70081301	0.036
000:01:59	0.101	43	2.75	1.23	1.276896942	33.67538803	0.036727273
000:02:01	0.103	43	2.75	1.23	1.27786173	33.64996305	0.037454545
000:02:03	0.105	44	2.75	1.23	1.278827977	34.40650407	0.038181818
000:02:05	0.107	44	2.75	1.23	1.279795687	34.3804878	0.038909091
000:02:07	0.108	44	2.75	1.23	1.280280091	34.36747967	0.039272727
000:02:09	0.11	44	2.75	1.23	1.28125	34.34146341	0.04
000:02:11	0.112	44	2.75	1.23	1.28222138	34.31544715	0.040727273
000:02:13	0.114	44	2.75	1.23	1.283194234	34.28943089	0.041454545
000:02:15	0.115	44	2.75	1.23	1.283681214	34.27642276	0.041818182

000:02:17	0.117	44	2.75	1.23	1.284656286	34.2504065	0.042545455
000:02:19	0.119	45	2.75	1.23	1.285632839	35.00221729	0.043272727
000:02:21	0.121	45	2.75	1.23	1.286610879	34.97560976	0.044
000:02:23	0.122	45	2.75	1.23	1.287100457	34.96230599	0.044363636
000:02:25	0.124	45	2.75	1.23	1.288080731	34.93569845	0.045090909
000:02:27	0.126	45	2.75	1.23	1.2890625	34.90909091	0.045818182
000:02:29	0.128	45	2.75	1.23	1.290045767	34.88248337	0.046545455
000:02:31	0.129	45	2.75	1.23	1.290537963	34.8691796	0.046909091
000:02:33	0.131	46	2.75	1.23	1.291523482	35.61685144	0.047636364
000:02:35	0.133	46	2.75	1.23	1.292510508	35.58965262	0.048363636
000:02:37	0.135	46	2.75	1.23	1.293499044	35.56245381	0.049090909
000:02:39	0.137	45	2.75	1.23	1.294489093	34.76274945	0.049818182
000:02:41	0.138	46	2.75	1.23	1.294984686	35.52165558	0.050181818
000:02:43	0.14	46	2.75	1.23	1.295977011	35.49445676	0.050909091
000:02:45	0.142	46	2.75	1.23	1.296970859	35.46725795	0.051636364
000:02:47	0.144	46	2.75	1.23	1.297966232	35.44005913	0.052363636
000:02:49	0.145	46	2.75	1.23	1.298464491	35.42645972	0.052727273
000:02:51	0.147	46	2.75	1.23	1.299462159	35.3992609	0.053454545
000:02:53	0.149	46	2.75	1.23	1.300461361	35.37206208	0.054181818
000:02:55	0.151	47	2.75	1.23	1.301462101	36.11322986	0.054909091
000:02:57	0.152	46	2.75	1.23	1.301963048	35.33126386	0.055272727
000:02:59	0.154	47	2.75	1.23	1.302966102	36.07154472	0.056
000:03:01	0.156	47	2.75	1.23	1.303970702	36.04375462	0.056727273
000:03:03	0.158	47	2.75	1.23	1.304976852	36.01596452	0.057454545
000:03:05	0.159	47	2.75	1.23	1.305480509	36.00206948	0.057818182
000:03:07	0.161	47	2.75	1.23	1.306488992	35.97427938	0.058545455

000:03:09	0.163	47	2.75	1.23	1.307499034	35.94648928	0.059272727
000:03:11	0.164	47	2.75	1.23	1.30800464	35.93259424	0.059636364
000:03:13	0.166	47	2.75	1.23	1.309017028	35.90480414	0.060363636
000:03:15	0.168	47	2.75	1.23	1.310030984	35.87701404	0.061090909
000:03:17	0.17	47	2.75	1.23	1.311046512	35.84922395	0.061818182
000:03:19	0.171	47	2.75	1.23	1.311554866	35.8353289	0.062181818
000:03:49	0.198	47	2.75	1.23	1.325431034	35.4601626	0.072
000:04:19	0.223	48	2.75	1.23	1.338543728	35.85986696	0.081090909
000:04:49	0.248	48	2.75	1.23	1.351918465	35.50509978	0.090181818
000:05:19	0.273	48	2.75	1.23	1.365563181	35.15033259	0.099272727
000:05:49	0.3	49	2.75	1.23	1.380612245	35.49150037	0.109090909
000:06:19	0.326	49	2.75	1.23	1.395420792	35.11485588	0.118545455
000:06:49	0.352	48	2.75	1.23	1.410550459	34.02926829	0.128
000:07:19	0.378	49	2.75	1.23	1.426011804	34.36156689	0.137454545
000:07:49	0.404	49	2.75	1.23	1.441815857	33.98492239	0.146909091
000:08:19	0.429	49	2.75	1.23	1.457345972	33.62276423	0.156
000:08:49	0.455	48	2.75	1.23	1.473856209	32.56762749	0.165454545
000:09:19	0.481	48	2.75	1.23	1.490744822	32.19866962	0.174909091

Table B-14: Results of test at water content at plastic limit

TIME	VERTICAL DEFLECTION (in)	LOAD (lb)	L_0 (in)	A_0 $(in)^2$	A_C $(in)^2$	STRESS (psi)	STRAIN (in/in)
000:00:00	0.001	2	2.875	1.35	1.350469729	1.480966184	0.000347826
000:00:01	0.001	3	2.875	1.35	1.350469729	2.221449275	0.000347826
000:00:02	0.002	4	2.875	1.35	1.350939784	2.960901771	0.000695652
000:00:03	0.003	4	2.875	1.35	1.351410167	2.959871176	0.001043478
000:00:04	0.004	5	2.875	1.35	1.351880878	3.698550725	0.001391304
000:00:05	0.005	6	2.875	1.35	1.352351916	4.436714976	0.00173913
000:00:06	0.006	6	2.875	1.35	1.352823283	4.435169082	0.002086957
000:00:07	0.006	6	2.875	1.35	1.352823283	4.435169082	0.002086957
000:00:08	0.007	7	2.875	1.35	1.353294979	5.172560386	0.002434783
000:00:09	0.008	7	2.875	1.35	1.353767004	5.170756844	0.002782609
000:00:10	0.009	8	2.875	1.35	1.354239358	5.907375201	0.003130435
000:00:11	0.01	8	2.875	1.35	1.354712042	5.90531401	0.003478261
000:00:12	0.011	8	2.875	1.35	1.355185056	5.903252818	0.003826087
000:00:13	0.012	9	2.875	1.35	1.3556584	6.63884058	0.004173913
000:00:14	0.013	9	2.875	1.35	1.356132075	6.636521739	0.004521739
000:00:15	0.013	9	2.875	1.35	1.356132075	6.636521739	0.004521739
000:00:16	0.014	10	2.875	1.35	1.356606082	7.371336554	0.004869565
000:00:17	0.015	10	2.875	1.35	1.35708042	7.368760064	0.005217391
000:00:18	0.016	10	2.875	1.35	1.357555089	7.366183575	0.005565217

000:00:19	0.017	10	2.875	1.35	1.358030091	7.363607085	0.005913043
000:00:20	0.018	11	2.875	1.35	1.358505425	8.097133655	0.00626087
000:00:21	0.019	11	2.875	1.35	1.358981092	8.094299517	0.006608696
000:00:22	0.02	11	2.875	1.35	1.359457093	8.091465378	0.006956522
000:00:23	0.021	11	2.875	1.35	1.359933427	8.08863124	0.007304348
000:00:24	0.021	12	2.875	1.35	1.359933427	8.823961353	0.007304348
000:00:25	0.022	12	2.875	1.35	1.360410095	8.820869565	0.007652174
000:00:26	0.023	12	2.875	1.35	1.360887097	8.817777778	0.008
000:00:27	0.024	12	2.875	1.35	1.361364434	8.81468599	0.008347826
000:00:28	0.025	13	2.875	1.35	1.361842105	9.54589372	0.008695652
000:00:29	0.026	13	2.875	1.35	1.362320112	9.542544283	0.009043478
000:00:30	0.027	13	2.875	1.35	1.362798455	9.539194847	0.009391304
000:00:31	0.028	13	2.875	1.35	1.363277134	9.535845411	0.00973913
000:00:32	0.029	13	2.875	1.35	1.363756149	9.532495974	0.010086957
000:00:33	0.03	14	2.875	1.35	1.364235501	10.26215781	0.010434783
000:00:34	0.03	14	2.875	1.35	1.364235501	10.26215781	0.010434783
000:00:35	0.031	14	2.875	1.35	1.36471519	10.25855072	0.010782609
000:00:36	0.032	14	2.875	1.35	1.365195216	10.25494364	0.011130435
000:00:37	0.033	14	2.875	1.35	1.365675581	10.25133655	0.011478261
000:00:38	0.034	15	2.875	1.35	1.366156283	10.97971014	0.011826087
000:00:39	0.035	15	2.875	1.35	1.366637324	10.97584541	0.012173913
000:00:40	0.036	15	2.875	1.35	1.367118704	10.97198068	0.012521739
000:00:41	0.037	15	2.875	1.35	1.367600423	10.96811594	0.012869565
000:00:42	0.038	15	2.875	1.35	1.368082481	10.96425121	0.013217391
000:00:43	0.038	15	2.875	1.35	1.368082481	10.96425121	0.013217391
000:00:44	0.039	16	2.875	1.35	1.36856488	11.6910789	0.013565217

000:00:45	0.04	16	2.875	1.35	1.369047619	11.68695652	0.013913043
000:00:46	0.041	16	2.875	1.35	1.369530699	11.68283414	0.01426087
000:00:47	0.042	16	2.875	1.35	1.370014119	11.67871176	0.014608696
000:00:48	0.043	17	2.875	1.35	1.370497881	12.40425121	0.014956522
000:00:49	0.044	17	2.875	1.35	1.370981985	12.39987118	0.015304348
000:00:50	0.045	17	2.875	1.35	1.371466431	12.39549114	0.015652174
000:00:51	0.046	17	2.875	1.35	1.37195122	12.39111111	0.016
000:00:52	0.046	17	2.875	1.35	1.37195122	12.39111111	0.016
000:00:53	0.047	18	2.875	1.35	1.372436351	13.11536232	0.016347826
000:00:54	0.048	18	2.875	1.35	1.372921825	13.11072464	0.016695652
000:00:55	0.049	18	2.875	1.35	1.373407643	13.10608696	0.017043478
000:00:56	0.05	18	2.875	1.35	1.373893805	13.10144928	0.017391304
000:00:57	0.051	18	2.875	1.35	1.374380312	13.09681159	0.01773913
000:00:58	0.052	19	2.875	1.35	1.374867163	13.81951691	0.018086957
000:00:59	0.053	19	2.875	1.35	1.375354359	13.81462158	0.018434783
000:01:00	0.054	19	2.875	1.35	1.3758419	13.80972625	0.018782609
000:01:01	0.055	19	2.875	1.35	1.376329787	13.80483092	0.019130435
000:01:02	0.055	19	2.875	1.35	1.376329787	13.80483092	0.019130435
000:01:03	0.056	20	2.875	1.35	1.376818021	14.52624799	0.019478261
000:01:04	0.057	20	2.875	1.35	1.3773066	14.52109501	0.019826087
000:01:05	0.058	20	2.875	1.35	1.377795527	14.51594203	0.020173913
000:01:06	0.059	20	2.875	1.35	1.378284801	14.51078905	0.020521739
000:01:07	0.06	20	2.875	1.35	1.378774423	14.50563607	0.020869565
000:01:08	0.061	20	2.875	1.35	1.379264392	14.50048309	0.021217391
000:01:09	0.062	21	2.875	1.35	1.37975471	15.22009662	0.021565217
000:01:10	0.062	21	2.875	1.35	1.37975471	15.22009662	0.021565217

000:01:11	0.063	21	2.875	1.35	1.380245377	15.21468599	0.021913043
000:01:12	0.064	21	2.875	1.35	1.380736393	15.20927536	0.02226087
000:01:13	0.065	21	2.875	1.35	1.381227758	15.20386473	0.022608696
000:01:14	0.066	22	2.875	1.35	1.381719473	15.92219002	0.022956522
000:01:15	0.067	22	2.875	1.35	1.382211538	15.91652174	0.023304348
000:01:16	0.068	22	2.875	1.35	1.382703954	15.91085346	0.023652174
000:01:17	0.069	22	2.875	1.35	1.383196721	15.90518519	0.024
000:01:18	0.07	23	2.875	1.35	1.38368984	16.62222222	0.024347826
000:01:19	0.07	22	2.875	1.35	1.38368984	15.89951691	0.024347826
000:01:20	0.071	23	2.875	1.35	1.38418331	16.6162963	0.024695652
000:01:21	0.072	23	2.875	1.35	1.384677132	16.61037037	0.025043478
000:01:22	0.073	23	2.875	1.35	1.385171306	16.60444444	0.025391304
000:01:23	0.074	23	2.875	1.35	1.385665834	16.59851852	0.02573913
000:01:24	0.075	23	2.875	1.35	1.386160714	16.59259259	0.026086957
000:01:25	0.076	24	2.875	1.35	1.386655949	17.30782609	0.026434783
000:01:26	0.077	24	2.875	1.35	1.387151537	17.30164251	0.026782609
000:01:27	0.077	24	2.875	1.35	1.387151537	17.30164251	0.026782609
000:01:28	0.078	24	2.875	1.35	1.387647479	17.29545894	0.027130435
000:01:29	0.079	25	2.875	1.35	1.388143777	18.00966184	0.027478261
000:01:30	0.08	25	2.875	1.35	1.388640429	18.00322061	0.027826087
000:01:31	0.081	25	2.875	1.35	1.389137437	17.99677939	0.028173913
000:01:32	0.082	25	2.875	1.35	1.389634801	17.99033816	0.028521739
000:01:33	0.083	25	2.875	1.35	1.390132521	17.98389694	0.028869565
000:01:34	0.083	26	2.875	1.35	1.390132521	18.70325282	0.028869565
000:01:35	0.084	26	2.875	1.35	1.390630598	18.69655395	0.029217391
000:01:36	0.085	26	2.875	1.35	1.391129032	18.68985507	0.029565217

