ESTABLISHMENT OF FUNDAMENTAL CHARACTERISTICS OF SOME UNSATURATED SRI LANKAN RESIDUAL SOILS

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Thesis submitted in partial fulfillment of the requirements for the degree of Master of Engineering in Foundation Engineering and Earth Retaining Systems

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DECLARATION

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ABSTRACT

Slope failure in tropical climates frequently occurs due to excessive rainfall. Heavy infiltration causes destruction of matric suctions, development of perched water table conditions and rise of ground water table. Severe erosion and surface destruction will also be caused by the heavy prolonged rainfall. In order to understand the threshold values of rainfall leading to instability it is necessary to model this process with a reasonable accuracy.

Sri Lankan residual soil formations are formed by weathering of the metamorphic parent rock and have inherited significant abrupt variations in engineering characteristics. Basic characteristics of these soil formations such as soil water characteristic curves (SWCCs), variation of permeability with water content and unsaturated shear strength parameters are essential parameters in these analyses. These characteristics have not been established for typical residual soils forming slopes in Sri Lanka.

This thesis highlights the need for detailed experimental studies and presents comprehensive studies that have been conducted at the University of Moratuwa and National Building Research Organization (NBRO) laboratories to establish the fundamental characteristics of unsaturated Sri Lankan residual soils. Undisturbed samples of soil obtained from the failed slope at Welipenna in the Southern Expressway were used in this study.

Direct shear tests were done by modifying the conventional apparatus by incorporating a miniature tensiometer which allows for the simple and direct measurement of soil matric suction during shearing. Soil water characteristic curves (SWCCs) were also established using these apparatus. Alternatively, pressure plate apparatus was also used for this purpose. In addition to that, soil water characteristic curves (SWCCs) were developed from gradation curve also.

Permeability of an unsaturated soil varies considerably with the level of saturation and will make a very significance influence on the infiltration process. Permeability function which defines the variation of permeability with matric suction was investigated on undisturbed samples. The method is based on continuously drying and wetting the soil sample while continuously monitoring the suction gradient and the change in soil mass. The thesis highlights the importance of these studies and presents the procedures that are being used.

DEDICATION

This thesis is dedicated to my parents Late Mr.N.Vethasalam and Mrs.V.Sakunthaladevi. They have encouraged me all the time “study, study, study……., then only you will achieve your target”. As they said I have obtained my BSc. Eng. (Civil) in March 2004 and I started my master carrier in May 2013. I have lost my father in March 2015 during my masters. Appa! your dream came true and I know that you are somewhere around here watching our achievements.

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Nanthini Vasanthan,
9th November 2016.

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List of symbols

A	- Cross sectional area of the sample
A*	- Point corresponds to the air-entry value
B*	- Point corresponds to residual Water Content
c_a	- Apparent cohesion
c^s	- Additional cohesion in unsaturated soil due to matric suction
c'	- Effective cohesion
C_v	- Coefficient of consolidation
dt	- Change of time
dV_w	- Change of volume of water
dz	- Change of elevation head
e	- Void ratio of the soil
e_0	- Initial void ratio
e_f	- Final void ratio
g	- Acceleration due to gravity
G_s	- Specific gravity of the soil
h_i	- Total pore length
h_t	- Total head
H_1	- Height of drainage path for section- 1
H_2	- Height of drainage path for section- 2
i	- Hydraulic gradient
I_r	- Rainfall intensity
k	- Permeability of the soil
m	- Soil mass
m_v	- Coefficient of volume compressibility

n_i	- Number of spherical particles
p	- Normal stress applied for consolidation test
q	- Boundary flux
Q	- Nodal flux
r_i	- Pore radius
R_i	- Mean particle radius
R_s	- Radius of curvature
s	- Matric suction
S_r	- Degree of saturation of the soil
t	- Elapsed time
t_{90}	- Time taken for 90% consolidation
$t_{90,1}$	- Time taken for 90% consolidation for Section-1
$t_{90,2}$	- Time taken for 90% consolidation for Section-2
T_{90}	- Time factor for 90% consolidation
T_s	- Surface tension
u_a	- Pore air pressure
u_w	- Pore water pressure
$(u_a - u_w)_b$	- Matric suction at air-entry value
$(u_a - u_w)_{calc}$	- Matric suction calculated
$(u_a - u_w)_{meas}$	- Matric suction measured
$(u_a - u_w)_r$	- Matric suction at residual water content
v	- Flux or discharge velocity
V	- Volume of soil
V_b	- Sample bulk volume per unit sample mass
V_{pi}	- Total solid volume

V_t	- Voltage at any suction/pressure at the time
V_{vi}	- Pore volume per unit sample mass in i^{th} particle size range
V_w	- Volume of water of soil
V_0	- Voltage at atmospheric pressure
w	- Gravimetric moisture content of the soil
W_i	- Solid mass per unit sample mass in i^{th} particle site range
z	- Elevation head of each tensiometer relative to the base of sample
W_s	- Solid weight of the soil
γ_w	- Unit weight of the water
θ_r	- Residual volumetric water content
θ_s	- Saturated volumetric water content
θ_w	- Volumetric water content
θ	- Contact angle
$(\sigma_n - u_a)$	- Net normal stress
τ	- Shear stress
ϕ'	- Effective internal angle of friction
σ_n	- Normal stress
σ', $(\sigma_n - u_w)$	- Effective stress
τ_{max}	- Shear strength at failure
ϕ^b	- Angle of shearing resistance due to suction
σ_x	- Total normal stress in the x-direction (or on the x-plane)
σ_y	- Total normal stress in the y-direction (or on the y-plane)
σ_z	- Total normal stress in the z-direction (or on the z-plane)
$(\sigma_x - u_a)$	- Net normal stress in the x-direction
$(\sigma_y - u_a)$	- Net normal stress in the y-direction

$(\sigma_z - u_a)$	- Net normal stress in the z-direction
τ_{xy}	- Shear stress on the x-plane in the y-direction
τ_{xz}	- Shear stress on the x-plane in the z-direction
τ_{yx}	- Shear stress on the y-plane in the x-direction
τ_{yz}	- Shear stress on the y-plane in the z-direction
τ_{zx}	- Shear stress on the z-plane in the x-direction
τ_{zy}	- Shear stress on the z-plane in the y-direction
ρ_p	- Particle density
θ_{vi}	- Volumetric water content i^{th} particle size range
θ^*_{vi}	- Average volumetric water content represent by mid-point of the i^{th} particle size range
θ_{vi+1}	- Volumetric water content $(i+1)^{th}$ particle size range
π	- Mathematical constant (Pi)
α	- Model parameter
ρ_w	- Density of water
ρ_d	- Dry density of soil
ρ_w	- Density of water
ψ	- Soil water pressure head

List of abbreviations

Al	- Aluminum
$Al_2 O_3$	- Aluminum Oxide
ATM	- Atmospheric pressure
ATT	- At The Time
BSCS	- British Soil Classification System
Cr	- Chromium
E01	- Express way No.1
Fe	- Iron
$Fe_2 O_3$	- Ferric Oxide
GED	- Geotechnical Engineering Division
GIL	- Geotechnical Innovation Laboratory
HC	- Highland Complex
KC	- Kadugannawa Complex
KU	- Kasetsart University
KU T1	- Kasetsart University Tensionmeter type 1
KU T2	- Kasetsart University Tensionmeter type 2
KU T3	- Kasetsart University Tensionmeter type 3
KU T4	- Kasetsart University Tensionmeter type 4
LCD	- Liquid Crystal Display
MEMs	- Micro Electro Mechanical System
Mn	- Manganese
MH	- SANDY elastic SILT
MS	- SANDY SILT
NBRO	- National Building Research Organization

Ni	- Nickel
PVC	- Poly Vinyl Chloride
SD	- Secure Digital
SM	- SILTY SAND
SWCC	- Soil Water Characteristic Curve
VC	- Vijayan Complex
WC	- Wanni Complex
1-D	- One Dimensional

Annexures

Chapter 1

1.0. INTRODUCTION

1.1. Scope of soil mechanics

Soil mechanics involves an application of principles of mechanics to study the behavior of soils. Soils are naturally formed material comprising of solids and voids spaces in between. These voids spaces may be filled water, air or a combination of the two. Soils can be divided into categories of saturated and unsaturated. Classical soil mechanics was developed for saturated soils where all the voids are filled with water where soil is a two phase material.

Subsequently it was realized that the behavior of unsaturated soils cannot be explained with the principles and concepts of classical, saturated soil mechanics. Commonly, it is the presence of more than two phases that results in a material that is difficult to deal with in engineering practice. The categories of soils are illustrated in Figure 1.1. A large percentage (more than 30%) of soils present in the earth is unsaturated (after Fredlund and Rahardjo, 1993) and special attention must be paid to understand the differences. The differentiation between saturated and unsaturated soils becomes necessary due to basic differences in their nature and engineering behavior. An unsaturated soil has more than two phases, and the pore-water pressure is negative relative to the pore-air pressure. Any soil near the ground surface, present in a relatively dry environment, will be subjected to negative pore-water pressures and possible desaturation.

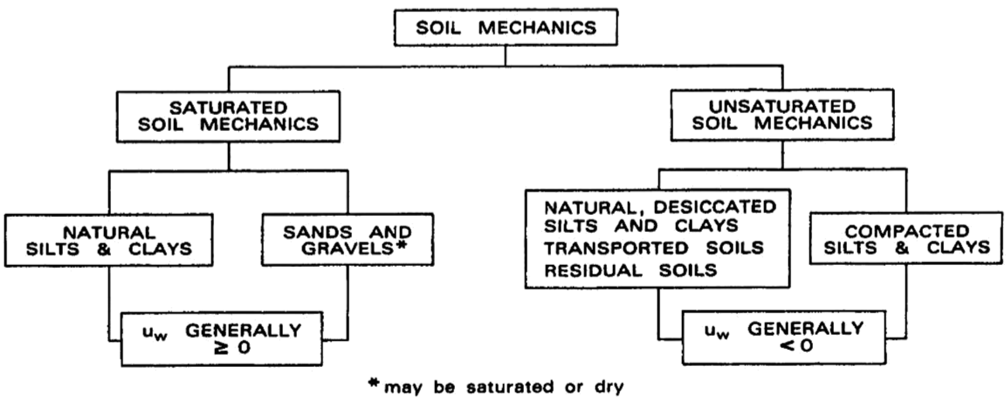


Figure 1.1: Categorization of soil mechanics (after Fredlund and Rahardjo, 1993)

It was recognized lately that the behavior of residual soils is different from that of classical transported soils. Once again, the primary factor contributing to their unusual behavior is their negative pore-water pressures. Attempts have been made to use saturated soil mechanics design procedures on these soils with limited success.

1.2. Unsaturated soil mechanics

Unsaturated Soil Mechanics is the branch of traditional soil mechanics that takes into account the effects of the pore air phase when quantifying values such as shear strength, permeability and volume change.

An unsaturated soil is commonly defined as having three phases, namely, 1) solids, 2) water, and 3) air. However, it may be more correct to recognize the existence of a fourth phase, namely, that of the air-water interface or contractile skin (Fredlund and Morgenstern, 1977). The presence of even the smallest amount of air renders a soil unsaturated. A small amount of air, likely occurring as occluded air bubbles, renders the pore fluid compressible. Generally, it is a larger amount of air which makes the air phase continuous throughout the soil. At the same time, the pore-air and pore-water pressures begin to differ significantly, with the result that the principles and concepts involved differ from those of classical, saturated soil mechanics.

1.3. Role of climate

Climate plays an important role in whether a soil is saturated or unsaturated. Water is removed from the soil either by evaporation from the ground surface or by evapotranspiration from a vegetative cover. These processes produce an upward flux of water out of the soil. On the other hand, rainfall and other forms of precipitation provide a downward flux into the soil. The difference between these two flux conditions on a local scale largely dictates the pore-water pressure conditions in the soil. Year after year, the soil mass is subjected to varying and changing environmental conditions. These produce changes in the pore-water pressure distribution, which in turn result in shrinking and swelling of the soil deposit. The pore- water pressure distribution with depth can take on a wide variety of shapes as a result of environmental changes.

Significant areas of the earth's surface are classified as arid zones (Figure 1.2). The annual evaporation from the ground surface in these regions exceeds the annual precipitation.

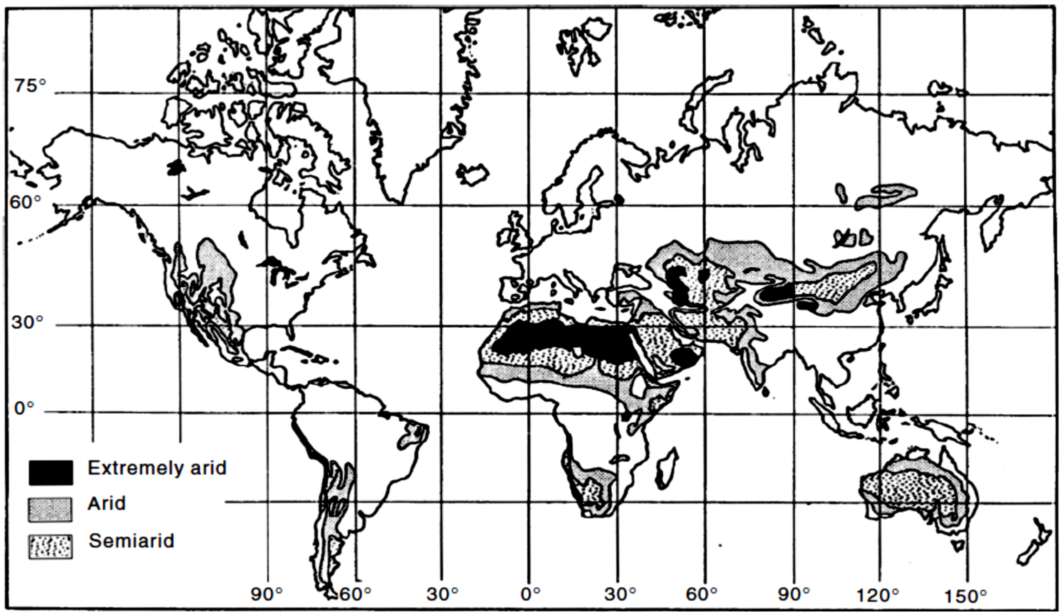


Figure 1.2: The climatic classification of the extremely arid, arid and semi-arid areas of the world (from Megis, 1953 and Dregne, 1976)

Arid and semi-arid areas usually have a deep ground water table. Soils located above the water table have negative pore-water pressures. The soils are de-saturated due to the excessive evaporation and evapotranspiration. Climatic changes highly influence the water content of the soil in the proximity of the ground surface. Upon wetting, the pore-water pressures increase, tending toward positive values. As a result, changes occur in the volume and shear strength of the soil. Some soils exhibit extreme swelling or expansion when wetted. Other soils are known for their significant loss of shear strength upon wetting. Changes in the negative pore-water pressures associated with heavy rainfalls are the cause of numerous slope failures. Reductions in the bearing capacity and resilient modulus of soils are also associated with increases in the pore water pressures. These phenomena indicate the important role that negative pore water pressures play in controlling the mechanical behavior of unsaturated soils.

1.4. Unsaturated soil in nature and practice

1.4.1. Unsaturated soil in hydrologic cycle

Figure 1.3 shows a schematic diagram of the unsaturated soil environment and its role in the natural hydrologic cycle. The steady-state position of the water table is controlled by the general topography of the system, the soil properties, and the balance achieved among the natural mechanisms that act to either add or remove water to or from the subsurface. The scale of the corresponding hydrologic cycle could be either local or regional, extending from as small as a local engineering work site to as large as the continental of global scale. Globally, the amount of water in the unsaturated zone located between the water table and the ground surface represents only a small portion of the total water involved in the hydrologic cycle (less than 0.01%). However, because the unsaturated zone forms the necessary transition between the atmosphere and larger groundwater aquifers at depth, the movement of water within this small portion of the cycle is indeed significant.

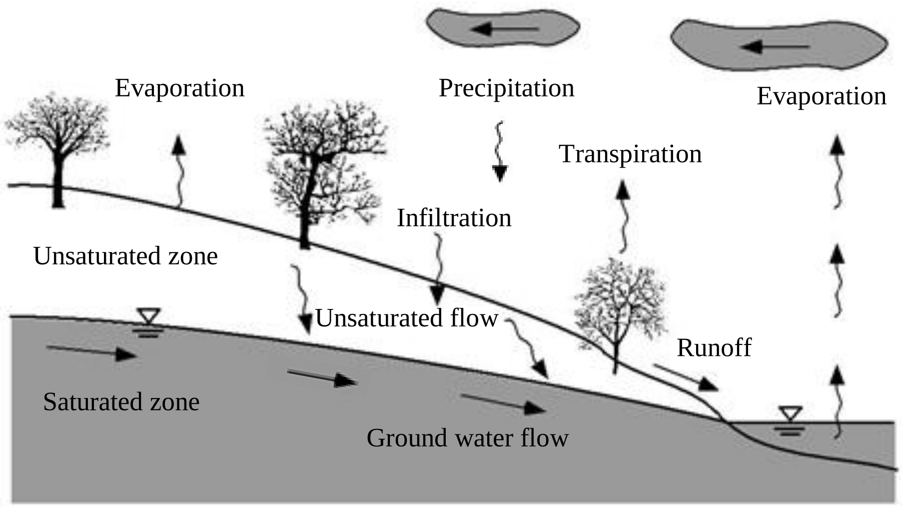


Figure 1.3: Role of the unsaturated zone in the natural hydrologic cycle (Lu, N. and Likos, W.J., 2004)

A schematic representation of the hydraulic regime near the ground surface in a typical slope made of residual soil is presented in Figure 1.4.

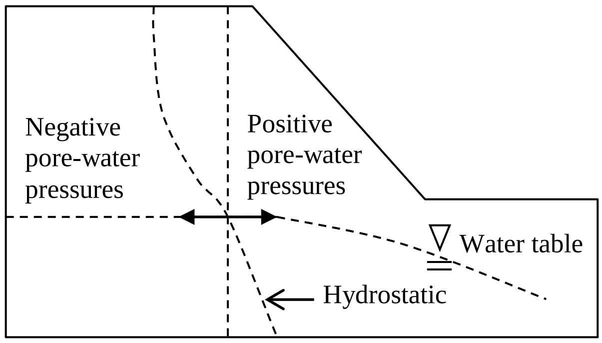


Figure 1.4: Hydraulic regime of the unsaturated zone.

1.5. Effect of negative pore water pressure on unsaturated soils in Sri Lanka

Two-thirds of Sri Lankan land area is covered with residual soils. Landslides in Sri Lanka and in many other tropical countries are triggered by excessive rainfall. Rain induced failures in slopes made of residual soils are a major geotechnical hazard in Sri Lanka. These soils which are formed by the in-situ weathering of the metamorphic parent rock are characterized by the heterogeneous nature inherited from the difference in its mineralogy and the process of variable weathering under tropical conditions. Safety margins of these slopes are high during the periods of dry weather due the prevailing matric suctions. As such, very steep and high slopes could be seen standing safe. The infiltration of rainwater destroys the matric suction and cause the rise of ground water table as rainfall prolongs. The destruction of the matric suction commences at the surface and the wetting front progresses downwards as rainfall continues. The water infiltrated downward will cause a rise of the level of the ground water table. Towards the toe of the slope the infiltration would cause much greater destruction in matric suction profile with a rainfall of heavier intensity perched water table conditions could develop at surface level. Those changes would trigger failures in the slopes.

Further, the systems of joints in the parent rock remain as zones of weakness and high permeability in the residual soil formed. They are termed as relict joints and induce significant complications in the behaviour of these slopes. Therefore, special attention should be paid in the modelling process when handling unsaturated soils with relict joints.

Further, the zones of contrasting permeability are formed due to heterogeneous nature of the residual soil formed by the weathering of parent metamorphic rock. (Kulathilaka and Sujeevan, 2011). During the process of infiltration high pore water pressures are built up at these boundaries.

Many researchers in the region have studied the effects of rainfall on the pore pressure regime by both analytical and experimental approaches. Rahardjo et al., (2000), studied the process through an instrumented slope at the Nanyang Technological University in Singapore. Similar studies were done by Jotisankasa et al., (2008) in Thailand.

Such detail studies were not done for local soils and, it is now necessary to establish the data on basic characteristics such as; matric suction profiles, soil water characteristic curves and response of the pore pressure regime to rainfall in natural slopes of Sri Lanka.

1.6. Unsaturated soil properties

Unlike tests in traditional soil mechanics tests that directly measure unsaturated soil properties are not as easily accessible and are often extremely labour intensive. One tool that has made the analysis of unsaturated soil data simpler and more practical is the soil water characteristic curve. This plot of gravimetric water content, volumetric water content, or degree of saturation versus suction (matric or total) indirectly allows for the determination of unsaturated soil properties that can be used to determine the shear strength, permeability, and volume change of material. There are several methods available to determine the unsaturated soil properties. Methods include the direct determination of soil properties through experimental procedures, matching material properties to those available in databases, and through the use of the soil water characteristic curve (SWCC). Figure 1.5 depicts a comprehensive list of methods and techniques available to determine these properties.

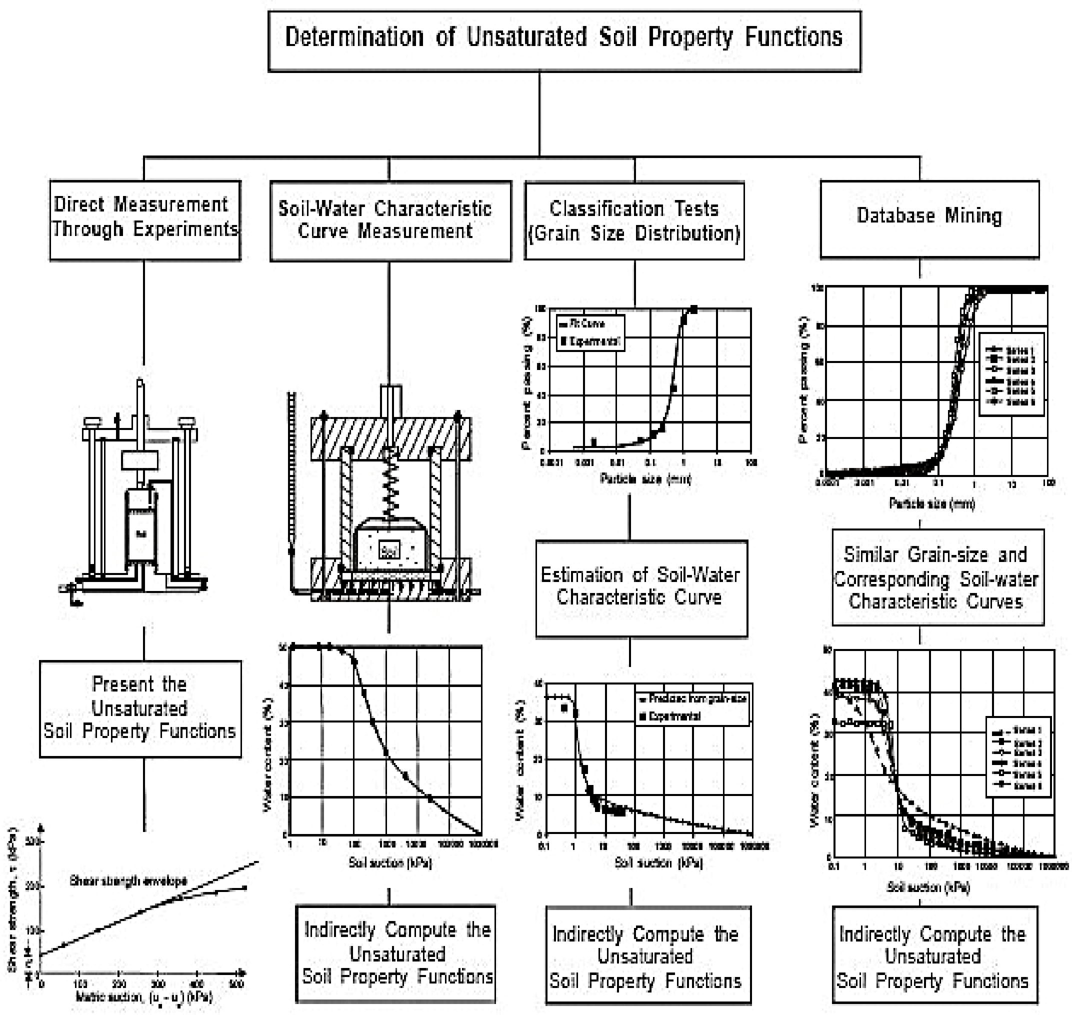


Figure 1.5: Methods for determining unsaturated soil properties (after Fredlund and Rahardjo, 1993)

1.6.1. Soil water characteristic curve (SWCC)

The soil water characteristic curve, originally developed in the agriculture science field, is a plot that represents the water storage capacity of a specific material (Fredlund and Rahardjo, 1993). The majority of soil water characteristic curve data generated using volumetric pressure plate extractors has been developed for material in its natural state. There has been very limited data generated that takes into account the effects of overburden pressure on the shape and air entry value (suction required to cause the largest pores to de-saturate) of the soil water characteristic curve.

Soil water characteristic curves are commonly reported as matric suction vs. degree of saturation, gravimetric water content and/or volumetric water content. There has recently been a comparison of the way in which the curve should be represented and the associated benefits and detractions of each (Fredlund, 2006). One explanation of the popularity of the use of the gravimetric water content when representing the soil water characteristic is due to its common usage in traditional soil mechanics. Its measurement requires the knowledge of the mass of the soil solids, which remains constant throughout the duration of the test.

A major problem associated with the use of the gravimetric water content is that it does not give the correct air entry value of the soil when the soil undergoes volume change during the drying phase (Fredlund, 2006).

Use of the volumetric water content to show the relationship between the matric suction and the water storage capacity of a material has been the most popular means by which to display the curve within the soil science discipline. The volumetric water content is the most common water content used in soil databases, that derive their results from studies conducted in the soil science discipline. From an analysis view, it allows for a quick interpretation of the change in volume of a material during testing. Use of the volumetric water content eliminates the need for taking continual mass readings to determine the gravimetric water content.

Soil water characteristic curve (SWCC) defining the variation of matric suction with volumetric water content (Figure 1.6) and Permeability function defining the variation of permeability with the matric suction are essential characteristics to be used in the modeling of the infiltration process. An idealized soil water characteristic curve (SWCC) shows two characteristic points A* and B*. Point A* corresponds to the air-entry value ($(u_a-u_w)_b$), and B* corresponds to the residual water content (θ_r). As shown in Figure 1.6, prior to A*, the soil is saturated or nearly saturated, so it can be treated as a saturated. Beyond B*, there is little water in the soil, so the effects of water content or negative pore-water pressure on soil behaviour may be negligible.

What is of great concern in an unsaturated soils is the stage between A* and B*, in which both air and water phases are continuous or partially continuous, and hence the soil properties are strongly related to its water content or negative pore-water pressure.

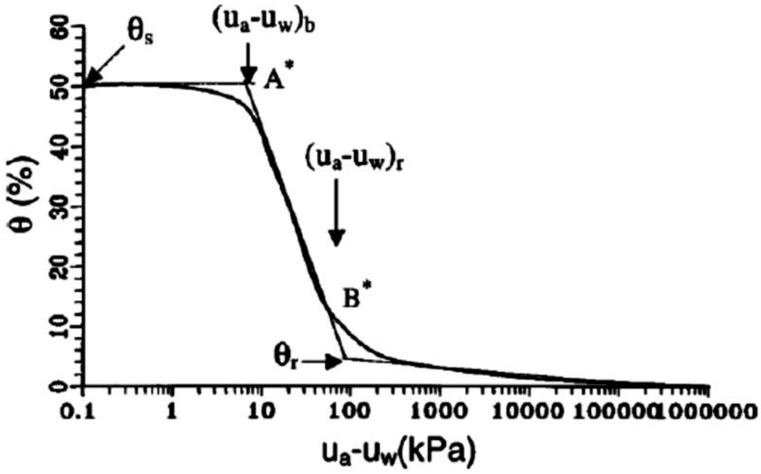


Figure 1.6: An idealized soil water characteristic curve

1.7. Thesis objectives

The objective of this thesis is the establishment of basic characteristics of a selected unsaturated Sri Lankan residual soil. In achieving this objective an experimental program was designed to generate the soil water characteristic curves using pressure plate apparatus and tensiometer to be compared with empirical predictions done with grading curves. Experimental procedures were also established to determine the variation of the permeability of the unsaturated soil with the water content. Methods were also developed to determine the shear strength characteristics of unsaturated soils modifying direct shear apparatus by incorporating a miniature tensiometer which allows for the simple and direct measurement of suction during shearing.

Above characteristics had not been established so far for typical residual soils forming slopes in Sri Lanka. Undisturbed samples of soil obtained from the failed slope at Welipenna in the Southern Expressway were used in this study.

Establishment of these fundamental soil properties will enable accurate modelling of the infiltration procedure, which would enable identification of threshold values of rainfall intensity and duration that would lead to failure.

1.8. Thesis Outline

Chapter 2 of the thesis reviews the available literature on the numerical modeling of infiltration of water in an unsaturated soil and highlights the need for detailed studies to obtain the unsaturated soil characteristics. Processes adopted by other researchers in this context are also presented in Chapter 2.

The bulk of the work in this study is the development of experimental procedure to determine the shear strength function, permeability function and the soil water characteristic curve (SWCC). Numerous works done in this context are presented in different chapters of the thesis.

Chapter 3 presents the geology of the research area and preliminary experimental studies which covers undisturbed sample collection, index property tests, 1-D consolidation test and fully saturated permeability tests.

Chapter 4 presents the development of soil water characteristic curves (SWCCs) using 5-bar pressure plate apparatus for both types of soils encountered at the site.

Chapter 5 elaborates several direct shear tests conducted on SILTY SAND before acquiring the tensiometer and on SANDY SILT with matric suction measurement using the tensiometer for different levels of saturation and different normal loading conditions.

Chapter 6 presents the development of permeability function for drying and wetting paths for both type of soils encountered at the site using the method of continuous measurements of weight of the sample with time while measuring the matric suction.

Chapter 7 provides details on the development of soil water characteristic curves (SWCCs) with different techniques such as using pressure plate apparatus, direct shear tests with matric suction measurement, permeability function tests.

Experimentally determined curves are compared with the curves deduced from gradation curves.

Chapter 8 summarizes the findings and makes suggestions for the further progress in this research area.

Chapter 2

2.0. LITERATURE REVIEW

2.1. Phases of soil

Saturated soil is a two phase system, namely solid and water, whereas unsaturated soil with continuous air phase is a four phase system. The four phases are:

- Solid
- Water
- Air
- Contractile skin

Figure 2.1 shows a typical unsaturated soil mass with contractile skin. The most distinctive property of the air-water interface (i.e., contractile skin) is its ability to exert a tensile pull. It behaves like an elastic membrane under tension interwoven throughout the soil structure. This property is called surface tension. The phenomenon of surface tension results from the intermolecular forces acting on molecules in the contractile skin. This results in an increased compression of the soil structure and as a result increases the shear strength of the soil.

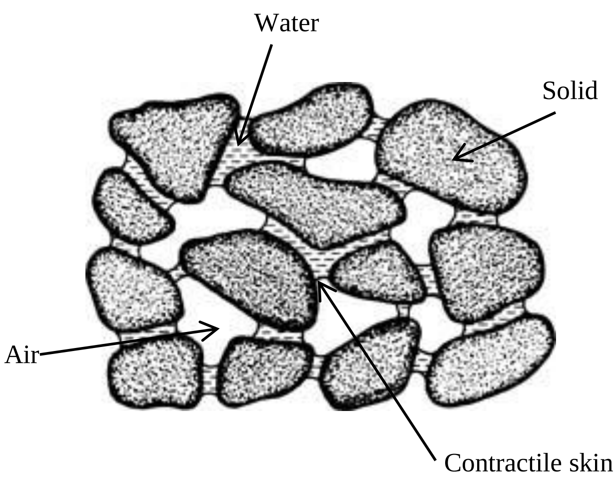


Figure 2.1: Four phases of unsaturated soils

In the unsaturated zone pore-water pressure is negative relative to the pore-air pressure. The difference between pore-air pressure and pore-water pressure is defined as matric suction or capillary pressure. The Figure 2.1 depicts the presence of phases in soil structure. In a fully saturated soil the void spaces are fully occupied by water where as in an unsaturated or dry soils voids are partially or fully filled with air. Therefore, it is evident that when dealing with unsaturated soils it is a must to study about different behaviour of all the three phases and how they interact and interrelated with each other.

2.1.1. Capillarity action

Spreading of liquids on solid surfaces, liquid rising in capillaries or liquids entrapped in crevices are different phenomenon that a liquid undergoes when it combines with solid structure. The phenomenon of capillarity in a pores medium is due to two forces:

- Liquid adhesion to soil surface - tends to spread the liquid
- Cohesive surface tension force of liquid - tends to reduce the liquid-air interface

2.1.2. Capillarity in Soils

Soil is a heterogeneous material consists of pores of different geometries. This complex nature makes different combinations of interfaces, interstices, capillaries and wedges in which the water is retained. Water retains in these interstices depending on the amount of capillary forces that exert on the particles. Also water molecules are adsorbed to solid surfaces by considerable forces. Certain models have been developed to visualize this scenario. “Bundle of Capillaries” is such conceptual model that has been developed to visualize and study about this. In this case the pore spaces are equalized to cylindrical capillaries as shown in Figure 2.2 which make it easier to assign certain parameters for studying and analyzing purposes.

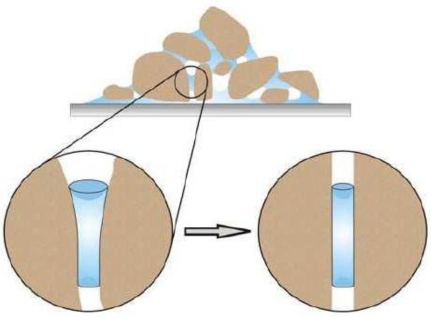


Figure 2.2: Idealization of soil pores as cylindrical capillaries

2.2. What is meant by matric suction....?

The phenomenon of surface tension is governed by the forces acting on the molecules of air-water interface. Because of the surface tension the water molecules in the air-water interface or the contractile skin experience an unbalanced force towards the water body. Therefore, a tensile pull is developed along this contractile skin in order to make it equilibrium. Owing to this tensile pull the contractile skin acts like a curved membrane.

Generally in soils, soil particles which have an origin of silica, more likely to adsorb water molecules rather than air. Therefore the air molecules, which are totally encompassed or surrounded by water, are compressed and experience a relatively high pressure than the water molecules. Therefore the contractile skin is always subjected to an air pressure of u_a, which is greater than the water pressure u_w. This pressure difference exists in soils due to the presence of liquid and gas phases, is called **Matric Suction**.

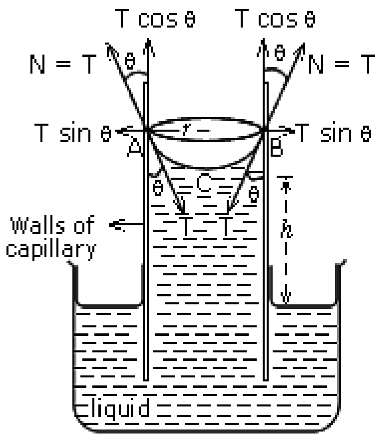


Figure 2.3: Forces due to suction, acting on different surfaces

The Figure 2.3 shows the components of surface tension, T_s and how they act on each surface.

Pressure difference between contractile skin, i.e., Matric suction,

$u_a - u_w = 2T_s/R_s$ [2.1]

Where the radius of curvature, R_s can be considered analogous to the pore radius, r_i in a soil by assuming a zero contact angle (i.e., $\theta = 0$). As the pore radius gets smaller, the matric suction in the soil gets larger. Therefore, it can be written as;

$$u_a - u_w = 2T_s/r_i \qquad [2.2]$$

2.3. Matric suction why it is important?

Matric suction results in giving an additional strength to the soil structure. The compressive force exerts on the soil particles in the walls of interconnected pores (which behave as the capillary tube) produce this additional strength which is capable of enhancing the stability of the soil structure.

This additional strength is quite significant especially in slopes as it withstands for that additional amount of resistance required to keep the slope stable. The available literature suggests that the fluctuations of matric suction have a direct impact on shallow seated slips which are encountered relatively above the ground water table. This is due to the fact that infiltration of water into the slope once the rainy season starts results in saturating the areas above the water table (Perched water table).

During this process, so called menisci water (accumulated in pore spaces) becomes bulk water which entirely occupies the pore volume. So, it is evident that due to this infiltration the meniscus bursts and results in diminishing the compressive force exerted on soil particles. This decrease in matric suction leads the slope to a critical point where it could not further resist the movement. This is the governing factor of majority of shallow seated landslides.

In addition to slope studies. Most of the engineered constructions are carried out on unsaturated soils. Therefore, it is of importance to have an idea about the amount of shear strength given to the soil by suction when it comes to construction purposes. Also the design engineers should have an idea about how the infiltration of water changes this strength.

2.4. Stress state variables

The mechanical behavior of a soil (i.e., the volume change and shear strength behavior) can be described in terms of the state of stress in the soil. The state of stress in a soil consists of certain combinations of stress variables that can be referred to as stress state variables. Three independent sets of normal stresses (i.e., surface tractions) are involved with the equilibrium equation for the soil structure. These are net normal stress (σ - u_a), matric suction (u_a - u_w) and pore-air pressure u_a, which govern the equilibrium of the soil structure and the contractile skin. The components of these variables are physically measurable quantities. The (σ - u_a) and (u_a - u_w) are referred to as the two independent stress state variables for an unsaturated soil. More specifically, these are the surface tractions controlling the equilibrium of the soil structure and the contractile skin (Fredlund and Rahardjo, 1993).

Similar stress state variables can also be extracted from the soil structure equilibrium equations for the x-, y-, and z- directions. The complete form of the stress state for an unsaturated soil can therefore be written as two independent stress tensors as shown in Equation [2.3] and Equation [2.4] (Fredlund and Rahardjo, 1993).

$$\begin{pmatrix} (\sigma_x - u_a) & \tau_{yx} & \tau_{zx} \\ \tau_{xy} & (\sigma_y - u_a) & \tau_{zy} \\ \tau_{xz} & \tau_{yz} & (\sigma_z - u_a) \end{pmatrix} \qquad [2.3]$$

$$\begin{pmatrix} (u_a - u_w) & 0 & 0 \\ 0 & (u_a - u_w) & 0 \\ 0 & 0 & (u_a - u_w) \end{pmatrix} \qquad [2.4]$$

Above tensors cannot be combined into one matrix since the stress variables have different soil properties (i.e., porosities) outside the partial differential terms. The porosity terms are soil properties that should not be included in the description of the stress state of a soil. Figure 2.4 illustrates the two independent tensors acting at a point in an unsaturated soil.

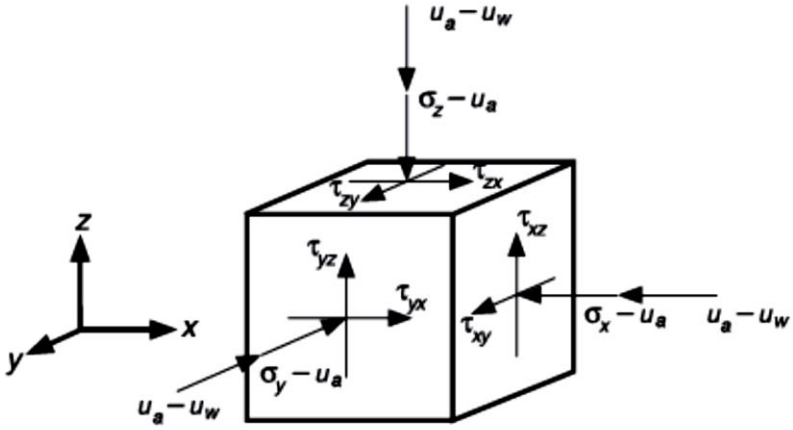


Figure 2.4: The stress state variables for an unsaturated soil (Fredlund and Rahardjo, 1993)

In the case of compressible soil particles or pore fluid, an additional stress tensor, u_a, must be used to describe the stress tensor as shown in Equation [2.5] (Fredlund and Rahardjo, 1993).

$$\begin{pmatrix} u_a & 0 & 0 \\ 0 & u_a & 0 \\ 0 & 0 & u_a \end{pmatrix} \qquad [2.5]$$

As an unsaturated soil approaches saturation, degree of saturation, S_r, approaches 100%. The pore air pressure, u_a, approaches the pore water pressure, u_w, and the matric suction term, $(u_a - u_w)$, tends to zero. Only the first stress tensor is retained for a saturated soil when considering this special case. It can be illustrated as shown in the Equation [2.6] (Fredlund and Rahardjo, 1993).

$$\begin{pmatrix} (\sigma_x - u_w) & \tau_{yx} & \tau_{zx} \\ \tau_{xy} & (\sigma_y - u_w) & \tau_{zy} \\ \tau_{xz} & \tau_{yz} & (\sigma_z - u_w) \end{pmatrix} \quad [2.6]$$

2.5. Shear strength theory

The difference between performing slope stability analyses on saturated and unsaturated soils lies in the equation used to define the shear strength.

2.5.1. Saturated shear strength

The shear strength of saturated soil is controlled by one stress state variable, namely, the effective stress, $(\sigma_n - u_w)$. The corresponding Mohr-Coulomb failure envelope is a straight line defined by an intercept, c′ (i.e., effective cohesion) and a slope, tanϕ′ (i.e., tangent of the effective angle of internal friction) as shown in Figure 2.5. The saturated shear strength equation is presented in Equation [2.7],

$$\tau = c' + (\sigma_n - u_w) \tan\phi' \quad [2.7]$$

Where, σ_n = Total normal stress on the slip surface

u_w = Pore water pressure in the soil

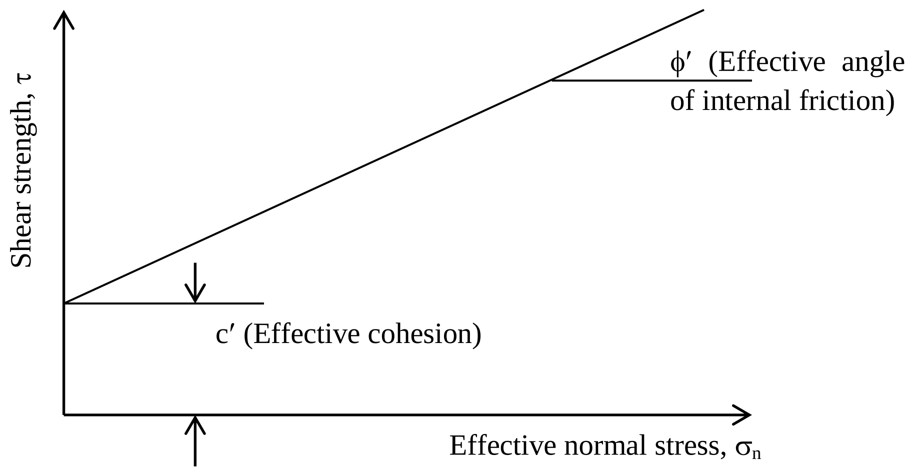


Figure 2.5: Mohr-Coulomb failure envelope for a saturated soil

2.5.2. Unsaturated soil with a planar modified Mohr-Coulomb envelope

The relationship between soil and the shear strength of an unsaturated soil is referred to as the shear strength function. This relationship can be satisfactory predicated for many engineering problems through the use of the saturated shear strength parameters and the soil water characteristic curve.

The laboratory measurement of the shear strength of a soil versus soil suction can be performed using either a modified triaxial apparatus or a modified direct shear apparatus. In each case, the equipment must be modified to allow for the independent measurements (or control) of the pore-air and pore-water pressures.

It has been found that the shear strength relationship involving suction can be either linear or non-linear. In general, it is possible to linearize the non- linear shear strength versus suction relationship over a selected range of soil suctions.

An unsaturated soil requires two independent stress state variables which must be given consideration in defining the failure envelope. The Mohr-Coulomb type formulation for a saturated soil has been extended to a formulation for unsaturated soils by Fredlund et al., (1978). In so doing, two dimensional failure surface was prescribed for an unsaturated soil (Figure 2.6). If the surface is assumed to be planar, the equation for the unsaturated shear strength can be written as follows,

$$\tau = c' + (\sigma_n - u_a) \tan\phi' + (u_a - u_w)\tan\phi^b \qquad [2.8]$$

Where,

ϕ^b = The slope of the shear strength versus matric suction, $(u_a - u_w)$, relationship when $(\sigma_n - u_a)$ is held constant.

u_a = Pore air pressure in the soil which in many cases will be, equal to atmospheric conditions.

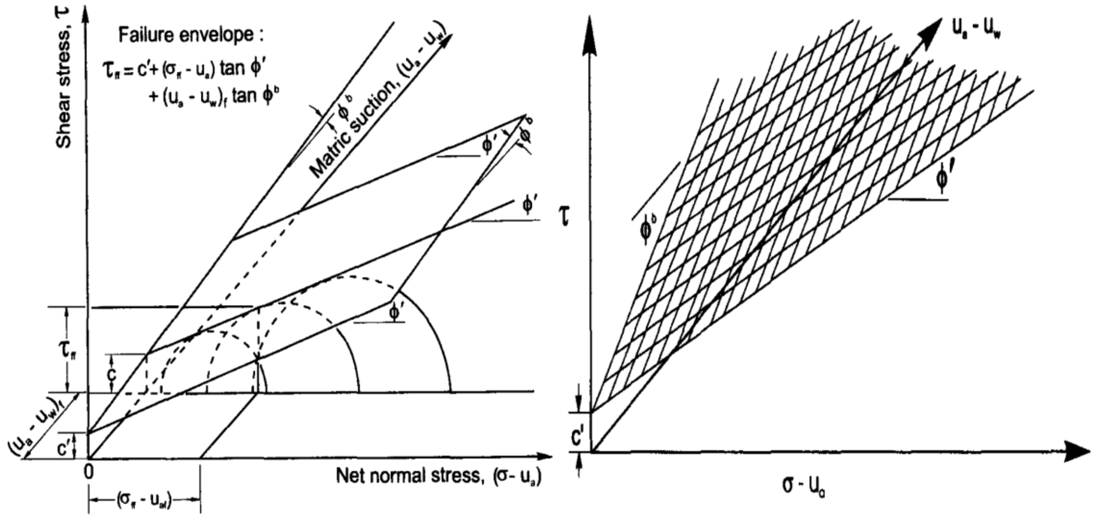


Figure 2.6: Planar modified Mohr-Coulomb failure envelope as a planar surface for an unsaturated soil (after Fredlund and Rahardjo, 1993)

The effective angle of internal friction is assumed to be the same for all suction values. In other words, the planar surface has no "warp".

2.5.3. Unsaturated soil with a curved matric suction envelope

As unsaturated soils have been tested over an increasingly larger range of suction values, it was found that failure envelope with respect to suction is non-linear and several researchers have published data which clearly shows the non-linearity. One example is presented in Figure 2.7 for the laboratory data on a compacted glacial till by Gan et al., (1988) and Madrid clayey sand for different net normal stress by Escario and Juca, (1989).

At low suctions, a change in the negative pore-water pressure produces the same change in shear strength as a total stress (under drained conditions), as long as the soil remains saturated. The ϕ^b angle corresponding to suctions below the air-entry value of the soil is equal to ϕ'. As the soil de-saturates, the ϕ^b angle decreases because water no longer covers the entire void space on the failure plane.

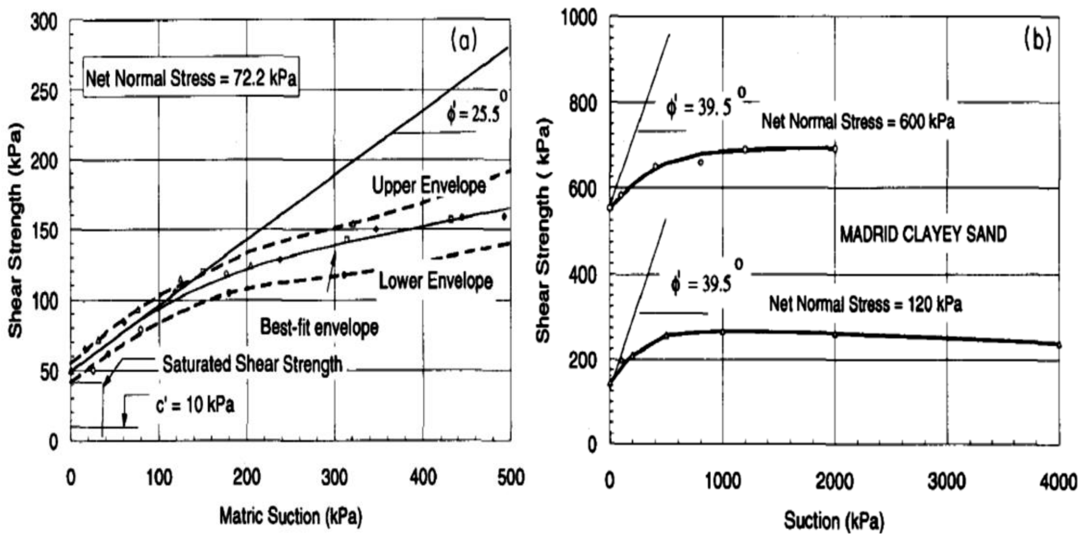


Figure 2.7: Shear strength versus matric suction (a) for a compacted glacial till with a net normal stress 72.2kPa (modified after Gan et al. (1988)), (b) for different net-normal stress 120kPa & 600kPa (modified after Escario and Juca (1989))

After several researches conducted by Gan et al. (1988) and Escario & Juca (1989), it has been proved that shear strength versus soil suction relationship over a selected range of soil suctions is non- linear (Fredlund and Rahardjo, 1993) as shown in Figure 2.8.

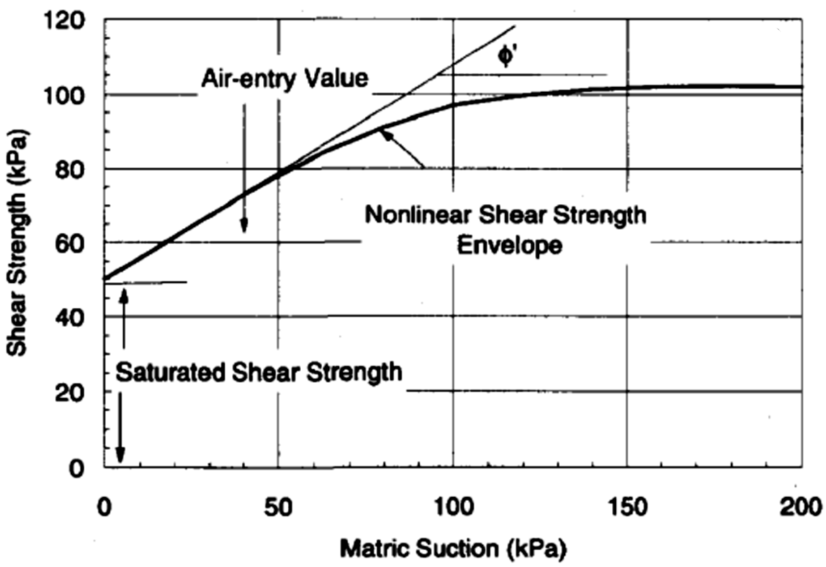


Figure 2.8: Non-linear shear strength envelope for an unsaturated soil (after Fredlund and Rahardjo, 1993)

When non-linear shear strength versus matric suction relationship is incorporated into the Mohr-Coulomb failure envelope, a warped surface is obtained as shown in Figure 2.9. It is assumed that the non-linearity in the matric suction direction is the same at all net normal stresses. This may not be rigorously correct but represents a first approximation of the non-linearity with respect to matric suction.

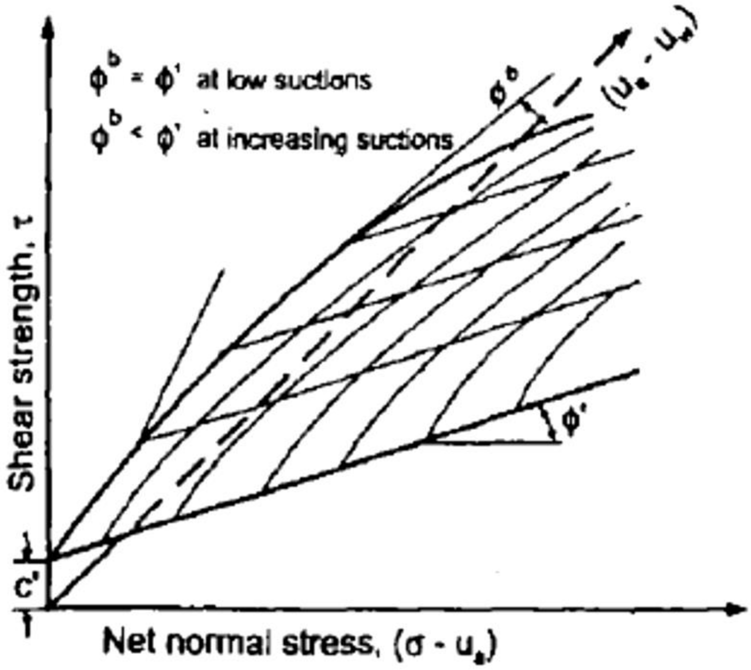


Figure 2.9: Non-planar modified Mohr-Coulomb failure envelope with respect to matric suction for an unsaturated soil (after Fredlund and Rahardjo, 1993)

Some other researchers such as Vanapalli et al., (1996) on model for the prediction of shear strength with respect to soil suction and Jotisankasa et al., (2010) on decomposed granite (SM) mixed with different percentages of kaolin at normal stress of 15.5kPa as shown in Figure 2.10 also proved that the failure envelope with respect to soil suction is non-linear.

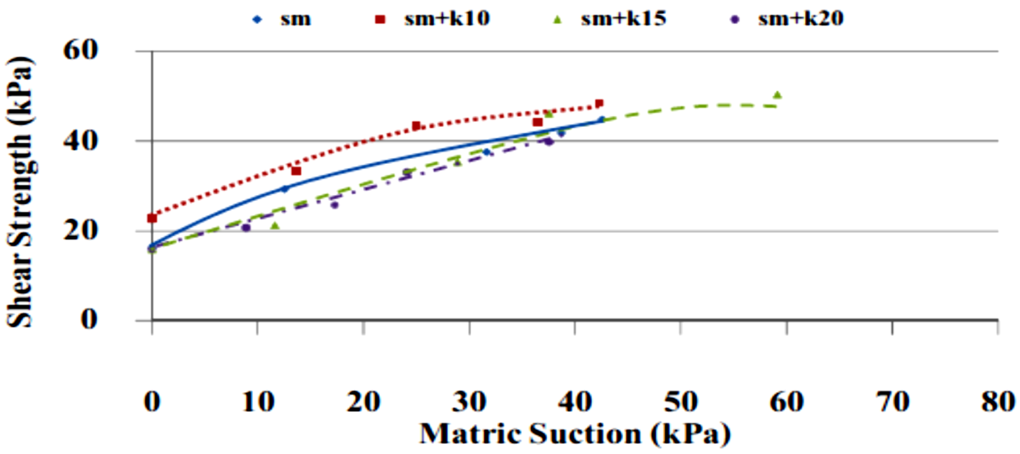


Figure 2.10: Shear strength versus matric suction for decomposed granite (SM) mixed with different percentages of kaolin at normal stress of 15.5kPa (after Jotisankasa et al., (2010))

2.6. Measurement of matric suction

Matric suction can be evaluated either in a direct or indirect manner. The negative pore-water pressure is measured using direct methods. The pore air pressure, which is generally atmospheric in the field, minus the negative pore water pressure gives the matric suction.

High air entry ceramic disks are used for direct measurements of negative pore-water pressures. There are varieties of methods for direct measurement of matric suction such as axis-translation, tensiometer, pressure plate apparatus, filter paper, chilled-mirror hygrometer etc., and for indirect measurement of matric suction such as thermal conductivity sensor could be used.

In this research project two direct methods of matric suction measurements namely; pressure plate apparatus and tensiometer were used. Soil water characteristic curves (SWCCs) were also derived indirectly using the grain size distribution curve.

2.7. Soil water characteristic curve (SWCC)

The soil water characteristic curve (SWCC) for a soil is defined as the relationship between water content and suction for the soil. The water content defines the amount of water contained within the pores of the soil. The suction may be either the matric suction of the soil or total suction (i.e., matric + osmotic suction). This curve can be used to estimate various parameters required to describe unsaturated soil behavior. Laboratory studies have shown that there is a relationship between the soil water characteristic curve for a particular soil and the properties of the unsaturated soil (Fredlund and Rajhardjo, 1993). Some of those properties are hydraulic conductivity, shear strength, unfrozen water content, specific heat, thermal conductivity, water storage, diffusion and adsorption.

Soil water characteristic curve (SWCC) is the basic property which describes the retention of water under equilibrium conditions at a given matric potential. It is mainly related to the pore size and connectivity of pore spaces. Therefore, soil texture and structure have a considerable impact on soil water characteristics.

Soil water characteristic curve (SWCC) is the basic function which facilitates further analysis of advance issues related to soil such as shear strength, seepage and volume change problems (Barbour, 1998; Fredlund, 2000). It is the center or base of the engineering behaviours of an unsaturated soil. The soil water characteristic curve (SWCC) provides a means of relating the fundamental soil properties to each other and controlling the state at which each engineering behaviour calculated.

To quantify the amount of water in soil, several terms have been used;

- Gravimetric water content
- Volumetric water content
- Degree of saturation
- Volume of water referred to original volume of the specimen.

Gravimetric water content is more preferably used by engineers whereas volumetric water content is a more popular term amongst soil scientists and people who are involving in agricultural field. The use of correct term for analysing depends on the fact that amount of deformation or the volume change that soils undergo during the test. Initial conditions of the sample, stress history of the soil (a slurried clay would show a greater deformation whereas a compacted clay would have a lower degree of deformability. Meanwhile sand or gravel materials act non-deformable.), method of collecting the sample have a direct impact on the methods to be used for testing and interpreting the results. Therefore all the soil water characteristic curves are placed under one of the following categories (Fredlund, 2002).

- Compacted
- Undisturbed
- Slurried

The matric suction of a soil corresponding to a given water content is not unique. It depends on the history of wetting and drying of the soil. Because a considered soil may have undergone these processes for prolong time periods. Therefore, the soil water characteristic curve for a considered soil is not unique.

During the drying process larger pores drain initially but during the wetting process smaller pores are initially occupied by water. Generally, Menisci radius of the wetting path is greater than that of the drying path which results in reducing the suction for a given water content. In the wetting process 100% of saturation is harder to achieve because of the entrapped air bubbles. It takes a considerable amount of time to remove the entrapped air bubbles present in the small pore spaces of the soil structure.

This is important for modeling more than one aspect of soil behaviour in a single analysis. The soil water characteristic curve (SWCC) contains three important pieces of information: pore size distribution, amount of water contained in the pores at any suction and the stress state of the soil and soil water. The soil water characteristic curve (SWCC) has three stages as shown in Figure 2.11 which describe the process of desaturation of a soil (i.e., increasing suction). These are outlined in proceeding sections (Fredlund and Rahardjo, 1993).

2.7.1. The capillary saturation zone (boundary effect zone)

The pore-water is in tension but the soil remains saturated due to capillary forces. This stage ends at the air entry value, where the applied suction overcomes the capillary water forces in the soil and air enters the soil pores.

2.7.2. The desaturation zone (transition zone)

The water is displaced by air within the pores. Liquid water drains from the pores and is displaced by air. This stage ends at the residual water content, where pore water becomes occluded and the permeability is greatly reduced.

2.7.3. The residual saturation zone (residual zone)

The water is firmly adsorbed onto the soil particles and flow occurs in the form of vapour. In this stage the term suction loses its physical significance. Instead it can be regarded as a term for energy required to withdraw a unit of water from a mass soil. This stage is terminated at oven dryness. When the soil is heated to 105°C, corresponding to a suction of approximately $1*10^6$ kPa, and is assumed to have zero water content. This point is a benchmark for all soils; any water not driven off is chemically bonded to the soil and is not important with respect to the engineering behaviour.

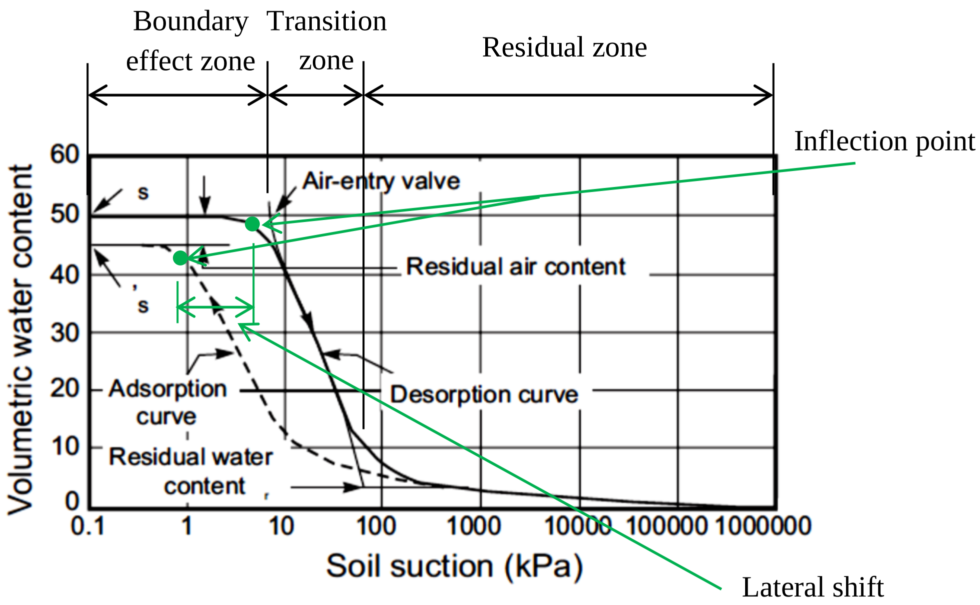


Figure 2.11: Typical soil water characteristic curves for desorption and adsorption for unsaturated soils (after Fredlund and Rahardjo, 1993)

2.7.4. Air-entry value

This is the point at which air starts to enter the soil, i.e. the air starts to enter the largest pore of the soil.

2.7.5. Residual water content

The water content of where a larger suction is required to remove the additional water.

Soil water characteristic curve (SWCC) does not suggest any idea about the current state of the residual soil, i.e., by looking at the soil water characteristic curve (SWCC) measurements one could not get exact idea about whether the soil is experiencing the wetting state, drying state or somewhere in between these two bounding curves. This shows the hysteretic nature of the soil water characteristic curve (SWCC) which indicates that it is not a single valued unique relationship of soil water behaviour.

2.7.6. The inflection point

This is the point at which the bounding curves (Desorption-drying and Adsorption-wetting curves) have a maximum slope when it is drawn in the log scale. This point can be used to measure the lateral shift between the wetting and drying curves.

When determining the in-situ suction conditions of a soil it is better to use drying curve as it gives the maximum possible suction corresponding to a given water content. Further, the approximations can be made on the wetting curve using the magnitude of the lateral shift at the inflection point. But sometimes this approach may depend on the purpose of study. Because when it comes to slope stability analysis and other landslide related issues sometimes it is necessary to study the wetting path as these problems are related to adsorption of water rather than desorption.

2.7.7. The hysteresis of two curves

The available literature on soil water characteristic curve (SWCC) and unsaturated soil studies accounts for this hysteresis nature of drying and wetting curves.

- The contact angle for wetting is larger than that of drying.
- The presence of entrapped air bubbles during soil wetting
- "ink-bottle" effect of soil pores

The larger contact angle of soil-water interface during wetting path, results in reducing the suction at that particular degree of saturation as the value of cosine value of the contact angle decreases with increasing contact angles. The entrapped air bubbles which are present as a result of the ink-bottle effect causing from non-uniformity in shape and sizes of interconnected pores, eventually dissolve with water. This ultimately results in producing a lower suction during wetting path, when compared to drying at a particular degree of saturation of the soil. Therefore, the reasons for the leftward shift of the wetting curve can be reasoned out with these facts.

2.8. Modelling of soil water characteristics curve (SWCC)

Several attempts have been made over the years to give an appropriate mathematical representation to soil water characteristic curves (SWCCs). The most difficult aspect of this curve fitting criteria is to define parameters that are independently related to well define features of the shape of the soil water characteristic curves. (Gitirana & Fredlund, 2004).

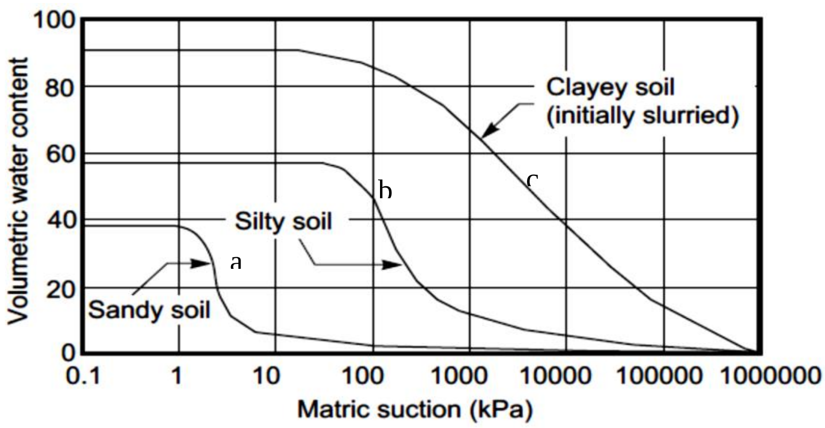


Figure 2.12: Conceptual soil water characteristic curves (SWCCs) of different soil types (after Fredlund and Rahardjo, 1993)

Figure 2.12 shows the different soil water characteristic curves (SWCCs) of various soil types. The curves (a) and (b) are related to sandy and silty soils respectively. These curves have distinctive bending points with respect to air entry value suction and residual suction. Curve (c) represents soil water characteristic curve (SWCC) of clayey soils where the suction value related to the residual moisture content cannot always be visually identified. This suggests that in clayey soils capillarity is not the only dominant factor governing the soil water behaviour but there is a considerable impact from adsorptive forces.

2.9. Establishment of soil water characteristic curve (SWCC)

2.9.1. **Using KU** tensiometer

Jotisankasa et al., (2010) developed a miniature tensiometer consisting of micro electro mechanical system (MEMs) pressure sensor, 1Bar High-Air-Entry porous ceramic and transparent acrylic tube at the Kasetsart University (KU) (Figure 2.13 & Figure 2.14). The device requires thorough saturation with water so that tensile stress can be transferred effectively between the soil water and the pressure sensor. This is normally achieved by evacuating air from different parts of the device in a water-filled reservoir using a vacuum pump, as described in details by Jotisankasa, (2010).

Figure 2.13: Miniature KU tensiometer sensor

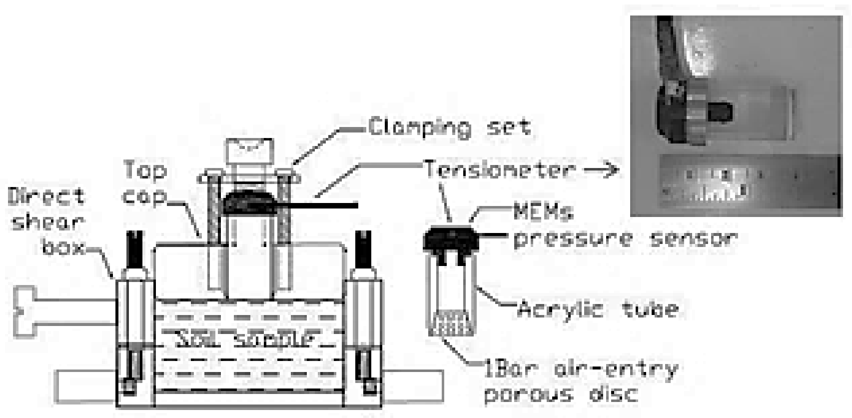


Figure 2.14: KU tensiometer and its incorporation in direct shear box (modified from Jotisankasa and Mairaing, 2010)

KU T1 & T2 tensiometers were used for laboratory usage only, KU T3 was used for both laboratory and field purposes and KU T4 was used mainly for field practice. They are designed to measure pore water pressure ranging from -100kPa (suction/tension) to 600kPa (piezometric potential/water level). The device can thus be considered to function as both tensiometer and piezometer. Once the soil gets too dry and suction exceeds 100kPa (pressure below -100kPa), bubbles will gradually form within the water reservoir of the tensiometer. Over prolonged period, the tensiometer will be empty of water. After water refilling, the device will function again. The pressure transducer used in the tensiometer is for absolute pressure measurement (absolute pressure = gauge pressure + 1 atm). Therefore, it is important to take note of zero atmospheric reading before and after measurement, and, if required, to apply correction from barometric reading. For this purpose, another dry tensiometer (without the acrylic tube) can be used as a barometer. The matric suction was calculated using the equation [2.9],

$$\text{Matric suction, } s = (u_a - u_w) = (-u_w) = (V_0 - V_t)/\text{ sensitivity} \qquad [2.9]$$

Where,

V_0 is zero atmospheric voltage reading, or reading when tensiometer is submerged at water surface. (The value of zero voltage should be around 0.850 ±0.05, depending on the barometric pressure)

V_t is current voltage reading for any suction/pressure, (conveniently spot read from multi-meter)

Sensitivity is a constant (Volt/kPa) for each tensiometer, as provided in the calibration sheet, carried out by Geotechnical Innovation Laboratory **(**GIL), Kasetsart University.

Typical applications of the tensiometers KU T1/T2/T3/T4 are as follows:

- Point wise measurement of pore water pressure/suction
- Soil column studies for infiltration and evaporation process
- Soil water characteristic curve (SWCC - water content-suction) determination
- Watering scheduling for pot plants, pot experiments, and irrigation system

- •Determination of capillary rise and vadose zone water movement
- •Spot readings with the ATT hand-held unit
- •Continuous with data loggers
- •Monitoring of pore water pressure or ground water level in slope for landslide warning system
- •Geotechnical engineering works such as vacuum consolidation, dam engineering, road embankment construction, and excavation.

The shear strength of an unsaturated soil can also be expressed as;

$$\tau = c' + (\sigma - u_a)\tan\phi' + c^s \qquad [2.10]$$

Where,

c' = Effective cohesion intercept

σ = Normal total stress

u_a = Pore air pressure (for atmospheric pressure, u_a equals zero)

ϕ' = The effective angle of shearing resistance

c^s = The additional cohesion in unsaturated soil due to matric suction

The value of c^s can be determined as follows;

$$c^s = (u_a - u_w)\tan\phi^b \text{ , if } u_w < u_a \qquad [2.11]$$

Where,

u_w = Pore water pressure,

ϕ^b = Angle of shearing resistance due to suction

Jotisankasa & Mairaing (2010) studied the relationship between c^s and suction of residual soils from landslide areas using the suction-monitored direct shear test presented in Figure 2.14. Only minor modification was made to the top cap of conventional direct shear box, whereby the tensiometer is inserted through an orifice of the top cap and a clamping set was used to secure the tensiometer in place during shearing. The main difference is that the miniature tensiometer used in this study was of a lower capacity, capable of measuring suction from value of zero to 100kPa. This smaller range of suction is however more appropriate for slope stability studies.

During testing, a constant water content condition of the soil specimen can be maintained by using plastic wrap and pieces of wet clothes to cover the whole shear box. Typical testing program for characterization of soils in slope stability studies consists of slow (consolidated-drained) shearing tests on saturated samples and constant water content shearing tests on unsaturated samples with various initial suctions. In unsaturated tests, the moisture content samples can be modified to the required values prior to testing by either gradual water spraying or air-drying.

Such suction monitored shearing tests thus offer alternative tools for characterizing unsaturated shear strength in slope stability studies. It is also appreciated that the failure condition in the soil slope during rainfall could be simulated by the shearing infiltration test with increasing pore water pressure and constant total stress (Rahardjo et al., 2009). For practical purpose, the conventional suction-monitored shearing tests can be used and will be adequate for the first estimate. Further research is still needed to investigate whether or not the shear strength parameters (i.e., ϕ', c', c^s, ϕ^b) from conventional shear tests and shearing infiltration test are essentially the same.

The volumetric water content θ_w can be defined as;

$$\theta_w = V_w / V \qquad [2.12]$$

Where,

V_w = Volume of water

V = Total volume of soil

And can be converted as;

$\theta_w = w \times \rho_d / \rho_w$ [2.13]

Where,

w = Gravimetric moisture content

ρ_d = Dry density of soil

ρ_w = Density of water

Volumetric water content can also be written in terms of degree of saturation, S_r, gravimetric water content, w, or volumetric water content, θ_w, and all are related by the equation,

$\theta_w = wG_s/ (1+e) = S_re/ (1+e)$ [2.14]

As already outlined soil water characteristic curve (SWCC) is required as a key property for advanced analysis of slope including infiltration, and prediction of unsaturated shear strength. As illustrated by Equations [2.10] and [2.11] the shear strength of an unsaturated soil is related to the prevailing matric suction.

Jotisankasa & Vathananukij, (2008) made use of the soil water characteristic curve (SWCC) to estimate the amount of rainfall required to reduce the suction to zero or saturate the slope. This was used as basis for early warning system for shallow landslide.

The method is called continuous measurement. For the drying soil water characteristic curve (SWCC), the top surface of soil sample can be left exposed to ambient air, and the soil suction can be monitored continuously at three locations on sample's side as shown in Figure 2.15. The weight of the sample can also be continuously measured using an electric balance connected to a data logger.

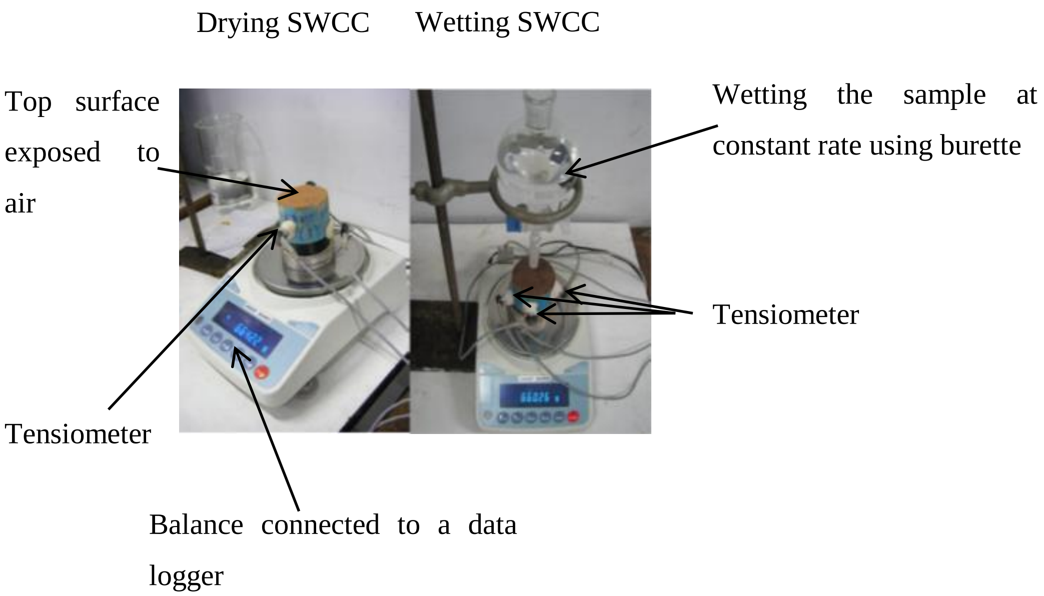


Figure 2.15: Experiment setup for the continuous measurement of soil water characteristic curve (SWCC) (after Jotisankasa et al., 2010)

For the determination of wetting soil water characteristic curve (SWCC), the top surface of sample can be continuously wetted by way of water dripping from burette as shown in Figure 2.21. The main advantage of the continuous soil water characteristic curve (SWCC) measurement is the shorter testing duration which is only a few days per one path (from suction of 100kPa to 0kPa). Some of the results obtained are shown in Figure 2.16 & Figure 2.17.

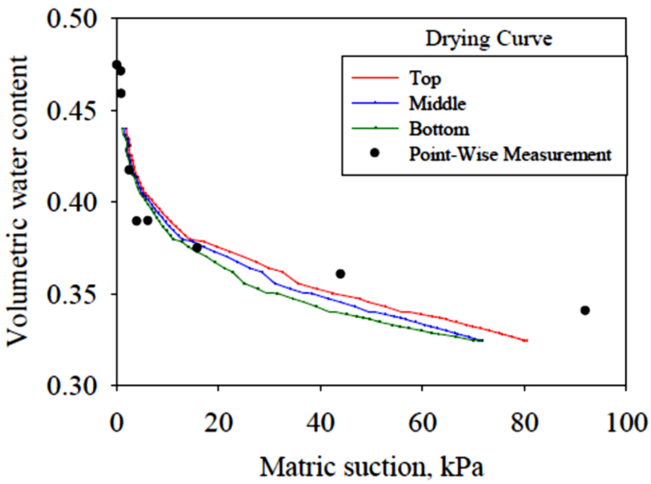


Figure 2.16: Drying SWCCs for a silty residual soil (after Jotisankasa et al., 2010)

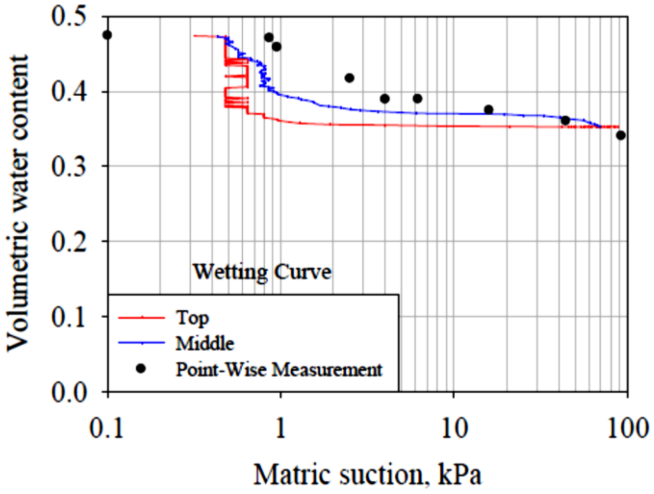


Figure 2.17: Wetting SWCCs for a silty residual soil (after Jotisankasa et al., 2010)

2.9.2. Using pressure plate apparatus

Soil water characteristic curve of a soil can be obtained by using a pressure-plate apparatus also. Soil water characteristic curves (SWCCs) were developed (Tharanganie, 2004) using a 5-bar pressure plate apparatus as shown in Figure 2.18 for compacted soil sample collected at the sites Pussellawa and Kahagalla.

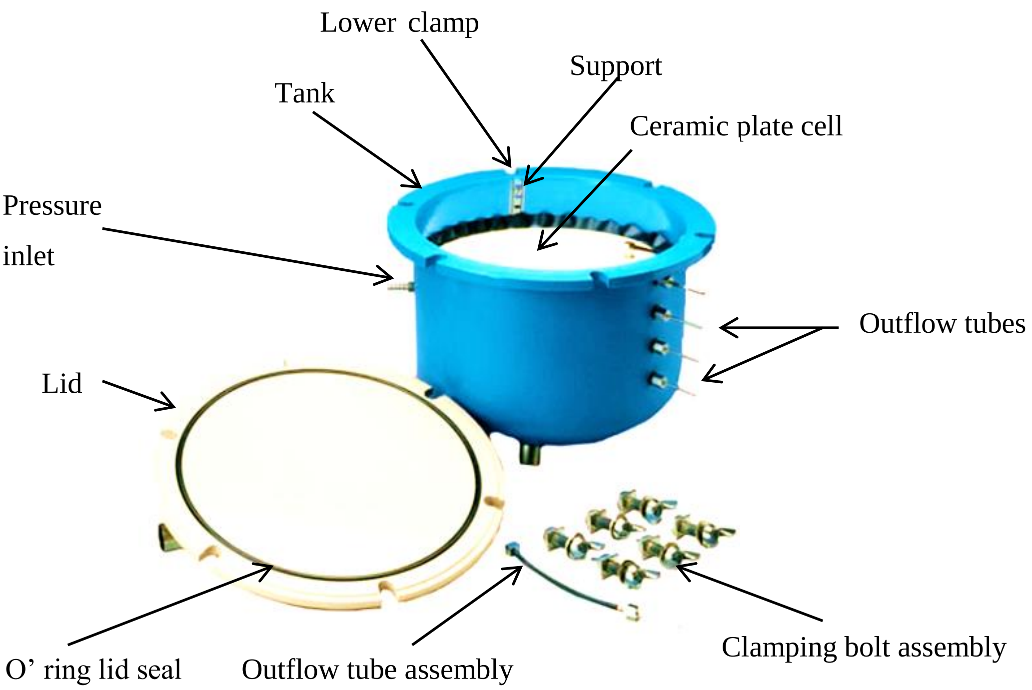


Figure 2.18: Pressure plate (5-bar) extractor

In their research, specimens were prepared in rubber retaining rings of 50mm diameter and 10mm height. Retaining ring was held in position by a PVC ring of 52mm internal diameter and 10mm height. Specimens were compacted to 100% of the maximum dry density. For the preparation of specimens, oven dried soils sieved through 1.18mm sieve were used. Some of the results (SWCCs) obtained are shown in Figure 2.19 & Figure 2.20 for Pussellawa & Kahagalla landslides respectively.