000:01:37	0.086	26	2.875	1.35	1.391627824	18.6831562	0.029913043
000:01:38	0.087	26	2.875	1.35	1.392126973	18.67645733	0.03026087
000:01:39	0.088	26	2.875	1.35	1.39262648	18.66975845	0.030608696
000:01:41	0.089	27	2.875	1.35	1.393126346	19.38086957	0.030956522
000:01:43	0.091	27	2.875	1.35	1.394127155	19.36695652	0.031652174
000:01:45	0.093	27	2.875	1.35	1.395129403	19.35304348	0.032347826
000:01:47	0.094	27	2.875	1.35	1.395631068	19.34608696	0.032695652
000:01:49	0.096	28	2.875	1.35	1.39663548	20.04818035	0.033391304
000:01:51	0.098	28	2.875	1.35	1.39764134	20.03375201	0.034086957
000:01:53	0.1	28	2.875	1.35	1.398648649	20.01932367	0.034782609
000:01:55	0.101	29	2.875	1.35	1.399152848	20.7268277	0.035130435
000:01:57	0.103	30	2.875	1.35	1.400162338	21.42608696	0.035826087
000:01:59	0.105	30	2.875	1.35	1.401173285	21.41062802	0.036521739
000:02:01	0.106	30	2.875	1.35	1.401679307	21.40289855	0.036869565
000:02:03	0.108	31	2.875	1.35	1.402692447	22.10035427	0.037565217
000:02:05	0.11	31	2.875	1.35	1.403707052	22.08438003	0.03826087
000:02:07	0.111	31	2.875	1.35	1.404214906	22.07639291	0.038608696
000:02:09	0.113	32	2.875	1.35	1.405231716	22.77204509	0.039304348
000:02:11	0.115	32	2.875	1.35	1.40625	22.75555556	0.04
000:02:13	0.116	32	2.875	1.35	1.406759696	22.74731079	0.040347826
000:02:15	0.118	32	2.875	1.35	1.407780196	22.73082126	0.041043478
000:02:17	0.12	33	2.875	1.35	1.408802178	23.42415459	0.04173913
000:02:19	0.121	33	2.875	1.35	1.409313725	23.41565217	0.042086957
000:02:21	0.123	33	2.875	1.35	1.410337936	23.39864734	0.042782609
000:02:23	0.124	34	2.875	1.35	1.4108506	24.0989372	0.043130435
000:02:25	0.126	34	2.875	1.35	1.411877046	24.08141707	0.043826087

000:02:27	0.128	34	2.875	1.35	1.412904987	24.06389694	0.044521739
000:02:29	0.13	35	2.875	1.35	1.413934426	24.75362319	0.045217391
000:02:31	0.131	35	2.875	1.35	1.414449708	24.74460548	0.045565217
000:02:33	0.133	35	2.875	1.35	1.4154814	24.72657005	0.04626087
000:02:35	0.135	35	2.875	1.35	1.416514599	24.70853462	0.046956522
000:02:37	0.136	36	2.875	1.35	1.417031763	25.40521739	0.047304348
000:02:39	0.138	36	2.875	1.35	1.418067227	25.38666667	0.048
000:02:41	0.14	36	2.875	1.35	1.419104205	25.36811594	0.048695652
000:02:43	0.141	37	2.875	1.35	1.419623263	26.06325282	0.049043478
000:02:45	0.143	37	2.875	1.35	1.420662518	26.0441868	0.04973913
000:02:47	0.145	37	2.875	1.35	1.421703297	26.02512077	0.050434783
000:02:49	0.147	38	2.875	1.35	1.422745601	26.7089211	0.051130435
000:02:51	0.148	37	2.875	1.35	1.423267327	25.99652174	0.051478261
000:02:53	0.15	38	2.875	1.35	1.424311927	26.67954911	0.052173913
000:02:55	0.152	38	2.875	1.35	1.425358061	26.65996779	0.052869565
000:02:57	0.154	39	2.875	1.35	1.426405733	27.34144928	0.053565217
000:02:59	0.155	39	2.875	1.35	1.426930147	27.33140097	0.053913043
000:03:01	0.157	39	2.875	1.35	1.427980132	27.31130435	0.054608696
000:03:03	0.159	40	2.875	1.35	1.429031664	27.99098229	0.055304348
000:03:05	0.16	40	2.875	1.35	1.429558011	27.98067633	0.055652174
000:03:07	0.162	40	2.875	1.35	1.430611869	27.96006441	0.056347826
000:03:09	0.164	40	2.875	1.35	1.431667281	27.9394525	0.057043478
000:03:11	0.165	40	2.875	1.35	1.432195572	27.92914654	0.057391304
000:03:13	0.167	41	2.875	1.35	1.433253323	28.60624799	0.058086957
000:03:15	0.169	41	2.875	1.35	1.434312639	28.58512077	0.058782609
000:03:17	0.171	41	2.875	1.35	1.435373521	28.56399356	0.059478261

000:03:19	0.172	41	2.875	1.35	1.43590455	28.55342995	0.059826087
000:03:49	0.198	46	2.875	1.35	1.449850579	31.72740741	0.068869565
000:04:19	0.225	49	2.875	1.35	1.464622642	33.45571659	0.07826087
000:04:49	0.252	52	2.875	1.35	1.479698818	35.14228663	0.087652174
000:05:19	0.278	55	2.875	1.35	1.494512899	36.80128824	0.096695652
000:05:49	0.303	58	2.875	1.35	1.509039658	38.43504026	0.105391304
000:06:19	0.329	60	2.875	1.35	1.524450118	39.35845411	0.114434783
000:06:49	0.354	63	2.875	1.35	1.539567632	40.92057971	0.123130435
000:07:19	0.379	65	2.875	1.35	1.554987981	41.80096618	0.131826087
000:07:49	0.405	67	2.875	1.35	1.571356275	42.63832528	0.140869565
000:08:19	0.432	69	2.875	1.35	1.588722882	43.43111111	0.15026087
000:08:49	0.458	71	2.875	1.35	1.605812991	44.21436393	0.159304348
000:09:19	0.484	72	2.875	1.35	1.62327478	44.35478261	0.168347826
000:09:49	0.51	74	2.875	1.35	1.641120507	45.09114332	0.177391304
000:10:19	0.535	75	2.875	1.35	1.658653846	45.2173913	0.186086957
000:10:49	0.56	76	2.875	1.35	1.676565875	45.33075684	0.194782609
000:11:19	0.586	77	2.875	1.35	1.695609436	45.41140097	0.203826087
000:11:49	0.612	77	2.875	1.35	1.715090588	44.89558776	0.212869565
000:12:19	0.639	78	2.875	1.35	1.735800537	44.93603865	0.22226087
000:12:49	0.665	78	2.875	1.35	1.756221719	44.41352657	0.231304348
000:13:19	0.691	77	2.875	1.35	1.777129121	43.32830918	0.240347826

Table B-15: Results of test at water content below plastic limit

TIME	VERTICAL DEFLECTION (in)	LOAD (lb)	L_0 (in)	A_0 $(in)^2$	A_C $(in)^2$	STRESS (psi)	STRAIN (in/in)
000:00:00	0	-1	2.8125	1.23	1.23	-0.81300813	0
000:00:01	0	-1	2.8125	1.23	1.23	-0.81300813	0
000:00:02	0	3	2.8125	1.23	1.23	2.43902439	0
000:00:03	0.001	6	2.8125	1.23	1.230437489	4.876314363	0.000355556
000:00:04	0.002	6	2.8125	1.23	1.230875289	4.874579946	0.000711111
000:00:05	0.002	7	2.8125	1.23	1.230875289	5.687009937	0.000711111
000:00:06	0.003	8	2.8125	1.23	1.231313401	6.497127371	0.001066667
000:00:07	0.004	8	2.8125	1.23	1.231751825	6.494814815	0.001422222
000:00:08	0.005	8	2.8125	1.23	1.232190561	6.492502258	0.001777778
000:00:09	0.006	8	2.8125	1.23	1.23262961	6.490189702	0.002133333
000:00:10	0.007	9	2.8125	1.23	1.233068972	7.298861789	0.002488889
000:00:11	0.008	9	2.8125	1.23	1.233508647	7.296260163	0.002844444
000:00:12	0.009	10	2.8125	1.23	1.233948636	8.104065041	0.0032
000:00:13	0.009	10	2.8125	1.23	1.233948636	8.104065041	0.0032
000:00:14	0.01	10	2.8125	1.23	1.234388938	8.101174345	0.003555556
000:00:15	0.011	10	2.8125	1.23	1.234829556	8.09828365	0.003911111
000:00:16	0.012	11	2.8125	1.23	1.235270487	8.904932249	0.004266667
000:00:17	0.013	11	2.8125	1.23	1.235711734	8.901752484	0.004622222
000:00:18	0.014	11	2.8125	1.23	1.236153296	8.898572719	0.004977778
000:00:19	0.015	11	2.8125	1.23	1.236595174	8.895392954	0.005333333

000:00:20	0.016	12	2.8125	1.23	1.237037368	9.700596206	0.005688889
000:00:21	0.017	12	2.8125	1.23	1.237479878	9.697127371	0.006044444
000:00:22	0.017	11	2.8125	1.23	1.237479878	8.889033424	0.006044444
000:00:23	0.018	11	2.8125	1.23	1.237922705	8.885853659	0.0064
000:00:24	0.019	11	2.8125	1.23	1.238365849	8.882673893	0.006755556
000:00:25	0.02	10	2.8125	1.23	1.238809311	8.072267389	0.007111111
000:00:26	0.021	10	2.8125	1.23	1.23925309	8.069376694	0.007466667
000:00:27	0.022	10	2.8125	1.23	1.239697187	8.066485998	0.007822222
000:00:28	0.023	9	2.8125	1.23	1.240141602	7.257235772	0.008177778
000:00:29	0.024	9	2.8125	1.23	1.240586337	7.254634146	0.008533333
000:00:30	0.025	9	2.8125	1.23	1.24103139	7.25203252	0.008888889
000:00:31	0.026	8	2.8125	1.23	1.241476763	6.443938573	0.009244444
000:00:32	0.027	8	2.8125	1.23	1.241922456	6.441626016	0.0096
000:00:33	0.028	8	2.8125	1.23	1.242368468	6.43931346	0.009955556
000:00:34	0.029	8	2.8125	1.23	1.242814802	6.437000903	0.010311111
000:00:35	0.03	7	2.8125	1.23	1.243261456	5.630352304	0.010666667
000:00:36	0.031	7	2.8125	1.23	1.243708431	5.628328817	0.011022222
000:00:37	0.032	7	2.8125	1.23	1.244155727	5.62630533	0.011377778
000:00:38	0.033	7	2.8125	1.23	1.244603346	5.624281843	0.011733333
000:00:39	0.034	6	2.8125	1.23	1.245051287	4.819078591	0.012088889
000:00:40	0.035	5	2.8125	1.23	1.24549955	4.014453478	0.012444444
000:00:41	0.036	5	2.8125	1.23	1.245948136	4.01300813	0.0128
000:00:42	0.037	5	2.8125	1.23	1.246397046	4.011562782	0.013155556
000:00:43	0.038	5	2.8125	1.23	1.246846279	4.010117435	0.013511111
000:00:44	0.039	4	2.8125	1.23	1.247295836	3.206937669	0.013866667
000:00:45	0.04	4	2.8125	1.23	1.247745717	3.205781391	0.014222222

000:00:46	0.041	3	2.8125	1.23	1.248195923	2.403468835	0.014577778
000:00:47	0.041	3	2.8125	1.23	1.248195923	2.403468835	0.014577778
000:00:48	0.042	2	2.8125	1.23	1.248646454	1.601734417	0.014933333
000:00:49	0.043	2	2.8125	1.23	1.24909731	1.601156278	0.015288889
000:00:50	0.044	2	2.8125	1.23	1.249548492	1.600578139	0.015644444
000:00:51	0.045	2	2.8125	1.23	1.25	1.6	0.016
000:00:52	0.046	2	2.8125	1.23	1.250451834	1.599421861	0.016355556
000:00:53	0.047	1	2.8125	1.23	1.250903996	0.799421861	0.016711111
000:00:54	0.048	1	2.8125	1.23	1.251356484	0.799132791	0.017066667
000:00:55	0.049	0	2.8125	1.23	1.2518093	0	0.017422222
000:00:56	0.05	0	2.8125	1.23	1.252262443	0	0.017777778
000:00:57	0.051	0	2.8125	1.23	1.252715915	0	0.018133333
000:00:58	0.051	-1	2.8125	1.23	1.252715915	-0.798265583	0.018133333

- Sample with 700% sand, 300% clay

Table B-16: Results of test at water content above plastic limit

TIME	VERTICAL DEFLECTION (in)	LOAD (lb)	L_0 (in)	A_0 $(in)^2$	A_C $(in)^2$	STRESS (psi)	STRAIN (in/in)
000:00:00	0	0	2.125	1.76	1.76	0	0
000:00:01	0.001	0	2.125	1.76	1.760828625	0	0.000470588
000:00:02	0.002	0	2.125	1.76	1.761658031	0	0.000941176
000:00:03	0.003	0	2.125	1.76	1.762488219	0	0.001411765
000:00:04	0.004	0	2.125	1.76	1.763319189	0	0.001882353
000:00:05	0.005	0	2.125	1.76	1.764150943	0	0.002352941
000:00:06	0.006	0	2.125	1.76	1.764983483	0	0.002823529
000:00:07	0.007	1	2.125	1.76	1.765816808	0.56631016	0.003294118
000:00:08	0.008	0	2.125	1.76	1.766650921	0	0.003764706
000:00:09	0.008	0	2.125	1.76	1.766650921	0	0.003764706
000:00:10	0.009	0	2.125	1.76	1.767485822	0	0.004235294
000:00:11	0.01	0	2.125	1.76	1.768321513	0	0.004705882
000:00:12	0.011	0	2.125	1.76	1.769157994	0	0.005176471
000:00:13	0.012	0	2.125	1.76	1.769995267	0	0.005647059
000:00:14	0.013	1	2.125	1.76	1.770833333	0.564705882	0.006117647
000:00:15	0.014	0	2.125	1.76	1.771672193	0	0.006588235
000:00:16	0.015	0	2.125	1.76	1.772511848	0	0.007058824
000:00:17	0.015	1	2.125	1.76	1.772511848	0.564171123	0.007058824

000:00:18	0.016	0	2.125	1.76	1.7733523	0	0.007529412
000:00:19	0	0	2.125	1.76	1.76	0	0
000:00:20	0.001	0	2.125	1.76	1.760828625	0	0.000470588
000:00:21	0.002	0	2.125	1.76	1.761658031	0	0.000941176
000:00:22	0.003	0	2.125	1.76	1.762488219	0	0.001411765
000:00:23	0.004	0	2.125	1.76	1.763319189	0	0.001882353
000:00:24	0.005	0	2.125	1.76	1.764150943	0	0.002352941
000:00:25	0.005	0	2.125	1.76	1.764150943	0	0.002352941
000:00:26	0.006	0	2.125	1.76	1.764983483	0	0.002823529
000:00:27	0.007	0	2.125	1.76	1.765816808	0	0.003294118
000:00:28	0.008	1	2.125	1.76	1.766650921	0.566042781	0.003764706
000:00:29	0.009	0	2.125	1.76	1.767485822	0	0.004235294
000:00:30	0.01	1	2.125	1.76	1.768321513	0.565508021	0.004705882
000:00:31	0.011	0	2.125	1.76	1.769157994	0	0.005176471
000:00:32	0.011	0	2.125	1.76	1.769157994	0	0.005176471
000:00:33	0.012	1	2.125	1.76	1.769995267	0.564973262	0.005647059
000:00:34	0.013	1	2.125	1.76	1.770833333	0.564705882	0.006117647
000:00:35	0.014	0	2.125	1.76	1.771672193	0	0.006588235
000:00:36	0.015	0	2.125	1.76	1.772511848	0	0.007058824
000:00:37	0.016	0	2.125	1.76	1.7733523	0	0.007529412
000:00:38	0.017	0	2.125	1.76	1.774193548	0	0.008
000:00:39	0.017	1	2.125	1.76	1.774193548	0.563636364	0.008
000:00:40	0.018	1	2.125	1.76	1.775035596	0.563368984	0.008470588
000:00:41	0.019	0	2.125	1.76	1.775878443	0	0.008941176
000:00:42	0.02	0	2.125	1.76	1.77672209	0	0.009411765
000:00:43	0.021	0	2.125	1.76	1.77756654	0	0.009882353

000:00:44	0.022	0	2.125	1.76	1.778411793	0	0.010352941
000:00:45	0.023	1	2.125	1.76	1.77925785	0.562032086	0.010823529
000:00:46	0.024	1	2.125	1.76	1.780104712	0.561764706	0.011294118
000:00:47	0.024	0	2.125	1.76	1.780104712	0	0.011294118
000:00:48	0.025	0	2.125	1.76	1.780952381	0	0.011764706
000:00:49	0.026	1	2.125	1.76	1.781800858	0.561229947	0.012235294
000:00:50	0.027	1	2.125	1.76	1.782650143	0.560962567	0.012705882
000:00:51	0.028	1	2.125	1.76	1.783500238	0.560695187	0.013176471
000:00:52	0.029	0	2.125	1.76	1.784351145	0	0.013647059
000:00:53	0.03	0	2.125	1.76	1.785202864	0	0.014117647
000:00:54	0.03	1	2.125	1.76	1.785202864	0.560160428	0.014117647
000:00:55	0.031	0	2.125	1.76	1.786055396	0	0.014588235
000:00:56	0.032	0	2.125	1.76	1.786908743	0	0.015058824
000:00:57	0.033	0	2.125	1.76	1.787762906	0	0.015529412
000:00:58	0.034	1	2.125	1.76	1.788617886	0.559090909	0.016
000:00:59	0.035	1	2.125	1.76	1.789473684	0.558823529	0.016470588
000:01:00	0.036	1	2.125	1.76	1.790330302	0.55855615	0.016941176
000:01:01	0.037	0	2.125	1.76	1.791187739	0	0.017411765
000:01:02	0.037	1	2.125	1.76	1.791187739	0.55828877	0.017411765
000:01:03	0.038	1	2.125	1.76	1.792045999	0.55802139	0.017882353
000:01:04	0.039	1	2.125	1.76	1.792905081	0.557754011	0.018352941
000:01:05	0.04	1	2.125	1.76	1.793764988	0.557486631	0.018823529
000:01:06	0.041	1	2.125	1.76	1.79462572	0.557219251	0.019294118
000:01:07	0.042	1	2.125	1.76	1.795487278	0.556951872	0.019764706
000:01:08	0.043	1	2.125	1.76	1.796349664	0.556684492	0.020235294
000:01:09	0.043	1	2.125	1.76	1.796349664	0.556684492	0.020235294

000:01:10	0.044	1	2.125	1.76	1.797212878	0.556417112	0.020705882
000:01:11	0.045	0	2.125	1.76	1.798076923	0	0.021176471
000:01:12	0.046	1	2.125	1.76	1.798941799	0.555882353	0.021647059
000:01:13	0.047	1	2.125	1.76	1.799807507	0.555614973	0.022117647
000:01:14	0.048	1	2.125	1.76	1.800674049	0.555347594	0.022588235
000:01:15	0.049	1	2.125	1.76	1.801541426	0.555080214	0.023058824
000:01:16	0.049	1	2.125	1.76	1.801541426	0.555080214	0.023058824
000:01:17	0.05	1	2.125	1.76	1.802409639	0.554812834	0.023529412
000:01:18	0.051	1	2.125	1.76	1.803278689	0.554545455	0.024
000:01:19	0.052	1	2.125	1.76	1.804148577	0.554278075	0.024470588
000:01:20	0.053	0	2.125	1.76	1.805019305	0	0.024941176
000:01:21	0.054	0	2.125	1.76	1.805890874	0	0.025411765
000:01:22	0.054	1	2.125	1.76	1.805890874	0.553743316	0.025411765
000:01:23	0.055	1	2.125	1.76	1.806763285	0.553475936	0.025882353
000:01:24	0.056	1	2.125	1.76	1.807636539	0.553208556	0.026352941
000:01:25	0.057	1	2.125	1.76	1.808510638	0.552941176	0.026823529
000:01:26	0.058	1	2.125	1.76	1.809385583	0.552673797	0.027294118
000:01:27	0.059	1	2.125	1.76	1.810261375	0.552406417	0.027764706
000:01:28	0.059	1	2.125	1.76	1.810261375	0.552406417	0.027764706
000:01:29	0.06	1	2.125	1.76	1.811138015	0.552139037	0.028235294
000:01:30	0.061	1	2.125	1.76	1.812015504	0.551871658	0.028705882
000:01:31	0.062	1	2.125	1.76	1.812893844	0.551604278	0.029176471
000:01:32	0.063	1	2.125	1.76	1.813773036	0.551336898	0.029647059
000:01:33	0.064	1	2.125	1.76	1.814653081	0.551069519	0.030117647
000:01:34	0.064	1	2.125	1.76	1.814653081	0.551069519	0.030117647
000:01:35	0.065	1	2.125	1.76	1.815533981	0.550802139	0.030588235

000:01:36	0.066	1	2.125	1.76	1.816415736	0.550534759	0.031058824
000:01:37	0.067	1	2.125	1.76	1.817298348	0.55026738	0.031529412
000:01:38	0.068	1	2.125	1.76	1.818181818	0.55	0.032
000:01:39	0.069	1	2.125	1.76	1.819066148	0.54973262	0.032470588
000:01:41	0.07	1	2.125	1.76	1.819951338	0.549465241	0.032941176
000:01:43	0.072	1	2.125	1.76	1.821724306	0.548930481	0.033882353
000:01:45	0.074	1	2.125	1.76	1.823500731	0.548395722	0.034823529
000:01:47	0.076	1	2.125	1.76	1.825280625	0.547860963	0.035764706
000:01:49	0.077	1	2.125	1.76	1.826171875	0.547593583	0.036235294
000:01:51	0.079	1	2.125	1.76	1.827956989	0.547058824	0.037176471
000:01:53	0.081	1	2.125	1.76	1.829745597	0.546524064	0.038117647
000:01:55	0.082	1	2.125	1.76	1.830641214	0.546256684	0.038588235
000:01:57	0.084	1	2.125	1.76	1.832435081	0.545721925	0.039529412
000:01:59	0.086	1	2.125	1.76	1.834232467	0.545187166	0.040470588
000:02:01	0.087	1	2.125	1.76	1.835132483	0.544919786	0.040941176
000:02:03	0.089	1	2.125	1.76	1.836935167	0.544385027	0.041882353
000:02:05	0.091	1	2.125	1.76	1.838741396	0.543850267	0.042823529
000:02:07	0.093	1	2.125	1.76	1.840551181	0.543315508	0.043764706
000:02:09	0.094	1	2.125	1.76	1.84145741	0.543048128	0.044235294
000:02:11	0.096	1	2.125	1.76	1.843272548	0.542513369	0.045176471
000:02:13	0.098	2	2.125	1.76	1.845091268	1.083957219	0.046117647
000:02:15	0.099	1	2.125	1.76	1.846001974	0.54171123	0.046588235
000:02:17	0.101	1	2.125	1.76	1.847826087	0.541176471	0.047529412
000:02:19	0.103	1	2.125	1.76	1.849653808	0.540641711	0.048470588
000:02:21	0.104	1	2.125	1.76	1.850569025	0.540374332	0.048941176
000:02:23	0.106	1	2.125	1.76	1.852402179	0.539839572	0.049882353

000:02:25	0.108	1	2.125	1.76	1.854238969	0.539304813	0.050823529
000:02:27	0.11	1	2.125	1.76	1.856079404	0.538770053	0.051764706
000:02:29	0.111	1	2.125	1.76	1.857000993	0.538502674	0.052235294
000:02:31	0.113	1	2.125	1.76	1.858846918	0.537967914	0.053176471
000:02:33	0.115	1	2.125	1.76	1.860696517	0.537433155	0.054117647
000:02:35	0.117	1	2.125	1.76	1.862549801	0.536898396	0.055058824
000:02:37	0.118	2	2.125	1.76	1.863477828	1.073262032	0.055529412
000:02:39	0.12	1	2.125	1.76	1.865336658	0.536096257	0.056470588
000:02:41	0.122	1	2.125	1.76	1.867199201	0.535561497	0.057411765
000:02:43	0.124	1	2.125	1.76	1.869065467	0.535026738	0.058352941
000:02:45	0.125	1	2.125	1.76	1.87	0.534759358	0.058823529
000:02:47	0.127	1	2.125	1.76	1.871871872	0.534224599	0.059764706
000:02:49	0.129	2	2.125	1.76	1.873747495	1.067379679	0.060705882
000:02:51	0.131	2	2.125	1.76	1.875626881	1.06631016	0.061647059
000:02:53	0.132	1	2.125	1.76	1.876567988	0.532887701	0.062117647
000:02:55	0.134	1	2.125	1.76	1.878453039	0.532352941	0.063058824
000:02:57	0.136	1	2.125	1.76	1.88034188	0.531818182	0.064
000:02:59	0.138	2	2.125	1.76	1.882234524	1.062566845	0.064941176
000:03:01	0.14	1	2.125	1.76	1.884130982	0.530748663	0.065882353
000:03:03	0.141	1	2.125	1.76	1.885080645	0.530481283	0.066352941
000:03:05	0.143	1	2.125	1.76	1.886982846	0.529946524	0.067294118
000:03:07	0.145	2	2.125	1.76	1.888888889	1.058823529	0.068235294
000:03:09	0.147	1	2.125	1.76	1.890798787	0.528877005	0.069176471
000:03:11	0.148	2	2.125	1.76	1.891755185	1.057219251	0.069647059
000:03:13	0.15	2	2.125	1.76	1.893670886	1.056149733	0.070588235
000:03:15	0.152	2	2.125	1.76	1.895590471	1.055080214	0.071529412

000:03:17	0.154	1	2.125	1.76	1.897513952	0.527005348	0.072470588
000:03:19	0.156	2	2.125	1.76	1.899441341	1.052941176	0.073411765
000:03:49	0.182	2	2.125	1.76	1.924858466	1.039037433	0.085647059
000:04:19	0.208	2	2.125	1.76	1.95096505	1.02513369	0.097882353
000:04:49	0.234	2	2.125	1.76	1.977789529	1.011229947	0.110117647
000:05:19	0.26	2	2.125	1.76	2.00536193	0.997326203	0.122352941
000:05:49	0.285	3	2.125	1.76	2.032608696	1.475935829	0.134117647
000:06:19	0.311	3	2.125	1.76	2.061742007	1.455080214	0.146352941
000:06:49	0.337	4	2.125	1.76	2.091722595	1.912299465	0.158588235
000:07:19	0.363	4	2.125	1.76	2.122587968	1.884491979	0.170823529
000:07:49	0.389	4	2.125	1.76	2.15437788	1.856684492	0.183058824
000:08:19	0.415	4	2.125	1.76	2.187134503	1.828877005	0.195294118
000:08:49	0.441	4	2.125	1.76	2.220902613	1.801069519	0.207529412
000:09:19	0.467	4	2.125	1.76	2.255729795	1.773262032	0.219764706
000:09:49	0.492	4	2.125	1.76	2.290263319	1.746524064	0.231529412
000:10:19	0.518	4	2.125	1.76	2.327317984	1.718716578	0.243764706
000:10:49	0.544	4	2.125	1.76	2.365591398	1.690909091	0.256
000:11:19	0.57	4	2.125	1.76	2.405144695	1.663101604	0.268235294
000:11:49	0.596	4	2.125	1.76	2.446043165	1.635294118	0.280470588
000:12:19	0.622	4	2.125	1.76	2.48835662	1.607486631	0.292705882
000:12:49	0.648	4	2.125	1.76	2.532159783	1.579679144	0.304941176
000:13:19	0.674	4	2.125	1.76	2.577532736	1.551871658	0.317176471
000:13:49	0.699	4	2.125	1.76	2.622720898	1.52513369	0.328941176

Table B-17: Results of test at water content at plastic limit

TIME	VERTICAL DEFLECTION (in)	LOAD (lb)	L_0 (in)	A_0 $(in)^2$	A_C $(in)^2$	STRESS (psi)	STRAIN (in/in)
000:00:00	0.002	1	2.75	1.35	1.350982533	0.74020202	0.000727273
000:00:01	0.003	1	2.75	1.35	1.351474336	0.73993266	0.001090909
000:00:02	0.004	1	2.75	1.35	1.351966497	0.7396633	0.001454545
000:00:03	0.005	1	2.75	1.35	1.352459016	0.739393939	0.001818182
000:00:04	0.005	1	2.75	1.35	1.352459016	0.739393939	0.001818182
000:00:05	0.006	1	2.75	1.35	1.352951895	0.739124579	0.002181818
000:00:06	0.007	1	2.75	1.35	1.353445133	0.738855219	0.002545455
000:00:07	0.008	1	2.75	1.35	1.353938731	0.738585859	0.002909091
000:00:08	0.009	1	2.75	1.35	1.354432689	0.738316498	0.003272727
000:00:09	0.01	1	2.75	1.35	1.354927007	0.738047138	0.003636364
000:00:10	0.01	1	2.75	1.35	1.354927007	0.738047138	0.003636364
000:00:11	0.011	1	2.75	1.35	1.355421687	0.737777778	0.004
000:00:12	0.012	1	2.75	1.35	1.355916728	0.737508418	0.004363636
000:00:13	0.013	1	2.75	1.35	1.35641213	0.737239057	0.004727273
000:00:14	0.014	1	2.75	1.35	1.356907895	0.736969697	0.005090909
000:00:15	0.015	1	2.75	1.35	1.357404022	0.736700337	0.005454545
000:00:16	0.016	1	2.75	1.35	1.357900512	0.736430976	0.005818182
000:00:17	0.016	1	2.75	1.35	1.357900512	0.736430976	0.005818182
000:00:18	0.017	1	2.75	1.35	1.358397366	0.736161616	0.006181818
000:00:19	0.018	2	2.75	1.35	1.358894583	1.471784512	0.006545455