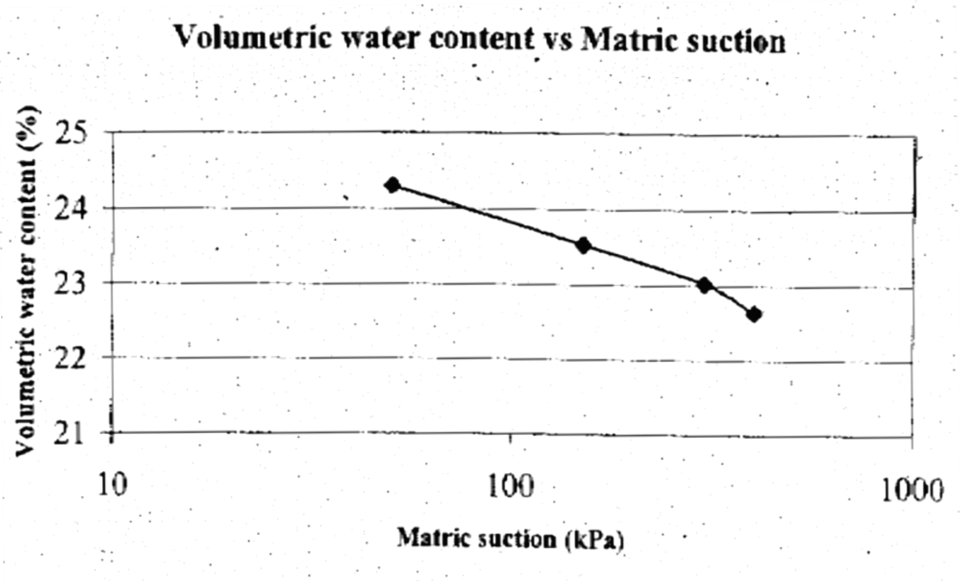


Figure 2.19: Soil water characteristic curve (SWCC) for Pussellawa landslide soil using pressure plate apparatus (after Tharanganie, 2004)

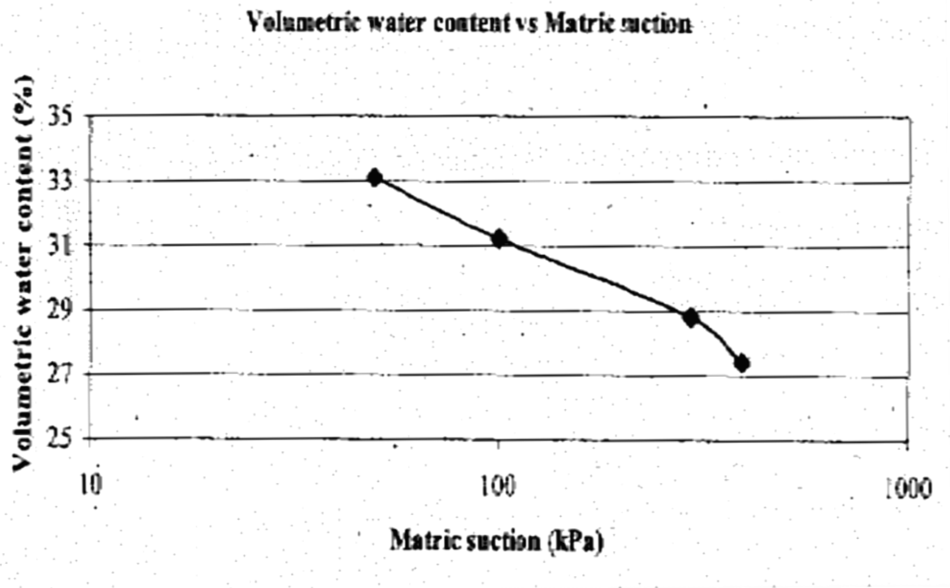


Figure 2.20: Soil water characteristic curve (SWCC) for Kahagalla landslide soil using pressure plate apparatus (after Tharanganie, 2004)

The shear strength parameters were determined by conduct of tri-axial tests with the unsaturated samples with different equilibrium (u_a - u_w) values and results are summarized in Figure 2.21 & Figure 2.22.

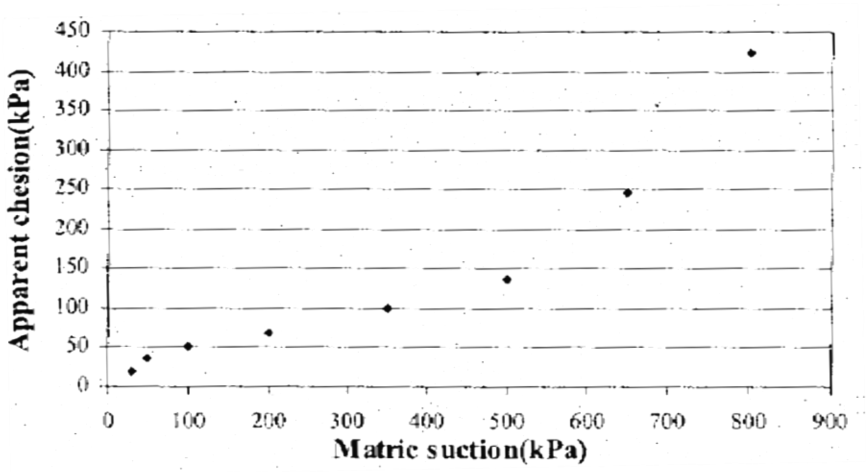


Figure 2.21: The variation of apparent cohesion with matric suction for Pussellawa landslide soil (after Tharanganie, 2004)

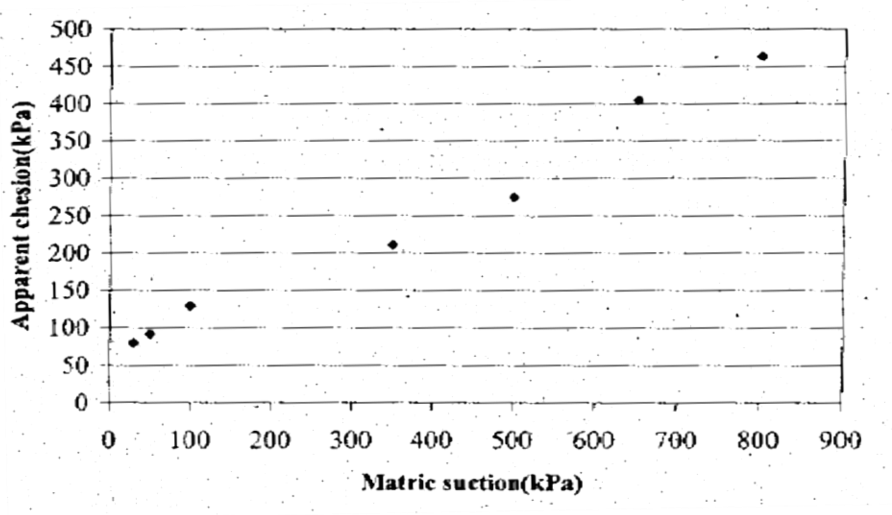


Figure 2.22: The variation of apparent cohesion with matric suction for Kahagalla landslide soil (after Tharanganie, 2004)

2.9.3. Determination of permeability function

In the study of effect of rainfall on slope stability rain infiltration and evaporation processes are frequently investigated in order to couple the climatic effect with the stability analysis. The boundary condition at the ground surface is of great importance when performing such analysis (Vaughan, 1994, Rahardjo et al., 2009).

The value of suction at this boundary in general undergoes an extreme fluctuation during wet and dry season. In particular, it can exceed many thousands of kPa after a prolonged dry period.

Prolonged rainfall and infiltration can diminish soil suction to nearly zero at a critical depth and frequently become a triggering mechanism of shallow slope failure (e.g. Springman et al., 2003, Chen et al., 2004, and Godt et al., 2009). Additionally, perched water table or positive pore water pressure can also be induced during heavy rainfall at a shallow depth in soil slopes as a result of wetting front being impeded by zones of much lower permeability in drier unsaturated soil or impervious rock underneath (e.g. Vaughan, 1985, Collins & Znidarcic, 2004, and Jotisankasa et al., 2008).

Therefore, the coefficient of permeability of unsaturated soils is of increasing concern for analyses of flow in saturated/ unsaturated soil for applications in the geotechnical and geo-environmental areas. As such, a proper evaluation of the coefficient of permeability can make the saturated/ unsaturated flow analysis more accurate. The coefficient of permeability of an unsaturated soil may be predicted using one of several empirical estimation procedures available in the literature (Fredlund et al., 1994). However, the accuracy for such a prediction sometimes is not satisfactory. Each of the estimation procedures has been tested on limited amount of data.

The coefficient of permeability can also be experimentally measured and can provide good data for the verification of the coefficient of permeability for both theoretical and experimental determinations. The soil under consideration is commonly assumed to be of constant volume. However, soil is known to behave as a deformable porous medium. The total volume of a soil may change due to change in stress state variables. Available experimental methods have also been developed based on the assumption that the soil specimen remains at constant volume. As such, the deformation in the soil specimen is usually neglected.

In order to properly deal with soils as a deformable porous medium, a better coefficient of permeability of a deformable unsaturated soil can be determined and the change in total volume of the soil specimen also has been monitored by some researchers such as Huang et al., (1995) using a specially designed triaxial permeameter and Jotisankasa et al., (2010) using a particularly designed apparatus with tensiometer.

Therefore, permeability function is one of the most sophisticated parameters to measure in unsaturated soils. The aforementioned continuous soil water characteristic curve (SWCC) measurement method proposed by Jotisankasa et al., (2010) can also be used to determine the permeability function. The values of suction at three locations can be used to calculate the hydraulic gradient, i, as follows;

$$i = d\,(z - s/\gamma_w)/\,dz \qquad [2.15]$$

Where z is the elevation head of each tensiometer relative to the base of sample, s is matric suction, and γ_w the unit weight of water. For the drying and wetting tests, based on the previous research experience Jotisankasa et al., (2010) suggested that the value of hydraulic gradient, i, calculated over only the upper and middle pore pressure measurement gives better results of k-function than calculated over three measurements. This is perhaps due to non-uniformity of the pore water pressure distribution as described previously.

The plot of change in soil mass with time can be used to calculate the flux or discharge velocity, v, at any particular time as follows;

$$v = dV_w/\,Adt \qquad [2.16]$$

Where dV_w is the change of volume of water in soil sample which can be calculated from change in soil mass during test, A is the cross section area of sample, and dt is the elapsed time. Linear regression can be used to calculate the slope (velocity) from data points.

The value of permeability at any suction and volumetric water content can then be calculated as in Equation [2.17].

$$k = v / i \qquad [2.17]$$

Some of the results obtained are shown in Figure 2.23, Figure 2.24 & Figure 2.25.

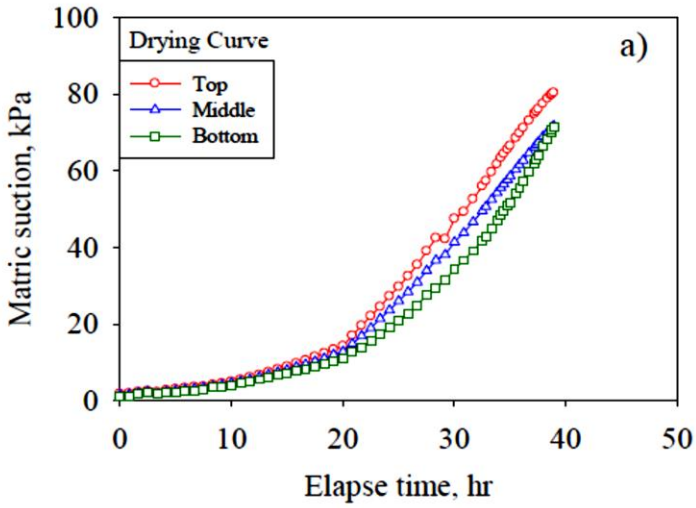


Figure 2.23: Typical results during drying path for a silty residual soil (after Jotisankasa et al., 2010)

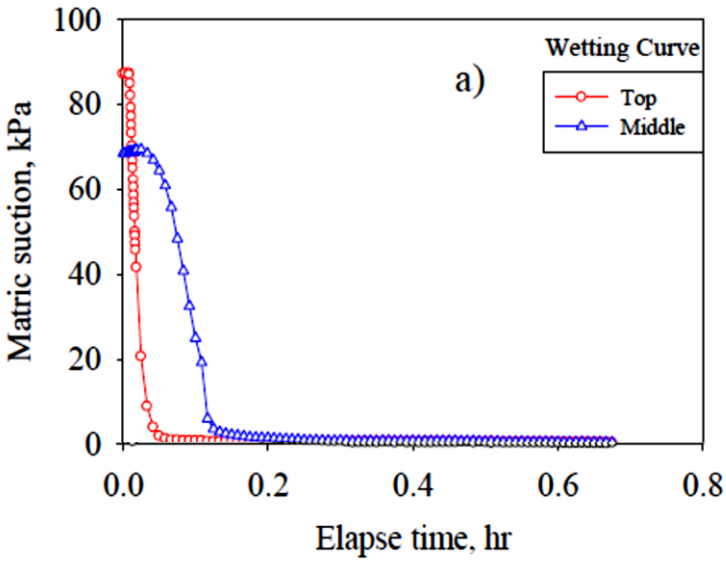


Figure 2.24: Typical results during wetting path for a silty residual soil (after Jotisankasa et al., 2010)

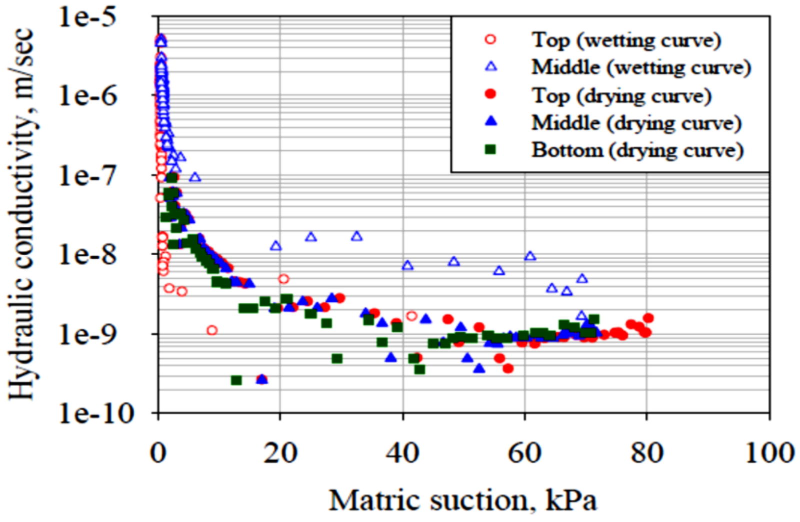


Figure 2.25: Typical results of permeability function for a silty residual soil (after Jotisankasa et al., 2010)

2.9.4. Estimation of soil water characteristic curve using grain size distribution

Grain size distribution is one of the most primary functions associated with any type of soil. It is a derivation of two basic laboratory tests, namely sieve analysis and hydrometer analysis. Efforts have been taken to predict soil-water behaviour using grain size distribution.

Direct measurements of soil water characteristic curve is more time consuming and as well as it is not the most cost effective way.

Gupta and Larson (1979), Arya and Paris, (1981), Jotisankasa et al., (2009) have conducted research works to establish soil water characteristic curve (SWCC) using grain size distribution. Arya & Paris, (1981) proposed the well-known physic-empirical model to predict the volumetric water content-suction relationship of a soil from its particle size distribution, dry density and specific gravity. This approach is based on the conversion of a particle size distribution into a pore size distribution. The cumulative pore volumes corresponding to progressively increasing pore radii are divided by the sample dry density to give the volumetric water contents and the pore radii are converted to equivalent soil suctions using the equation of capillarity.

The formulation is based on an empirical parameter, α, used to fit the experimental results to the model. Different soils have different curve fitting parameters associated with them resulting from difference of texture, fabric and etc. (Jotisankasa et al., 2009). The detailed mathematical formulation of the model is presented in the proceeding sections.

2.9.4.1. Pore volume and volumetric water content

The cumulative particle size distribution curve was divided into "n" fractions and then the solid mass is reassembled to form a natural-structure sample. In doing so, it can imagine that particles in each size fraction pack in a discrete domain and that, when all the domains are assembled together, the resulting assemblage has a bulk density measured on a natural structure sample. This requires the assumption that the bulk density of the natural structure sample applies to the assemblages formed by each of the n fractions uniformly.

It is recognized, of course, that in a natural sample, particles are not packed in discrete domains consisting of uniform size particles; they are more or less randomly distributed. But since the interest is in a pore volume attributable to the particles in a given size fraction, the assumption made above does not pose an inexplicable problem. The pore volume associated with each size fraction now was computed as;

$$V_{vi} = (W_i/\rho_p) \times e, \quad i=1, 2, 3, \ldots, n \qquad [2.18]$$

Where V_{vi} is the pore volume per unit sample mass associated with the solid particles in the i^{th} particle-size range, W_i, is the solid mass per unit sample mass in the i^{th} particle-size range, ρ_p is the particle density, and e is the void ratio. The values of W_i are obtained from the plots of particle size distribution curve (Figure 2.26). The differences in cumulative percentages corresponding to successive particle sizes divided by 100 result in values of W_i, such that the sum of all W_i, is unity.

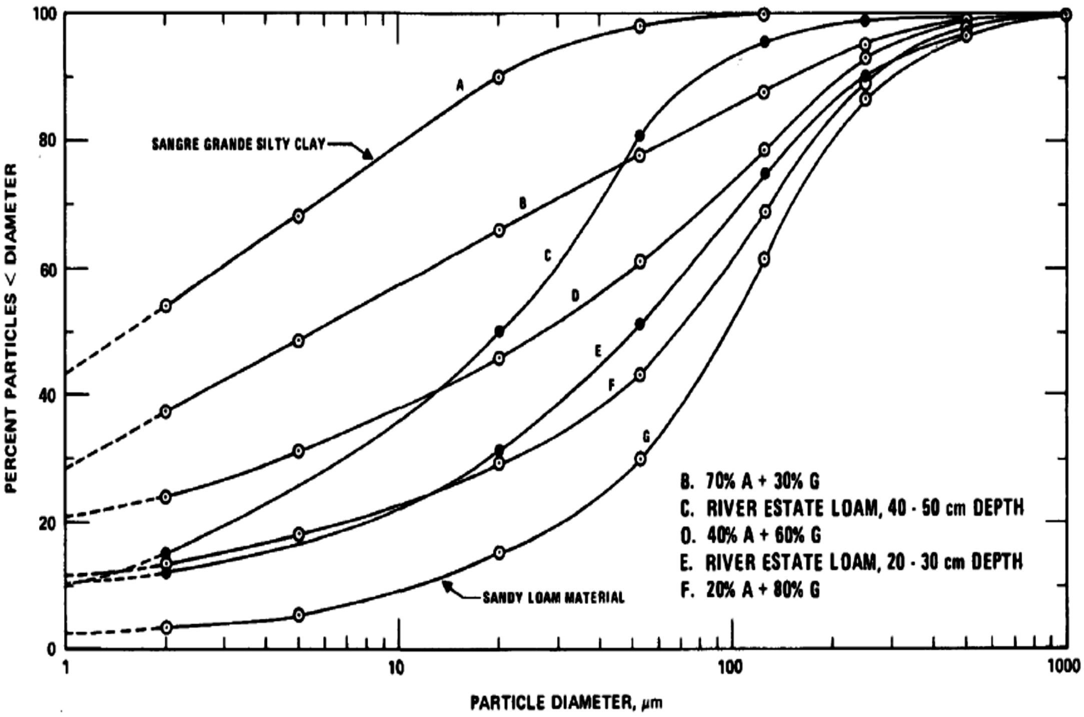


Figure 2.26: Particle size distribution of soil materials on which moisture characteristic data were obtained. Dashed lines indicate extrapolation (after Arya & Paris, 1981)

The pore volumes V_{vi} generated by each size fraction are progressively accumulated and considered filled with water. The volumetric water content is then computed;

$$\theta_{vi} = \sum_{j=1}^{j=i} V_{vj}/V_b, \quad i=1, 2, 3,\ldots, n \qquad [2.19]$$

Where θ_{vi}, is the volumetric water content represented by a pore volume for which the largest size pore corresponds to the upper limit of the i^{th} particle-size range, and V_b is the sample bulk volume per unit sample mass given by;

$$V_b = \sum_{i=1}^{i=n} W_i/\rho_d = 1/\rho_d, \quad i=1, 2, 3,\ldots, n \qquad [2.20]$$

An average volumetric water content corresponding to the midpoint of a given particle-size range is given approximately (if size intervals are small) by;

$$\theta_{vi}^{*} = (\theta_{vi} + \theta_{vi+1})/2 \qquad [2.21]$$

Where θ_{vi}^*, is the average volumetric water content represented by a pore volume for which the largest size pore corresponds to the midpoint of the i^{th} particle size range.

2.9.4.2. Particle size and pore radius

In addition to the assumption made earlier that the solid fraction in each particle size range can be assembled into a discrete domain with a dry density of the sample, It was assumed (i) that the solid volume in any given assemblage can be approximated as that of uniform size spheres defined by the mean particle radius for the fraction, and (ii) that the volume of the resulting pores can be approximated as that of uniform size cylindrical capillary tubes whose radii are related to the mean particle radius for the fraction. With these assumptions, the relationship between pore and particle radii is formulated. If the solid mass in the i^{th} particle-range is represented by n_i, spherical particles and if the entire pore volume formed by the assemblage of particles in that range was represented by a single cylindrical pore, then;

$$V_{pi} = 4\pi n_i R_i^3/3 = W_i/\rho_p \qquad [2.22]$$

and

$$V_{vi} = \pi r_i^2 h_i, = (W_i/\rho_p) \text{ x } e \qquad [2.23]$$

Where V_{pi} is the total solid volume in the assemblage, R_i is the mean particle radius, r_i, is the mean pore radius, and h_i, is the total pore length.

Dividing Equation [2.22] by Equation [2.23] gives;

$$r_i^2/R_i^3, = 4n_ie/3h_i \qquad [2.24]$$

For a given assemblage of particles, It was proposed to approximate the pore length as the number of particles that lie along the pore path times the length contributed by each particle.

Thus, in a cubic close packed assemblage of uniform size spherical particles, the total pore length is equal $n_i 2R_i$. In a natural soil material, however, the pore length depends on actual particle shapes, sizes, and orientations. Given that the actual soil particles are non-spherical and it was assumed that each particle contributes a length that is greater than the diameter of an equivalent sphere.

As a result, the number of spherical particles with radius R_i, required to track the total pore length in a natural soil material exceeds n_i. Let the number of particles required be n_i^{α}, where α is > 1. The total pore length, h_i, and then equal $n_i^{\alpha} 2R_i$.

Substitution for h_i in Equation [2.24] gives;

$$r_i = R_i[4en_i^{(1-\alpha)}/6]^{1/2} \qquad [2.25]$$

The value of n_i in Equation [2.25] can be obtained from Equation [2.22], and α is to be determined empirically (Figure 2.27).

2.9.4.3. Pore radius and soil water pressure

Once the pore radii are obtained, the equivalent soil water pressure can be obtained from the familiar equation of capillarity,

$$\psi = 2T_s\cos\theta/\rho_w g r_i \qquad [2.26]$$

where ψ, is the soil water pressure, T_s is the surface tension of water, θ is the contact angle, ρ_w is the density of water, g is the acceleration due to gravity, and r_i is the pore radius. Surface tension and density of water are temperature dependent, while the contact angle may vary depending on organic content of the soil. However, it was assumed that a temperature of 25°C and a contact angle of 0°. Where adequate information on temperature and contact angle is available, appropriate adjustments may be made.

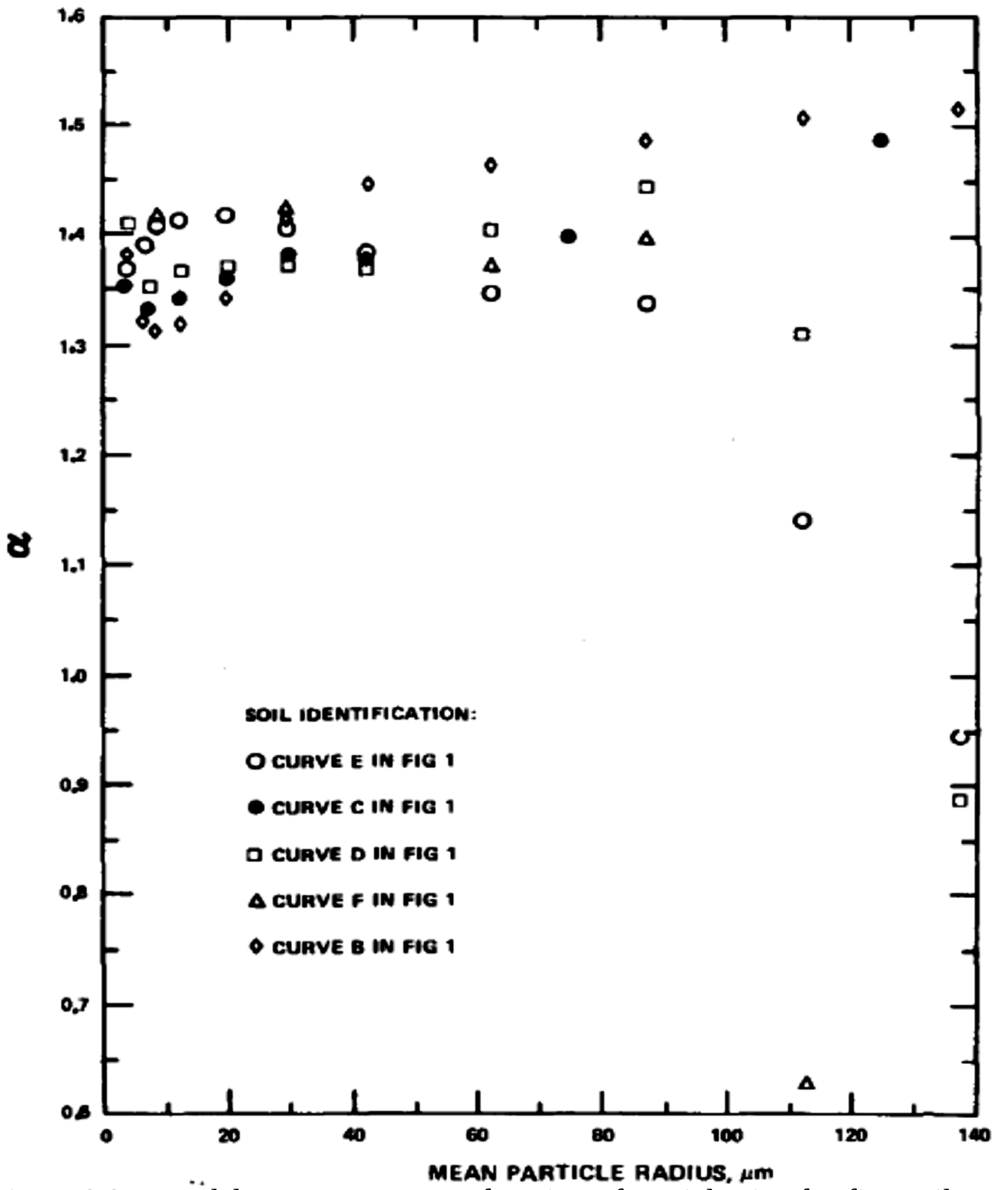


Figure 2.27: Model parameter α as a function of particle size for five soil materials (after Arya & Paris, 1981)

Arya & Paris, (1981) applied this formulation using data obtained at the Caribbean Agricultural Research and Development Institute and the University of the West Indies, Trinidad.

This process was applied on the soil obtained from the current study site. The development of the soil water characteristic curves (SWCCs) for the two soil types SILTY SAND and SANDY SILT encountered in the research are illustrated in Section 7.4 of the thesis.

2.10. Analytical studies done in Sri Lanka on infiltration of rainwater

Sujeevan and Kulathilaka (2011) modeled the infiltration into a typical cut slope in the Southern Expressway using Geo-slope SEEP/W software. Results of studies on cut slopes with a gradient of 1:1 with 2m wide berms at vertical intervals of 7.5m are presented here. The geometry of the cut slope and the boundary conditions utilized for the transient seepage analysis are shown in Figure 2.28.

Three cases of sub soil condition were studied. In Case 1 the entire slope is assumed to be made of residual soils and in Case 2 a thick layer of residual soil is underlain by weathered rock. The boundary between the residual soil and the weathered rock is shown by line JC in Figure 2.28. Finally in the Case 3 the thickness of the residual soil is much lower and the boundary between the residual soil and the weathered rock is shown by line IC in Figure 2.28.

A boundary flux, q, equal to the desired rainfall intensity, I_r, was applied to the surface of the slope. The nodal flux, Q, was taken to be zero at the sides of the slope above the water table and at the bottom of the slope to simulate a no flow zone (Figure 2.28). Equal total heads, h_t, were applied at the sides of the slope below the water table. The broken line indicates the initial water table of the slopes and it was taken to be the same for all three cases. Analysis was carried out for different rainfall intensities such as of 5mm/hr, 20mm/hr over duration of 1 to 5 days.

In the absence of actual Soil Water Characteristic Curves and Permeability functions of different soil layers some standard data available in literature was used (Figure 2.29).

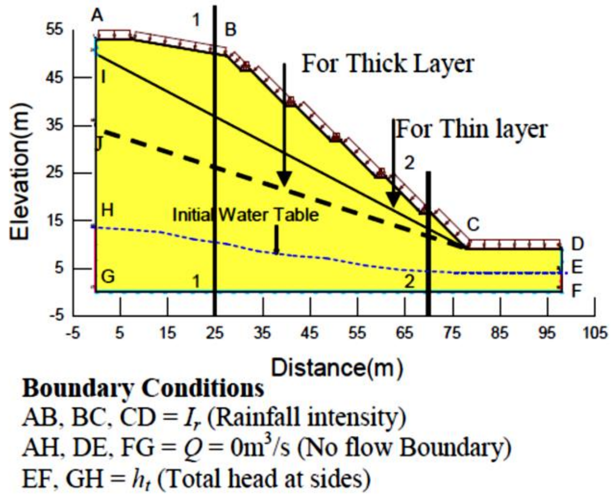
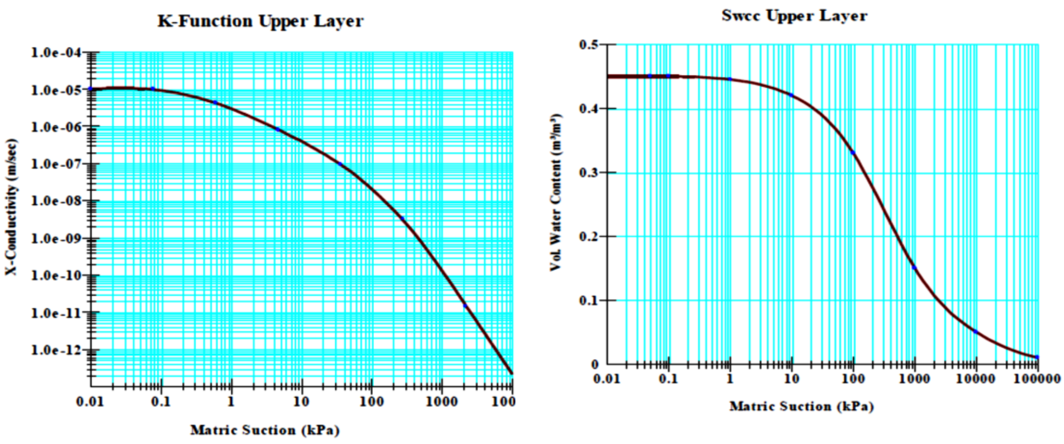


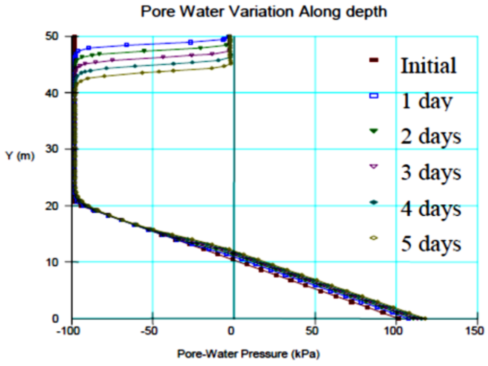
Figure 2.28: Cut slope (1:1) geometry, selected sections and boundary conditions



(a) Hydraulic conductivity function **(b) Soil water characteristic curve**

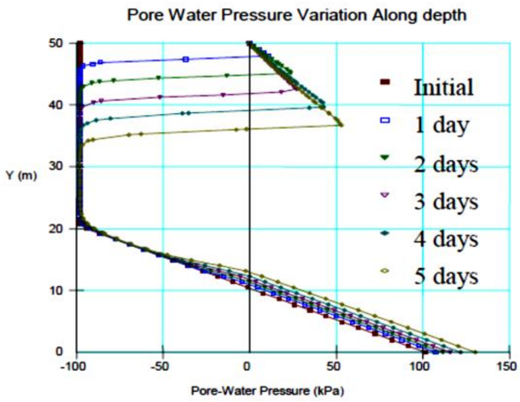
Figure 2.29: Characteristics of residual soils used

Initial pore water pressure profile was assigned with an upper limit of 100kPa on the matric suction. The variation of pore pressure over the depth due to the prolonged rainfall was studied. Figure 2.30 presents the variations in the pore pressure regime at Section 1 for a rainfall of intensity 5mm/hr. It could be seen that the matric suction is completely lost over a depth of around 5m and there is a very small rise of ground water table. When the rainfall intensity is 20 mm/hr, a perched water table condition has developed at Section 1 (Figure 2.31). The ground water table rise is not very significant. At section 2 there is a perched water table at the initial stages and a significant rise of ground water table (Figure 2.32).



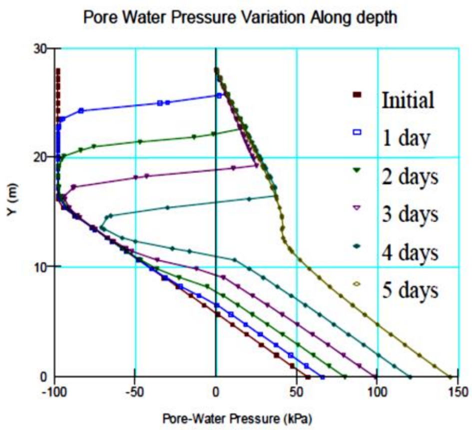
(a) For Section 1-1

Figure 2.30: Variation of pore water pressure for rainfall of 5mm/hr (after Sujeevan and Kulathilaka, 2011)



(a) For Section 1-1

Figure 2.31: Variation of pore water pressure for rainfall of 20mm/hr (after Sujeevan and Kulathilaka, 2011)



(b) For Section 2-2

Figure 2.32: Variation of pore water pressure for rainfall of 20mm/hr (after Sujeevan and Kulathilaka, 2011)

If there are surface drainage measures and surface protection vegetation of lower permeability (10^{-7} m/s) the infiltration would be much reduced and matric suctions are retained in the soil as illustrated in Figure 2.33. (Kulathilaka and Kumara, 2011).

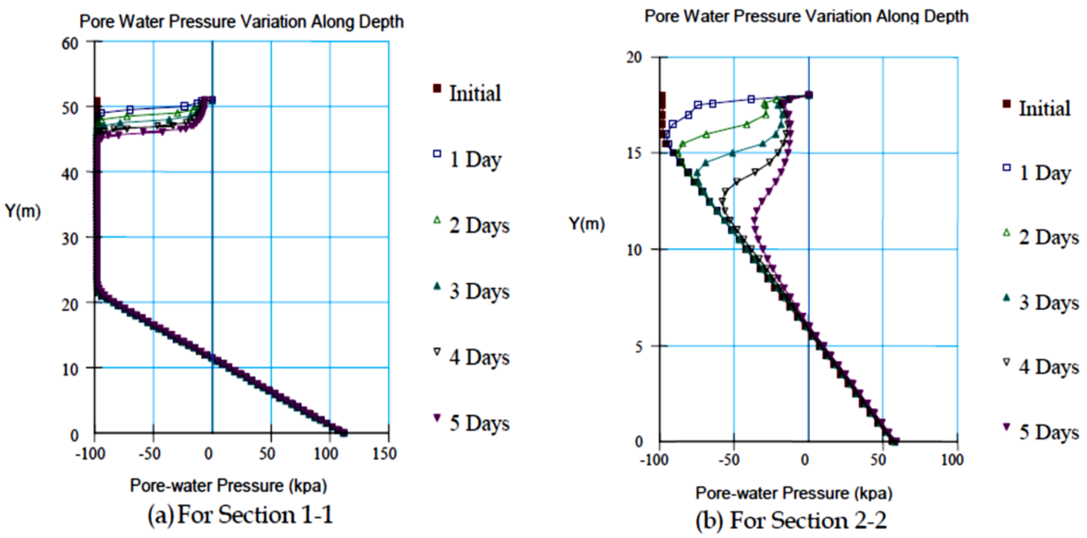


Figure 2.33: Pore water pressure distribution for 5mm/hr rainfall with vegetation layer of permeability 10^{-7}m/s (Case 1) (after Kulathilaka and Kumara, 2011)

The results of these analyses highlight the importance of knowing the characteristics of unsaturated soils accurately.

Chapter 3

3.0. GEOLOGY AND BASIC PROPERTIES OF THE SOIL TESTED

3.1. Site description and collection of undisturbed sample

Sri Lanka lies in the monsoon region of South Asia. The research area (Welipenna) is situated on the Western Province of the island and experiences a humid tropical climate. Landslide occurred on 2nd November 2012 at Welipenna at the chainage of 42km+500m along the Southern Expressway (E01) due to continuous heavy rainfall. Undisturbed box samples of soil obtained from different elevations on the failed slope at Welipenna further into the intact slope just above the scar of the failure were used in this study.

Figure 3.1: The research study area

3.2. General geology of the project area

About 90% of Sri Lanka basement is underlain by late proterozoic high grade metamorphic rock and the rest is made up of Mesozoic (Jurassic), Tertiary (Miocene) and quarternary sedimentary formation. The late proterozoic high grade basement of Sri Lanka is divided into three main and one subordinate lithotectonic units namely Highland Complex (HC), Wanni Complex (WC), Vijayan Complex (VC) and Kadugannawa Complex (KC).

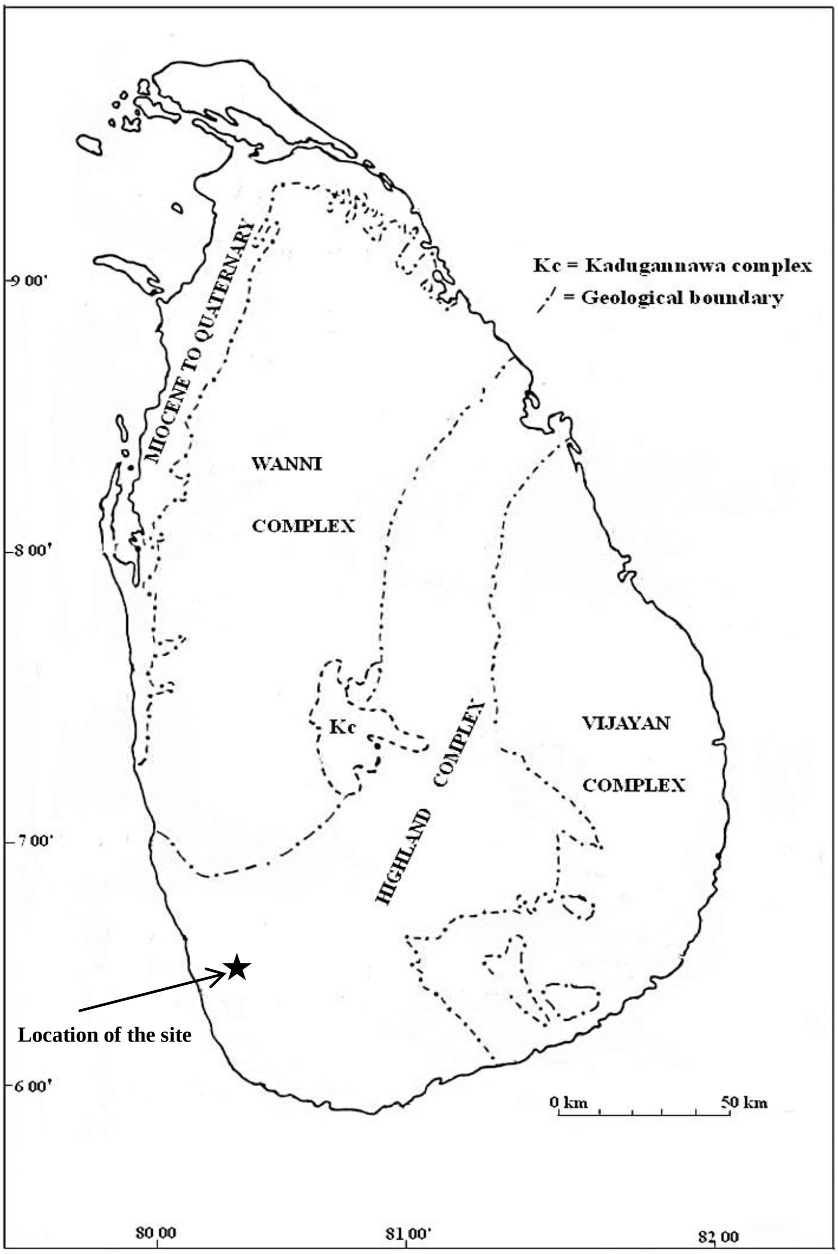


Figure 3.2: Simplified geological map of Sri Lanka showing major lithotectonic units (After Cooray, 1994)

Highland Complex (Figure 3.2) occupies the central island as well as most of the south-western part of the island and extends to the north-eastern coast in the form of a narrow belt. It consists of meta-sedimentary rocks, migmatite and meta-igneous rock. The meta-sedimentary rocks are meta-quartzite, marble, calc silicate, granulites, garnet silimanite graphite gneiss (khondalite), cordierite bearing gneiss, calc gneiss, garnet quartz-feldspar granulites and gneisses (Kroner et al., 1991).

Over 50% of the complex is made up granitoid origin quartzfeldspathic banded gneisses and charnockitic gneisses tectonically interlayer with metasediments. However, some portions of highland complex are made of amphibolites facies metamorphic rocks (hornblende biotite gneiss, garnet biotite gneiss, garnet hornblende biotite gneiss) as a result of retro-grade metamorphism process. Highland Complex has suffered three multi-phase deformations.

3.3. Geology of the site

The study area covers with lateritic soil as major soil type. Laterite is a rather dense, but relatively easily worked, mottled earthy mass of cellular structure which is enriched in iron and aluminum hydroxides and derives relatively rapidly in the air, after which it can be used as a rather strong construction material. In addition to minerals of the aluminum and iron hydroxide groups, laterite contains considerable amounts of kaolinite, filling the cells of the kaolinite sequioxide matrix.

Typically the laterites of Sri Lanka are mottled deep red, yellow or reddish-brown ferruginous earth showing cellular structure, many vesicles benign outlined by paler materials. In a typical case, partly decomposed parent rock can be seen.

The main process of the laterite formation is the relative or absolute enrichment of Al, Fe, Mn, Ni, and Cr. Such a weathering process occurring under tropical or subtropical climatic conditions may lead to the formation of range of products prominent among them in Sri Lanka being Fe- rich, Al-rich and Ni-rich laterite. Thus a given rock may be upgraded in a metal content by leaching of silica during the weathering process. In this work, the term laterite is used to denote rock whose Fe and Al content are enriched. The term lateritisation is enrichment of Fe_2O_3 and the term bauxitisation is reserved for those residues rich in Al_2O_3. Since the laterite studies have shown to be rich in both these oxides, these parameters have been utilized for the purpose of this work.

3.4. Determination of the characteristics of soils encountered

Experimental procedures were conducted to establish; soil water characteristic curves (SWCCs), permeability functions, shear strength parameters of the unsaturated residual soils encountered at the site using the methods prescribed in the preceding sections. Further, soil water characteristic curves (SWCCs) were developed analytically also using Arya & Paris method from particle size distribution curve.

Initially, the basic index properties of the soil, such as; particle size distribution, atterberg limits, specific gravity were determined. Consolidation tests and permeability tests were also conducted after saturation of the samples. The saturated permeability is required in the development of the permeability function and consolidation characteristics are necessary to determine the strain rates in direct shear tests.

Furthermore, pressure plate test, direct shear tests with/without tensiometer and permeability function tests were also performed on undisturbed sample to establish unsaturated characteristic properties.

3.4.1. Classification of the soil

Soil classification was carried out as per the British Soil Classification System (BSCS) and Unified Soil Classification System (USCS) to identify the soil types encountered at the site. Accordingly, two types of soil were recognized such that SILTY SAND/SITY SAND with GRAVEL and SANDY SILT/SANDY elastic SILT for BSCS/USCS respectively were present in the box samples. Particle size distribution obtained using the wet sieving technique is presented in Figure 3.3 & Figure 3.4 and results are tabulated in Annex 1 for both types of soils. Soil sample have different composition of percentage as shown in Table 3.1 & Table 3.2.

Series of specific gravity tests were performed on both soil types and average values were obtained as **2.60** and **2.66** for SILTY SAND and SANDY SILT respectively. Soil classification is used as per the British Soil Classification System (BSCS) in proceeding sections.

Table 3.1: Summary index property test for soil type 01(SILTY SAND)

Sample No.	Classification		Liquid limit	Plastic limit	Plasticity index	Gravel /(%)	Sand /(%)	Silt /(%)	Clay /(%)
	BSCS	USCS							
Sample 1	SM	SM	Non-plastic			16	64	16	4

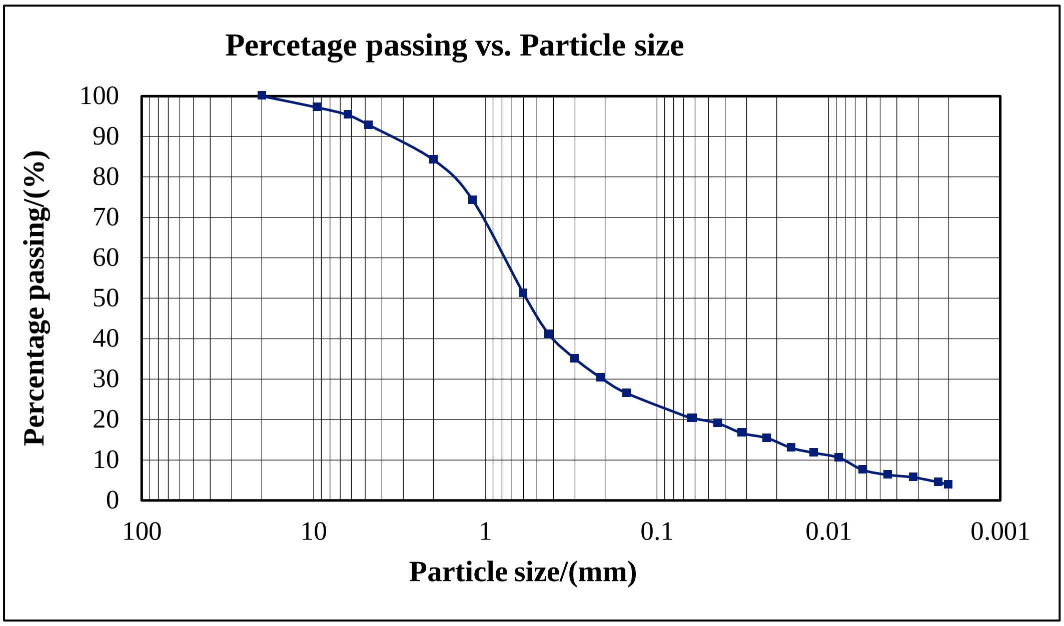


Figure 3.3: Particle size distribution for SILTY SAND

Table 3.2: Summary index property test for soil type 02 (SANDY SILT)

Sample No.	Classification		Liquid limit	Plastic limit	Plasticity index	Gravel /(%)	Sand /(%)	Silt /(%)	Clay /(%)
	BSCS	USCS							
Sample 2	MS	MH	54	43	11	2	43	35	20

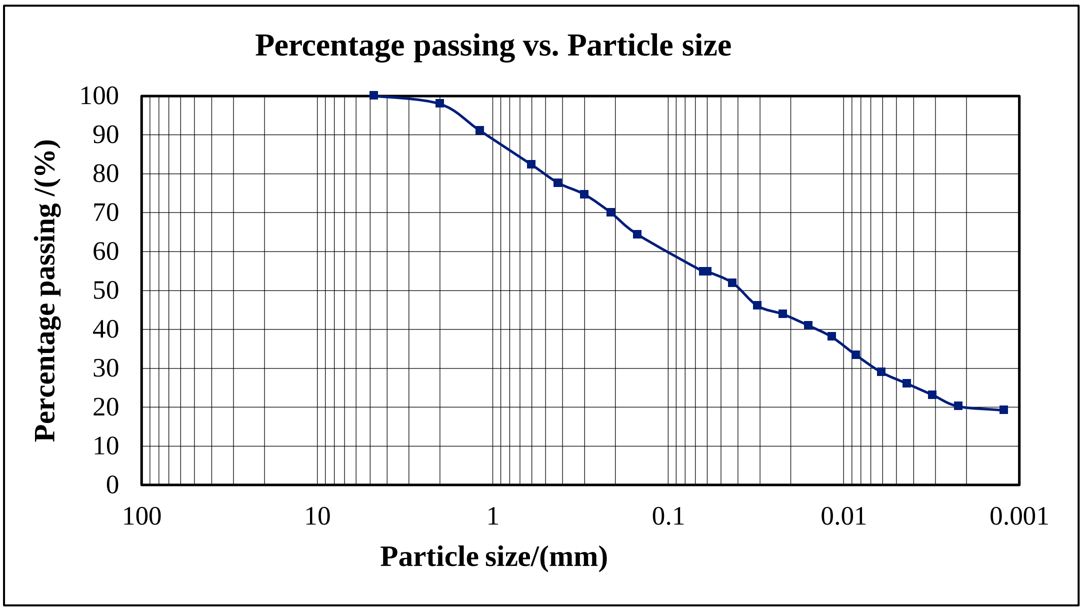


Figure 3.4: Particle size distribution for SANDY SILT

3.4.2. Determination of saturation period

Undisturbed trial specimen was prepared into direct shear cutter ring and it was kept under water up to a level just below the top surface by covering top and bottom surface using porous stone to avoid wash out the particles from the surface. Then, sample was weighed after 24hrs and again kept under the water. This procedure was repeated for few days and observed the weight with variation of 0.01g. It can be concluded that minimum saturation period is 24hrs for small size specimen such as direct shear tests, consolidation test. Similar procedure was followed for large size specimen such as permeability function test and saturation period was calculated. Subsequently the saturation was confirmed by computation using basic measurements.

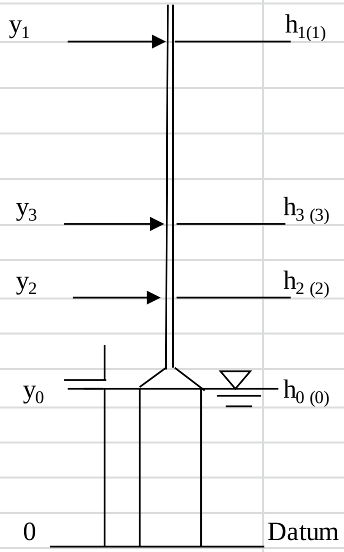
3.4.3. Saturated permeability of the soil

Before developing permeability function it is necessary to find the permeability of the soil under saturated conditions. Undisturbed specimen was extruded from box sample by jacking. Then it was allowed to get fully saturated for few days with the help of vacuum pump which speeds up and confirm fully saturation by removing the air in the soil sample.

Then falling head permeability was selected as it contains considerable percentage of fines. Several trials (5Nos.) were conducted on each soil type and the average values of permeability are shown in Figure 3.5 & Figure 3.6.

Saturated permeability of SILTY SAND was **8.69×10^{-7} m/s** and of SANDY SILT was **2.12×10^{-6} m/s**.

Sample details				
Diameter (D) mm	99	Area (A)	7700.8	mm^2
Length (L) mm	129	Volume	993.4	cm^3
Measured (Before Test)				
Mass of sample+mould (g)	2656.4	Bulk density	1.72	g/cm^3
Mass of mould (g)	944	Dry density	1.34	g/cm^3
Mass of sample (g)	1712.4	Specific Gravity	2.60	-
Moisture content (%)	28.83	Test temp:	25	^{o}C
Standpipe details		**Remarks:**		
Diameter (d) mm	5.00			
Area (a) mm^2	19.64			



Referance point	**Height above datum y (mm)**		**Height above outlet h (mm)**		**Test time t (sec)**	**t (min)**	**Height ratio**	
(1)	y_1	1115	h_1	932	(1 - 3) 283.0	4.72	h_1/h_3	2.198
(3)	y_3	607	h_3	424	(3 - 2) 315.0	5.25	h_3/h_2	2.197
(2)	y_2	376	h_2	193			$\log_{10}(h_1/h_3)$	0.342
(0)	y_0	183	h_0	0			$\log_{10}(h_3/h_2)$	0.342

Permeability (k) = [3.84aL log$_{10}$ (h$_0$/h$_t$)/At] x 10^{-5} m/s

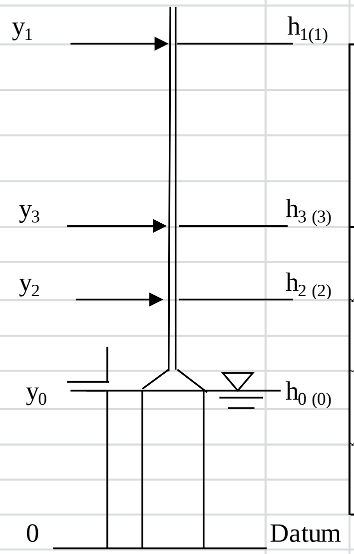
Test run (1 to 3)	k =	0.091632	$\times 10^{-5}$ m/s	
Test run (3 to 2)	k =	0.082265	$\times 10^{-5}$ m/s	
Permeability (k) = at (25^{o}C)		**8.69×10^{-7}**	**m/s**	

Where,

L - Length of sample (mm)
A- Area of cross section of sample (mm^2)
a - Area of cross section of standpipe (mm^2)
t - Test time (min)
h_0- Drop in head at time "0"
h_t- Drop in head at time "t"

Figure 3.5: Details of permeability test for SILTY SAND

Sample details				
Diameter (D) mm	99	Area (A)	7700.8	mm^2
Length (L) mm	129	Volume	993.4	cm^3
Measured (Before Test)				
Mass of sample+mould (g)	2446.57	Bulk density	1.51	g/cm^3
Mass of mould (g)	944	Dry density	1.17	g/cm^3
Mass of sample (g)	1502.57	Specific Gravity	2.60	-
Moisture content (%)	29.1	Test temp:	25	^oC
Standpipe details		**Remarks:**		
Diameter (d) mm	5.00			
Area (a) mm^2	19.64			



Referance point	Height above datum y (mm)		Height above outlet h (mm)		Test time t (sec)	Test time t (min)	Height ratio	
(1)	y_1	1115	h_1	932	(1 - 3) 120.0	2.00	h_1/h_3	2.198
(3)	y_3	607	h_3	424	(3 - 2) 124.4	2.07	h_3/h_2	2.197
(2)	y_2	376	h_2	193			$\log_{10}(h_1/h_3)$	0.342
(0)	y_0	183	h_0	0			$\log_{10}(h_3/h_2)$	0.342

Permeability (k) = [3.84aL log $_{10}$ ***(h*** $_0$ ***/h*** $_t$ ***)/At] x 10*** $^{-5}$ ***m/s***

Test run (1 to 3)	k =	0.216098	$x10^{-5}$ m/s
Test run (3 to 2)	k =	0.208307	$x10^{-5}$ m/s
Permeability (k) = at (25°C)		**$2.12x10^{-6}$**	**m/s**

Where,

L - Length of sample (mm)
A- Area of cross section of sample (mm^2)
a - Area of cross section of standpipe (mm^2)
t - Test time (min)
h_0- Drop in head at time "0"
h_t- Drop in head at time "t"

Figure 3.6: Details of permeability test for SANDY SILT

3.4.4. Consolidation test

It was required to come up with an appropriate shearing rate during the testing of the samples in the direct shear box under consolidated drained conditions. Consolidation test was conducted after saturation of the samples to obtain the coefficient of consolidation under saturated conditions.

Specimen details, the variation of the coefficient of consolidation with the stress level and the variation of void ratio with stress applied (log scale) obtained through the testing are presented in Table 3.3, Table 3.4 & Figure 3.7 respectively.

Table 3.3: Specimen details for the consolidation test

Parameter	**Value**	**Parameter**	**Value**
Diameter/(mm)	50.00	Bulk density/(kg/m^3)	1598
Height at initial/(mm)	19.40	Moisture content/(%)	34.0
Void ratio at initial, e_0	1.180	Dry density/(kg/m^3)	1193
Saturation, S_r/(%)	100	Specific gravity, G_s	2.60
Void ratio at final, e_f	1.09	Solid height/(mm)	8.90

Table 3.4: Variation of coefficient of consolidation

Stress level/ (kPa)	**Void ratio, (e)**	**Coefficient of volume compressibility, m_v/(m^2/kN)**	**Coefficient of consolidation, C_v/(m^2/Yr) (√time method)**
0 - 50	1.145	0.00032	6.603
0 - 100	1.122	0.00021	5.513
0 - 200	1.092	0.00014	3.829

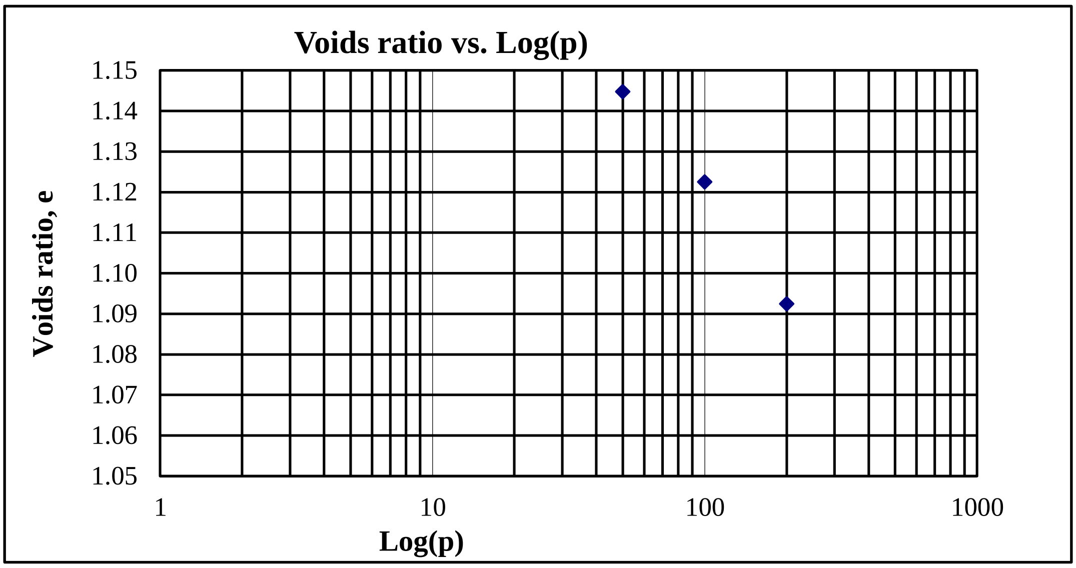


Figure 3.7: The variation of void ratio with stress applied

Stress level in direct shear testing was limited up to 200kPa as the maximum normal stress to be applied in direct shear test is 200kPa.

By applying the Equation [3.1], t_{90} values for consolidation sample were calculated for each stress level.

$$T_{90} = C_v * t_{90} / H^2 \quad [3.1]$$

Where, T_{90} is time factor corresponds to 90% degree of consolidation, t_{90} time taken for 90% degree of consolidation, C_v is the coefficient of consolidation and H is the drainage length.

Same equation was used for both consolidation and direct shear samples as those have different heights and it can be converted as;

$$t_{90,1} / H_1^2 = t_{90,2} / H_2^2 \quad [3.2]$$

From the Equation [3.2], t_{90} values for the direct shear sample can be calculated. Then shearing rate was calculated by allowing maximum horizontal displacement of 6mm for each stress level and lowest shearing rate was selected for all the direct shear tests.

Chapter 4

4.0. DEVELOPMENT OF SWCC WITH PRESSURE PLATE APPARATUS

Soil water characteristic curve (SWCC) of a soil can be obtained by using a pressure-plate apparatus also. In this research, a 5-bar pressure plate apparatus (Figure 4.1) was used for this purpose.

4.1. Pressure plate apparatus

The essential components of the pressure plate apparatus are:

- Pressure vessel
- Ceramic pressure plate cell
- A pressure control and supply system

Figure 4.1: Typical arrangement of 5-bar pressure plate apparatus used for the research

Undisturbed specimen was used this study with dimension of 54.6mm inner diameter PVC ring of 10mm height and one edge is sharpened to get undisturbed sample easily.

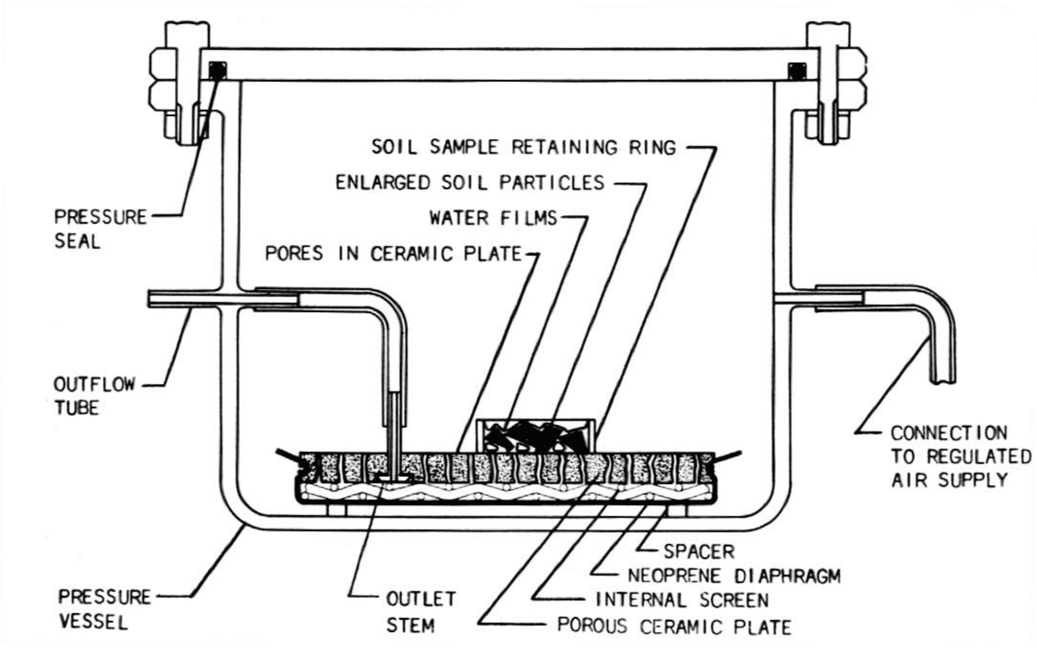


Figure 4.2: Cross sectional view of a ceramic pressure plate cell

Figure 4.2 shows diagrammatically a cross sectional view of a ceramic pressure plate cell mounted in a pressure vessel with outflow tube running through the vessel wall to the atmosphere, and with a soil sample held in place on the porous ceramic surface of the cell.

Each ceramic pressure plate cell consists of a porous ceramic plate, covered on one side by a thin neoprene diaphragm, which is sealed to the edges of the ceramic plate. An internal screen between the plate and diaphragm provides a passage for flow of water. An outlet stem running through the plate connects this passage to an outflow tube fitting, which connects to the atmosphere outside the extractor.

During each series of test, four soil samples were placed on the porous ceramic surface, held in place by retaining rings (PVC) with filter paper placed at the bottom. Porous ceramic plates together with samples were then saturated with water and this is usually done by allowing an excess of water to stand on the surface of the cell for several hours. After saturation, excess water on the surface of the cell was removed and then air pressure was applied to extract moisture from the soil samples.

As soon as air pressure inside the chamber was raised above atmospheric pressure, the higher pressure inside the chamber forces excess water through the microscopic pores in the ceramic plate and out through the outlet stem via the passage afforded by the screen. The high pressure air, however, will not flow through the pores in the ceramic plate since the pores are filled with water and the surface tension of the water at the air-water interface at each of the pores supports the pressure much the same as a flexible rubber diaphragm. The pressure value that finally breaks down these water meniscuses is called the “Air entry value” for the porous plate.

During the run, at any set air pressure in the extractor, soil moisture will flow from around each of the soil particles and out through the ceramic plate until such time as the effective curvature of water films throughout the soil are the same as at the pores in the plate. When this occurs, an equilibrium is reached and the flow of soil moisture ceases.

By maintaining different values of matric suction (u_a - u_w) in the apparatus for a sufficiently long period confirmed by observing constant volume change through outflow tube, samples were brought to equilibrium under different matric suctions. Average volumetric water content was determined by obtaining the weights of all four samples under equilibrium conditions for each level of matric suction (u_a - u_w).

The basic data are presented in Table 4.1 & Table 4.3 and the variation of volumetric water content with matric suction are tabulated in Table 4.2 & Table 4.4 and graphically shown in Figure 4.3 & Figure 4.4 for SILTY SAND & SANDY SILT respectively.

Table 4.1: The condition of the specimens used for the series for SILTY SAND

Parameter	Value			
Specimen No.	1	2	3	4
Moisture content/(%)	31.17	32.09	31.44	31.46
Inner diameter/(mm)	54.6	54.6	54.6	54.6
Height/(mm)	10	10	10	10
Volume/(cm^3)	23.414	23.414	23.414	23.414
Wet density/(kg/m^3)	1731.44	1733.15	1747.67	1747.25
Dry density/(kg/m^3)	1320.00	1312.12	1329.68	1329.06

Table 4.2: Variation of matric suction with volumetric water content for SILTY SAND

Set No.	Pore air pressure, u_a/(kPa)	Pore water pressure, u_w/(kPa)	Matric suction, $(u_a - u_w)$/(kPa)	Volumetric water content, θ_w/(%)
1	100	100	0	49.42
2	105	100	5	48.50
3	110	100	10	47.80
4	120	100	20	46.49
5	130	100	30	45.77
6	140	100	40	45.21
7	150	100	50	44.88
8	160	100	60	44.46
9	170	100	70	44.16
10	180	100	80	43.85
11	190	100	90	43.52
12	200	100	100	43.30
13	250	100	150	42.86
14	300	100	200	42.70
15	350	100	250	42.54
16	400	100	300	42.35
17	450	100	350	42.30
18	500	100	400	41.91

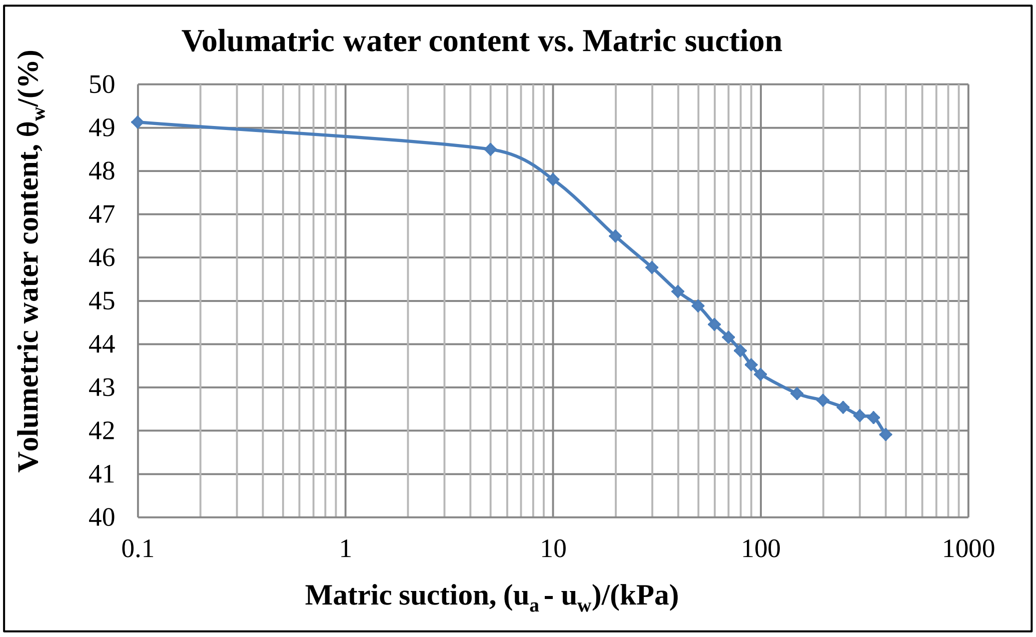


Figure 4.3: Soil water characteristic curve (SWCC) for SILTY SAND

Table 4.3: The condition of the specimens used for the series for SANDY SILT

Parameter	**Value**			
Specimen No.	1	2	3	4
Moisture content/(%)	28.20	28.95	27.26	27.48
Inner diameter/(mm)	54.6	54.6	54.6	54.6
Height/(mm)	10	10	10	10
Volume/(cm^3)	23.414	23.414	23.414	23.414
Wet density/(kg/m^3)	1651.15	1319.72	1659.26	1325.28
Dry density/(kg/m^3)	1287.90	1023.46	1303.83	1039.56

Table 4.4: Variation of matric suction with volumetric water content for SANDY SILT

Set No.	Pore air pressure, u_a/(kPa)	Pore water pressure, u_w/(kPa)	Matric suction, $(u_a - u_w)$/(kPa)	Volumetric water content, θ_w/(%)
1	100	100	0	56.56
2	105	100	5	53.13
3	110	100	10	49.15
4	125	100	25	44.62
5	150	100	50	38.54
6	175	100	75	34.41
7	200	100	100	32.01
8	300	100	200	32.18
9	400	100	300	31.13
10	500	100	400	31.12

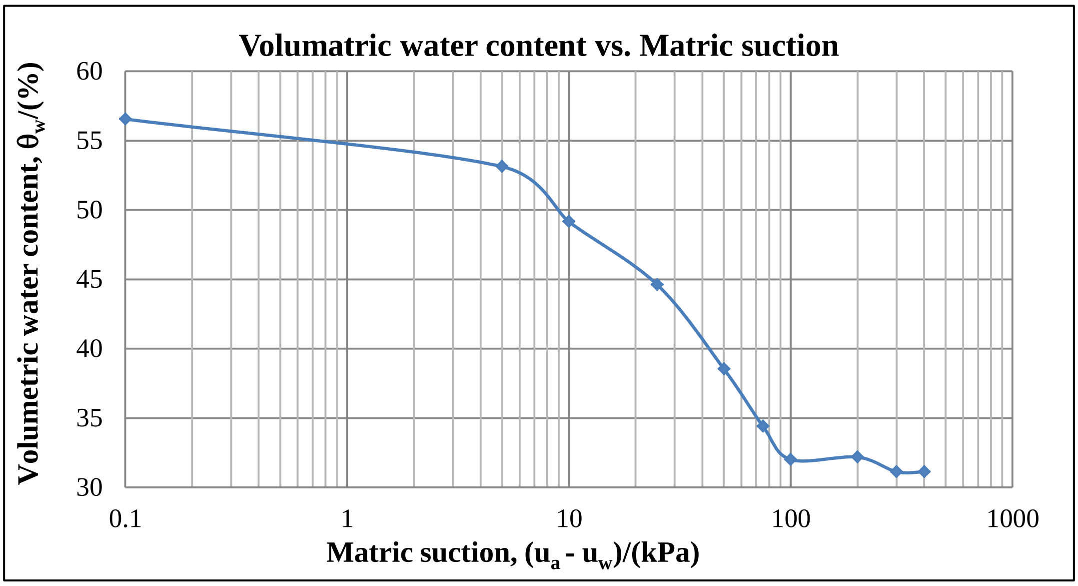


Figure 4.4: Soil water characteristic curve (SWCC) for SANDY SILT

4.2. Concluding comments

Table 4.1 & Table 4.3 show the large variation in dry densities (1.32g/cm^3 for soil type 01 and 1.16g/cm^3 for soil type 02) due to non-homogeneity of the residual soil. Figure 4.5 shows very narrow variation of volumetric water content for soil type 01

(SILTY SAND) while bit broader variation for soil type 02 (SANDY SILT). This is because soil type 01 contains 4% of clay while soil type 02 consists of 20% of clay. Accordingly, sandy soils show narrow variation in volumetric water content and if clay content is more, it produces the soil water characteristic curve (SWCC) similar to that of theoretical soil water characteristic curve (SWCC).

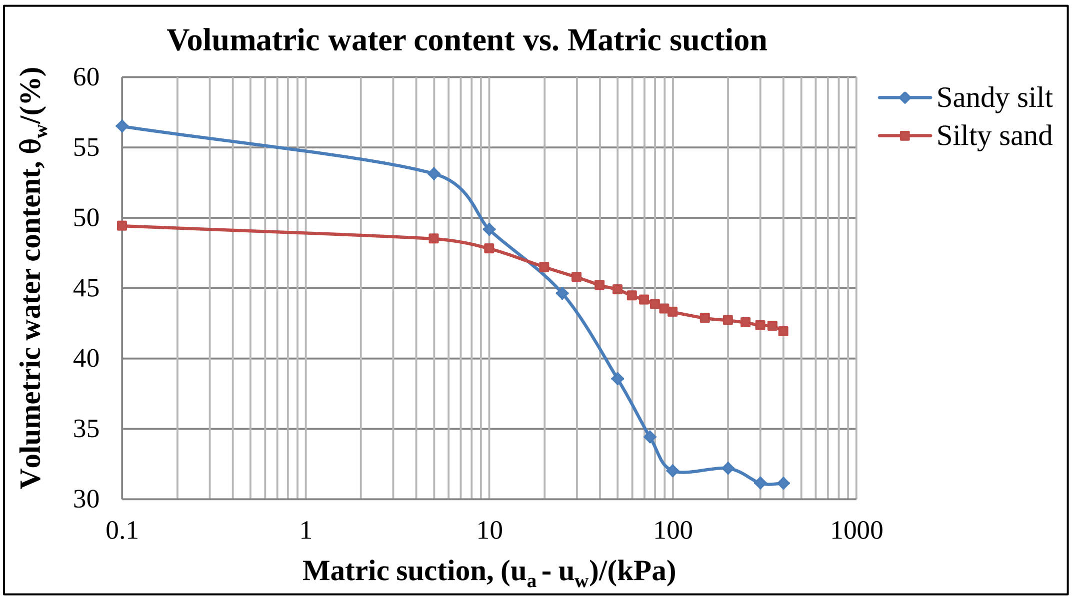


Figure 4.5: Comparison of soil water characteristic curve (SWCC) for both soil types

Least count of pressure gauge used in pressure plate apparatus is 10kPa and it couldn't be measured 5kPa and the relevant volumetric water content value was averaged from the volumetric water content values that for 0kPa and 10kPa.

One of the difficulties faced in this research study is that maintaining the pressure in a particular position during the test as least count is 10kPa. This was overcome by manual adjusting of the valve to keep the pressure constant throughout the project.

Chapter 5

5.0. DIRECT SHEAR TESTS

Direct shear test was chosen over other tests for this study because of the shorter drainage path of soil sample and thus lesser time taken to dissipate the excess pore water pressure. Tests were carried out on undisturbed residual soil specimens of 6cmx6cmx2.5cm in order to determine the shear strength parameters of soil under different levels of saturation.

5.1. Direct shear tests without suction measurements

5.1.1. Testing procedure

These tests were done as a preliminary study prior to acquiring the of KU tensiometers. Soil sample used in this series is soil type 01 i.e., is SILTY SAND. The degree of saturation of test specimens was changed by adding different amount of water on top and bottom surface of natural sample after turning it upside down before the placement in the shear box. Curing period to move the water along the height of the sample was calculated using permeability value and it was approximately 4hrs. For the experimental work curing period was taken as minimum of 6hrs. For each degree of saturation, specimens were tested under net normal stresses of 50kPa, 100kPa, 150kPa and 200kPa with a shearing rate of 0.125mm/min. The shearing rate was estimated based on the values of coefficient of consolidation to ensure complete dissipation of pore water pressures if saturation condition has prevailed.

5.1.2. Assumption of same ϕ' at all levels of saturation

Shear stress versus normal stress relationship of soil was determined experimentally. The cohesion, c' and internal angle of friction, ϕ'were obtained from fully saturated direct shear test and ϕ' is taken to be constant for specific soil (Fredlund and Rahardjo, 1993). Hence, manual curve fitting was performed for the test results by keeping internal angle of friction, ϕ' at this value to obtain relevant apparent cohesion values at different levels of saturation.

5.1.3. Analysis and results for conventional direct shear test

Before acquiring KU tensiometer, an attempt was implemented to develop the correlation between matric suction and apparent cohesion using pressure plate apparatus and conventional direct shear test. Accordingly, conventional direct shear tests were carried out for different saturation levels and all the test results and the graphical representations are summarized in proceeding sections. The test results for the variation of shear stress with shear strain and the variation of volume change with shear strain are tabulated in Annex 2.

5.1.3.1. Sample under fully saturated condition

Initially, the tests were performed on fully saturated specimen. The basic data are presented in Table 5.1. This data confirmed that the samples are saturated. The slight variability within the four samples is also evident in the data.

Table 5.1: The condition of tested specimen for fully saturated condition (SILTY SAND)

Parameter		**Value**			
Specimen No.		1	2	3	4
Moisture content/(%)	Before test	37.90	44.63	32.93	38.68
	After test	31.87	38.08	33.28	31.28
Saturation/(%)	Before test	100.00	100.00	100.00	100.00
	After test	95.76	99.37	101.03	102.71
Volumetric water content/(%)	Before test	49.63	53.71	46.12	50.14
	After test	44.42	50.63	51.20	46.12
Dry density/(kg/m^3)	Before test	1309.62	1203.52	1400.77	1296.27
	After test	1393.81	1329.56	1538.63	1474.38
Void ratio	Before test	0.99	1.16	0.86	1.01
	After test	0.87	0.96	0.69	0.76

The stress – strain curves obtained for normal load intensities of 50, 100, 150 and 200kPa are presented in Figure 5.1, the volume change – shear strain variation is shown in Figure 5.2.

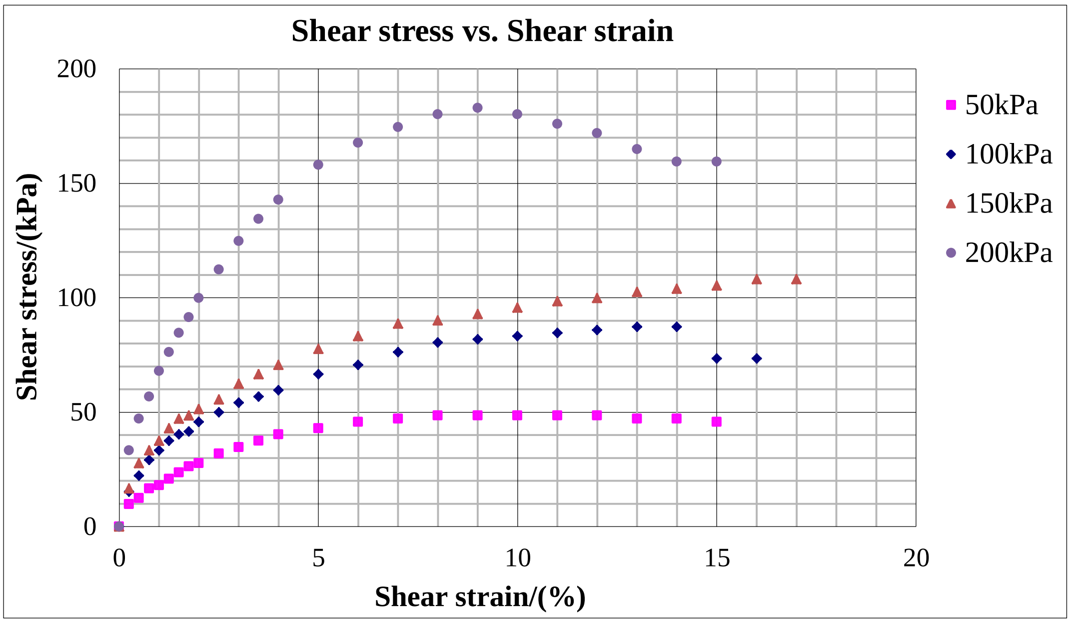


Figure 5.1: The variation of shear stress with shear strain for fully saturated condition (SILTY SAND)

The variation of shear stress with shear strain for normal load of 150kPa shows lower values compared to other normal loads.

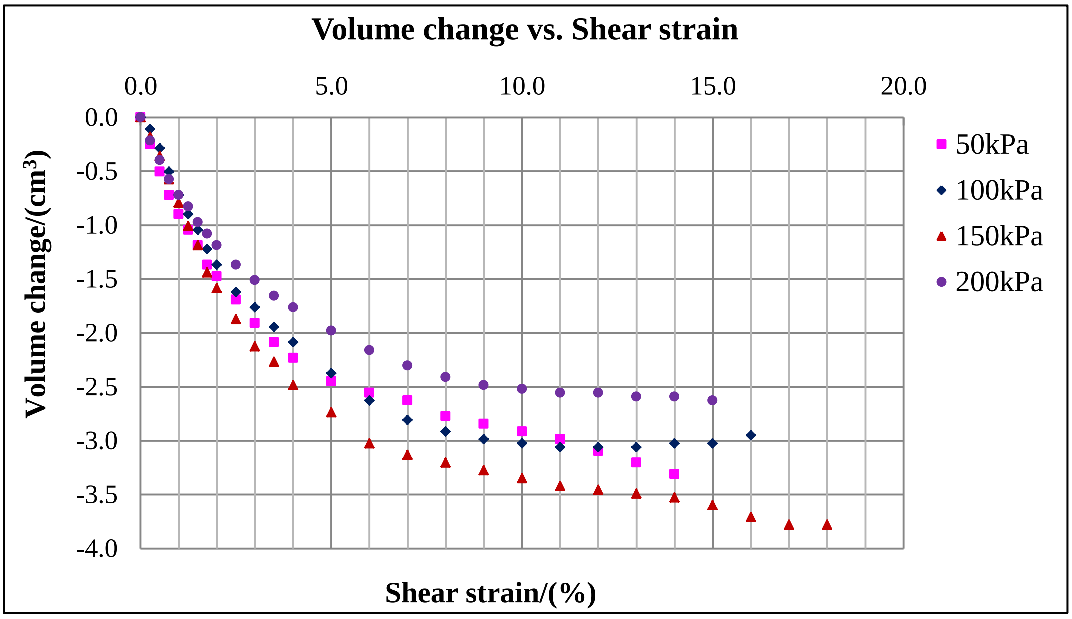


Figure 5.2: The variation of volume change with shear strain for fully saturated condition (SILTY SAND)

The volume change for normal load of 200kPa is much lower compared to other loading conditions.

Shear stress (maximum) and strain at failure for each loading condition were obtained from the Figure 5.1 and tabulated in Table 5.2.

Table 5.2: Shear stress and strain values at failure with normal stress for fully saturated condition (SILTY SAND)

Parameter	**Value**			
Normal stress/(kPa)	50.00	100.00	150.00	200.00
Strain at failure/(%)	8.00	13.00	16.00	9.00
Shear stress at failure/(kPa)	48.50	87.30	108.10	182.90

The shear strength envelope was plotted as shown in Figure 5.3 using the data given Table 5.2 and shear strength parameters c' & ϕ' for fully saturated condition is tabulated in Table 5.3.

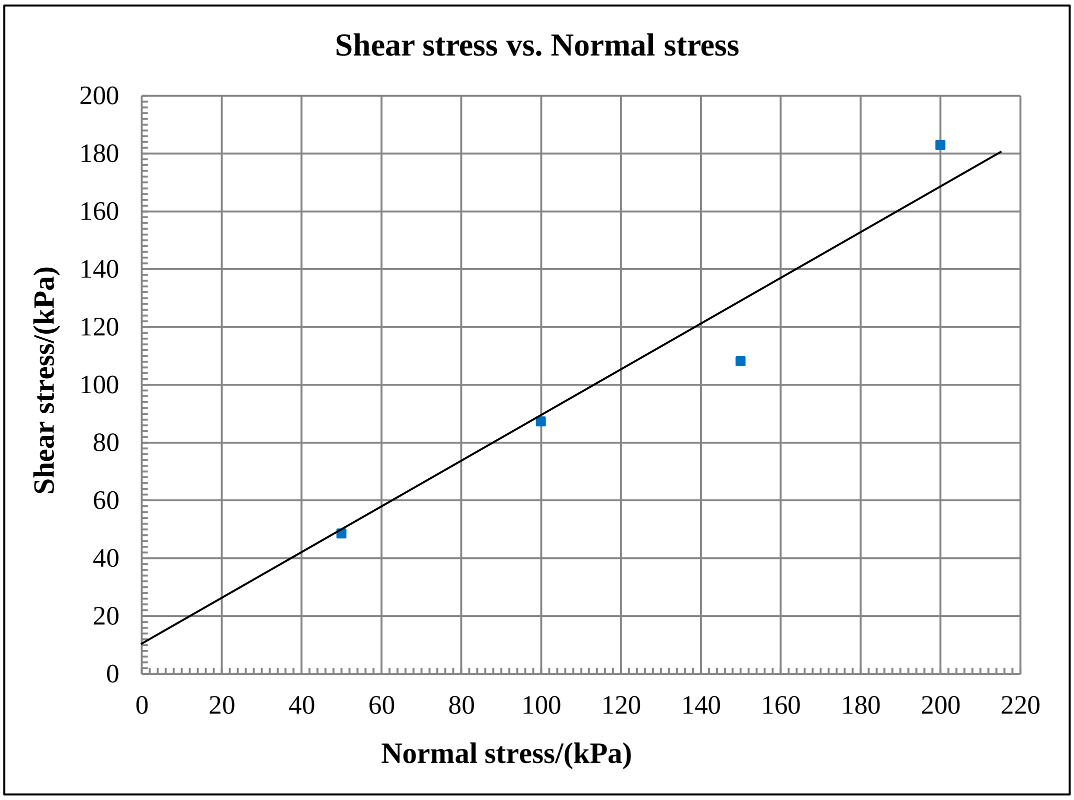


Figure 5.3: The variation of shear stress with normal stress for fully saturated condition (SILTY SAND)

Table 5.3: Shear strength parameters for fully saturated condition (SILTY SAND)

Parameter	**Value**
Cohesion, c′/(kPa)	10
Internal angle of friction, ϕ′/(deg.)	38

Thereafter, samples were tested at different levels of saturation and first series of tests was attempted with the sample at the natural water content. In the other series of tests a calculated amount of water was added to the tested soil specimen to achieve a target degree of saturations of 40%, 65% and 83%, which were confirmed by data. As mentioned in section 5.1.2, ϕ′obtained from fully saturated condition was taken to be constant for specific soil of 38 degrees and relevant apparent cohesions, c_a for different saturation levels were obtained.

5.1.3.2. Sample with approximately 40% (as it is) saturated condition

Tests were performed on approximately 40% (as it is) saturated specimen. The basic data are presented in Table 5.4.

Table 5.4: The condition of tested specimen for approximately 40% (as it is) saturated condition (SILTY SAND)

Parameter		**Value**			
Specimen No.		1	2	3	4
Moisture content/(%)	Before test	14.29	14.60	14.06	13.68
	After test	13.37	12.74	12.49	11.66
Saturation/(%)	Before test	39.50	39.21	39.80	39.33
	After test	38.52	38.81	43.89	42.54
Volumetric water content/(%)	Before test	19.15	19.29	19.06	18.68
	After test	18.27	17.87	18.66	17.70
Dry density/(kg/m^3)	Before test	1339.61	1321.01	1355.12	1365.10
	After test	1366.95	1402.94	1494.39	1518.13
Void ratio	Before test	0.94	0.97	0.92	0.90
	After test	0.90	0.85	0.74	0.71

The stress – strain curves obtained for normal load intensities of 50, 100, 150 and 200kPa are presented in Figure 5.4, the volume change – shear strain variation is shown in Figure 5.5.

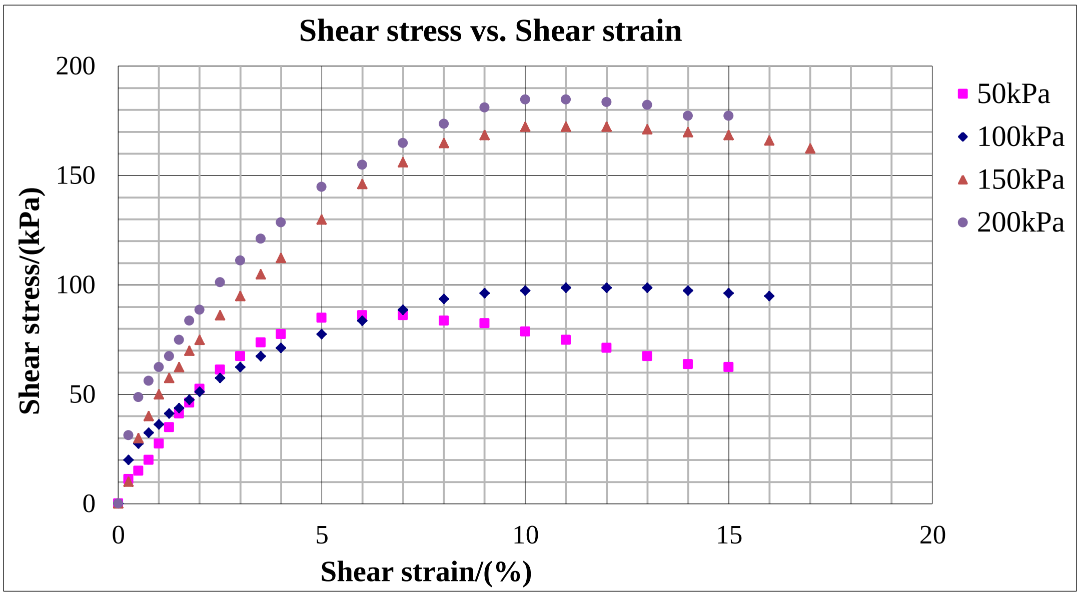


Figure 5.4: The variation of shear stress with shear strain for approximately 40% (as it is) saturated condition (SILTY SAND)

Normal loads of 50kPa & 150kPa show little bit high variation in shear stress with shear strain related to other loads.

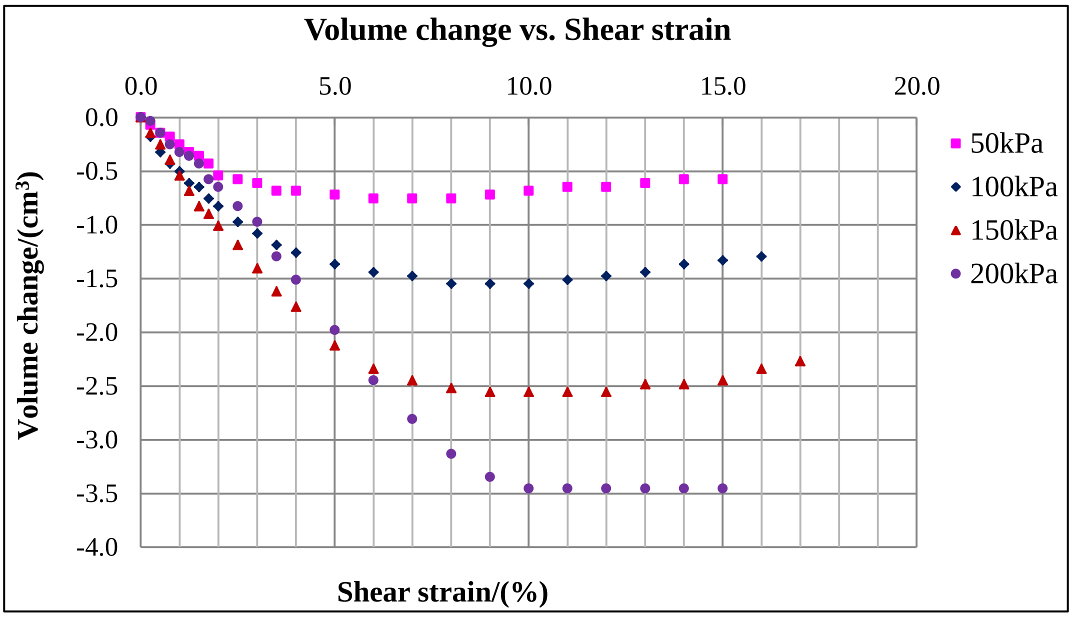


Figure 5.5: The variation of volume change with shear strain for approximately 40% (as it is) saturated condition (SILTY SAND)

The variation of volume change with shear strain in Figure 5.5 shows pretty good order as per the normal loads.

Shear stress (maximum) and strain at failure for each loading condition was obtained from the Figure 5.4 and tabulated in Table 5.5.

Table 5.5: Shear stress and strain values at failure with normal stress for approximately 40% (as it is) saturated condition (SILTY SAND)

Parameter	**Value**			
Normal stress/(kPa)	50.00	100.00	150.00	200.00
Strain at failure/(%)	7.00	11.00	11.00	11.00
Shear stress at failure/(kPa)	86.11	98.59	172.21	184.69

The shear strength envelope was plotted as shown in Figure 5.6 using the data given Table 5.5 and apparent cohesion, c_a for approximately 40% saturated condition is tabulated in Table 5.6.

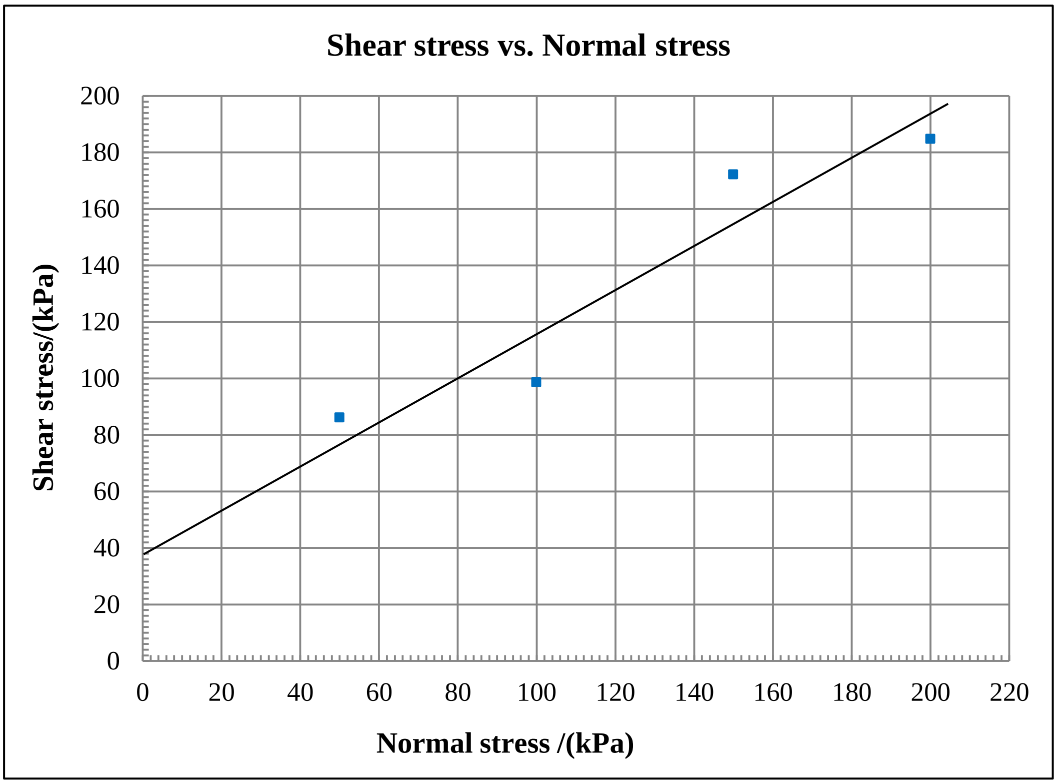


Figure 5.6: The variation of shear stress with normal stress for approximately 40% (as it is) saturated condition (SILTY SAND)

Table 5.6: Shear strength parameters for approximately 40% (as it is) saturated condition (SILTY SAND)

Parameter	**Value**
Apparent cohesion, c_a/(kPa)	38
Internal angle of friction, ϕ'/(deg.)	38

5.1.3.3. Sample with approximately 65% saturated condition

Tests were performed on approximately 65% saturated specimen. The basic data are presented in Table 5.7.

Table 5.7: The condition of tested specimen for approximately 65% saturated condition (SILTY SAND)

Parameter		**Value**			
Specimen No.		1	2	3	4
Moisture content/(%)	Before test	27.63	30.58	18.80	20.88
	After test	26.56	29.67	17.87	19.80
Saturation/(%)	Before test	63.12	64.08	62.95	64.00
	After test	61.76	66.90	65.71	71.76
Volumetric water content/(%)	Before test	27.63	30.58	18.80	20.88
	After test	27.63	30.58	18.80	20.88
Dry density /(kg/m^3)	Before test	1216.13	1160.29	1463.53	1406.83
	After test	1227.42	1207.63	1523.24	1514.03
Void ratio	Before test	1.14	1.24	0.78	0.85
	After test	1.12	1.15	0.71	0.72

The stress – strain curves obtained for normal load intensities of 50, 100, 150 and 200kPa are presented in Figure 5.7, the volume change – shear strain variation is shown in Figure 5.8.

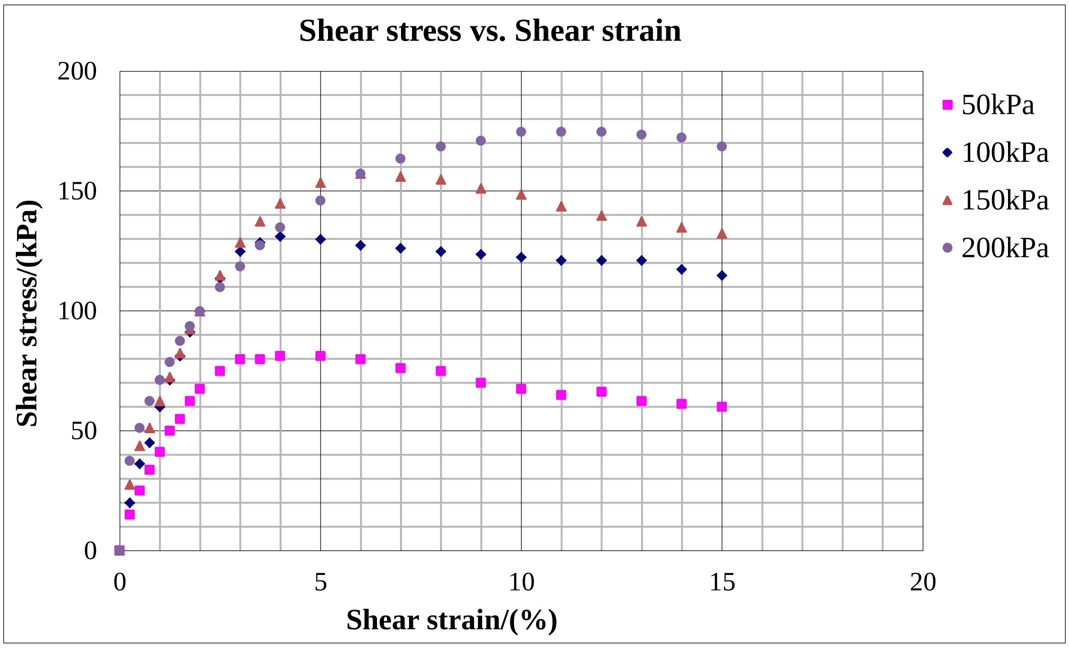


Figure 5.7: The variation of shear stress with shear strain for approximately 65% saturated condition (SILTY SAND)

The variation of shear stress with shear strain in Figure 5.7 shows quite good order as per the normal loads.

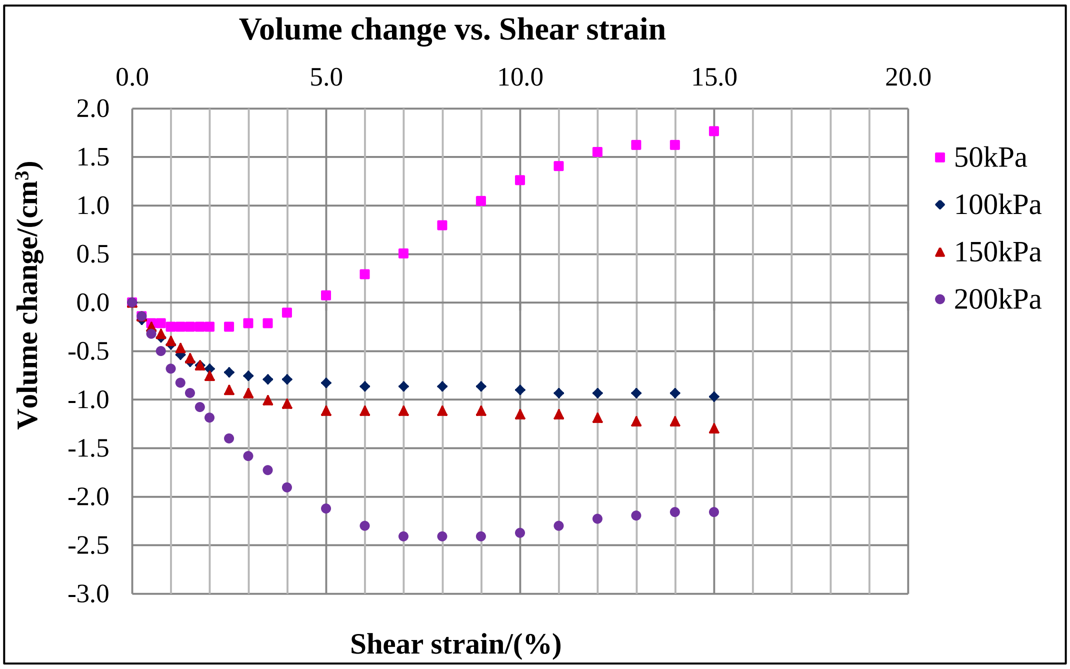


Figure 5.8: The variation of volume change with shear strain for approximately 65% saturated condition (SILTY SAND)

The variation of volume change with shear strain in Figure 5.8 shows fairly good order as per the normal loads. However, there was a dilation effect observed on one specimen of normal load of 50kPa.

Shear stress (maximum) and strain at failure for each loading condition was obtained from the Figure 5.7 and tabulated in Table 5.8.

Table 5.8: Shear stress and strain values at failure with normal stress for approximately 65% saturated condition (SILTY SAND)

Parameter	**Value**			
Normal stress/(kPa)	50.00	100.00	150.00	200.00
Strain at failure/(%)	4.00	4.00	6.00	11.00
Shear stress at failure/(kPa)	81.12	131.03	157.24	174.71

The shear strength envelope was plotted as shown in Figure 5.9 using the data given Table 5.8 and apparent cohesion, c_a for approximately 65% saturated condition is tabulated in Table 5.9.

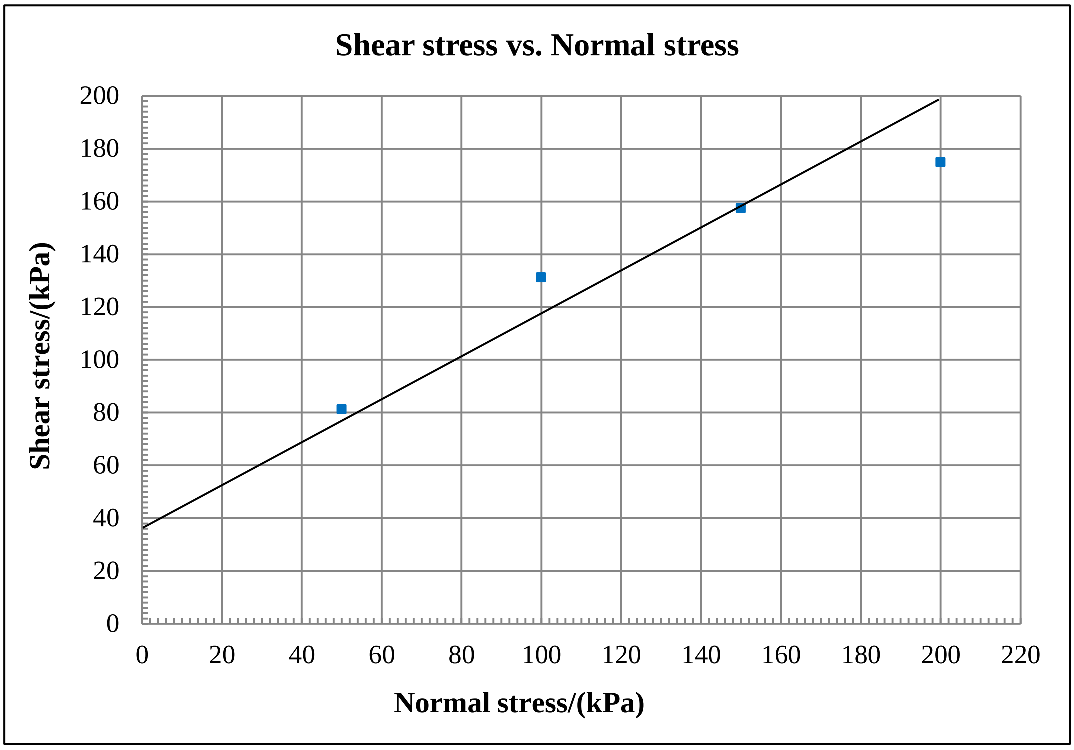


Figure 5.9: The variation of shear stress with normal stress for approximately 65% saturated condition (SILTY SAND)

Table 5.9: Shear strength parameters for approximately 65% saturated condition (SILTY SAND)

Parameter	Value
Apparent cohesion, c_a/(kPa)	36
Internal angle of friction, ϕ'/(deg.)	38

5.1.3.4. Sample with approximately 83% saturated condition

Tests were performed on approximately 83% saturated specimen. The basic data are presented in Table 5.10.

Table 5.10: The condition of tested specimen for approximately 83% saturated condition (SILTY SAND)

Parameter		**Value**			
Specimen No.		1	2	3	4
Moisture content/(%)	Before test	34.18	30.48	27.70	38.83
	After test	32.74	30.17	26.30	37.49
Saturation/(%)	Before test	77.86	77.89	77.05	78.07
	After test	84.04	83.18	85.64	97.68
Volumetric water content/(%)	Before test	41.50	39.28	37.22	44.03
	After test	42.29	40.37	38.02	48.79
Dry density /(kg/m^3)	Before test	1214.09	1288.87	1343.89	1133.74
	After test	1291.59	1338.11	1445.67	1301.35
Void ratio	Before test	1.14	1.02	0.93	1.29
	After test	1.01	0.94	0.80	1.00

The stress – strain curves obtained for normal load intensities of 50, 100, 150 and 200kPa are presented in Figure 5.10, the volume change – shear strain variation is shown in Figure 5.11.

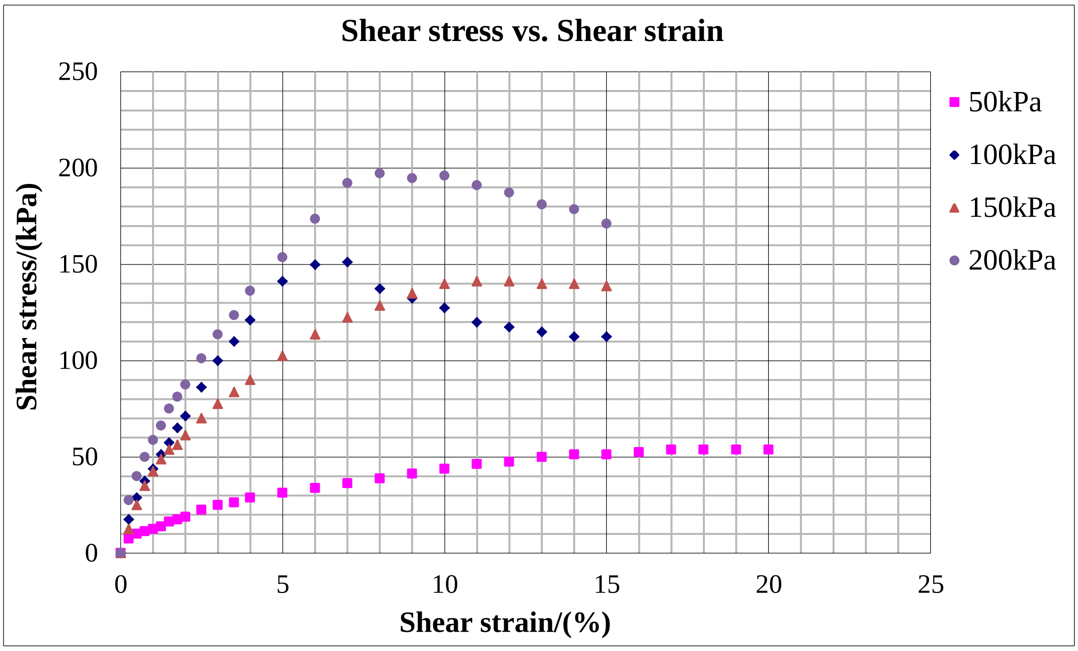


Figure 5.10: The variation of shear stress with shear strain for approximately 83% saturated condition (SILTY SAND)

The variation of shear stress with shear strain for normal load of 100kPa shows relatively higher values and it has reached the failure at early strain compared to other normal loads.

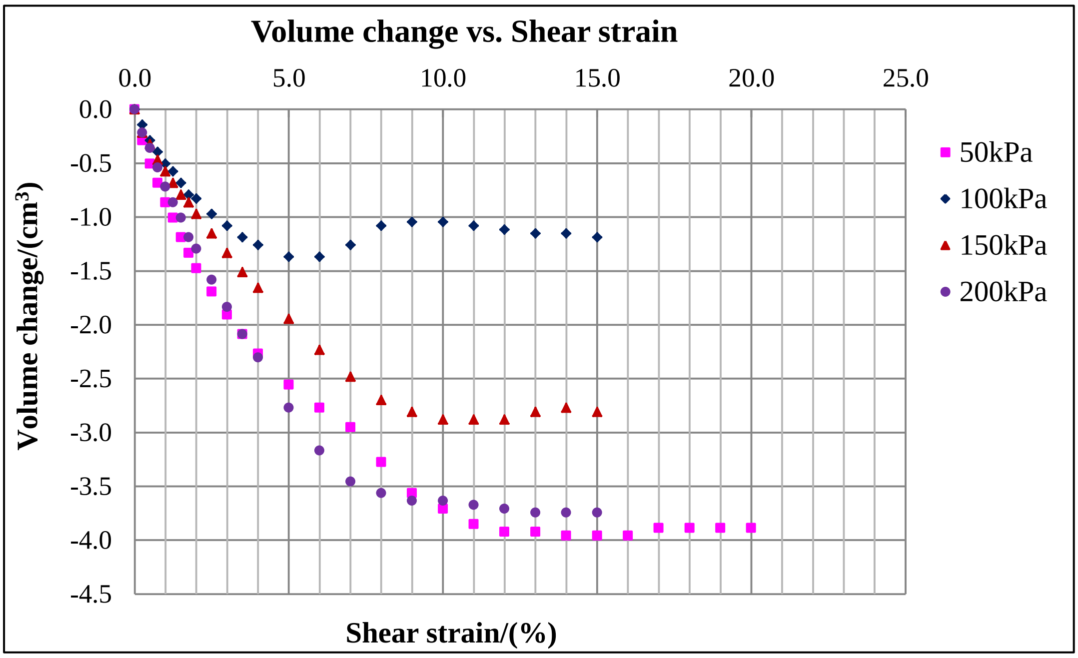


Figure 5.11: The variation of volume change with shear strain for approximately 83% saturated condition (SILTY SAND)

The volume change for normal load of 50kPa is much higher related to other loading conditions.

Shear stress (maximum) and strain at failure for each loading condition was obtained from the Figure 5.10 and tabulated in Table 5.11.

Table 5.11: Shear stress and strain values at failure with normal stress for approximately 83% saturated condition (SILTY SAND)

Parameter	**Value**			
Normal stress/(kPa)	50.00	100.00	150.00	200.00
Strain at failure/(%)	17.00	7.00	11.00	8.00
Shear stress at failure/(kPa)	53.66	151.00	141.02	197.17

The shear strength envelope was plotted as shown in Figure 5.12 using the data given Table 5.11 and apparent cohesion, c_a for approximately 83% saturated condition is tabulated in Table 5.12. However, the shear stress at failure for the normal load of 100kPa was neglected as it has shown unexpected high value.

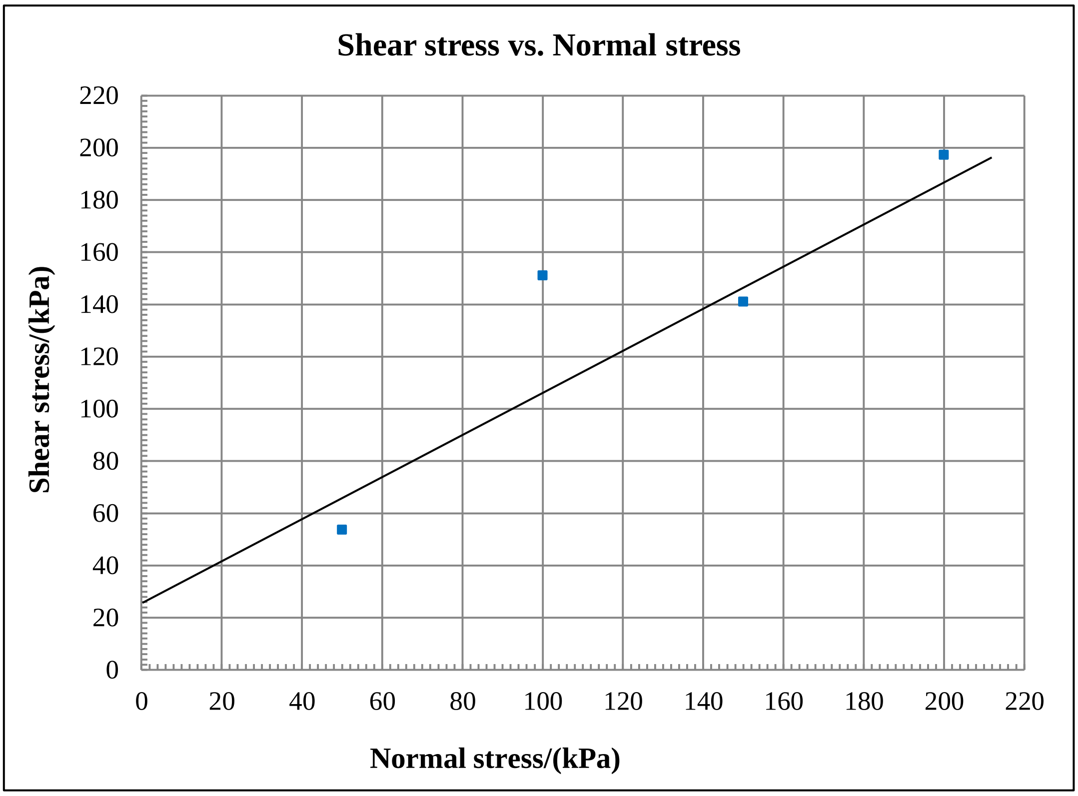


Figure 5.12: The variation of shear stress with normal stress for approximately 83% saturated condition (SILTY SAND)

Table 5.12: Shear strength parameters for approximately 83% saturated condition (SILTY SAND)

Parameter	**Value**
Apparent cohesion, c_a/(kPa)	26
Internal angle of friction, ϕ'/(deg.)	38

5.1.4. Variation of apparent cohesion with saturation and volumetric water content (SILTY SAND)

The variation of apparent cohesion with degree of saturation is tabulated in Table 5.13 and presented in Figure 5.13. As an alternate presentation the apparent cohesion is tabulated in Table 5.14 and plotted in Figure 5.14 against the volumetric water content.

Table 5.13: The variation of apparent cohesion with degree of saturation (SILTY SAND)

Apparent cohesion, c_a/(kPa)	**Average degree of saturation/(%)**	**Degree of saturation before test/(%)**	**Degree of saturation after test/(%)**
38	40.20	39.46	40.94
36	65.04	63.54	66.53
26	82.68	77.72	87.64
10	100.00	100.00	100.00

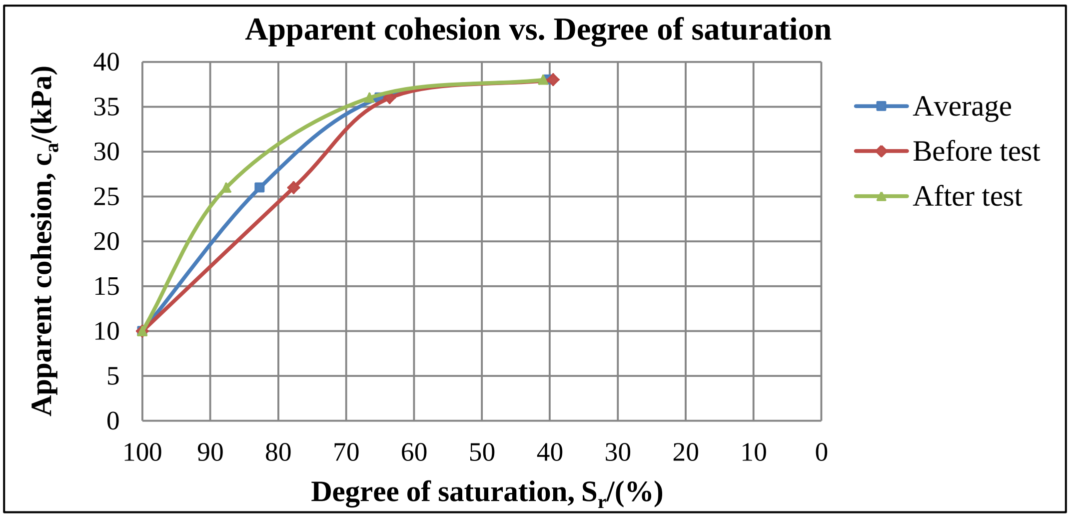


Figure 5.13: The variation of apparent cohesion with degree of saturation (SILTY SAND)

Table 5.14: The variation of apparent cohesion with volumetric water content (SILTY SAND)

Apparent cohesion, c_a/(kPa)	Average volumetric water content/(%)	Volumetric water content before test/(%)	Volumetric water content after test/(%)
38	18.64	19.05	18.16
36	32.12	32.10	32.11
26	41.74	40.84	42.58
10	49.42	50.19	48.32

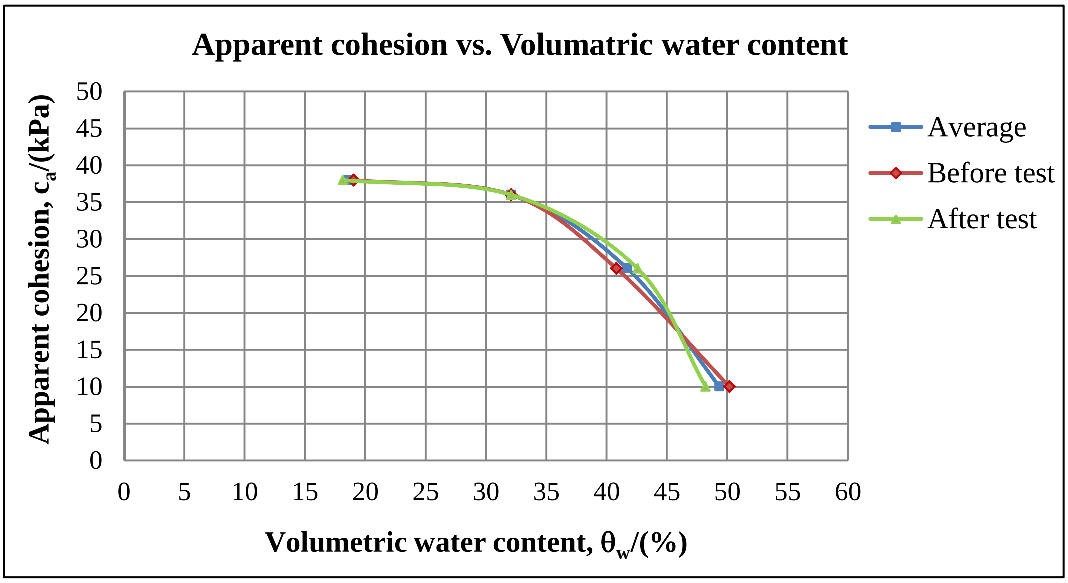


Figure 5.14: The variation of apparent cohesion with volumetric water content (SILTY SAND)

5.1.5. Development of angle of shearing resistance due to suction, ϕ^b using pressure plate apparatus (SILTY SAND)

The relationship of matric suctions and volumetric water contents obtained from the pressure plate apparatus was used together with direct shear test results to derive an apparent cohesion for the different equilibrium volumetric water contents achieved in the pressure plate apparatus. This data is presented in Table 5.15 and the variation of apparent cohesion with matric suction is presented in Figure 5.15. Following the observations made by former researchers Gan et al., (1988), Escario, V. & Juca, J., (1989), Vanapalli et al., (1996) and Jotisankasa et al., (2010) the angle of shearing resistance due to suction, ϕ^b displayed a non-linear relationship.

Table 5.15: The variation of volumetric water content with matric suction and apparent cohesion (SILTY SAND)

Matric suction, $(u_a - u_w)$/(kPa)	**Volumetric water content, θ_w/(%)**	**Apparent cohesion, c_a/(kPa)**
0	49.42	10.00
5	48.50	12.20
10	47.80	13.90
20	46.49	16.50
30	45.77	18.20
40	45.21	19.30
50	44.88	20.20
60	44.46	21.10
70	44.16	21.70
80	43.85	22.40
90	43.52	23.00
100	43.30	23.50
150	42.86	24.10
200	42.70	24.50
250	42.54	24.80
300	42.35	25.00
350	42.30	25.20
400	41.91	25.80

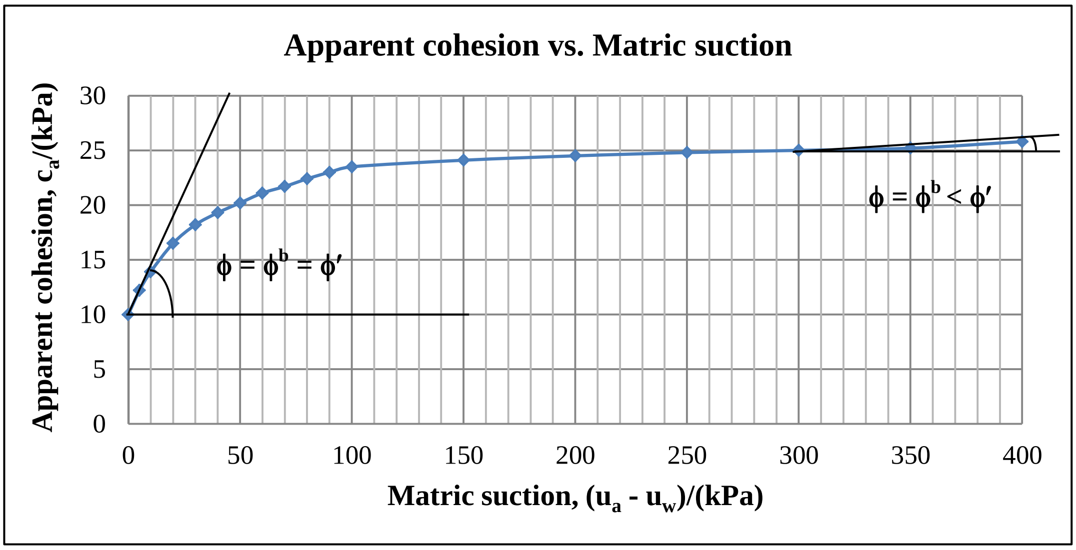


Figure 5.15: The variation of apparent cohesion with matric suction (SILTY SAND)

5.2. Direct shear test with matric suction measurement using tensiometer

5.2.1. KU T3 Tensiometer

KU T3 tensiometer model was purchased by university of Moratuwa and was used in this research project. It has designed to measure pore water pressure from -100kPa (safe capacity) to 600kPa but it can be measured for a maximum of approximately -117kPa or 0.068Volt. However, calibration factor will be no longer constant beyond -100kPa (calibration chart is straight line up to -100kPa beyond that it is curvilinear) and sometimes bubbles will form gradually within the water reservoir of the tensiometer. Therefore, the matric suction values obtained from the KU tensiometer was limited to -100kPa for this study.

5.2.1.1. Tensiometer description and data transferring to computer

Figure 5.16 shows the details of the tensiometer. The sensor body is made of stainless steel which encloses the absolute pressure transducer and all electronics parts. High quality water resistant resin is used to backfill the body for water-tightness of electronics. A piezo-resistive pressure transducer was used to measure absolute pressure. The sensor is based on micro electro mechanical system (MEMs) technology with high reliability, accuracy and temperature compensation.

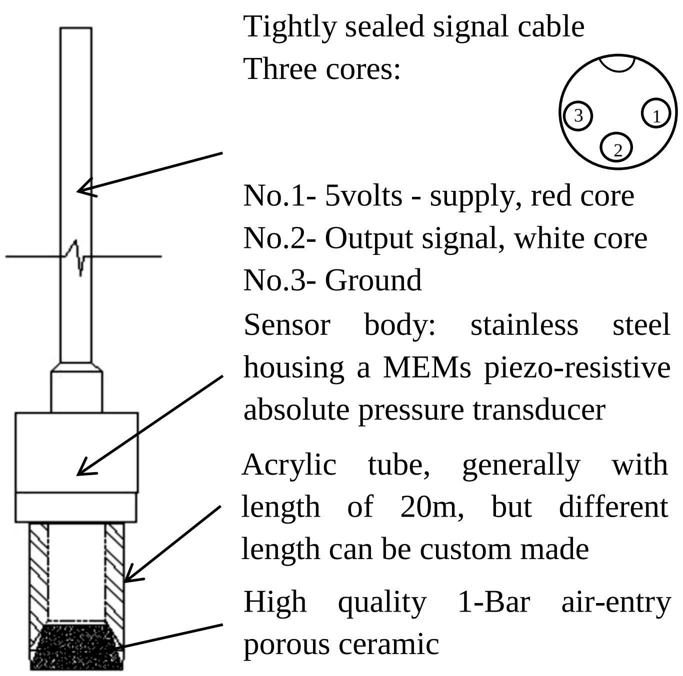


Figure 5.16: Basic components of KU tensiometer

The setup for the direct shear test is presented in Figure 5.17 and schematic diagram of data transfer from tensiometer is illustrated in Figure 5.18.

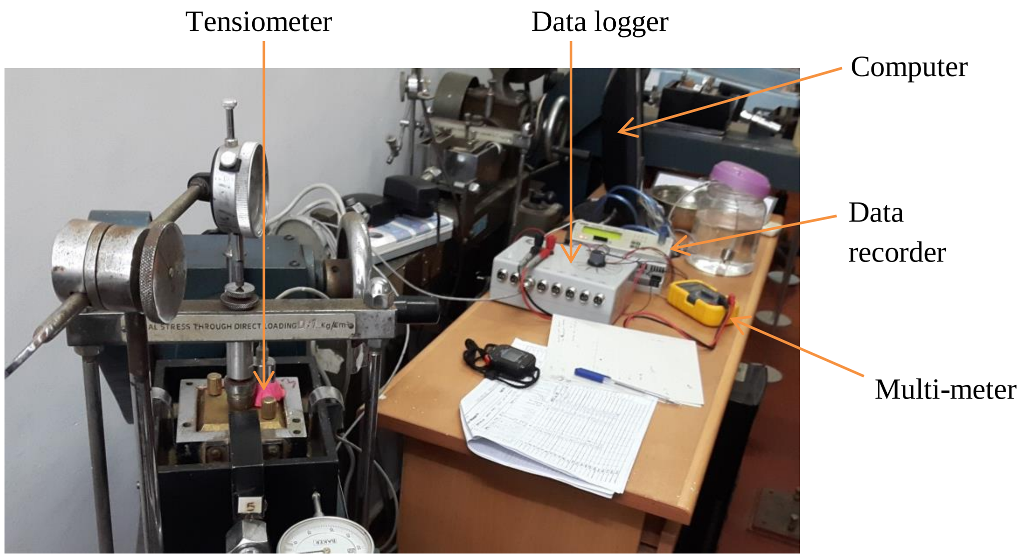


Figure 5.17: All components connected for the process of data transferring from tensiometer

Above arrangement can be converted as follows for easy and better understanding.

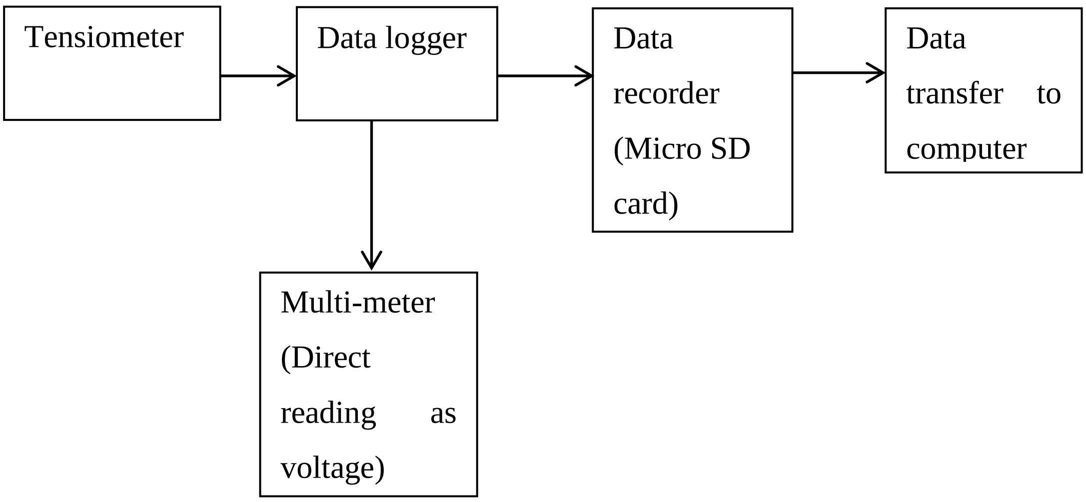


Figure 5.18: Schematic diagram of data transferring from tensiometer

An easy snap-shot reading of the tensiometer can be made using multi-meter as shown in Figure 5.19 when the dial is turned in front of the multi-meter to **2-volt** mode. The reading shown in the LCD is in voltage.

Figure 5.19: Multi-meter for snapshot reading of tensiometer

5.2.2. Water saturation and de-airing process

The tensiometers as supplied in the package are still in dry condition and thus need water saturation and de-airing before use. The silver bowl kept inside the vacuum chamber is first filled with water (Figure 5.20). The tensiometer and a separate acrylic tube are then submerged in the silver and evacuation continues for <u>about 2-3 hrs</u> to water-saturate the space within the sensor body, acrylic tube and porous ceramic. The cable plug needs to be positioned well above the water level, while inside the vacuum chamber. After evacuation, the vacuum was slowly released and the acrylic tube (with O-ring) is screwed in the sensor <u>underwater</u> to make sure the connection is perfectly sealed (Figure 5.21).

Figure 5.20: Water saturation and de-airing process in to the vacuum chamber

Figure 5.21: Screwing the acrylic tube with O-ring in the sensor body to achieve tight seal

In order to test the tensiometer after assembling, a tissue paper can be used to dry the porous ceramic; the reading should go down to as low as about 100kPa. If air bubble occurs or the response is too slow, the sensor should be re-saturated.

5.2.3. Testing procedure

The specimens of soil type 02 (SANDY SILT as out lined in Chapter 3) were subjected to direct shear test with the measurement of the matric suction. The tensiometer was initially attached to the specimen and some time was allowed to reach the equilibrium condition before applying normal loads. Tests were done under drained conditions after application of the relevant normal stress. The shearing was done at a rate of 0.125mm/min which ensured consolidation based on the value of coefficient of consolidation. The process is illustrated in Figure 5.22.

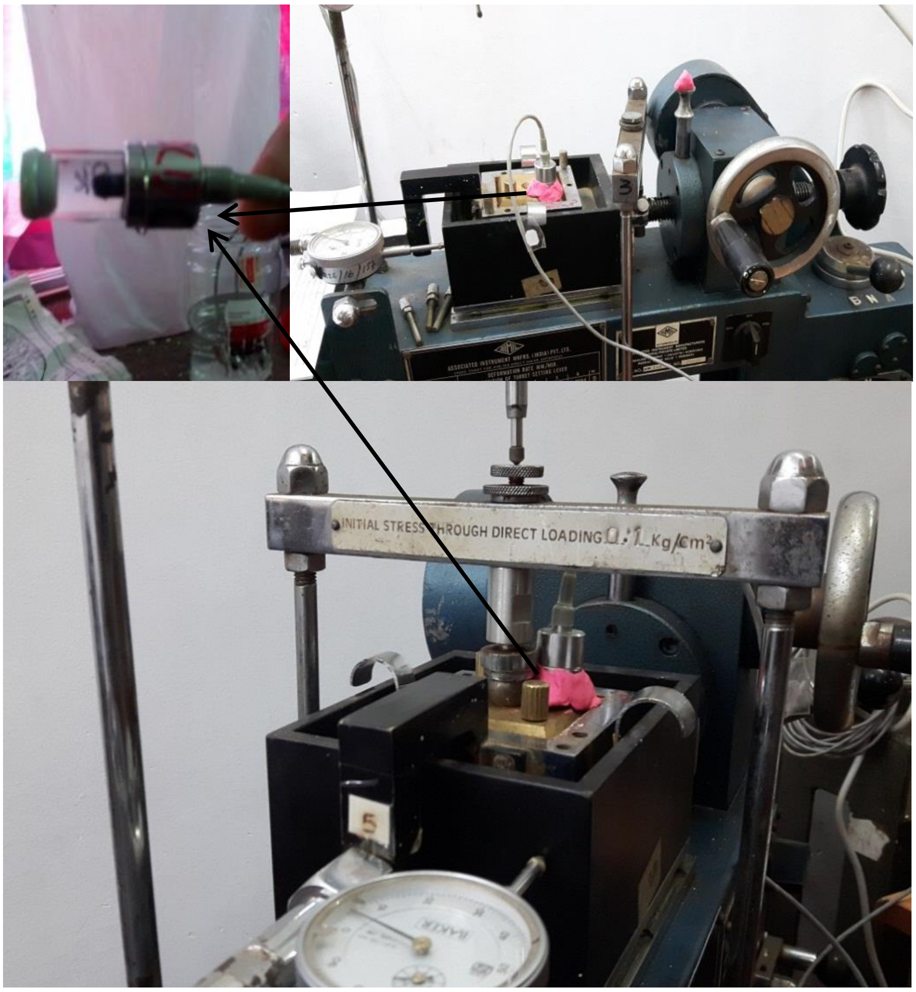


Figure 5.22: Typical direct shear test at equilibrium stage (without load), consolidation and shearing stages (with load) with tensiometer

5.2.4. Assumption of same ϕ′ at all levels of saturation

Shear stress versus normal stress relationship of soil was determined experimentally. Following the guidelines by Fredlund and Rahardjo, (1993) the effective angle of shearing resistance ϕ′ was assumed to be same for all samples of different levels of saturation.

5.2.5. Analysis and results for conventional direct shear test with tensiometer

After acquiring the KU tensiometers direct shear tests were conducted with measurement of matric suction. Ensuring the saturation of the tensiometer by complete de-airing is a tedious process which consumed a long time. As such, a complete set of results to derive the parameters could be obtained after overcoming the initial difficulties.

The test results for the variations of shear stress with shear strain, volume change with shear strain are tabulated in Annex 2 and matric suction with time for equilibrium, consolidation and shearing stages and matric suction with shear strain are tabulated in Annex 3.

5.2.5.1. Sample under fully saturated condition

Initially, the tests were performed on fully saturated specimen. The basic data are presented in Table 5.16. This data confirmed that the samples are saturated. The slight variability within the four samples is also evident in the data.

Table 5.16: The condition of tested specimen for fully saturated condition (SANDY SILT)

Parameter		**Value**			
Specimen No.		1	2	3	4
Moisture content/(%)	Before test	49.08	43.77	44.81	42.11
	After test	50.32	44.97	44.00	43.84
Saturation/(%)	Before test	100.00	100.00	100.00	100.00
	After test	110.89	109.96	120.04	126.08
Volumetric water content/(%)	Before test	56.26	52.73	53.92	52.14
	After test	60.02	56.67	58.58	59.86
Dry density/(kg/m^3)	Before test	1146.46	1204.61	1203.42	1238.21
	After test	1192.74	1260.05	1331.22	1365.47
Void ratio	Before test	1.27	1.16	1.16	1.10
	After test	1.18	1.06	0.95	0.90

The stress – strain curves obtained for normal load intensities of 50, 100, 150 and 200kPa are presented in Figure 5.23, the volume change – shear strain variation is shown in Figure 5.24.

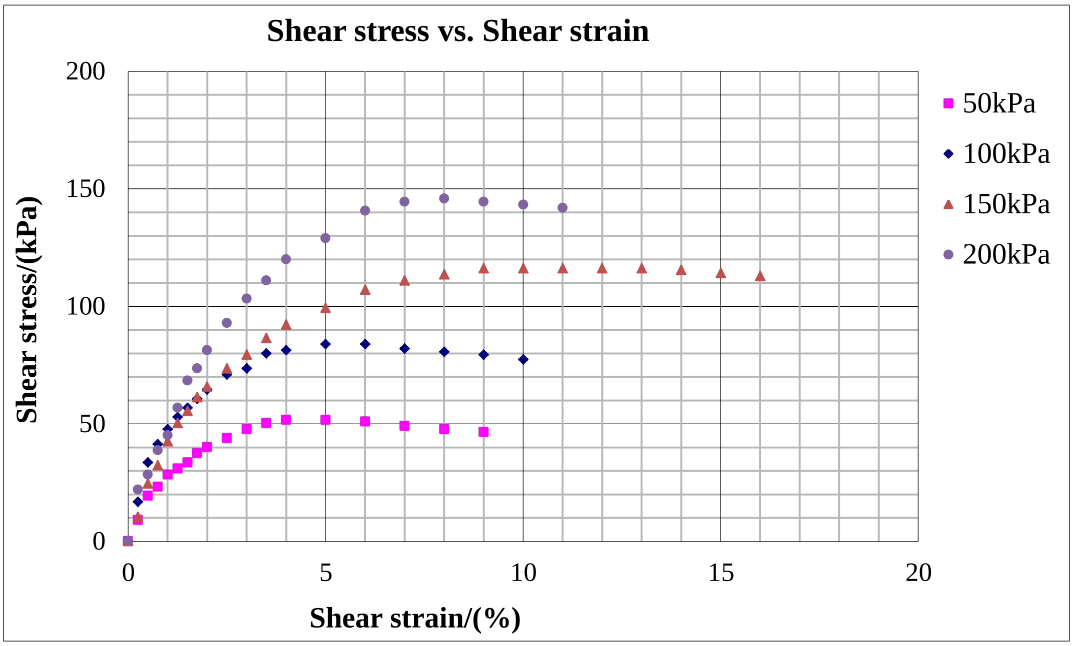


Figure 5.23: The variation of shear stress with shear strain for fully saturated condition (SANDY SILT)

The variation of shear stress with shear strain in Figure 5.23 shows rather good order as per the normal loads.

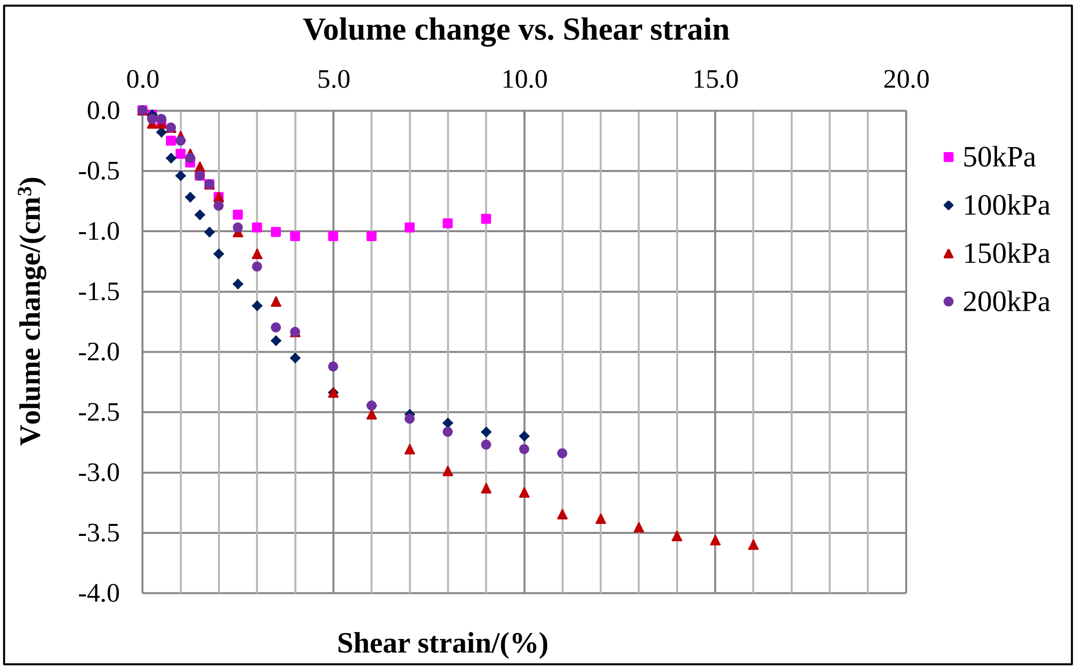


Figure 5.24: The variation of volume change with shear strain for fully saturated condition (SANDY SILT)

The volume change for normal load of 200kPa is bit lower than that of 150kPa of normal load.

Shear stress (maximum) and strain at failure for each loading condition was obtained from the Figure 5.23 and tabulated in Table 5.17.

Table 5.17: Shear stress and strain values at failure with normal stress for fully saturated condition (SANDY SILT)

Parameter	**Value**			
Normal stress/(kPa)	50.00	100.00	150.00	200.00
Strain at failure/(%)	5.00	6.00	10.00	8.00
Shear stress at failure/(kPa)	51.58	83.81	116.05	145.71

The shear strength envelope was plotted as shown in Figure 5.25 using the data given Table 5.17 and shear strength parameters c' & ϕ' for fully saturated condition is tabulated in Table 5.18.

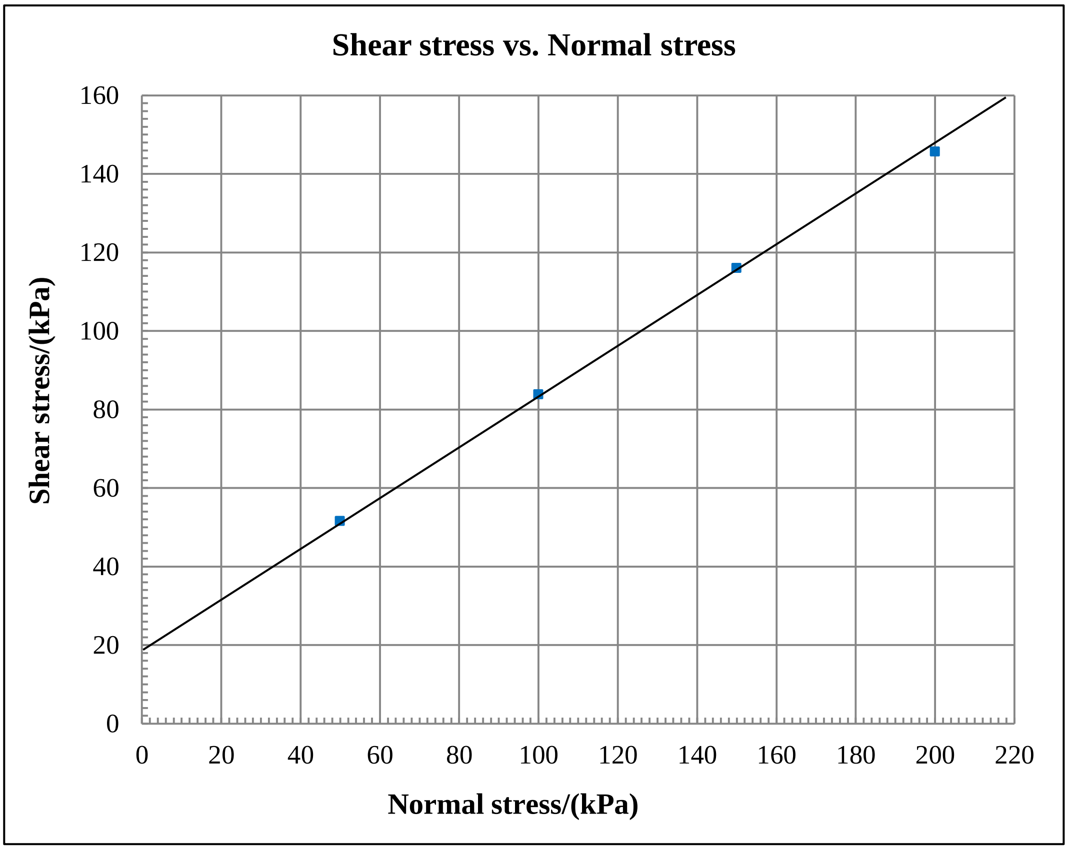


Figure 5.25: The variation of shear stress with normal stress for fully saturated condition (SANDY SILT)

Table 5.18: Shear strength parameters for fully saturated condition (SANDY SILT)

Parameter	**Value**
Cohesion, c′/(kPa)	18
Internal angle of friction, ϕ′/(deg.)	33

At fully saturated condition matric suction diminishes to the value of zero discussed in detail in previous sections. Accordingly, no readings were taken using tensiometer during the direct shear test conducted for fully saturated condition.

The state of the sample at the failure surface is presented in Figure 5.26. Patches of whitish clay are seen in all specimens.

Normal stress = 50kPa	Normal stress = 100kPa

Normal stress = 150kPa	Normal stress = 200kPa

Figure 5.26: Direct shear specimens after the testing for fully saturated condition (SANDY SILT)

Thereafter, samples were tested at different levels of saturation and first series of tests was attempted with the sample at the natural water content. In the other series of tests a calculated amount of water was added to the tested soil specimen to achieve a target degree of saturations of 50%, 65%, 72%, 81% and 92%, which were confirmed by data. The ϕ′ obtained from fully saturated condition was taken to be constant for specific soil of 33 degrees and relevant apparent cohesions, c_a for different saturation levels were obtained.

After the tensiometer was attached to the sample it was kept for some time until the readings reach equilibrium. Thereafter, the normal stress was applied and sample was consolidated for 24hrs. This was followed by shearing under drained conditions. Matric suction was monitored throughout the test.

5.2.5.2. Sample with approximately 50% saturated condition

The conventional direct shear test with matric suction measurements couldn't be performed on this specimen as matric suction value exceeded the safe limit of 100kPa during the equilibrium stage (before the consolidation stage). However, it was allowed to go for maximum limit of 117kPa. The multi-meter reading was continuously reduced to 0.068Volt without getting equilibrium and it is obvious that the matric suction for this particular saturation level should be greater than 117kPa. The basic data are presented in Table 5.19. The variation of matric suction with time (two trials were performed) during equilibrium stage is shown in Figure 5.27.

Table 5.19: The condition of tested specimen for approximately 50% saturated condition (SANDY SILT)

Parameter		**Value**
Specimen No.		1
Moisture content/(%)	Before test	20.38
	After test	*
Saturation/(%)	Before test	49.25
	After test	*
Volumetric water content/(%)	Before test	25.53
	After test	*
Dry density/(kg/m^3)	Before test	1252.38
	After test	*
Void ratio	Before test	1.08
	After test	*

* - Couldn't perform the direct shear test

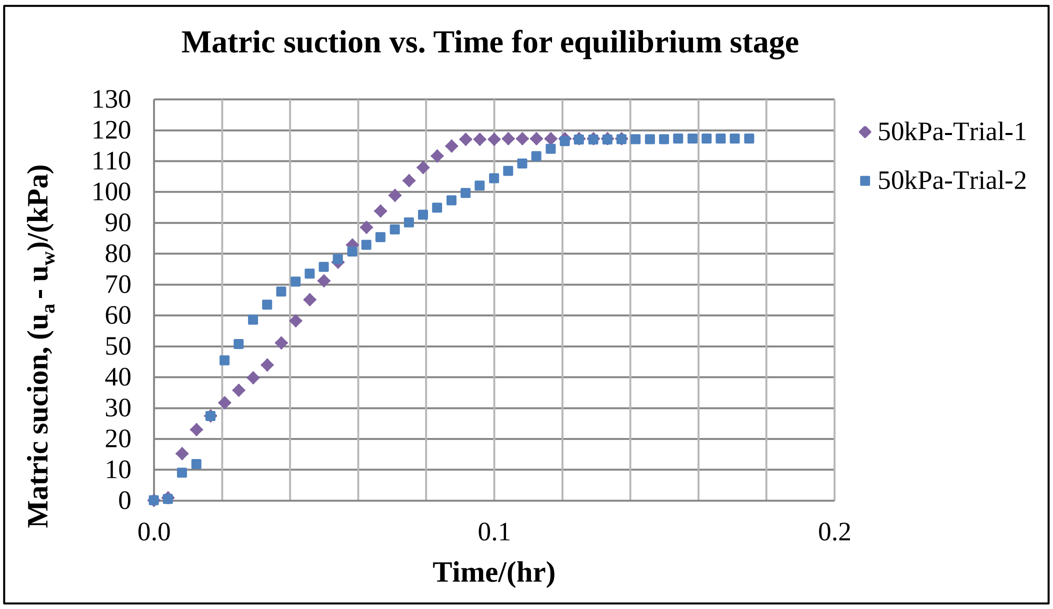


Figure 5.27: The variation of matric suction with time for approximately 50% saturated condition (SANDY SILT)

5.2.5.3. Sample with approximately 65% saturated condition

Tests were performed on approximately 65% saturated specimen. The basic data are presented in Table 5.20.

Table 5.20: The condition of tested specimen for approximately 65% saturated condition (SANDY SILT)

Parameter		**Value**			
Specimen No.		1	2	3	4
Moisture content/(%)	Before test	26.31	27.05	26.97	27.13
	After test	25.92	26.92	26.13	25.08
Saturation/(%)	Before test	63.28	64.29	64.12	64.44
	After test	66.92	69.16	65.85	68.86
Volumetric water content/(%)	Before test	32.87	33.59	33.49	33.67
	After test	33.57	34.78	33.44	33.49
Dry density/(kg/m^3)	Before test	1249.37	1241.68	1241.84	1241.37
	After test	1295.49	1292.34	1279.72	1335.38
Void ratio	Before test	1.08	1.09	1.09	1.09
	After test	1.01	1.01	1.03	0.95

The stress – strain curves obtained for normal load intensities of 50, 100, 150 and 200kPa are presented in Figure 5.28, the volume change – shear strain variation is shown in Figure 5.29.

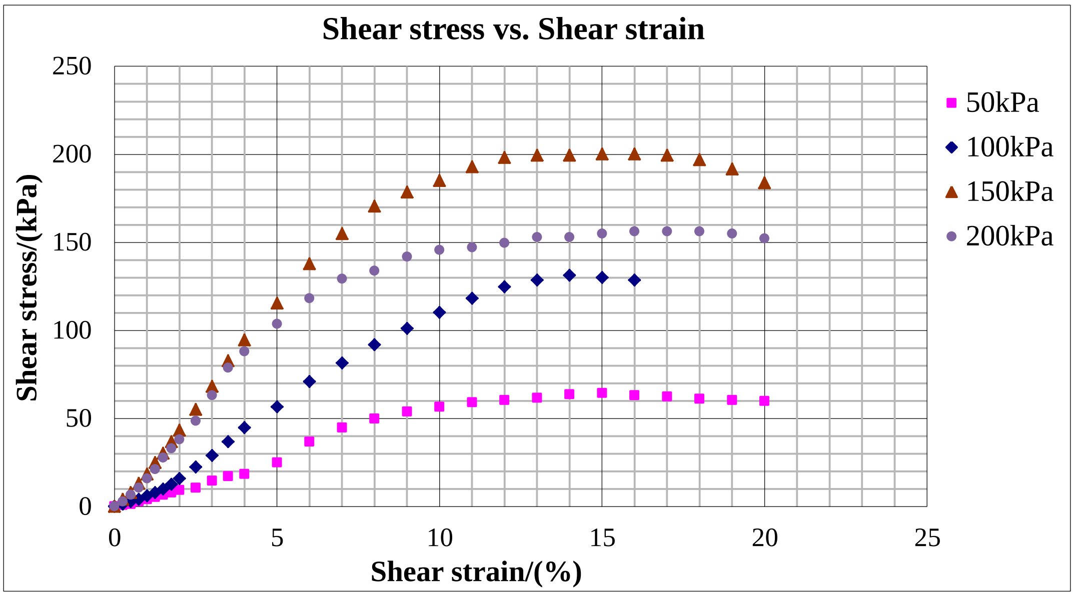


Figure 5.28: The variation of shear stress with shear strain for approximately 65% saturated condition (SANDY SILT)

The variation of shear stress with shear strain for normal load of 200kPa shows relatively lower values while normal load of 150kPa shows relatively higher values compared to other normal loads.

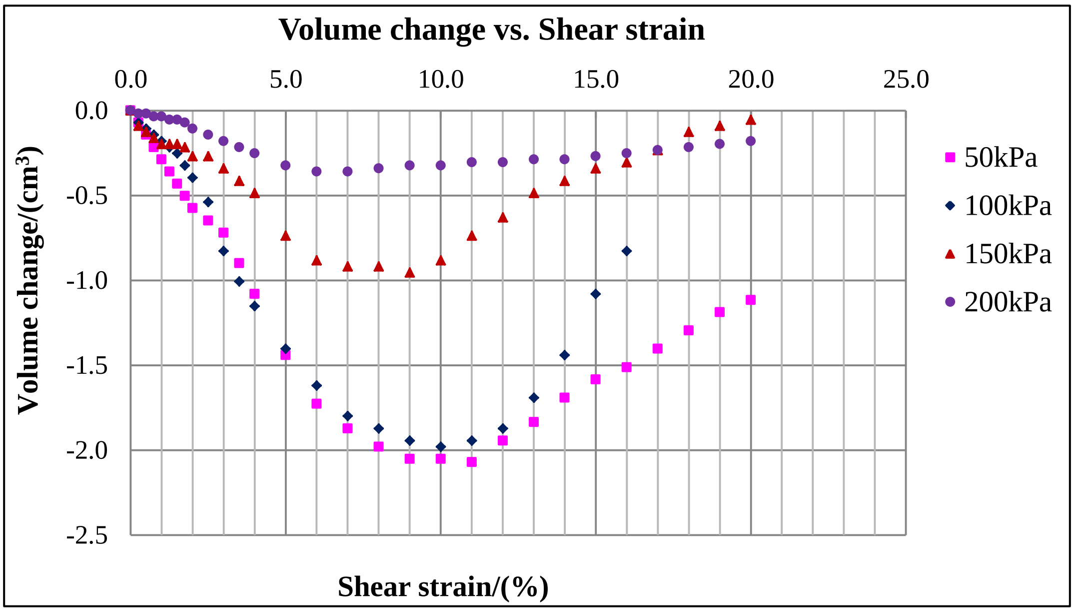


Figure 5.29: The variation of volume change with shear strain for approximately 65% saturated condition (SANDY SILT)

The volume changes displayed in Figure 5.29 show the reverse order with normal loading conditions.

Shear stress (maximum) and strain at failure for each loading condition was obtained from the Figure 5.28 and tabulated in Table 5.21.

Table 5.21: Shear stress and strain values at failure with normal stress for approximately 65% saturated condition (SANDY SILT)

Parameter	**Value**			
Normal stress/(kPa)	50.00	100.00	150.00	200.00
Strain at failure/(%)	15.00	14.00	15.00	16.00
Shear stress at failure/(kPa)	64.26	131.14	200.00	156.06

The shear strength envelope was plotted as shown in Figure 5.30 using the data given Table 5.21 and apparent cohesion, c_a for approximately 65% saturated condition is tabulated in Table 5.22. However, the shear stress at failure for the normal load of 150kPa was neglected as it has shown unexpected high value.

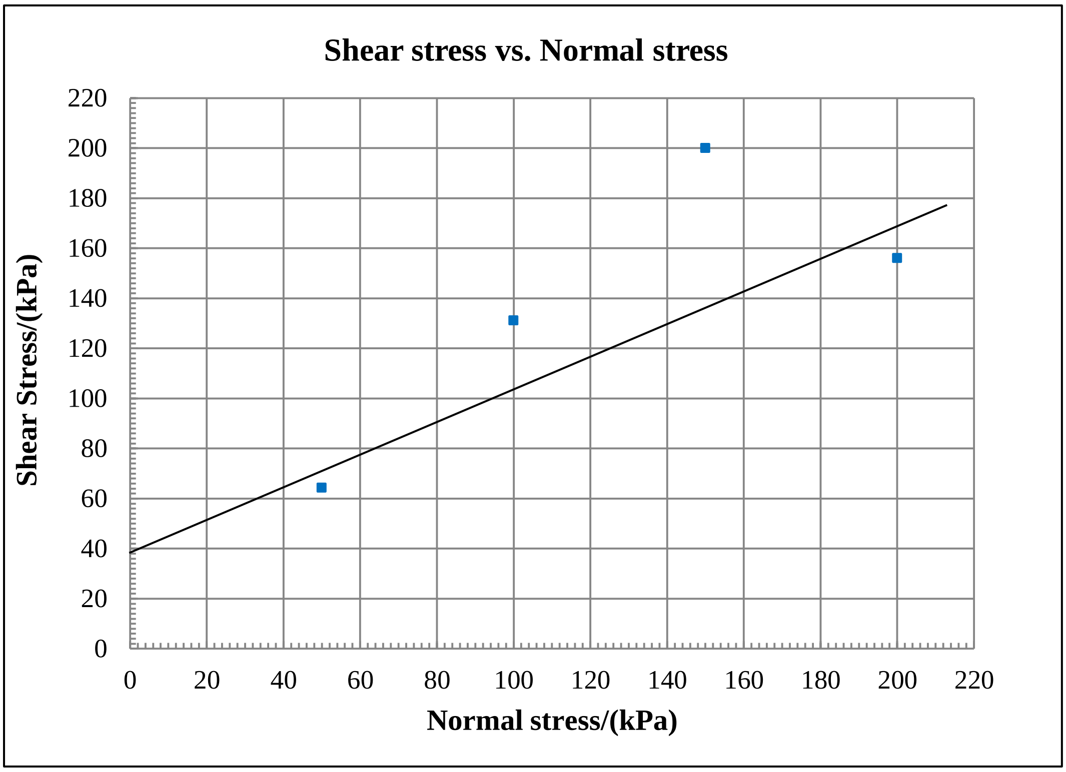


Figure 5.30: The variation of shear stress with normal stress for approximately 65% saturated condition (SANDY SILT)

Table 5.22: Shear strength parameters for approximately 65% saturated condition (SANDY SILT)

Parameter	Value
Apparent cohesion, c_a/(kPa)	38
Internal angle of friction, ϕ'/(deg.)	33

Matric suction values for approximately 65% saturated condition on four specimens during the stage of equilibrium and for different normal loading conditions (four levels) during the stages of consolidation and shearing were measured and the variation of matric suction with time for the above mentioned stages and the variation of matric suction with shear strain are presented in Figure 5.31 to Figure 5.34.

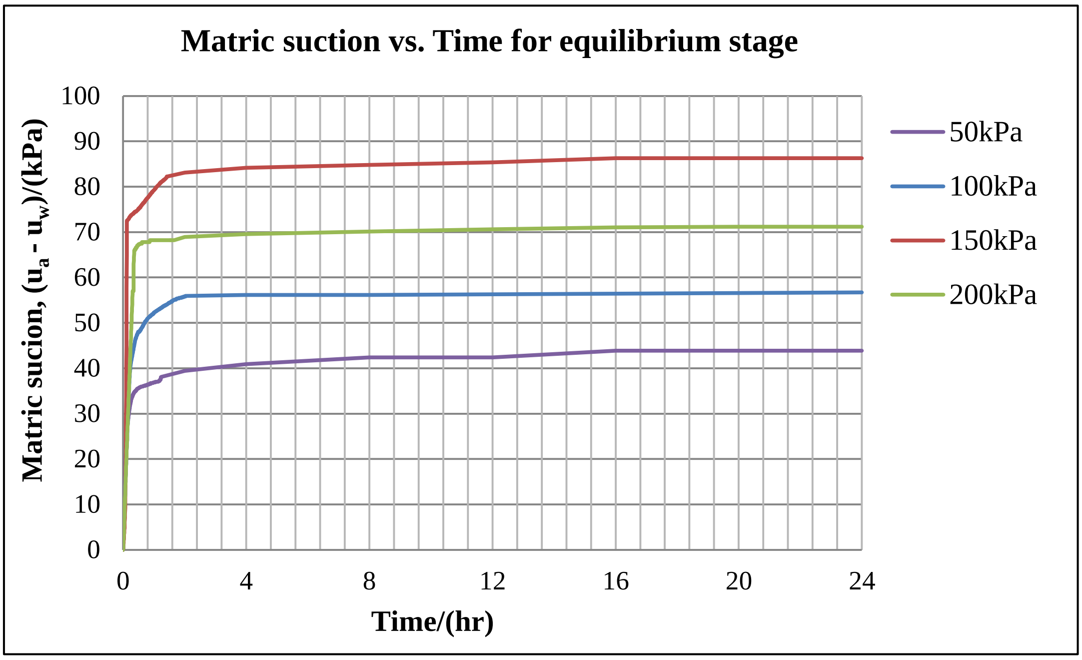


Figure 5.31: The variation of matric suction with time at equilibrium stage for approximately 65% saturated condition (SANDY SILT)

Figure 5.31 displays large variation in matric suction for a particular saturation level during the equilibrium stage (before applying the normal loads).