000:00:20	0.019	2	2.75	1.35	1.359392164	1.471245791	0.006909091
000:00:21	0.02	2	2.75	1.35	1.35989011	1.470707071	0.007272727
000:00:22	0.021	1	2.75	1.35	1.360388421	0.735084175	0.007636364
000:00:23	0.022	1	2.75	1.35	1.360887097	0.734814815	0.008
000:00:24	0.023	1	2.75	1.35	1.361386139	0.734545455	0.008363636
000:00:25	0.024	1	2.75	1.35	1.361885547	0.734276094	0.008727273
000:00:26	0.024	2	2.75	1.35	1.361885547	1.468552189	0.008727273
000:00:27	0.025	1	2.75	1.35	1.362385321	0.734006734	0.009090909
000:00:28	0.026	1	2.75	1.35	1.362885463	0.733737374	0.009454545
000:00:29	0.027	1	2.75	1.35	1.363385971	0.733468013	0.009818182
000:00:30	0.028	1	2.75	1.35	1.363886848	0.733198653	0.010181818
000:00:31	0.029	1	2.75	1.35	1.364388093	0.732929293	0.010545455
000:00:32	0.03	1	2.75	1.35	1.364889706	0.732659933	0.010909091
000:00:33	0.03	1	2.75	1.35	1.364889706	0.732659933	0.010909091
000:00:34	0.031	1	2.75	1.35	1.365391688	0.732390572	0.011272727
000:00:35	0.032	1	2.75	1.35	1.36589404	0.732121212	0.011636364
000:00:36	0.033	1	2.75	1.35	1.366396761	0.731851852	0.012
000:00:37	0.034	1	2.75	1.35	1.366899853	0.731582492	0.012363636
000:00:38	0.035	1	2.75	1.35	1.367403315	0.731313131	0.012727273
000:00:39	0.036	1	2.75	1.35	1.367907148	0.731043771	0.013090909
000:00:40	0.037	1	2.75	1.35	1.368411353	0.730774411	0.013454545
000:00:41	0.038	1	2.75	1.35	1.368915929	0.730505051	0.013818182
000:00:42	0.038	2	2.75	1.35	1.368915929	1.461010101	0.013818182
000:00:43	0.039	1	2.75	1.35	1.369420878	0.73023569	0.014181818
000:00:44	0.04	2	2.75	1.35	1.369926199	1.45993266	0.014545455
000:00:45	0.041	2	2.75	1.35	1.370431894	1.459393939	0.014909091

000:00:46	0.042	2	2.75	1.35	1.370937962	1.458855219	0.015272727
000:00:47	0.043	2	2.75	1.35	1.371444403	1.458316498	0.015636364
000:00:48	0.044	2	2.75	1.35	1.37195122	1.457777778	0.016
000:00:49	0.045	2	2.75	1.35	1.37245841	1.457239057	0.016363636
000:00:50	0.045	2	2.75	1.35	1.37245841	1.457239057	0.016363636
000:00:51	0.046	1	2.75	1.35	1.372965976	0.728350168	0.016727273
000:00:52	0.047	2	2.75	1.35	1.373473918	1.456161616	0.017090909
000:00:53	0.048	2	2.75	1.35	1.373982235	1.455622896	0.017454545
000:00:54	0.049	2	2.75	1.35	1.374490929	1.455084175	0.017818182
000:00:55	0.05	2	2.75	1.35	1.375	1.454545455	0.018181818
000:00:56	0.051	2	2.75	1.35	1.375509448	1.454006734	0.018545455
000:00:57	0.051	2	2.75	1.35	1.375509448	1.454006734	0.018545455
000:00:58	0.052	2	2.75	1.35	1.376019274	1.453468013	0.018909091
000:00:59	0.053	2	2.75	1.35	1.376529477	1.452929293	0.019272727
000:01:00	0.054	2	2.75	1.35	1.377040059	1.452390572	0.019636364
000:01:01	0.055	2	2.75	1.35	1.37755102	1.451851852	0.02
000:01:02	0.056	2	2.75	1.35	1.378062361	1.451313131	0.020363636
000:01:03	0.057	2	2.75	1.35	1.378574081	1.450774411	0.020727273
000:01:04	0.058	2	2.75	1.35	1.379086181	1.45023569	0.021090909
000:01:05	0.058	2	2.75	1.35	1.379086181	1.45023569	0.021090909
000:01:06	0.059	2	2.75	1.35	1.379598662	1.44969697	0.021454545
000:01:07	0.06	2	2.75	1.35	1.380111524	1.449158249	0.021818182
000:01:08	0.061	2	2.75	1.35	1.380624768	1.448619529	0.022181818
000:01:09	0.062	2	2.75	1.35	1.381138393	1.448080808	0.022545455
000:01:10	0.063	2	2.75	1.35	1.3816524	1.447542088	0.022909091
000:01:11	0.064	2	2.75	1.35	1.382166791	1.447003367	0.023272727

000:01:12	0.064	2	2.75	1.35	1.382166791	1.447003367	0.023272727
000:01:13	0.065	2	2.75	1.35	1.382681564	1.446464646	0.023636364
000:01:14	0.066	2	2.75	1.35	1.383196721	1.445925926	0.024
000:01:15	0.067	2	2.75	1.35	1.383712262	1.445387205	0.024363636
000:01:16	0.068	2	2.75	1.35	1.384228188	1.444848485	0.024727273
000:01:17	0.069	2	2.75	1.35	1.384744498	1.444309764	0.025090909
000:01:18	0.07	2	2.75	1.35	1.385261194	1.443771044	0.025454545
000:01:19	0.07	2	2.75	1.35	1.385261194	1.443771044	0.025454545
000:01:20	0.071	2	2.75	1.35	1.385778275	1.443232323	0.025818182
000:01:21	0.072	2	2.75	1.35	1.386295743	1.442693603	0.026181818
000:01:22	0.073	2	2.75	1.35	1.386813597	1.442154882	0.026545455
000:01:23	0.074	2	2.75	1.35	1.387331839	1.441616162	0.026909091
000:01:24	0.075	2	2.75	1.35	1.387850467	1.441077441	0.027272727
000:01:25	0.076	2	2.75	1.35	1.388369484	1.440538721	0.027636364
000:01:26	0.077	2	2.75	1.35	1.388888889	1.44	0.028
000:01:27	0.077	3	2.75	1.35	1.388888889	2.16	0.028
000:01:28	0.078	3	2.75	1.35	1.389408683	2.159191919	0.028363636
000:01:29	0.079	2	2.75	1.35	1.389928866	1.438922559	0.028727273
000:01:30	0.08	3	2.75	1.35	1.390449438	2.157575758	0.029090909
000:01:31	0.081	3	2.75	1.35	1.390970401	2.156767677	0.029454545
000:01:32	0.082	2	2.75	1.35	1.391491754	1.437306397	0.029818182
000:01:33	0.083	3	2.75	1.35	1.392013498	2.155151515	0.030181818
000:01:34	0.084	3	2.75	1.35	1.392535634	2.154343434	0.030545455
000:01:35	0.084	3	2.75	1.35	1.392535634	2.154343434	0.030545455
000:01:36	0.085	3	2.75	1.35	1.393058161	2.153535354	0.030909091
000:01:37	0.086	3	2.75	1.35	1.393581081	2.152727273	0.031272727

000:01:38	0.087	3	2.75	1.35	1.394104394	2.151919192	0.031636364
000:01:39	0.088	3	2.75	1.35	1.394628099	2.151111111	0.032
000:01:41	0.09	2	2.75	1.35	1.395676692	1.432996633	0.032727273
000:01:43	0.091	3	2.75	1.35	1.39620158	2.148686869	0.033090909
000:01:45	0.093	3	2.75	1.35	1.39725254	2.147070707	0.033818182
000:01:47	0.095	3	2.75	1.35	1.398305085	2.145454545	0.034545455
000:01:49	0.097	3	2.75	1.35	1.399359216	2.143838384	0.035272727
000:01:51	0.098	3	2.75	1.35	1.399886878	2.143030303	0.035636364
000:01:53	0.1	3	2.75	1.35	1.400943396	2.141414141	0.036363636
000:01:55	0.102	3	2.75	1.35	1.402001511	2.13979798	0.037090909
000:01:57	0.103	3	2.75	1.35	1.402531167	2.138989899	0.037454545
000:01:59	0.105	4	2.75	1.35	1.403591682	2.84983165	0.038181818
000:02:01	0.107	3	2.75	1.35	1.404653802	2.135757576	0.038909091
000:02:03	0.108	4	2.75	1.35	1.405185466	2.846599327	0.039272727
000:02:05	0.11	3	2.75	1.35	1.40625	2.133333333	0.04
000:02:07	0.112	4	2.75	1.35	1.407316149	2.842289562	0.040727273
000:02:09	0.114	4	2.75	1.35	1.408383915	2.84013468	0.041454545
000:02:11	0.115	3	2.75	1.35	1.408918406	2.129292929	0.041818182
000:02:13	0.117	4	2.75	1.35	1.409988606	2.836902357	0.042545455
000:02:15	0.119	4	2.75	1.35	1.411060433	2.834747475	0.043272727
000:02:17	0.12	4	2.75	1.35	1.411596958	2.833670034	0.043636364
000:02:19	0.122	4	2.75	1.35	1.412671233	2.831515152	0.044363636
000:02:21	0.124	4	2.75	1.35	1.413747144	2.829360269	0.045090909
000:02:23	0.126	4	2.75	1.35	1.414824695	2.827205387	0.045818182
000:02:25	0.127	4	2.75	1.35	1.415364087	2.826127946	0.046181818
000:02:27	0.129	4	2.75	1.35	1.416444105	2.823973064	0.046909091

000:02:29	0.131	4	2.75	1.35	1.417525773	2.821818182	0.047636364
000:02:31	0.132	4	2.75	1.35	1.418067227	2.820740741	0.048
000:02:33	0.134	4	2.75	1.35	1.419151376	2.818585859	0.048727273
000:02:35	0.135	4	2.75	1.35	1.419694073	2.817508418	0.049090909
000:02:37	0.137	4	2.75	1.35	1.420780712	2.815353535	0.049818182
000:02:39	0.139	4	2.75	1.35	1.421869016	2.813198653	0.050545455
000:02:41	0.14	5	2.75	1.35	1.422413793	3.515151515	0.050909091
000:02:43	0.142	4	2.75	1.35	1.423504601	2.80996633	0.051636364
000:02:45	0.144	4	2.75	1.35	1.424597084	2.807811448	0.052363636
000:02:47	0.146	5	2.75	1.35	1.425691244	3.507070707	0.053090909
000:02:49	0.147	5	2.75	1.35	1.426238955	3.505723906	0.053454545
000:02:51	0.149	5	2.75	1.35	1.42733564	3.503030303	0.054181818
000:02:53	0.151	4	2.75	1.35	1.428434013	2.80026936	0.054909091
000:02:55	0.152	4	2.75	1.35	1.428983834	2.799191919	0.055272727
000:02:57	0.154	5	2.75	1.35	1.430084746	3.496296296	0.056
000:02:59	0.156	5	2.75	1.35	1.431187355	3.493602694	0.056727273
000:03:01	0.157	5	2.75	1.35	1.431739298	3.492255892	0.057090909
000:03:03	0.159	5	2.75	1.35	1.432844462	3.48956229	0.057818182
000:03:05	0.161	5	2.75	1.35	1.433951333	3.486868687	0.058545455
000:03:07	0.163	5	2.75	1.35	1.435059915	3.484175084	0.059272727
000:03:09	0.164	5	2.75	1.35	1.435614849	3.482828283	0.059636364
000:03:11	0.166	5	2.75	1.35	1.436726006	3.48013468	0.060363636
000:03:13	0.168	5	2.75	1.35	1.437838885	3.477441077	0.061090909
000:03:15	0.169	5	2.75	1.35	1.438395971	3.476094276	0.061454545
000:03:17	0.171	5	2.75	1.35	1.439511439	3.473400673	0.062181818
000:03:19	0.173	5	2.75	1.35	1.440628638	3.470707071	0.062909091

000:03:49	0.199	6	2.75	1.35	1.455311642	4.122828283	0.072363636
000:04:19	0.225	7	2.75	1.35	1.47029703	4.760942761	0.081818182
000:04:49	0.252	8	2.75	1.35	1.486188951	5.382895623	0.091636364
000:05:19	0.277	9	2.75	1.35	1.501213101	5.995151515	0.100727273
000:05:49	0.303	10	2.75	1.35	1.517163874	6.591245791	0.110181818
000:06:19	0.328	11	2.75	1.35	1.532824112	7.176296296	0.119272727
000:06:49	0.354	12	2.75	1.35	1.549457429	7.744646465	0.128727273
000:07:19	0.379	12	2.75	1.35	1.565795023	7.663838384	0.137818182
000:07:49	0.405	13	2.75	1.35	1.58315565	8.211447811	0.147272727
000:08:19	0.432	13	2.75	1.35	1.601596204	8.116902357	0.157090909
000:08:49	0.458	12	2.75	1.35	1.619764398	7.408484848	0.166545455
000:09:19	0.484	11	2.75	1.35	1.638349515	6.714074074	0.176
000:09:49	0.51	11	2.75	1.35	1.657366071	6.637037037	0.185454545
000:10:19	0.535	10	2.75	1.35	1.676072235	5.966329966	0.194545455
000:10:49	0.561	9	2.75	1.35	1.695979899	5.306666667	0.204
000:11:19	0.586	8	2.75	1.35	1.715573013	4.663164983	0.213090909
000:11:49	0.612	7	2.75	1.35	1.736435921	4.031245791	0.222545455
000:12:19	0.639	7	2.75	1.35	1.758645192	3.9803367	0.232363636
000:12:49	0.665	6	2.75	1.35	1.78057554	3.36969697	0.241818182
000:13:19	0.691	5	2.75	1.35	1.803059738	2.773063973	0.251272727

Table B-18: Results of test at water content below plastic limit

TIME	VERTICAL DEFLECTION (in)	LOAD (lb)	L_0 (in)	A_0 $(in)^2$	A_C $(in)^2$	STRESS (psi)	STRAIN (in/in)
000:00:00	0	0	2.75	1.23	1.23	0	0
000:00:01	0	0	2.75	1.23	1.23	0	0
000:00:02	0	0	2.75	1.23	1.23	0	0
000:00:03	0.001	0	2.75	1.23	1.230447435	0	0.000363636
000:00:04	0.002	0	2.75	1.23	1.230895197	0	0.000727273
000:00:05	0.002	0	2.75	1.23	1.230895197	0	0.000727273
000:00:06	0.003	0	2.75	1.23	1.231343284	0	0.001090909
000:00:07	0.004	0	2.75	1.23	1.231791697	0	0.001454545
000:00:08	0.005	0	2.75	1.23	1.232240437	0	0.001818182
000:00:09	0.006	0	2.75	1.23	1.232689504	0	0.002181818
000:00:10	0.007	0	2.75	1.23	1.233138899	0	0.002545455
000:00:11	0.007	0	2.75	1.23	1.233138899	0	0.002545455
000:00:12	0.008	0	2.75	1.23	1.233588621	0	0.002909091
000:00:13	0.009	0	2.75	1.23	1.234038672	0	0.003272727
000:00:14	0.01	1	2.75	1.23	1.234489051	0.810051737	0.003636364
000:00:15	0.011	1	2.75	1.23	1.234939759	0.809756098	0.004
000:00:16	0.012	1	2.75	1.23	1.235390796	0.809460458	0.004363636
000:00:17	0.013	2	2.75	1.23	1.235842163	1.618329638	0.004727273
000:00:18	0.014	2	2.75	1.23	1.23629386	1.617738359	0.005090909