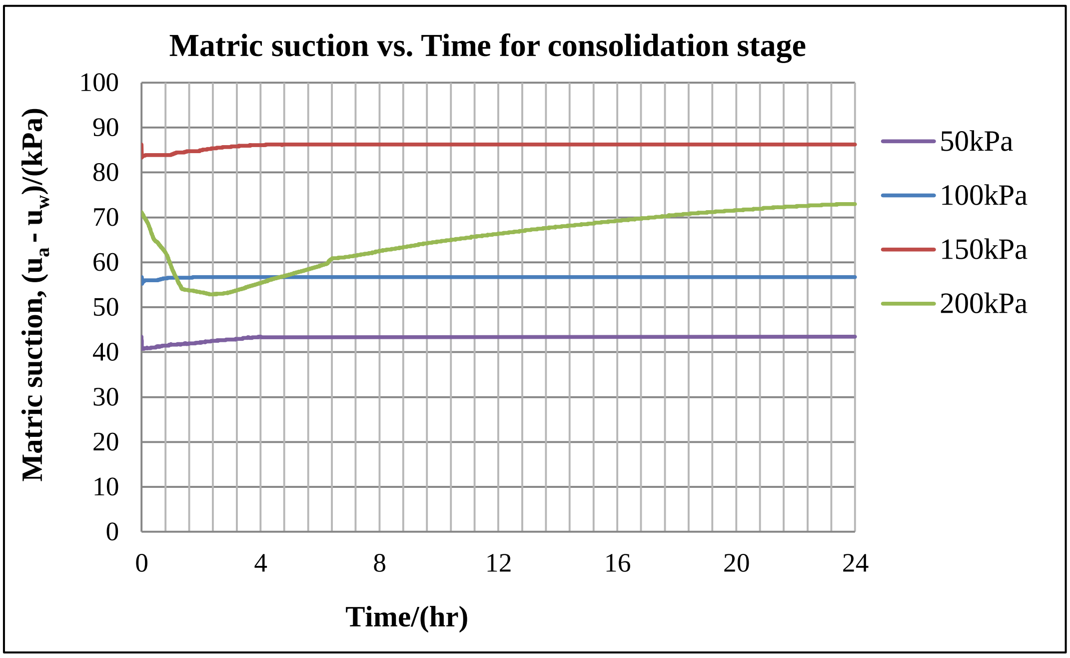


Figure 5.32: The variation of matric suction with time at consolidation stage for approximately 65% saturated condition (SANDY SILT)

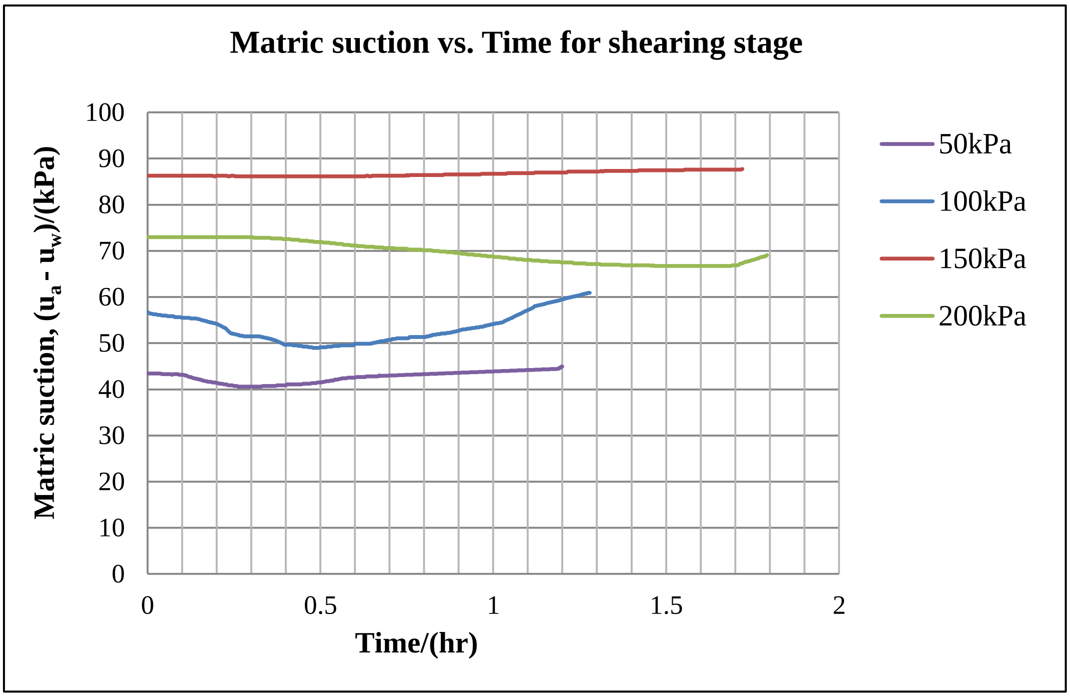


Figure 5.33: The variation of matric suction with time at shearing stage for approximately 65% saturated condition (SANDY SILT)

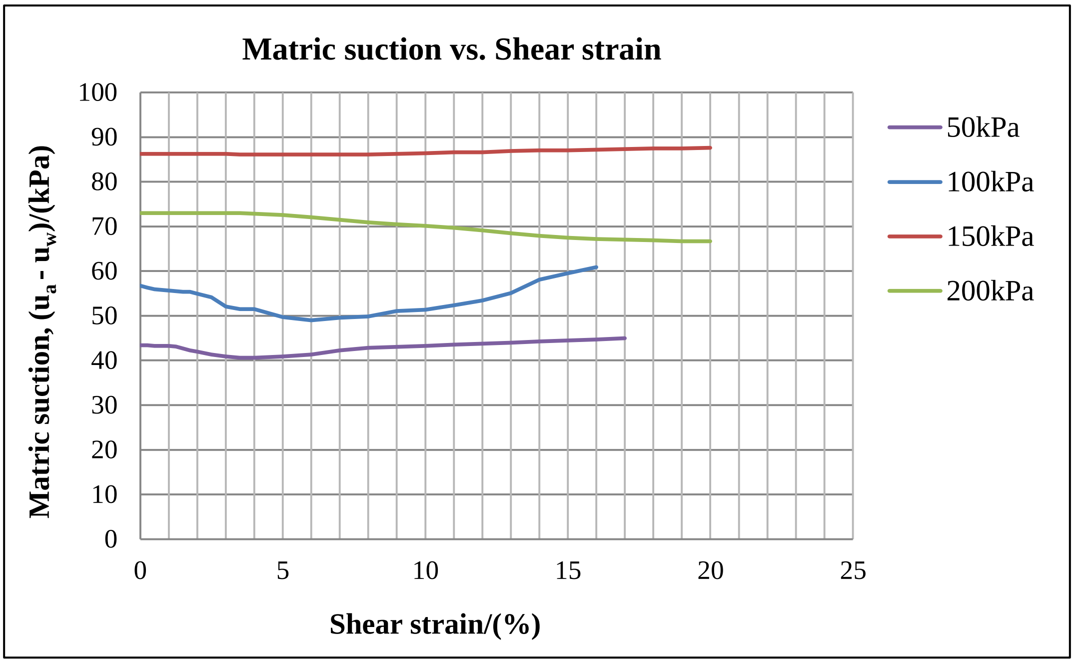


Figure 5.34: The variation of matric suction with shear strain at shearing stage for approximately 65% saturated condition (SANDY SILT)

The state of the sample at the failure surface is presented in Figure 5.35.

Normal stress = 100kPa

Figure 5.35: Direct shear specimen after the testing for approximately 65% saturated condition (SANDY SILT)

5.2.5.4. Sample with approximately 72% saturated condition

Tests were performed on approximately 72% saturated specimen. The basic data are presented in Table 5.23.

Table 5.23: The condition of tested specimen for approximately 72% saturated condition (SANDY SILT)

Parameter		**Value**			
Specimen No.		1	2	3	4
Moisture content/(%)	Before test	30.56	29.30	31.11	29.12
	After test	32.41	27.56	29.86	27.15
Saturation/(%)	Before test	70.14	71.28	70.74	68.81
	After test	76.96	74.96	75.66	69.70
Volumetric water content/(%)	Before test	37.26	36.82	37.73	36.05
	After test	40.22	36.63	38.32	35.07
Dry density/(kg/m^3)	Before test	1219.00	1256.75	1212.98	1237.95
	After test	1241.09	1329.33	1283.31	1291.68
Void ratio	Before test	1.13	1.07	1.14	1.10
	After test	1.09	0.96	1.03	1.01

The stress – strain curves obtained for normal load intensities of 50, 100, 150 and 200kPa are presented in Figure 5.36, the volume change – shear strain variation is shown in Figure 5.37.

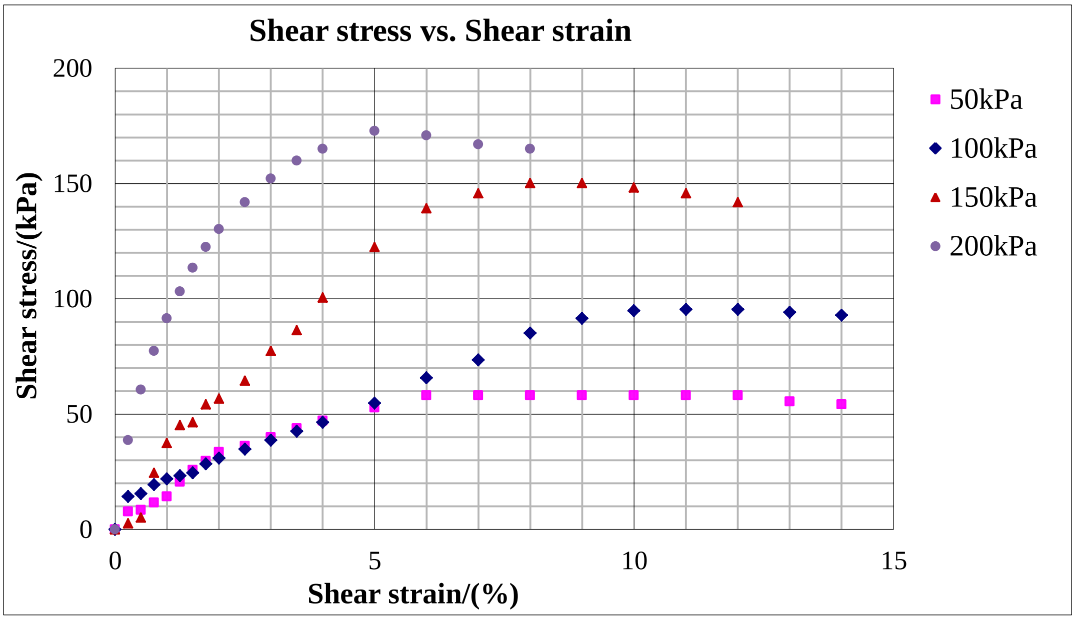


Figure 5.36: The variation of shear stress with shear strain for approximately 72% saturated condition (SANDY SILT)

The variation of shear stress with shear strain in figure 5.36 shows slightly good order as per the normal loads.

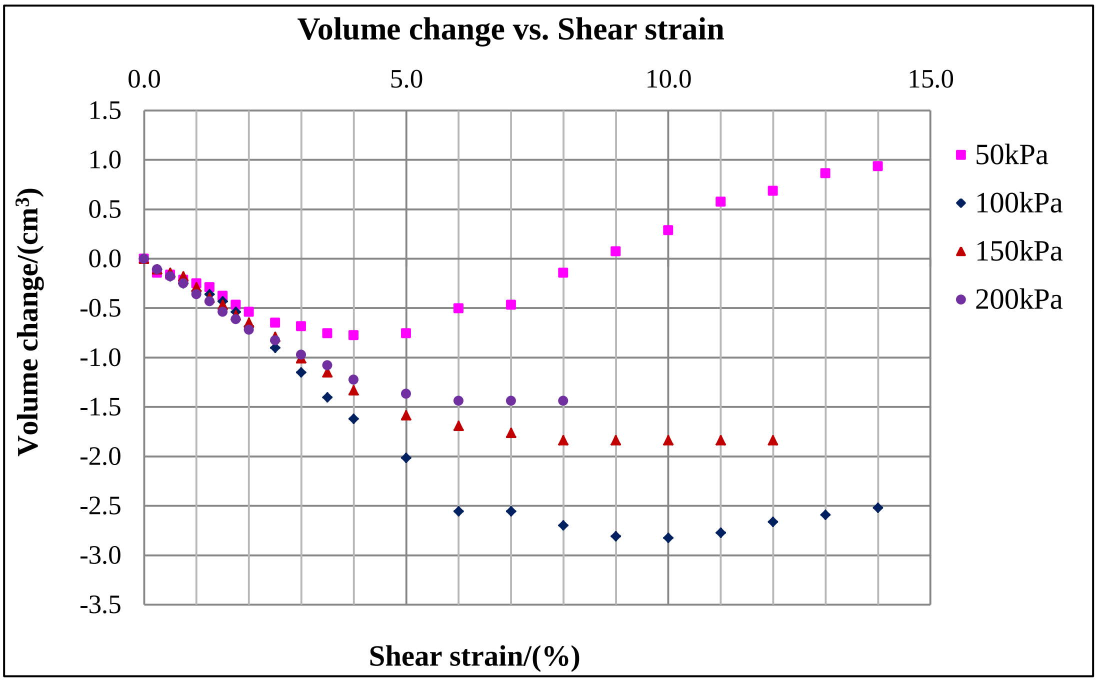


Figure 5.37: The variation of volume change with shear strain for approximately 72% saturated condition (SANDY SILT)

The volume change for normal load of 200kPa is bit lower than that of 150kPa of normal load and normal load of 100kPa shows little higher value related to other loading conditions. At normal load of 50kPa the sample has shown some dilation.

Shear stress (maximum) and strain at failure for each loading condition was obtained from the Figure 5.36 and tabulated in Table 5.24.

Table 5.24: Shear stress and strain values at failure with normal stress for approximately 72% saturated condition (SANDY SILT)

Parameter	**Value**			
Normal stress/(kPa)	50.00	100.00	150.00	200.00
Strain at failure/(%)	6.00	11.00	8.00	5.00
Shear Stress at failure/(kPa)	58.03	95.42	150.22	172.79

The shear strength envelope was plotted as shown in Figure 5.38 using the data given Table 5.24 and apparent cohesion, c_a for approximately 72% saturated condition is tabulated in Table 5.25.

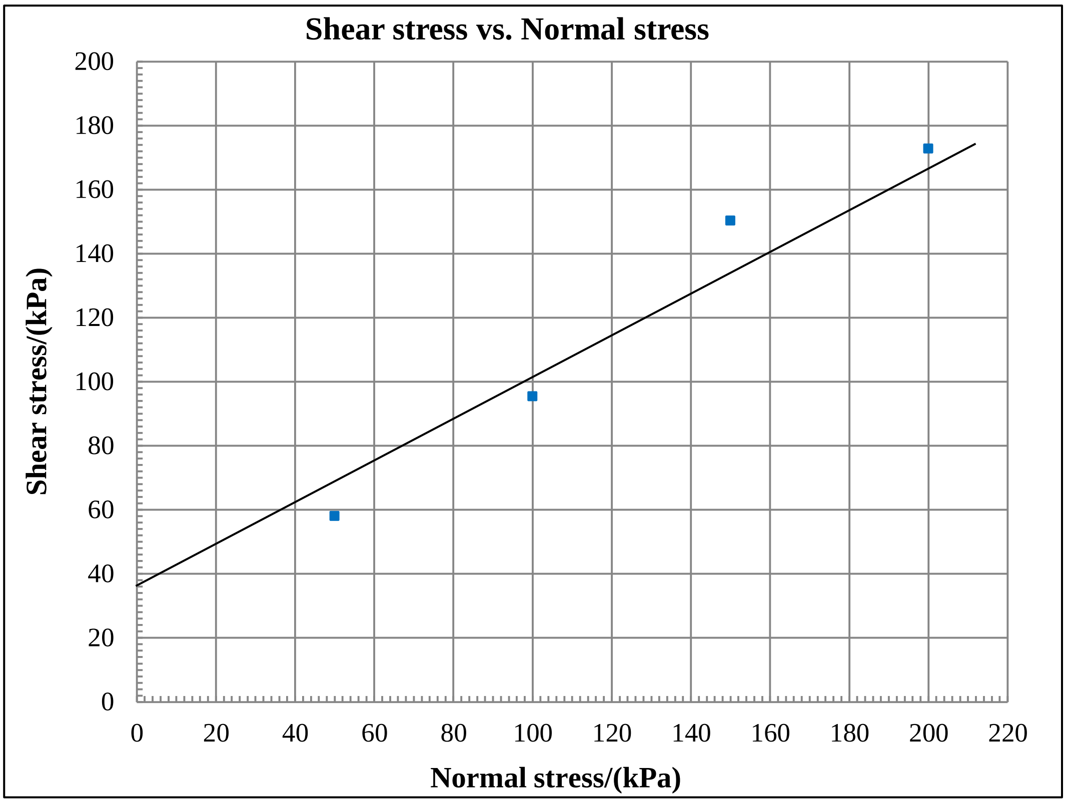


Figure 5.38: The variation of shear stress with normal stress for approximately 72% saturated condition (SANDY SILT)

Table 5.25: Shear strength parameters for approximately 72% saturated condition (SANDY SILT)

Parameter	**Value**
Apparent cohesion, c_a/(kPa)	36
Internal angle of friction, ϕ'/(deg.)	33

Matric suction values for approximately 72% saturated condition on four specimens during the stage of equilibrium and for different normal loading conditions (four levels) during the stages of consolidation and shearing were measured and the variation of matric suction with time for the above mentioned stages and the variation of matric suction with shear strain are presented in Figure 5.29 to Figure 5.42.

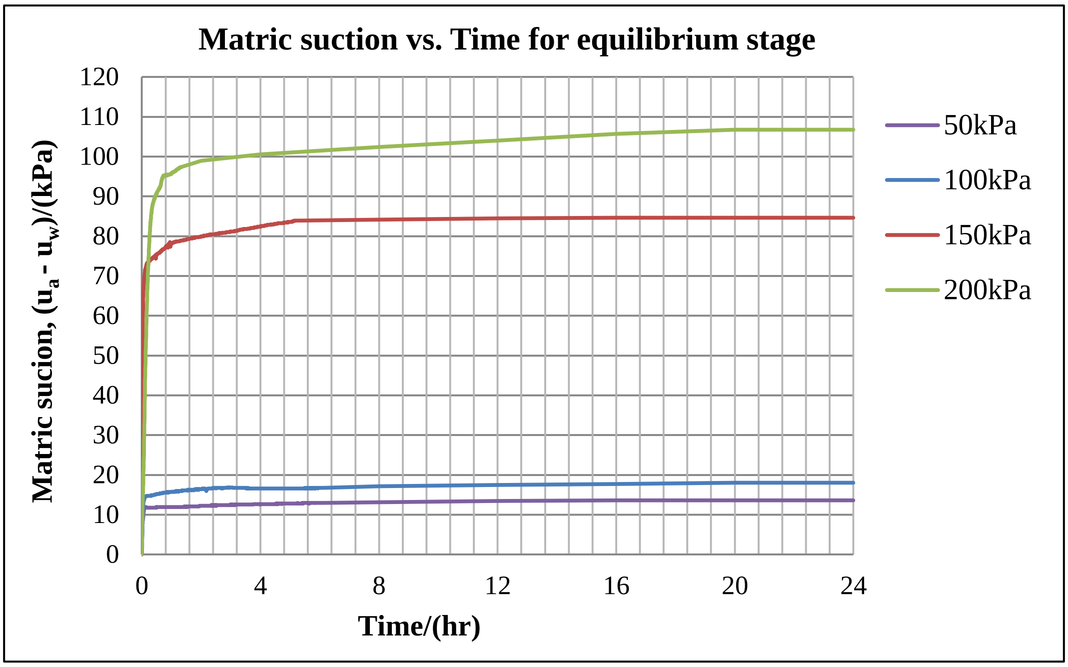


Figure 5.39: The variation of matric suction with time at equilibrium stage for approximately 72% saturated condition (SANDY SILT)

Figure 5.39 displays huge variation in matric suction for a particular saturation level during the equilibrium stage (before applying the normal loads).

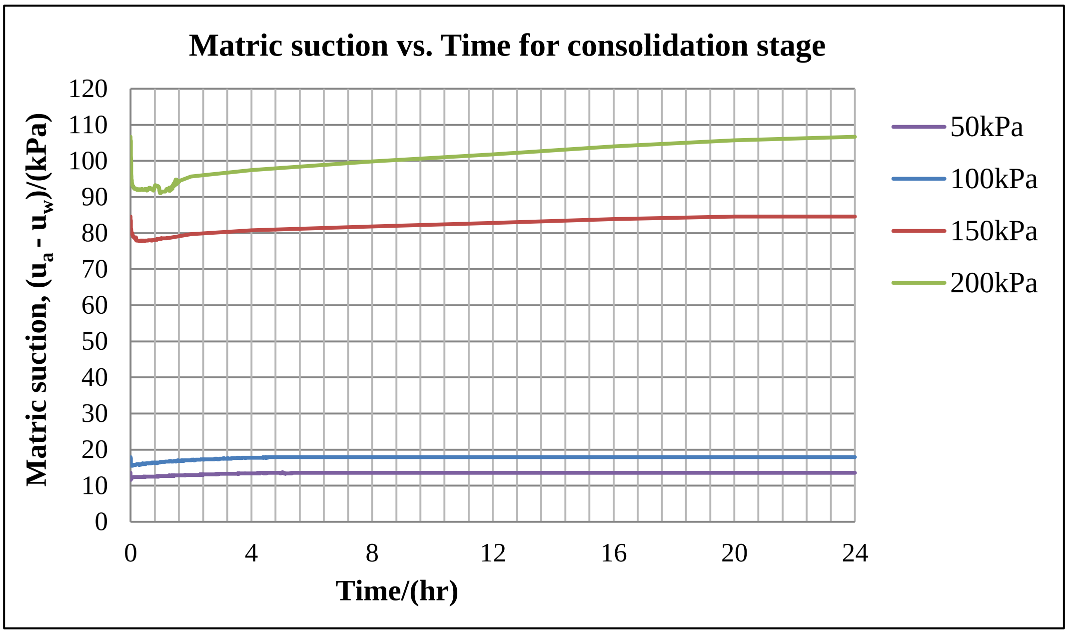


Figure 5.40: The variation of matric suction with time at consolidation stage for approximately 72% saturated condition (SANDY SILT)

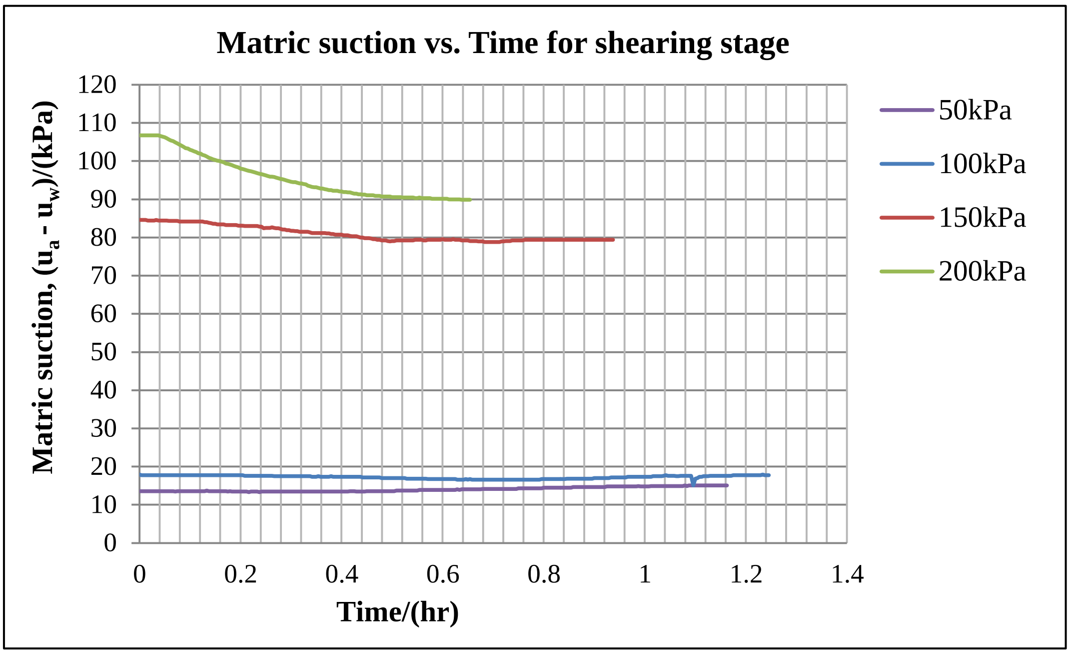


Figure 5.41: The variation of matric suction with time at shearing stage for approximately 72% saturated condition (SANDY SILT)

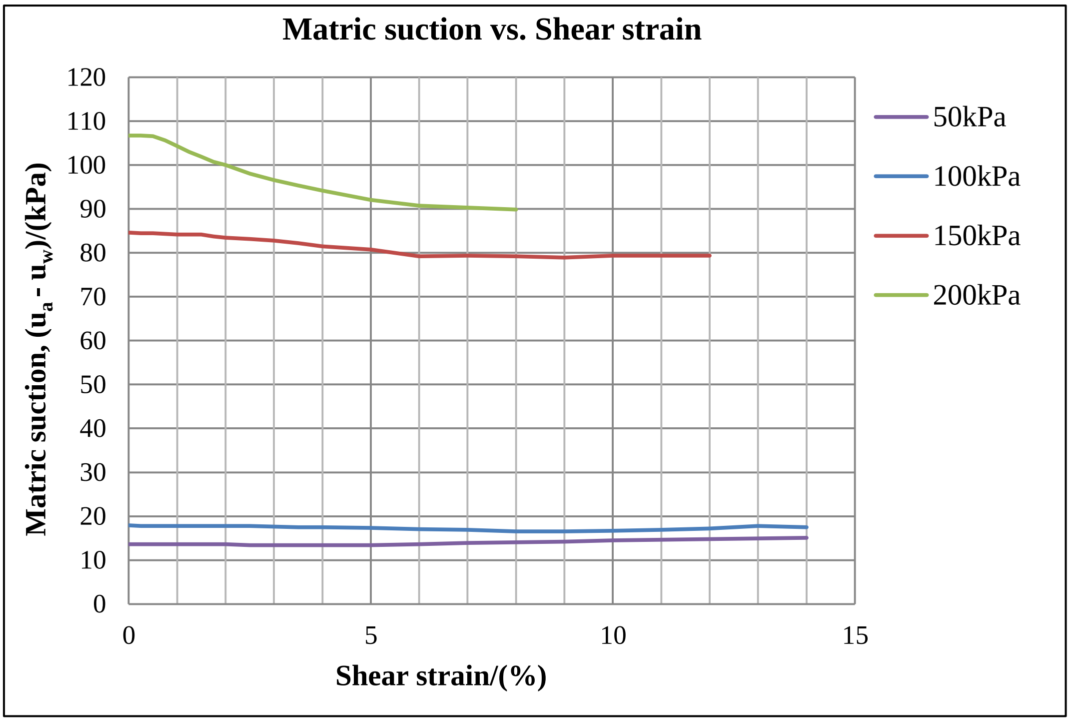


Figure 5.42: The variation of matric suction with shear strain at shearing stage for approximately 72% saturated condition (SANDY SILT)

The state of the sample at the failure surface is presented in Figure 5.43. Patches of whitish clay are seen in all specimens.

Normal stress = 50kPa

Normal stress = 100kPa

Normal stress = 200kPa

Figure 5.43: Direct shear specimen after the testing for approximately 72% saturated condition (SANDY SILT)

5.2.5.5. Sample with approximately 81% saturated condition

Tests were performed on approximately 81% saturated specimen. The basic data are presented in Table 5.26.

Table 5.26: The condition of tested specimen for approximately 81% saturated condition (SANDY SILT)

Parameter		**Value**			
Specimen No.		1	2	3	4
Moisture content/(%)	Before test	34.42	30.66	34.14	33.24
	After test	36.05	30.96	35.00	31.31
Saturation/(%)	Before test	77.08	76.61	76.96	79.54
	After test	83.10	83.74	84.58	87.71
Volumetric water content/(%)	Before test	41.41	39.06	41.22	41.42
	After test	44.05	41.04	43.83	42.22
Dry density/(kg/m^3)	Before test	1203.22	1274.24	1207.47	1246.03
	After test	1221.79	1325.68	1252.56	1348.52
Void ratio	Before test	1.16	1.04	1.15	1.09
	After test	1.13	0.96	1.08	0.93

The stress – strain curves obtained for normal load intensities of 50, 100, 150 and 200kPa are presented in Figure 5.44, the volume change – shear strain variation is shown in Figure 5.45.

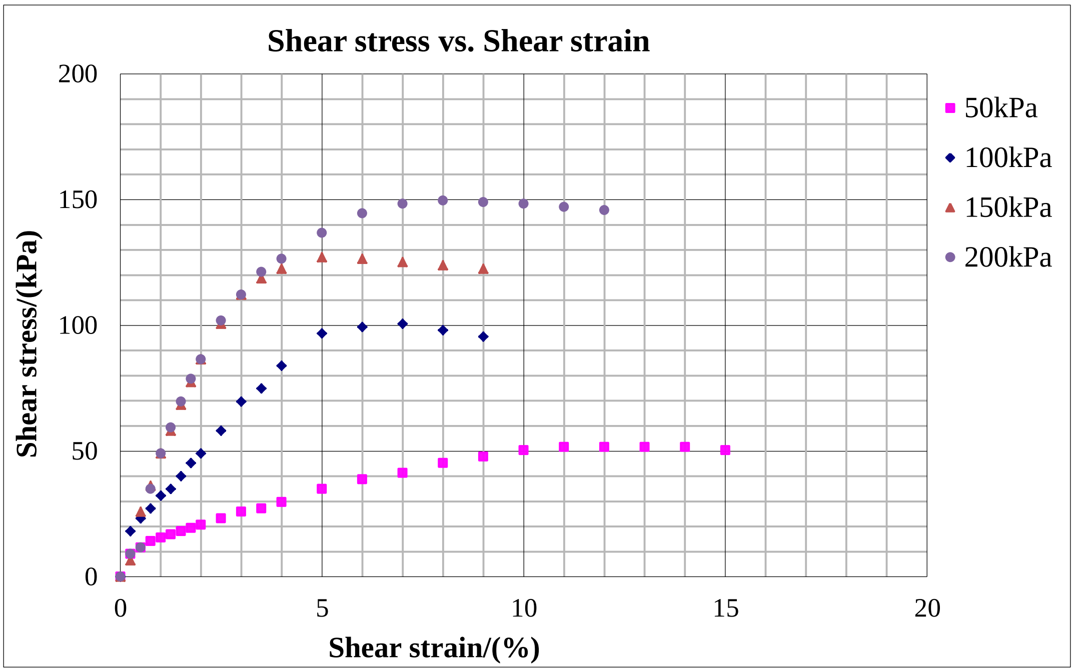


Figure 5.44: The variation of shear stress with shear strain for approximately 81% saturated condition (SANDY SILT)

The variation of shear stress with shear strain in Figure 5.44 shows reasonably good order as per the normal loads.

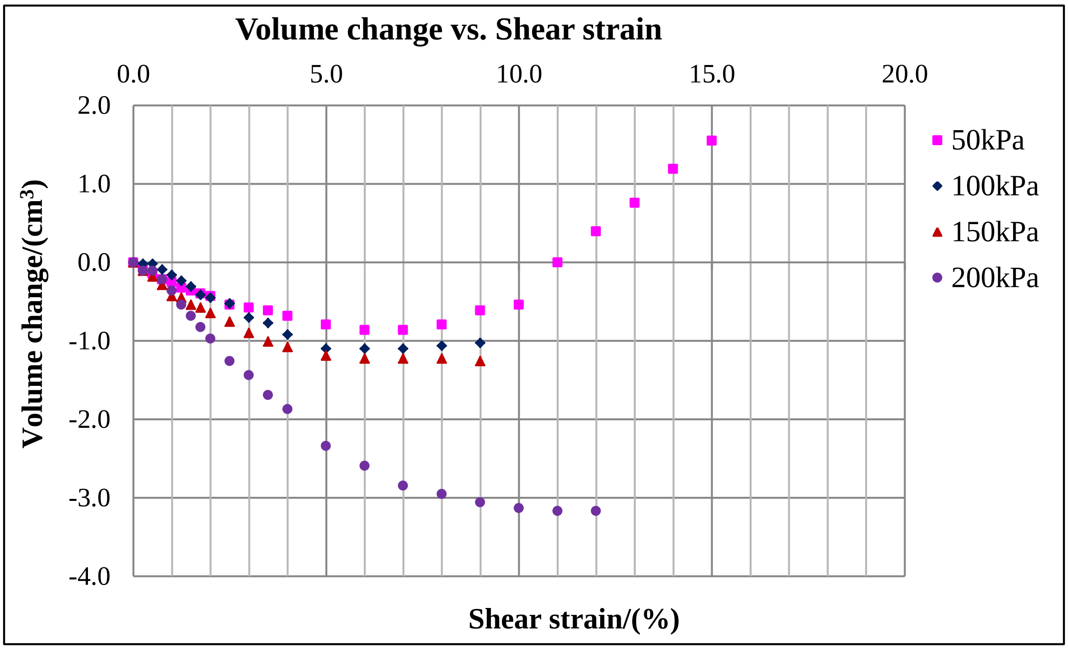


Figure 5.45: The variation of volume change with shear strain for approximately 81% saturated condition (SANDY SILT)

The variation of volume change with shear strain for normal load of 150kPa shows lower values paralleled to other normal loading conditions. The sample tested at a normal load of 50kPa shows some dilation towards the end of the test.

Shear stress (maximum) and strain at failure for each loading condition was obtained from the Figure 5.44 and tabulated in Table 5.27.

Table 5.27: Shear stress and strain values at failure with normal stress for approximately 81% saturated condition (SANDY SILT)

Parameter	**Value**			
Normal stress/(kPa)	50.00	100.00	150.00	200.00
Strain at failure/(%)	11.00	7.00	5.00	8.00
Shear stress at failure/(kPa)	51.58	100.58	127.01	149.58

The shear strength envelope was plotted as shown in Figure 5.46 using the data given Table 5.27 and apparent cohesion, c_a for approximately 81% saturated condition is tabulated in Table 5.28.

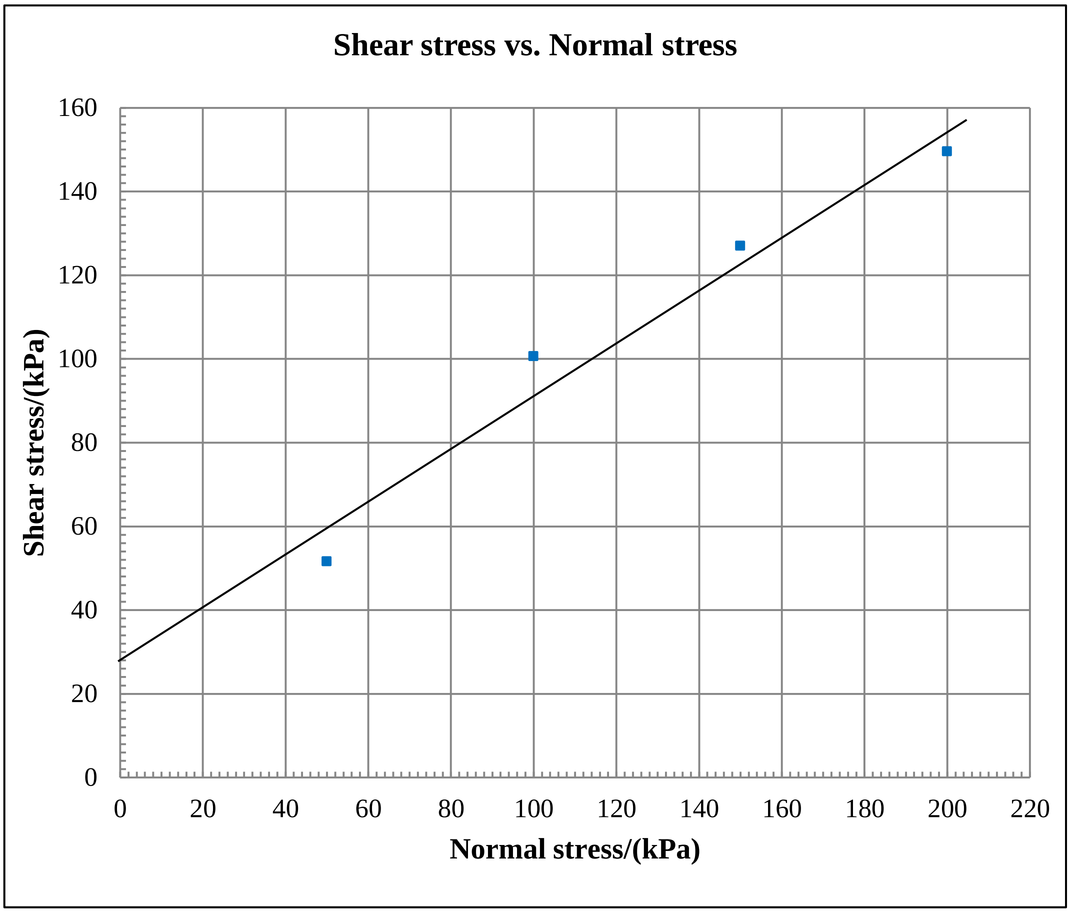


Figure 5.46: The variation of shear stress with normal stress for approximately 81% saturated condition (SANDY SILT)

Table 5.28: Shear strength parameters for approximately 81% saturated condition (SANDY SILT)

Parameter	**Value**
Apparent cohesion, c_a/(kPa)	28
Internal angle of friction, ϕ'/(deg.)	33

Matric suction values for approximately 81% saturated condition on four specimens during the stage of equilibrium and for different normal loading conditions (four levels) during the stages of consolidation and shearing were measured and the variation of matric suction with time for the above mentioned stages and the variation of matric suction with shear strain are presented Figure 5.47 to Figure 5.50.

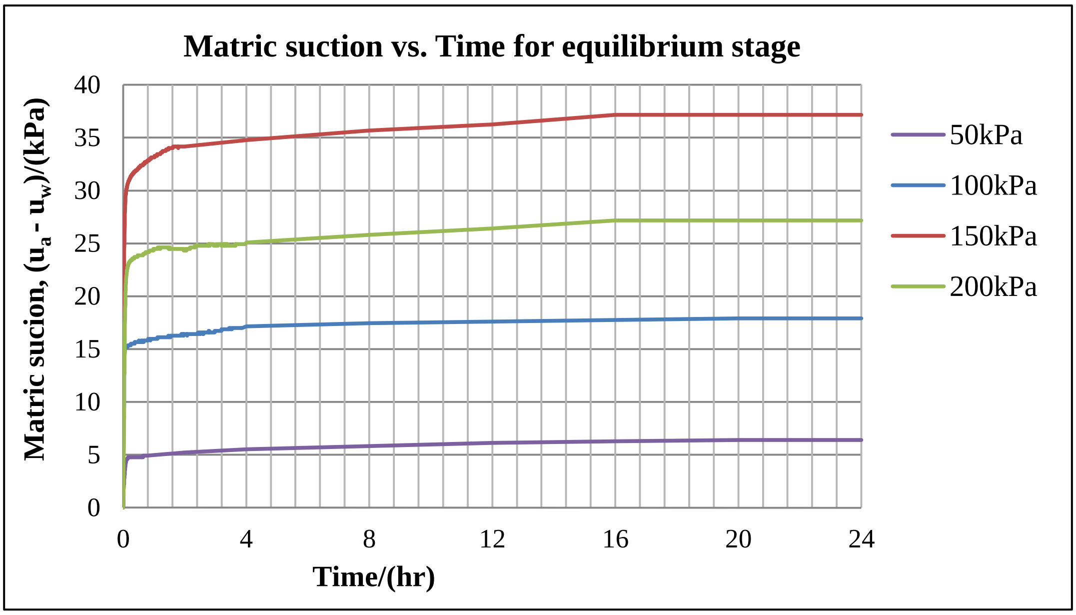


Figure 5.47: The variation of matric suction with time at equilibrium stage for approximately 81% saturated condition (SANDY SILT)

Figure 5.47 displays big variation in matric suction for a particular saturation level during the equilibrium stage (before applying the normal loads).

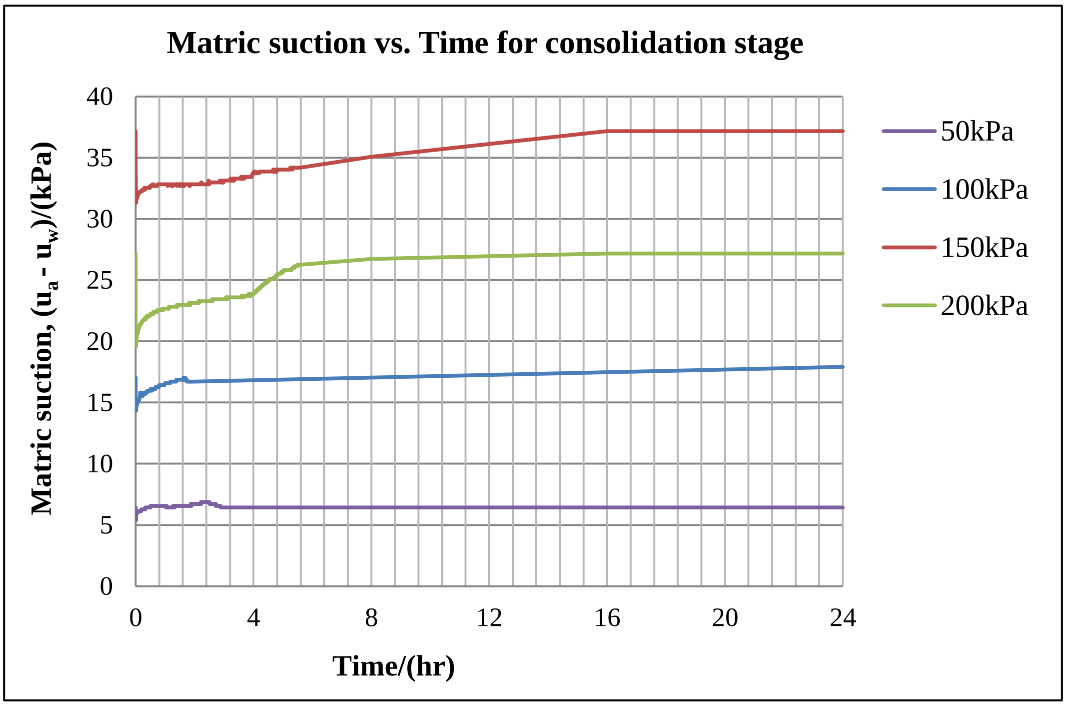


Figure 5.48: The variation of matric suction with time at consolidation stage for approximately 81% saturated condition (SANDY SILT)

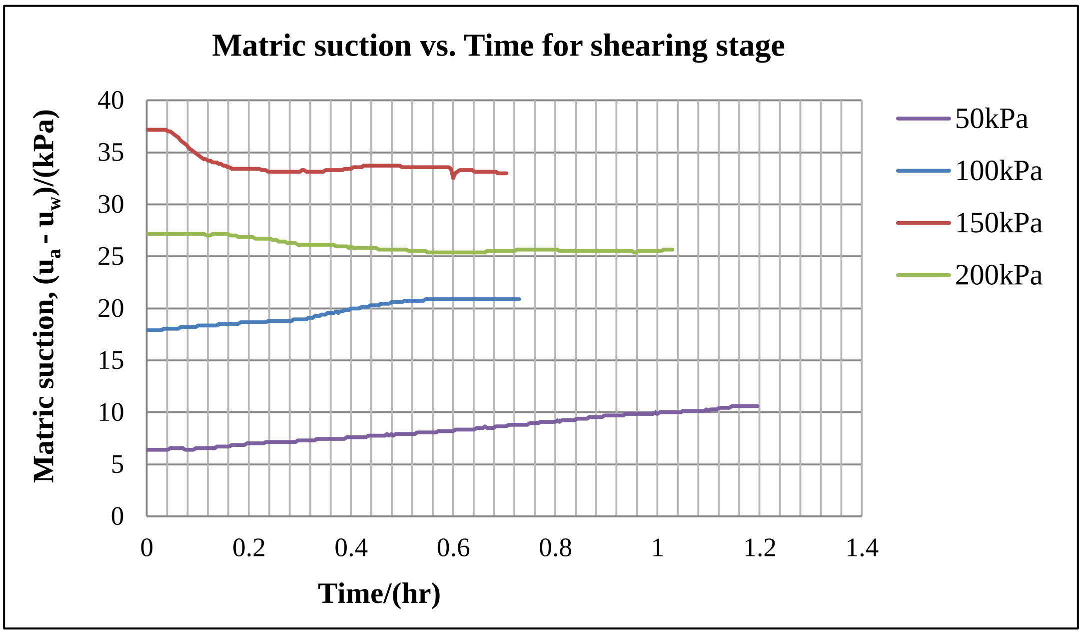


Figure 5.49: The variation of matric suction with time at shearing stage for approximately 81% saturated condition (SANDY SILT)

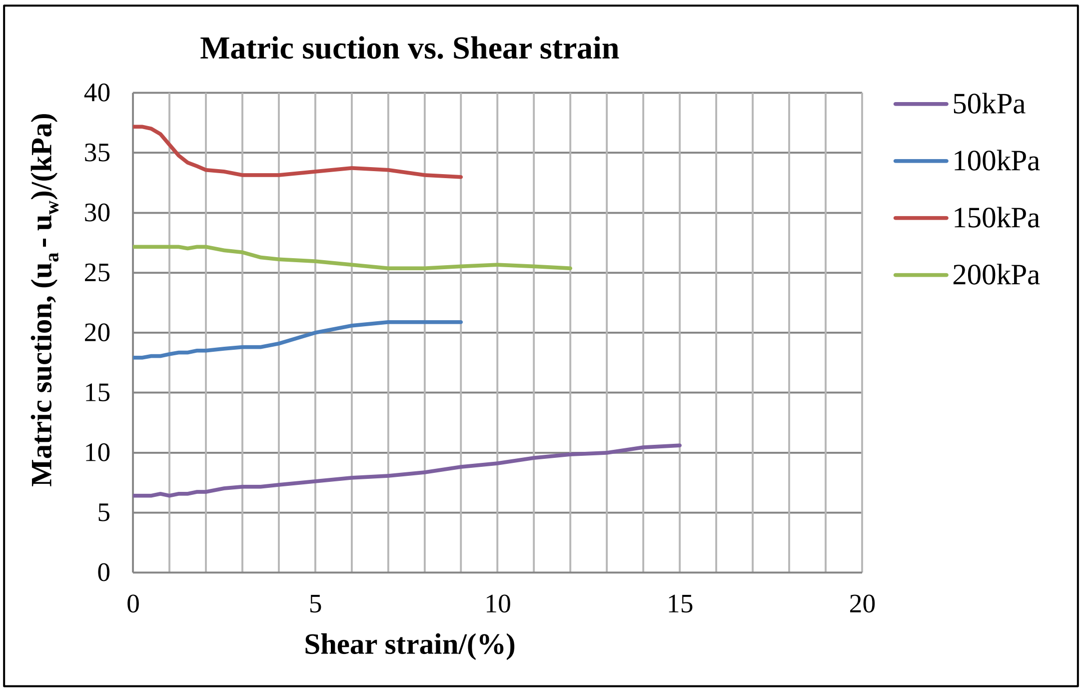


Figure 5.50: The variation of matric suction with shear strain at shearing stage for approximately 81% saturated condition (SANDY SILT)

The state of the sample at the failure surface is presented in Figure 5.51. Patches of whitish clay are seen in all specimens.

Normal stress = 100kPa	Normal stress = 150kPa

Figure 5.51: Direct shear specimen after the testing for approximately 81% saturated condition (SANDY SILT)

5.2.5.6. Sample with approximately 92% saturated condition

Tests were performed on approximately 92% saturated specimen. The basic data are presented in Table 5.29.

Table 5.29: The condition of tested specimen for approximately 92% saturated condition (SANDY SILT)

Parameter		**Value**			
Specimen No.		1	2	3	4
Moisture content/(%)	Before test	38.51	40.92	46.00	44.20
	After test	44.09	40.86	44.21	43.36
Saturation/(%)	Before test	83.86	86.63	84.73	83.00
	After test	102.97	98.43	99.13	100.30
Volumetric water content/(%)	Before test	45.64	47.75	49.59	48.19
	After test	54.24	51.09	53.23	53.08
Dry density/(kg/m^3)	Before test	1185.07	1166.93	1078.19	1090.39
	After test	1230.35	1250.46	1203.88	1224.06
Void ratio	Before test	1.19	1.23	1.41	1.38
	After test	1.11	1.08	1.16	1.12

The stress – strain curves obtained for normal load intensities of 50, 100, 150 and 200kPa are presented in Figure 5.52, the volume change – shear strain variation is shown in Figure 5.53.

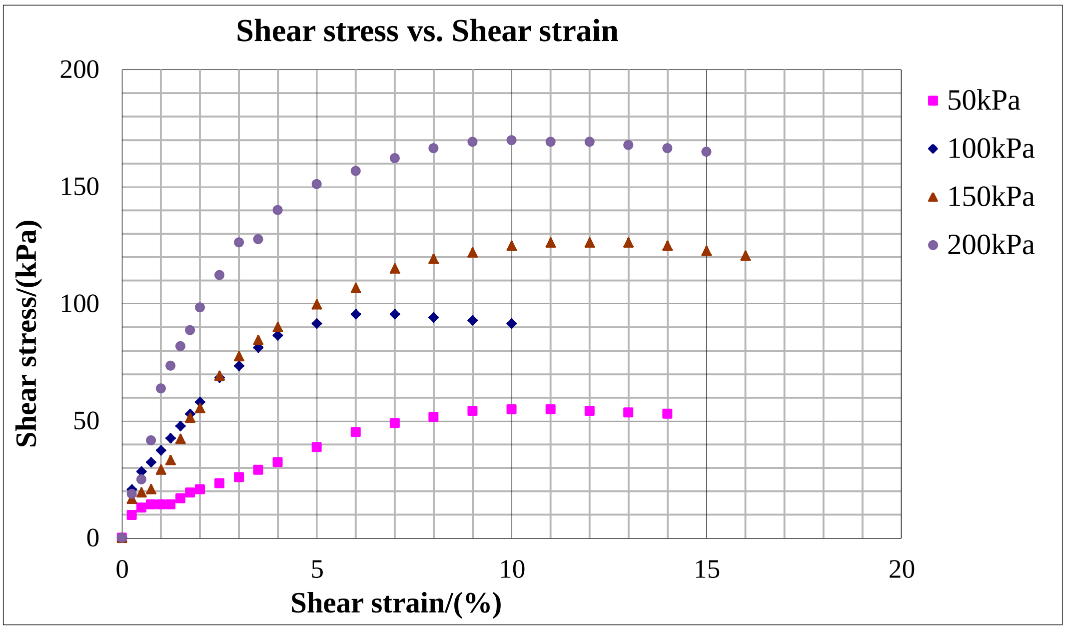


Figure 5.52: The variation of shear stress with shear strain for approximately 92% saturated condition (SANDY SILT)

The variation of shear stress with shear strain in Figure 5.52 shows good order as per the normal loads.

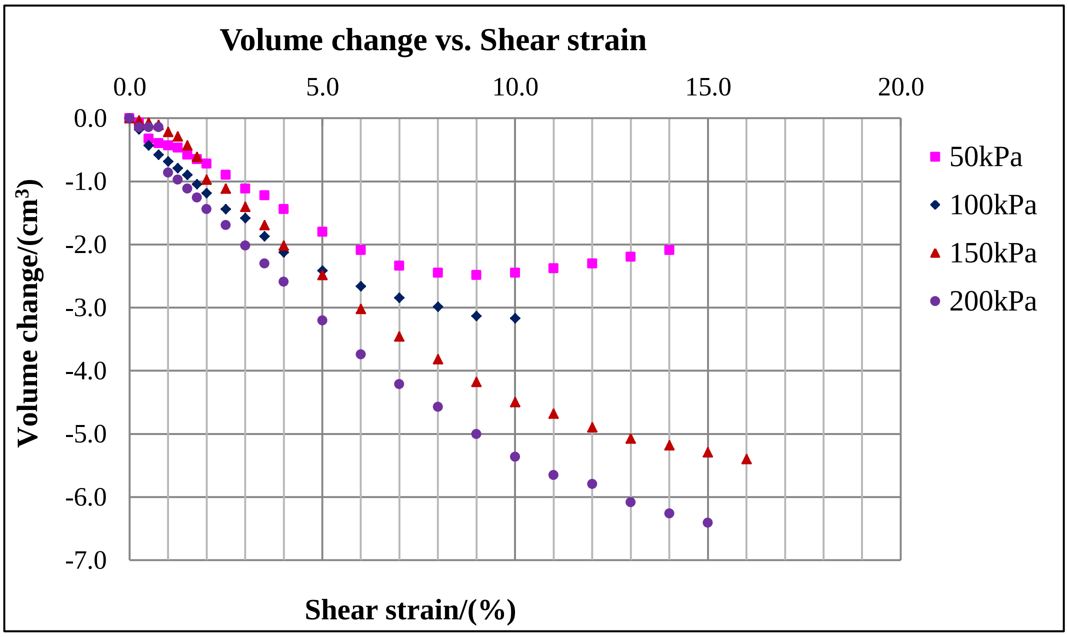


Figure 5.53: The variation of volume change with shear strain for approximately 92% saturated condition (SANDY SILT)

The variation of volume change with shear strain in Figure 5.53 shows good order as per the normal loads.

Shear stress (maximum) and strain at failure for each loading condition was obtained from the Figure 5.52 and tabulated in Table 5.30.

Table 5.30: Shear stress and strain values at failure with normal stress for approximately 92% saturated condition (SANDY SILT)

Parameter	**Value**			
Normal stress/(kPa)	50.00	100.00	150.00	200.00
Strain at failure/(%)	10.00	6.00	11.00	10.00
Shear stress at failure/(kPa)	54.80	95.42	126.07	169.72

The shear strength envelope was plotted as shown in Figure 5.54 using the data given Table 5.30 and apparent cohesion, c_a for approximately 92% saturated condition is tabulated in Table 5.31.

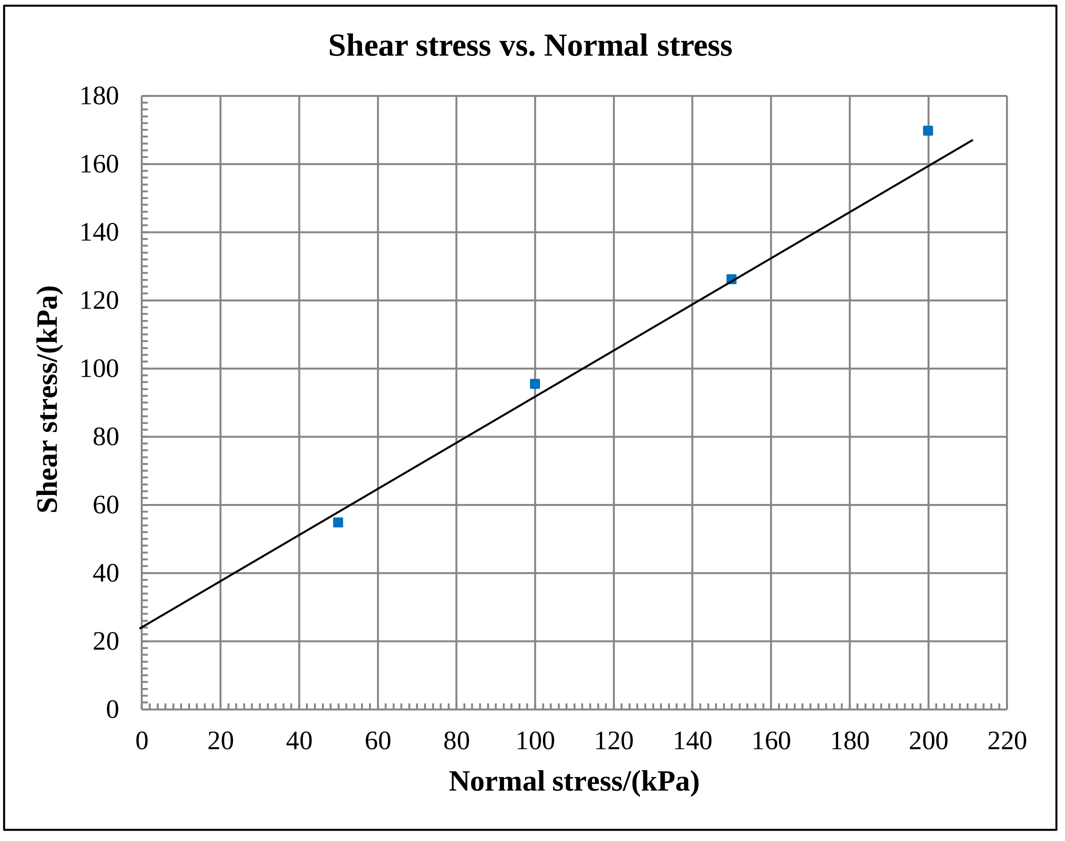


Figure 5.54: The variation of shear stress with normal stress for approximately 92% saturated condition (SANDY SILT)

Table 5.31: Shear strength parameters for approximately 92% saturated condition (SANDY SILT)

Parameter	**Value**
Apparent cohesion, c_a/(kPa)	24
Internal angle of friction, ϕ'/(deg.)	33

Matric suction values for approximately 92% saturated condition on four specimens during the stage of equilibrium and for different normal loading conditions (four levels) during the stages of consolidation and shearing were measured and the variation of matric suction with time for the above mentioned stages and the variation of matric suction with shear strain are presented Figure 5.55 to Figure 5.58.

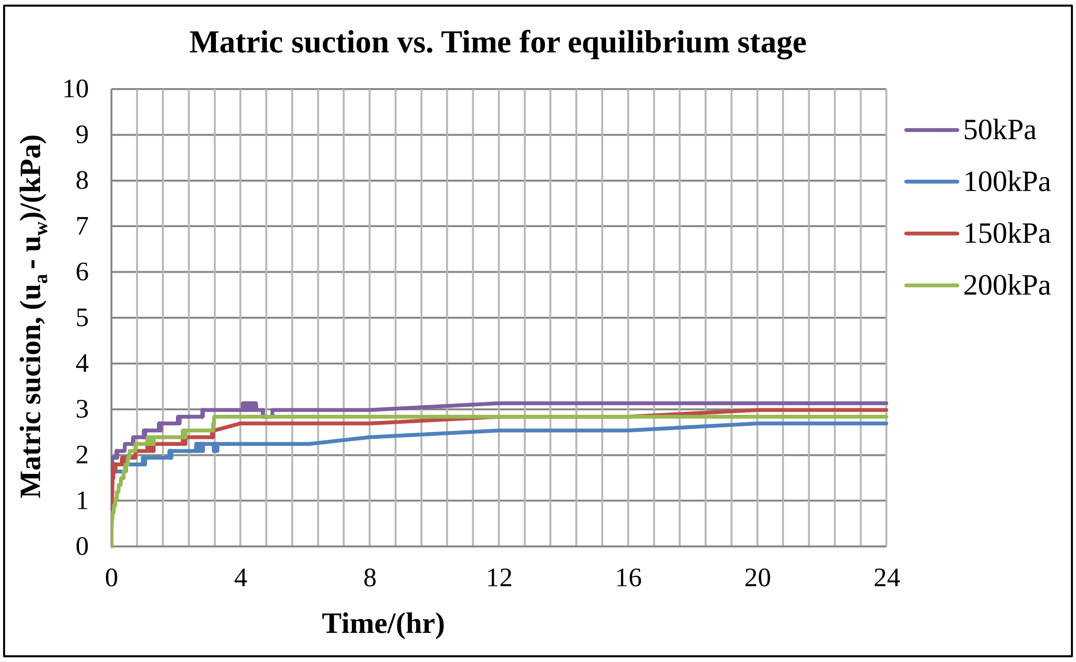


Figure 5.55: The variation of matric suction with time at equilibrium stage for approximately 92% saturated condition (SANDY SILT)

Figure 5.55 displays almost same variation in matric suction for a particular saturation level during the equilibrium stage (before applying the normal loads).

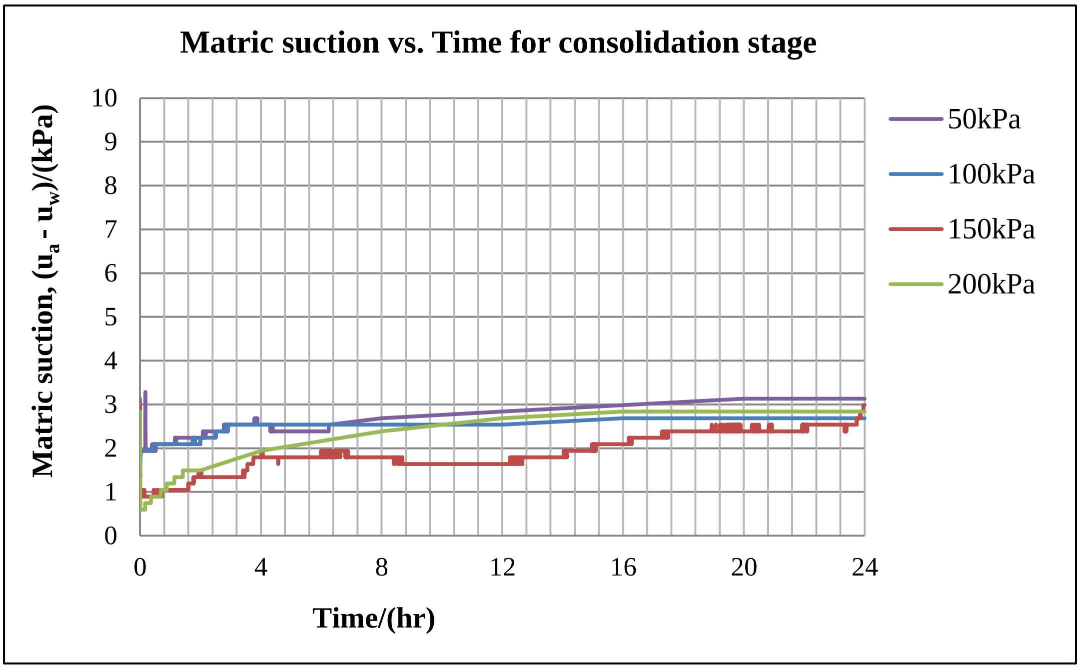


Figure 5.56: The variation of matric suction with time at consolidation stage for approximately 92% saturated condition (SANDY SILT)

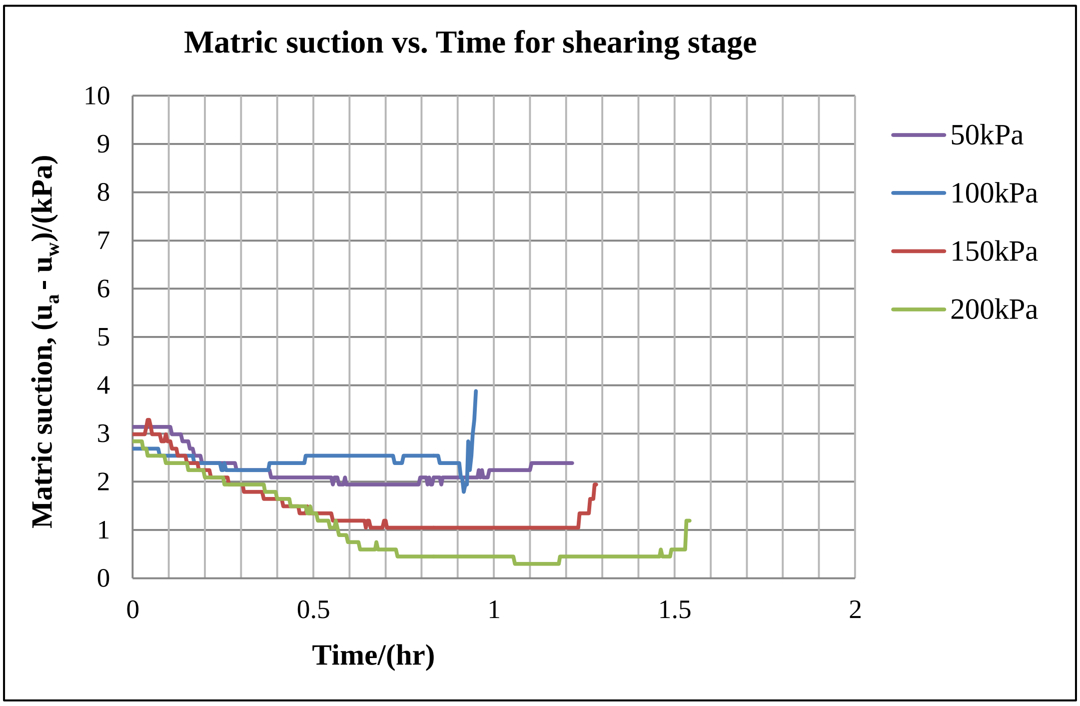


Figure 5.57: The variation of matric suction with time at shearing stage for approximately 92% saturated condition (SANDY SILT)

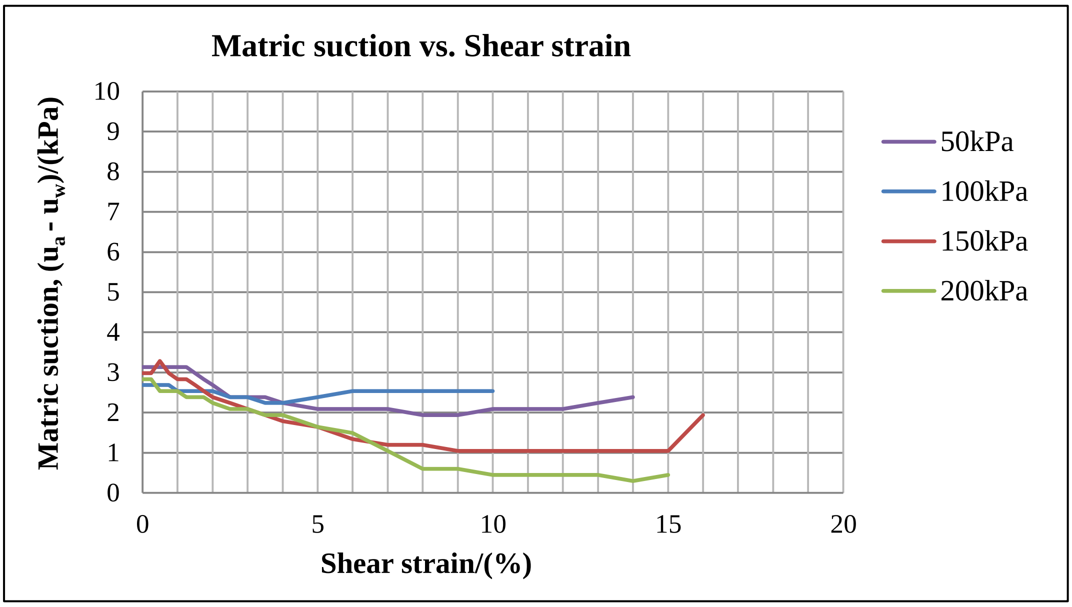
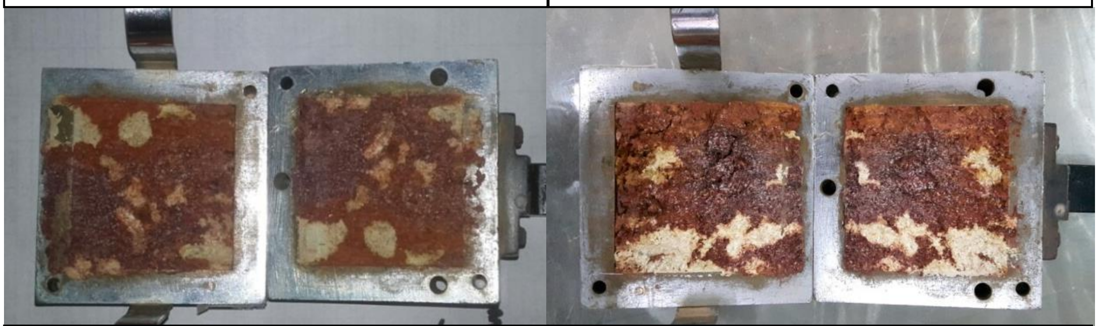


Figure 5.58: The variation of matric suction with shear strain at shearing stage for approximately 92% saturated condition (SANDY SILT)

The state of the sample at the failure surface is presented in Figure 5.59. Patches of whitish clay are seen in all specimens.

Normal stress = 50kPa	Normal stress = 100kPa



Normal stress = 150kPa	Normal stress = 200kPa

Figure 5.59: Direct shear specimen after the testing for approximately 92% saturated condition (SANDY SILT)

5.2.6. Variation of apparent cohesion with saturation and volumetric water content (SANDY SILT)

The variation of apparent cohesion with degree of saturation is tabulated in Table 5.32 and presented in Figure 5.60. As an alternate presentation the apparent cohesion is tabulated in Table 5.33 and plotted in Figure 5.61 against the volumetric water content.

Table 5.32: The variation of apparent cohesion with degree of saturation (SANDY SILT)

Apparent cohesion, c_a/(kPa)	Average degree of saturation/(%)	Degree of saturation before test/(%)	Degree of saturation after test/(%)
38	65.87	64.03	67.70
36	72.28	70.24	74.32
28	81.17	77.55	84.78
24	92.28	84.56	100.00
18	99.85	99.71	100.00

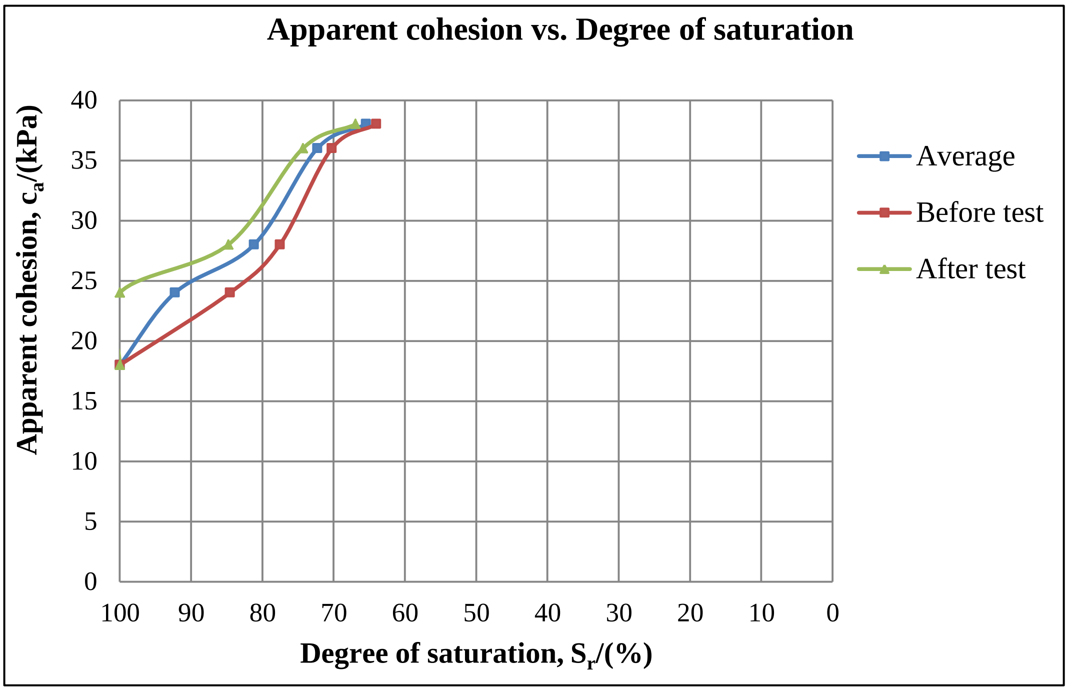


Figure 5.60: The variation of apparent cohesion with degree of saturation (SANDY SILT)

Table 5.33: The variation of apparent cohesion with volumetric water content (SANDY SILT)

Apparent cohesion, c_a/(kPa)	Average volumetric water content/(%)	Volumetric water content before test/(%)	Volumetric water content after test/(%)
38	33.61	33.41	33.82
36	37.26	36.97	37.56
28	41.98	40.78	43.19
24	50.35	47.79	52.91
18	56.27	53.76	58.78

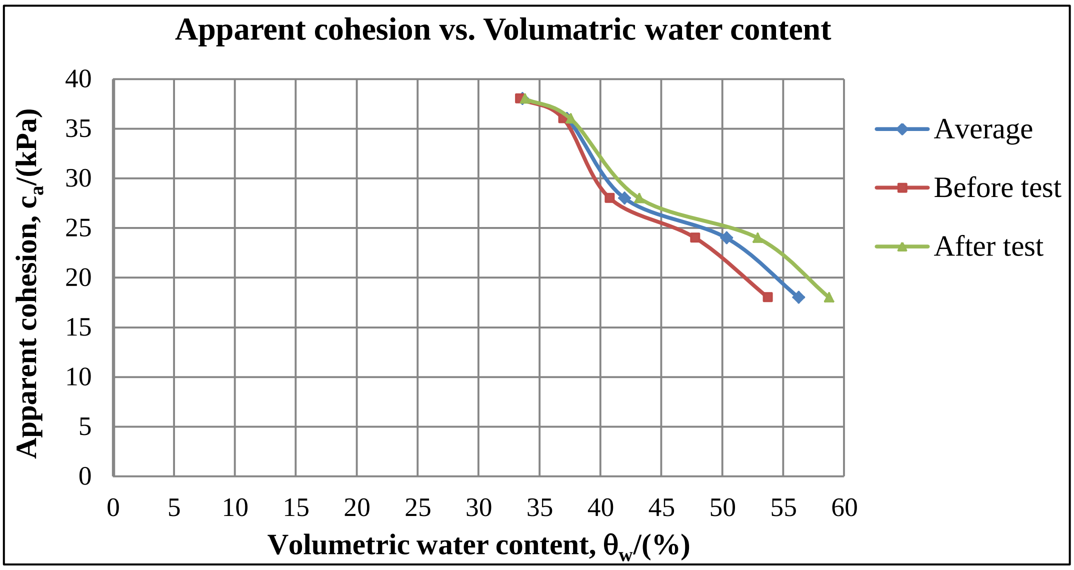


Figure 5.61: The variation of apparent cohesion with volumetric water content (SANDY SILT)

5.2.7. Development of angle of shearing resistance due to suction, ϕ^b using pressure plate apparatus (SANDY SILT)

The relationship of matric suctions and volumetric water contents obtained from the pressure plate apparatus was used together with direct shear test results to derive an apparent cohesion for the different equilibrium volumetric water contents achieved in the pressure plate apparatus. This data is presented in Table 5.34 and the variation of apparent cohesion with matric suction is presented in Figure 5.62. Following the observations made by former researchers Gan et al., (1988), Escario, V. & Juca, J., (1989), Vanapalli et al., (1996) and Jotisankasa et al., (2010) the angle of shearing resistance due to suction, ϕ^b displayed a non-linear relationship.

Table 5.34: The variation of volumetric water content with matric suction and apparent cohesion (SANDY SILT)

Matric suction, $(u_a - u_w)$/(kPa)	Volumetric water content, θ_w/(%)	Apparent cohesion, c_a/(kPa)
0	56.27	18.00
5	53.13	21.40
10	49.15	24.90
25	44.62	29.00
50	38.54	34.90
75	34.41	37.80
100	32.01	38.20

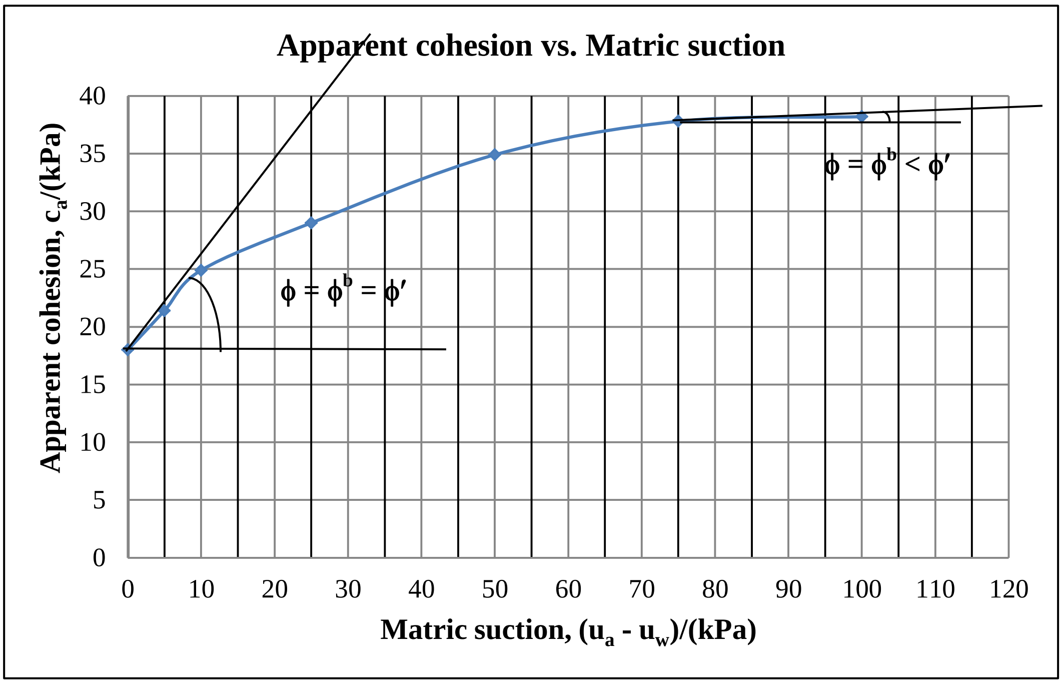


Figure 5.62: The variation of apparent cohesion with matric suction (SANDY SILT)

5.2.8. Development of angle of shearing resistance due to suction, ϕ^b using tensiometer apparatus (SANDY SILT)

The variation of peak shear strength (happens at failure) with relevant matric suction values for all the specimens used for the direct shear test with tensiometer arrangement for different levels of saturation are summarized in Table 5.35 and graphically presented in Figure 5.63 for each normal loading category. The variations of apparent cohesion with average matric suction derived from these tests are presented in Figure 5.64. It could be seen that the ϕ^b value is not a constant. Similar results were obtained by Gan et al., (1988), Escario, V. & Juca, J., (1989), Vanapalli et al., (1996) and Jotisankasa et al., (2010).

Table 5.35: The variation of shear strength, normalized shear strength with matric suction for different saturated condition (SANDY SILT)

Saturation, S_r/(%)	**Shear strength, τ_{max}/(kPa)**	**Matric suction, $(u_a - u_w)$/(kPa)**
50kpa		
65	64.26	44.48
72	58.03	13.58
81	51.58	9.55
92	54.80	2.09
100	51.60	0.00
100kPa		
65	131.14	58.06
72	95.42	16.87
81	100.58	20.90
92	95.42	2.54
100	83.80	0.00
150kPa		
65	200.00	87.01
72	150.22	79.25
81	127.01	33.43
92	126.07	1.04
100	116.10	0.00
200kPa		
65	156.06	67.16
72	172.79	92.09
81	149.58	25.37
92	169.72	0.45
100	145.70	0.00

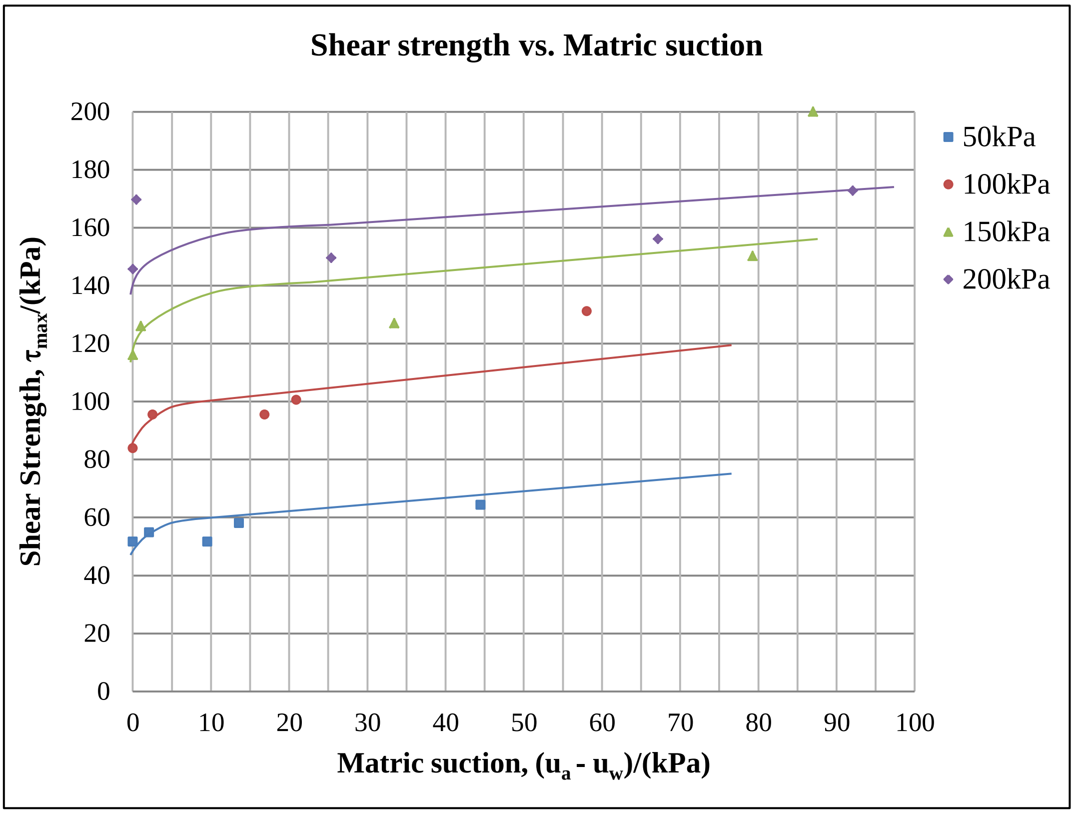


Figure 5.63: The variation of maximum shear strength (at failure) with matric suction for different loading conditions (SANDY SILT)

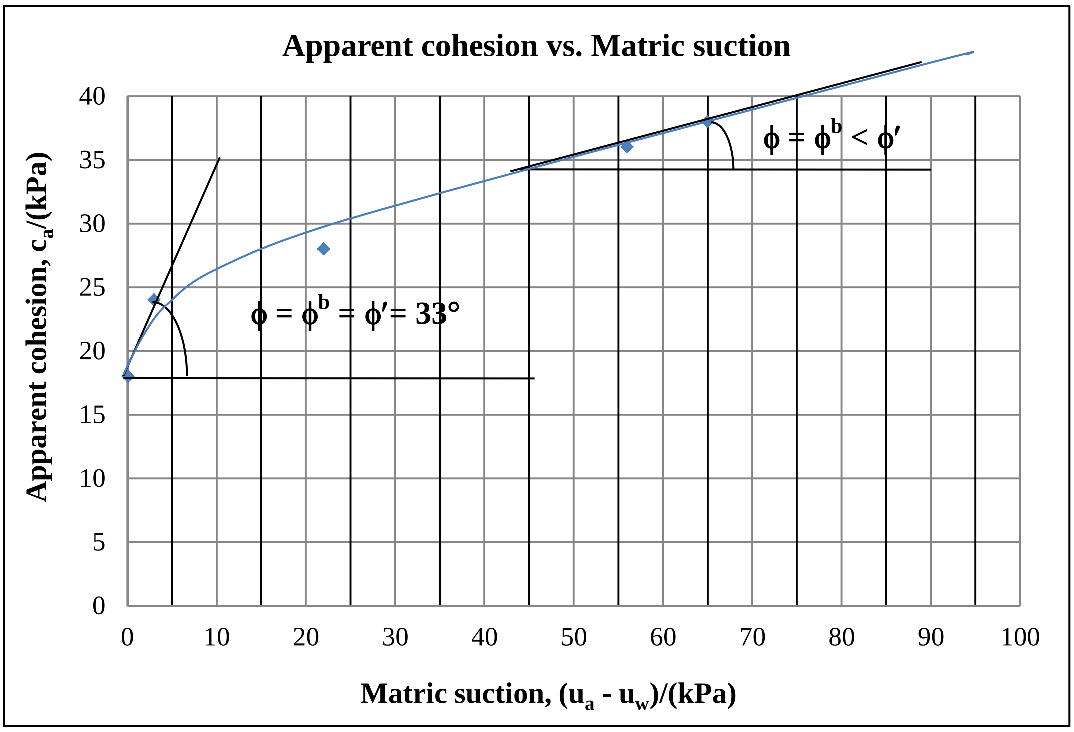


Figure 5.64: The variation of apparent cohesion with matric suction (SANDY SILT)

5.3. Concluding comments

The undisturbed box samples obtained from the site contained two main types of soils. The saturated shear strength parameters are;

1) SILTY SAND with $c' = 10$kPa and $\phi' = 38°$
2) SANDY SILT with $c' = 18$kPa and $\phi' = 33°$

Initial direct shear tests without matric suction measurement were taken on SILTY SAND. Direct shear tests with matric suction measurement later were conducted on SANDY SILT.

The particle size distribution, permeability, soil water characteristic curves (SWCCs) and shear strength parameters are significantly different for the two types of soil.

Even within one type the second series of test done with SANDY SILT there was non-homogeneity in the failure plane. While clay patches were present within the brownish SANDY SILT.

In this testing different series of tests were done at varying degrees of target saturation levels 65%, 72%, 81%, 92%,…etc. for each saturation level of specimen were prepared to be at different normal stress levels; 50,100, 150 & 200kPa. The anticipated condition was that the four samples would be identical. However, due to the non-homogeneous nature of the residual soil (a product of weathering of metamorphic rock) the four samples were not identical and significant differences were observed.

As such, there were many variations detected in stress-strain curves and volume change-strain curves. Some of the specimens have reached the peak shear strength at early strain and few as much delayed strain levels. Some specimens have shown dilation effects. In some cases the peak shear strength at a lower normal stress was greater than that at a higher normal stress. These imperfections could result from;

- Local changes in dry density /voids /particle arrangement(structure)
- Local changes in mineral composition
- Anomalies in particle size such that presence of gravel particle as completely weathered rock fragments. If the gravel particles are encountered along failure surface/plane during shearing and it gives high peak shear strength at failure.
- Pockets of soft materials whitish clay derived from weathering of feldspar rich rock
- Differences in type of the soil i.e., if the soil is sandy and dense state, the dilation effect can be expected.

All the above features make the soil non-homogeneous. Photographs of the shear plane after shearing confirm that there are pockets of feldspar rich minerals (whitish yellow) and ferrous rich minerals (dark brownish/ blackish dots) and those are very weak in strength and weight of the particles also relatively low.

However, by maintain careful attention it was possible to draw reasonable failure envelops and obtain strength parameters at different saturation levels.

The computed degree of saturation at the end of the test for some specimens had values over 100% which is practically not possible. This is after accommodating the volume reduction computed by vertical displacement. There could be some imperfections in these readings. At the last stages of the test these could be some tilting of the upper loading plate which could introduce some errors into the vertical displacement readings. There could be another error on weight loss of soil during the sample transferring into the direct shear box and removing from the direct shear box before and after the test respectively.

Matric suction for a particular saturation level should be same theoretically and do not depend on the normal loads what was applied during consolidation and shearing stages as the equilibrium stage was achieved before apply the normal load.

However, in this research study, due to the non-homogenous conditions already discussed a large range of variation in matric suction values obtained for a particular saturation level.

The 90% value of matric suction for a particular saturation level was achieved within few minutes time during equilibrium stage and equilibrium (remaining 10%) was attained within 24hrs.

The matric suction decreased slightly initially during the consolidation stage under a given applied normal load due to development of pore water pressure (positive) and then came back within 24hrs time after the dissipation of pore water pressure.

At the initial shearing stage of most tests, some compression was observed which was accompanied by a slight decrease in matric suction (increase in pore water pressure). Subsequently, the sample with higher suction started to dilate and the suction increased accordingly. Upon reaching the peak and ultimate state, the suction then appeared to level off.

Angle of shearing resistance due to suction, ϕ^b was developed using pressure plate test and direct shear test. Initially, ϕ^b is equals to ϕ' and then decreases to a constant value such that, $\phi^b < \phi'$. Further, the shape of the graph for the variation of apparent cohesion/ peak shear strength at failure with matric suction with/without normal loads for a certain soil type matches with graphs obtained by other researchers.

Chapter 6

6.0. DEVELOPMENT OF PERMEABILITY FUNCTION

There is no engineering property that can vary more widely than the coefficient of permeability of the spectrum of different soil type. Even within a single soil type it varies significantly over the different levels of saturation. In an unsaturated soil the water flow is taking place only through the saturated pores. Part of infiltrated water goes for storage. The process of infiltration of water in an unsaturated soil is controlled by its permeability which will vary continuously as water gets stored in voids previously filled with air.

As such it is extremely important to establish the permeability function-the variation of permeability with matric suction in the infiltration studies. Different methods available for determination of permeability function of an unsaturated soil were discussed in Chapter 2. In this research permeability was established by laboratory tests conducted similar to the approaches developed and performed at Department of Civil Engineering, University of Kasetsart, Thailand. In the experiment, the soil under consideration is commonly assumed to be of constant volume. The undisturbed sample used for the permeability function test was initially saturated and instrumented with three KU tensiometers at different heights on different plan locations as illustrated in Figures 6.1.

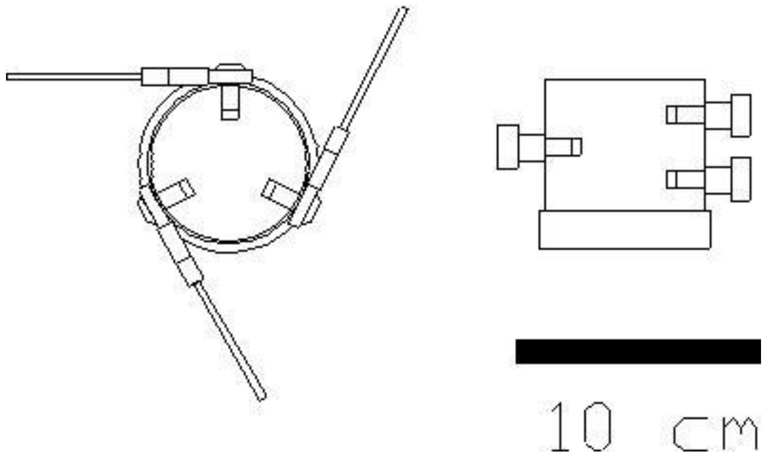


Figure 6.1: Arrangement of KU tensiometers in permeability function for drying/wetting path test

The values of suction at three locations can be used to calculate the hydraulic gradient, i, as in Equation [6.1];

$$i = d\,(z - s/\gamma_w)/\,dz \qquad [6.1]$$

Where z is the elevation head of each tensiometer relative to the base of sample, s is matric suction, and γ_w the unit weight of water. The plot of change in soil mass with time can be used to calculate the flux or discharge velocity, v, at any particular time as in Equation [6.2];

$$v = dV_w/\,Adt \qquad [6.2]$$

Where dV_w is the change of volume of water in soil sample which can be calculated from change in soil mass during test, A is the cross section area of sample, and dt is the elapsed time. Linear regression can be used to calculate the slope (velocity) from data points. The value of permeability at any suction and volumetric water content can then be calculated as in Equation [6.3].

$$k = v/\,i \qquad [6.3]$$

The rate of movement of water is very small and determined through the weight loss/gain by an electronic balance which measures to an accuracy of second decimal of a gram. Linear regression over about 100 data points was used in calculating the values of flux, v. Further, elevations from a reference level (base of the mould) of each tensiometer and other required parameters were measured for the purpose of the analysis.

Accordingly, continuous measurements of weight of the sample were taken with time while measuring matric suction for drying and wetting conditions.

The main advantage of the continuous measurement is the shorter testing duration which is only a few days per one path (from suction of 100kPa to 0kPa). Besides, the function of permeability at different suctions, and water contents can also be determined from this test.

For the drying and wetting tests, previous research experience earned by Jotisankasa et al., (2010) suggests that the value of hydraulic gradient, i, calculated over only the upper and middle pore pressure measurement gives better results of k-function than calculated over three measurements.

The same concept was adopted in this research study also for both drying and wetting methods. Accordingly, hydraulic gradient was calculated and plotted against matric suction of top and middle levels separately.

6.1. Drying method

For the drying method, the top surface of soil sample was left exposed to ambient air, and the soil suction was monitored continuously at two locations on sample's side as shown in Figure 6.2. The sample's weight was also continuously measured using an electric balance connected to a data logger. Further, elevations from a reference level (base of the mould) of each tensiometer and other required parameters were measured for the purpose of the analysis.

Two types of sample collected at Welipenna site were used to obtain the variation of unsaturated permeability with matric suction and the results are tabulated in Annex 4 and graphical representations given in proceeding figures.

Figure 6.2: Typical arrangement for permeability function test for drying path

6.1.1.For soil type 01 - SILTY SAND

The variation of the soil mass with time is presented in Figure 6.3. The increase of matric suction with gradually drying up of the sample is illustrated in Figure 6.4. Soil water characteristic curve (SWCC) is shown in Figure 6.5. The variation of hydraulic gradient with time is presented in Figure 6.6. The permeability function is illustrated in Figure 6.7.

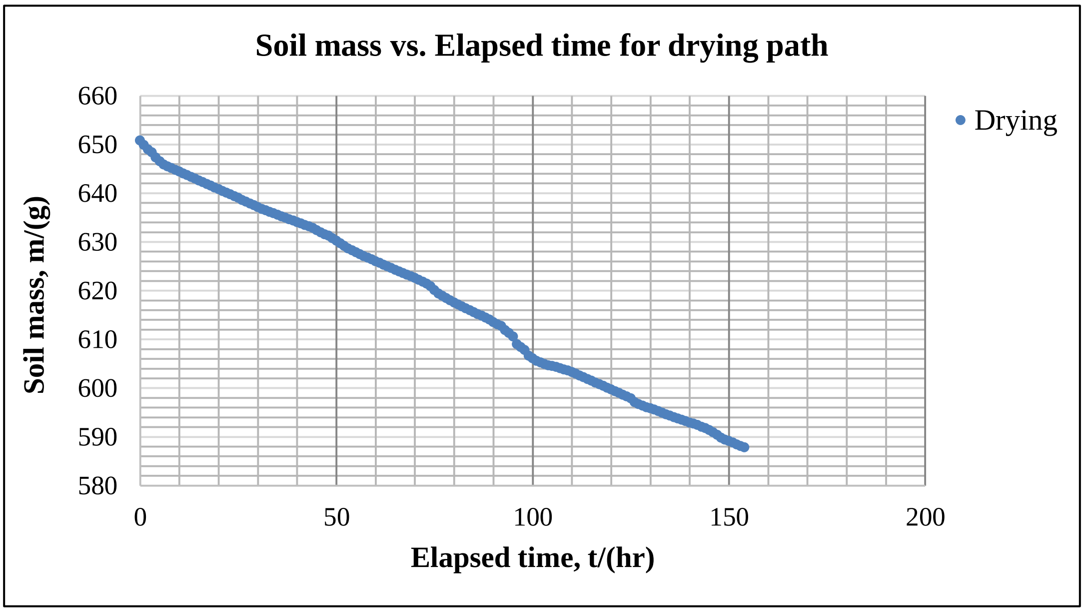


Figure 6.3: The variation of soil mass with time for SILTY SAND (drying path)

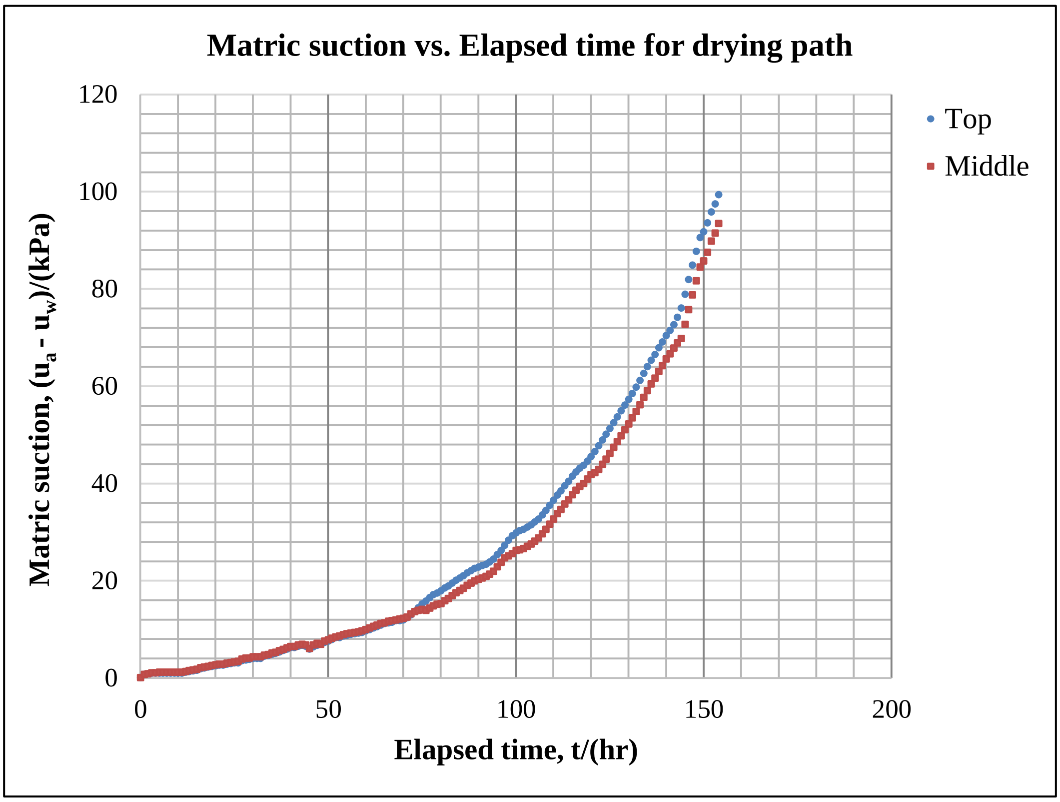


Figure 6.4: The variation of matric suction with time for SILTY SAND (drying path)

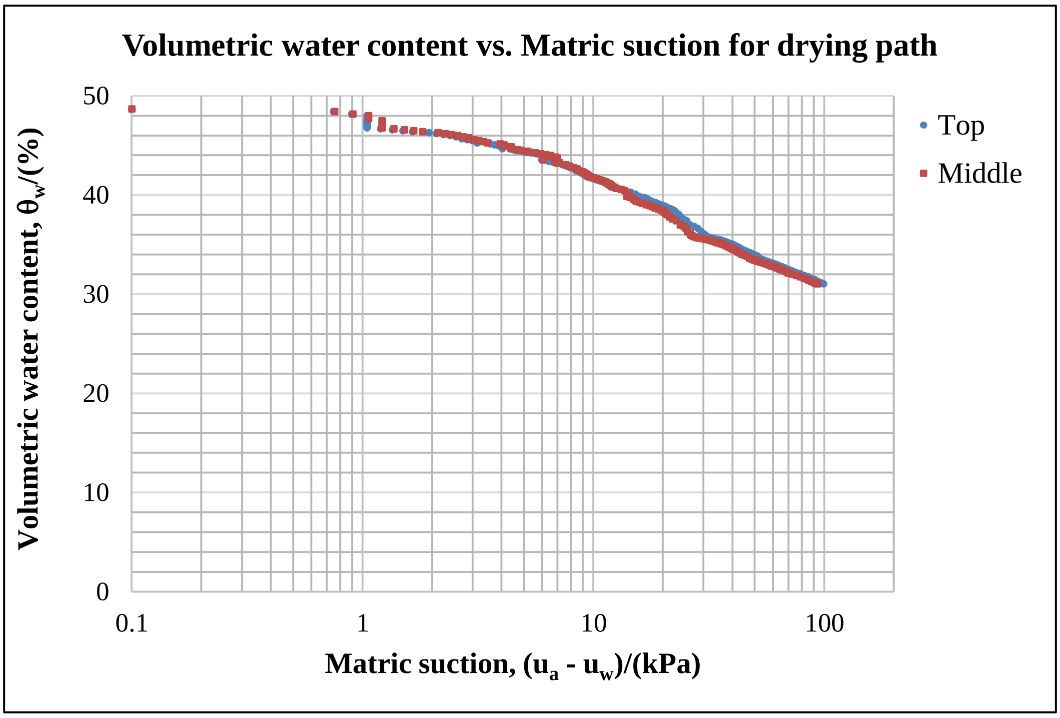


Figure 6.5: The variation of volumetric water content with matric suction (SWCC) for SILTY SAND (drying path)

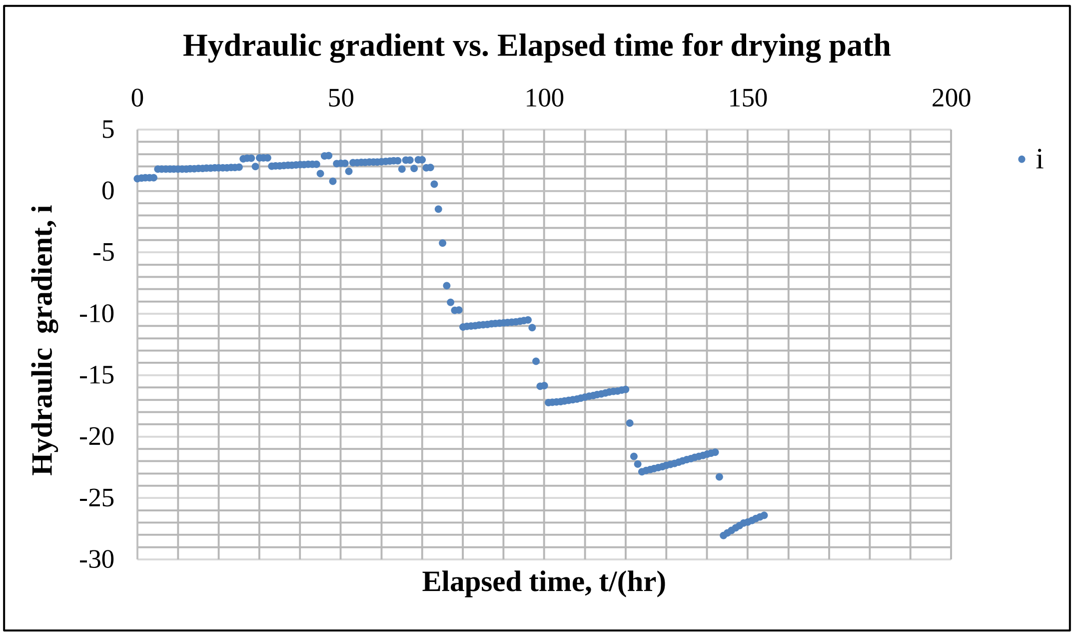


Figure 6.6: The variation of hydraulic gradient with time for SILTY SAND (drying path)

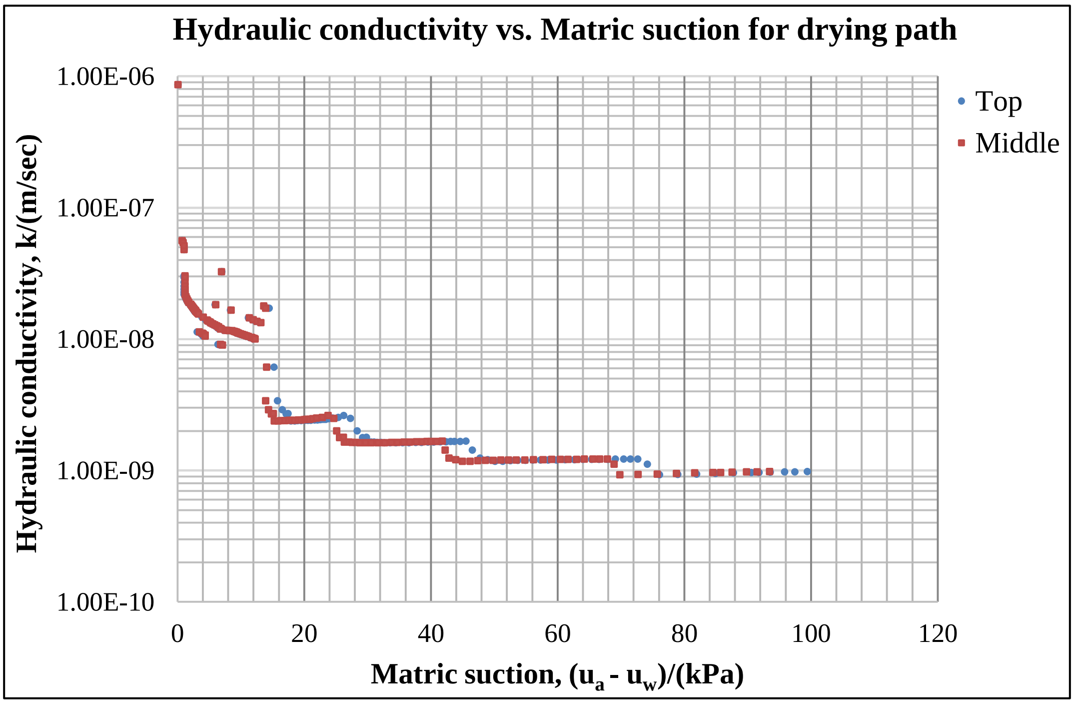


Figure 6.7: The variation of hydraulic conductivity with matric suction for SILTY SAND (drying path)

6.1.2.For soil type 02 - SANDY SILT

The variation of the soil mass with time is presented in Figure 6.8. The increase of matric suction with gradually drying up of the sample is illustrated in Figure 6.9.

Soil water characteristic curve (SWCC) is shown in Figure 6.10. The variation of hydraulic gradient with time is presented in Figure 6.11. The permeability function is illustrated in Figure 6.12.

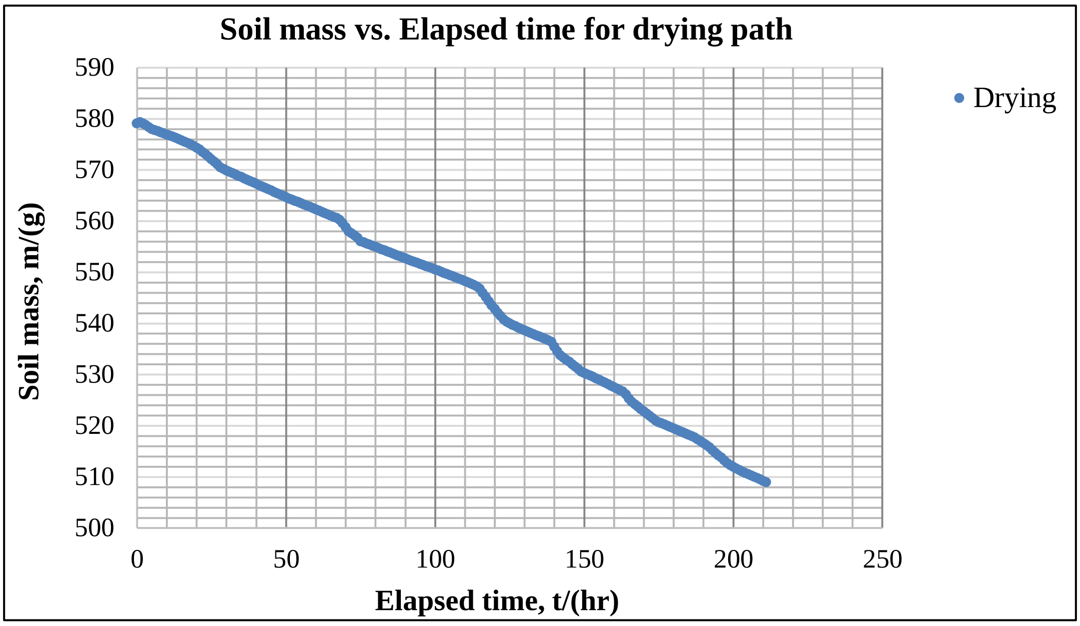


Figure 6.8: The variation of soil mass with time for SANDY SILT (drying path)

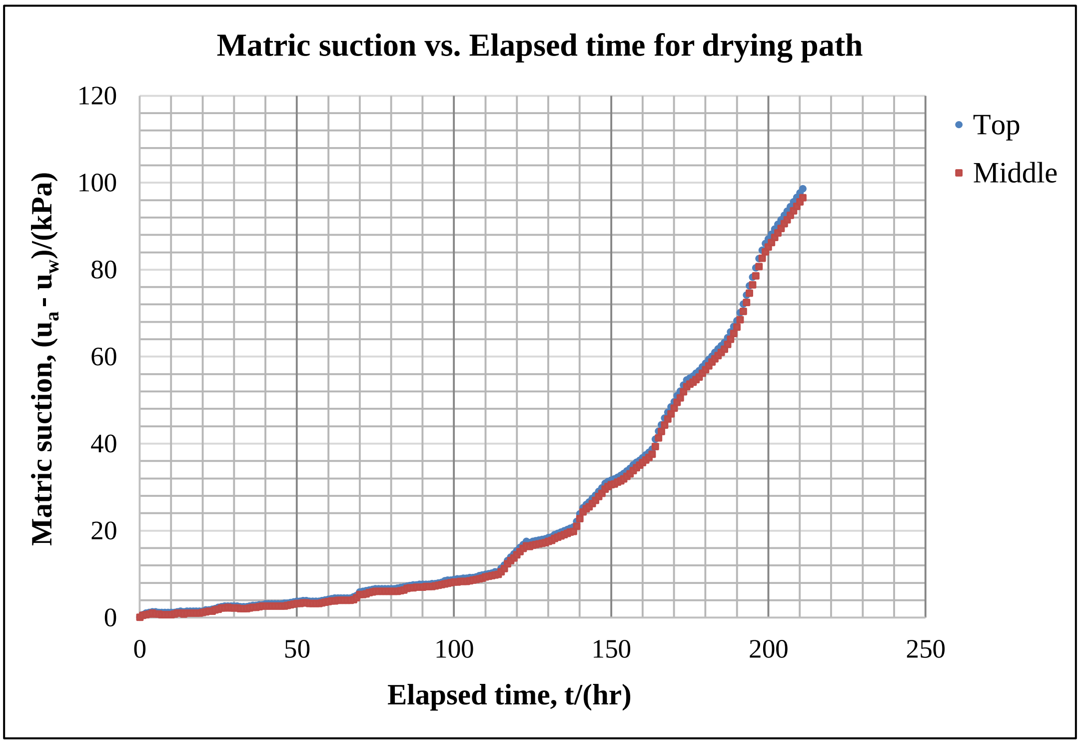


Figure 6.9: The variation of matric suction with time for SANDY SILT (drying path)

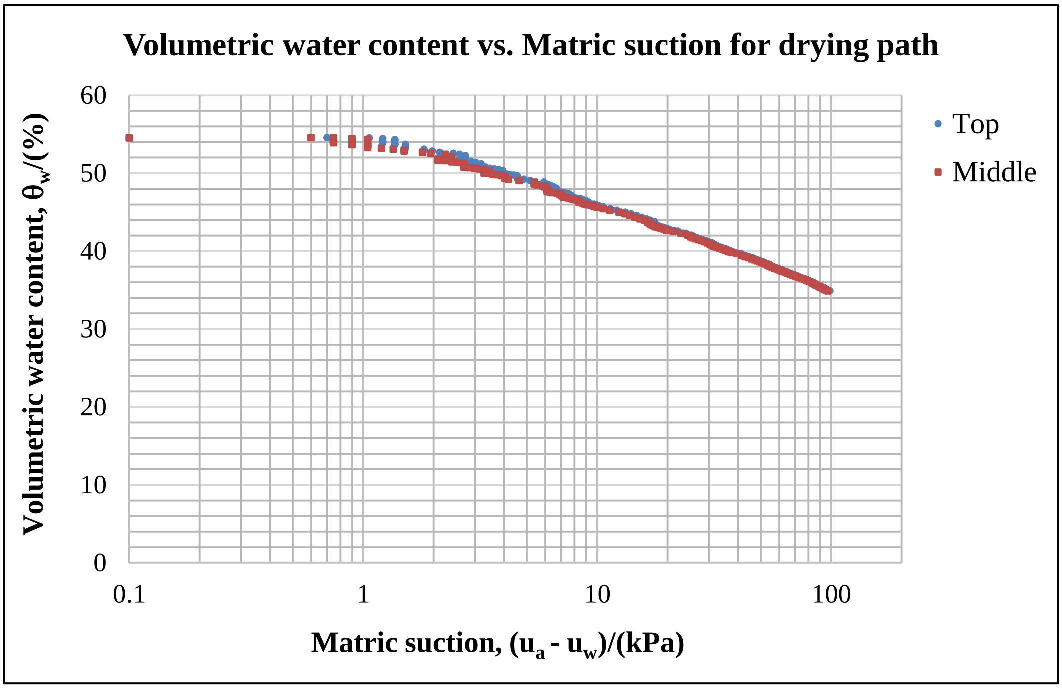


Figure 6.10: The variation of volumetric water content with matric suction (SWCC) for SANDY SILT (drying path)

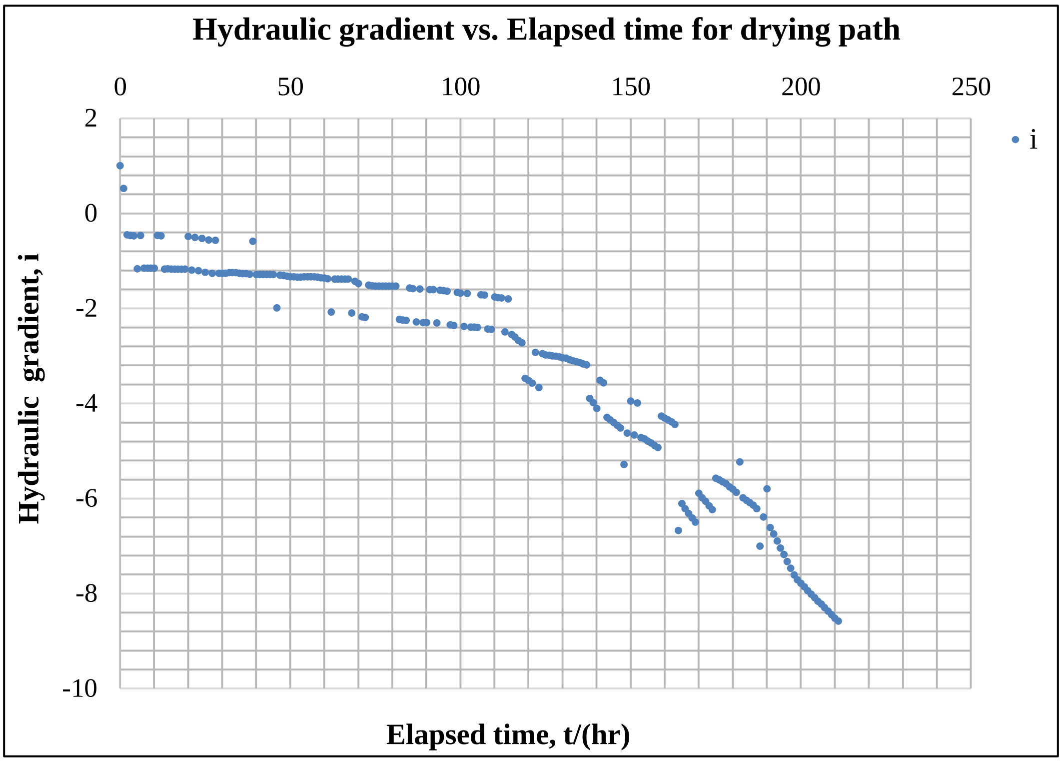


Figure 6.11: The variation of hydraulic gradient with time for SANDY SILT (drying path)

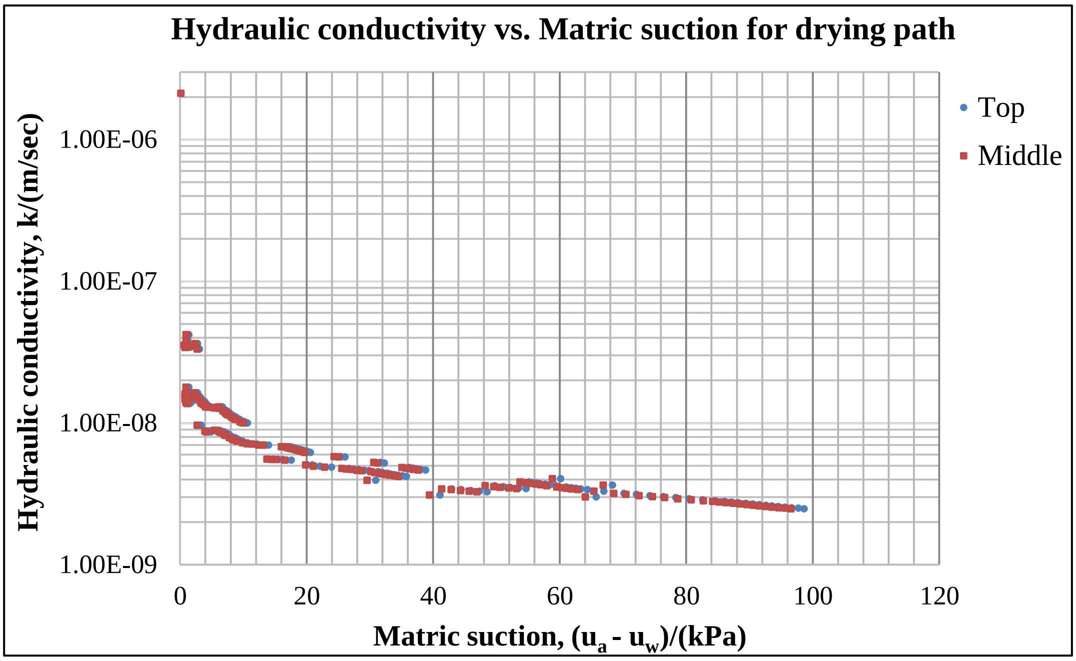


Figure 6.12: The variation of hydraulic conductivity with matric suction for SANDY SILT (drying path)

6.2. Wetting method

For the determination of wetting method, the top surface of sample is continuously wetted by way of water dripping at a constant rate from burette as shown in Figure 6.13. Other procedures were followed same as drying method. Here also two types of sample collected at Welipenna site were used to obtain the variation of unsaturated permeability with matric suction and the results are tabulated in Annex 4 and graphical representations given in proceeding figures.

Figure 6.13: Typical arrangement for permeability function test for wetting path

6.2.1.For soil type 01- SILTY SAND

The variation of the soil mass with time is presented in Figure 6.14. The increase of matric suction with gradually drying up of the sample is illustrated in Figure 6.15. Soil water characteristic curve (SWCC) is shown in Figure 6.16. The variation of hydraulic gradient with time is presented in Figure 6.17. The permeability function is illustrated in Figure 6.18.

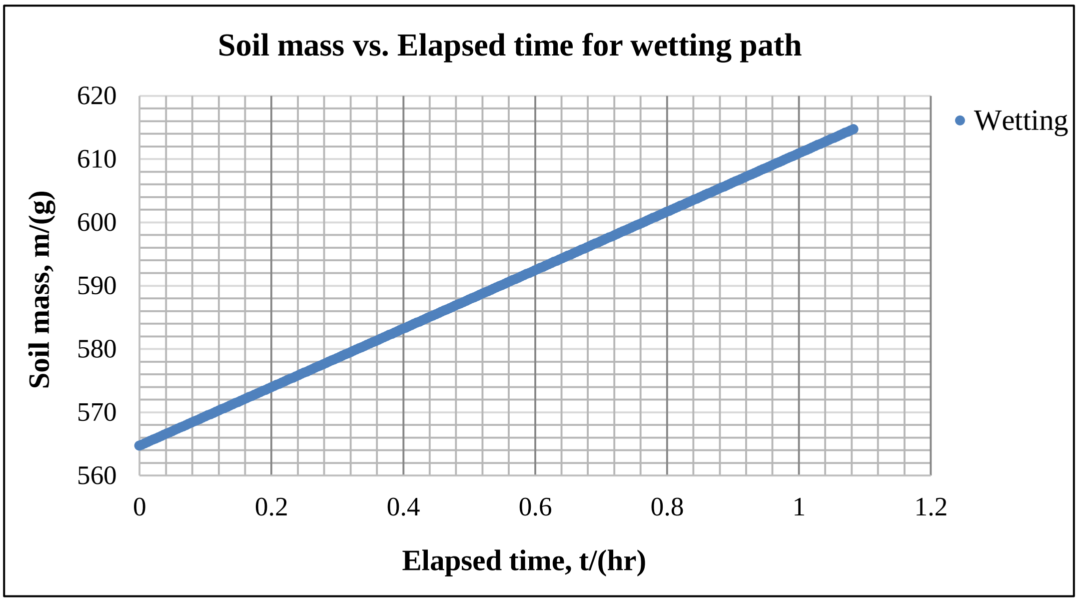


Figure 6.14: The variation of soil mass with time for SILTY SAND (linear variation due to constant rate of dripping of water-wetting path)

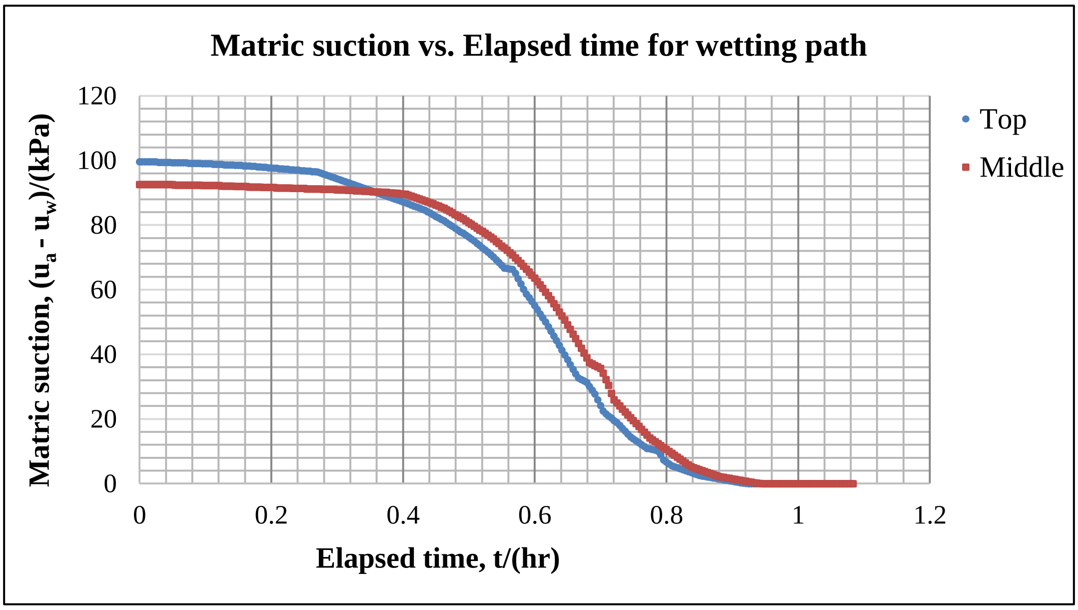


Figure 6.15: The variation of matric suction with time for SILTY SAND (wetting path)

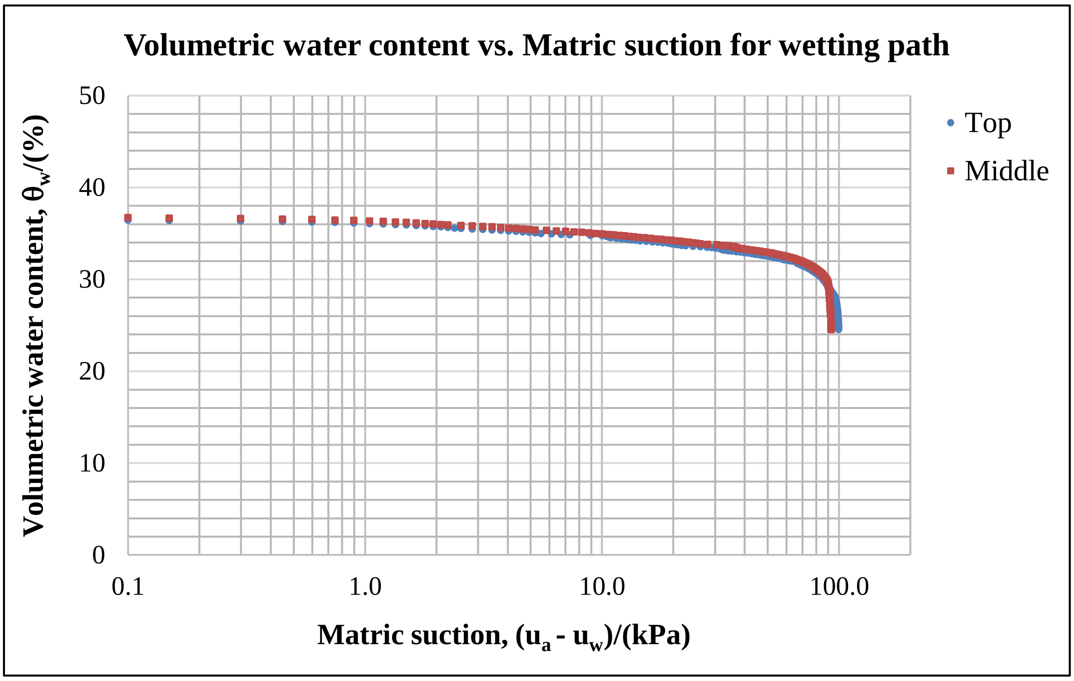


Figure 6.16: The variation of volumetric water content with matric suction (SWCC) for SILTY SAND (wetting path)

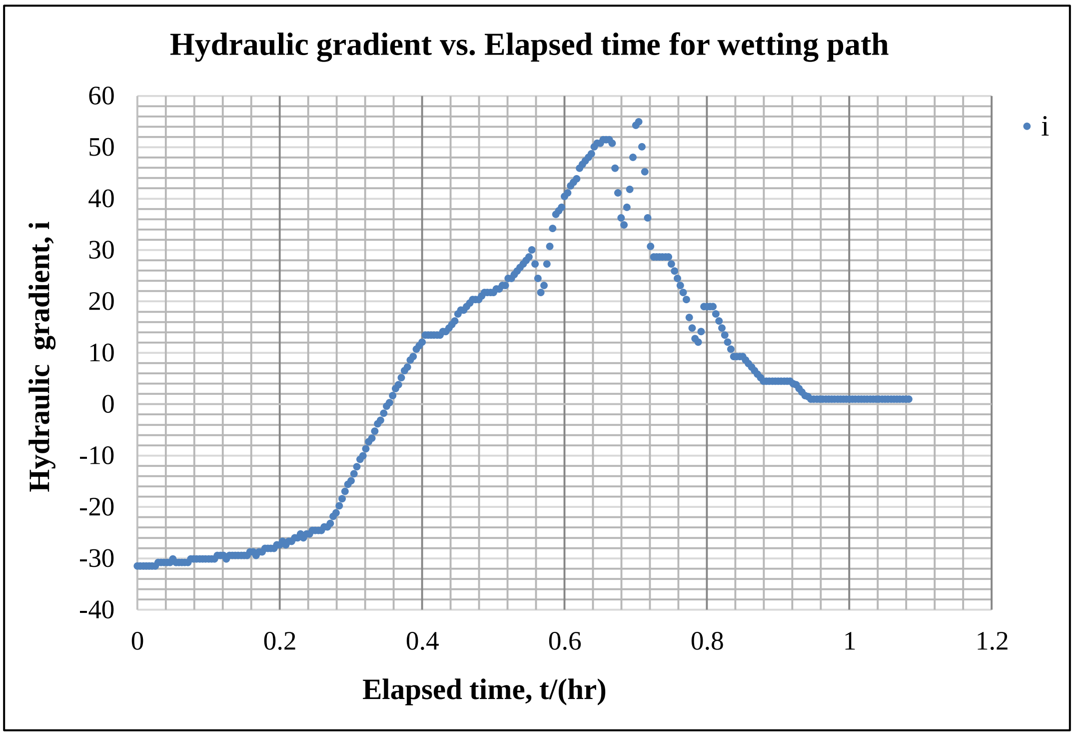


Figure 6.17: The variation of hydraulic gradient with time for SILTY SAND (wetting path)

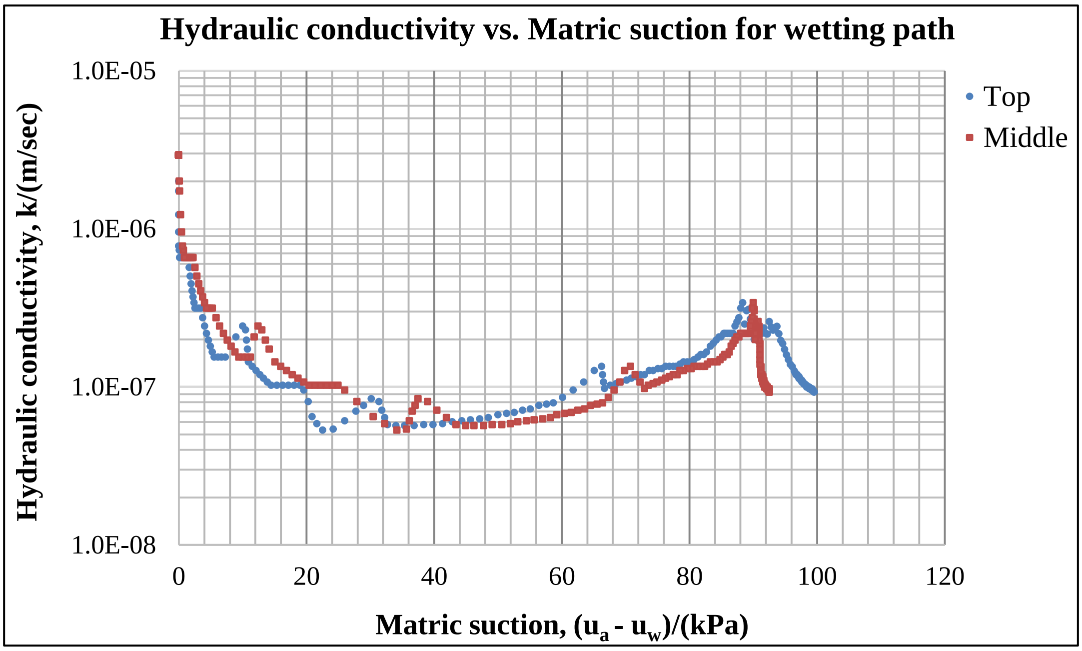


Figure 6.18: The variation of hydraulic conductivity with matric suction for SILTY SAND (wetting path)

6.2.2.For soil type 02 - SANDY SILT

The variation of the soil mass with time is presented in Figure 6.19. The increase of matric suction with gradually drying up of the sample is illustrated in Figure 6.20. Soil water characteristic curve (SWCC) is shown in Figure 6.21. The variation of hydraulic gradient with time is presented in Figure 6.22. The permeability function is illustrated in Figure 6.23.

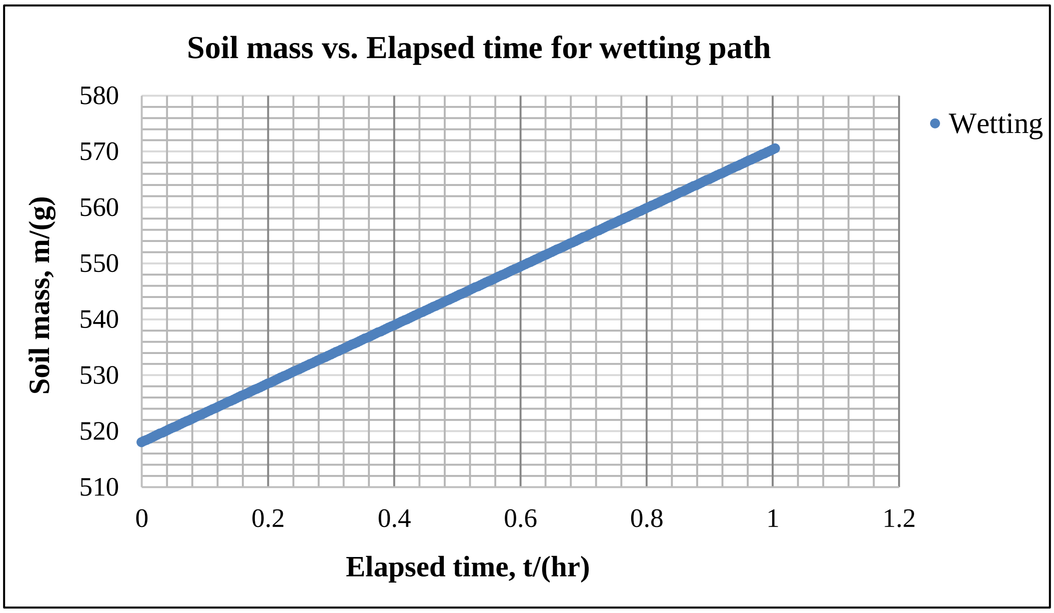


Figure 6.19: The variation of soil mass with time for SANDY SILT (wetting path)

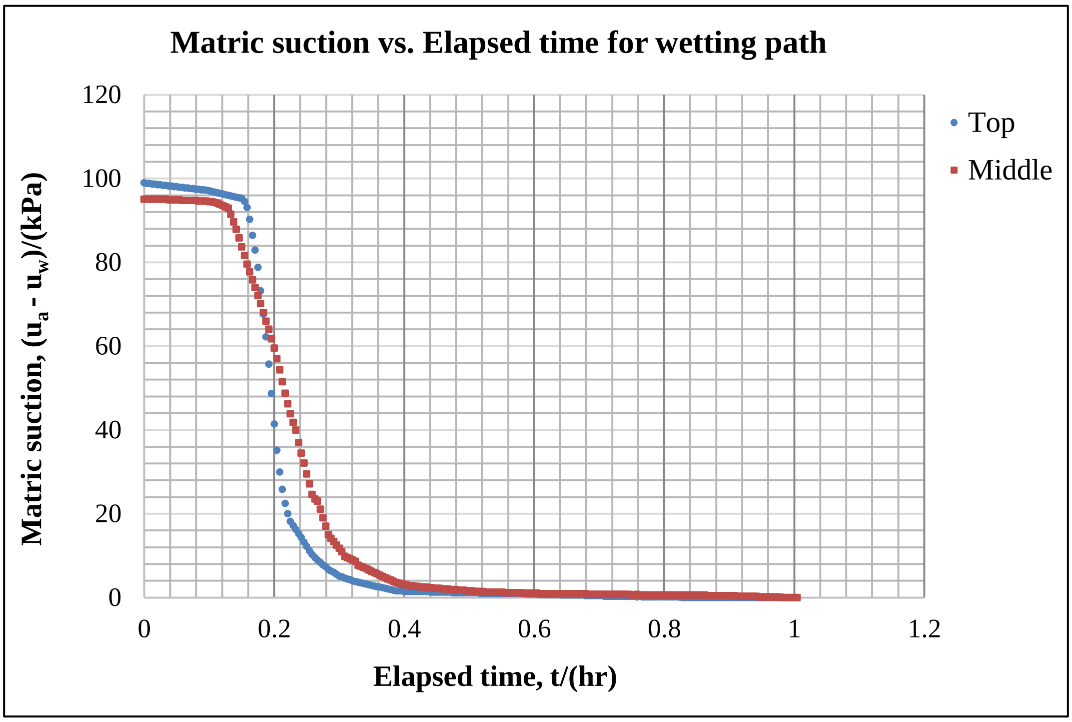


Figure 6.20: The variation of matric suction with time for SANDY SILT (wetting path)

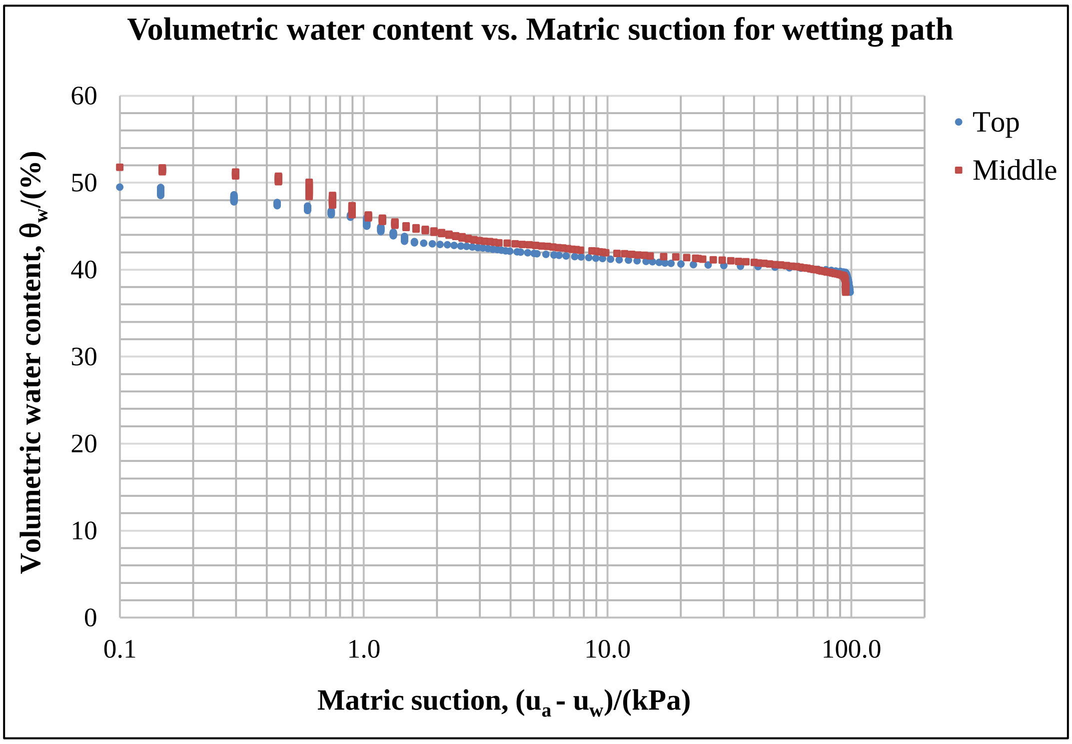


Figure 6.21: The variation of volumetric water content with matric suction (SWCC) for SANDY SILT (wetting path)

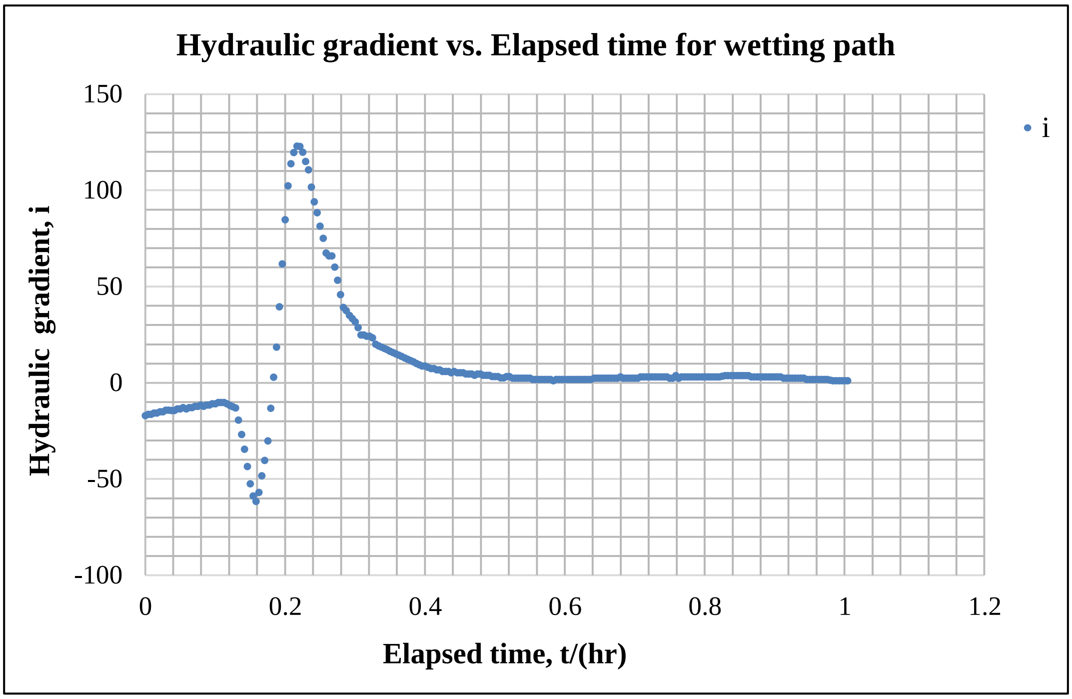


Figure 6.22: The variation of hydraulic gradient with time for SANDY SILT (wetting path)

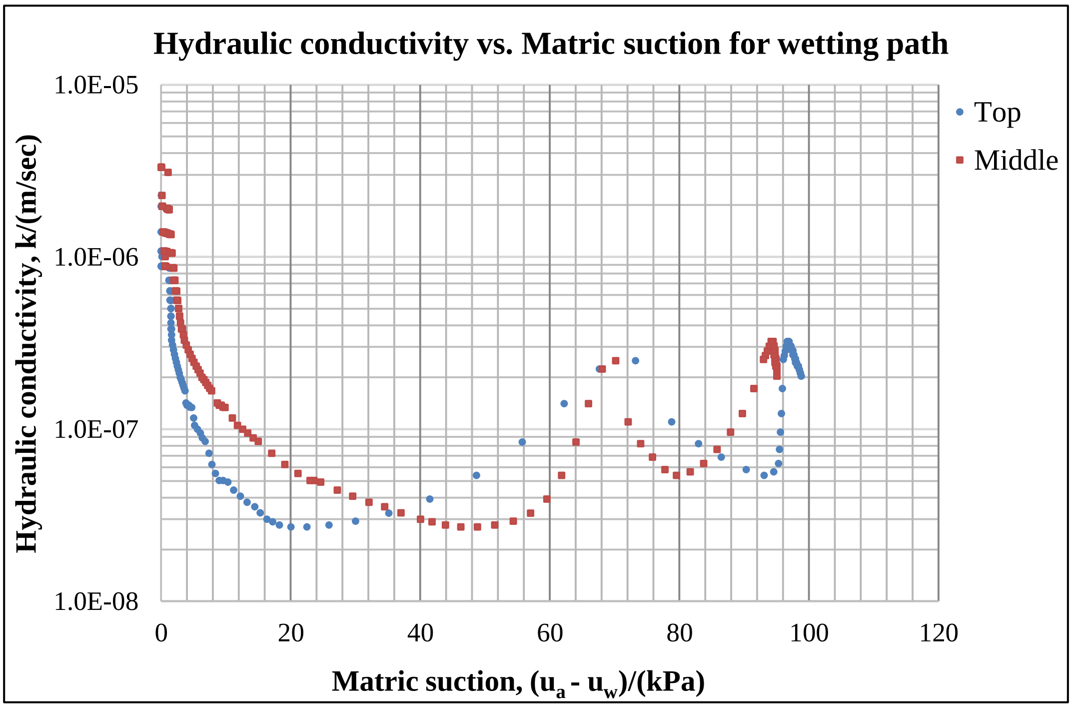


Figure 6.23: The variation of hydraulic conductivity with matric suction for SANDY SILT (wetting path)

There is a practice of plotting the graph for matric suction in log scale for permeability function (since the measured values of matric suction in this research is

0-100kPa, a linear scale was used.) The relevant graphs in log scale are presented in Figure 6.24, Figure 6.25, Figure 6.26 and Figure 6.27 for drying and wetting paths for both soil types.

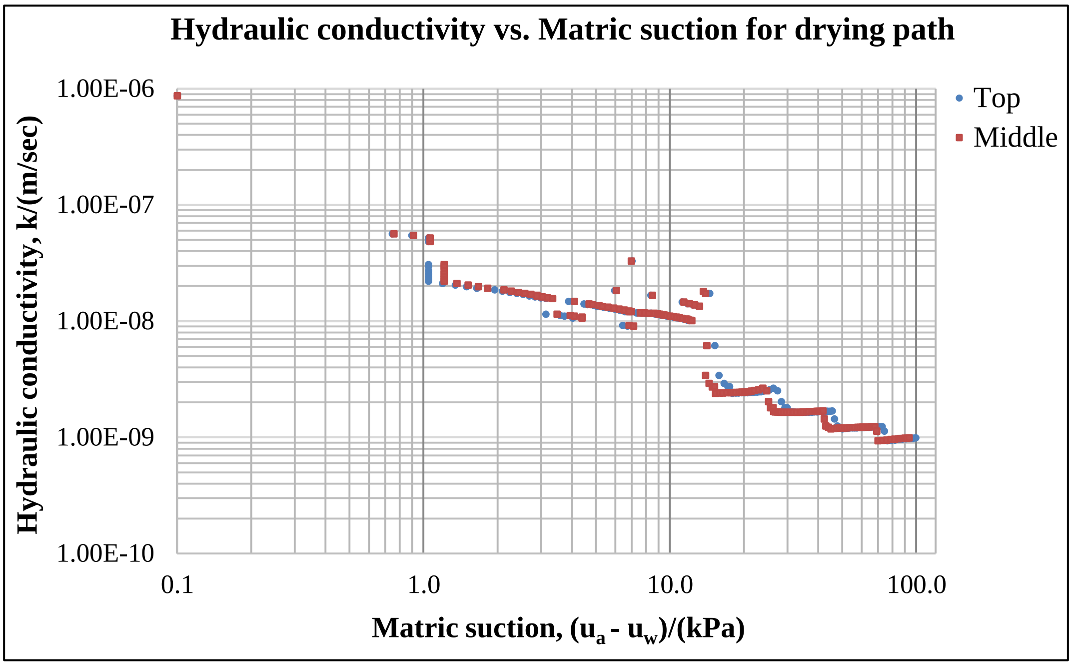


Figure 6.24: The variation of hydraulic conductivity with matric suction for SILTY SAND (drying path)

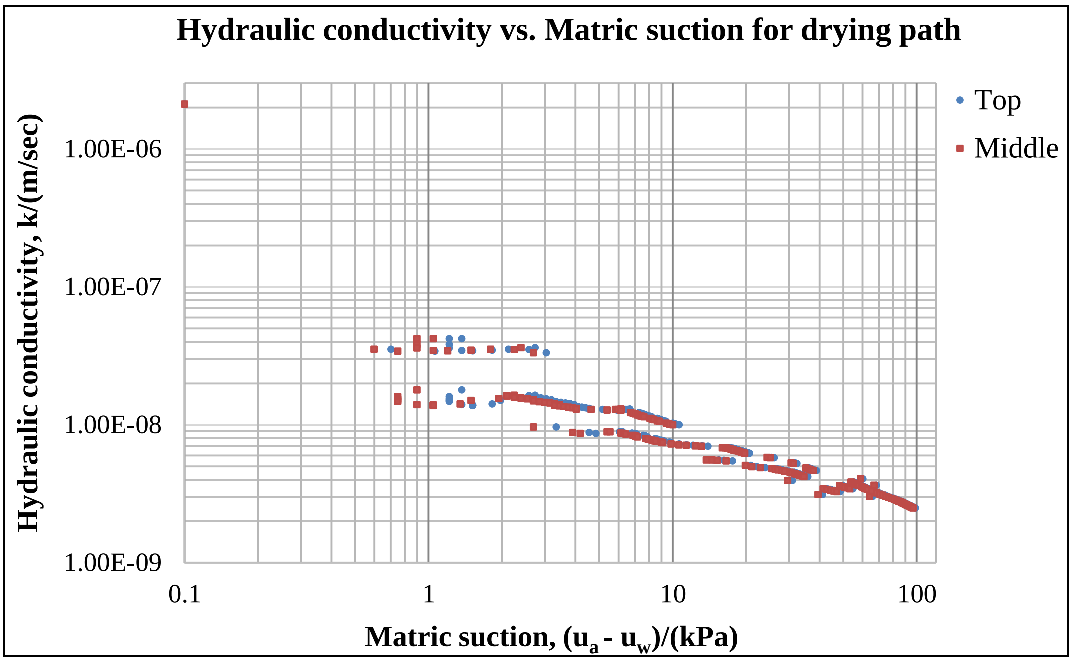


Figure 6.25: The variation of hydraulic conductivity with matric suction for SANDY SILT (drying path)

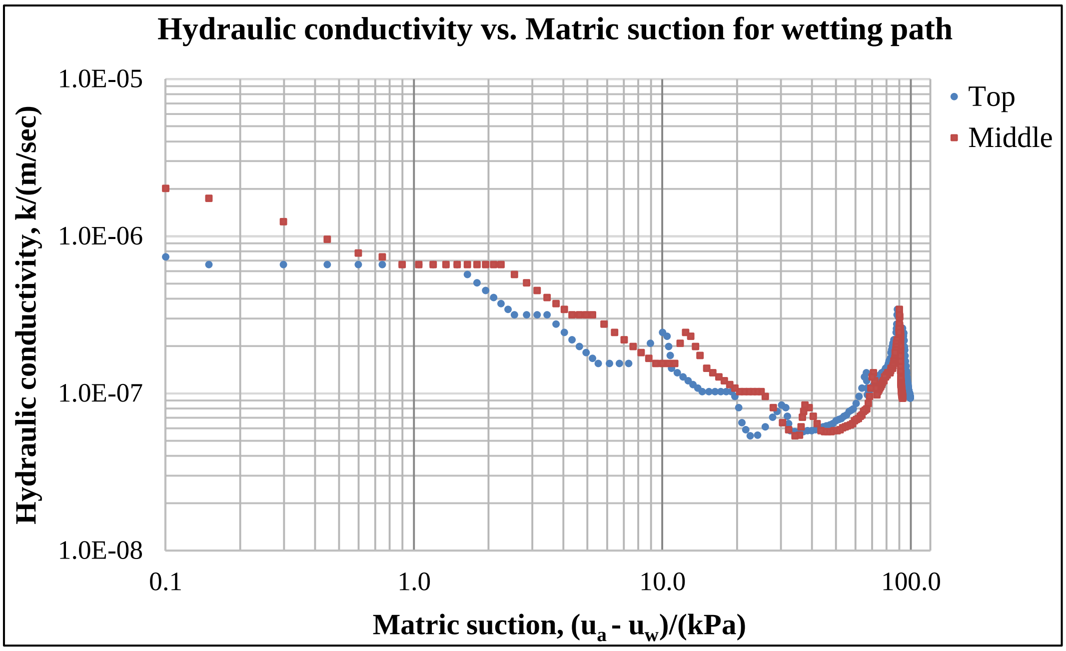


Figure 6.26: The variation of hydraulic conductivity with matric suction for SILTY SAND (wetting path)

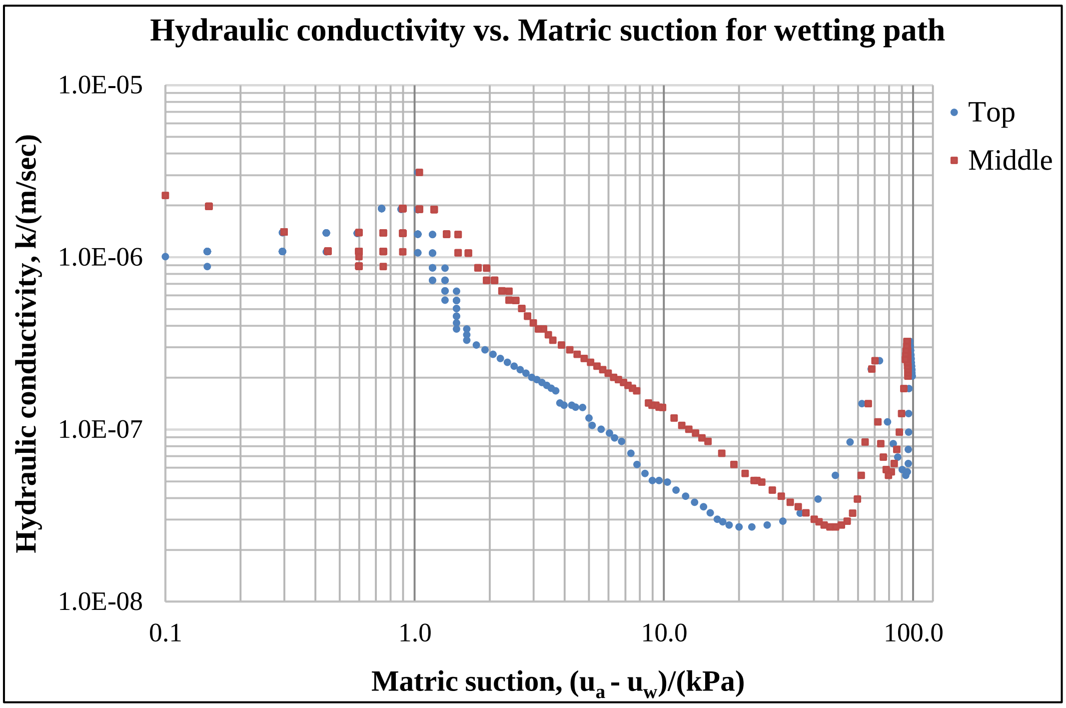


Figure 6.27: The variation of hydraulic conductivity with matric suction for SANDY SILT (wetting path)

6.3. Concluding comments

The differences in the permeability function given by the two tensiometers appear to be greater in the wetting path approach. This is believed to be due to the greater non-linearity of the suction distribution in the wetting tests.

There is nevertheless a difficulty in using this technique for wetting tests due to non-linearity of the matric suction due to poor infiltration which depends on dry density, structural arrangement of soil particles, mineral composition, crack pattern developed on the top surface of the soil specimen and soil type. This technique is still not very accurate for wetting path.

The hydraulic conductivity, i appears to vary nonlinearly with time. The negative value of “i” suggests upward movement of water or net evaporation.

Both wetting and drying k-functions appear to be nearly in the same range; approximately $1x10^{-6}$m/sec - $1x10^{-9}$m/sec. The drying k-function however appears to be of less scatter than the wetting k-function, possibly due to the less non-linearity of the suction distribution during drying test as described previously.

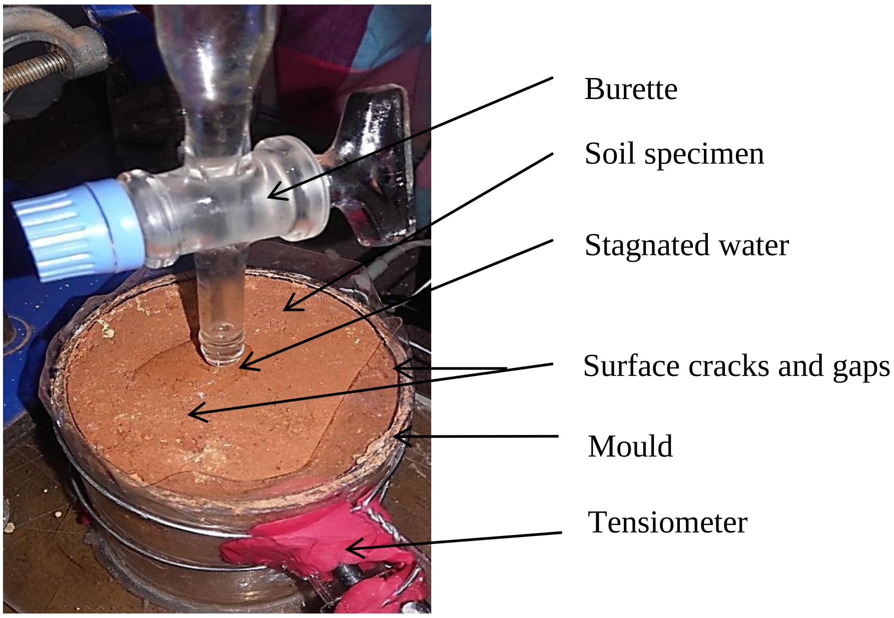


Figure 6.28: The incident of water stagnated on the surface of the tested specimen during wetting path

As illustrated in the Figure 6.18 and Figure 6.23 in wetting path method, there were some small peaks at initial stage of wetting path (dry condition, hence high matric suction). This was due to the non-homogeneous infiltration process due to very dry condition at the top surface. Once the water was dripped on to the top surface, the water spread on the top surface of the soil specimen for few minutes of time without infiltrating into the soil. Thereafter suddenly the water diminished through surface cracks and gaps encountered due to shrinkage during drying process. This water filled the pores up to a certain depth of the soil specimen from the top and curved surface and that area appear to be slightly high permeability as it has a high level of saturation than other areas, when more water dripped into the soil. At the same time infiltration process also was taken place and water filled the pores to a depth greater than earlier. Again same process was repeated and results in some temporary peaks in permeability.

The results obtained in this research study were compared with other research output and they are acceptable range for each soil type.

The drying path with continuous technique thus offers a very quick and simple way for k-function determination of unsaturated soils.

Chapter 7

7.0. DEVELOPMENT OF SWCC WITH DIFFERENT TECHNIQUES

Soil water characteristic curve (SWCC) is an especial piece of data in the advanced analysis of infiltration of water in to an unsaturated soil. The soil water characteristic curve (SWCC) can be used as a tool either directly or indirectly along with the saturated shear strength parameters, c' and ϕ', to predict the shear strength function for an unsaturated soil. In addition, Johnson & Sitar, (1990) and Jotisankasa & Vathananukij, (2008) made use of the soil water characteristic curve (SWCC) in order to estimate the amount of rainfall required to reduce the suction to zero or saturate the slope, which is used as basis for early warning system for shallow landslide. Therefore, the establishment of soil water characteristic curves (SWCCs) plays an important role in geotechnical engineering field and the soil water characteristic curves (SWCCs) for "undisturbed" soil sample collected from the site of landslide at Welipenna determined in this research using four different testing procedure.

7.1. Establishment of SWCC using pressure plate apparatus

Details of this method are already deliberated in the chapter 4 and therefore some of the outputs relevant to this chapter are reproduced in Figure 7.1 and Figure 7.2 for the two different soil types.

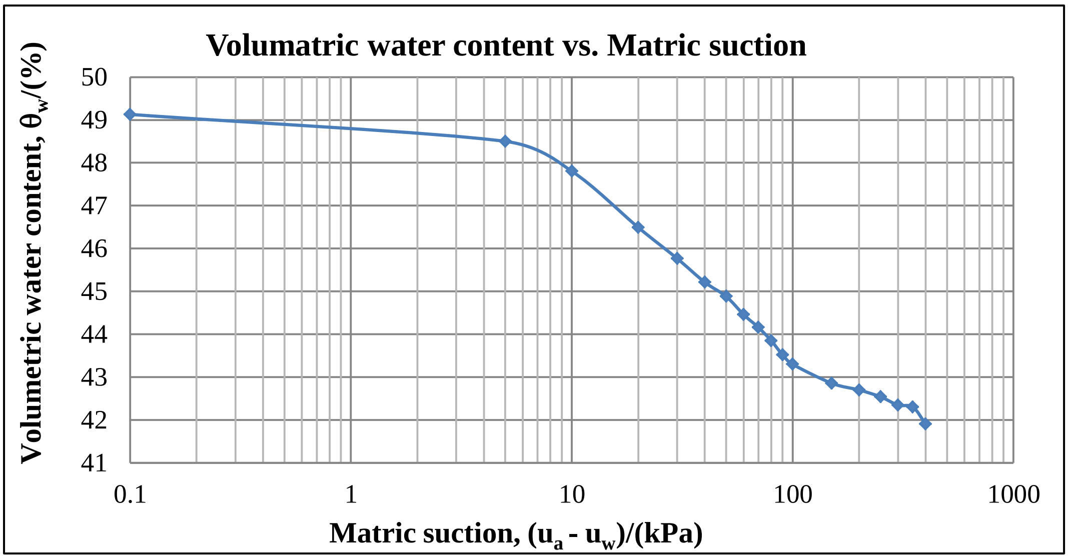


Figure 7.1: The variation of volumetric water content with matric suction (SWCC) for SILTY SAND

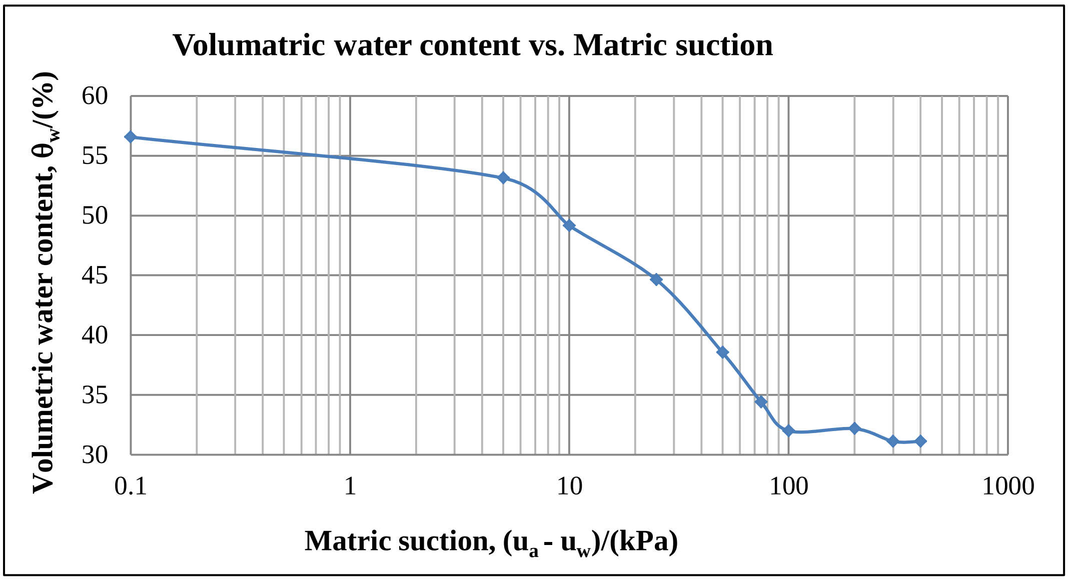


Figure 7.2: The variation of volumetric water content with matric suction (SWCC) for SANDY SILT

7.2. Establishment of SWCC using direct shear tests with matric suction measurement

Chapter 5 clearly states the relationship between unsaturated maximum shear strength at failure with matric suction for different saturation level and the variation of matric suction with time during the processes of equilibrium, consolidation and shearing. Soil water characteristic curve (SWCC) can also be established using the data obtained from the sample tested at different levels of saturation. The values for the SANDY SILT are given in Table 7.1 and presented graphically in Figure 7.3.