000:00:19	0.014	2	2.75	1.23	1.23629386	1.617738359	0.005090909
000:00:20	0.015	3	2.75	1.23	1.236745887	2.425720621	0.005454545
000:00:21	0.016	3	2.75	1.23	1.237198244	2.424833703	0.005818182
000:00:22	0.017	3	2.75	1.23	1.237650933	2.423946785	0.006181818
000:00:23	0.018	4	2.75	1.23	1.238103953	3.230746489	0.006545455
000:00:24	0.019	4	2.75	1.23	1.238557305	3.229563932	0.006909091
000:00:25	0.02	4	2.75	1.23	1.239010989	3.228381375	0.007272727
000:00:26	0.02	4	2.75	1.23	1.239010989	3.228381375	0.007272727
000:00:27	0.021	4	2.75	1.23	1.239465005	3.227198817	0.007636364
000:00:28	0.022	4	2.75	1.23	1.239919355	3.22601626	0.008
000:00:29	0.023	4	2.75	1.23	1.240374037	3.224833703	0.008363636
000:00:30	0.024	4	2.75	1.23	1.240829054	3.223651146	0.008727273
000:00:31	0.025	5	2.75	1.23	1.241284404	4.028085735	0.009090909
000:00:32	0.026	5	2.75	1.23	1.241740088	4.026607539	0.009454545
000:00:33	0.027	5	2.75	1.23	1.242196107	4.025129342	0.009818182
000:00:34	0.027	5	2.75	1.23	1.242196107	4.025129342	0.009818182
000:00:35	0.028	5	2.75	1.23	1.242652461	4.023651146	0.010181818
000:00:36	0.029	5	2.75	1.23	1.243109151	4.022172949	0.010545455
000:00:37	0.03	5	2.75	1.23	1.243566176	4.020694752	0.010909091
000:00:38	0.031	5	2.75	1.23	1.244023538	4.019216556	0.011272727
000:00:39	0.032	5	2.75	1.23	1.244481236	4.017738359	0.011636364
000:00:40	0.033	5	2.75	1.23	1.244939271	4.016260163	0.012
000:00:41	0.033	5	2.75	1.23	1.244939271	4.016260163	0.012
000:00:42	0.034	5	2.75	1.23	1.245397644	4.014781966	0.012363636
000:00:43	0.035	5	2.75	1.23	1.245856354	4.013303769	0.012727273
000:00:44	0.036	5	2.75	1.23	1.246315402	4.011825573	0.013090909

000:00:45	0.037	5	2.75	1.23	1.246774788	4.010347376	0.013454545
000:00:46	0.038	5	2.75	1.23	1.247234513	4.00886918	0.013818182
000:00:47	0.039	5	2.75	1.23	1.247694578	4.007390983	0.014181818
000:00:48	0.04	5	2.75	1.23	1.248154982	4.005912786	0.014545455
000:00:49	0.041	5	2.75	1.23	1.248615725	4.00443459	0.014909091
000:00:50	0.041	5	2.75	1.23	1.248615725	4.00443459	0.014909091
000:00:51	0.042	5	2.75	1.23	1.249076809	4.002956393	0.015272727
000:00:52	0.043	5	2.75	1.23	1.249538234	4.001478197	0.015636364
000:00:53	0.044	5	2.75	1.23	1.25	4	0.016
000:00:54	0.045	5	2.75	1.23	1.250462107	3.998521803	0.016363636
000:00:55	0.046	5	2.75	1.23	1.250924556	3.997043607	0.016727273
000:00:56	0.047	5	2.75	1.23	1.251387347	3.99556541	0.017090909
000:00:57	0.047	5	2.75	1.23	1.251387347	3.99556541	0.017090909
000:00:58	0.048	5	2.75	1.23	1.251850481	3.994087214	0.017454545
000:00:59	0.049	5	2.75	1.23	1.252313958	3.992609017	0.017818182
000:01:00	0.05	6	2.75	1.23	1.252777778	4.789356984	0.018181818
000:01:01	0.051	5	2.75	1.23	1.253241941	3.989652624	0.018545455
000:01:02	0.052	5	2.75	1.23	1.253706449	3.988174427	0.018909091
000:01:03	0.053	6	2.75	1.23	1.254171301	4.784035477	0.019272727
000:01:04	0.054	6	2.75	1.23	1.254636499	4.782261641	0.019636364
000:01:05	0.054	6	2.75	1.23	1.254636499	4.782261641	0.019636364
000:01:06	0.055	6	2.75	1.23	1.255102041	4.780487805	0.02
000:01:07	0.056	6	2.75	1.23	1.255567929	4.778713969	0.020363636
000:01:08	0.057	6	2.75	1.23	1.256034163	4.776940133	0.020727273
000:01:09	0.058	6	2.75	1.23	1.256500743	4.775166297	0.021090909
000:01:10	0.059	6	2.75	1.23	1.25696767	4.773392461	0.021454545

000:01:11	0.06	6	2.75	1.23	1.257434944	4.771618625	0.021818182
000:01:12	0.061	6	2.75	1.23	1.257902566	4.769844789	0.022181818
000:01:13	0.061	6	2.75	1.23	1.257902566	4.769844789	0.022181818
000:01:14	0.062	6	2.75	1.23	1.258370536	4.768070953	0.022545455
000:01:15	0.063	6	2.75	1.23	1.258838854	4.766297118	0.022909091
000:01:16	0.064	6	2.75	1.23	1.25930752	4.764523282	0.023272727
000:01:17	0.065	6	2.75	1.23	1.259776536	4.762749446	0.023636364
000:01:18	0.066	6	2.75	1.23	1.260245902	4.76097561	0.024
000:01:19	0.067	6	2.75	1.23	1.260715617	4.759201774	0.024363636
000:01:20	0.068	6	2.75	1.23	1.261185682	4.757427938	0.024727273
000:01:21	0.069	6	2.75	1.23	1.261656098	4.755654102	0.025090909
000:01:22	0.069	6	2.75	1.23	1.261656098	4.755654102	0.025090909
000:01:23	0.07	6	2.75	1.23	1.262126866	4.753880266	0.025454545
000:01:24	0.071	6	2.75	1.23	1.262597984	4.75210643	0.025818182
000:01:25	0.072	6	2.75	1.23	1.263069455	4.750332594	0.026181818
000:01:26	0.073	6	2.75	1.23	1.263541278	4.748558758	0.026545455
000:01:27	0.074	6	2.75	1.23	1.264013453	4.746784922	0.026909091
000:01:28	0.075	6	2.75	1.23	1.264485981	4.745011086	0.027272727
000:01:29	0.075	6	2.75	1.23	1.264485981	4.745011086	0.027272727
000:01:30	0.076	6	2.75	1.23	1.264958863	4.743237251	0.027636364
000:01:31	0.077	6	2.75	1.23	1.265432099	4.741463415	0.028
000:01:32	0.078	7	2.75	1.23	1.265905689	5.529637842	0.028363636
000:01:33	0.079	7	2.75	1.23	1.266379633	5.527568367	0.028727273
000:01:34	0.08	7	2.75	1.23	1.266853933	5.525498891	0.029090909
000:01:35	0.081	7	2.75	1.23	1.267328587	5.523429416	0.029454545
000:01:36	0.082	7	2.75	1.23	1.267803598	5.521359941	0.029818182

000:01:37	0.082	7	2.75	1.23	1.267803598	5.521359941	0.029818182
000:01:38	0.083	7	2.75	1.23	1.268278965	5.519290466	0.030181818
000:01:39	0.084	7	2.75	1.23	1.268754689	5.51722099	0.030545455
000:01:41	0.086	7	2.75	1.23	1.269707207	5.51308204	0.031272727
000:01:43	0.088	7	2.75	1.23	1.270661157	5.508943089	0.032
000:01:45	0.089	7	2.75	1.23	1.27113867	5.506873614	0.032363636
000:01:47	0.091	7	2.75	1.23	1.272094772	5.502734664	0.033090909
000:01:49	0.093	7	2.75	1.23	1.273052315	5.498595713	0.033818182
000:01:51	0.095	7	2.75	1.23	1.274011299	5.494456763	0.034545455
000:01:53	0.096	8	2.75	1.23	1.274491334	6.277014043	0.034909091
000:01:55	0.098	8	2.75	1.23	1.275452489	6.272283814	0.035636364
000:01:57	0.1	7	2.75	1.23	1.276415094	5.484109387	0.036363636
000:01:59	0.102	8	2.75	1.23	1.277379154	6.262823356	0.037090909
000:02:01	0.103	8	2.75	1.23	1.27786173	6.260458241	0.037454545
000:02:03	0.105	8	2.75	1.23	1.278827977	6.255728012	0.038181818
000:02:05	0.107	8	2.75	1.23	1.279795687	6.250997783	0.038909091
000:02:07	0.108	8	2.75	1.23	1.280280091	6.248632668	0.039272727
000:02:09	0.11	8	2.75	1.23	1.28125	6.243902439	0.04
000:02:11	0.112	8	2.75	1.23	1.28222138	6.23917221	0.040727273
000:02:13	0.114	8	2.75	1.23	1.283194234	6.234441981	0.041454545
000:02:15	0.115	8	2.75	1.23	1.283681214	6.232076866	0.041818182
000:02:17	0.117	8	2.75	1.23	1.284656286	6.227346637	0.042545455
000:02:19	0.119	8	2.75	1.23	1.285632839	6.222616408	0.043272727
000:02:21	0.12	8	2.75	1.23	1.286121673	6.220251293	0.043636364
000:02:23	0.122	8	2.75	1.23	1.287100457	6.215521064	0.044363636
000:02:25	0.124	8	2.75	1.23	1.288080731	6.210790835	0.045090909

000:02:27	0.126	9	2.75	1.23	1.2890625	6.981818182	0.045818182
000:02:29	0.127	9	2.75	1.23	1.289553946	6.979157428	0.046181818
000:02:31	0.129	9	2.75	1.23	1.290537963	6.97383592	0.046909091
000:02:33	0.131	9	2.75	1.23	1.291523482	6.968514412	0.047636364
000:02:35	0.133	9	2.75	1.23	1.292510508	6.963192905	0.048363636
000:02:37	0.134	9	2.75	1.23	1.293004587	6.960532151	0.048727273
000:02:39	0.136	9	2.75	1.23	1.293993879	6.955210643	0.049454545
000:02:41	0.138	9	2.75	1.23	1.294984686	6.949889135	0.050181818
000:02:43	0.14	9	2.75	1.23	1.295977011	6.944567627	0.050909091
000:02:45	0.141	9	2.75	1.23	1.296473745	6.941906874	0.051272727
000:02:47	0.143	9	2.75	1.23	1.297468354	6.936585366	0.052
000:02:49	0.145	9	2.75	1.23	1.298464491	6.931263858	0.052727273
000:02:51	0.146	10	2.75	1.23	1.298963134	7.698447894	0.053090909
000:02:53	0.148	10	2.75	1.23	1.299961568	7.692535107	0.053818182
000:02:55	0.15	9	2.75	1.23	1.300961538	6.917960089	0.054545455
000:02:57	0.152	10	2.75	1.23	1.301963048	7.680709534	0.055272727
000:02:59	0.153	10	2.75	1.23	1.302464382	7.677753141	0.055636364
000:03:01	0.155	9	2.75	1.23	1.303468208	6.904656319	0.056363636
000:03:03	0.157	10	2.75	1.23	1.304473583	7.665927568	0.057090909
000:03:05	0.158	10	2.75	1.23	1.304976852	7.662971175	0.057454545
000:03:07	0.16	10	2.75	1.23	1.305984556	7.657058389	0.058181818
000:03:09	0.162	10	2.75	1.23	1.306993818	7.651145602	0.058909091
000:03:11	0.163	10	2.75	1.23	1.307499034	7.648189209	0.059272727
000:03:13	0.165	10	2.75	1.23	1.308510638	7.642276423	0.06
000:03:15	0.167	11	2.75	1.23	1.30952381	8.4	0.060727273
000:03:17	0.169	11	2.75	1.23	1.310538551	8.393495935	0.061454545

000:03:19	0.17	10	2.75	1.23	1.311046512	7.627494457	0.061818182
000:03:49	0.196	12	2.75	1.23	1.324393109	9.06075388	0.071272727
000:04:19	0.222	13	2.75	1.23	1.338014241	9.715890613	0.080727273
000:04:49	0.248	14	2.75	1.23	1.351918465	10.3556541	0.090181818
000:05:19	0.275	15	2.75	1.23	1.366666667	10.97560976	0.1
000:05:49	0.301	17	2.75	1.23	1.38117599	12.30835181	0.109454545
000:06:19	0.326	17	2.75	1.23	1.395420792	12.1827051	0.118545455
000:06:49	0.352	18	2.75	1.23	1.410550459	12.76097561	0.128
000:07:19	0.378	18	2.75	1.23	1.426011804	12.62261641	0.137454545
000:07:49	0.404	19	2.75	1.23	1.441815857	13.17782705	0.146909091
000:08:19	0.429	19	2.75	1.23	1.457345972	13.03739837	0.156
000:08:49	0.455	18	2.75	1.23	1.473856209	12.21286031	0.165454545
000:09:19	0.48	18	2.75	1.23	1.490088106	12.07982262	0.174545455
000:09:49	0.506	17	2.75	1.23	1.507352941	11.27804878	0.184
000:10:19	0.533	16	2.75	1.23	1.525710419	10.48691796	0.193818182

- Sample with 800% sand, 20% clay

Table B-19: Results of test at water content above plastic limit

TIME	VERTICAL DEFLECTION (in)	LOAD (lb)	L_0 (in)	A_0 $(in)^2$	A_C $(in)^2$	STRESS (psi)	STRAIN (in/in)
000:00:00	0	0	2.5	1.5	1.5	0	0
000:00:01	0.001	0	2.5	1.5	1.50060024	0	0.0004
000:00:02	0.002	0	2.5	1.5	1.501200961	0	0.0008
000:00:03	0.003	0	2.5	1.5	1.501802163	0	0.0012
000:00:04	0.003	0	2.5	1.5	1.501802163	0	0.0012
000:00:05	0.004	0	2.5	1.5	1.502403846	0	0.0016
000:00:06	0.005	0	2.5	1.5	1.503006012	0	0.002
000:00:07	0.006	0	2.5	1.5	1.503608661	0	0.0024
000:00:08	0.007	0	2.5	1.5	1.504211793	0	0.0028
000:00:09	0.008	0	2.5	1.5	1.504815409	0	0.0032
000:00:10	0.009	0	2.5	1.5	1.50541951	0	0.0036
000:00:11	0.009	0	2.5	1.5	1.50541951	0	0.0036
000:00:12	0.01	0	2.5	1.5	1.506024096	0	0.004
000:00:13	0.011	0	2.5	1.5	1.506629168	0	0.0044
000:00:14	0.012	0	2.5	1.5	1.507234727	0	0.0048
000:00:15	0.013	0	2.5	1.5	1.507840772	0	0.0052
000:00:16	0.014	0	2.5	1.5	1.508447305	0	0.0056
000:00:17	0.015	0	2.5	1.5	1.509054326	0	0.006