Table 7.1: The variation of volumetric water content with matric suction for different saturation level and normal stress for before and after the shearing for SANDY SILT (from direct shear test data)

Saturation, S_r/(%)	Normal stress /(kPa)	Before test		After test	
		Volumetric water content, θ_w/(%)	Matric suction /(kPa)	Volumetric water content, θ_w/(%)	Matric suction /(kPa)
50		25.53	117.00		
65	50	32.87	43.43	33.57	44.95
	100	33.59	56.72	34.78	60.90
	150	33.49	86.27	33.44	87.61
	200	33.67	72.99	33.49	66.72

Table 7.1: continued…………

72	50	37.26	13.58	40.22	15.07
	100	36.82	17.91	36.63	17.46
	150	37.73	84.63	38.32	79.40
	200	36.05	106.72	35.07	89.85
81	50	41.41	6.42	44.05	10.60
	100	39.06	17.91	41.04	20.90
	150	41.22	37.16	43.83	32.99
	200	41.42	27.16	42.22	25.37
92	50	45.64	3.13	54.24	2.39
	100	47.75	2.69	51.09	2.54
	150	49.59	2.99	53.23	1.94
	200	48.19	2.84	53.08	0.45
100	50	56.26	0.00	60.02	0.00
	100	52.73	0.00	56.67	0.00
	150	53.92	0.00	58.58	0.00
	200	52.14	0.00	59.86	0.00

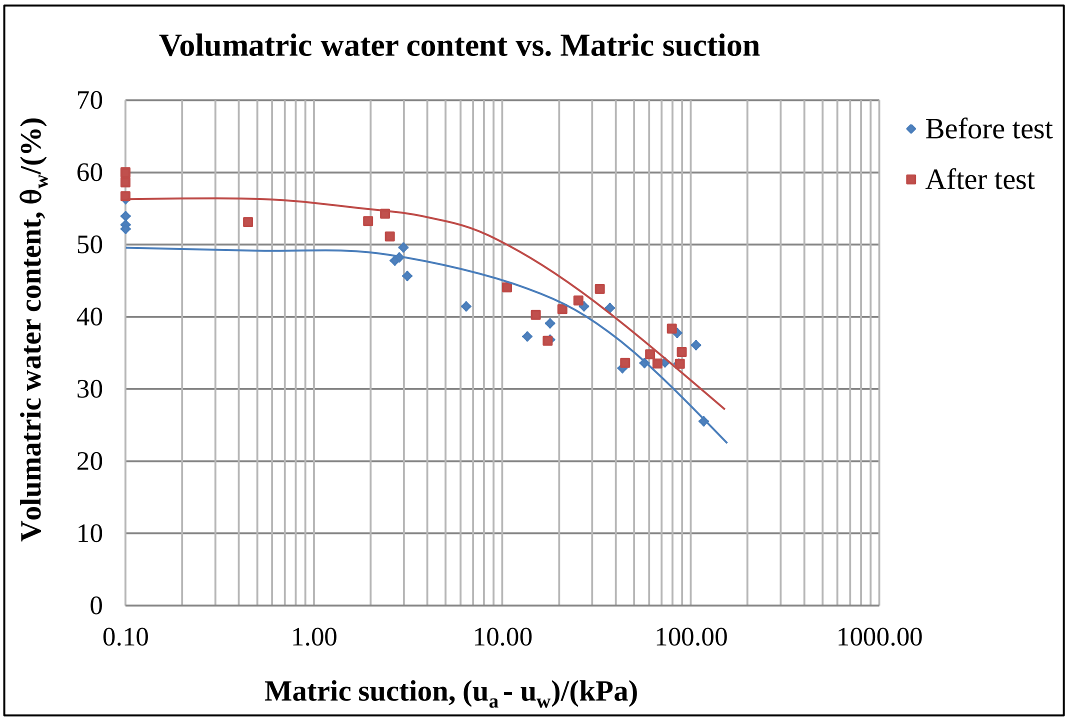


Figure 7.3: The variation of volumetric water content with matric suction (SWCC) for SANDY SILT

7.3. Establishment of SWCC using permeability function

Specifics of this method were already discussed in the Chapter 6 and therefore some of the outputs relevant to this chapter are presented in Figure 7.4 & Figure 7.5 for drying path for SILTY SAND & SANDY SILT respectively and in Figure 7.6 & Figure 7.7 for wetting path for SILTY SAND & SANDY SILT respectively.

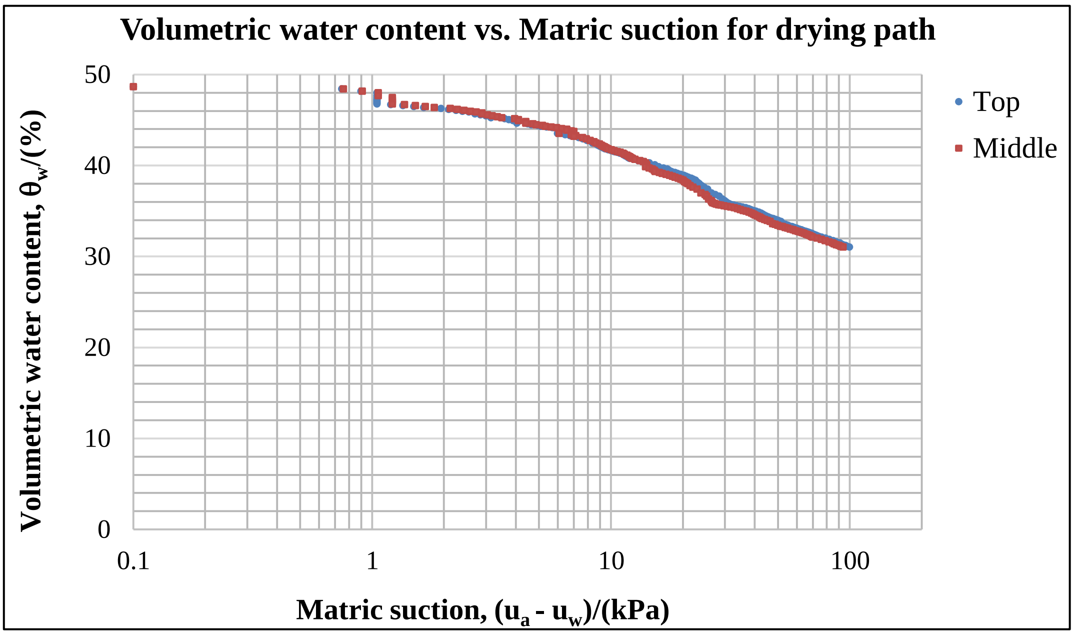


Figure 7.4: The variation of volumetric water content with matric suction (SWCC) during drying path for SILTY SAND

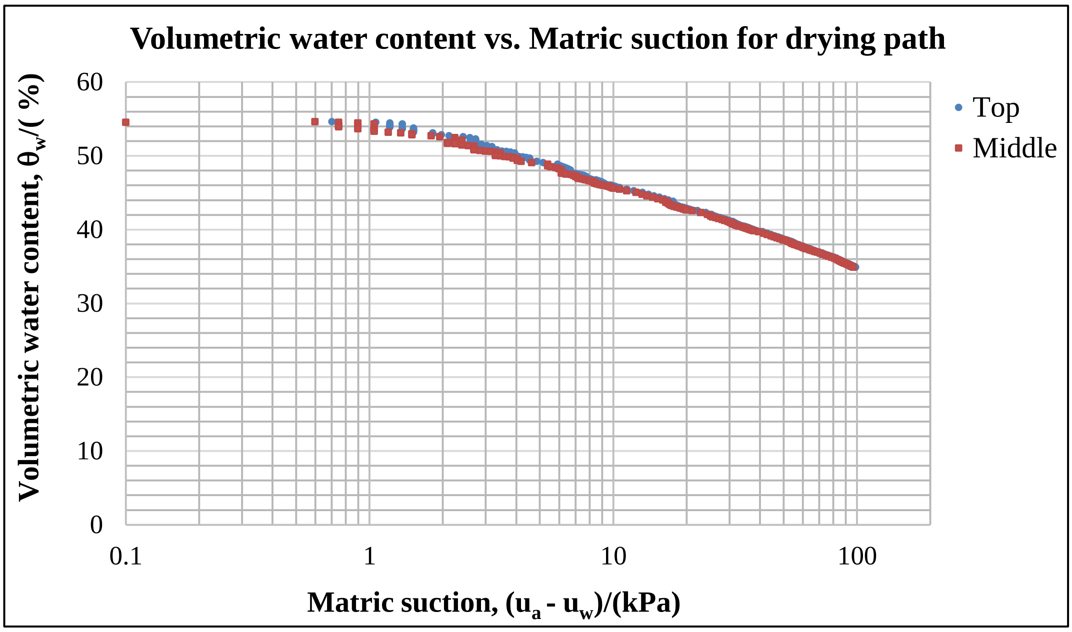


Figure 7.5: The variation of volumetric water content with matric suction (SWCC) during drying path for SANDY SILT

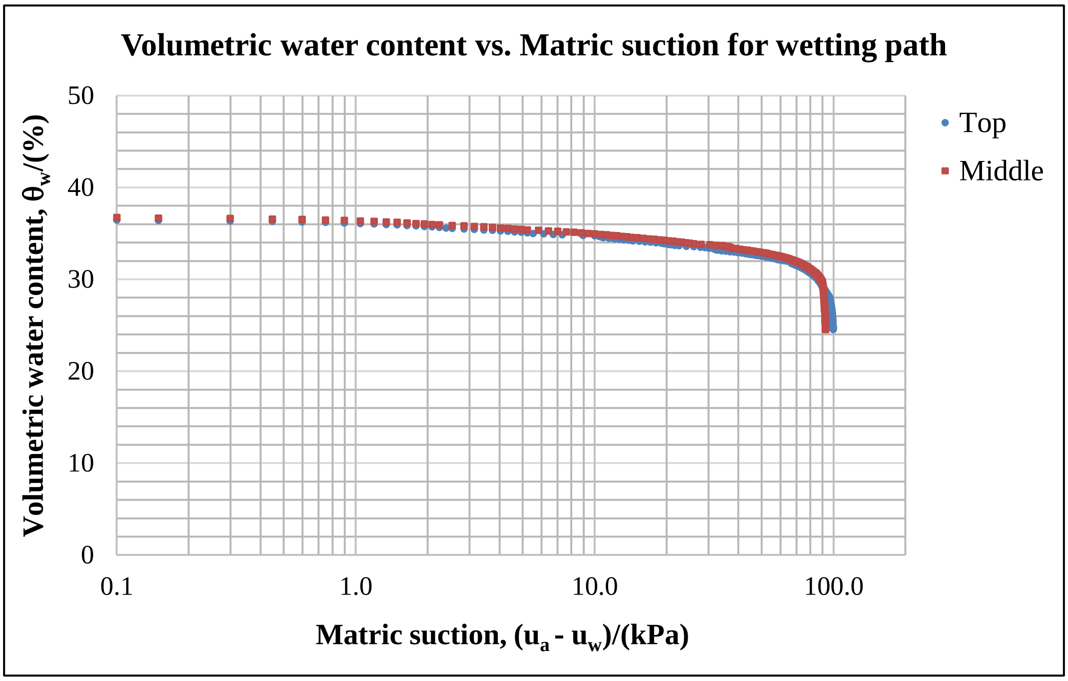


Figure 7.6: The variation of volumetric water content with matric suction (SWCC) during wetting path for SILTY SAND

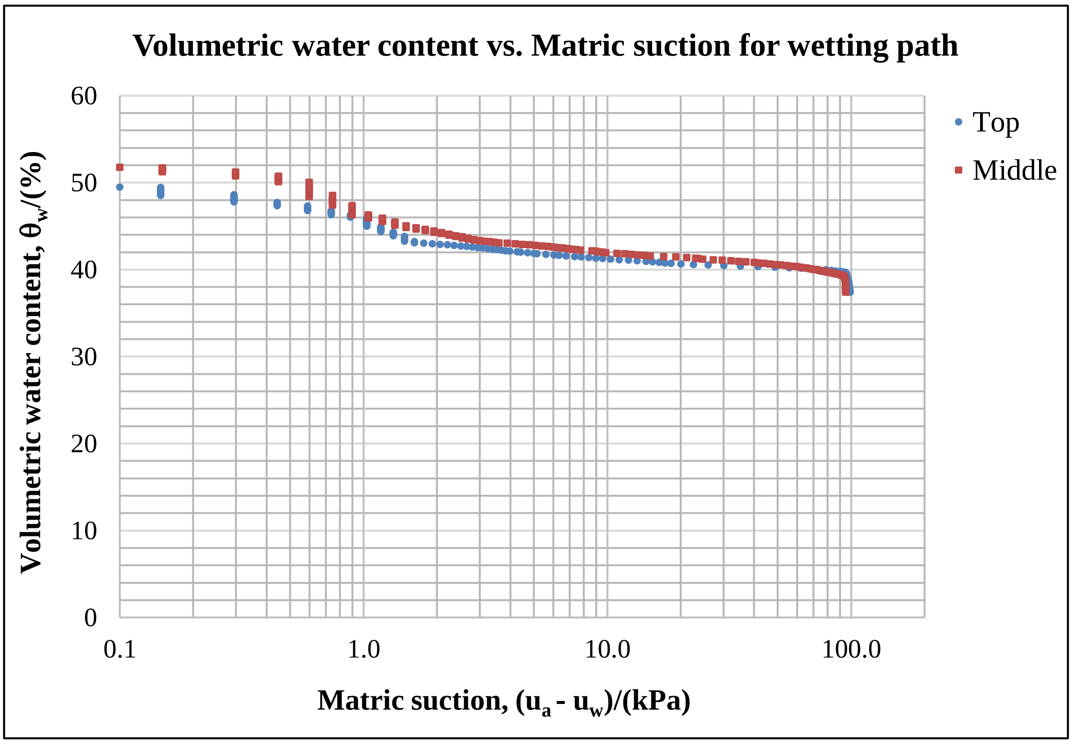


Figure 7.7: The variation of volumetric water content with matric suction (SWCC) during wetting path for SANDY SILT

7.4. Derivation of SWCC using the gradation curves

Arya & Paris, (1981) proposed a distinguished physico-empirical model to predict the volumetric water content-suction relationship of a soil from its particle-size distribution, dry density and specific gravity. This approach is based on the transformation of a particle size distribution into a pore size distribution.

As discussed in Chapter 2, the accumulative pore volumes corresponding to progressively growing pore radii are divided by the sample dry density to give the volumetric water contents and the pore radii are converted to equivalent soil suctions using the equation of capillarity. The formulation is based on an empirical parameter, α, used to fit the experimental results to the model.

Under this method two different soil water characteristic curves were derived such that the variation of volumetric water content (θ_{vi}) with matric suction titled as Arya, 1/Arya, 2 for SILTY SAND/SANDY SILT respectively & average volumetric water content (θ^{*}_{vi}) with matric suction titled as Arya & Paris, 1/Arya & Paris, 2 for SILTY SAND/SANDY SILT respectively.

The values of parameters used in the derivation of soil water characteristic curve from the gradation curve and assumed are given in the Table 7.2.

Table 7.2: The parameters used in the Arya & Paris method

Parameters	**Value**	
	SILTY SAND	**SANDY SILT**
Average void ratio, e	1.008	1.207
Average dry density, ρ_d /(g/cm^3)	1.301	1.210
Specific gravity, G_s	2.60	2.66
Bulk volume per unit mass, V_b /(cm^3/g)	0.769	0.827
Cosθ, (where θ = 0, assumed)	1	1
Surface tension, T_s/(kN/m) (assumed)	0.00007275	0.00007275

Theory behind this method was discussed in detailed in Chapter 2 and using the Equation [7.1] unknown empirical model parameter, α can be derived in a manner such that;

- The relationship between volumetric water content and matric suction should follow the path similar to all the other methods for two types of soils.
- α is nearly constant for smaller particle size and reaching peak and decreasing with increasing particle diameter.

$$2T_s\cos\theta/s = R_i[4en_i^{(1-\alpha)}/6]^{1/2} \qquad [7.1]$$

Accordingly, for any given soil, the computed water contents were translated into soil water pressures using the measured moisture characteristic curve. These pressure values were then converted to equivalent pore radii which were then solved for α.

The values of α thus computed are plotted as a function of mean particle radius for SILTY SAND is displayed in Figure 7.10 and for SANDY SILT is displayed in Figure 7.13 where best-fit values of α for each of the soils were calculated by using the Equation [7.1], data given in the Table 7.2 and an iterative procedure that minimized the sums of $|\log(u_a - u_w)_{meas} - \log(u_a - u_w)_{calc}|$.

The reasonable best fits for soil water characteristic curves (SWCCs) were plotted as shown in Figure 7.9 for SILTY SAND and in Figure 7.12 for SANDY SILT from particle gradation curve reproduced in Figure 7.8 for SILTY SAND and in Figure 7.11 for SANDY SILT and all relevant data were tabulated in Annex 5.

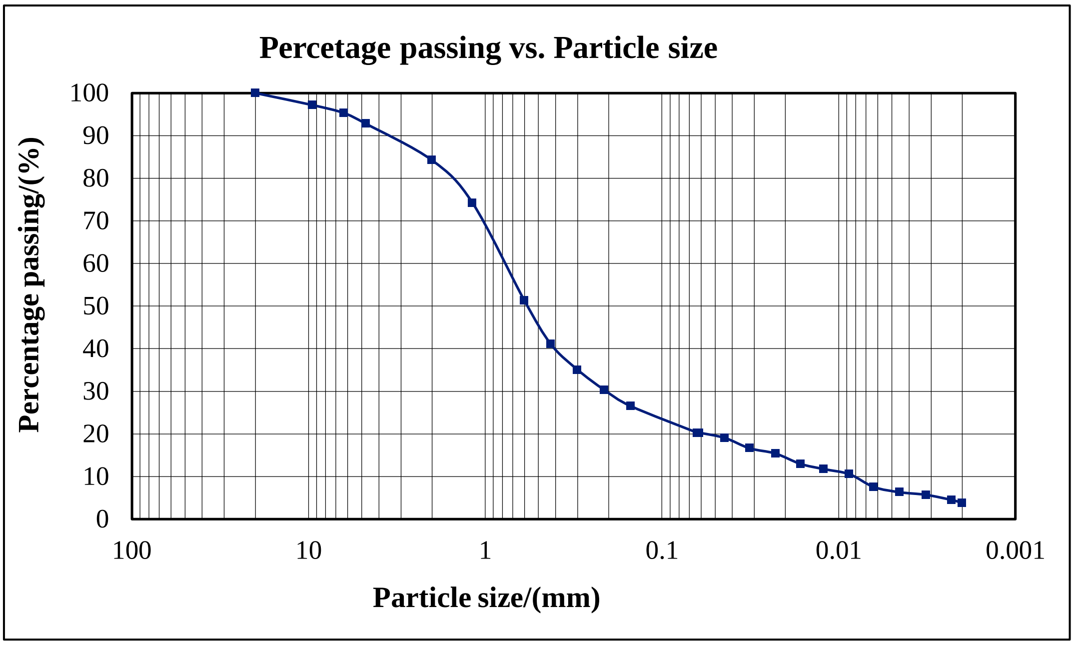


Figure 7.8: The variation of percentage passing with particle size for SILTY SAND

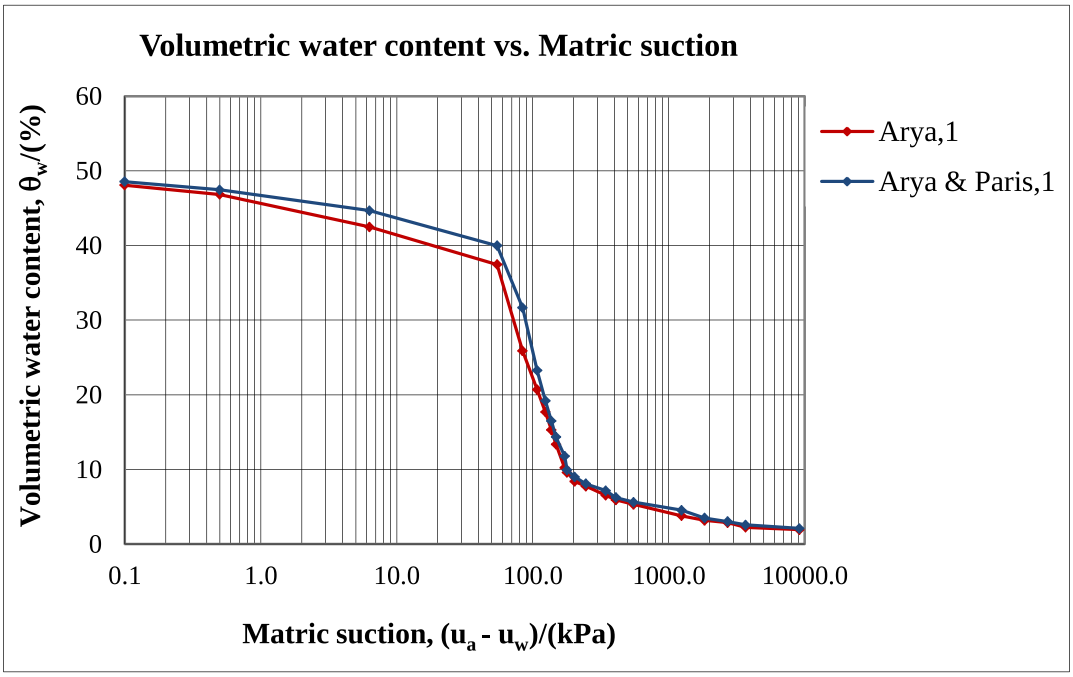


Figure 7.9: The variation of volumetric water content with matric suction for SILTY SAND

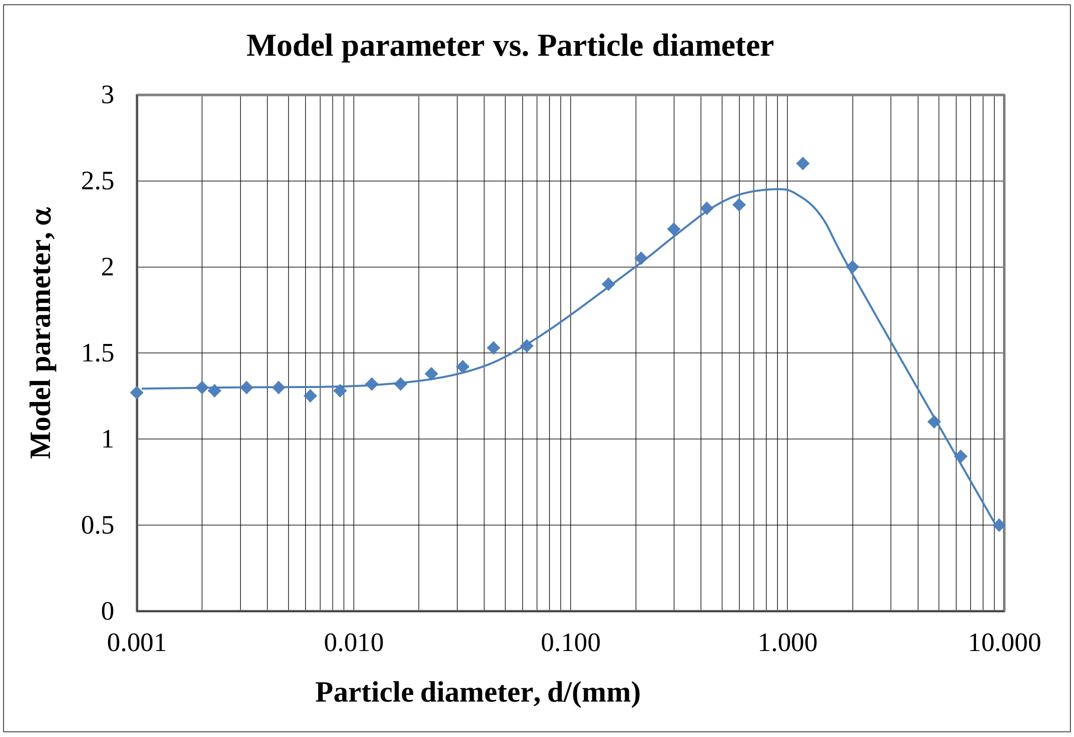


Figure 7.10: The variation of model parameter with particle diameter for SILTY SAND

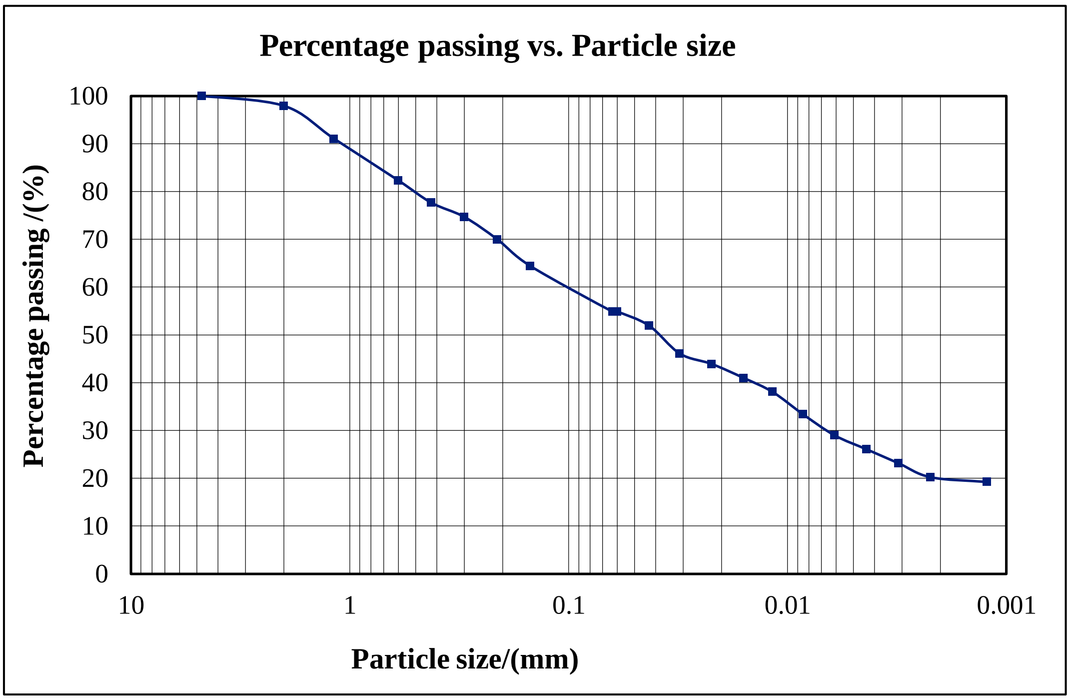


Figure 7.11: The variation of percentage passing with particle size for SANDY SILT

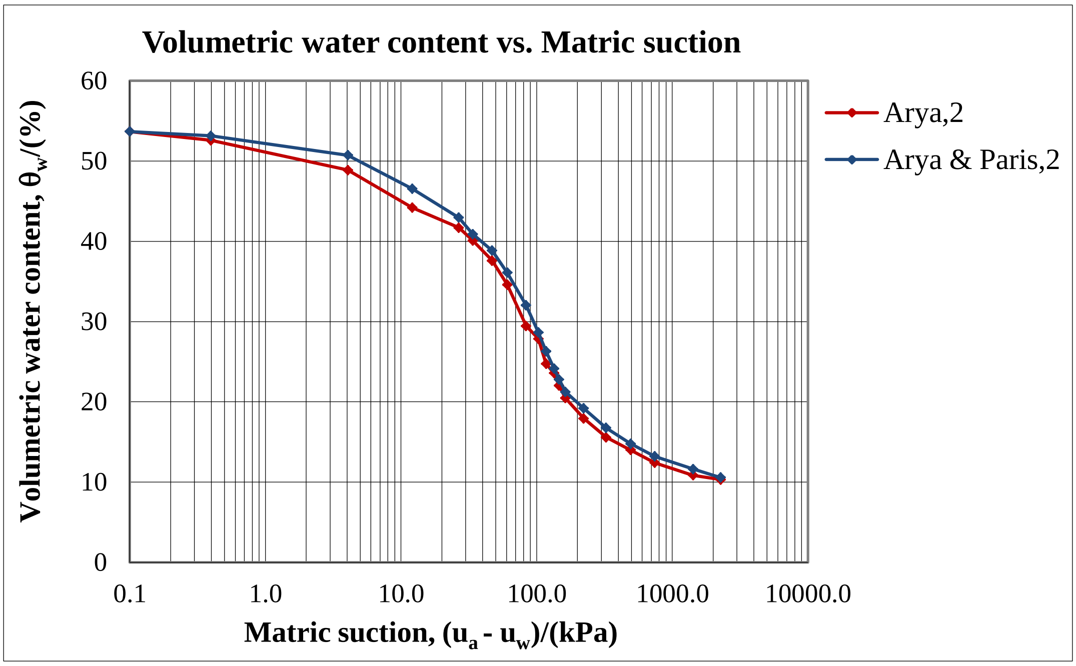


Figure 7.12: The variation of volumetric water content with matric suction for SANDY SILT

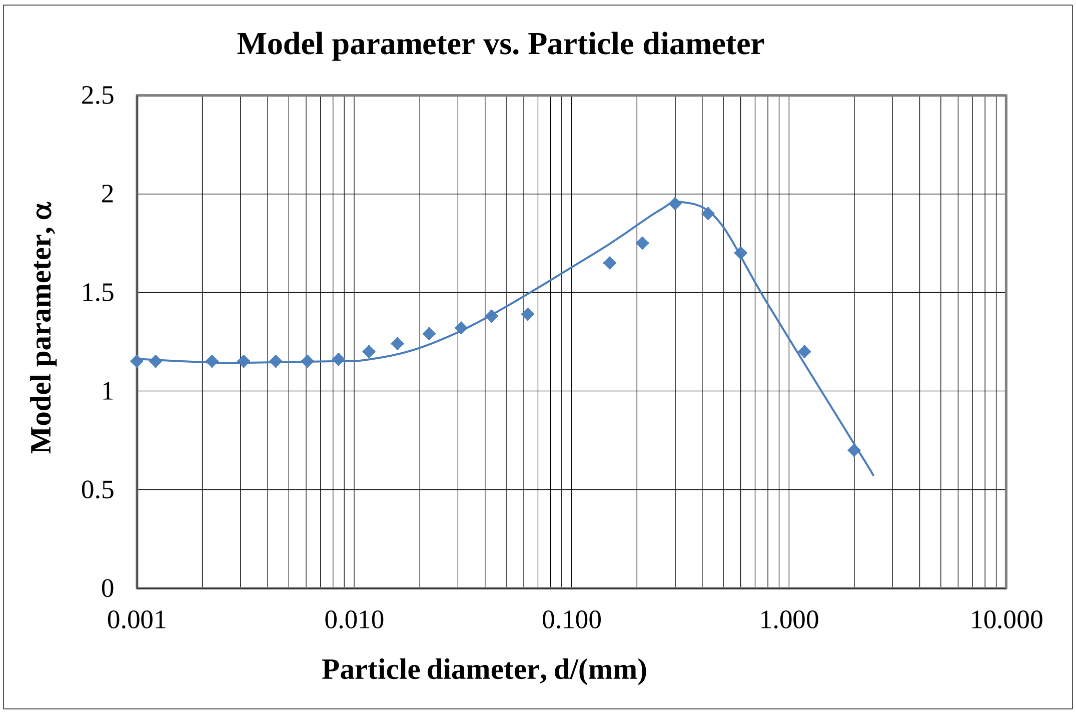


Figure 7.13: The variation of model parameter with particle diameter for SANDY SILT

7.5. Comparison of different techniques

The philosophy used in each method for derivation or prediction of soil water characteristic curve (SWCC) is different. Comparisons were provided in Figure 7.14 & Figure 7.15 between those four methods for a limited suction range for different kinds of equipment engaged for two types of soils encountered at the site.

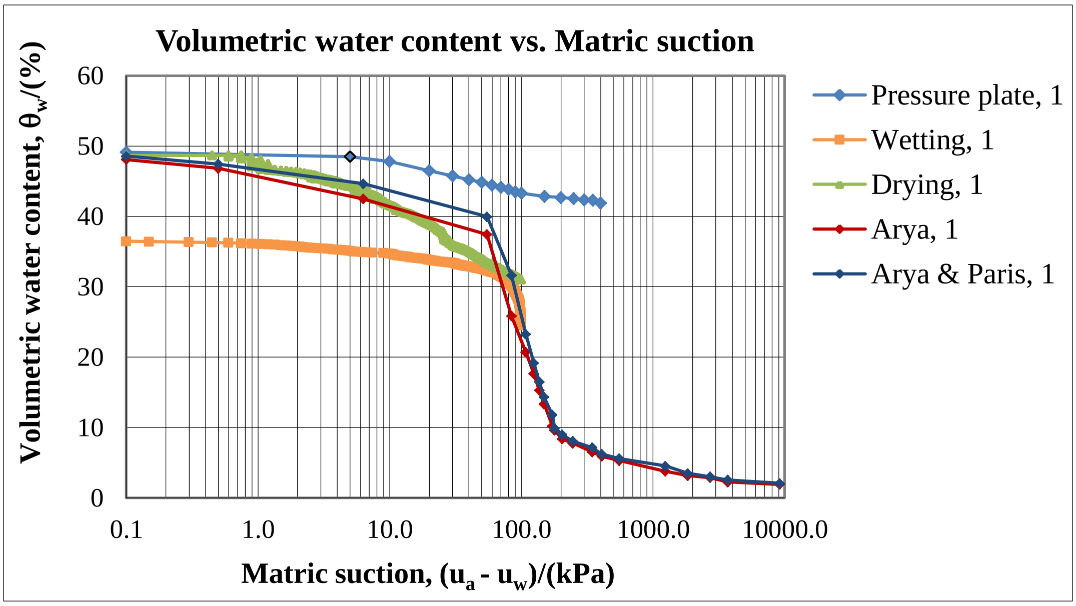


Figure 7.14: The variation of volumetric water content with matric suction (SWCC) for SILTY SAND for various methods

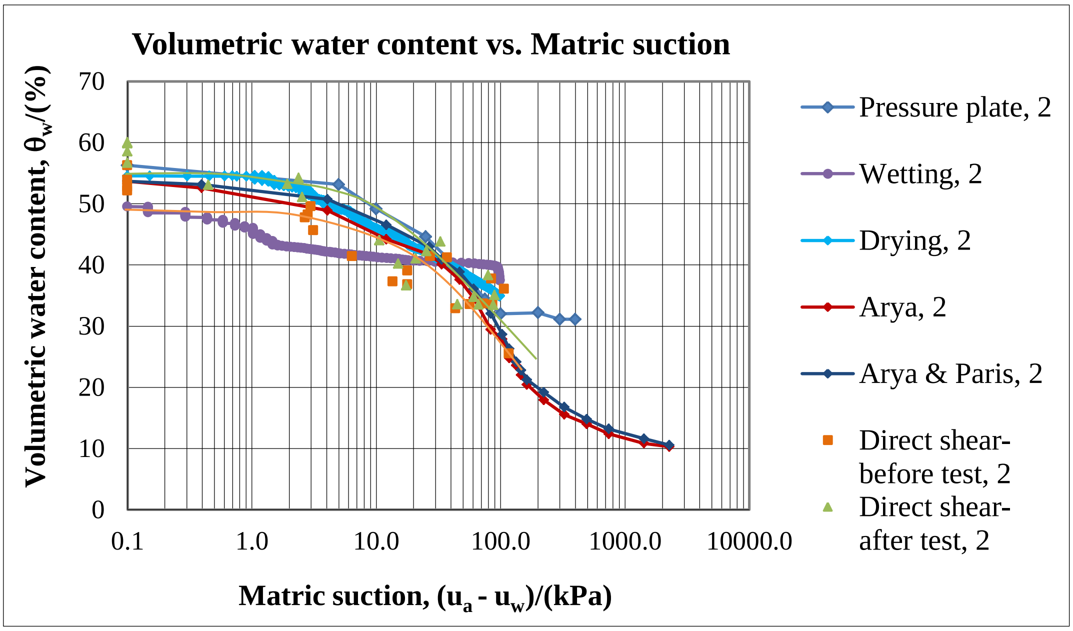


Figure 7.15: The variation of volumetric water content with matric suction (SWCC) for SANDY SILT for various methods

From the results it appears that the pressure plate apparatus is not appropriate for soils with sandy nature and the level of accuracy is low at interested suction range (transition range of approximately 10kPa to 100kPa as the least count of pressure gauge is 10kPa and it can be used for measurement of suction range of 500kPa which is the high air entry value of pressure plate used in this study.

The direct shear test with matric suction measurement is desirable for any kind of soil but it is time consuming process and can be used for limited suction range (100kPa) and it is difficult to achieve same saturation level for all four specimens due to non-homogeneity of the soil.

Meanwhile permeability function with drying method is best out of four methods because it is easy to perform, very quick, level of accuracy is high as least count of tensiometer is 0.001Volt, no need to maintain a particular saturation level to get volumetric water content as continuous measurement of weight loss and less man power is necessary (only initial stage) but it can be used for limited suction range (100kPa).

At the same time Arya & Paris method is useful tool for fine soils. Data show that the value of α does not change substantially for particle radii from about 1μm to about 100μm. Furthermore, over this range of particle sizes, the values of α for two texturally different soil materials lie within a narrow range from about 1.15 to about 1.25. For the particles larger than a 100μm radius, there appears to be a tendency for α rise to a peak and drop sharply with an increase in particle size and it is difficult to get overall best fit value α for a coarse grained soil.

Chapter 8

8.0. SUMMARY AND CONCLUSIONS

Slope failures in tropical climates are triggered by excessive rainfall. In order to predict the vulnerability and variation of the safety margins of a slope due to a given rainfall, it is necessary to understand the mechanism of infiltration and resulting loss of matric suction, the possible developments of perched water table and the rise of the ground water table.

Analytical studies were done (Sujeevan and Kulathilaka, 2011) simulating the process of infiltration and illustrating the reduction of the safety factors with a prolonged rainfall (Kulathilaka and Sujeevan, 2011) for cut slopes in Sri Lanka. Due to the absence of actual data on Sri Lankan residual soils basic characteristics such as soil water characteristic curve (SWCC) and permeability functions available in literature were used in these studies. The findings of these studies highlighted the importance of establishing these basic characteristics for Sri Lankan residual soils.

The testing to determine these characteristics were conducted with undisturbed samples for two types of soils encountered at the site of the failed slope at Welipenna in the Southern expressway and initially commenced using pressure plate apparatus and conventional direct shear test. After acquiring KU tensiometers and other accessories such as data loggers, a suction monitored direct shear box equipped with the miniature tensiometer is used as an alternative testing technique for characterizing the properties of unsaturated soils for slope stability analysis.

Different levels of saturation were obtained by controlled wetting of the samples. The tensiometer was fixed to the test sample after de-airing and left to reach the equilibrium state. The consolidation of the sample at the applied normal stress and shearing under drained conditions was conducted while monitoring the matric suction. Tests were done at four levels of saturation. Four stress levels were used for each saturation level.

Matric suction for a particular saturation level should be same theoretically and do not depend on the normal loads what was applied during consolidation and shearing stages as the equilibrium stage was achieved before apply the normal load.

However, in this study, there were variations in matric suction values obtained for a particular saturation level. This could be due to the non-homogeneity of the soil.

Variation of shear strength with the matric suction was plotted for different stress levels. Thereafter the variation of the apparent cohesion with the matric suction was also plotted. These plots demonstrated similar trends observed by other researchers and it would appear that the shear strength contribution due to suction can be more accurately estimated with matric suction measurement using the KU tensiometer.

The data from the large number of direct shear test samples was collated to establish the soil water characteristic curve (SWCC) initially. The soil water characteristic curves (SWCCs) as well as the permeability-suction function were investigated on residual soil for both wetting and drying paths also. A novel method was proposed based on continuously drying and wetting the soil sample while continuous monitoring the suction gradient and the change in soil mass. The advantage of this method is that the soil water characteristic curve (SWCC) and k-function of an undisturbed sample can be determined in the suction range of 0 to 100kPa within less than a week.

However, the difference of the wetting soil water characteristic curves (SWCCs) obtained from various test methods appear to be greater than that of drying soil water characteristic curves (SWCCs) and drying k-function however appears to be of less scatter than the wetting. This is believed to be non-linearity of the suction distribution due to poor infiltration which depends on dry density, structural arrangement of soil particles, mineral composition, crack pattern developed on the top surface of the soil specimen and soil type.

This method is still not very accurate for wetting path. Thus, drying path with continuous technique thus offers a very quick and simple way for k-function determination of unsaturated soils.

An attempt was made to determine soil water characteristic curves (SWCCs) from particle size distribution curve of a particular soil type using Arya & Paris, (1981) method and it was difficult to get a best fit value for model parameter α for a particular soil type as it depends on grain size of the soil materials. With the available tensiometer the upper limit of measurement is 100kPa but the empirical curve extends beyond that. There was a good agreement within the measured range.

8.1. Future outlook

The studies presented in this study show promise of using the procedures predicting the shear strength of an unsaturated soil using the soil water characteristic curve and the saturated shear strength parameters. More experimental studies are necessary on different types of soils to better understand the shear strength behavior of unsaturated soils and develop better prediction procedures.

Once the basic characteristics are established it is planned to model the rainfall event to back analyze the failure. The case of failure at Welipenna would serve as a test case to calibrate the process of modeling and testing. With the establishment of the basic characteristics of the different soil layers in a given slope, the process of infiltration and resulting changes in the pore pressure regime can be modeled to a reasonable accuracy.

With the help of the KU tensiometers it is possible to monitor the changes in the pore pressures in field from high matric suction values to positive pore water pressures during any given rainfall. It is planned to install these instruments in an identified slope where rainfall also is monitored. The data acquired from the instrumented slope can be compared with the predicted changes from the modeling process. With such studies the analysis can be calibrated and it would be possible to establish threshold values of rainfall that could lead to failure in a given slopes of critical importance. Establishment of such values would make it possible to issue reliable early warning of landslides based on rainfall monitoring.

The process of monitoring will also be very helpful to assess the effectiveness of surface and subsurface drainage and surface protecting vegetation that would help to preserve the safety margins in given slope.

Chapter 9

9.0. REFERENCES

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Annex 1

Particle size distribution test results

The variation of percentage passing with particle size distribution for both soil types

Soil type 01 (silty sand)		**Soil type 02 (sandy silt)**	
Particle diameter/(mm)	**Percentage passing/(%)**	**Particle diameter/(mm)**	**Percentage passing/(%)**
20.0000	100.0	20.0000	100.0
9.5000	97.2	9.5000	100.0
6.3000	95.3	6.3000	100.0
4.7500	92.8	4.7500	100.0
2.0000	84.2	2.0000	97.9
1.1800	74.2	1.1800	91.1
0.6000	51.3	0.6000	82.3
0.4250	41.0	0.4250	77.7
0.3000	35.0	0.3000	74.7
0.2120	30.3	0.2120	70.0
0.1500	26.5	0.1500	64.4
0.0630	20.3	0.0630	54.9
0.0617	20.3	0.0599	54.9
0.0441	19.1	0.0429	51.9
0.0319	16.6	0.0311	46.1
0.0228	15.4	0.0222	43.9
0.0165	13.0	0.0158	41.0
0.0121	11.7	0.0117	38.1
0.0087	10.5	0.0085	33.4
0.0063	7.5	0.0061	29.0
0.0045	6.3	0.0044	26.1
0.0032	5.7	0.0031	23.1
0.0023	4.5	0.0022	20.2
0.0020	3.8	0.0012	19.2

Annex 2

Direct shear test results

The variation of shear stress, volume change with shear strain for approximately 40% saturated condition for SILTY SAND

Normal load/(kPa)											
50			100			150			200		
Strain/ (%)	Shear stress/ (kPa)	Volume change/ (cm^3)	Strain/ (%)	Shear stress/ (kPa)	Volume change/ (cm^3)	Strain/ (%)	Shear stress/ (kPa)	Volume change/ (cm^3)	Strain/ (%)	Shear stress/ (kPa)	Volume change/ (cm^3)
0.00	0.0	0.00	0.00	0.0	0.00	0.00	0.0	0.00	0.00	0.0	0.00
0.25	11.2	-0.07	0.25	20.0	-0.18	0.25	10.0	-0.14	0.25	31.2	-0.04
0.50	15.0	-0.14	0.50	27.5	-0.32	0.50	30.0	-0.25	0.50	48.7	-0.14
0.75	20.0	-0.18	0.75	32.4	-0.43	0.75	39.9	-0.40	0.75	56.2	-0.25
1.00	27.5	-0.25	1.00	36.2	-0.50	1.00	49.9	-0.54	1.00	62.4	-0.32
1.25	34.9	-0.32	1.25	41.2	-0.61	1.25	57.4	-0.68	1.25	67.4	-0.36
1.50	41.2	-0.36	1.50	43.7	-0.65	1.50	62.4	-0.83	1.50	74.9	-0.43
1.75	46.2	-0.43	1.75	47.4	-0.76	1.75	69.9	-0.90	1.75	83.6	-0.58
2.00	52.4	-0.54	2.00	51.2	-0.83	2.00	74.9	-1.01	2.00	88.6	-0.65
2.50	61.1	-0.58	2.50	57.4	-0.97	2.50	86.1	-1.19	2.50	101.1	-0.83
3.00	67.4	-0.61	3.00	62.4	-1.08	3.00	94.8	-1.40	3.00	111.1	-0.97
3.50	73.6	-0.68	3.50	67.4	-1.19	3.50	104.8	-1.62	3.50	121.0	-1.30
4.00	77.4	-0.68	4.00	71.1	-1.26	4.00	112.3	-1.76	4.00	128.5	-1.51
5.00	84.9	-0.72	5.00	77.4	-1.37	5.00	129.8	-2.12	5.00	144.8	-1.98
6.00	86.1	-0.76	6.00	83.6	-1.44	6.00	146.0	-2.34	6.00	154.7	-2.45
7.00	86.1	-0.76	7.00	88.6	-1.48	7.00	156.0	-2.45	7.00	164.7	-2.81
8.00	83.6	-0.76	8.00	93.6	-1.55	8.00	164.7	-2.52	8.00	173.5	-3.13
9.00	82.4	-0.72	9.00	96.1	-1.55	9.00	168.5	-2.56	9.00	180.9	-3.35
10.00	78.6	-0.68	10.00	97.3	-1.55	10.00	172.2	-2.56	10.00	184.7	-3.46
11.00	74.9	-0.65	11.00	98.6	-1.51	11.00	172.2	-2.56	11.00	184.7	-3.46
12.00	71.1	-0.65	12.00	98.6	-1.48	12.00	172.2	-2.56	12.00	183.4	-3.46
13.00	67.4	-0.61	13.00	98.6	-1.44	13.00	171.0	-2.48	13.00	182.2	-3.46
14.00	63.6	-0.58	14.00	97.3	-1.37	14.00	169.7	-2.48	14.00	177.2	-3.46
15.00	62.4	-0.58	15.00	96.1	-1.33	15.00	168.5	-2.45	15.00	177.2	-3.46
			16.00	94.8	-1.30	16.00	166.0	-2.34			
						17.00	162.2	-2.27			

The variation of shear stress, volume change with shear strain for approximately 65% saturated condition for SILTY SAND

Normal load/(kPa)											
50			100			150			200		
Strain/ (%)	Shear stress/ (kPa)	Volume change/ (cm^3)	Strain/ (%)	Shear stress/ (kPa)	Volume change/ (cm^3)	Strain/ (%)	Shear stress/ (kPa)	Volume change/ (cm^3)	Strain/ (%)	Shear stress/ (kPa)	Volume change/ (cm^3)
0.00	0.0	0.00	0.00	0.0	0.00	0.00	0.0	0.00	0.00	0.0	0.00
0.25	15.0	-0.14	0.25	20.0	-0.18	0.25	27.5	-0.14	0.25	37.4	-0.14
0.50	25.0	-0.22	0.50	36.2	-0.29	0.50	43.7	-0.25	0.50	51.2	-0.32
0.75	33.7	-0.22	0.75	44.9	-0.36	0.75	51.2	-0.32	0.75	62.4	-0.50
1.00	41.2	-0.25	1.00	59.9	-0.43	1.00	62.4	-0.40	1.00	71.1	-0.68
1.25	49.9	-0.25	1.25	71.1	-0.54	1.25	72.4	-0.47	1.25	78.6	-0.83
1.50	54.9	-0.25	1.50	81.1	-0.61	1.50	82.4	-0.58	1.50	87.4	-0.94
1.75	62.4	-0.25	1.75	91.1	-0.65	1.75	92.3	-0.65	1.75	93.6	-1.08
2.00	67.4	-0.25	2.00	99.8	-0.68	2.00	99.8	-0.76	2.00	99.8	-1.19
2.50	74.9	-0.25	2.50	113.6	-0.72	2.50	114.8	-0.90	2.50	109.8	-1.40
3.00	79.9	-0.22	3.00	124.8	-0.76	3.00	128.5	-0.94	3.00	118.6	-1.58
3.50	79.9	-0.22	3.50	128.5	-0.79	3.50	137.3	-1.01	3.50	127.3	-1.73
4.00	81.1	-0.11	4.00	131.0	-0.79	4.00	144.8	-1.04	4.00	134.8	-1.91
5.00	81.1	0.07	5.00	129.8	-0.83	5.00	153.5	-1.12	5.00	146.0	-2.12
6.00	79.9	0.29	6.00	127.3	-0.86	6.00	157.2	-1.12	6.00	157.2	-2.30
7.00	76.1	0.50	7.00	126.0	-0.86	7.00	156.0	-1.12	7.00	163.5	-2.41
8.00	74.9	0.79	8.00	124.8	-0.86	8.00	154.7	-1.12	8.00	168.5	-2.41
9.00	69.9	1.04	9.00	123.5	-0.86	9.00	151.0	-1.12	9.00	171.0	-2.41
10.00	67.4	1.26	10.00	122.3	-0.90	10.00	148.5	-1.15	10.00	174.7	-2.38
11.00	64.9	1.40	11.00	121.0	-0.94	11.00	143.5	-1.15	11.00	174.7	-2.30
12.00	66.1	1.55	12.00	121.0	-0.94	12.00	139.8	-1.19	12.00	174.7	-2.23
13.00	62.4	1.62	13.00	121.0	-0.94	13.00	137.3	-1.22	13.00	173.5	-2.20
14.00	61.1	1.62	14.00	117.3	-0.94	14.00	134.8	-1.22	14.00	172.2	-2.16
15.00	59.9	1.76	15.00	114.8	-0.97	15.00	132.3	-1.30	15.00	168.5	-2.16

The variation of shear stress, volume change with shear strain for approximately 83% saturated condition for SILTY SAND

Normal load/(kPa)											
50			100			150			200		
Strain/ (%)	Shear stress/ (kPa)	Volume change/ (cm^3)	Strain/ (%)	Shear stress/ (kPa)	Volume change/ (cm^3)	Strain/ (%)	Shear stress/ (kPa)	Volume change/ (cm^3)	Strain/ (%)	Shear stress/ (kPa)	Volume change/ (cm^3)
0.00	0.0	0.00	0.00	0.0	0.00	0.00	0.0	0.00	0.00	0.0	0.00
0.25	7.5	-0.29	0.25	17.5	-0.14	0.25	12.5	-0.22	0.25	27.5	-0.22
0.50	10.0	-0.50	0.50	28.7	-0.29	0.50	25.0	-0.32	0.50	39.9	-0.36
0.75	11.2	-0.68	0.75	37.4	-0.40	0.75	34.9	-0.47	0.75	49.9	-0.54
1.00	12.5	-0.86	1.00	43.7	-0.50	1.00	42.4	-0.58	1.00	58.7	-0.72
1.25	13.7	-1.01	1.25	51.2	-0.58	1.25	48.7	-0.68	1.25	66.1	-0.86
1.50	16.2	-1.19	1.50	57.4	-0.68	1.50	53.7	-0.79	1.50	74.9	-1.01
1.75	17.5	-1.33	1.75	64.9	-0.79	1.75	56.2	-0.86	1.75	81.1	-1.19
2.00	18.7	-1.48	2.00	71.1	-0.83	2.00	61.1	-0.97	2.00	87.4	-1.30
2.50	22.5	-1.69	2.50	86.1	-0.97	2.50	69.9	-1.15	2.50	101.1	-1.58
3.00	25.0	-1.91	3.00	99.8	-1.08	3.00	77.4	-1.33	3.00	113.6	-1.84
3.50	26.2	-2.09	3.50	109.8	-1.19	3.50	83.6	-1.51	3.50	123.5	-2.09
4.00	28.7	-2.27	4.00	121.0	-1.26	4.00	89.9	-1.66	4.00	136.0	-2.30
5.00	31.2	-2.56	5.00	141.0	-1.37	5.00	102.3	-1.94	5.00	153.5	-2.77
6.00	33.7	-2.77	6.00	149.8	-1.37	6.00	113.6	-2.23	6.00	173.5	-3.17
7.00	36.2	-2.95	7.00	151.0	-1.26	7.00	122.3	-2.48	7.00	192.2	-3.46
8.00	38.7	-3.28	8.00	137.3	-1.08	8.00	128.5	-2.70	8.00	197.2	-3.56
9.00	41.2	-3.56	9.00	132.3	-1.04	9.00	134.8	-2.81	9.00	194.7	-3.64
10.00	43.7	-3.71	10.00	127.3	-1.04	10.00	139.8	-2.88	10.00	195.9	-3.64
11.00	46.2	-3.85	11.00	119.8	-1.08	11.00	141.0	-2.88	11.00	190.9	-3.67
12.00	47.4	-3.92	12.00	117.3	-1.12	12.00	141.0	-2.88	12.00	187.2	-3.71
13.00	49.9	-3.92	13.00	114.8	-1.15	13.00	139.8	-2.81	13.00	180.9	-3.74
14.00	51.2	-3.96	14.00	112.3	-1.15	14.00	139.8	-2.77	14.00	178.5	-3.74
15.00	51.2	-3.96	15.00	112.3	-1.19	15.00	138.5	-2.81	15.00	171.0	-3.74
16.00	52.4	-3.96									
17.00	53.7	-3.89									
18.00	53.7	-3.89									
19.00	53.7	-3.89									
20.00	53.7	-3.89									

The variation of shear stress, volume change with shear strain for fully saturated condition for SILTY SAND

Normal load/(kPa)											
50			100			150			200		
Strain/ (%)	Shear stress/ (kPa)	Volume change/ (cm^3)	Strain/ (%)	Shear stress/ (kPa)	Volume change/ (cm^3)	Strain/ (%)	Shear stress/ (kPa)	Volume change/ (cm^3)	Strain/ (%)	Shear stress/ (kPa)	Volume change/ (cm^3)
0.00	0.0	0.00	0.00	0.0	0.00	0.00	0.0	0.00	0.00	0.0	0.00
0.25	9.7	-0.25	0.25	15.2	-0.11	0.25	16.6	-0.18	0.25	33.3	-0.22
0.50	12.5	-0.50	0.50	22.2	-0.29	0.50	27.7	-0.36	0.50	47.1	-0.40
0.75	16.6	-0.72	0.75	29.1	-0.50	0.75	33.3	-0.58	0.75	56.8	-0.58
1.00	18.0	-0.90	1.00	33.3	-0.72	1.00	37.4	-0.79	1.00	67.9	-0.72
1.25	20.8	-1.04	1.25	37.4	-0.90	1.25	42.9	-1.01	1.25	76.2	-0.83
1.50	23.6	-1.19	1.50	40.2	-1.04	1.50	47.1	-1.19	1.50	84.5	-0.97
1.75	26.3	-1.37	1.75	41.6	-1.22	1.75	48.5	-1.44	1.75	91.4	-1.08
2.00	27.7	-1.48	2.00	45.7	-1.37	2.00	51.3	-1.58	2.00	99.8	-1.19
2.50	31.9	-1.69	2.50	49.9	-1.62	2.50	55.4	-1.87	2.50	112.2	-1.37
3.00	34.6	-1.91	3.00	54.0	-1.76	3.00	62.3	-2.12	3.00	124.7	-1.51
3.50	37.4	-2.09	3.50	56.8	-1.94	3.50	66.5	-2.27	3.50	134.4	-1.66
4.00	40.2	-2.23	4.00	59.6	-2.09	4.00	70.7	-2.48	4.00	142.7	-1.76
5.00	42.9	-2.45	5.00	66.5	-2.38	5.00	77.6	-2.74	5.00	157.9	-1.98
6.00	45.7	-2.56	6.00	70.7	-2.63	6.00	83.1	-3.02	6.00	167.6	-2.16
7.00	47.1	-2.63	7.00	76.2	-2.81	7.00	88.7	-3.13	7.00	174.6	-2.30
8.00	48.5	-2.77	8.00	80.4	-2.92	8.00	90.1	-3.20	8.00	180.1	-2.41
9.00	48.5	-2.84	9.00	81.7	-2.99	9.00	92.8	-3.28	9.00	182.9	-2.48
10.00	48.5	-2.92	10.00	83.1	-3.02	10.00	95.6	-3.35	10.00	180.1	-2.52
11.00	48.5	-2.99	11.00	84.5	-3.06	11.00	98.4	-3.42	11.00	175.9	-2.56
12.00	48.5	-3.10	12.00	85.9	-3.06	12.00	99.8	-3.46	12.00	171.8	-2.56
13.00	47.1	-3.20	13.00	87.3	-3.06	13.00	102.5	-3.49	13.00	164.9	-2.59
14.00	47.1	-3.31	14.00	87.3	-3.02	14.00	103.9	-3.53	14.00	159.3	-2.59
15.00	45.7	-3.46	15.00	73.4	-3.02	15.00	105.3	-3.60	15.00	159.3	-2.63
			16.00	73.4	-2.95	16.00	108.1	-3.71			
						17.00	108.1	-3.78			
						18.00	106.7	-3.78			

The variation of shear stress, volume change with shear strain for approximately 65% saturated condition for SANDY SILT

Normal load/(kPa)											
50			100			150			200		
Strain/ (%)	Shear stress/ (kPa)	Volume change/ (cm^3)	Strain/ (%)	Shear stress/ (kPa)	Volume change/ (cm^3)	Strain/ (%)	Shear stress/ (kPa)	Volume change/ (cm^3)	Strain/ (%)	Shear stress/ (kPa)	Volume change/ (cm^3)
0.00	0.0	0.00	0.00	0.0	0.00	0.00	0.0	0.00	0.00	0.0	0.00
0.25	0.7	-0.07	0.25	1.3	-0.07	0.25	3.9	-0.09	0.25	2.6	-0.02
0.50	1.3	-0.14	0.50	2.6	-0.11	0.50	7.9	-0.13	0.50	6.6	-0.02
0.75	2.6	-0.22	0.75	3.9	-0.14	0.75	13.1	-0.16	0.75	10.5	-0.04
1.00	3.9	-0.29	1.00	5.9	-0.18	1.00	18.4	-0.20	1.00	15.7	-0.04
1.25	5.2	-0.36	1.25	7.9	-0.22	1.25	24.9	-0.20	1.25	21.0	-0.05
1.50	6.6	-0.43	1.50	9.8	-0.25	1.50	30.2	-0.20	1.50	27.5	-0.05
1.75	7.9	-0.50	1.75	12.5	-0.32	1.75	36.7	-0.22	1.75	32.8	-0.07
2.00	9.2	-0.58	2.00	15.7	-0.40	2.00	43.3	-0.27	2.00	38.0	-0.11
2.50	10.5	-0.65	2.50	22.3	-0.54	2.50	55.1	-0.27	2.50	48.5	-0.14
3.00	14.4	-0.72	3.00	28.9	-0.83	3.00	68.2	-0.34	3.00	62.9	-0.18
3.50	17.0	-0.90	3.50	36.7	-1.01	3.50	82.6	-0.41	3.50	78.7	-0.22
4.00	18.4	-1.08	4.00	44.6	-1.15	4.00	94.4	-0.49	4.00	87.9	-0.25
5.00	24.9	-1.44	5.00	56.4	-1.40	5.00	115.4	-0.74	5.00	103.6	-0.32
6.00	36.7	-1.73	6.00	70.8	-1.62	6.00	137.7	-0.88	6.00	118.0	-0.36
7.00	44.6	-1.87	7.00	81.3	-1.80	7.00	154.7	-0.92	7.00	129.2	-0.36
8.00	49.8	-1.98	8.00	91.8	-1.87	8.00	170.5	-0.92	8.00	133.8	-0.34
9.00	53.8	-2.05	9.00	101.0	-1.94	9.00	178.4	-0.95	9.00	141.6	-0.32
10.00	56.4	-2.05	10.00	110.2	-1.98	10.00	184.9	-0.88	10.00	145.6	-0.32
11.00	59.0	-2.07	11.00	118.0	-1.94	11.00	192.8	-0.74	11.00	146.9	-0.31
12.00	60.3	-1.94	12.00	124.6	-1.87	12.00	198.0	-0.63	12.00	149.5	-0.31
13.00	61.6	-1.84	13.00	128.5	-1.69	13.00	199.3	-0.49	13.00	152.8	-0.29
14.00	63.6	-1.69	14.00	131.1	-1.44	14.00	199.3	-0.41	14.00	152.8	-0.29
15.00	64.3	-1.58	15.00	129.8	-1.08	15.00	200.0	-0.34	15.00	154.7	-0.27
16.00	62.9	-1.51	16.00	128.5	-0.83	16.00	200.0	-0.31	16.00	156.1	-0.25
17.00	62.3	-1.40				17.00	199.3	-0.23	17.00	156.1	-0.23
18.00	61.0	-1.30				18.00	196.7	-0.13	18.00	156.1	-0.22
19.00	60.3	-1.19				19.00	191.5	-0.09	19.00	154.7	-0.20
20.00	59.7	-1.12				20.00	183.6	-0.05	20.00	152.1	-0.18

The variation of shear stress, volume change with shear strain for approximately 72% saturated condition for SANDY SILT

Normal load/(kPa)											
50			100			150			200		
Strain/ (%)	Shear stress/ (kPa)	Volume change/ (cm^3)	Strain/ (%)	Shear stress/ (kPa)	Volume change/ (cm^3)	Strain/ (%)	Shear stress/ (kPa)	Volume change/ (cm^3)	Strain/ (%)	Shear stress/ (kPa)	Volume change/ (cm^3)
0.00	0.0	0.00	0.00	0.0	0.00	0.00	0.0	0.00	0.00	87.7	0.00
0.25	7.7	-0.14	0.25	14.2	-0.11	0.25	2.6	-0.11	0.25	87.6	-0.11
0.50	8.4	-0.16	0.50	15.5	-0.18	0.50	5.2	-0.14	0.50	87.5	-0.18
0.75	11.6	-0.22	0.75	19.3	-0.25	0.75	24.5	-0.18	0.75	87.4	-0.25
1.00	14.2	-0.25	1.00	21.9	-0.32	1.00	37.4	-0.29	1.00	87.3	-0.36
1.25	20.6	-0.29	1.25	23.2	-0.36	1.25	45.1	-0.40	1.25	87.3	-0.43
1.50	25.8	-0.38	1.50	24.5	-0.43	1.50	46.4	-0.47	1.50	87.2	-0.54
1.75	29.7	-0.47	1.75	28.4	-0.54	1.75	54.2	-0.58	1.75	87.1	-0.61
2.00	33.5	-0.54	2.00	30.9	-0.68	2.00	56.7	-0.65	2.00	87.0	-0.72
2.50	36.1	-0.65	2.50	34.8	-0.90	2.50	64.5	-0.79	2.50	86.9	-0.83
3.00	40.0	-0.68	3.00	38.7	-1.15	3.00	77.4	-1.01	3.00	86.7	-0.97
3.50	43.8	-0.76	3.50	42.6	-1.40	3.50	86.4	-1.15	3.50	86.6	-1.08
4.00	47.1	-0.77	4.00	46.4	-1.62	4.00	100.6	-1.33	4.00	86.5	-1.22
5.00	52.9	-0.76	5.00	54.8	-2.02	5.00	122.5	-1.58	5.00	86.3	-1.37
6.00	58.0	-0.50	6.00	65.8	-2.56	6.00	139.3	-1.69	6.00	86.3	-1.44
7.00	58.0	-0.47	7.00	73.5	-2.56	7.00	145.7	-1.76	7.00	86.3	-1.44
8.00	58.0	-0.14	8.00	85.1	-2.70	8.00	150.2	-1.84	8.00	86.3	-1.44
9.00	58.0	0.07	9.00	91.6	-2.81	9.00	150.2	-1.84			
10.00	58.0	0.29	10.00	94.8	-2.83	10.00	148.3	-1.84			
11.00	58.0	0.58	11.00	95.4	-2.77	11.00	145.7	-1.84			
12.00	58.0	0.68	12.00	95.4	-2.66	12.00	141.8	-1.84			
13.00	55.4	0.86	13.00	94.1	-2.59						
14.00	54.2	0.94	14.00	92.8	-2.52						

The variation of shear stress, volume change with shear strain for approximately 81% saturated condition for SANDY SILT

Normal load/(kPa)											
50			100			150			200		
Strain/ (%)	Shear stress/ (kPa)	Volume change/ (cm^3)	Strain/ (%)	Shear stress/ (kPa)	Volume change/ (cm^3)	Strain/ (%)	Shear stress/ (kPa)	Volume change/ (cm^3)	Strain/ (%)	Shear stress/ (kPa)	Volume change/ (cm^3)
0.00	0.0	0.00	0.00	0.0	0.00	0.00	0.0	0.00	0.00	0.0	0.00
0.25	9.0	-0.07	0.25	18.1	-0.02	0.25	6.4	-0.11	0.25	9.0	-0.11
0.50	11.6	-0.14	0.50	23.2	-0.02	0.50	25.8	-0.18	0.50	11.6	-0.11
0.75	14.2	-0.22	0.75	27.1	-0.09	0.75	36.1	-0.29	0.75	34.8	-0.22
1.00	15.5	-0.25	1.00	32.2	-0.16	1.00	49.0	-0.43	1.00	49.0	-0.36
1.25	16.8	-0.32	1.25	34.8	-0.23	1.25	58.0	-0.45	1.25	59.3	-0.54
1.50	18.1	-0.36	1.50	40.0	-0.31	1.50	68.3	-0.54	1.50	69.6	-0.68
1.75	19.3	-0.40	1.75	45.1	-0.41	1.75	77.4	-0.58	1.75	78.7	-0.83
2.00	20.6	-0.43	2.00	49.0	-0.45	2.00	86.4	-0.65	2.00	86.4	-0.97
2.50	23.2	-0.54	2.50	58.0	-0.52	2.50	100.6	-0.76	2.50	101.9	-1.26
3.00	25.8	-0.58	3.00	69.6	-0.70	3.00	112.2	-0.90	3.00	112.2	-1.44
3.50	27.1	-0.61	3.50	74.8	-0.77	3.50	118.6	-1.01	3.50	121.2	-1.69
4.00	29.7	-0.68	4.00	83.8	-0.92	4.00	122.5	-1.08	4.00	126.4	-1.87
5.00	34.8	-0.79	5.00	96.7	-1.10	5.00	127.0	-1.19	5.00	136.7	-2.34
6.00	38.7	-0.86	6.00	99.3	-1.10	6.00	126.4	-1.22	6.00	144.4	-2.59
7.00	41.3	-0.86	7.00	100.6	-1.10	7.00	125.1	-1.22	7.00	148.3	-2.84
8.00	45.1	-0.79	8.00	98.0	-1.06	8.00	123.8	-1.22	8.00	149.6	-2.95
9.00	47.7	-0.61	9.00	95.4	-1.03	9.00	122.5	-1.26	9.00	148.9	-3.06
10.00	50.3	-0.54							10.00	148.3	-3.13
11.00	51.6	0.00							11.00	147.0	-3.17
12.00	51.6	0.40							12.00	145.7	-3.17
13.00	51.6	0.76									
14.00	51.6	1.19									
15.00	50.3	1.55									

The variation of shear stress, volume change with shear strain for approximately 92 % saturated condition for SANDY SILT

Normal load/(kPa)											
50			100			150			200		
Strain/ (%)	Shear stress/ (kPa)	Volume change/ (cm^3)	Strain/ (%)	Shear stress/ (kPa)	Volume change/ (cm^3)	Strain/ (%)	Shear stress/ (kPa)	Volume change/ (cm^3)	Strain/ (%)	Shear stress/ (kPa)	Volume change/ (cm^3)
0.00	0.0	0.00	0.00	0.0	0.00	0.00	0.0	0.00	0.00	0.0	0.00
0.25	9.7	-0.07	0.25	20.6	-0.18	0.25	16.6	-0.04	0.25	18.7	-0.14
0.50	12.9	-0.32	0.50	28.4	-0.43	0.50	19.4	-0.07	0.50	24.9	-0.14
0.75	14.2	-0.40	0.75	32.2	-0.58	0.75	20.8	-0.11	0.75	41.6	-0.14
1.00	14.2	-0.43	1.00	37.4	-0.68	1.00	29.1	-0.22	1.00	63.7	-0.86
1.25	14.2	-0.47	1.25	42.6	-0.79	1.25	33.3	-0.29	1.25	73.4	-0.97
1.50	16.8	-0.58	1.50	47.7	-0.90	1.50	42.3	-0.43	1.50	81.7	-1.12
1.75	19.3	-0.65	1.75	52.9	-1.04	1.75	51.3	-0.61	1.75	88.7	-1.26
2.00	20.6	-0.72	2.00	58.0	-1.19	2.00	55.4	-0.97	2.00	98.4	-1.44
2.50	23.2	-0.90	2.50	68.3	-1.44	2.50	69.3	-1.12	2.50	112.2	-1.69
3.00	25.8	-1.12	3.00	73.5	-1.58	3.00	77.6	-1.40	3.00	126.1	-2.02
3.50	29.0	-1.22	3.50	81.2	-1.87	3.50	84.5	-1.69	3.50	127.5	-2.30
4.00	32.2	-1.44	4.00	86.4	-2.12	4.00	90.1	-2.02	4.00	139.9	-2.59
5.00	38.7	-1.80	5.00	91.6	-2.41	5.00	99.8	-2.48	5.00	151.0	-3.20
6.00	45.1	-2.09	6.00	95.4	-2.66	6.00	106.7	-3.02	6.00	156.6	-3.74
7.00	49.0	-2.34	7.00	95.4	-2.84	7.00	115.0	-3.46	7.00	162.1	-4.21
8.00	51.6	-2.45	8.00	94.1	-2.99	8.00	119.1	-3.82	8.00	166.3	-4.57
9.00	54.2	-2.48	9.00	92.8	-3.13	9.00	121.9	-4.18	9.00	169.0	-5.00
10.00	54.8	-2.45	10.00	91.6	-3.17	10.00	124.7	-4.50	10.00	169.7	-5.36
11.00	54.8	-2.38				11.00	126.1	-4.68	11.00	169.0	-5.65
12.00	54.2	-2.30				12.00	126.1	-4.90	12.00	169.0	-5.80
13.00	53.5	-2.20				13.00	126.1	-5.08	13.00	167.6	-6.08
14.00	52.9	-2.09				14.00	124.7	-5.18	14.00	166.3	-6.26
						15.00	122.6	-5.29	15.00	164.9	-6.41
						16.00	120.5	-5.40			

The variation of shear stress, volume change with shear strain for approximately fully saturated condition for SANDY SILT

Normal load/(kPa)											
50			100			150			200		
Strain/ (%)	Shear stress/ (kPa)	Volume change/ (cm^3)	Strain/ (%)	Shear stress/ (kPa)	Volume change/ (cm^3)	Strain/ (%)	Shear stress/ (kPa)	Volume change/ (cm^3)	Strain/ (%)	Shear stress/ (kPa)	Volume change/ (cm^3)
0.00	0.0	0.00	0.00	0.0	0.00	0.00	0.0	0.00	0.00	0.0	0.00
0.25	9.0	-0.04	0.25	16.8	-0.04	0.25	10.3	-0.11	0.25	21.9	-0.07
0.50	19.3	-0.11	0.50	33.5	-0.18	0.50	24.5	-0.11	0.50	28.4	-0.07
0.75	23.2	-0.25	0.75	41.3	-0.40	0.75	32.2	-0.14	0.75	38.7	-0.14
1.00	28.4	-0.36	1.00	47.7	-0.54	1.00	42.6	-0.22	1.00	45.1	-0.25
1.25	30.9	-0.43	1.25	52.9	-0.72	1.25	50.3	-0.36	1.25	56.7	-0.40
1.50	33.5	-0.54	1.50	56.7	-0.86	1.50	55.4	-0.47	1.50	68.3	-0.54
1.75	37.4	-0.61	1.75	60.6	-1.01	1.75	61.2	-0.61	1.75	73.5	-0.61
2.00	40.0	-0.72	2.00	64.5	-1.19	2.00	65.8	-0.72	2.00	81.2	-0.79
2.50	43.8	-0.86	2.50	70.9	-1.44	2.50	73.5	-1.01	2.50	92.8	-0.97
3.00	47.7	-0.97	3.00	73.5	-1.62	3.00	79.3	-1.19	3.00	103.2	-1.30
3.50	50.3	-1.01	3.50	79.9	-1.91	3.50	86.4	-1.58	3.50	110.9	-1.80
4.00	51.6	-1.04	4.00	81.2	-2.05	4.00	92.2	-1.84	4.00	119.9	-1.84
5.00	51.6	-1.04	5.00	83.8	-2.34	5.00	99.3	-2.34	5.00	128.9	-2.12
6.00	50.9	-1.04	6.00	83.8	-2.45	6.00	107.0	-2.52	6.00	140.6	-2.45
7.00	49.0	-0.97	7.00	81.9	-2.52	7.00	110.9	-2.81	7.00	144.4	-2.56
8.00	47.7	-0.94	8.00	80.6	-2.59	8.00	113.5	-2.99	8.00	145.7	-2.66
9.00	46.4	-0.90	9.00	79.3	-2.66	9.00	116.1	-3.13	9.00	144.4	-2.77
			10.00	77.4	-2.70	10.00	116.1	-3.17	10.00	143.1	-2.81
						11.00	116.1	-3.35	11.00	141.8	-2.84
						12.00	116.1	-3.38			
						13.00	116.1	-3.46			
						14.00	115.4	-3.53			
						15.00	114.1	-3.564			
						16.00	112.8	-3.60			

Annex 3

Matric suction results during direct shear tests

50% of degree of saturation

50kPa			
Equilibrium stage			
Trial 1		Trial 2	
Matric suction/(kPa)	Time/(hr)	Matric suction/(kPa)	Time/(hr)
0.000	0.000	0.000	0.000
0.896	0.004	0.448	0.004
15.224	0.008	8.955	0.008
22.985	0.013	11.791	0.013
27.463	0.017	27.313	0.017
31.642	0.021	45.373	0.021
35.672	0.025	50.597	0.025
39.701	0.029	58.507	0.029
43.881	0.033	63.433	0.033
51.045	0.038	67.612	0.038
58.209	0.042	70.896	0.042
65.075	0.046	73.433	0.046
71.194	0.050	75.672	0.050
77.164	0.054	78.209	0.054
82.836	0.058	80.597	0.058
88.507	0.063	82.836	0.063
93.731	0.067	85.224	0.067
98.806	0.071	87.761	0.071
103.582	0.075	90.000	0.075
107.910	0.079	92.537	0.079
111.642	0.083	94.776	0.083
114.776	0.088	97.164	0.088
117.015	0.092	99.552	0.092
117.015	0.096	101.940	0.096
117.015	0.100	104.328	0.100
117.164	0.104	106.716	0.104
117.164	0.108	109.104	0.108
117.164	0.113	111.493	0.113
117.164	0.117	113.881	0.117
117.164	0.121	116.418	0.121
117.164	0.125	116.866	0.125
117.164	0.129	116.866	0.129
117.164	0.133	116.866	0.133
117.164	0.138	117.015	0.138
		117.015	0.142
		117.015	0.146
		117.015	0.150
		117.164	0.154
		117.164	0.158
		117.164	0.163
		117.164	0.167

		117.164	0.171
		117.164	0.175
		117.164	0.175
		117.164	0.176
		117.164	0.176
		117.164	0.176
		117.164	0.176
		117.164	0.177

65% of degree of saturation

50kPa							
Equilibrium stage		Consolidation stage		Shearing stage			
Matric suction/(kPa)	Time/(hr)	Matric suction/(kPa)	Time/(hr)	Matric suction/(kPa)	Time/(hr)	Matric suction/(kPa)	Shear strain/(%)
0.000	0.000	43.433	0.000	43.433	0.000	43.433	0.000
1.194	0.004	42.985	0.000	43.433	0.004	43.433	0.250
2.985	0.008	42.537	0.001	43.433	0.008	43.284	0.500
4.179	0.013	41.791	0.002	43.433	0.013	43.284	0.750
5.821	0.017	41.194	0.003	43.433	0.017	43.284	1.000
6.866	0.021	40.746	0.004	43.433	0.021	43.134	1.250
7.910	0.025	41.045	0.008	43.433	0.025	42.687	1.500
8.657	0.029	41.045	0.013	43.433	0.029	42.239	1.750
9.403	0.033	41.045	0.017	43.433	0.033	41.940	2.000
10.149	0.038	40.896	0.021	43.433	0.038	41.343	2.500
11.194	0.042	40.896	0.025	43.284	0.042	40.896	3.000
12.239	0.046	40.896	0.029	43.284	0.046	40.597	3.500
13.284	0.050	40.896	0.033	43.284	0.050	40.597	4.000
14.179	0.054	40.896	0.038	43.284	0.054	40.896	5.000
14.925	0.058	40.896	0.042	43.284	0.058	41.343	6.000
15.970	0.063	40.896	0.046	43.284	0.063	42.239	7.000
17.313	0.067	40.746	0.050	43.284	0.067	42.836	8.000
18.358	0.071	40.746	0.054	43.134	0.071	43.047	9.000
19.254	0.075	40.746	0.058	43.284	0.075	43.284	10.000
20.000	0.079	40.746	0.063	43.284	0.079	43.520	11.000
20.746	0.083	40.746	0.067	43.284	0.083	43.756	12.000
21.493	0.088	40.746	0.071	43.284	0.088	44.005	13.000
22.239	0.092	40.746	0.075	43.134	0.092	44.241	14.000
22.836	0.096	40.746	0.079	43.134	0.096	44.478	15.000
23.433	0.100	40.896	0.083	43.134	0.100	44.714	16.000
23.881	0.104	40.896	0.088	43.134	0.104	44.950	17.000
24.478	0.108	40.896	0.092	42.985	0.108		
24.925	0.113	40.896	0.096	42.985	0.113		
25.373	0.117	40.896	0.100	42.836	0.117		
25.672	0.121	40.896	0.104	42.687	0.121		
25.970	0.125	40.896	0.108	42.687	0.125		
26.418	0.129	40.896	0.113	42.537	0.129		
26.716	0.133	40.896	0.117	42.388	0.133		
27.015	0.138	40.896	0.121	42.388	0.138		
27.313	0.142	40.896	0.125	42.239	0.142		
27.612	0.146	40.896	0.129	42.239	0.146		
27.761	0.150	40.896	0.133	42.090	0.150		
28.060	0.154	40.896	0.138	42.090	0.154		
28.209	0.158	40.896	0.142	41.940	0.158		
28.507	0.163	40.896	0.146	41.940	0.163		
28.806	0.167	40.896	0.150	41.791	0.167		
28.955	0.171	40.896	0.154	41.791	0.171		
29.254	0.175	40.896	0.158	41.642	0.175		
29.403	0.179	40.896	0.163	41.642	0.179		
29.701	0.183	40.896	0.167	41.642	0.183		
29.851	0.188	40.896	0.171	41.493	0.188		
30.149	0.192	40.896	0.175	41.493	0.192		
30.299	0.196	41.045	0.179	41.493	0.196		
30.597	0.200	41.045	0.183	41.343	0.200		

30.746	0.204	40.896	0.188	41.343	0.204		
30.896	0.208	40.896	0.192	41.194	0.208		
31.194	0.213	40.896	0.196	41.194	0.213		
31.343	0.217	40.896	0.200	41.194	0.217		
31.493	0.221	40.896	0.204	41.045	0.221		
31.642	0.225	40.896	0.208	41.045	0.225		
31.791	0.229	40.896	0.213	41.045	0.229		
32.090	0.233	40.896	0.217	40.896	0.233		
32.239	0.238	40.896	0.221	40.896	0.238		
32.388	0.242	40.896	0.225	40.896	0.242		
32.388	0.246	40.896	0.229	40.896	0.246		
32.537	0.250	40.896	0.233	40.746	0.250		
32.687	0.254	40.896	0.238	40.746	0.254		
32.836	0.258	40.896	0.242	40.746	0.258		
32.985	0.263	40.896	0.246	40.597	0.263		
33.134	0.267	40.896	0.250	40.597	0.267		
33.134	0.271	40.896	0.254	40.597	0.271		
33.284	0.275	40.896	0.258	40.597	0.275		
33.284	0.279	40.896	0.263	40.597	0.279		
33.433	0.283	40.896	0.267	40.597	0.283		
33.582	0.288	40.896	0.271	40.597	0.288		
33.582	0.292	40.896	0.275	40.597	0.292		
33.731	0.296	40.896	0.279	40.597	0.296		
33.731	0.300	40.896	0.283	40.597	0.300		
33.881	0.304	40.896	0.288	40.597	0.304		
33.881	0.308	40.896	0.292	40.597	0.308		
34.030	0.313	40.896	0.296	40.597	0.313		
34.030	0.317	40.896	0.300	40.597	0.317		
34.179	0.321	40.896	0.304	40.597	0.321		
34.179	0.325	40.896	0.308	40.597	0.325		
34.328	0.329	41.045	0.313	40.597	0.329		
34.328	0.333	41.045	0.317	40.746	0.333		
34.328	0.338	41.045	0.321	40.746	0.338		
34.478	0.342	41.045	0.325	40.746	0.342		
34.478	0.346	41.045	0.329	40.746	0.346		
34.478	0.350	41.045	0.333	40.746	0.350		
34.627	0.354	41.045	0.338	40.746	0.354		
34.627	0.358	41.045	0.342	40.746	0.358		
34.627	0.363	41.045	0.346	40.746	0.363		
34.776	0.367	41.045	0.350	40.746	0.367		
34.776	0.371	41.045	0.354	40.746	0.371		
34.776	0.375	41.045	0.358	40.896	0.375		
34.776	0.379	41.045	0.363	40.896	0.379		
34.925	0.383	41.045	0.367	40.896	0.383		
34.925	0.388	41.045	0.371	40.896	0.388		
34.925	0.392	41.045	0.375	40.896	0.392		
34.925	0.396	41.045	0.379	40.896	0.396		
34.925	0.400	41.045	0.383	40.896	0.400		
35.075	0.404	41.045	0.388	41.045	0.404		
35.075	0.408	41.045	0.392	41.045	0.408		
35.075	0.413	41.045	0.396	41.045	0.413		
35.075	0.417	41.045	0.400	41.045	0.417		
35.075	0.421	41.045	0.404	41.045	0.421		

35.224	0.425	41.045	0.408	41.045	0.425		
35.224	0.429	41.045	0.413	41.045	0.429		
35.224	0.433	41.045	0.417	41.045	0.433		
35.224	0.438	41.045	0.421	41.045	0.438		
35.373	0.442	41.045	0.425	41.045	0.442		
35.373	0.446	41.045	0.429	41.045	0.446		
35.373	0.450	41.045	0.433	41.194	0.450		
35.373	0.454	41.045	0.438	41.194	0.454		
35.373	0.458	41.045	0.442	41.194	0.458		
35.373	0.463	41.045	0.446	41.194	0.463		
35.373	0.467	41.045	0.450	41.194	0.467		
35.522	0.471	41.045	0.454	41.194	0.471		
35.522	0.475	41.045	0.458	41.343	0.475		
35.522	0.479	41.045	0.463	41.343	0.479		
35.522	0.483	41.045	0.467	41.343	0.483		
35.522	0.488	41.045	0.471	41.343	0.488		
35.522	0.492	41.045	0.475	41.493	0.492		
35.522	0.496	41.045	0.479	41.493	0.496		
35.522	0.500	41.194	0.483	41.493	0.500		
35.672	0.504	41.194	0.488	41.493	0.504		
35.672	0.508	41.194	0.492	41.642	0.508		
35.672	0.513	41.194	0.496	41.642	0.513		
35.672	0.517	41.194	0.500	41.791	0.517		
35.672	0.521	41.194	0.504	41.791	0.521		
35.672	0.525	41.194	0.508	41.791	0.525		
35.672	0.529	41.194	0.513	41.940	0.529		
35.672	0.533	41.343	0.517	41.940	0.533		
35.821	0.538	41.343	0.521	41.940	0.538		
35.821	0.542	41.343	0.525	42.090	0.542		
35.821	0.546	41.343	0.529	42.090	0.546		
35.821	0.550	41.343	0.533	42.090	0.550		
35.821	0.554	41.343	0.538	42.239	0.554		
35.821	0.558	41.343	0.542	42.239	0.558		
35.821	0.563	41.343	0.546	42.388	0.563		
35.821	0.567	41.343	0.550	42.388	0.567		
35.821	0.571	41.194	0.554	42.388	0.571		
35.821	0.575	41.343	0.558	42.388	0.575		
35.970	0.579	41.343	0.563	42.537	0.579		
35.970	0.583	41.343	0.567	42.537	0.583		
35.970	0.588	41.343	0.571	42.537	0.588		
35.970	0.592	41.194	0.575	42.537	0.592		
35.970	0.596	41.194	0.579	42.537	0.596		
35.970	0.600	41.194	0.583	42.537	0.600		
35.970	0.604	41.194	0.588	42.687	0.604		
35.970	0.608	41.194	0.592	42.687	0.608		
35.970	0.613	41.194	0.596	42.687	0.613		
35.970	0.617	41.194	0.600	42.687	0.617		
35.970	0.621	41.194	0.604	42.687	0.621		
35.970	0.625	41.343	0.608	42.687	0.625		
35.970	0.629	41.343	0.613	42.687	0.629		
35.970	0.633	41.343	0.617	42.836	0.633		
35.970	0.638	41.343	0.621	42.836	0.638		
35.970	0.642	41.343	0.625	42.836	0.642		

35.970	0.646	41.343	0.629	42.836	0.646		
36.119	0.650	41.343	0.633	42.836	0.650		
36.119	0.654	41.343	0.638	42.836	0.654		
36.119	0.658	41.343	0.642	42.836	0.658		
36.119	0.663	41.343	0.646	42.836	0.663		
36.119	0.667	41.343	0.650	42.836	0.667		
36.119	0.671	41.343	0.654	42.985	0.671		
36.119	0.675	41.343	0.658	42.910	0.675		
36.119	0.679	41.343	0.663	42.923	0.679		
36.119	0.683	41.343	0.667	42.935	0.683		
36.119	0.688	41.343	0.671	42.948	0.688		
36.119	0.692	41.343	0.675	42.960	0.692		
36.119	0.696	41.343	0.679	42.973	0.696		
36.119	0.700	41.343	0.683	42.985	0.700		
36.119	0.704	41.493	0.688	42.998	0.704		
36.119	0.708	41.493	0.692	43.010	0.708		
36.119	0.713	41.493	0.696	43.022	0.713		
36.269	0.717	41.493	0.700	43.035	0.717		
36.269	0.721	41.493	0.704	43.047	0.721		
36.269	0.725	41.493	0.708	43.060	0.725		
36.269	0.729	41.493	0.713	43.072	0.729		
36.269	0.733	41.493	0.717	43.085	0.733		
36.269	0.738	41.493	0.721	43.097	0.738		
36.269	0.742	41.493	0.725	43.109	0.742		
36.269	0.746	41.493	0.729	43.122	0.746		
36.269	0.750	41.493	0.733	43.134	0.750		
36.269	0.754	41.493	0.738	43.147	0.754		
36.269	0.758	41.493	0.742	43.159	0.758		
36.269	0.763	41.493	0.746	43.172	0.763		
36.269	0.767	41.493	0.750	43.184	0.767		
36.269	0.771	41.493	0.754	43.197	0.771		
36.269	0.775	41.493	0.758	43.209	0.775		
36.269	0.779	41.493	0.763	43.221	0.779		
36.418	0.783	41.493	0.767	43.234	0.783		
36.418	0.788	41.493	0.771	43.246	0.788		
36.418	0.792	41.493	0.775	43.259	0.792		
36.418	0.796	41.493	0.779	43.271	0.796		
36.418	0.800	41.493	0.783	43.284	0.800		
36.418	0.804	41.493	0.788	43.296	0.804		
36.418	0.808	41.493	0.792	43.308	0.808		
36.418	0.813	41.493	0.796	43.321	0.813		
36.418	0.817	41.493	0.800	43.333	0.817		
36.418	0.821	41.493	0.804	43.346	0.821		
36.418	0.825	41.493	0.808	43.358	0.825		
36.418	0.829	41.493	0.813	43.371	0.829		
36.567	0.833	41.493	0.817	43.383	0.833		
36.567	0.838	41.493	0.821	43.396	0.838		
36.567	0.842	41.493	0.825	43.408	0.842		
36.567	0.846	41.493	0.829	43.420	0.846		
36.567	0.850	41.493	0.833	43.433	0.850		
36.567	0.854	41.493	0.838	43.445	0.854		
36.567	0.858	41.493	0.842	43.458	0.858		
36.567	0.863	41.493	0.846	43.470	0.863		

36.567	0.867	41.493	0.850	43.483	0.867		
36.567	0.871	41.493	0.854	43.495	0.871		
36.567	0.875	41.493	0.858	43.507	0.875		
36.567	0.879	41.493	0.863	43.520	0.879		
36.567	0.883	41.493	0.867	43.532	0.883		
36.567	0.888	41.493	0.871	43.545	0.888		
36.567	0.892	41.493	0.875	43.557	0.892		
36.716	0.896	41.493	0.879	43.570	0.896		
36.716	0.900	41.493	0.883	43.582	0.900		
36.716	0.904	41.493	0.888	43.595	0.904		
36.716	0.908	41.493	0.892	43.607	0.908		
36.716	0.913	41.493	0.896	43.619	0.913		
36.716	0.917	41.493	0.900	43.632	0.917		
36.716	0.921	41.493	0.904	43.644	0.921		
36.716	0.925	41.493	0.908	43.657	0.925		
36.716	0.929	41.493	0.913	43.669	0.929		
36.716	0.933	41.493	0.917	43.682	0.933		
36.716	0.938	41.493	0.921	43.694	0.938		
36.716	0.942	41.642	0.925	43.706	0.942		
36.716	0.946	41.642	0.929	43.719	0.946		
36.716	0.950	41.642	0.933	43.731	0.950		
36.716	0.954	41.642	0.938	43.744	0.954		
36.716	0.958	41.642	0.942	43.756	0.958		
36.716	0.963	41.642	0.946	43.769	0.963		
36.716	0.967	41.642	0.950	43.781	0.967		
36.716	0.971	41.642	0.954	43.794	0.971		
36.716	0.975	41.642	0.958	43.806	0.975		
36.716	0.979	41.642	0.963	43.818	0.979		
36.866	0.983	41.642	0.967	43.831	0.983		
36.866	0.988	41.642	0.971	43.843	0.988		
36.866	0.992	41.642	0.975	43.856	0.992		
36.866	0.996	41.642	0.979	43.868	0.996		
36.866	1.000	41.642	0.983	43.881	1.000		
36.866	1.004	41.791	0.988	43.893	1.004		
36.866	1.008	41.642	0.992	43.905	1.008		
36.866	1.013	41.642	0.996	43.918	1.013		
36.866	1.017	41.642	1.000	43.930	1.017		
36.866	1.021	41.642	1.004	43.943	1.021		
36.866	1.025	41.642	1.008	43.955	1.025		
36.866	1.029	41.642	1.013	43.968	1.029		
36.866	1.033	41.642	1.017	43.980	1.033		
36.866	1.038	41.642	1.021	43.993	1.038		
36.866	1.042	41.642	1.025	44.005	1.042		
36.866	1.046	41.642	1.029	44.017	1.046		
37.015	1.050	41.642	1.033	44.030	1.050		
37.015	1.054	41.642	1.038	44.042	1.054		
37.015	1.058	41.642	1.042	44.055	1.058		
37.015	1.063	41.642	1.046	44.067	1.063		
37.015	1.067	41.642	1.050	44.080	1.067		
37.015	1.071	41.642	1.054	44.092	1.071		
37.015	1.075	41.642	1.058	44.104	1.075		
37.015	1.079	41.642	1.063	44.117	1.079		
37.015	1.083	41.642	1.067	44.129	1.083		

37.015	1.088	41.642	1.071	44.142	1.088		
37.015	1.092	41.642	1.075	44.154	1.092		
37.015	1.096	41.642	1.079	44.167	1.096		
37.015	1.100	41.642	1.083	44.179	1.100		
37.015	1.104	41.642	1.088	44.192	1.104		
37.015	1.108	41.642	1.092	44.204	1.108		
37.015	1.113	41.642	1.096	44.216	1.113		
37.015	1.117	41.642	1.100	44.229	1.117		
37.015	1.121	41.642	1.104	44.241	1.121		
37.015	1.125	41.642	1.108	44.254	1.125		
37.015	1.129	41.642	1.113	44.266	1.129		
37.015	1.133	41.642	1.117	44.279	1.133		
37.015	1.138	41.642	1.121	44.291	1.138		
37.015	1.142	41.642	1.125	44.303	1.142		
37.015	1.146	41.642	1.129	44.316	1.146		
37.164	1.150	41.642	1.133	44.328	1.150		
37.164	1.154	41.642	1.138	44.341	1.154		
37.164	1.158	41.642	1.142	44.353	1.158		
37.164	1.163	41.642	1.146	44.366	1.163		
37.164	1.167	41.642	1.150	44.378	1.167		
37.164	1.171	41.642	1.154	44.391	1.171		
37.164	1.175	41.642	1.158	44.403	1.175		
37.164	1.179	41.642	1.163	44.415	1.179		
37.164	1.183	41.642	1.167	44.428	1.183		
37.164	1.188	41.642	1.171	44.440	1.188		
37.313	1.188	41.642	1.175	44.453	1.188		
37.313	1.188	41.642	1.179	44.465	1.188		
37.313	1.188	41.642	1.183	44.478	1.188		
37.313	1.189	41.642	1.188	44.490	1.189		
37.313	1.189	41.642	1.192	44.502	1.189		
37.313	1.189	41.642	1.196	44.515	1.189		
37.313	1.189	41.791	1.200	44.527	1.189		
37.313	1.190	41.791	1.204	44.540	1.190		
37.313	1.190	41.791	1.208	44.552	1.190		
37.313	1.190	41.791	1.213	44.565	1.190		
37.313	1.191	41.791	1.217	44.577	1.191		
37.313	1.191	41.791	1.221	44.590	1.191		
37.313	1.191	41.791	1.225	44.602	1.191		
37.313	1.191	41.791	1.229	44.614	1.191		
37.313	1.192	41.791	1.233	44.627	1.192		
37.313	1.192	41.791	1.238	44.639	1.192		
37.313	1.192	41.791	1.242	44.652	1.192		
37.313	1.193	41.791	1.246	44.664	1.193		
37.313	1.193	41.791	1.250	44.677	1.193		
37.313	1.193	41.791	1.254	44.689	1.193		
37.313	1.193	41.791	1.258	44.701	1.193		
37.313	1.194	41.791	1.263	44.714	1.194		
37.313	1.194	41.791	1.267	44.726	1.194		
37.313	1.194	41.791	1.271	44.739	1.194		
37.313	1.194	41.791	1.275	44.751	1.194		
37.313	1.195	41.791	1.279	44.764	1.195		
37.313	1.195	41.791	1.283	44.776	1.195		
37.313	1.195	41.642	1.288	44.789	1.195		

37.313	1.196	41.642	1.292	44.801	1.196		
37.313	1.196	41.642	1.296	44.813	1.196		
37.313	1.196	41.642	1.300	44.826	1.196		
37.313	1.196	41.642	1.304	44.838	1.196		
37.313	1.197	41.642	1.308	44.851	1.197		
37.313	1.197	41.642	1.313	44.863	1.197		
37.313	1.197	41.642	1.317	44.876	1.197		
37.313	1.198	41.791	1.321	44.888	1.198		
37.313	1.198	41.791	1.325	44.900	1.198		
37.313	1.198	41.791	1.329	44.913	1.198		
37.313	1.198	41.791	1.333	44.925	1.198		
37.313	1.199	41.791	1.338	44.938	1.199		
37.313	1.199	41.791	1.342	44.950	1.199		
37.463	1.199	41.791	1.346	44.963	1.199		
37.463	1.199	41.791	1.350	44.975	1.199		
37.463	1.200	41.791	1.354		1.200		
37.463	1.200	41.791	1.358		1.200		
37.463	1.200	41.791	1.363		1.200		
37.463	1.201	41.791	1.367		1.201		
37.463	1.201	41.791	1.371		1.201		
37.463	1.201	41.791	1.375		1.201		
37.463	1.201	41.791	1.379		1.201		
37.463	1.202	41.791	1.383		1.202		
37.463	1.202	41.791	1.388		1.202		
37.463	1.202	41.791	1.392		1.202		
37.463	1.203	41.791	1.396		1.203		
37.463	1.203	41.791	1.400		1.203		
37.463	1.203	41.791	1.404		1.203		
37.463	1.203	41.791	1.408		1.203		
37.463	1.204	41.791	1.413		1.204		
37.463	1.204	41.791	1.417		1.204		
37.463	1.204	41.791	1.421		1.204		
37.463	1.204	41.791	1.425		1.204		
37.463	1.205	41.791	1.429		1.205		
37.463	1.205	41.940	1.433		1.205		
37.463	1.205	41.791	1.438		1.205		
37.463	1.206	41.791	1.442		1.206		
37.463	1.206	41.940	1.446		1.206		
37.463	1.206	41.940	1.450		1.206		
37.463	1.206	41.940	1.454		1.206		
37.463	1.207	41.940	1.458		1.207		
37.463	1.207	41.940	1.463		1.207		
37.463	1.207	41.940	1.467		1.207		
37.463	1.208	41.940	1.471		1.208		
37.463	1.208	41.940	1.475		1.208		
37.463	1.208	41.940	1.479		1.208		
37.463	1.208	41.940	1.483		1.208		
37.463	1.209	41.791	1.488		1.209		
37.463	1.209	41.940	1.492		1.209		
37.463	1.209	41.791	1.496		1.209		
37.463	1.209	41.791	1.500		1.209		
37.463	1.210	41.791	1.504		1.210		
37.463	1.210	41.791	1.508		1.210		

37.463	1.210	41.791	1.513		1.210		
37.463	1.211	41.791	1.517		1.211		
37.463	1.211	41.791	1.521		1.211		
37.463	1.211	41.791	1.525		1.211		
37.612	1.211	41.791	1.529		1.211		
37.612	1.212	41.791	1.533		1.212		
37.612	1.212	41.791	1.538		1.212		
37.612	1.212	41.791	1.542		1.212		
37.612	1.213	41.791	1.546		1.213		
37.612	1.213	41.791	1.550		1.213		
37.612	1.213	41.791	1.554		1.213		
37.612	1.213	41.791	1.558		1.213		
37.612	1.214	41.791	1.563		1.214		
37.612	1.214	41.791	1.567		1.214		
37.612	1.214	41.791	1.571		1.214		
37.612	1.214	41.791	1.575		1.214		
37.612	1.215	41.940	1.579		1.215		
37.612	1.215	41.940	1.583		1.215		
37.612	1.215	41.940	1.588		1.215		
37.612	1.216	41.940	1.592		1.216		
37.612	1.216	41.940	1.596		1.216		
37.612	1.216	41.940	1.600		1.216		
37.612	1.216	41.940	1.604		1.216		
37.612	1.217	41.940	1.608		1.217		
37.612	1.217	41.940	1.613		1.217		
37.612	1.217	41.940	1.617		1.217		
37.612	1.218	41.940	1.621		1.218		
37.612	1.218	41.940	1.625		1.218		
37.612	1.218	41.940	1.629		1.218		
37.612	1.218	41.940	1.633		1.218		
37.612	1.219	41.940	1.638		1.219		
37.612	1.219	41.940	1.642		1.219		
37.612	1.219	41.940	1.646		1.219		
37.612	1.219	41.940	1.650		1.219		
37.612	1.220	41.940	1.654		1.220		
37.612	1.220	41.940	1.658		1.220		
37.612	1.220	41.940	1.663		1.220		
37.612	1.221	41.940	1.667		1.221		
37.612	1.221	41.940	1.671		1.221		
37.612	1.221	41.940	1.675		1.221		
37.612	1.221	41.940	1.679		1.221		
37.612	1.222	41.940	1.683		1.222		
37.612	1.222	41.940	1.688		1.222		
37.612	1.222	41.940	1.692		1.222		
37.612	1.223	41.940	1.696		1.223		
37.612	1.223	41.940	1.700		1.223		
37.612	1.223	41.940	1.704		1.223		
37.612	1.223	41.940	1.708		1.223		
37.612	1.224	41.940	1.713		1.224		
37.612	1.224	41.940	1.717		1.224		
37.612	1.224	41.940	1.721		1.224		
37.761	1.224	41.940	1.725		1.224		
37.761	1.225	41.940	1.729		1.225		

37.761	1.225	41.940	1.733		1.225		
37.761	1.225	41.940	1.738		1.225		
37.761	1.226	41.940	1.742		1.226		
37.761	1.226	41.940	1.746		1.226		
37.761	1.226	41.940	1.750		1.226		
37.761	1.226	41.940	1.754		1.226		
37.761	1.227	41.940	1.758		1.227		
37.761	1.227	41.940	1.763		1.227		
37.761	1.227	41.940	1.767		1.227		
37.761	1.228	41.940	1.771		1.228		
37.761	1.228	41.940	1.775		1.228		
37.910	1.228	41.940	1.779		1.228		
37.910	1.228	41.940	1.783		1.228		
37.910	1.229	41.940	1.788		1.229		
37.910	1.229	41.940	1.792		1.229		
37.910	1.229	41.940	1.796		1.229		
37.910	1.229	41.940	1.800		1.229		
37.910	1.230	41.940	1.804		1.230		
37.910	1.230	41.940	1.808		1.230		
37.910	1.230	41.940	1.813		1.230		
37.910	1.231	42.090	1.817		1.231		
37.910	1.231	42.090	1.821		1.231		
37.910	1.231	42.090	1.825		1.231		
37.910	1.231	42.090	1.829		1.231		
37.910	1.232	42.090	1.833		1.232		
37.910	1.232	42.090	1.838		1.232		
37.910	1.232	42.090	1.842		1.232		
38.060	1.233	42.090	1.846		1.233		
38.060	1.233	42.090	1.850		1.233		
38.060	1.233	42.090	1.854		1.233		
38.060	1.233	42.090	1.858		1.233		
38.060	1.234	42.090	1.863		1.234		
38.060	1.234	42.090	1.867		1.234		
38.060	1.234	42.090	1.871		1.234		
38.060	1.234	42.090	1.875		1.234		
38.060	1.235	42.090	1.879		1.235		
38.060	1.235	42.090	1.883		1.235		
38.060	1.235	42.090	1.888		1.235		
38.060	1.236	42.090	1.892		1.236		
38.060	1.236	42.090	1.896		1.236		
38.060	1.236	42.090	1.900		1.236		
39.403	2.000	42.090	1.904		2.000		
40.896	4.000	42.090	1.908		4.000		
42.388	8.000	42.090	1.913		8.000		
42.388	12.000	42.090	1.917		12.000		
43.881	16.000	42.090	1.921		16.000		
43.881	20.000	42.090	1.925		20.000		
43.881	24.000	42.090	1.929		24.000		
		42.090	1.933				
		42.090	1.938				
		42.090	1.942				
		42.090	1.946				
		42.090	1.950				

		42.090	1.954				
		42.090	1.958				
		42.090	1.963				
		42.239	1.967				
		42.090	1.971				
		42.090	1.975				
		42.090	1.979				
		42.090	1.983				
		42.090	1.988				
		42.090	1.992				
		42.090	1.996				
		42.090	2.000				
		42.090	2.004				
		42.090	2.008				
		42.239	2.013				
		42.239	2.017				
		42.239	2.021				
		42.239	2.025				
		42.239	2.029				
		42.239	2.033				
		42.239	2.038				
		42.239	2.042				
		42.239	2.046				
		42.239	2.050				
		42.239	2.054				
		42.239	2.058				
		42.239	2.063				
		42.239	2.067				
		42.239	2.071				
		42.239	2.075				
		42.239	2.079				
		42.239	2.083				
		42.239	2.088				
		42.239	2.092				
		42.239	2.096				
		42.239	2.100				
		42.239	2.104				
		42.239	2.108				
		42.239	2.113				
		42.239	2.117				
		42.239	2.121				
		42.239	2.125				
		42.239	2.129				
		42.388	2.133				
		42.388	2.138				
		42.239	2.142				
		42.388	2.146				
		42.239	2.150				
		42.388	2.154				
		42.388	2.158				
		42.388	2.163				
		42.388	2.167				
		42.388	2.171				

		42.388	2.175				
		42.388	2.179				
		42.388	2.183				
		42.388	2.188				
		42.388	2.192				
		42.388	2.196				
		42.388	2.200				
		42.388	2.204				
		42.388	2.208				
		42.388	2.213				
		42.388	2.217				
		42.388	2.221				
		42.388	2.225				
		42.388	2.229				
		42.388	2.233				
		42.388	2.238				
		42.388	2.242				
		42.388	2.246				
		42.388	2.250				
		42.388	2.254				
		42.388	2.258				
		42.388	2.263				
		42.388	2.267				
		42.388	2.271				
		42.388	2.275				
		42.388	2.279				
		42.388	2.283				
		42.388	2.288				
		42.388	2.292				
		42.388	2.296				
		42.388	2.300				
		42.388	2.304				
		42.388	2.308				
		42.388	2.313				
		42.388	2.317				
		42.388	2.321				
		42.388	2.325				
		42.388	2.329				
		42.388	2.333				
		42.537	2.338				
		42.537	2.342				
		42.537	2.346				
		42.537	2.350				
		42.537	2.354				
		42.537	2.358				
		42.537	2.363				
		42.537	2.367				
		42.537	2.371				
		42.537	2.375				
		42.537	2.379				
		42.537	2.383				
		42.537	2.388				
		42.537	2.392				

		42.537	2.396				
		42.537	2.400				
		42.537	2.404				
		42.537	2.408				
		42.537	2.413				
		42.537	2.417				
		42.537	2.421				
		42.537	2.425				
		42.537	2.429				
		42.537	2.433				
		42.537	2.438				
		42.537	2.442				
		42.537	2.446				
		42.537	2.450				
		42.537	2.454				
		42.537	2.458				
		42.537	2.463				
		42.537	2.467				
		42.537	2.471				
		42.537	2.475				
		42.537	2.479				
		42.537	2.483				
		42.537	2.488				
		42.537	2.492				
		42.537	2.496				
		42.537	2.500				
		42.537	2.504				
		42.537	2.508				
		42.537	2.513				
		42.537	2.517				
		42.537	2.521				
		42.537	2.525				
		42.537	2.529				
		42.687	2.533				
		42.687	2.538				
		42.687	2.542				
		42.687	2.546				
		42.687	2.550				
		42.687	2.554				
		42.687	2.558				
		42.537	2.563				
		42.687	2.567				
		42.537	2.571				
		42.687	2.575				
		42.687	2.579				
		42.687	2.583				
		42.687	2.588				
		42.687	2.592				
		42.687	2.596				
		42.687	2.600				
		42.687	2.604				
		42.687	2.608				
		42.687	2.613				

		42.687	2.617				
		42.687	2.621				
		42.687	2.625				
		42.687	2.629				
		42.687	2.633				
		42.687	2.638				
		42.687	2.642				
		42.687	2.646				
		42.687	2.650				
		42.687	2.654				
		42.687	2.658				
		42.687	2.663				
		42.687	2.667				
		42.687	2.671				
		42.687	2.675				
		42.687	2.679				
		42.687	2.683				
		42.687	2.688				
		42.687	2.692				
		42.687	2.696				
		42.687	2.700				
		42.687	2.704				
		42.687	2.708				
		42.687	2.713				
		42.687	2.717				
		42.687	2.721				
		42.687	2.725				
		42.687	2.729				
		42.687	2.733				
		42.687	2.738				
		42.687	2.742				
		42.687	2.746				
		42.687	2.750				
		42.687	2.754				
		42.687	2.758				
		42.687	2.763				
		42.687	2.767				
		42.687	2.771				
		42.687	2.775				
		42.687	2.779				
		42.687	2.783				
		42.687	2.788				
		42.687	2.792				
		42.687	2.796				
		42.687	2.800				
		42.687	2.804				
		42.687	2.808				
		42.687	2.813				
		42.687	2.817				
		42.687	2.821				
		42.687	2.825				
		42.687	2.829				
		42.836	2.833				

		42.836	2.838				
		42.836	2.842				
		42.836	2.846				
		42.836	2.850				
		42.836	2.854				
		42.836	2.858				
		42.836	2.863				
		42.836	2.867				
		42.836	2.871				
		42.836	2.875				
		42.836	2.879				
		42.836	2.883				
		42.836	2.888				
		42.836	2.892				
		42.836	2.896				
		42.836	2.900				
		42.836	2.904				
		42.836	2.908				
		42.836	2.913				
		42.836	2.917				
		42.836	2.921				
		42.836	2.925				
		42.836	2.929				
		42.836	2.933				
		42.836	2.938				
		42.836	2.942				
		42.836	2.946				
		42.836	2.950				
		42.836	2.954				
		42.836	2.958				
		42.836	2.963				
		42.836	2.967				
		42.836	2.971				
		42.836	2.975				
		42.836	2.979				
		42.836	2.983				
		42.836	2.988				
		42.836	2.992				
		42.836	2.996				
		42.836	3.000				
		42.836	3.004				
		42.836	3.008				
		42.836	3.013				
		42.836	3.017				
		42.836	3.021				
		42.836	3.025				
		42.836	3.029				
		42.836	3.033				
		42.836	3.038				
		42.836	3.042				
		42.836	3.046				
		42.836	3.050				
		42.836	3.054				

		42.836	3.058				
		42.836	3.063				
		42.836	3.067				
		42.836	3.071				
		42.836	3.075				
		42.836	3.079				
		42.836	3.083				
		42.836	3.088				
		42.836	3.092				
		42.836	3.096				
		42.836	3.100				
		42.836	3.104				
		42.836	3.108				
		42.836	3.113				
		42.836	3.117				
		42.836	3.121				
		42.836	3.125				
		42.836	3.129				
		42.836	3.133				
		42.836	3.138				
		42.836	3.142				
		42.836	3.146				
		42.836	3.150				
		42.836	3.154				
		42.985	3.158				
		42.985	3.163				
		42.836	3.167				
		42.836	3.171				
		42.985	3.175				
		42.985	3.179				
		42.985	3.183				
		42.985	3.188				
		42.985	3.192				
		42.985	3.196				
		42.985	3.200				
		42.985	3.204				
		42.985	3.208				
		42.985	3.213				
		42.985	3.217				
		42.985	3.221				
		42.985	3.225				
		42.985	3.229				
		42.985	3.233				
		42.985	3.238				
		42.985	3.242				
		42.985	3.246				
		42.985	3.250				
		42.985	3.254				
		42.985	3.258				
		42.985	3.263				
		42.985	3.267				
		42.985	3.271				
		42.985	3.275				

		42.985	3.279				
		42.985	3.283				
		42.985	3.288				
		42.985	3.292				
		42.985	3.296				
		42.985	3.300				
		42.985	3.304				
		42.985	3.308				
		42.985	3.313				
		42.985	3.317				
		42.985	3.321				
		42.985	3.325				
		42.985	3.329				
		42.985	3.333				
		42.985	3.338				
		42.985	3.342				
		42.985	3.346				
		42.985	3.350				
		42.985	3.354				
		42.985	3.358				
		42.985	3.363				
		42.985	3.367				
		42.985	3.371				
		42.985	3.375				
		42.985	3.379				
		42.985	3.383				
		42.985	3.388				
		42.985	3.392				
		42.985	3.396				
		42.985	3.400				
		43.134	3.404				
		43.134	3.408				
		43.134	3.413				
		43.134	3.417				
		43.134	3.421				
		43.134	3.425				
		43.134	3.429				
		43.134	3.433				
		43.134	3.438				
		43.134	3.442				
		43.134	3.446				
		43.134	3.450				
		43.134	3.454				
		43.134	3.458				
		43.134	3.463				
		43.134	3.467				
		43.134	3.471				
		43.134	3.475				
		43.134	3.479				
		43.134	3.483				
		43.134	3.488				
		43.134	3.492				
		43.134	3.496				

		43.134	3.500				
		43.134	3.504				
		43.134	3.508				
		43.134	3.513				
		43.134	3.517				
		43.134	3.521				
		43.134	3.525				
		43.134	3.529				
		43.134	3.533				
		43.134	3.538				
		43.134	3.542				
		43.134	3.546				
		43.134	3.550				
		43.134	3.554				
		43.134	3.558				
		43.134	3.563				
		43.284	3.567				
		43.134	3.571				
		43.134	3.575				
		43.284	3.579				
		43.284	3.583				
		43.284	3.588				
		43.284	3.592				
		43.284	3.596				
		43.284	3.600				
		43.284	3.604				
		43.284	3.608				
		43.284	3.613				
		43.284	3.617				
		43.134	3.621				
		43.134	3.625				
		43.134	3.629				
		43.134	3.633				
		43.134	3.638				
		43.134	3.642				
		43.134	3.646				
		43.134	3.650				
		43.134	3.654				
		43.134	3.658				
		43.134	3.663				
		43.134	3.667				
		43.134	3.671				
		43.134	3.675				
		43.134	3.679				
		43.134	3.683				
		43.134	3.688				
		43.134	3.692				
		43.134	3.696				
		43.134	3.700				
		43.134	3.704				
		43.134	3.708				
		43.134	3.713				
		43.134	3.717				

		43.284	3.721				
		43.284	3.725				
		43.284	3.729				
		43.284	3.733				
		43.284	3.738				
		43.284	3.742				
		43.284	3.746				
		43.284	3.750				
		43.284	3.754				
		43.284	3.758				
		43.284	3.763				
		43.284	3.767				
		43.284	3.771				
		43.284	3.775				
		43.284	3.779				
		43.284	3.783				
		43.284	3.788				
		43.284	3.792				
		43.284	3.796				
		43.284	3.800				
		43.284	3.804				
		43.284	3.808				
		43.284	3.813				
		43.284	3.817				
		43.284	3.821				
		43.284	3.825				
		43.284	3.829				
		43.284	3.833				
		43.284	3.838				
		43.284	3.842				
		43.284	3.846				
		43.284	3.850				
		43.284	3.854				
		43.284	3.858				
		43.284	3.863				
		43.284	3.867				
		43.284	3.871				
		43.284	3.875				
		43.284	3.879				
		43.284	3.883				
		43.284	3.888				
		43.284	3.892				
		43.284	3.896				
		43.284	3.900				
		43.284	3.904				
		43.284	3.908				
		43.284	3.913				
		43.284	3.917				
		43.433	3.921				
		43.284	3.925				
		43.284	3.929				
		43.284	3.933				
		43.284	3.938				

		43.433	3.942				
		43.433	3.946				
		43.433	3.950				
		43.433	3.954				
		43.433	3.958				
		43.433	3.963				
		43.433	3.967				
		43.433	3.971				
		43.433	3.975				
		43.433	3.979				
		43.433	3.983				
		43.433	3.988				
		43.433	3.992				
		43.433	3.996				
		43.433	4.000				
		43.433	4.004				
		43.433	4.008				
		43.284	4.013				
		43.284	4.017				
		43.284	4.021				
		43.284	4.025				
		43.284	4.029				
		43.284	4.033				
		43.284	4.038				
		43.284	4.042				
		43.284	4.046				
		43.284	4.050				
		43.284	4.054				
		43.284	4.058				
		43.284	4.063				
		43.284	4.067				
		43.284	4.071				
		43.284	4.075				
		43.284	4.079				
		43.284	4.083				
		43.284	4.088				
		43.433	8.000				
		43.433	12.000				
		43.433	16.000				
		43.433	20.000				
		43.433	24.000				

65% of degree of saturation

100kPa							
Equilibrium stage		Consolidation stage		Shearing stage			
Matric suction/(kPa)	Time/(hr)	Matric suction/(kPa)	Time/(hr)	Matric suction/(kPa)	Time/(hr)	Matric suction/(kPa)	Shear strain/(%)
0.000	0.000	56.716	0.000	56.716	0.000	0.000	56.716
0.597	0.004	55.224	0.004	56.567	0.004	0.250	56.269
1.194	0.008	55.373	0.008	56.418	0.008	0.500	55.970
1.791	0.013	55.373	0.013	56.418	0.013	0.750	55.821
2.388	0.017	55.522	0.017	56.269	0.017	1.000	55.672
2.985	0.021	55.522	0.021	56.269	0.021	1.250	55.522
3.582	0.025	55.522	0.025	56.269	0.025	1.500	55.373
4.179	0.029	55.672	0.029	56.119	0.029	1.750	55.373
4.776	0.033	55.672	0.033	56.119	0.033	2.000	54.925
5.970	0.038	55.672	0.038	56.119	0.038	2.500	54.179
6.866	0.042	55.672	0.042	55.970	0.042	3.000	52.090
7.761	0.046	55.821	0.046	55.970	0.046	3.500	51.493
8.657	0.050	55.821	0.050	55.970	0.050	4.000	51.493
9.552	0.054	55.821	0.054	55.970	0.054	5.000	49.701
10.448	0.058	55.821	0.058	55.821	0.058	6.000	48.955
11.343	0.063	55.821	0.063	55.821	0.063	7.000	49.552
12.239	0.067	55.821	0.067	55.821	0.067	8.000	49.851
13.134	0.071	55.821	0.071	55.821	0.071	9.000	51.045
14.030	0.075	55.821	0.075	55.821	0.075	10.000	51.343
14.925	0.079	55.821	0.079	55.672	0.079	11.000	52.388
15.821	0.083	55.821	0.083	55.672	0.083	12.000	53.433
16.716	0.088	55.970	0.088	55.672	0.088	13.000	55.075
17.463	0.092	55.970	0.092	55.672	0.092	14.000	58.060
18.209	0.096	55.970	0.096	55.672	0.096	15.000	59.552
18.955	0.100	55.970	0.100	55.522	0.100	16.000	60.896
19.701	0.104	55.970	0.104	55.522	0.104		
20.448	0.108	55.970	0.108	55.522	0.108		
21.194	0.113	55.970	0.113	55.522	0.113		
21.940	0.117	55.970	0.117	55.522	0.117		
22.687	0.121	55.970	0.121	55.522	0.121		
23.433	0.125	55.970	0.125	55.373	0.125		
24.179	0.129	55.970	0.129	55.373	0.129		
24.925	0.133	55.970	0.133	55.373	0.133		
25.672	0.138	55.970	0.138	55.373	0.138		
26.418	0.142	55.970	0.142	55.373	0.142		
27.164	0.146	55.970	0.146	55.224	0.146		
27.910	0.150	55.970	0.150	55.224	0.150		
28.657	0.154	55.970	0.154	55.075	0.154		
29.403	0.158	55.970	0.158	54.925	0.158		
30.149	0.163	55.970	0.163	54.925	0.163		
30.896	0.167	55.970	0.167	54.776	0.167		
31.642	0.171	55.970	0.171	54.776	0.171		
32.388	0.175	55.970	0.175	54.627	0.175		
33.134	0.179	55.970	0.179	54.627	0.179		
33.881	0.183	55.970	0.183	54.478	0.183		
34.478	0.188	55.970	0.188	54.478	0.188		
35.075	0.192	55.970	0.192	54.328	0.192		
35.672	0.196	55.970	0.196	54.328	0.196		
36.269	0.200	55.970	0.200	54.179	0.200		

36.866	0.204	55.970	0.204	54.030	0.204		
37.463	0.208	55.970	0.208	53.881	0.208		
38.060	0.213	55.970	0.213	53.731	0.213		
38.657	0.217	55.970	0.217	53.582	0.217		
38.955	0.221	55.970	0.221	53.433	0.221		
39.254	0.225	55.970	0.225	53.284	0.225		
39.552	0.229	55.970	0.229	52.985	0.229		
39.851	0.233	55.970	0.233	52.687	0.233		
40.149	0.238	55.970	0.238	52.388	0.238		
40.448	0.242	55.970	0.242	52.090	0.242		
40.746	0.246	55.970	0.246	52.090	0.246		
41.045	0.250	55.970	0.250	51.940	0.250		
41.194	0.254	55.970	0.254	51.940	0.254		
41.343	0.258	55.970	0.258	51.791	0.258		
41.493	0.263	55.970	0.263	51.791	0.263		
41.642	0.267	55.970	0.267	51.642	0.267		
41.791	0.271	55.970	0.271	51.642	0.271		
41.940	0.275	55.970	0.275	51.642	0.275		
42.090	0.279	55.970	0.279	51.493	0.279		
42.239	0.283	55.970	0.283	51.493	0.283		
42.388	0.288	55.970	0.288	51.493	0.288		
42.537	0.292	55.970	0.292	51.493	0.292		
42.687	0.296	55.970	0.296	51.493	0.296		
42.836	0.300	55.970	0.300	51.493	0.300		
42.985	0.304	55.970	0.304	51.493	0.304		
43.134	0.308	55.970	0.308	51.493	0.308		
43.284	0.313	55.970	0.313	51.493	0.313		
43.433	0.317	55.970	0.317	51.493	0.317		
43.582	0.321	55.970	0.321	51.493	0.321		
43.731	0.325	55.970	0.325	51.493	0.325		
43.881	0.329	55.970	0.329	51.343	0.329		
44.030	0.333	55.970	0.333	51.343	0.333		
44.179	0.338	55.970	0.338	51.194	0.338		
44.328	0.342	55.970	0.342	51.194	0.342		
44.478	0.346	55.970	0.346	51.045	0.346		
44.627	0.350	55.970	0.350	51.045	0.350		
44.776	0.354	55.970	0.354	50.896	0.354		
44.925	0.358	55.970	0.358	50.896	0.358		
45.075	0.363	55.970	0.363	50.746	0.363		
45.224	0.367	55.970	0.367	50.746	0.367		
45.373	0.371	55.970	0.371	50.597	0.371		
45.522	0.375	55.970	0.375	50.448	0.375		
45.672	0.379	55.970	0.379	50.299	0.379		
45.821	0.383	55.970	0.383	50.149	0.383		
45.970	0.388	55.970	0.388	50.000	0.388		
46.119	0.392	55.970	0.392	49.851	0.392		
46.269	0.396	55.970	0.396	49.701	0.396		
46.418	0.400	55.970	0.400	49.701	0.400		
46.418	0.404	55.970	0.404	49.701	0.404		
46.567	0.408	55.970	0.408	49.701	0.408		
46.567	0.413	55.970	0.413	49.701	0.413		
46.716	0.417	55.970	0.417	49.701	0.417		
46.716	0.421	55.970	0.421	49.552	0.421		
46.866	0.425	55.970	0.425	49.552	0.425		

46.866	0.429	55.970	0.429	49.552	0.429		
47.015	0.433	55.970	0.433	49.552	0.433		
47.015	0.438	55.970	0.438	49.403	0.438		
47.164	0.442	55.970	0.442	49.403	0.442		
47.164	0.446	55.970	0.446	49.403	0.446		
47.313	0.450	55.970	0.450	49.254	0.450		
47.313	0.454	55.970	0.454	49.254	0.454		
47.463	0.458	55.970	0.458	49.254	0.458		
47.463	0.463	55.970	0.463	49.254	0.463		
47.612	0.467	55.970	0.467	49.104	0.467		
47.612	0.471	55.970	0.471	49.104	0.471		
47.761	0.475	55.970	0.475	49.104	0.475		
47.761	0.479	55.970	0.479	48.955	0.479		
47.910	0.483	55.970	0.483	48.955	0.483		
47.910	0.488	55.970	0.488	48.955	0.488		
48.060	0.492	55.970	0.492	48.955	0.492		
48.060	0.496	55.970	0.496	48.955	0.496		
47.910	0.500	55.970	0.500	49.104	0.500		
47.910	0.504	55.970	0.504	49.104	0.504		
47.910	0.508	55.970	0.508	49.104	0.508		
47.910	0.513	55.970	0.513	49.104	0.513		
48.060	0.517	55.970	0.517	49.104	0.517		
48.060	0.521	55.970	0.521	49.254	0.521		
48.060	0.525	55.970	0.525	49.254	0.525		
48.060	0.529	55.970	0.529	49.254	0.529		
48.209	0.533	55.970	0.533	49.254	0.533		
48.209	0.538	55.970	0.538	49.403	0.538		
48.209	0.542	55.970	0.542	49.403	0.542		
48.209	0.546	55.970	0.546	49.403	0.546		
48.209	0.550	56.119	0.550	49.403	0.550		
48.358	0.554	56.119	0.554	49.403	0.554		
48.358	0.558	56.119	0.558	49.552	0.558		
48.358	0.563	56.119	0.563	49.552	0.563		
48.358	0.567	56.119	0.567	49.552	0.567		
48.507	0.571	56.119	0.571	49.552	0.571		
48.507	0.575	56.119	0.575	49.552	0.575		
48.507	0.579	56.119	0.579	49.552	0.579		
48.657	0.583	56.119	0.583	49.552	0.583		
48.657	0.588	56.119	0.588	49.552	0.588		
48.657	0.592	56.119	0.592	49.552	0.592		
48.806	0.596	56.119	0.596	49.552	0.596		
48.806	0.600	56.119	0.600	49.851	0.600		
48.806	0.604	56.119	0.604	49.851	0.604		
48.955	0.608	56.119	0.608	49.851	0.608		
48.955	0.613	56.119	0.613	49.851	0.613		
48.955	0.617	56.119	0.617	49.851	0.617		
49.104	0.621	56.119	0.621	49.851	0.621		
49.104	0.625	56.269	0.625	49.851	0.625		
49.104	0.629	56.269	0.629	49.851	0.629		
49.254	0.633	56.269	0.633	49.851	0.633		
49.254	0.638	56.269	0.638	49.851	0.638		
49.254	0.642	56.269	0.642	49.851	0.642		
49.403	0.646	56.269	0.646	49.851	0.646		
49.403	0.650	56.269	0.650	50.000	0.650		

49.403	0.654	56.269	0.654	50.000	0.654		
49.552	0.658	56.269	0.658	50.149	0.658		
49.552	0.663	56.269	0.663	50.149	0.663		
49.552	0.667	56.269	0.667	50.299	0.667		
49.701	0.671	56.269	0.671	50.299	0.671		
49.701	0.675	56.269	0.675	50.448	0.675		
49.701	0.679	56.269	0.679	50.448	0.679		
49.851	0.683	56.269	0.683	50.448	0.683		
49.851	0.688	56.269	0.688	50.597	0.688		
49.851	0.692	56.269	0.692	50.597	0.692		
50.000	0.696	56.269	0.696	50.746	0.696		
50.000	0.700	56.269	0.700	50.746	0.700		
50.000	0.704	56.269	0.704	50.746	0.704		
50.149	0.708	56.269	0.708	50.896	0.708		
50.149	0.713	56.418	0.713	50.896	0.713		
50.149	0.717	56.418	0.717	50.896	0.717		
50.299	0.721	56.418	0.721	51.045	0.721		
50.299	0.725	56.418	0.725	51.045	0.725		
50.299	0.729	56.418	0.729	51.045	0.729		
50.299	0.733	56.418	0.733	51.045	0.733		
50.448	0.738	56.418	0.738	51.045	0.738		
50.448	0.742	56.418	0.742	51.045	0.742		
50.448	0.746	56.418	0.746	51.045	0.746		
50.448	0.750	56.418	0.750	51.045	0.750		
50.597	0.754	56.418	0.754	51.045	0.754		
50.597	0.758	56.418	0.758	51.343	0.758		
50.597	0.763	56.418	0.763	51.343	0.763		
50.597	0.767	56.418	0.767	51.343	0.767		
50.746	0.771	56.418	0.771	51.343	0.771		
50.746	0.775	56.418	0.775	51.343	0.775		
50.746	0.779	56.418	0.779	51.343	0.779		
50.746	0.783	56.418	0.783	51.343	0.783		
50.896	0.788	56.418	0.788	51.343	0.788		
50.896	0.792	56.418	0.792	51.343	0.792		
50.896	0.796	56.418	0.796	51.343	0.796		
50.896	0.800	56.418	0.800	51.343	0.800		
50.896	0.804	56.418	0.804	51.343	0.804		
51.045	0.808	56.418	0.808	51.493	0.808		
51.045	0.813	56.418	0.813	51.493	0.813		
51.045	0.817	56.418	0.817	51.642	0.817		
51.045	0.821	56.418	0.821	51.642	0.821		
51.045	0.825	56.418	0.825	51.791	0.825		
51.194	0.829	56.418	0.829	51.791	0.829		
51.194	0.833	56.418	0.833	51.791	0.833		
51.194	0.838	56.418	0.838	51.940	0.838		
51.194	0.842	56.418	0.842	51.940	0.842		
51.194	0.846	56.418	0.846	51.940	0.846		
51.343	0.850	56.418	0.850	52.090	0.850		
51.343	0.854	56.418	0.854	52.090	0.854		
51.343	0.858	56.418	0.858	52.090	0.858		
51.343	0.863	56.567	0.863	52.090	0.863		
51.343	0.867	56.567	0.867	52.239	0.867		
51.343	0.871	56.567	0.871	52.239	0.871		
51.493	0.875	56.567	0.875	52.239	0.875		

51.493	0.879	56.567	0.879	52.388	0.879		
51.493	0.883	56.567	0.883	52.388	0.883		
51.493	0.888	56.567	0.888	52.537	0.888		
51.493	0.892	56.567	0.892	52.537	0.892		
51.642	0.896	56.567	0.896	52.687	0.896		
51.642	0.900	56.567	0.900	52.687	0.900		
51.642	0.904	56.567	0.904	52.836	0.904		
51.642	0.908	56.567	0.908	52.836	0.908		
51.642	0.913	56.567	0.913	52.985	0.913		
51.642	0.917	56.567	0.917	52.985	0.917		
51.791	0.921	56.567	0.921	52.985	0.921		
51.791	0.925	56.567	0.925	53.134	0.925		
51.791	0.929	56.567	0.929	53.134	0.929		
51.791	0.933	56.567	0.933	53.134	0.933		
51.791	0.938	56.567	0.938	53.284	0.938		
51.791	0.942	56.567	0.942	53.284	0.942		
51.940	0.946	56.567	0.946	53.284	0.946		
51.940	0.950	56.567	0.950	53.433	0.950		
51.940	0.954	56.567	0.954	53.433	0.954		
51.940	0.958	56.567	0.958	53.433	0.958		
51.940	0.963	56.567	0.963	53.582	0.963		
51.940	0.967	56.567	0.967	53.582	0.967		
51.940	0.971	56.567	0.971	53.582	0.971		
52.090	0.975	56.567	0.975	53.731	0.975		
52.090	0.979	56.567	0.979	53.731	0.979		
52.090	0.983	56.567	0.983	53.881	0.983		
52.090	0.988	56.567	0.988	53.881	0.988		
52.090	0.992	56.567	0.992	54.030	0.992		
52.090	0.996	56.567	0.996	54.030	0.996		
52.239	1.000	56.567	1.000	54.179	1.000		
52.239	1.004	56.567	1.004	54.179	1.004		
52.239	1.008	56.567	1.008	54.328	1.008		
52.239	1.013	56.567	1.013	54.328	1.013		
52.239	1.017	56.567	1.017	54.328	1.017		
52.239	1.021	56.567	1.021	54.478	1.021		
52.388	1.025	56.567	1.025	54.478	1.025		
52.388	1.029	56.567	1.029	54.627	1.029		
52.388	1.033	56.567	1.033	54.776	1.033		
52.388	1.038	56.567	1.038	54.925	1.038		
52.388	1.042	56.567	1.042	55.075	1.042		
52.388	1.046	56.567	1.046	55.224	1.046		
52.388	1.050	56.567	1.050	55.373	1.050		
52.537	1.054	56.567	1.054	55.522	1.054		
52.537	1.058	56.567	1.058	55.672	1.058		
52.537	1.063	56.567	1.063	55.821	1.063		
52.537	1.067	56.567	1.067	55.970	1.067		
52.537	1.071	56.567	1.071	56.119	1.071		
52.537	1.075	56.567	1.075	56.269	1.075		
52.537	1.079	56.567	1.079	56.418	1.079		
52.537	1.083	56.567	1.083	56.567	1.083		
52.687	1.088	56.567	1.088	56.716	1.088		
52.687	1.092	56.567	1.092	56.866	1.092		
52.687	1.096	56.567	1.096	57.015	1.096		
52.687	1.100	56.567	1.100	57.164	1.100		

52.687	1.104	56.567	1.104	57.313	1.104		
52.687	1.108	56.567	1.108	57.463	1.108		
52.687	1.113	56.567	1.113	57.612	1.113		
52.836	1.117	56.567	1.117	57.761	1.117		
52.836	1.121	56.567	1.121	58.060	1.121		
52.836	1.125	56.567	1.125	58.060	1.125		
52.836	1.129	56.567	1.129	58.209	1.129		
52.836	1.133	56.567	1.133	58.209	1.133		
52.836	1.138	56.567	1.138	58.358	1.138		
52.836	1.142	56.567	1.142	58.358	1.142		
52.836	1.146	56.567	1.146	58.507	1.146		
52.985	1.150	56.567	1.150	58.507	1.150		
52.985	1.154	56.567	1.154	58.657	1.154		
52.985	1.158	56.567	1.158	58.657	1.158		
52.985	1.163	56.567	1.163	58.806	1.163		
52.985	1.167	56.567	1.167	58.806	1.167		
52.985	1.171	56.567	1.171	58.955	1.171		
52.985	1.175	56.567	1.175	58.955	1.175		
52.985	1.179	56.567	1.179	59.104	1.179		
53.134	1.183	56.567	1.183	59.104	1.183		
53.134	1.188	56.567	1.188	59.254	1.188		
53.134	1.192	56.567	1.192	59.254	1.192		
53.134	1.196	56.567	1.196	59.403	1.196		
53.134	1.200	56.567	1.200	59.552	1.200		
53.134	1.204	56.567	1.204	59.552	1.204		
53.134	1.208	56.567	1.208	59.701	1.208		
53.284	1.213	56.567	1.213	59.701	1.213		
53.284	1.217	56.567	1.217	59.851	1.217		
53.284	1.221	56.567	1.221	59.851	1.221		
53.284	1.225	56.567	1.225	60.000	1.225		
53.284	1.229	56.567	1.229	60.000	1.229		
53.284	1.233	56.567	1.233	60.149	1.233		
53.284	1.238	56.567	1.238	60.149	1.238		
53.284	1.242	56.567	1.242	60.299	1.242		
53.433	1.246	56.567	1.246	60.299	1.246		
53.433	1.250	56.567	1.250	60.448	1.250		
53.433	1.254	56.567	1.254	60.448	1.254		
53.433	1.258	56.567	1.258	60.597	1.258		
53.433	1.263	56.567	1.263	60.597	1.263		
53.433	1.267	56.567	1.267	60.746	1.267		
53.433	1.271	56.567	1.271	60.746	1.271		
53.433	1.275	56.567	1.275	60.896	1.275		
53.433	1.279	56.567	1.279	60.896	1.279		
53.582	1.283	56.567	1.283				
53.582	1.288	56.567	1.288				
53.582	1.292	56.567	1.292				
53.582	1.296	56.567	1.296				
53.582	1.300	56.567	1.300				
53.582	1.304	56.567	1.304				
53.582	1.308	56.567	1.308				
53.582	1.313	56.567	1.313				
53.582	1.317	56.567	1.317				
53.731	1.321	56.567	1.321				
53.731	1.325	56.567	1.325				

53.731	1.329	56.567	1.329				
53.731	1.333	56.567	1.333				
53.731	1.338	56.567	1.338				
53.731	1.342	56.567	1.342				
53.731	1.346	56.567	1.346				
53.731	1.350	56.567	1.350				
53.731	1.354	56.567	1.354				
53.731	1.358	56.567	1.358				
53.881	1.363	56.567	1.363				
53.881	1.367	56.567	1.367				
53.881	1.371	56.567	1.371				
53.881	1.375	56.567	1.375				
53.881	1.379	56.567	1.379				
53.881	1.383	56.567	1.383				
53.881	1.388	56.567	1.388				
53.881	1.392	56.567	1.392				
53.881	1.396	56.567	1.396				
54.030	1.400	56.567	1.400				
54.030	1.404	56.567	1.404				
54.030	1.408	56.567	1.408				
54.030	1.413	56.567	1.413				
54.030	1.417	56.567	1.417				
54.030	1.421	56.567	1.421				
54.030	1.425	56.567	1.425				
54.030	1.429	56.567	1.429				
54.030	1.433	56.567	1.433				
54.030	1.438	56.567	1.438				
54.179	1.442	56.567	1.442				
54.179	1.446	56.567	1.446				
54.179	1.450	56.567	1.450				
54.179	1.454	56.567	1.454				
54.179	1.458	56.567	1.458				
54.328	1.463	56.567	1.463				
54.328	1.467	56.567	1.467				
54.328	1.471	56.567	1.471				
54.328	1.475	56.567	1.475				
54.328	1.479	56.567	1.479				
54.328	1.483	56.567	1.483				
54.328	1.488	56.567	1.488				
54.328	1.492	56.567	1.492				
54.478	1.496	56.567	1.496				
54.478	1.500	56.567	1.500				
54.478	1.504	56.567	1.504				
54.478	1.508	56.567	1.508				
54.478	1.513	56.567	1.513				
54.478	1.517	56.567	1.517				
54.478	1.521	56.567	1.521				
54.478	1.525	56.567	1.525				
54.478	1.529	56.567	1.529				
54.627	1.533	56.567	1.533				
54.627	1.538	56.567	1.538				
54.627	1.542	56.567	1.542				
54.627	1.546	56.567	1.546				
54.627	1.550	56.567	1.550				

54.627	1.554	56.567	1.554				
54.627	1.558	56.567	1.558				
54.627	1.563	56.567	1.563				
54.627	1.567	56.567	1.567				
54.627	1.571	56.567	1.571				
54.627	1.575	56.567	1.575				
54.776	1.579	56.567	1.579				
54.776	1.583	56.567	1.583				
54.776	1.588	56.567	1.588				
54.776	1.592	56.567	1.592				
54.776	1.596	56.567	1.596				
54.776	1.600	56.567	1.600				
54.776	1.604	56.567	1.604				
54.776	1.608	56.567	1.608				
54.776	1.613	56.567	1.613				
54.925	1.617	56.567	1.617				
54.925	1.621	56.567	1.621				
54.925	1.625	56.567	1.625				
54.925	1.629	56.567	1.629				
54.925	1.633	56.567	1.633				
54.925	1.638	56.567	1.638				
54.925	1.642	56.567	1.642				
54.925	1.646	56.567	1.646				
55.075	1.650	56.567	1.650				
55.075	1.654	56.567	1.654				
55.075	1.658	56.567	1.658				
55.075	1.663	56.567	1.663				
55.075	1.667	56.567	1.667				
55.075	1.671	56.567	1.671				
55.075	1.675	56.567	1.675				
55.075	1.679	56.567	1.679				
55.075	1.683	56.567	1.683				
55.075	1.688	56.567	1.688				
55.075	1.692	56.567	1.692				
55.075	1.696	56.567	1.696				
55.075	1.700	56.567	1.700				
55.075	1.704	56.716	1.704				
55.075	1.708	56.716	1.708				
55.075	1.713	56.716	1.713				
55.224	1.717	56.716	1.717				
55.224	1.721	56.716	1.721				
55.224	1.725	56.716	1.725				
55.224	1.729	56.716	1.729				
55.224	1.733	56.716	1.733				
55.224	1.738	56.716	1.738				
55.373	1.742	56.716	1.742				
55.373	1.746	56.716	1.746				
55.373	1.750	56.716	1.750				
55.373	1.754	56.716	1.754				
55.373	1.758	56.716	1.758				
55.373	1.763	56.716	1.763				
55.373	1.767	56.716	1.767				
55.373	1.771	56.716	1.771				
55.373	1.775	56.716	1.775				

55.373	1.779	56.716	1.779				
55.373	1.783	56.716	1.783				
55.373	1.788	56.716	1.788				
55.373	1.792	56.716	1.792				
55.373	1.796	56.716	1.796				
55.373	1.800	56.716	1.800				
55.373	1.804	56.716	1.804				
55.373	1.808	56.716	1.808				
55.373	1.813	56.716	1.813				
55.373	1.817	56.716	1.817				
55.522	1.821	56.716	1.821				
55.522	1.825	56.716	1.825				
55.522	1.829	56.716	1.829				
55.522	1.833	56.716	1.833				
55.522	1.838	56.716	1.838				
55.522	1.842	56.716	1.842				
55.522	1.846	56.716	1.846				
55.522	1.850	56.716	1.850				
55.522	1.854	56.716	1.854				
55.522	1.858	56.716	1.858				
55.522	1.863	56.716	1.863				
55.522	1.867	56.716	1.867				
55.522	1.871	56.716	1.871				
55.522	1.875	56.716	1.875				
55.522	1.879	56.716	1.879				
55.522	1.883	56.716	1.883				
55.522	1.888	56.716	1.888				
55.522	1.892	56.716	1.892				
55.522	1.896	56.716	1.896				
55.672	1.900	56.716	1.900				
55.672	1.904	56.716	1.904				
55.672	1.908	56.716	1.908				
55.672	1.913	56.716	1.913				
55.672	1.917	56.716	1.917				
55.672	1.921	56.716	1.921				
55.672	1.925	56.716	1.925				
55.672	1.929	56.716	1.929				
55.672	1.933	56.716	1.933				
55.672	1.938	56.716	1.938				
55.672	1.942	56.716	1.942				
55.672	1.946	56.716	1.946				
55.672	1.950	56.716	1.950				
55.672	1.954	56.716	1.954				
55.672	1.958	56.716	1.958				
55.672	1.963	56.716	1.963				
55.821	1.967	56.716	1.967				
55.821	1.971	56.716	1.971				
55.821	1.975	56.716	1.975				
55.821	1.979	56.716	1.979				
55.821	1.983	56.716	1.983				
55.821	1.988	56.716	1.988				
55.821	1.992	56.716	1.992				
55.821	1.996	56.716	1.996				
55.821	2.000	56.716	2.000				

55.821	2.004	56.716	2.004				
55.821	2.008	56.716	2.008				
55.821	2.013	56.716	2.013				
55.821	2.017	56.716	2.017				
55.821	2.021	56.716	2.021				
55.821	2.025	56.716	2.025				
55.970	2.029	56.716	2.029				
55.970	2.033	56.716	2.033				
55.970	2.038	56.716	2.038				
55.970	2.042	56.716	2.042				
55.970	2.046	56.716	2.046				
55.970	2.050	56.716	2.050				
55.970	2.054	56.716	2.054				
55.970	2.058	56.716	2.058				
56.119	4.000	56.716	4.000				
56.119	8.000	56.716	8.000				
56.269	12.000	56.716	12.000				
56.418	16.000	56.716	16.000				
56.567	20.000	56.716	20.000				
56.716	24.000	56.716	24.000				

65% of degree of saturation

150kPa							
Equilibrium stage		Consolidation stage		Shearing stage			
Matric suction/(kPa)	Time/(hr)	Matric suction/(kPa)	Time/(hr)	Matric suction/(kPa)	Time/(hr)	Matric suction/(kPa)	Shear strain/(%)
0.000	0.000	86.269	0.000	86.269	0.000	86.269	0.000
0.299	0.004	83.284	0.004	86.269	0.004	86.269	0.250
0.597	0.008	83.284	0.008	86.269	0.008	86.269	0.500
1.045	0.013	83.433	0.013	86.269	0.013	86.269	0.750
1.493	0.017	83.433	0.017	86.269	0.017	86.269	1.000
1.940	0.021	83.433	0.021	86.269	0.021	86.269	1.250
2.388	0.025	83.582	0.025	86.269	0.025	86.269	1.500
2.836	0.029	83.582	0.029	86.269	0.029	86.269	1.750
3.284	0.033	83.582	0.033	86.269	0.033	86.269	2.000
3.731	0.038	83.582	0.038	86.269	0.038	86.269	2.500
4.328	0.042	83.582	0.042	86.269	0.042	86.269	3.000
4.776	0.046	83.582	0.046	86.269	0.046	86.119	3.500
5.075	0.050	83.582	0.050	86.269	0.050	86.119	4.000
6.119	0.054	83.731	0.054	86.269	0.054	86.119	5.000
7.015	0.058	83.731	0.058	86.269	0.058	86.119	6.000
7.910	0.063	83.731	0.063	86.269	0.063	86.119	7.000
9.254	0.067	83.731	0.067	86.269	0.067	86.119	8.000
10.746	0.071	83.731	0.071	86.269	0.071	86.269	9.000
12.687	0.075	83.731	0.075	86.269	0.075	86.418	10.000
14.925	0.079	83.731	0.079	86.269	0.079	86.567	11.000
17.612	0.083	83.731	0.083	86.269	0.083	86.567	12.000
20.896	0.088	83.731	0.088	86.269	0.088	86.866	13.000
24.627	0.092	83.731	0.092	86.269	0.092	87.015	14.000
28.806	0.096	83.731	0.096	86.269	0.096	87.015	15.000
33.731	0.100	83.731	0.100	86.269	0.100	87.164	16.000
38.955	0.104	83.731	0.104	86.269	0.104	87.313	17.000
44.776	0.108	83.731	0.108	86.269	0.108	87.463	18.000
51.045	0.113	83.731	0.113	86.269	0.113	87.463	19.000
57.761	0.117	83.731	0.117	86.269	0.117	87.612	20.000
64.925	0.121	83.881	0.121	86.269	0.121		
72.537	0.125	83.881	0.125	86.269	0.125		
72.537	0.129	83.881	0.129	86.269	0.129		
72.537	0.133	83.881	0.133	86.269	0.133		
72.537	0.138	83.881	0.138	86.269	0.138		
72.687	0.142	83.881	0.142	86.269	0.142		
72.687	0.146	83.881	0.146	86.269	0.146		
72.687	0.150	83.881	0.150	86.269	0.150		
72.687	0.154	83.881	0.154	86.269	0.154		
72.687	0.158	83.881	0.158	86.269	0.158		
72.836	0.163	83.881	0.163	86.269	0.163		
72.836	0.167	83.881	0.167	86.269	0.167		
72.836	0.171	83.881	0.171	86.269	0.171		
72.836	0.175	83.881	0.175	86.269	0.175		
72.836	0.179	83.881	0.179	86.269	0.179		
72.985	0.183	83.881	0.183	86.269	0.183		
72.985	0.188	83.881	0.188	86.269	0.188		
72.985	0.192	83.881	0.192	86.119	0.192		
72.985	0.196	83.881	0.196	86.119	0.196		
72.985	0.200	83.881	0.200	86.269	0.200		

73.284	0.204	83.881	0.204	86.269	0.204		
73.284	0.208	83.881	0.208	86.269	0.208		
73.284	0.213	83.881	0.213	86.269	0.213		
73.284	0.217	83.881	0.217	86.269	0.217		
73.284	0.221	83.881	0.221	86.269	0.221		
73.433	0.225	83.881	0.225	86.269	0.225		
73.433	0.229	83.881	0.229	86.269	0.229		
73.433	0.233	83.881	0.233	86.119	0.233		
73.433	0.238	83.881	0.238	86.119	0.238		
73.582	0.242	83.881	0.242	86.269	0.242		
73.582	0.246	83.881	0.246	86.269	0.246		
73.582	0.250	83.881	0.250	86.269	0.250		
73.582	0.254	83.881	0.254	86.119	0.254		
73.731	0.258	83.881	0.258	86.119	0.258		
73.731	0.263	83.881	0.263	86.119	0.263		
73.731	0.267	83.881	0.267	86.119	0.267		
73.731	0.271	83.881	0.271	86.119	0.271		
73.881	0.275	83.881	0.275	86.119	0.275		
73.881	0.279	83.881	0.279	86.119	0.279		
73.881	0.283	83.881	0.283	86.119	0.283		
73.881	0.288	83.881	0.288	86.119	0.288		
73.881	0.292	83.881	0.292	86.119	0.292		
73.881	0.296	83.881	0.296	86.119	0.296		
73.881	0.300	83.881	0.300	86.119	0.300		
73.881	0.304	83.881	0.304	86.119	0.304		
74.030	0.308	83.881	0.308	86.119	0.308		
74.030	0.313	83.881	0.313	86.119	0.313		
74.030	0.317	83.881	0.317	86.119	0.317		
74.030	0.321	83.881	0.321	86.119	0.321		
74.030	0.325	83.881	0.325	86.119	0.325		
74.030	0.329	83.881	0.329	86.119	0.329		
74.179	0.333	83.881	0.333	86.119	0.333		
74.179	0.338	83.881	0.338	86.119	0.338		
74.179	0.342	83.881	0.342	86.119	0.342		
74.179	0.346	83.881	0.346	86.119	0.346		
74.179	0.350	83.881	0.350	86.119	0.350		
74.179	0.354	83.881	0.354	86.119	0.354		
74.328	0.358	83.881	0.358	86.119	0.358		
74.328	0.363	83.881	0.363	86.119	0.363		
74.328	0.367	83.881	0.367	86.119	0.367		
74.328	0.371	83.881	0.371	86.119	0.371		
74.328	0.375	83.881	0.375	86.119	0.375		
74.328	0.379	83.881	0.379	86.119	0.379		
74.328	0.383	83.881	0.383	86.119	0.383		
74.478	0.388	83.881	0.388	86.119	0.388		
74.478	0.392	83.881	0.392	86.119	0.392		
74.478	0.396	83.881	0.396	86.119	0.396		
74.478	0.400	83.881	0.400	86.119	0.400		
74.478	0.404	83.881	0.404	86.119	0.404		
74.478	0.408	83.881	0.408	86.119	0.408		
74.478	0.413	83.881	0.413	86.119	0.413		
74.478	0.417	83.881	0.417	86.119	0.417		
74.478	0.421	83.881	0.421	86.119	0.421		
74.627	0.425	83.881	0.425	86.119	0.425		

74.627	0.429	83.881	0.429	86.119	0.429		
74.627	0.433	83.881	0.433	86.119	0.433		
74.627	0.438	83.881	0.438	86.119	0.438		
74.627	0.442	83.881	0.442	86.119	0.442		
74.627	0.446	83.881	0.446	86.119	0.446		
74.627	0.450	83.881	0.450	86.119	0.450		
74.776	0.454	83.881	0.454	86.119	0.454		
74.776	0.458	83.881	0.458	86.119	0.458		
74.776	0.463	83.881	0.463	86.119	0.463		
74.776	0.467	83.881	0.467	86.119	0.467		
74.776	0.471	83.881	0.471	86.119	0.471		
74.925	0.475	83.881	0.475	86.119	0.475		
74.925	0.479	83.881	0.479	86.119	0.479		
74.925	0.483	83.881	0.483	86.119	0.483		
74.925	0.488	83.881	0.488	86.119	0.488		
75.075	0.492	83.881	0.492	86.119	0.492		
75.075	0.496	83.881	0.496	86.119	0.496		
75.075	0.500	83.881	0.500	86.119	0.500		
75.075	0.504	83.881	0.504	86.119	0.504		
75.075	0.508	83.881	0.508	86.119	0.508		
75.224	0.513	83.881	0.513	86.119	0.513		
75.224	0.517	83.881	0.517	86.119	0.517		
75.224	0.521	83.881	0.521	86.119	0.521		
75.224	0.525	83.881	0.525	86.119	0.525		
75.224	0.529	83.881	0.529	86.119	0.529		
75.373	0.533	83.881	0.533	86.119	0.533		
75.373	0.538	83.881	0.538	86.119	0.538		
75.373	0.542	83.881	0.542	86.119	0.542		
75.373	0.546	83.881	0.546	86.119	0.546		
75.373	0.550	83.881	0.550	86.119	0.550		
75.522	0.554	83.881	0.554	86.119	0.554		
75.522	0.558	83.881	0.558	86.119	0.558		
75.522	0.563	83.881	0.563	86.119	0.563		
75.522	0.567	83.881	0.567	86.119	0.567		
75.672	0.571	83.881	0.571	86.119	0.571		
75.672	0.575	83.881	0.575	86.119	0.575		
75.672	0.579	83.881	0.579	86.119	0.579		
75.672	0.583	83.881	0.583	86.119	0.583		
75.821	0.588	83.881	0.588	86.119	0.588		
75.821	0.592	83.881	0.592	86.119	0.592		
75.821	0.596	83.881	0.596	86.119	0.596		
75.821	0.600	83.881	0.600	86.119	0.600		
75.970	0.604	83.881	0.604	86.119	0.604		
75.970	0.608	83.881	0.608	86.119	0.608		
75.970	0.613	83.881	0.613	86.119	0.613		
75.970	0.617	83.881	0.617	86.119	0.617		
76.119	0.621	83.881	0.621	86.119	0.621		
76.119	0.625	83.881	0.625	86.119	0.625		
76.119	0.629	83.881	0.629	86.119	0.629		
76.119	0.633	83.881	0.633	86.269	0.633		
76.269	0.638	83.881	0.638	86.269	0.638		
76.269	0.642	83.881	0.642	86.119	0.642		
76.269	0.646	83.881	0.646	86.119	0.646		
76.269	0.650	83.881	0.650	86.269	0.650		

76.269	0.654	83.881	0.654	86.269	0.654		
76.418	0.658	83.881	0.658	86.269	0.658		
76.418	0.663	83.881	0.663	86.269	0.663		
76.418	0.667	83.881	0.667	86.269	0.667		
76.418	0.671	83.881	0.671	86.269	0.671		
76.567	0.675	83.881	0.675	86.269	0.675		
76.567	0.679	83.881	0.679	86.269	0.679		
76.567	0.683	83.881	0.683	86.269	0.683		
76.567	0.688	83.881	0.688	86.269	0.688		
76.567	0.692	83.881	0.692	86.269	0.692		
76.716	0.696	83.881	0.696	86.269	0.696		
76.716	0.700	83.881	0.700	86.269	0.700		
76.716	0.704	83.881	0.704	86.269	0.704		
76.716	0.708	83.881	0.708	86.269	0.708		
76.866	0.713	83.881	0.713	86.269	0.713		
76.866	0.717	83.881	0.717	86.269	0.717		
76.866	0.721	83.881	0.721	86.269	0.721		
76.866	0.725	83.881	0.725	86.269	0.725		
77.015	0.729	83.881	0.729	86.269	0.729		
77.015	0.733	83.881	0.733	86.269	0.733		
77.015	0.738	83.881	0.738	86.269	0.738		
77.015	0.742	83.881	0.742	86.269	0.742		
77.164	0.746	83.881	0.746	86.269	0.746		
77.164	0.750	83.881	0.750	86.418	0.750		
77.164	0.754	83.881	0.754	86.269	0.754		
77.164	0.758	83.881	0.758	86.418	0.758		
77.313	0.763	83.881	0.763	86.418	0.763		
77.313	0.767	83.881	0.767	86.418	0.767		
77.313	0.771	83.881	0.771	86.418	0.771		
77.313	0.775	83.881	0.775	86.418	0.775		
77.463	0.779	83.881	0.779	86.418	0.779		
77.463	0.783	83.881	0.783	86.418	0.783		
77.463	0.788	83.881	0.788	86.418	0.788		
77.463	0.792	83.881	0.792	86.418	0.792		
77.612	0.796	83.881	0.796	86.418	0.796		
77.612	0.800	83.881	0.800	86.418	0.800		
77.612	0.804	83.881	0.804	86.418	0.804		
77.612	0.808	83.881	0.808	86.418	0.808		
77.612	0.813	83.881	0.813	86.418	0.813		
77.761	0.817	83.881	0.817	86.418	0.817		
77.761	0.821	83.881	0.821	86.418	0.821		
77.761	0.825	83.881	0.825	86.418	0.825		
77.761	0.829	83.881	0.829	86.418	0.829		
77.910	0.833	83.881	0.833	86.418	0.833		
77.910	0.838	83.881	0.838	86.418	0.838		
77.910	0.842	83.881	0.842	86.418	0.842		
77.910	0.846	83.881	0.846	86.418	0.846		
78.060	0.850	83.881	0.850	86.418	0.850		
78.060	0.854	83.881	0.854	86.418	0.854		
78.060	0.858	83.881	0.858	86.567	0.858		
78.060	0.863	83.881	0.863	86.567	0.863		
78.060	0.867	83.881	0.867	86.567	0.867		
78.209	0.871	83.881	0.871	86.567	0.871		
78.209	0.875	83.881	0.875	86.567	0.875		

78.209	0.879	83.881	0.879	86.567	0.879		
78.209	0.883	83.881	0.883	86.567	0.883		
78.358	0.888	83.881	0.888	86.567	0.888		
78.358	0.892	83.881	0.892	86.567	0.892		
78.358	0.896	83.881	0.896	86.567	0.896		
78.358	0.900	83.881	0.900	86.567	0.900		
78.507	0.904	83.881	0.904	86.567	0.904		
78.507	0.908	83.881	0.908	86.567	0.908		
78.507	0.913	83.881	0.913	86.567	0.913		
78.507	0.917	83.881	0.917	86.567	0.917		
78.657	0.921	83.881	0.921	86.567	0.921		
78.657	0.925	83.881	0.925	86.567	0.925		
78.657	0.929	83.881	0.929	86.567	0.929		
78.657	0.933	83.881	0.933	86.567	0.933		
78.806	0.938	83.881	0.938	86.567	0.938		
78.806	0.942	83.881	0.942	86.567	0.942		
78.806	0.946	83.881	0.946	86.567	0.946		
78.806	0.950	83.881	0.950	86.567	0.950		
78.955	0.954	83.881	0.954	86.567	0.954		
78.955	0.958	83.881	0.958	86.567	0.958		
78.955	0.963	83.881	0.963	86.567	0.963		
78.955	0.967	83.881	0.967	86.716	0.967		
79.104	0.971	83.881	0.971	86.716	0.971		
79.104	0.975	83.881	0.975	86.716	0.975		
79.104	0.979	83.881	0.979	86.716	0.979		
79.104	0.983	83.881	0.983	86.716	0.983		
79.104	0.988	83.881	0.988	86.716	0.988		
79.254	0.992	84.030	0.992	86.716	0.992		
79.254	0.996	84.030	0.996	86.716	0.996		
79.254	1.000	84.030	1.000	86.716	1.000		
79.254	1.004	84.030	1.004	86.716	1.004		
79.254	1.008	84.030	1.008	86.716	1.008		
79.403	1.013	84.030	1.013	86.716	1.013		
79.403	1.017	84.030	1.017	86.716	1.017		
79.403	1.021	84.030	1.021	86.716	1.021		
79.403	1.025	84.030	1.025	86.716	1.025		
79.403	1.029	84.030	1.029	86.716	1.029		
79.552	1.033	84.030	1.033	86.716	1.033		
79.552	1.038	84.030	1.038	86.716	1.038		
79.552	1.042	84.030	1.042	86.866	1.042		
79.552	1.046	84.030	1.046	86.866	1.046		
79.552	1.050	84.030	1.050	86.866	1.050		
79.701	1.054	84.179	1.054	86.866	1.054		
79.701	1.058	84.179	1.058	86.866	1.058		
79.701	1.063	84.179	1.063	86.866	1.063		
79.701	1.067	84.179	1.067	86.866	1.067		
79.851	1.071	84.179	1.071	86.866	1.071		
79.851	1.075	84.179	1.075	86.866	1.075		
79.851	1.079	84.179	1.079	86.866	1.079		
79.851	1.083	84.179	1.083	86.866	1.083		
80.000	1.088	84.179	1.088	86.866	1.088		
80.000	1.092	84.179	1.092	86.866	1.092		
80.000	1.096	84.179	1.096	86.866	1.096		
80.000	1.100	84.179	1.100	86.866	1.100		

80.000	1.104	84.179	1.104	86.866	1.104		
80.149	1.108	84.328	1.108	86.866	1.108		
80.149	1.113	84.328	1.113	86.866	1.113		
80.149	1.117	84.328	1.117	86.866	1.117		
80.149	1.121	84.328	1.121	87.015	1.121		
80.149	1.125	84.328	1.125	87.015	1.125		
80.299	1.129	84.328	1.129	87.015	1.129		
80.299	1.133	84.328	1.133	87.015	1.133		
80.299	1.138	84.328	1.138	87.015	1.138		
80.299	1.142	84.328	1.142	87.015	1.142		
80.299	1.146	84.328	1.146	87.015	1.146		
80.448	1.150	84.328	1.150	87.015	1.150		
80.448	1.154	84.328	1.154	87.015	1.154		
80.448	1.158	84.328	1.158	87.015	1.158		
80.448	1.163	84.478	1.163	87.015	1.163		
80.448	1.167	84.478	1.167	87.015	1.167		
80.597	1.171	84.478	1.171	87.015	1.171		
80.597	1.175	84.478	1.175	87.015	1.175		
80.597	1.179	84.478	1.179	87.015	1.179		
80.597	1.183	84.478	1.183	87.015	1.183		
80.597	1.188	84.478	1.188	87.015	1.188		
80.746	1.192	84.478	1.192	87.015	1.192		
80.746	1.196	84.478	1.196	87.015	1.196		
80.746	1.200	84.478	1.200	87.015	1.200		
80.746	1.204	84.478	1.204	87.015	1.204		
80.746	1.208	84.478	1.208	87.015	1.208		
80.746	1.213	84.478	1.213	87.015	1.213		
80.896	1.217	84.478	1.217	87.164	1.217		
80.896	1.221	84.478	1.221	87.164	1.221		
80.896	1.225	84.478	1.225	87.164	1.225		
80.896	1.229	84.478	1.229	87.164	1.229		
80.896	1.233	84.478	1.233	87.164	1.233		
81.045	1.238	84.478	1.238	87.164	1.238		
81.045	1.242	84.478	1.242	87.164	1.242		
81.045	1.246	84.478	1.246	87.164	1.246		
81.045	1.250	84.478	1.250	87.164	1.250		
81.045	1.254	84.478	1.254	87.164	1.254		
81.045	1.258	84.478	1.258	87.164	1.258		
81.194	1.263	84.478	1.263	87.164	1.263		
81.194	1.267	84.478	1.267	87.164	1.267		
81.194	1.271	84.478	1.271	87.164	1.271		
81.194	1.275	84.478	1.275	87.164	1.275		
81.194	1.279	84.478	1.279	87.164	1.279		
81.194	1.283	84.478	1.283	87.164	1.283		
81.343	1.288	84.478	1.288	87.164	1.288		
81.343	1.292	84.478	1.292	87.164	1.292		
81.343	1.296	84.478	1.296	87.164	1.296		
81.343	1.300	84.478	1.300	87.164	1.300		
81.343	1.304	84.478	1.304	87.164	1.304		
81.343	1.308	84.478	1.308	87.164	1.308		
81.343	1.313	84.478	1.313	87.313	1.313		
81.493	1.317	84.478	1.317	87.164	1.317		
81.493	1.321	84.478	1.321	87.313	1.321		
81.493	1.325	84.478	1.325	87.313	1.325		