000:00:18	0.016	0	2.5	1.5	1.509661836	0	0.0064
000:00:19	0.016	0	2.5	1.5	1.509661836	0	0.0064
000:00:20	0.017	0	2.5	1.5	1.510269835	0	0.0068
000:00:21	0.018	0	2.5	1.5	1.510878324	0	0.0072
000:00:22	0.019	0	2.5	1.5	1.511487304	0	0.0076
000:00:23	0.02	0	2.5	1.5	1.512096774	0	0.008
000:00:24	0.021	0	2.5	1.5	1.512706737	0	0.0084
000:00:25	0.022	0	2.5	1.5	1.513317191	0	0.0088
000:00:26	0.023	0	2.5	1.5	1.513928139	0	0.0092
000:00:27	0.024	0	2.5	1.5	1.51453958	0	0.0096
000:00:28	0.025	0	2.5	1.5	1.515151515	0	0.01
000:00:29	0.025	0	2.5	1.5	1.515151515	0	0.01
000:00:30	0.026	0	2.5	1.5	1.515763945	0	0.0104
000:00:31	0.027	0	2.5	1.5	1.51637687	0	0.0108
000:00:32	0.028	0	2.5	1.5	1.516990291	0	0.0112
000:00:33	0.029	0	2.5	1.5	1.517604209	0	0.0116
000:00:34	0.03	0	2.5	1.5	1.518218623	0	0.012
000:00:35	0.031	0	2.5	1.5	1.518833536	0	0.0124
000:00:36	0.031	0	2.5	1.5	1.518833536	0	0.0124
000:00:37	0.032	0	2.5	1.5	1.519448947	0	0.0128
000:00:38	0.033	0	2.5	1.5	1.520064856	0	0.0132
000:00:39	0.034	0	2.5	1.5	1.520681265	0	0.0136
000:00:40	0.035	0	2.5	1.5	1.521298174	0	0.014
000:00:41	0.036	0	2.5	1.5	1.521915584	0	0.0144
000:00:42	0.037	0	2.5	1.5	1.522533496	0	0.0148
000:00:43	0.038	0	2.5	1.5	1.523151909	0	0.0152

000:00:44	0.039	0	2.5	1.5	1.523770825	0	0.0156
000:00:45	0.039	0	2.5	1.5	1.523770825	0	0.0156
000:00:46	0.04	0	2.5	1.5	1.524390244	0	0.016
000:00:47	0.041	0	2.5	1.5	1.525010167	0	0.0164
000:00:48	0.042	1	2.5	1.5	1.525630594	0.655466667	0.0168
000:00:49	0.043	0	2.5	1.5	1.526251526	0	0.0172
000:00:50	0.044	0	2.5	1.5	1.526872964	0	0.0176
000:00:51	0.045	0	2.5	1.5	1.527494908	0	0.018
000:00:52	0.046	0	2.5	1.5	1.528117359	0	0.0184
000:00:53	0.046	0	2.5	1.5	1.528117359	0	0.0184
000:00:54	0.047	1	2.5	1.5	1.528740318	0.654133333	0.0188
000:00:55	0.048	1	2.5	1.5	1.529363785	0.653866667	0.0192
000:00:56	0.049	0	2.5	1.5	1.52998776	0	0.0196
000:00:57	0.05	0	2.5	1.5	1.530612245	0	0.02
000:00:58	0.051	0	2.5	1.5	1.53123724	0	0.0204
000:00:59	0.052	0	2.5	1.5	1.531862745	0	0.0208
000:01:00	0.053	0	2.5	1.5	1.532488762	0	0.0212
000:01:01	0.053	0	2.5	1.5	1.532488762	0	0.0212
000:01:02	0.054	0	2.5	1.5	1.53311529	0	0.0216
000:01:03	0.055	0	2.5	1.5	1.533742331	0	0.022
000:01:04	0.056	0	2.5	1.5	1.534369885	0	0.0224
000:01:05	0.057	0	2.5	1.5	1.534997953	0	0.0228
000:01:06	0.058	0	2.5	1.5	1.535626536	0	0.0232
000:01:07	0.059	0	2.5	1.5	1.536255633	0	0.0236
000:01:08	0.06	0	2.5	1.5	1.536885246	0	0.024
000:01:09	0.061	0	2.5	1.5	1.537515375	0	0.0244

000:01:10	0.062	0	2.5	1.5	1.538146021	0	0.0248
000:01:11	0.062	0	2.5	1.5	1.538146021	0	0.0248
000:01:12	0.063	0	2.5	1.5	1.538777185	0	0.0252
000:01:13	0.064	0	2.5	1.5	1.539408867	0	0.0256
000:01:14	0.065	0	2.5	1.5	1.540041068	0	0.026
000:01:15	0.066	0	2.5	1.5	1.540673788	0	0.0264
000:01:16	0.067	1	2.5	1.5	1.541307028	0.6488	0.0268
000:01:17	0.068	0	2.5	1.5	1.541940789	0	0.0272
000:01:18	0.068	1	2.5	1.5	1.541940789	0.648533333	0.0272
000:01:19	0.069	-1	2.5	1.5	1.542575072	-0.648266667	0.0276
000:01:20	0.07	0	2.5	1.5	1.543209877	0	0.028
000:01:21	0.071	0	2.5	1.5	1.543845204	0	0.0284
000:01:22	0.072	1	2.5	1.5	1.544481054	0.647466667	0.0288
000:01:23	0.073	0	2.5	1.5	1.545117429	0	0.0292
000:01:24	0.074	1	2.5	1.5	1.545754328	0.646933333	0.0296
000:01:25	0.075	0	2.5	1.5	1.546391753	0	0.03
000:01:26	0.075	0	2.5	1.5	1.546391753	0	0.03
000:01:27	0.076	0	2.5	1.5	1.547029703	0	0.0304
000:01:28	0.077	1	2.5	1.5	1.54766818	0.646133333	0.0308
000:01:29	0.078	1	2.5	1.5	1.548307184	0.645866667	0.0312
000:01:30	0.079	1	2.5	1.5	1.548946716	0.6456	0.0316
000:01:31	0.08	0	2.5	1.5	1.549586777	0	0.032
000:01:32	0.081	0	2.5	1.5	1.550227367	0	0.0324
000:01:33	0.082	0	2.5	1.5	1.550868486	0	0.0328
000:01:34	0.082	0	2.5	1.5	1.550868486	0	0.0328

000:01:35	0.083	0	2.5	1.5	1.551510137	0	0.0332
000:01:36	0.084	0	2.5	1.5	1.552152318	0	0.0336
000:01:37	0.085	0	2.5	1.5	1.552795031	0	0.034
000:01:38	0.086	0	2.5	1.5	1.553438277	0	0.0344
000:01:39	0.087	0	2.5	1.5	1.554082056	0	0.0348
000:01:41	0.088	0	2.5	1.5	1.554726368	0	0.0352
000:01:43	0.09	1	2.5	1.5	1.556016598	0.642666667	0.036
000:01:45	0.092	1	2.5	1.5	1.55730897	0.642133333	0.0368
000:01:47	0.093	0	2.5	1.5	1.557955962	0	0.0372
000:01:49	0.095	1	2.5	1.5	1.559251559	0.641333333	0.038
000:01:51	0.097	1	2.5	1.5	1.560549313	0.6408	0.0388
000:01:53	0.098	1	2.5	1.5	1.561199001	0.640533333	0.0392
000:01:55	0.1	1	2.5	1.5	1.5625	0.64	0.04
000:01:57	0.102	1	2.5	1.5	1.563803169	0.639466667	0.0408
000:01:59	0.104	1	2.5	1.5	1.565108514	0.638933333	0.0416
000:02:01	0.105	1	2.5	1.5	1.565762004	0.638666667	0.042
000:02:03	0.107	1	2.5	1.5	1.567070623	0.638133333	0.0428
000:02:05	0.108	1	2.5	1.5	1.567725753	0.637866667	0.0432
000:02:07	0.11	1	2.5	1.5	1.569037657	0.637333333	0.044
000:02:09	0.112	1	2.5	1.5	1.570351759	0.6368	0.0448
000:02:11	0.114	1	2.5	1.5	1.571668064	0.636266667	0.0456
000:02:13	0.115	1	2.5	1.5	1.572327044	0.636	0.046
000:02:15	0.117	1	2.5	1.5	1.573646664	0.635466667	0.0468
000:02:17	0.119	1	2.5	1.5	1.574968501	0.634933333	0.0476
000:02:19	0.12	1	2.5	1.5	1.575630252	0.634666667	0.048
000:02:21	0.122	1	2.5	1.5	1.576955425	0.634133333	0.0488

000:02:23	0.124	1	2.5	1.5	1.578282828	0.6336	0.0496
000:02:25	0.125	1	2.5	1.5	1.578947368	0.633333333	0.05
000:02:27	0.127	1	2.5	1.5	1.580278129	0.6328	0.0508
000:02:29	0.129	1	2.5	1.5	1.581611135	0.632266667	0.0516
000:02:31	0.13	1	2.5	1.5	1.582278481	0.632	0.052
000:02:33	0.132	1	2.5	1.5	1.583614865	0.631466667	0.0528
000:02:35	0.134	1	2.5	1.5	1.584953508	0.630933333	0.0536
000:02:37	0.135	1	2.5	1.5	1.585623679	0.630666667	0.054
000:02:39	0.137	1	2.5	1.5	1.586965722	0.630133333	0.0548
000:02:41	0.139	1	2.5	1.5	1.588310038	0.6296	0.0556
000:02:43	0.14	2	2.5	1.5	1.588983051	1.258666667	0.056
000:02:45	0.142	1	2.5	1.5	1.590330789	0.6288	0.0568
000:02:47	0.144	1	2.5	1.5	1.591680815	0.628266667	0.0576
000:02:49	0.146	1	2.5	1.5	1.593033135	0.627733333	0.0584
000:02:51	0.147	1	2.5	1.5	1.593710157	0.627466667	0.0588
000:02:53	0.149	1	2.5	1.5	1.595065929	0.626933333	0.0596
000:02:55	0.151	1	2.5	1.5	1.59642401	0.6264	0.0604
000:02:57	0.152	1	2.5	1.5	1.597103918	0.626133333	0.0608
000:02:59	0.154	2	2.5	1.5	1.598465473	1.2512	0.0616
000:03:01	0.156	1	2.5	1.5	1.599829352	0.625066667	0.0624
000:03:03	0.157	1	2.5	1.5	1.600512164	0.6248	0.0628
000:03:05	0.159	1	2.5	1.5	1.601879539	0.624266667	0.0636
000:03:07	0.161	1	2.5	1.5	1.603249252	0.623733333	0.0644
000:03:09	0.163	1	2.5	1.5	1.604621309	0.6232	0.0652
000:03:11	0.164	2	2.5	1.5	1.605308219	1.245866667	0.0656
000:03:13	0.166	1	2.5	1.5	1.606683805	0.6224	0.0664

000:03:15	0.168	2	2.5	1.5	1.60806175	1.243733333	0.0672
000:03:17	0.169	2	2.5	1.5	1.608751609	1.2432	0.0676
000:03:19	0.171	1	2.5	1.5	1.610133104	0.621066667	0.0684
000:03:49	0.197	1	2.5	1.5	1.628310899	0.614133333	0.0788
000:04:19	0.223	2	2.5	1.5	1.646903821	1.2144	0.0892
000:04:49	0.25	2	2.5	1.5	1.666666667	1.2	0.1
000:05:19	0.276	2	2.5	1.5	1.686151079	1.186133333	0.1104
000:05:49	0.302	2	2.5	1.5	1.706096451	1.172266667	0.1208
000:06:19	0.327	2	2.5	1.5	1.725724804	1.158933333	0.1308
000:06:49	0.353	2	2.5	1.5	1.746623195	1.145066667	0.1412
000:07:19	0.378	2	2.5	1.5	1.767200754	1.131733333	0.1512
000:07:49	0.404	2	2.5	1.5	1.789122137	1.117866667	0.1616
000:08:19	0.431	2	2.5	1.5	1.812469792	1.103466667	0.1724
000:08:49	0.457	2	2.5	1.5	1.835535977	1.0896	0.1828
000:09:19	0.483	2	2.5	1.5	1.859196827	1.075733333	0.1932
000:09:49	0.508	2	2.5	1.5	1.88253012	1.0624	0.2032
000:10:19	0.534	2	2.5	1.5	1.907426246	1.048533333	0.2136
000:10:49	0.559	2	2.5	1.5	1.931993818	1.0352	0.2236
000:11:19	0.585	2	2.5	1.5	1.958224543	1.021333333	0.234

Table B-20: Results of test at water content at plastic limit

TIME	VERTICAL DEFLECTION (in)	LOAD (lb)	L_0 (in)	A_0 $(in)^2$	A_C $(in)^2$	STRESS (psi)	STRAIN (in/in)
000:00:00	0.001	0	2.8125	1.23	1.230437489	0	0.000355556
000:00:01	0.002	0	2.8125	1.23	1.230875289	0	0.000711111
000:00:02	0.003	0	2.8125	1.23	1.231313401	0	0.001066667
000:00:03	0.004	0	2.8125	1.23	1.231751825	0	0.001422222
000:00:04	0.004	1	2.8125	1.23	1.231751825	0.811851852	0.001422222
000:00:05	0.005	0	2.8125	1.23	1.232190561	0	0.001777778
000:00:06	0.006	1	2.8125	1.23	1.23262961	0.811273713	0.002133333
000:00:07	0.007	0	2.8125	1.23	1.233068972	0	0.002488889
000:00:08	0.008	0	2.8125	1.23	1.233508647	0	0.002844444
000:00:09	0.009	0	2.8125	1.23	1.233948636	0	0.0032
000:00:10	0.009	0	2.8125	1.23	1.233948636	0	0.0032
000:00:11	0.01	1	2.8125	1.23	1.234388938	0.810117435	0.003555556
000:00:12	0.011	0	2.8125	1.23	1.234829556	0	0.003911111
000:00:13	0.012	0	2.8125	1.23	1.235270487	0	0.004266667
000:00:14	0.013	0	2.8125	1.23	1.235711734	0	0.004622222
000:00:15	0.014	0	2.8125	1.23	1.236153296	0	0.004977778
000:00:16	0.015	0	2.8125	1.23	1.236595174	0	0.005333333
000:00:17	0.015	0	2.8125	1.23	1.236595174	0	0.005333333
000:00:18	0.016	0	2.8125	1.23	1.237037368	0	0.005688889
000:00:19	0.017	1	2.8125	1.23	1.237479878	0.808093948	0.006044444

000:00:20	0.018	0	2.8125	1.23	1.237922705	0	0.0064
000:00:21	0.019	1	2.8125	1.23	1.238365849	0.807515808	0.006755556
000:00:22	0.02	0	2.8125	1.23	1.238809311	0	0.007111111
000:00:23	0.021	1	2.8125	1.23	1.23925309	0.806937669	0.007466667
000:00:24	0.022	0	2.8125	1.23	1.239697187	0	0.007822222
000:00:25	0.023	0	2.8125	1.23	1.240141602	0	0.008177778
000:00:26	0.023	0	2.8125	1.23	1.240141602	0	0.008177778
000:00:27	0.024	0	2.8125	1.23	1.240586337	0	0.008533333
000:00:28	0.025	0	2.8125	1.23	1.24103139	0	0.008888889
000:00:29	0.026	0	2.8125	1.23	1.241476763	0	0.009244444
000:00:30	0.027	0	2.8125	1.23	1.241922456	0	0.0096
000:00:31	0.028	1	2.8125	1.23	1.242368468	0.804914182	0.009955556
000:00:32	0.029	1	2.8125	1.23	1.242814802	0.804625113	0.010311111
000:00:33	0.03	1	2.8125	1.23	1.243261456	0.804336043	0.010666667
000:00:34	0.03	1	2.8125	1.23	1.243261456	0.804336043	0.010666667
000:00:35	0.031	1	2.8125	1.23	1.243708431	0.804046974	0.011022222
000:00:36	0.032	1	2.8125	1.23	1.244155727	0.803757904	0.011377778
000:00:37	0.033	1	2.8125	1.23	1.244603346	0.803468835	0.011733333
000:00:38	0.034	1	2.8125	1.23	1.245051287	0.803179765	0.012088889
000:00:39	0.035	1	2.8125	1.23	1.24549955	0.802890696	0.012444444
000:00:40	0.036	1	2.8125	1.23	1.245948136	0.802601626	0.0128
000:00:41	0.037	1	2.8125	1.23	1.246397046	0.802312556	0.013155556
000:00:42	0.038	1	2.8125	1.23	1.246846279	0.802023487	0.013511111
000:00:43	0.038	1	2.8125	1.23	1.246846279	0.802023487	0.013511111
000:00:44	0.039	1	2.8125	1.23	1.247295836	0.801734417	0.013866667
000:00:45	0.04	1	2.8125	1.23	1.247745717	0.801445348	0.014222222

000:00:46	0.041	2	2.8125	1.23	1.248195923	1.602312556	0.014577778
000:00:47	0.042	2	2.8125	1.23	1.248646454	1.601734417	0.014933333
000:00:48	0.043	2	2.8125	1.23	1.24909731	1.601156278	0.015288889
000:00:49	0.044	2	2.8125	1.23	1.249548492	1.600578139	0.015644444
000:00:50	0.045	2	2.8125	1.23	1.25	1.6	0.016
000:00:51	0.046	2	2.8125	1.23	1.250451834	1.599421861	0.016355556
000:00:52	0.046	2	2.8125	1.23	1.250451834	1.599421861	0.016355556
000:00:53	0.047	2	2.8125	1.23	1.250903996	1.598843722	0.016711111
000:00:54	0.048	2	2.8125	1.23	1.251356484	1.598265583	0.017066667
000:00:55	0.049	2	2.8125	1.23	1.2518093	1.597687444	0.017422222
000:00:56	0.05	2	2.8125	1.23	1.252262443	1.597109304	0.017777778
000:00:57	0.051	2	2.8125	1.23	1.252715915	1.596531165	0.018133333
000:00:58	0.052	2	2.8125	1.23	1.253169716	1.595953026	0.018488889
000:00:59	0.053	2	2.8125	1.23	1.253623845	1.595374887	0.018844444
000:01:00	0.053	2	2.8125	1.23	1.253623845	1.595374887	0.018844444
000:01:01	0.054	2	2.8125	1.23	1.254078303	1.594796748	0.0192
000:01:02	0.055	2	2.8125	1.23	1.254533092	1.594218609	0.019555556
000:01:03	0.056	2	2.8125	1.23	1.25498821	1.59364047	0.019911111
000:01:04	0.057	2	2.8125	1.23	1.255443658	1.593062331	0.020266667
000:01:05	0.058	2	2.8125	1.23	1.255899437	1.592484192	0.020622222
000:01:06	0.059	2	2.8125	1.23	1.256355547	1.591906052	0.020977778
000:01:07	0.06	3	2.8125	1.23	1.256811989	2.38699187	0.021333333
000:01:08	0.061	2	2.8125	1.23	1.257268762	1.590749774	0.021688889
000:01:09	0.062	2	2.8125	1.23	1.257725868	1.590171635	0.022044444
000:01:10	0.063	2	2.8125	1.23	1.258183306	1.589593496	0.0224
000:01:11	0.064	2	2.8125	1.23	1.258641077	1.589015357	0.022755556

000:01:12	0.064	3	2.8125	1.23	1.258641077	2.383523035	0.022755556
000:01:13	0.065	3	2.8125	1.23	1.259099181	2.382655827	0.023111111
000:01:14	0.066	3	2.8125	1.23	1.259557619	2.381788618	0.023466667
000:01:15	0.067	3	2.8125	1.23	1.26001639	2.380921409	0.023822222
000:01:16	0.068	3	2.8125	1.23	1.260475496	2.380054201	0.024177778
000:01:17	0.069	2	2.8125	1.23	1.260934937	1.586124661	0.024533333
000:01:18	0.07	2	2.8125	1.23	1.261394713	1.585546522	0.024888889
000:01:19	0.071	2	2.8125	1.23	1.261854824	1.584968383	0.025244444
000:01:20	0.071	2	2.8125	1.23	1.261854824	1.584968383	0.025244444
000:01:21	0.072	3	2.8125	1.23	1.262315271	2.376585366	0.0256
000:01:22	0.073	2	2.8125	1.23	1.262776054	1.583812105	0.025955556
000:01:23	0.074	3	2.8125	1.23	1.263237174	2.374850949	0.026311111
000:01:24	0.075	3	2.8125	1.23	1.26369863	2.37398374	0.026666667
000:01:25	0.076	3	2.8125	1.23	1.264160424	2.373116531	0.027022222
000:01:26	0.077	3	2.8125	1.23	1.264622555	2.372249322	0.027377778
000:01:27	0.078	3	2.8125	1.23	1.265085025	2.371382114	0.027733333
000:01:28	0.078	3	2.8125	1.23	1.265085025	2.371382114	0.027733333
000:01:29	0.079	3	2.8125	1.23	1.265547832	2.370514905	0.028088889
000:01:30	0.08	3	2.8125	1.23	1.266010979	2.369647696	0.028444444
000:01:31	0.081	3	2.8125	1.23	1.266474465	2.368780488	0.0288
000:01:32	0.082	3	2.8125	1.23	1.26693829	2.367913279	0.029155556
000:01:33	0.083	3	2.8125	1.23	1.267402455	2.36704607	0.029511111
000:01:34	0.084	3	2.8125	1.23	1.26786696	2.366178862	0.029866667
000:01:35	0.085	3	2.8125	1.23	1.268331806	2.365311653	0.030222222
000:01:36	0.085	4	2.8125	1.23	1.268331806	3.153748871	0.030222222
000:01:37	0.086	3	2.8125	1.23	1.268796992	2.364444444	0.030577778

000:01:38	0.087	4	2.8125	1.23	1.269262521	3.151436314	0.030933333
000:01:39	0.088	3	2.8125	1.23	1.269728391	2.362710027	0.031288889
000:01:41	0.09	3	2.8125	1.23	1.270661157	2.36097561	0.032
000:01:43	0.091	3	2.8125	1.23	1.271128054	2.360108401	0.032355556
000:01:45	0.093	4	2.8125	1.23	1.272062879	3.144498645	0.033066667
000:01:47	0.095	4	2.8125	1.23	1.27299908	3.142186089	0.033777778
000:01:49	0.097	4	2.8125	1.23	1.27393666	3.139873532	0.034488889
000:01:51	0.098	4	2.8125	1.23	1.274405968	3.138717254	0.034844444
000:01:53	0.1	4	2.8125	1.23	1.275345622	3.136404697	0.035555556
000:01:55	0.102	4	2.8125	1.23	1.276286663	3.134092141	0.036266667
000:01:57	0.104	4	2.8125	1.23	1.277229094	3.131779584	0.036977778
000:01:59	0.105	4	2.8125	1.23	1.277700831	3.130623306	0.037333333
000:02:01	0.107	4	2.8125	1.23	1.278645352	3.12831075	0.038044444
000:02:03	0.109	4	2.8125	1.23	1.279591271	3.125998193	0.038755556
000:02:05	0.11	4	2.8125	1.23	1.280064755	3.124841915	0.039111111
000:02:07	0.112	4	2.8125	1.23	1.281012775	3.122529359	0.039822222
000:02:09	0.114	4	2.8125	1.23	1.281962201	3.120216802	0.040533333
000:02:11	0.116	4	2.8125	1.23	1.282913035	3.117904246	0.041244444
000:02:13	0.117	4	2.8125	1.23	1.283388982	3.116747967	0.0416
000:02:15	0.119	4	2.8125	1.23	1.284341934	3.114435411	0.042311111
000:02:17	0.121	4	2.8125	1.23	1.285296303	3.112122855	0.043022222
000:02:19	0.122	3	2.8125	1.23	1.28577402	2.333224932	0.043377778
000:02:21	0.124	4	2.8125	1.23	1.286730519	3.10865402	0.044088889
000:02:23	0.126	3	2.8125	1.23	1.287688442	2.329756098	0.0448
000:02:25	0.127	3	2.8125	1.23	1.288167939	2.328888889	0.045155556
000:02:27	0.129	3	2.8125	1.23	1.289128004	2.327154472	0.045866667

000:02:29	0.131	3	2.8125	1.23	1.290089502	2.325420054	0.046577778
000:02:31	0.132	3	2.8125	1.23	1.290570789	2.324552846	0.046933333
000:02:33	0.134	3	2.8125	1.23	1.291534441	2.322818428	0.047644444
000:02:35	0.136	3	2.8125	1.23	1.292499533	2.321084011	0.048355556
000:02:37	0.137	3	2.8125	1.23	1.29298262	2.320216802	0.048711111
000:02:39	0.139	3	2.8125	1.23	1.293949878	2.318482385	0.049422222
000:02:41	0.141	3	2.8125	1.23	1.294918585	2.316747967	0.050133333
000:02:43	0.143	3	2.8125	1.23	1.295888743	2.31501355	0.050844444
000:02:45	0.144	3	2.8125	1.23	1.296374368	2.314146341	0.0512
000:02:47	0.146	3	2.8125	1.23	1.297346709	2.312411924	0.051911111
000:02:49	0.148	3	2.8125	1.23	1.29832051	2.310677507	0.052622222
000:02:51	0.149	3	2.8125	1.23	1.298807959	2.309810298	0.052977778
000:02:53	0.151	3	2.8125	1.23	1.299783956	2.308075881	0.053688889
000:02:55	0.153	3	2.8125	1.23	1.300761421	2.306341463	0.0544
000:02:57	0.155	3	2.8125	1.23	1.301740357	2.304607046	0.055111111
000:02:59	0.156	3	2.8125	1.23	1.302230378	2.303739837	0.055466667
000:03:01	0.158	3	2.8125	1.23	1.303211528	2.30200542	0.056177778
000:03:03	0.16	3	2.8125	1.23	1.304194156	2.300271003	0.056888889
000:03:05	0.161	4	2.8125	1.23	1.304686027	3.065871725	0.057244444
000:03:07	0.163	3	2.8125	1.23	1.305670881	2.297669377	0.057955556
000:03:09	0.165	3	2.8125	1.23	1.306657224	2.295934959	0.058666667
000:03:11	0.167	3	2.8125	1.23	1.307645058	2.294200542	0.059377778
000:03:13	0.168	3	2.8125	1.23	1.308139535	2.293333333	0.059733333
000:03:15	0.17	3	2.8125	1.23	1.309129612	2.291598916	0.060444444
000:03:17	0.172	3	2.8125	1.23	1.310121189	2.289864499	0.061155556
000:03:19	0.173	3	2.8125	1.23	1.310617541	2.28899729	0.061511111

000:03:49	0.2	3	2.8125	1.23	1.324162679	2.265582656	0.071111111
000:04:19	0.226	2	2.8125	1.23	1.33747342	1.49535682	0.080355556
000:04:49	0.253	1	2.8125	1.23	1.35158234	0.739873532	0.089955556
000:05:19	0.279	2	2.8125	1.23	1.365452931	1.464715447	0.0992
000:05:49	0.304	1	2.8125	1.23	1.379061192	0.725130985	0.108088889
000:06:19	0.33	1	2.8125	1.23	1.393504532	0.717615176	0.117333333
000:06:49	0.356	1	2.8125	1.23	1.408253613	0.710099368	0.126577778
000:07:19	0.381	1	2.8125	1.23	1.422732881	0.702872629	0.135466667

Table B-21: Results of test at water content below plastic limit

TIME	**VERTICAL DEFLECTION (in)**	**LOAD (lb)**	**L_0 (in)**	**A_0 $(in)^2$**	**A_C $(in)^2$**	**STRESS (psi)**	**STRAIN (in/in)**
			2.875	1.23			
000:00:00	0	0	2.875	1.23	1.23	0	0
000:00:01	0	0	2.875	1.23	1.23	0	0
000:00:02	0	0	2.875	1.23	1.23	0	0
000:00:03	0.001	1	2.875	1.23	1.230427975	0.812725345	0.000347826
000:00:04	0.002	0	2.875	1.23	1.230856248	0	0.000695652
000:00:05	0.003	1	2.875	1.23	1.231284819	0.812159774	0.001043478
000:00:06	0.004	1	2.875	1.23	1.231713689	0.811876988	0.001391304

000:00:07	0.005	1	2.875	1.23	1.232142857	0.811594203	0.00173913
000:00:08	0.006	1	2.875	1.23	1.232572325	0.811311417	0.002086957
000:00:09	0.006	1	2.875	1.23	1.232572325	0.811311417	0.002086957
000:00:10	0.007	1	2.875	1.23	1.233002092	0.811028632	0.002434783
000:00:11	0.008	1	2.875	1.23	1.233432159	0.810745847	0.002782609
000:00:12	0.009	1	2.875	1.23	1.233862526	0.810463061	0.003130435
000:00:13	0.01	2	2.875	1.23	1.234293194	1.620360551	0.003478261
000:00:14	0.011	2	2.875	1.23	1.234724162	1.619794981	0.003826087
000:00:15	0.011	2	2.875	1.23	1.234724162	1.619794981	0.003826087
000:00:16	0.012	3	2.875	1.23	1.235155431	2.428844115	0.004173913
000:00:17	0.013	2	2.875	1.23	1.235587002	1.618663839	0.004521739
000:00:18	0.014	3	2.875	1.23	1.236018875	2.427147402	0.004869565
000:00:19	0.015	3	2.875	1.23	1.236451049	2.426299046	0.005217391
000:00:20	0.016	3	2.875	1.23	1.236883526	2.425450689	0.005565217
000:00:21	0.017	3	2.875	1.23	1.237316305	2.424602333	0.005913043
000:00:22	0.017	3	2.875	1.23	1.237316305	2.424602333	0.005913043
000:00:23	0.018	4	2.875	1.23	1.237749387	3.231671969	0.00626087
000:00:24	0.019	4	2.875	1.23	1.238182773	3.230540827	0.006608696
000:00:25	0.02	4	2.875	1.23	1.238616462	3.229409685	0.006956522
000:00:26	0.021	4	2.875	1.23	1.239050456	3.228278544	0.007304348
000:00:27	0.022	5	2.875	1.23	1.239484753	4.033934252	0.007652174
000:00:28	0.022	5	2.875	1.23	1.239484753	4.033934252	0.007652174
000:00:29	0.023	5	2.875	1.23	1.239919355	4.032520325	0.008
000:00:30	0.024	5	2.875	1.23	1.240354262	4.031106398	0.008347826
000:00:31	0.025	6	2.875	1.23	1.240789474	4.835630965	0.008695652
000:00:32	0.026	6	2.875	1.23	1.241224991	4.833934252	0.009043478

000:00:33	0.027	7	2.875	1.23	1.241660815	5.637610463	0.009391304
000:00:34	0.027	7	2.875	1.23	1.241660815	5.637610463	0.009391304
000:00:35	0.028	7	2.875	1.23	1.242096944	5.635630965	0.00973913
000:00:36	0.029	8	2.875	1.23	1.24253338	6.438458819	0.010086957
000:00:37	0.03	8	2.875	1.23	1.242970123	6.436196536	0.010434783
000:00:38	0.031	9	2.875	1.23	1.243407173	7.238176034	0.010782609
000:00:39	0.032	9	2.875	1.23	1.24384453	7.235630965	0.011130435
000:00:40	0.033	9	2.875	1.23	1.244282196	7.233085896	0.011478261
000:00:41	0.033	10	2.875	1.23	1.244282196	8.036762107	0.011478261
000:00:42	0.034	11	2.875	1.23	1.244720169	8.837327678	0.011826087
000:00:43	0.035	11	2.875	1.23	1.245158451	8.834217038	0.012173913
000:00:44	0.036	11	2.875	1.23	1.245597041	8.831106398	0.012521739
000:00:45	0.037	12	2.875	1.23	1.246035941	9.630540827	0.012869565
000:00:46	0.038	12	2.875	1.23	1.24647515	9.627147402	0.013217391
000:00:47	0.039	12	2.875	1.23	1.246914669	9.623753977	0.013565217
000:00:48	0.039	13	2.875	1.23	1.246914669	10.42573347	0.013565217
000:00:49	0.04	13	2.875	1.23	1.247354497	10.42205726	0.013913043
000:00:50	0.041	14	2.875	1.23	1.247794637	11.21979498	0.01426087
000:00:51	0.042	14	2.875	1.23	1.248235086	11.21583598	0.014608696
000:00:52	0.043	14	2.875	1.23	1.248675847	11.21187699	0.014956522
000:00:53	0.044	15	2.875	1.23	1.24911692	12.00848356	0.015304348
000:00:54	0.045	15	2.875	1.23	1.249558304	12.00424178	0.015652174
000:00:55	0.045	15	2.875	1.23	1.249558304	12.00424178	0.015652174
000:00:56	0.046	16	2.875	1.23	1.25	12.8	0.016
000:00:57	0.047	16	2.875	1.23	1.250442008	12.79547543	0.016347826
000:00:58	0.048	16	2.875	1.23	1.25088433	12.79095087	0.016695652

000:00:59	0.049	16	2.875	1.23	1.251326964	12.7864263	0.017043478
000:01:00	0.05	17	2.875	1.23	1.251769912	13.58077059	0.017391304
000:01:01	0.051	17	2.875	1.23	1.252213173	13.57596324	0.01773913
000:01:02	0.051	17	2.875	1.23	1.252213173	13.57596324	0.01773913
000:01:03	0.052	17	2.875	1.23	1.252656748	13.57115589	0.018086957
000:01:04	0.053	17	2.875	1.23	1.253100638	13.56634853	0.018434783
000:01:05	0.054	18	2.875	1.23	1.253544842	14.3592789	0.018782609
000:01:06	0.055	18	2.875	1.23	1.253989362	14.35418876	0.019130435
000:01:07	0.056	18	2.875	1.23	1.254434197	14.34909862	0.019478261
000:01:08	0.057	18	2.875	1.23	1.254879347	14.34400848	0.019826087
000:01:09	0.058	18	2.875	1.23	1.255324814	14.33891835	0.020173913
000:01:10	0.058	19	2.875	1.23	1.255324814	15.13552492	0.020173913
000:01:11	0.059	19	2.875	1.23	1.255770597	15.130152	0.020521739
000:01:12	0.06	19	2.875	1.23	1.256216696	15.12477907	0.020869565
000:01:13	0.061	19	2.875	1.23	1.256663113	15.11940615	0.021217391
000:01:14	0.062	19	2.875	1.23	1.257109847	15.11403323	0.021565217
000:01:15	0.063	18	2.875	1.23	1.257556899	14.31346766	0.021913043
000:01:16	0.064	18	2.875	1.23	1.258004269	14.30837752	0.02226087
000:01:17	0.064	18	2.875	1.23	1.258004269	14.30837752	0.02226087
000:01:18	0.065	18	2.875	1.23	1.258451957	14.30328738	0.022608696
000:01:19	0.066	18	2.875	1.23	1.258899964	14.29819724	0.022956522
000:01:20	0.067	17	2.875	1.23	1.259348291	13.4990456	0.023304348
000:01:21	0.068	17	2.875	1.23	1.259796936	13.49423825	0.023652174
000:01:22	0.069	17	2.875	1.23	1.260245902	13.48943089	0.024
000:01:23	0.07	16	2.875	1.23	1.260695187	12.69141039	0.024347826
000:01:24	0.071	16	2.875	1.23	1.261144793	12.68688583	0.024695652

000:01:25	0.072	16	2.875	1.23	1.26159472	12.68236126	0.025043478
000:01:26	0.073	16	2.875	1.23	1.262044968	12.67783669	0.025391304
000:01:27	0.073	15	2.875	1.23	1.262044968	11.8854719	0.025391304
000:01:28	0.074	15	2.875	1.23	1.262495537	11.88123012	0.02573913
000:01:29	0.075	15	2.875	1.23	1.262946429	11.87698834	0.026086957
000:01:30	0.076	15	2.875	1.23	1.263397642	11.87274655	0.026434783
000:01:31	0.077	15	2.875	1.23	1.263849178	11.86850477	0.026782609
000:01:32	0.078	15	2.875	1.23	1.264301037	11.86426299	0.027130435
000:01:33	0.079	14	2.875	1.23	1.264753219	11.06935313	0.027478261
000:01:34	0.08	14	2.875	1.23	1.265205725	11.06539413	0.027826087
000:01:35	0.081	14	2.875	1.23	1.265658554	11.06143514	0.028173913
000:01:36	0.081	14	2.875	1.23	1.265658554	11.06143514	0.028173913
000:01:37	0.082	14	2.875	1.23	1.266111708	11.05747614	0.028521739
000:01:38	0.083	14	2.875	1.23	1.266565186	11.05351714	0.028869565
000:01:39	0.084	13	2.875	1.23	1.26701899	10.26030399	0.029217391
000:01:41	0.086	13	2.875	1.23	1.267927573	10.25295157	0.029913043
000:01:43	0.088	13	2.875	1.23	1.26883746	10.24559915	0.030608696
000:01:45	0.089	13	2.875	1.23	1.269292893	10.24192294	0.030956522
000:01:47	0.091	12	2.875	1.23	1.270204741	9.447295864	0.031652174
000:01:49	0.093	12	2.875	1.23	1.271117901	9.440509014	0.032347826
000:01:51	0.095	12	2.875	1.23	1.272032374	9.433722163	0.033043478
000:01:53	0.097	11	2.875	1.23	1.272948164	8.64135737	0.03373913
000:01:55	0.098	11	2.875	1.23	1.273406554	8.63824673	0.034086957
000:01:57	0.1	11	2.875	1.23	1.274324324	8.632025451	0.034782609
000:01:59	0.102	10	2.875	1.23	1.275243419	7.841640156	0.035478261
000:02:01	0.104	10	2.875	1.23	1.27616384	7.835984447	0.036173913

000:02:03	0.105	10	2.875	1.23	1.276624549	7.833156592	0.036521739
000:02:05	0.107	10	2.875	1.23	1.277546965	7.827500884	0.037217391
000:02:07	0.109	10	2.875	1.23	1.278470716	7.821845175	0.037913043
000:02:09	0.111	9	2.875	1.23	1.279395803	7.03457052	0.038608696
000:02:11	0.112	10	2.875	1.23	1.279858849	7.813361612	0.038956522
000:02:13	0.114	9	2.875	1.23	1.280785947	7.026935313	0.039652174
000:02:15	0.116	9	2.875	1.23	1.281714389	7.021845175	0.040347826
000:02:17	0.118	9	2.875	1.23	1.282644178	7.016755037	0.041043478
000:02:19	0.119	8	2.875	1.23	1.283109579	6.234853305	0.041391304
000:02:21	0.121	8	2.875	1.23	1.284041394	6.230328738	0.042086957
000:02:23	0.123	8	2.875	1.23	1.284974564	6.225804171	0.042782609
000:02:25	0.125	8	2.875	1.23	1.285909091	6.221279604	0.043478261
000:02:27	0.126	8	2.875	1.23	1.286376864	6.219017321	0.043826087
000:02:29	0.128	7	2.875	1.23	1.287313433	5.437681159	0.044521739
000:02:31	0.13	7	2.875	1.23	1.288251366	5.433722163	0.045217391
000:02:33	0.132	7	2.875	1.23	1.289190667	5.429763167	0.045913043
000:02:35	0.133	7	2.875	1.23	1.289660832	5.427783669	0.04626087
000:02:37	0.135	7	2.875	1.23	1.29060219	5.423824673	0.046956522
000:02:39	0.137	7	2.875	1.23	1.291544923	5.419865677	0.047652174
000:02:41	0.138	7	2.875	1.23	1.292016807	5.417886179	0.048
000:02:43	0.14	6	2.875	1.23	1.292961609	4.640509014	0.048695652
000:02:45	0.142	6	2.875	1.23	1.293907794	4.637115589	0.049391304
000:02:47	0.144	6	2.875	1.23	1.294855364	4.633722163	0.050086957
000:02:49	0.145	6	2.875	1.23	1.29532967	4.632025451	0.050434783
000:02:51	0.147	5	2.875	1.23	1.296279326	3.857193355	0.051130435
000:02:53	0.149	5	2.875	1.23	1.297230374	3.8543655	0.051826087

000:02:55	0.151	5	2.875	1.23	1.298182819	3.851537646	0.052521739
000:02:57	0.152	5	2.875	1.23	1.298659567	3.850123719	0.052869565
000:02:59	0.154	5	2.875	1.23	1.299614112	3.847295864	0.053565217
000:03:01	0.156	5	2.875	1.23	1.300570063	3.84446801	0.05426087
000:03:03	0.157	5	2.875	1.23	1.301048565	3.843054083	0.054608696
000:03:05	0.159	5	2.875	1.23	1.302006627	3.840226228	0.055304348
000:03:07	0.161	5	2.875	1.23	1.302966102	3.837398374	0.056
000:03:09	0.163	4	2.875	1.23	1.303926991	3.067656416	0.056695652
000:03:11	0.164	4	2.875	1.23	1.304407968	3.066525274	0.057043478
000:03:13	0.166	4	2.875	1.23	1.305370986	3.06426299	0.05773913
000:03:15	0.168	4	2.875	1.23	1.306335427	3.062000707	0.058434783
000:03:17	0.17	4	2.875	1.23	1.307301294	3.059738423	0.059130435
000:03:19	0.171	4	2.875	1.23	1.307784763	3.058607282	0.059478261
000:03:49	0.197	3	2.875	1.23	1.320481703	2.271898197	0.068521739

- Table of unit weights where the water content is above the plastic limit

SAND	CLAY	LENGTH	DIAMETER	AREA	WEIGHT	VOLUME	WATER CONTENT	PLASTIC LIMIT	UNIT WEIGHT	DRY UNIT WEIGHT
20	80	0.234	0.109	0.009	0.251	0.002	34.000	28.130	114.905	85.750
50	50	2.750	0.104	0.009	0.269	0.002	21.390	16.860	134.500	103.105
0	100	0.245	0.104	0.008	0.287	0.002	42.260	38.670	137.823	96.881
10	90	0.229	0.104	0.008	0.235	0.002	33.520	30.210	120.715	90.409
40	60	0.234	0.109	0.009	0.269	0.002	22.280	18.310	122.998	100.587
70	30	0.177	0.125	0.012	0.264	0.002	18.680	17.830	121.483	102.362

80	20	0.208	0.109	0.009	0.273	0.002	20.040	15.910	140.430	116.986

- Table of unit weights where the water content is at the plastic limit

SAMPLE	SAND	CLAY	LENGTH	DIAMETER	AREA	WEIGHT	VOLUME	WATER CONTENT	PLASTIC LIMIT	UNIT WEIGHT	DRY UNIT WEIGHT
A2	20	80	0.234	0.109	0.009	0.243	0.002	30.660	28.130	110.881	84.862
B2	50	50	0.240	0.109	0.009	0.287	0.002	15.600	16.860	128.197	110.897
D2	0	100	0.234	0.109	0.009	0.234	0.002	37.700	38.670	106.853	77.598
E2	10	90	0.234	0.109	0.009	0.251	0.002	29.600	30.210	114.905	88.661
F2	40	60	0.234	0.109	0.009	0.273	0.002	19.700	18.310	124.964	104.398
G2	70	30	0.229	0.109	0.009	0.282	0.002	15.950	17.830	131.962	113.809

H2	80	20	0.234	0.109	0.009	0.278	0.002	15.580	15.910	127.013	109.892

- Table of unit weights where the water content is below the plastic limit

SAMPLE	SAND	CLAY	LENGTH	DIAMETER	AREA	WEIGHT	VOLUME	WATER CONTENT	PLASTIC LIMIT	UNIT WEIGHT	DRY UNIT WEIGHT
A	20	80	2.813	0.104	0.009	0.247	0.002	24.730	28.130	123.500	104.299
B	50	50	2.813	0.104	0.009	0.267	0.002	11.440	16.860	133.350	105.833
D	0	100	2.750	0.104	0.009	0.234	0.002	37.020	38.670	116.850	83.096

E	10	90	2.875	0.104	0.009	0.255	0.002	28.440	30.210	127.500	91.071
F	40	60	2.875	0.104	0.009	0.289	0.002	16.140	18.310	144.400	119.132
G	70	30	2.750	0.104	0.009	0.289	0.002	13.940	17.830	144.400	122.946
H	80	20	2.750	0.104	0.009	0.293	0.002	12.150	15.910	146.500	127.669