81.493	1.329	84.478	1.329	87.313	1.329		
81.493	1.333	84.478	1.333	87.313	1.333		
81.493	1.338	84.478	1.338	87.313	1.338		
81.642	1.342	84.478	1.342	87.313	1.342		
81.642	1.346	84.478	1.346	87.313	1.346		
81.642	1.350	84.478	1.350	87.313	1.350		
81.642	1.354	84.478	1.354	87.313	1.354		
81.642	1.358	84.478	1.358	87.313	1.358		
81.642	1.363	84.478	1.363	87.313	1.363		
81.791	1.367	84.478	1.367	87.313	1.367		
81.791	1.371	84.478	1.371	87.313	1.371		
81.791	1.375	84.478	1.375	87.313	1.375		
81.791	1.379	84.478	1.379	87.313	1.379		
81.791	1.383	84.478	1.383	87.313	1.383		
81.940	1.388	84.478	1.388	87.313	1.388		
81.940	1.392	84.478	1.392	87.313	1.392		
81.940	1.396	84.478	1.396	87.313	1.396		
81.940	1.400	84.478	1.400	87.313	1.400		
81.940	1.404	84.478	1.404	87.313	1.404		
82.090	1.408	84.478	1.408	87.313	1.408		
82.090	1.413	84.478	1.413	87.313	1.413		
82.090	1.417	84.478	1.417	87.313	1.417		
82.090	1.421	84.478	1.421	87.463	1.421		
82.239	1.425	84.478	1.425	87.463	1.425		
82.239	1.429	84.478	1.429	87.463	1.429		
82.239	1.433	84.478	1.433	87.463	1.433		
82.239	1.438	84.478	1.438	87.463	1.438		
82.239	1.442	84.627	1.442	87.463	1.442		
83.134	2.000	84.627	1.446	87.463	1.446		
84.179	4.000	84.627	1.450	87.463	1.450		
84.776	8.000	84.627	1.454	87.463	1.454		
85.373	12.000	84.627	1.458	87.463	1.458		
86.269	16.000	84.627	1.463	87.463	1.463		
86.269	20.000	84.627	1.467	87.463	1.467		
86.269	24.000	84.627	1.471	87.463	1.471		
		84.627	1.475	87.463	1.475		
		84.627	1.479	87.463	1.479		
		84.627	1.483	87.463	1.483		
		84.627	1.488	87.463	1.488		
		84.627	1.492	87.463	1.492		
		84.627	1.496	87.463	1.496		
		84.627	1.500	87.463	1.500		
		84.627	1.504	87.463	1.504		
		84.627	1.508	87.463	1.508		
		84.627	1.513	87.463	1.513		
		84.776	1.517	87.463	1.517		
		84.776	1.521	87.463	1.521		
		84.776	1.525	87.463	1.525		
		84.776	1.529	87.463	1.529		
		84.776	1.533	87.463	1.533		
		84.776	1.538	87.463	1.538		
		84.776	1.542	87.463	1.542		
		84.776	1.546	87.463	1.546		
		84.776	1.550	87.463	1.550		

		84.776	1.554	87.612	1.554		
		84.776	1.558	87.612	1.558		
		84.776	1.563	87.612	1.563		
		84.776	1.567	87.612	1.567		
		84.776	1.571	87.612	1.571		
		84.776	1.575	87.612	1.575		
		84.776	1.579	87.612	1.579		
		84.776	1.583	87.612	1.583		
		84.776	1.588	87.612	1.588		
		84.776	1.592	87.612	1.592		
		84.776	1.596	87.612	1.596		
		84.776	1.600	87.612	1.600		
		84.776	1.604	87.612	1.604		
		84.776	1.608	87.612	1.608		
		84.776	1.613	87.612	1.613		
		84.776	1.617	87.612	1.617		
		84.776	1.621	87.612	1.621		
		84.776	1.625	87.612	1.625		
		84.776	1.629	87.612	1.629		
		84.776	1.633	87.612	1.633		
		84.776	1.638	87.612	1.638		
		84.776	1.642	87.612	1.642		
		84.776	1.646	87.612	1.646		
		84.776	1.650	87.612	1.650		
		84.776	1.654	87.612	1.654		
		84.776	1.658	87.612	1.658		
		84.776	1.663	87.612	1.663		
		84.776	1.667	87.612	1.667		
		84.776	1.671	87.612	1.671		
		84.776	1.675	87.612	1.675		
		84.776	1.679	87.612	1.679		
		84.776	1.683	87.612	1.683		
		84.776	1.688	87.612	1.688		
		84.776	1.692	87.612	1.692		
		84.776	1.696	87.612	1.696		
		84.776	1.700	87.612	1.700		
		84.776	1.704	87.612	1.704		
		84.776	1.708	87.612	1.708		
		84.776	1.713	87.612	1.713		
		84.776	1.717	87.612	1.717		
		84.776	1.721	87.761	1.721		
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		84.776	1.742				
		84.776	1.746				
		84.776	1.750				
		84.776	1.754				
		84.776	1.758				
		84.776	1.763				
		84.776	1.767				
		84.776	1.771				
		84.776	1.775				

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		84.776	1.783				
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		84.776	1.825				
		84.776	1.829				
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		84.776	1.850				
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		84.925	2.050				
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		85.522	2.671				
		85.522	2.675				

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		85.672	2.750				
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		85.672	2.758				
		85.672	2.763				
		85.672	2.767				
		85.672	2.771				
		85.672	2.775				
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		85.672	2.783				
		85.672	2.788				
		85.672	2.792				
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		85.672	2.808				
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		85.672	2.825				
		85.672	2.829				
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		85.672	2.842				
		85.672	2.846				
		85.672	2.850				
		85.672	2.854				
		85.672	2.858				
		85.672	2.863				
		85.672	2.867				
		85.672	2.871				
		85.672	2.875				
		85.672	2.879				
		85.672	2.883				
		85.672	2.888				
		85.672	2.892				
		85.672	2.896				
		85.672	2.900				

		85.672	2.904				
		85.672	2.908				
		85.672	2.913				
		85.672	2.917				
		85.672	2.921				
		85.672	2.925				
		85.672	2.929				
		85.672	2.933				
		85.672	2.938				
		85.672	2.942				
		85.672	2.946				
		85.672	2.950				
		85.672	2.954				
		85.672	2.958				
		85.672	2.963				
		85.672	2.967				
		85.672	2.971				
		85.672	2.975				
		85.672	2.979				
		85.672	2.983				
		85.672	2.988				
		85.672	2.992				
		85.672	2.996				
		85.672	3.000				
		85.672	3.004				
		85.672	3.008				
		85.821	3.013				
		85.821	3.017				
		85.821	3.021				
		85.821	3.025				
		85.821	3.029				
		85.821	3.033				
		85.821	3.038				
		85.821	3.042				
		85.821	3.046				
		85.821	3.050				
		85.821	3.054				
		85.821	3.058				
		85.821	3.063				
		85.821	3.067				
		85.821	3.071				
		85.821	3.075				
		85.821	3.079				
		85.821	3.083				
		85.821	3.088				
		85.821	3.092				
		85.821	3.096				
		85.821	3.100				
		85.821	3.104				
		85.821	3.108				
		85.821	3.113				
		85.821	3.117				
		85.821	3.121				
		85.821	3.125				

		85.821	3.129				
		85.821	3.133				
		85.821	3.138				
		85.821	3.142				
		85.821	3.146				
		85.821	3.150				
		85.821	3.154				
		85.821	3.158				
		85.821	3.163				
		85.821	3.167				
		85.821	3.171				
		85.821	3.175				
		85.821	3.179				
		85.821	3.183				
		85.821	3.188				
		85.821	3.192				
		85.821	3.196				
		85.821	3.200				
		85.821	3.204				
		85.821	3.208				
		85.821	3.213				
		85.821	3.217				
		85.821	3.221				
		85.821	3.225				
		85.821	3.229				
		85.821	3.233				
		85.821	3.238				
		85.821	3.242				
		85.821	3.246				
		85.821	3.250				
		85.821	3.254				
		85.821	3.258				
		85.821	3.263				
		85.821	3.267				
		85.970	3.271				
		85.821	3.275				
		85.970	3.279				
		85.970	3.283				
		85.970	3.288				
		85.970	3.292				
		85.970	3.296				
		85.970	3.300				
		85.970	3.304				
		85.970	3.308				
		85.970	3.313				
		85.970	3.317				
		85.970	3.321				
		85.970	3.325				
		85.970	3.329				
		85.970	3.333				
		85.970	3.338				
		85.970	3.342				
		85.970	3.346				
		85.970	3.350				

		85.970	3.354				
		85.970	3.358				
		85.970	3.363				
		85.970	3.367				
		85.970	3.371				
		85.970	3.375				
		85.970	3.379				
		85.970	3.383				
		85.970	3.388				
		85.970	3.392				
		85.970	3.396				
		85.970	3.400				
		85.970	3.404				
		85.970	3.408				
		85.970	3.413				
		85.970	3.417				
		85.970	3.421				
		85.970	3.425				
		85.970	3.429				
		85.970	3.433				
		85.970	3.438				
		85.970	3.442				
		85.970	3.446				
		85.970	3.450				
		85.970	3.454				
		85.970	3.458				
		85.970	3.463				
		85.970	3.467				
		85.970	3.471				
		85.970	3.475				
		85.970	3.479				
		85.970	3.483				
		85.970	3.488				
		85.970	3.492				
		85.970	3.496				
		85.970	3.500				
		85.970	3.504				
		85.970	3.508				
		85.970	3.513				
		85.970	3.517				
		85.970	3.521				
		85.970	3.525				
		85.970	3.529				
		85.970	3.533				
		85.970	3.538				
		85.970	3.542				
		85.970	3.546				
		85.970	3.550				
		85.970	3.554				
		85.970	3.558				
		85.970	3.563				
		85.970	3.567				
		85.970	3.571				
		85.970	3.575				

		85.970	3.579				
		85.970	3.583				
		85.970	3.588				
		85.970	3.592				
		85.970	3.596				
		85.970	3.600				
		85.970	3.604				
		85.970	3.608				
		85.970	3.613				
		85.970	3.617				
		85.970	3.621				
		85.970	3.625				
		86.119	3.629				
		85.970	3.633				
		85.970	3.638				
		85.970	3.642				
		86.119	3.646				
		86.119	3.650				
		85.970	3.654				
		85.970	3.658				
		86.119	3.663				
		86.119	3.667				
		86.119	3.671				
		86.119	3.675				
		86.119	3.679				
		86.119	3.683				
		86.119	3.688				
		86.119	3.692				
		86.119	3.696				
		86.119	3.700				
		86.119	3.704				
		86.119	3.708				
		86.119	3.713				
		86.119	3.717				
		86.119	3.721				
		86.119	3.725				
		86.119	3.729				
		86.119	3.733				
		86.119	3.738				
		86.119	3.742				
		86.119	3.746				
		86.119	3.750				
		86.119	3.754				
		86.119	3.758				
		86.119	3.763				
		86.119	3.767				
		86.119	3.771				
		86.119	3.775				
		86.119	3.779				
		86.119	3.783				
		86.119	3.788				
		86.119	3.792				
		86.119	3.796				
		86.119	3.800				

		86.119	3.804				
		86.119	3.808				
		86.119	3.813				
		86.119	3.817				
		86.119	3.821				
		86.119	3.825				
		86.119	3.829				
		86.119	3.833				
		86.119	3.838				
		86.119	3.842				
		86.119	3.846				
		86.119	3.850				
		86.119	3.854				
		86.119	3.858				
		86.119	3.863				
		86.119	3.867				
		86.119	3.871				
		86.119	3.875				
		86.119	3.879				
		86.119	3.883				
		86.119	3.888				
		86.119	3.892				
		86.119	3.896				
		86.119	3.900				
		86.119	3.904				
		86.119	3.908				
		86.119	3.913				
		86.119	3.917				
		86.119	3.921				
		86.119	3.925				
		86.119	3.929				
		86.119	3.933				
		86.119	3.938				
		86.119	3.942				
		86.119	3.946				
		86.119	3.950				
		86.119	3.954				
		86.119	3.958				
		86.119	3.963				
		86.119	3.967				
		86.119	3.971				
		86.119	3.975				
		86.119	3.979				
		86.119	3.983				
		86.119	3.988				
		86.119	3.992				
		86.119	3.996				
		86.119	4.000				
		86.119	4.004				
		86.119	4.008				
		86.119	4.013				
		86.119	4.017				
		86.119	4.021				
		86.119	4.025				

		86.119	4.029				
		86.119	4.033				
		86.119	4.038				
		86.119	4.042				
		86.119	4.046				
		86.119	4.050				
		86.119	4.054				
		86.119	4.058				
		86.119	4.063				
		86.119	4.067				
		86.119	4.071				
		86.119	4.075				
		86.119	4.079				
		86.119	4.083				
		86.119	4.088				
		86.119	4.092				
		86.119	4.096				
		86.119	4.100				
		86.119	4.104				
		86.119	4.108				
		86.119	4.113				
		86.119	4.117				
		86.119	4.121				
		86.119	4.125				
		86.119	4.129				
		86.119	4.133				
		86.119	4.138				
		86.119	4.142				
		86.119	4.146				
		86.119	4.150				
		86.119	4.154				
		86.119	4.158				
		86.119	4.163				
		86.119	4.167				
		86.119	4.171				
		86.269	4.175				
		86.269	4.179				
		86.269	4.183				
		86.269	4.188				
		86.269	4.192				
		86.269	4.196				
		86.269	4.200				
		86.269	4.204				
		86.269	4.208				
		86.269	4.213				
		86.269	4.217				
		86.269	4.221				
		86.269	4.225				
		86.269	4.229				
		86.269	4.233				
		86.269	4.238				
		86.269	4.242				
		86.269	4.246				
		86.269	4.250				

		86.269	4.254				
		86.269	4.258				
		86.269	4.263				
		86.269	4.267				
		86.269	4.271				
		86.269	4.275				
		86.269	4.279				
		86.269	4.283				
		86.269	4.288				
		86.269	4.292				
		86.269	4.296				
		86.269	4.300				
		86.269	4.304				
		86.269	4.308				
		86.269	4.313				
		86.269	4.317				
		86.269	4.321				
		86.269	4.325				
		86.269	4.329				
		86.269	4.333				
		86.269	4.338				
		86.269	4.342				
		86.269	4.346				
		86.269	4.350				
		86.269	4.354				
		86.269	4.358				
		86.269	4.363				
		86.269	4.367				
		86.269	4.371				
		86.269	4.375				
		86.269	4.379				
		86.269	4.383				
		86.269	4.388				
		86.269	4.392				
		86.269	4.396				
		86.269	4.400				
		86.269	4.404				
		86.269	4.408				
		86.269	4.413				
		86.269	4.417				
		86.269	4.421				
		86.269	4.425				
		86.269	4.429				
		86.269	4.433				
		86.269	4.438				
		86.269	4.442				
		86.269	4.446				
		86.269	4.450				
		86.269	4.454				
		86.269	4.458				
		86.269	4.463				
		86.269	4.467				
		86.269	4.471				
		86.269	4.475				

		86.269	4.479				
		86.269	4.483				
		86.269	4.488				
		86.269	4.492				
		86.269	4.496				
		86.269	4.500				
		86.269	4.504				
		86.269	4.508				
		86.269	4.513				
		86.269	4.517				
		86.269	4.521				
		86.269	4.525				
		86.269	4.529				
		86.269	4.533				
		86.269	4.538				
		86.269	4.542				
		86.269	4.546				
		86.269	4.550				
		86.269	4.554				
		86.269	4.558				
		86.269	4.563				
		86.269	4.567				
		86.269	4.571				
		86.269	4.575				
		86.269	4.579				
		86.269	4.583				
		86.269	4.588				
		86.269	4.592				
		86.269	4.596				
		86.269	4.600				
		86.269	4.604				
		86.269	4.608				
		86.269	4.613				
		86.269	4.617				
		86.269	4.621				
		86.269	4.625				
		86.269	4.629				
		86.269	4.633				
		86.269	4.638				
		86.269	4.642				
		86.269	4.646				
		86.269	4.650				
		86.269	4.654				
		86.269	4.658				
		86.269	4.663				
		86.269	4.667				
		86.269	4.671				
		86.269	4.675				
		86.269	4.679				
		86.269	4.683				
		86.269	4.688				
		86.269	4.692				
		86.269	4.696				
		86.269	4.700				

		86.269	4.704				
		86.269	4.708				
		86.269	4.713				
		86.269	4.717				
		86.269	4.721				
		86.119	4.725				
		86.269	4.729				
		86.269	4.733				
		86.269	4.738				
		86.269	4.742				
		86.269	4.746				
		86.269	4.750				
		86.269	4.754				
		86.269	4.758				
		86.269	4.763				
		86.269	4.767				
		86.269	4.771				
		86.269	4.775				
		86.269	4.779				
		86.269	4.783				
		86.269	4.788				
		86.269	4.792				
		86.269	4.796				
		86.269	4.800				
		86.269	4.804				
		86.269	4.808				
		86.269	4.813				
		86.269	4.817				
		86.269	4.821				
		86.269	4.825				
		86.269	4.829				
		86.269	8.000				
		86.269	12.000				
		86.269	16.000				
		86.269	20.000				
		86.269	24.000				

65% of degree of saturation

200kPa							
Equilibrium stage		Consolidation stage		Shearing stage			
Matric suction/(kPa)	Time/(hr)	Matric suction/(kPa)	Time/(hr)	Matric suction/(kPa)	Time/(hr)	Matric suction/(kPa)	Shear strain/(%)
0.000	0.000	71.194	0.000	72.985	0.000	72.985	0.000
0.597	0.004	71.045	0.004	72.985	0.004	72.985	0.250
1.194	0.008	71.045	0.008	72.985	0.008	72.985	0.500
1.791	0.013	70.896	0.013	72.985	0.013	72.985	0.750
2.388	0.017	70.896	0.017	72.985	0.017	72.985	1.000
2.985	0.021	70.746	0.021	72.985	0.021	72.985	1.250
3.582	0.025	70.746	0.025	72.985	0.025	72.985	1.500
4.179	0.029	70.746	0.029	72.985	0.029	72.985	1.750
4.776	0.033	70.597	0.033	72.985	0.033	72.985	2.000
5.970	0.038	70.597	0.038	72.985	0.038	72.985	2.500
6.866	0.042	70.597	0.042	72.985	0.042	72.985	3.000
7.761	0.046	70.597	0.046	72.985	0.046	72.985	3.500
8.657	0.050	70.448	0.050	72.985	0.050	72.836	4.000
9.552	0.054	70.448	0.054	72.985	0.054	72.537	5.000
10.448	0.058	70.448	0.058	72.985	0.058	72.090	6.000
11.343	0.063	70.299	0.063	72.985	0.063	71.493	7.000
12.239	0.067	70.299	0.067	72.985	0.067	70.896	8.000
13.134	0.071	70.299	0.071	72.985	0.071	70.448	9.000
14.030	0.075	70.149	0.075	72.985	0.075	70.149	10.000
14.925	0.079	70.149	0.079	72.985	0.079	69.701	11.000
15.821	0.083	70.149	0.083	72.985	0.083	69.104	12.000
16.716	0.088	70.000	0.088	72.985	0.088	68.507	13.000
17.463	0.092	70.000	0.092	72.985	0.092	67.910	14.000
18.209	0.096	70.000	0.096	72.985	0.096	67.463	15.000
18.955	0.100	69.851	0.100	72.985	0.100	67.164	16.000
19.701	0.104	69.851	0.104	72.985	0.104	67.015	17.000
20.448	0.108	69.851	0.108	72.985	0.108	66.866	18.000
21.194	0.113	69.701	0.113	72.985	0.113	66.716	19.000
21.940	0.117	69.701	0.117	72.985	0.117	66.716	20.000
22.687	0.121	69.701	0.121	72.985	0.121		
23.433	0.125	69.701	0.125	72.985	0.125		
24.179	0.129	69.552	0.129	72.985	0.129		
24.925	0.133	69.552	0.133	72.985	0.133		
25.672	0.138	69.552	0.138	72.985	0.138		
26.418	0.142	69.552	0.142	72.985	0.142		
27.164	0.146	69.403	0.146	72.985	0.146		
27.910	0.150	69.403	0.150	72.985	0.150		
28.657	0.154	69.403	0.154	72.985	0.154		
29.403	0.158	69.254	0.158	72.985	0.158		
30.149	0.163	69.254	0.163	72.985	0.163		
30.896	0.167	69.254	0.167	72.985	0.167		
31.642	0.171	69.104	0.171	72.985	0.171		
32.388	0.175	69.104	0.175	72.985	0.175		
33.134	0.179	69.104	0.179	72.985	0.179		
33.881	0.183	68.955	0.183	72.985	0.183		
34.627	0.188	68.955	0.188	72.985	0.188		
35.373	0.192	68.955	0.192	72.985	0.192		
36.119	0.196	68.806	0.196	72.985	0.196		
36.866	0.200	68.806	0.200	72.985	0.200		

37.612	0.204	68.806	0.204	72.985	0.204		
38.358	0.208	68.657	0.208	72.985	0.208		
39.104	0.213	68.657	0.213	72.985	0.213		
39.851	0.217	68.657	0.217	72.985	0.217		
40.597	0.221	68.507	0.221	72.985	0.221		
41.343	0.225	68.507	0.225	72.985	0.225		
42.090	0.229	68.358	0.229	72.985	0.229		
42.836	0.233	68.358	0.233	72.985	0.233		
43.582	0.238	68.209	0.238	72.985	0.238		
44.328	0.242	68.209	0.242	72.985	0.242		
45.075	0.246	68.060	0.246	72.985	0.246		
45.821	0.250	68.060	0.250	72.985	0.250		
46.567	0.254	67.910	0.254	72.985	0.254		
47.313	0.258	67.910	0.258	72.985	0.258		
48.060	0.263	67.761	0.263	72.985	0.263		
48.806	0.267	67.761	0.267	72.985	0.267		
49.552	0.271	67.612	0.271	72.985	0.271		
50.299	0.275	67.612	0.275	72.985	0.275		
51.045	0.279	67.463	0.279	72.985	0.279		
51.791	0.283	67.463	0.283	72.985	0.283		
52.537	0.288	67.313	0.288	72.985	0.288		
53.284	0.292	67.313	0.292	72.985	0.292		
54.030	0.296	67.164	0.296	72.985	0.296		
54.776	0.300	67.164	0.300	72.985	0.300		
55.522	0.304	67.015	0.304	72.985	0.304		
56.269	0.308	67.015	0.308	72.836	0.308		
57.015	0.313	66.866	0.313	72.836	0.313		
57.015	0.317	66.716	0.317	72.836	0.317		
57.015	0.321	66.716	0.321	72.836	0.321		
57.015	0.325	66.567	0.325	72.836	0.325		
57.015	0.329	66.567	0.329	72.836	0.329		
57.015	0.333	66.418	0.333	72.836	0.333		
57.015	0.338	66.418	0.338	72.836	0.338		
57.015	0.342	66.269	0.342	72.836	0.342		
62.985	0.346	66.269	0.346	72.836	0.346		
63.731	0.350	66.119	0.350	72.836	0.350		
64.478	0.354	66.119	0.354	72.836	0.354		
65.224	0.358	65.970	0.358	72.687	0.358		
65.970	0.363	65.970	0.363	72.687	0.363		
65.970	0.367	65.821	0.367	72.687	0.367		
65.970	0.371	65.821	0.371	72.687	0.371		
65.970	0.375	65.672	0.375	72.687	0.375		
65.970	0.379	65.672	0.379	72.687	0.379		
66.269	0.383	65.522	0.383	72.687	0.383		
66.269	0.388	65.522	0.388	72.687	0.388		
66.269	0.392	65.373	0.392	72.537	0.392		
66.269	0.396	65.373	0.396	72.537	0.396		
66.269	0.400	65.373	0.400	72.537	0.400		
66.269	0.404	65.224	0.404	72.537	0.404		
66.269	0.408	65.224	0.408	72.537	0.408		
66.269	0.413	65.224	0.413	72.537	0.413		
66.567	0.417	65.075	0.417	72.388	0.417		
66.567	0.421	65.075	0.421	72.388	0.421		
66.567	0.425	65.075	0.425	72.388	0.425		

66.567	0.429	65.075	0.429	72.388	0.429		
66.567	0.433	64.925	0.433	72.388	0.433		
66.567	0.438	64.925	0.438	72.388	0.438		
66.567	0.442	64.925	0.442	72.239	0.442		
66.567	0.446	64.925	0.446	72.239	0.446		
66.567	0.450	64.925	0.450	72.239	0.450		
67.015	0.454	64.776	0.454	72.239	0.454		
67.015	0.458	64.776	0.458	72.239	0.458		
67.015	0.463	64.776	0.463	72.239	0.463		
67.015	0.467	64.776	0.467	72.090	0.467		
67.015	0.471	64.627	0.471	72.090	0.471		
67.015	0.475	64.627	0.475	72.090	0.475		
67.015	0.479	64.627	0.479	72.090	0.479		
67.015	0.483	64.627	0.483	71.940	0.483		
67.015	0.488	64.627	0.488	71.940	0.488		
67.015	0.492	64.627	0.492	71.940	0.492		
67.313	0.496	64.627	0.496	71.940	0.496		
67.313	0.500	64.627	0.500	71.940	0.500		
67.313	0.504	64.627	0.504	71.940	0.504		
67.313	0.508	64.627	0.508	71.791	0.508		
67.313	0.513	64.478	0.513	71.791	0.513		
67.313	0.517	64.478	0.517	71.791	0.517		
67.313	0.521	64.478	0.521	71.791	0.521		
67.313	0.525	64.478	0.525	71.791	0.525		
67.313	0.529	64.478	0.529	71.642	0.529		
67.313	0.533	64.478	0.533	71.642	0.533		
67.313	0.538	64.328	0.538	71.642	0.538		
67.463	0.542	64.328	0.542	71.642	0.542		
67.463	0.546	64.328	0.546	71.493	0.546		
67.463	0.550	64.328	0.550	71.493	0.550		
67.463	0.554	64.179	0.554	71.493	0.554		
67.463	0.558	64.179	0.558	71.493	0.558		
67.463	0.563	64.179	0.563	71.493	0.563		
67.463	0.567	64.179	0.567	71.343	0.567		
67.463	0.571	64.030	0.571	71.343	0.571		
67.463	0.575	64.030	0.575	71.343	0.575		
67.463	0.579	64.030	0.579	71.343	0.579		
67.463	0.583	64.030	0.583	71.343	0.583		
67.463	0.588	64.030	0.588	71.194	0.588		
67.463	0.592	63.881	0.592	71.194	0.592		
67.463	0.596	63.881	0.596	71.194	0.596		
67.463	0.600	63.881	0.600	71.194	0.600		
67.463	0.604	63.881	0.604	71.194	0.604		
67.463	0.608	63.881	0.608	71.045	0.608		
67.761	0.613	63.731	0.613	71.045	0.613		
67.761	0.617	63.731	0.617	71.045	0.617		
67.761	0.621	63.731	0.621	71.045	0.621		
67.761	0.625	63.731	0.625	71.045	0.625		
67.761	0.629	63.582	0.629	70.896	0.629		
67.761	0.633	63.582	0.633	70.896	0.633		
67.761	0.638	63.582	0.638	70.896	0.638		
67.761	0.642	63.582	0.642	70.896	0.642		
67.761	0.646	63.433	0.646	70.896	0.646		
67.761	0.650	63.433	0.650	70.896	0.650		

67.761	0.654	63.433	0.654	70.896	0.654		
67.761	0.658	63.433	0.658	70.746	0.658		
67.761	0.663	63.433	0.663	70.746	0.663		
67.761	0.667	63.284	0.667	70.746	0.667		
67.761	0.671	63.284	0.671	70.746	0.671		
67.761	0.675	63.284	0.675	70.746	0.675		
67.761	0.679	63.284	0.679	70.746	0.679		
67.761	0.683	63.134	0.683	70.597	0.683		
67.761	0.688	63.134	0.688	70.597	0.688		
67.761	0.692	63.134	0.692	70.597	0.692		
67.761	0.696	63.134	0.696	70.597	0.696		
67.761	0.700	63.134	0.700	70.597	0.700		
67.761	0.704	62.985	0.704	70.597	0.704		
67.761	0.708	62.985	0.708	70.597	0.708		
67.761	0.713	62.985	0.713	70.597	0.713		
67.761	0.717	62.836	0.717	70.448	0.717		
67.761	0.721	62.836	0.721	70.448	0.721		
67.761	0.725	62.836	0.725	70.448	0.725		
67.761	0.729	62.836	0.729	70.448	0.729		
67.761	0.733	62.836	0.733	70.448	0.733		
67.761	0.738	62.687	0.738	70.448	0.738		
67.761	0.742	62.687	0.742	70.448	0.742		
67.761	0.746	62.687	0.746	70.448	0.746		
67.761	0.750	62.687	0.750	70.448	0.750		
67.761	0.754	62.537	0.754	70.299	0.754		
67.761	0.758	62.537	0.758	70.299	0.758		
67.761	0.763	62.537	0.763	70.299	0.763		
67.761	0.767	62.537	0.767	70.299	0.767		
67.761	0.771	62.388	0.771	70.299	0.771		
67.761	0.775	62.388	0.775	70.299	0.775		
67.761	0.779	62.388	0.779	70.299	0.779		
67.761	0.783	62.388	0.783	70.299	0.783		
67.761	0.788	62.239	0.788	70.299	0.788		
67.761	0.792	62.239	0.792	70.299	0.792		
67.761	0.796	62.239	0.796	70.149	0.796		
67.761	0.800	62.239	0.800	70.149	0.800		
67.761	0.804	62.239	0.804	70.149	0.804		
67.761	0.808	62.090	0.808	70.149	0.808		
67.761	0.813	62.090	0.813	70.149	0.813		
67.761	0.817	62.090	0.817	70.149	0.817		
67.761	0.821	61.940	0.821	70.149	0.821		
67.761	0.825	61.940	0.825	70.000	0.825		
67.761	0.829	61.940	0.829	70.000	0.829		
67.761	0.833	61.791	0.833	70.000	0.833		
67.761	0.838	61.791	0.838	70.000	0.838		
67.761	0.842	61.642	0.842	70.000	0.842		
67.761	0.846	61.642	0.846	69.851	0.846		
67.761	0.850	61.642	0.850	69.851	0.850		
67.761	0.854	61.493	0.854	69.851	0.854		
67.761	0.858	61.493	0.858	69.851	0.858		
67.761	0.863	61.493	0.863	69.851	0.863		
67.761	0.867	61.343	0.867	69.701	0.867		
68.209	0.871	61.343	0.871	69.701	0.871		
68.209	0.875	61.194	0.875	69.701	0.875		

68.209	0.879	61.194	0.879	69.701	0.879		
68.209	0.883	61.045	0.883	69.701	0.883		
68.209	0.888	61.045	0.888	69.552	0.888		
68.209	0.892	60.896	0.892	69.552	0.892		
68.209	0.896	60.896	0.896	69.552	0.896		
68.209	0.900	60.746	0.900	69.552	0.900		
68.209	0.904	60.746	0.904	69.552	0.904		
68.209	0.908	60.597	0.908	69.403	0.908		
68.209	0.913	60.597	0.913	69.403	0.913		
68.209	0.917	60.448	0.917	69.403	0.917		
68.209	0.921	60.448	0.921	69.403	0.921		
68.209	0.925	60.299	0.925	69.254	0.925		
68.209	0.929	60.299	0.929	69.254	0.929		
68.209	0.933	60.149	0.933	69.254	0.933		
68.209	0.938	60.149	0.938	69.254	0.938		
68.209	0.942	60.000	0.942	69.254	0.942		
68.209	0.946	60.000	0.946	69.104	0.946		
68.209	0.950	59.851	0.950	69.104	0.950		
68.209	0.954	59.851	0.954	69.104	0.954		
68.209	0.958	59.701	0.958	69.104	0.958		
68.209	0.963	59.701	0.963	69.104	0.963		
68.209	0.967	59.552	0.967	68.955	0.967		
68.209	0.971	59.552	0.971	68.955	0.971		
68.209	0.975	59.403	0.975	68.955	0.975		
68.209	0.979	59.403	0.979	68.955	0.979		
68.209	0.983	59.254	0.983	68.806	0.983		
68.209	0.988	59.254	0.988	68.806	0.988		
68.209	0.992	59.104	0.992	68.806	0.992		
68.209	0.996	59.104	0.996	68.806	0.996		
68.209	1.000	58.955	1.000	68.806	1.000		
68.209	1.004	58.955	1.004	68.657	1.004		
68.209	1.008	58.806	1.008	68.657	1.008		
68.209	1.013	58.806	1.013	68.657	1.013		
68.209	1.017	58.657	1.017	68.657	1.017		
68.209	1.021	58.657	1.021	68.657	1.021		
68.209	1.025	58.507	1.025	68.507	1.025		
68.209	1.029	58.507	1.029	68.507	1.029		
68.209	1.033	58.358	1.033	68.507	1.033		
68.209	1.038	58.358	1.038	68.507	1.038		
68.209	1.042	58.209	1.042	68.507	1.042		
68.209	1.046	58.209	1.046	68.358	1.046		
68.209	1.050	58.060	1.050	68.358	1.050		
68.209	1.054	58.060	1.054	68.358	1.054		
68.209	1.058	58.060	1.058	68.358	1.058		
68.209	1.063	57.910	1.063	68.358	1.063		
68.209	1.067	57.910	1.067	68.209	1.067		
68.209	1.071	57.910	1.071	68.209	1.071		
68.209	1.075	57.761	1.075	68.209	1.075		
68.209	1.079	57.761	1.079	68.209	1.079		
68.209	1.083	57.761	1.083	68.209	1.083		
68.209	1.088	57.612	1.088	68.060	1.088		
68.209	1.092	57.612	1.092	68.060	1.092		
68.209	1.096	57.463	1.096	68.060	1.096		
68.209	1.100	57.463	1.100	68.060	1.100		

68.209	1.104	57.313	1.104	68.060	1.104		
68.209	1.108	57.313	1.108	68.060	1.108		
68.209	1.113	57.164	1.113	67.910	1.113		
68.209	1.117	57.164	1.117	67.910	1.117		
68.209	1.121	57.164	1.121	67.910	1.121		
68.209	1.125	57.015	1.125	67.910	1.125		
68.209	1.129	57.015	1.129	67.910	1.129		
68.209	1.133	57.015	1.133	67.910	1.133		
68.209	1.138	57.015	1.138	67.761	1.138		
68.209	1.142	56.866	1.142	67.761	1.142		
68.209	1.146	56.866	1.146	67.761	1.146		
68.209	1.150	56.866	1.150	67.761	1.150		
68.209	1.154	56.716	1.154	67.761	1.154		
68.209	1.158	56.716	1.158	67.761	1.158		
68.209	1.163	56.716	1.163	67.612	1.163		
68.209	1.167	56.567	1.167	67.612	1.167		
68.209	1.171	56.567	1.171	67.612	1.171		
68.209	1.175	56.418	1.175	67.612	1.175		
68.209	1.179	56.418	1.179	67.612	1.179		
68.209	1.183	56.418	1.183	67.612	1.183		
68.209	1.188	56.269	1.188	67.612	1.188		
68.209	1.192	56.269	1.192	67.612	1.192		
68.209	1.196	56.119	1.196	67.463	1.196		
68.209	1.200	56.119	1.200	67.463	1.200		
68.209	1.204	55.970	1.204	67.463	1.204		
68.209	1.208	55.970	1.208	67.463	1.208		
68.209	1.213	55.821	1.213	67.463	1.213		
68.209	1.217	55.821	1.217	67.463	1.217		
68.209	1.221	55.672	1.221	67.463	1.221		
68.209	1.225	55.672	1.225	67.463	1.225		
68.209	1.229	55.672	1.229	67.463	1.229		
68.209	1.233	55.522	1.233	67.313	1.233		
68.209	1.238	55.522	1.238	67.313	1.238		
68.209	1.242	55.522	1.242	67.313	1.242		
68.209	1.246	55.373	1.246	67.313	1.246		
68.209	1.250	55.373	1.250	67.313	1.250		
68.209	1.254	55.373	1.254	67.313	1.254		
68.209	1.258	55.224	1.258	67.313	1.258		
68.209	1.263	55.224	1.263	67.313	1.263		
68.209	1.267	55.224	1.267	67.313	1.267		
68.209	1.271	55.075	1.271	67.164	1.271		
68.209	1.275	55.075	1.275	67.164	1.275		
68.209	1.279	55.075	1.279	67.164	1.279		
68.209	1.283	54.925	1.283	67.164	1.283		
68.209	1.288	54.925	1.288	67.164	1.288		
68.209	1.292	54.925	1.292	67.164	1.292		
68.209	1.296	54.776	1.296	67.164	1.296		
68.209	1.300	54.776	1.300	67.164	1.300		
68.209	1.304	54.776	1.304	67.164	1.304		
68.209	1.308	54.627	1.308	67.164	1.308		
68.209	1.313	54.627	1.313	67.015	1.313		
68.209	1.317	54.627	1.317	67.015	1.317		
68.209	1.321	54.478	1.321	67.015	1.321		
68.209	1.325	54.478	1.325	67.015	1.325		

68.209	1.329	54.478	1.329	67.015	1.329		
68.209	1.333	54.328	1.333	67.015	1.333		
68.209	1.338	54.328	1.338	67.015	1.338		
68.209	1.342	54.328	1.342	67.015	1.342		
68.209	1.346	54.179	1.346	67.015	1.346		
68.209	1.350	54.179	1.350	67.015	1.350		
68.209	1.354	54.179	1.354	67.015	1.354		
68.209	1.358	54.179	1.358	67.015	1.358		
68.209	1.363	54.179	1.363	67.015	1.363		
68.209	1.367	54.030	1.367	67.015	1.367		
68.209	1.371	54.030	1.371	66.866	1.371		
68.209	1.375	54.030	1.375	66.866	1.375		
68.209	1.379	54.030	1.379	66.866	1.379		
68.209	1.383	54.030	1.383	66.866	1.383		
68.209	1.388	54.030	1.388	66.866	1.388		
68.209	1.392	54.030	1.392	66.866	1.392		
68.209	1.396	54.030	1.396	66.866	1.396		
68.209	1.400	54.030	1.400	66.866	1.400		
68.209	1.404	54.030	1.404	66.866	1.404		
68.209	1.408	54.030	1.408	66.866	1.408		
68.209	1.413	54.030	1.413	66.866	1.413		
68.209	1.417	54.030	1.417	66.866	1.417		
68.209	1.421	54.030	1.421	66.866	1.421		
68.209	1.425	54.030	1.425	66.866	1.425		
68.209	1.429	54.030	1.429	66.866	1.429		
68.209	1.433	54.030	1.433	66.866	1.433		
68.209	1.438	53.881	1.438	66.866	1.438		
68.209	1.442	53.881	1.442	66.866	1.442		
68.209	1.446	53.881	1.446	66.866	1.446		
68.209	1.450	53.881	1.450	66.866	1.450		
68.209	1.454	53.881	1.454	66.866	1.454		
68.209	1.458	53.881	1.458	66.716	1.458		
68.209	1.463	53.881	1.463	66.866	1.463		
68.209	1.467	53.881	1.467	66.716	1.467		
68.209	1.471	53.881	1.471	66.716	1.471		
68.209	1.475	53.881	1.475	66.716	1.475		
68.209	1.479	53.881	1.479	66.716	1.479		
68.209	1.483	53.881	1.483	66.716	1.483		
68.209	1.488	53.881	1.488	66.716	1.488		
68.209	1.492	53.881	1.492	66.716	1.492		
68.209	1.496	53.881	1.496	66.716	1.496		
68.209	1.500	53.881	1.500	66.716	1.500		
68.209	1.504	53.881	1.504	66.716	1.504		
68.209	1.508	53.881	1.508	66.716	1.508		
68.209	1.513	53.881	1.513	66.716	1.513		
68.209	1.517	53.881	1.517	66.716	1.517		
68.209	1.521	53.881	1.521	66.716	1.521		
68.209	1.525	53.881	1.525	66.716	1.525		
68.209	1.529	53.881	1.529	66.716	1.529		
68.209	1.533	53.881	1.533	66.716	1.533		
68.209	1.538	53.881	1.538	66.716	1.538		
68.209	1.542	53.881	1.542	66.716	1.542		
68.209	1.546	53.881	1.546	66.716	1.546		
68.209	1.550	53.881	1.550	66.716	1.550		

68.209	1.554	53.881	1.554	66.716	1.554		
68.209	1.558	53.881	1.558	66.716	1.558		
68.209	1.563	53.881	1.563	66.716	1.563		
68.209	1.567	53.881	1.567	66.716	1.567		
68.209	1.571	53.881	1.571	66.716	1.571		
68.209	1.575	53.731	1.575	66.716	1.575		
68.209	1.579	53.731	1.579	66.716	1.579		
68.209	1.583	53.731	1.583	66.716	1.583		
68.209	1.588	53.731	1.588	66.716	1.588		
68.209	1.592	53.731	1.592	66.716	1.592		
68.209	1.596	53.731	1.596	66.716	1.596		
68.209	1.600	53.731	1.600	66.716	1.600		
68.209	1.604	53.731	1.604	66.716	1.604		
68.209	1.608	53.731	1.608	66.716	1.608		
68.209	1.613	53.731	1.613	66.716	1.613		
68.209	1.617	53.731	1.617	66.716	1.617		
68.209	1.621	53.731	1.621	66.716	1.621		
68.209	1.625	53.731	1.625	66.716	1.625		
68.209	1.629	53.731	1.629	66.716	1.629		
68.209	1.633	53.731	1.633	66.716	1.633		
68.209	1.638	53.731	1.638	66.716	1.638		
68.209	1.642	53.731	1.642	66.716	1.642		
68.209	1.646	53.731	1.646	66.716	1.646		
68.209	1.650	53.731	1.650	66.716	1.650		
68.209	1.654	53.731	1.654	66.716	1.654		
68.209	1.658	53.731	1.658	66.716	1.658		
68.209	1.663	53.731	1.663	66.716	1.663		
68.955	2.000	53.731	1.667	66.716	1.667		
69.552	4.000	53.731	1.671	66.716	1.671		
70.149	8.000	53.731	1.675	66.716	1.675		
70.597	12.000	53.731	1.679	66.716	1.679		
71.045	16.000	53.731	1.683	66.716	1.683		
71.194	20.000	53.731	1.688	66.716	1.688		
71.194	24.000	53.731	1.692	66.866	1.692		
		53.731	1.696	66.866	1.696		
		53.731	1.700	66.866	1.700		
		53.731	1.704	66.866	1.704		
		53.731	1.708	66.866	1.708		
		53.731	1.713	67.164	1.713		
		53.731	1.717	67.313	1.717		
		53.731	1.721	67.313	1.721		
		53.731	1.725	67.463	1.725		
		53.731	1.729	67.612	1.729		
		53.731	1.733	67.612	1.733		
		53.731	1.738	67.761	1.738		
		53.731	1.742	67.761	1.742		
		53.731	1.746	67.910	1.746		
		53.582	1.750	68.060	1.750		
		53.582	1.754	68.060	1.754		
		53.582	1.758	68.209	1.758		
		53.582	1.763	68.358	1.763		
		53.582	1.767	68.358	1.767		
		53.582	1.771	68.507	1.771		
		53.582	1.775	68.657	1.775		

		53.582	1.779	68.657	1.779		
		53.582	1.783	68.806	1.783		
		53.582	1.788	68.806	1.788		
		53.582	1.792	69.104	1.792		
		53.582	1.796				
		53.582	1.800				
		53.582	1.804				
		53.582	1.808				
		53.582	1.813				
		53.582	1.817				
		53.582	1.821				
		53.582	1.825				
		53.582	1.829				
		53.582	1.833				
		53.582	1.838				
		53.582	1.842				
		53.433	1.846				
		53.433	1.850				
		53.433	1.854				
		53.433	1.858				
		53.433	1.863				
		53.433	1.867				
		53.433	1.871				
		53.433	1.875				
		53.433	1.879				
		53.433	1.883				
		53.433	1.888				
		53.433	1.892				
		53.433	1.896				
		53.433	1.900				
		53.433	1.904				
		53.433	1.908				
		53.433	1.913				
		53.433	1.917				
		53.433	1.921				
		53.433	1.925				
		53.433	1.929				
		53.433	1.933				
		53.433	1.938				
		53.433	1.942				
		53.433	1.946				
		53.433	1.950				
		53.433	1.954				
		53.433	1.958				
		53.284	1.963				
		53.284	1.967				
		53.284	1.971				
		53.284	1.975				
		53.284	1.979				
		53.284	1.983				
		53.284	1.988				
		53.284	1.992				
		53.284	1.996				
		53.284	2.000				

		53.284	2.004				
		53.284	2.008				
		53.284	2.013				
		53.284	2.017				
		53.284	2.021				
		53.284	2.025				
		53.284	2.029				
		53.284	2.033				
		53.284	2.038				
		53.284	2.042				
		53.284	2.046				
		53.284	2.050				
		53.284	2.054				
		53.284	2.058				
		53.284	2.063				
		53.284	2.067				
		53.284	2.071				
		53.284	2.075				
		53.284	2.079				
		53.284	2.083				
		53.284	2.088				
		53.284	2.092				
		53.134	2.096				
		53.134	2.100				
		53.134	2.104				
		53.134	2.108				
		53.134	2.113				
		53.134	2.117				
		53.134	2.121				
		53.134	2.125				
		53.134	2.129				
		53.134	2.133				
		53.134	2.138				
		53.134	2.142				
		53.134	2.146				
		53.134	2.150				
		53.134	2.154				
		53.134	2.158				
		53.134	2.163				
		53.134	2.167				
		53.134	2.171				
		53.134	2.175				
		53.134	2.179				
		52.985	2.183				
		52.985	2.188				
		52.985	2.192				
		52.985	2.196				
		52.985	2.200				
		52.985	2.204				
		52.985	2.208				
		52.985	2.213				
		52.985	2.217				
		52.985	2.221				
		52.985	2.225				

		52.985	2.229				
		52.985	2.233				
		52.985	2.238				
		52.985	2.242				
		52.985	2.246				
		52.985	2.250				
		52.985	2.254				
		52.985	2.258				
		52.985	2.263				
		52.836	2.267				
		52.836	2.271				
		52.836	2.275				
		52.836	2.279				
		52.836	2.283				
		52.836	2.288				
		52.836	2.292				
		52.836	2.296				
		52.836	2.300				
		52.836	2.304				
		52.836	2.308				
		52.836	2.313				
		52.836	2.317				
		52.836	2.321				
		52.836	2.325				
		52.836	2.329				
		52.836	2.333				
		52.836	2.338				
		52.836	2.342				
		52.836	2.346				
		52.836	2.350				
		52.836	2.354				
		52.836	2.358				
		52.836	2.363				
		52.836	2.367				
		52.836	2.371				
		52.836	2.375				
		52.836	2.379				
		52.836	2.383				
		52.836	2.388				
		52.836	2.392				
		52.836	2.396				
		52.836	2.400				
		52.836	2.404				
		52.836	2.408				
		52.836	2.413				
		52.836	2.417				
		52.836	2.421				
		52.836	2.425				
		52.836	2.429				
		52.836	2.433				
		52.836	2.438				
		52.985	2.442				
		52.836	2.446				
		52.836	2.450				

		52.836	2.454				
		52.836	2.458				
		52.836	2.463				
		52.836	2.467				
		52.836	2.471				
		52.836	2.475				
		52.836	2.479				
		52.836	2.483				
		52.836	2.488				
		52.836	2.492				
		52.985	2.496				
		52.985	2.500				
		52.836	2.504				
		52.985	2.508				
		52.985	2.513				
		52.985	2.517				
		52.985	2.521				
		52.836	2.525				
		52.836	2.529				
		52.985	2.533				
		52.985	2.538				
		52.985	2.542				
		52.985	2.546				
		52.985	2.550				
		52.985	2.554				
		52.985	2.558				
		52.985	2.563				
		52.985	2.567				
		52.985	2.571				
		52.985	2.575				
		52.985	2.579				
		52.985	2.583				
		52.985	2.588				
		52.985	2.592				
		52.985	2.596				
		52.985	2.600				
		52.985	2.604				
		52.985	2.608				
		52.985	2.613				
		52.985	2.617				
		52.985	2.621				
		52.985	2.625				
		52.985	2.629				
		52.985	2.633				
		52.985	2.638				
		52.985	2.642				
		52.985	2.646				
		52.985	2.650				
		52.985	2.654				
		52.985	2.658				
		52.985	2.663				
		52.985	2.667				
		52.985	2.671				
		52.985	2.675				

		52.985	2.679				
		52.985	2.683				
		52.985	2.688				
		52.985	2.692				
		52.985	2.696				
		52.985	2.700				
		52.985	2.704				
		52.985	2.708				
		52.985	2.713				
		52.985	2.717				
		52.985	2.721				
		52.985	2.725				
		52.985	2.729				
		52.985	2.733				
		52.985	2.738				
		52.985	2.742				
		52.985	2.746				
		52.985	2.750				
		52.985	2.754				
		53.134	2.758				
		53.134	2.763				
		53.134	2.767				
		53.134	2.771				
		53.134	2.775				
		53.134	2.779				
		53.134	2.783				
		53.134	2.788				
		53.134	2.792				
		53.134	2.796				
		53.134	2.800				
		53.134	2.804				
		53.134	2.808				
		53.134	2.813				
		53.134	2.817				
		53.134	2.821				
		53.134	2.825				
		53.134	2.829				
		53.134	2.833				
		53.134	2.838				
		53.134	2.842				
		53.134	2.846				
		53.134	2.850				
		53.134	2.854				
		53.134	2.858				
		53.134	2.863				
		53.134	2.867				
		53.134	2.871				
		53.134	2.875				
		53.134	2.879				
		53.134	2.883				
		53.134	2.888				
		53.284	2.892				
		53.134	2.896				
		53.284	2.900				

		53.284	2.904				
		53.284	2.908				
		53.284	2.913				
		53.284	2.917				
		53.284	2.921				
		53.284	2.925				
		53.284	2.929				
		53.284	2.933				
		53.284	2.938				
		53.284	2.942				
		53.284	2.946				
		53.284	2.950				
		53.284	2.954				
		53.284	2.958				
		53.284	2.963				
		53.284	2.967				
		53.284	2.971				
		53.284	2.975				
		53.284	2.979				
		53.284	2.983				
		53.284	2.988				
		53.433	2.992				
		53.433	2.996				
		53.433	3.000				
		53.433	3.004				
		53.433	3.008				
		53.433	3.013				
		53.433	3.017				
		53.433	3.021				
		53.433	3.025				
		53.433	3.029				
		53.433	3.033				
		53.433	3.038				
		53.433	3.042				
		53.433	3.046				
		53.433	3.050				
		53.433	3.054				
		53.433	3.058				
		53.433	3.063				
		53.433	3.067				
		53.582	3.071				
		53.582	3.075				
		53.582	3.079				
		53.582	3.083				
		53.582	3.088				
		53.582	3.092				
		53.582	3.096				
		53.582	3.100				
		53.582	3.104				
		53.582	3.108				
		53.582	3.113				
		53.582	3.117				
		53.582	3.121				
		53.582	3.125				

		53.582	3.129				
		53.582	3.133				
		53.582	3.138				
		53.731	3.142				
		53.731	3.146				
		53.731	3.150				
		53.731	3.154				
		53.731	3.158				
		53.731	3.163				
		53.731	3.167				
		53.731	3.171				
		53.731	3.175				
		53.731	3.179				
		53.731	3.183				
		53.731	3.188				
		53.731	3.192				
		53.731	3.196				
		53.731	3.200				
		53.731	3.204				
		53.881	3.208				
		53.881	3.213				
		53.881	3.217				
		53.881	3.221				
		53.881	3.225				
		53.881	3.229				
		53.881	3.233				
		53.881	3.238				
		53.881	3.242				
		53.881	3.246				
		53.881	3.250				
		53.881	3.254				
		53.881	3.258				
		53.881	3.263				
		53.881	3.267				
		53.881	3.271				
		53.881	3.275				
		53.881	3.279				
		54.030	3.283				
		54.030	3.288				
		54.030	3.292				
		54.030	3.296				
		54.030	3.300				
		54.030	3.304				
		54.030	3.308				
		54.030	3.313				
		54.030	3.317				
		54.030	3.321				
		54.030	3.325				
		54.030	3.329				
		54.030	3.333				
		54.030	3.338				
		54.030	3.342				
		54.030	3.346				
		54.030	3.350				

		54.030	3.354				
		54.030	3.358				
		54.030	3.363				
		54.179	3.367				
		54.179	3.371				
		54.179	3.375				
		54.179	3.379				
		54.179	3.383				
		54.179	3.388				
		54.179	3.392				
		54.179	3.396				
		54.179	3.400				
		54.179	3.404				
		54.179	3.408				
		54.179	3.413				
		54.179	3.417				
		54.179	3.421				
		54.179	3.425				
		54.179	3.429				
		54.179	3.433				
		54.179	3.438				
		54.328	3.442				
		54.328	3.446				
		54.328	3.450				
		54.328	3.454				
		54.328	3.458				
		54.328	3.463				
		54.328	3.467				
		54.328	3.471				
		54.328	3.475				
		54.328	3.479				
		54.328	3.483				
		54.328	3.488				
		54.328	3.492				
		54.328	3.496				
		54.328	3.500				
		54.478	3.504				
		54.478	3.508				
		54.478	3.513				
		54.478	3.517				
		54.478	3.521				
		54.478	3.525				
		54.478	3.529				
		54.478	3.533				
		54.478	3.538				
		54.478	3.542				
		54.478	3.546				
		54.478	3.550				
		54.478	3.554				
		54.478	3.558				
		54.478	3.563				
		54.478	3.567				
		54.478	3.571				
		54.478	3.575				

		54.627	3.579				
		54.627	3.583				
		54.627	3.588				
		54.627	3.592				
		54.627	3.596				
		54.627	3.600				
		54.627	3.604				
		54.627	3.608				
		54.627	3.613				
		54.627	3.617				
		54.627	3.621				
		54.627	3.625				
		54.627	3.629				
		54.627	3.633				
		54.627	3.638				
		54.627	3.642				
		54.627	3.646				
		54.627	3.650				
		54.776	3.654				
		54.776	3.658				
		54.776	3.663				
		54.776	3.667				
		54.776	3.671				
		54.776	3.675				
		54.776	3.679				
		54.776	3.683				
		54.776	3.688				
		54.776	3.692				
		54.776	3.696				
		54.776	3.700				
		54.776	3.704				
		54.776	3.708				
		54.776	3.713				
		54.776	3.717				
		54.776	3.721				
		54.776	3.725				
		54.776	3.729				
		54.925	3.733				
		54.925	3.738				
		54.925	3.742				
		54.925	3.746				
		54.925	3.750				
		54.925	3.754				
		54.925	3.758				
		54.925	3.763				
		54.925	3.767				
		54.925	3.771				
		54.925	3.775				
		54.925	3.779				
		54.925	3.783				
		54.925	3.788				
		54.925	3.792				
		54.925	3.796				
		54.925	3.800				

		55.075	3.804				
		55.075	3.808				
		55.075	3.813				
		55.075	3.817				
		55.075	3.821				
		55.075	3.825				
		55.075	3.829				
		55.075	3.833				
		55.075	3.838				
		55.075	3.842				
		55.075	3.846				
		55.075	3.850				
		55.075	3.854				
		55.075	3.858				
		55.075	3.863				
		55.075	3.867				
		55.075	3.871				
		55.075	3.875				
		55.224	3.879				
		55.224	3.883				
		55.224	3.888				
		55.224	3.892				
		55.224	3.896				
		55.224	3.900				
		55.224	3.904				
		55.224	3.908				
		55.224	3.913				
		55.224	3.917				
		55.224	3.921				
		55.224	3.925				
		55.224	3.929				
		55.224	3.933				
		55.224	3.938				
		55.224	3.942				
		55.224	3.946				
		55.373	3.950				
		55.373	3.954				
		55.373	3.958				
		55.373	3.963				
		55.373	3.967				
		55.373	3.971				
		55.373	3.975				
		55.373	3.979				
		55.373	3.983				
		55.373	3.988				
		55.373	3.992				
		55.373	3.996				
		55.373	4.000				
		62.537	8.000				
		66.418	12.000				
		69.254	16.000				
		71.642	20.000				
		72.985	24.000				

72% of degree of saturation

50kPa							
Equilibrium stage		Consolidation stage		Shearing stage			
Matric suction/(kPa)	Time/(hr)	Matric suction/(kPa)	Time/(hr)	Matric suction/(kPa)	Time/(hr)	Matric suction/(kPa)	Shear strain/(%)
0.000	0.000	13.582	0.000	13.582	0.000	13.582	0.000
1.791	0.004	13.284	0.000	13.582	0.004	13.582	0.250
3.731	0.008	12.687	0.001	13.582	0.008	13.582	0.500
5.522	0.013	11.642	0.002	13.582	0.013	13.582	0.750
6.567	0.017	11.642	0.003	13.582	0.017	13.582	1.000
7.313	0.021	11.791	0.004	13.582	0.021	13.582	1.250
7.910	0.025	11.940	0.008	13.582	0.025	13.582	1.500
8.507	0.029	12.090	0.013	13.582	0.029	13.582	1.750
8.955	0.033	12.090	0.017	13.582	0.033	13.582	2.000
8.806	0.038	12.239	0.021	13.582	0.038	13.433	2.500
8.955	0.042	12.239	0.025	13.582	0.042	13.433	3.000
9.552	0.046	12.239	0.029	13.582	0.046	13.433	3.500
10.000	0.050	12.239	0.033	13.582	0.050	13.433	4.000
10.299	0.054	12.239	0.038	13.582	0.054	13.433	5.000
10.597	0.058	12.239	0.042	13.582	0.058	13.582	6.000
10.896	0.063	12.239	0.046	13.582	0.063	13.881	7.000
11.045	0.067	12.239	0.050	13.582	0.067	14.030	8.000
11.343	0.071	12.239	0.054	13.433	0.071	14.179	9.000
11.493	0.075	12.239	0.058	13.582	0.075	14.478	10.000
11.493	0.079	12.239	0.063	13.582	0.079	14.627	11.000
11.642	0.083	12.239	0.067	13.582	0.083	14.776	12.000
11.642	0.088	12.239	0.071	13.582	0.088	14.925	13.000
11.791	0.092	12.239	0.075	13.582	0.092	15.075	14.000
11.791	0.096	12.239	0.079	13.582	0.096		
11.791	0.100	12.239	0.083	13.582	0.100		
11.791	0.104	12.388	0.088	13.582	0.104		
11.791	0.108	12.388	0.092	13.582	0.108		
11.791	0.113	12.388	0.096	13.582	0.113		
11.940	0.117	12.388	0.100	13.582	0.117		
11.940	0.121	12.388	0.104	13.582	0.121		
11.940	0.125	12.388	0.108	13.582	0.125		
11.940	0.129	12.388	0.113	13.582	0.129		
11.940	0.133	12.388	0.117	13.731	0.133		
11.940	0.138	12.388	0.121	13.582	0.138		
11.940	0.142	12.388	0.125	13.582	0.142		
11.940	0.146	12.388	0.129	13.582	0.146		
11.791	0.150	12.388	0.133	13.582	0.150		
11.791	0.154	12.388	0.138	13.582	0.154		
11.791	0.158	12.388	0.142	13.582	0.158		
11.791	0.163	12.388	0.146	13.582	0.163		
11.791	0.167	12.388	0.150	13.582	0.167		
11.791	0.171	12.388	0.154	13.582	0.171		
11.791	0.175	12.388	0.158	13.433	0.175		
11.791	0.179	12.388	0.163	13.582	0.179		
11.791	0.183	12.388	0.167	13.433	0.183		
11.791	0.188	12.388	0.171	13.433	0.188		
11.791	0.192	12.388	0.175	13.433	0.192		
11.791	0.196	12.388	0.179	13.433	0.196		
11.791	0.200	12.388	0.183	13.433	0.200		
11.791	0.204	12.388	0.188	13.433	0.204		
11.791	0.208	12.388	0.192	13.433	0.208		

11.791	0.213	12.388	0.196	13.433	0.213		
11.791	0.217	12.388	0.200	13.284	0.217		
11.791	0.221	12.388	0.204	13.433	0.221		
11.791	0.225	12.388	0.208	13.433	0.225		
11.791	0.229	12.388	0.213	13.433	0.229		
11.791	0.233	12.388	0.217	13.433	0.233		
11.791	0.238	12.388	0.221	13.284	0.238		
11.791	0.242	12.388	0.225	13.433	0.242		
11.791	0.246	12.388	0.229	13.433	0.246		
11.791	0.250	12.388	0.233	13.433	0.250		
11.791	0.254	12.388	0.238	13.433	0.254		
11.791	0.258	12.388	0.242	13.433	0.258		
11.791	0.263	12.388	0.246	13.433	0.263		
11.791	0.267	12.388	0.250	13.433	0.267		
11.791	0.271	12.388	0.254	13.433	0.271		
11.791	0.275	12.388	0.258	13.433	0.275		
11.791	0.279	12.388	0.263	13.433	0.279		
11.791	0.283	12.388	0.267	13.433	0.283		
11.791	0.288	12.388	0.271	13.433	0.288		
11.791	0.292	12.388	0.275	13.433	0.292		
11.791	0.296	12.388	0.279	13.433	0.296		
11.791	0.300	12.388	0.283	13.433	0.300		
11.791	0.304	12.388	0.288	13.433	0.304		
11.791	0.308	12.388	0.292	13.433	0.308		
11.791	0.313	12.388	0.296	13.433	0.313		
11.791	0.317	12.388	0.300	13.433	0.317		
11.791	0.321	12.388	0.304	13.433	0.321		
11.791	0.325	12.388	0.308	13.433	0.325		
11.791	0.329	12.388	0.313	13.433	0.329		
11.791	0.333	12.388	0.317	13.433	0.333		
11.791	0.338	12.388	0.321	13.433	0.338		
11.791	0.342	12.388	0.325	13.433	0.342		
11.791	0.346	12.388	0.329	13.433	0.346		
11.791	0.350	12.388	0.333	13.433	0.350		
11.791	0.354	12.388	0.338	13.433	0.354		
11.791	0.358	12.388	0.342	13.433	0.358		
11.791	0.363	12.388	0.346	13.433	0.363		
11.791	0.367	12.388	0.350	13.433	0.367		
11.791	0.371	12.388	0.354	13.433	0.371		
11.791	0.375	12.388	0.358	13.433	0.375		
11.791	0.379	12.388	0.363	13.433	0.379		
11.791	0.383	12.388	0.367	13.433	0.383		
11.791	0.388	12.388	0.371	13.433	0.388		
11.791	0.392	12.388	0.375	13.433	0.392		
11.791	0.396	12.388	0.379	13.433	0.396		
11.791	0.400	12.388	0.383	13.433	0.400		
11.791	0.404	12.388	0.388	13.433	0.404		
11.791	0.408	12.388	0.392	13.433	0.408		
11.791	0.413	12.388	0.396	13.433	0.413		
11.791	0.417	12.388	0.400	13.582	0.417		
11.791	0.421	12.388	0.404	13.582	0.421		
11.791	0.425	12.537	0.408	13.582	0.425		
11.791	0.429	12.537	0.413	13.433	0.429		
11.791	0.433	12.537	0.417	13.433	0.433		
11.791	0.438	12.537	0.421	13.433	0.438		
11.791	0.442	12.388	0.425	13.433	0.442		

11.791	0.446	12.537	0.429	13.433	0.446		
11.791	0.450	12.388	0.433	13.582	0.450		
11.791	0.454	12.537	0.438	13.582	0.454		
11.791	0.458	12.537	0.442	13.582	0.458		
11.791	0.463	12.388	0.446	13.582	0.463		
11.791	0.467	12.388	0.450	13.582	0.467		
11.791	0.471	12.388	0.454	13.582	0.471		
11.791	0.475	12.537	0.458	13.582	0.475		
11.791	0.479	12.537	0.463	13.582	0.479		
11.940	0.483	12.388	0.467	13.582	0.483		
11.791	0.488	12.537	0.471	13.582	0.488		
11.791	0.492	12.388	0.475	13.582	0.492		
11.791	0.496	12.388	0.479	13.582	0.496		
11.791	0.500	12.537	0.483	13.582	0.500		
11.940	0.504	12.537	0.488	13.582	0.504		
11.940	0.508	12.537	0.492	13.731	0.508		
11.940	0.513	12.537	0.496	13.731	0.513		
11.940	0.517	12.537	0.500	13.731	0.517		
11.940	0.521	12.537	0.504	13.731	0.521		
11.940	0.525	12.537	0.508	13.731	0.525		
11.940	0.529	12.537	0.513	13.731	0.529		
11.940	0.533	12.537	0.517	13.731	0.533		
11.940	0.538	12.537	0.521	13.731	0.538		
11.940	0.542	12.537	0.525	13.731	0.542		
11.940	0.546	12.537	0.529	13.731	0.546		
11.940	0.550	12.537	0.533	13.731	0.550		
11.940	0.554	12.537	0.538	13.881	0.554		
11.940	0.558	12.537	0.542	13.881	0.558		
11.940	0.563	12.537	0.546	13.881	0.563		
11.940	0.567	12.537	0.550	13.881	0.567		
11.940	0.571	12.537	0.554	13.881	0.571		
11.940	0.575	12.537	0.558	13.881	0.575		
11.940	0.579	12.537	0.563	13.881	0.579		
11.940	0.583	12.537	0.567	13.881	0.583		
11.940	0.588	12.537	0.571	13.881	0.588		
11.940	0.592	12.537	0.575	13.881	0.592		
11.940	0.596	12.537	0.579	13.881	0.596		
11.940	0.600	12.537	0.583	13.881	0.600		
11.940	0.604	12.537	0.588	13.881	0.604		
11.940	0.608	12.537	0.592	13.881	0.608		
11.940	0.613	12.537	0.596	13.881	0.613		
11.940	0.617	12.537	0.600	13.881	0.617		
11.940	0.621	12.537	0.604	13.881	0.621		
11.940	0.625	12.537	0.608	13.881	0.625		
11.940	0.629	12.537	0.613	14.030	0.629		
11.940	0.633	12.537	0.617	13.881	0.633		
11.940	0.638	12.537	0.621	14.030	0.638		
11.940	0.642	12.537	0.625	14.030	0.642		
11.940	0.646	12.537	0.629	14.030	0.646		
11.940	0.650	12.537	0.633	14.030	0.650		
11.940	0.654	12.537	0.638	14.030	0.654		
11.940	0.658	12.537	0.642	14.030	0.658		
11.940	0.663	12.537	0.646	14.030	0.663		
11.940	0.667	12.537	0.650	14.030	0.667		
11.940	0.671	12.537	0.654	14.030	0.671		
11.940	0.675	12.537	0.658	14.030	0.675		

11.940	0.679	12.537	0.663	14.179	0.679		
11.940	0.683	12.537	0.667	14.179	0.683		
11.940	0.688	12.537	0.671	14.179	0.688		
11.940	0.692	12.537	0.675	14.179	0.692		
11.940	0.696	12.537	0.679	14.179	0.696		
11.940	0.700	12.537	0.683	14.179	0.700		
11.940	0.704	12.537	0.688	14.179	0.704		
11.940	0.708	12.537	0.692	14.179	0.708		
11.940	0.713	12.537	0.696	14.179	0.713		
11.940	0.717	12.537	0.700	14.179	0.717		
11.940	0.721	12.537	0.704	14.179	0.721		
11.940	0.725	12.537	0.708	14.179	0.725		
11.940	0.729	12.537	0.713	14.179	0.729		
11.940	0.733	12.537	0.717	14.179	0.733		
11.940	0.738	12.537	0.721	14.179	0.738		
11.940	0.742	12.537	0.725	14.179	0.742		
11.940	0.746	12.537	0.729	14.179	0.746		
11.940	0.750	12.537	0.733	14.328	0.750		
11.940	0.754	12.537	0.738	14.328	0.754		
11.940	0.758	12.537	0.742	14.328	0.758		
11.940	0.763	12.537	0.746	14.328	0.763		
11.940	0.767	12.537	0.750	14.328	0.767		
11.940	0.771	12.537	0.754	14.328	0.771		
11.940	0.775	12.537	0.758	14.328	0.775		
11.940	0.779	12.537	0.763	14.328	0.779		
11.940	0.783	12.537	0.767	14.328	0.783		
11.940	0.788	12.537	0.771	14.328	0.788		
11.940	0.792	12.537	0.775	14.328	0.792		
11.940	0.796	12.537	0.779	14.328	0.796		
11.940	0.800	12.537	0.783	14.478	0.800		
11.940	0.804	12.537	0.788	14.478	0.804		
11.940	0.808	12.537	0.792	14.478	0.808		
11.940	0.813	12.537	0.796	14.478	0.813		
11.940	0.817	12.537	0.800	14.478	0.817		
11.940	0.821	12.537	0.804	14.478	0.821		
11.940	0.825	12.537	0.808	14.478	0.825		
11.940	0.829	12.537	0.813	14.478	0.829		
11.940	0.833	12.537	0.817	14.478	0.833		
11.940	0.838	12.537	0.821	14.478	0.838		
11.940	0.842	12.537	0.825	14.478	0.842		
11.940	0.846	12.537	0.829	14.478	0.846		
11.940	0.850	12.537	0.833	14.478	0.850		
11.940	0.854	12.537	0.838	14.478	0.854		
11.940	0.858	12.537	0.842	14.627	0.858		
11.940	0.863	12.537	0.846	14.627	0.863		
11.940	0.867	12.537	0.850	14.627	0.867		
11.940	0.871	12.537	0.854	14.627	0.871		
11.940	0.875	12.537	0.858	14.627	0.875		
11.940	0.879	12.537	0.863	14.627	0.879		
11.940	0.883	12.537	0.867	14.627	0.883		
11.940	0.888	12.537	0.871	14.627	0.888		
11.940	0.892	12.687	0.875	14.627	0.892		
11.940	0.896	12.537	0.879	14.627	0.896		
11.940	0.900	12.537	0.883	14.627	0.900		
11.940	0.904	12.537	0.888	14.627	0.904		
11.940	0.908	12.537	0.892	14.627	0.908		

11.940	0.913	12.537	0.896	14.627	0.913		
11.940	0.917	12.537	0.900	14.627	0.917		
11.940	0.921	12.537	0.904	14.627	0.921		
11.940	0.925	12.537	0.908	14.776	0.925		
11.940	0.929	12.537	0.913	14.776	0.929		
11.940	0.933	12.537	0.917	14.776	0.933		
11.940	0.938	12.537	0.921	14.776	0.938		
11.940	0.942	12.687	0.925	14.776	0.942		
11.940	0.946	12.687	0.929	14.776	0.946		
11.940	0.950	12.537	0.933	14.776	0.950		
11.940	0.954	12.687	0.938	14.776	0.954		
11.940	0.958	12.687	0.942	14.776	0.958		
11.940	0.963	12.687	0.946	14.776	0.963		
11.940	0.967	12.687	0.950	14.776	0.967		
11.940	0.971	12.687	0.954	14.776	0.971		
11.940	0.975	12.687	0.958	14.776	0.975		
11.940	0.979	12.687	0.963	14.776	0.979		
11.940	0.983	12.687	0.967	14.776	0.983		
11.940	0.988	12.687	0.971	14.925	0.988		
11.940	0.992	12.687	0.975	14.776	0.992		
11.940	0.996	12.687	0.979	14.776	0.996		
11.940	1.000	12.687	0.983	14.776	1.000		
11.940	1.004	12.687	0.988	14.776	1.004		
11.940	1.008	12.687	0.992	14.776	1.008		
11.940	1.013	12.687	0.996	14.925	1.013		
11.940	1.017	12.687	1.000	14.925	1.017		
11.940	1.021	12.687	1.004	14.925	1.021		
11.940	1.025	12.687	1.008	14.925	1.025		
11.940	1.029	12.687	1.013	14.925	1.029		
11.940	1.033	12.687	1.017	14.925	1.033		
11.940	1.038	12.687	1.021	14.925	1.038		
11.940	1.042	12.687	1.025	14.925	1.042		
11.940	1.046	12.687	1.029	14.925	1.046		
11.940	1.050	12.687	1.033	14.925	1.050		
11.940	1.054	12.687	1.038	14.925	1.054		
11.940	1.058	12.687	1.042	14.925	1.058		
11.940	1.063	12.687	1.046	14.925	1.063		
11.940	1.067	12.687	1.050	14.925	1.067		
11.940	1.071	12.687	1.054	14.925	1.071		
11.940	1.075	12.687	1.058	14.925	1.075		
11.940	1.079	12.687	1.063	15.075	1.079		
11.940	1.083	12.687	1.067	14.925	1.083		
11.940	1.088	12.687	1.071	15.075	1.088		
11.940	1.092	12.687	1.075	15.075	1.092		
11.940	1.096	12.687	1.079	15.075	1.096		
11.940	1.100	12.687	1.083	15.075	1.100		
11.940	1.104	12.687	1.088	15.075	1.104		
11.940	1.108	12.687	1.092	15.075	1.108		
11.940	1.113	12.687	1.096	15.075	1.113		
11.940	1.117	12.687	1.100	15.075	1.117		
11.940	1.121	12.687	1.104	15.075	1.121		
11.940	1.125	12.687	1.108	15.075	1.125		
11.940	1.129	12.687	1.113	15.075	1.129		
11.940	1.133	12.687	1.117	15.075	1.133		
11.940	1.138	12.687	1.121	15.075	1.138		
11.940	1.142	12.687	1.125	15.075	1.142		

11.940	1.146	12.687	1.129	15.075	1.146		
11.940	1.150	12.687	1.133	15.075	1.150		
11.940	1.154	12.687	1.138	15.075	1.154		
11.940	1.158	12.687	1.142	15.075	1.158		
11.940	1.163	12.687	1.146	15.075	1.163		
11.940	1.167	12.687	1.150				
11.940	1.171	12.687	1.154				
11.940	1.175	12.687	1.158				
11.940	1.179	12.687	1.163				
11.940	1.183	12.687	1.167				
11.940	1.188	12.687	1.171				
11.940	1.192	12.687	1.175				
11.940	1.196	12.687	1.179				
11.940	1.200	12.687	1.183				
11.940	1.204	12.687	1.188				
11.940	1.208	12.687	1.192				
11.940	1.213	12.687	1.196				
11.940	1.217	12.687	1.200				
11.940	1.221	12.687	1.204				
11.940	1.225	12.687	1.208				
11.940	1.229	12.687	1.213				
11.940	1.233	12.687	1.217				
11.940	1.238	12.687	1.221				
11.940	1.242	12.687	1.225				
11.940	1.246	12.687	1.229				
11.940	1.250	12.687	1.233				
11.940	1.254	12.687	1.238				
11.940	1.258	12.687	1.242				
11.940	1.263	12.687	1.246				
11.940	1.267	12.687	1.250				
11.940	1.271	12.687	1.254				
11.940	1.275	12.687	1.258				
11.940	1.279	12.687	1.263				
11.940	1.283	12.687	1.267				
11.940	1.288	12.687	1.271				
11.940	1.292	12.687	1.275				
11.940	1.296	12.836	1.279				
11.940	1.300	12.687	1.283				
11.940	1.304	12.687	1.288				
11.940	1.308	12.687	1.292				
11.940	1.313	12.687	1.296				
11.940	1.317	12.687	1.300				
11.940	1.321	12.687	1.304				
11.940	1.325	12.687	1.308				
11.940	1.329	12.687	1.313				
11.940	1.333	12.687	1.317				
11.940	1.338	12.687	1.321				
11.940	1.342	12.687	1.325				
11.940	1.346	12.687	1.329				
11.940	1.350	12.687	1.333				
11.940	1.354	12.687	1.338				
11.940	1.358	12.836	1.342				
11.940	1.363	12.836	1.346				
11.940	1.367	12.687	1.350				
11.940	1.371	12.687	1.354				
11.940	1.375	12.687	1.358				

11.940	1.379	12.687	1.363				
11.940	1.383	12.687	1.367				
11.940	1.388	12.836	1.371				
11.940	1.392	12.687	1.375				
11.940	1.396	12.687	1.379				
11.940	1.400	12.687	1.383				
11.940	1.404	12.687	1.388				
11.940	1.408	12.687	1.392				
11.940	1.413	12.836	1.396				
11.940	1.417	12.687	1.400				
11.940	1.421	12.836	1.404				
11.940	1.425	12.836	1.408				
12.090	1.429	12.687	1.413				
11.940	1.433	12.836	1.417				
12.090	1.438	12.687	1.421				
11.940	1.442	12.836	1.425				
11.940	1.446	12.836	1.429				
12.090	1.450	12.687	1.433				
12.090	1.454	12.836	1.438				
11.940	1.458	12.836	1.442				
12.090	1.463	12.836	1.446				
12.090	1.467	12.836	1.450				
12.090	1.471	12.836	1.454				
11.940	1.475	12.836	1.458				
12.090	1.479	12.836	1.463				
12.090	1.483	12.836	1.467				
12.090	1.488	12.836	1.471				
12.090	1.492	12.836	1.475				
12.090	1.496	12.836	1.479				
11.940	1.500	12.836	1.483				
11.940	1.504	12.836	1.488				
12.090	1.508	12.836	1.492				
12.090	1.513	12.836	1.496				
12.090	1.517	12.836	1.500				
12.090	1.521	12.836	1.504				
12.090	1.525	12.836	1.508				
12.090	1.529	12.836	1.513				
12.090	1.533	12.836	1.517				
12.090	1.538	12.836	1.521				
11.940	1.542	12.836	1.525				
12.090	1.546	12.836	1.529				
12.090	1.550	12.836	1.533				
12.090	1.554	12.836	1.538				
12.090	1.558	12.836	1.542				
12.090	1.563	12.836	1.546				
12.090	1.567	12.836	1.550				
12.090	1.571	12.836	1.554				
12.090	1.575	12.836	1.558				
12.090	1.579	12.836	1.563				
12.090	1.583	12.836	1.567				
12.090	1.588	12.836	1.571				
12.090	1.592	12.836	1.575				
12.090	1.596	12.836	1.579				
12.090	1.600	12.836	1.583				
12.090	1.604	12.836	1.588				
12.090	1.608	12.836	1.592				

12.090	1.613	12.836	1.596				
12.090	1.617	12.836	1.600				
12.090	1.621	12.836	1.604				
12.090	1.625	12.836	1.608				
12.090	1.629	12.836	1.613				
12.090	1.633	12.836	1.617				
12.090	1.638	12.836	1.621				
12.090	1.642	12.836	1.625				
12.090	1.646	12.836	1.629				
12.090	1.650	12.836	1.633				
12.090	1.654	12.836	1.638				
12.090	1.658	12.836	1.642				
12.090	1.663	12.836	1.646				
12.090	1.667	12.836	1.650				
12.090	1.671	12.836	1.654				
12.090	1.675	12.836	1.658				
12.090	1.679	12.836	1.663				
12.090	1.683	12.836	1.667				
12.090	1.688	12.836	1.671				
12.090	1.692	12.836	1.675				
12.090	1.696	12.836	1.679				
12.090	1.700	12.836	1.683				
12.090	1.704	12.836	1.688				
12.090	1.708	12.836	1.692				
12.090	1.713	12.836	1.696				
12.090	1.717	12.836	1.700				
12.090	1.721	12.836	1.704				
12.090	1.725	12.836	1.708				
12.090	1.729	12.836	1.713				
12.090	1.733	12.836	1.717				
12.090	1.738	12.836	1.721				
12.090	1.742	12.836	1.725				
12.090	1.746	12.836	1.729				
12.090	1.750	12.836	1.733				
12.090	1.754	12.836	1.738				
12.090	1.758	12.836	1.742				
12.090	1.763	12.836	1.746				
12.090	1.767	12.836	1.750				
12.090	1.771	12.836	1.754				
12.090	1.775	12.836	1.758				
12.090	1.779	12.836	1.763				
12.090	1.783	12.836	1.767				
12.090	1.788	12.836	1.771				
12.090	1.792	12.836	1.775				
12.090	1.796	12.836	1.779				
12.090	1.800	12.836	1.783				
12.090	1.804	12.985	1.788				
12.090	1.808	12.985	1.792				
12.090	1.813	12.836	1.796				
12.090	1.817	12.985	1.800				
12.090	1.821	12.985	1.804				
12.090	1.825	12.836	1.808				
12.090	1.829	12.985	1.813				
12.090	1.833	12.985	1.817				
12.090	1.838	12.985	1.821				
12.090	1.842	12.985	1.825				

12.090	1.846	12.985	1.829				
12.090	1.850	12.985	1.833				
12.090	1.854	12.985	1.838				
12.090	1.858	12.985	1.842				
12.090	1.863	12.985	1.846				
12.090	1.867	12.985	1.850				
12.090	1.871	12.985	1.854				
12.090	1.875	12.985	1.858				
12.090	1.879	12.985	1.863				
12.090	1.883	12.985	1.867				
12.090	1.888	12.985	1.871				
12.090	1.892	12.985	1.875				
12.090	1.896	12.985	1.879				
12.090	1.900	12.985	1.883				
12.090	1.904	12.985	1.888				
12.090	1.908	12.985	1.892				
12.090	1.913	12.985	1.896				
12.090	1.917	12.985	1.900				
12.090	1.921	12.985	1.904				
12.090	1.925	12.985	1.908				
12.090	1.929	12.985	1.913				
12.090	1.933	12.985	1.917				
12.090	1.938	12.985	1.921				
12.239	1.942	12.985	1.925				
12.239	1.946	12.985	1.929				
12.239	1.950	12.985	1.933				
12.239	1.954	12.985	1.938				
12.239	1.958	12.985	1.942				
12.239	1.963	12.985	1.946				
12.239	1.967	12.985	1.950				
12.239	1.971	12.985	1.954				
12.239	1.975	12.985	1.958				
12.239	1.979	12.985	1.963				
12.239	1.983	12.985	1.967				
12.239	1.988	12.985	1.971				
12.239	1.992	12.985	1.975				
12.239	1.996	12.985	1.979				
12.239	2.000	12.985	1.983				
12.239	2.004	12.985	1.988				
12.239	2.008	12.985	1.992				
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12.239	2.017	12.985	2.000				
12.239	2.021	12.985	2.004				
12.239	2.025	12.985	2.008				
12.239	2.029	12.985	2.013				
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12.239	2.038	12.985	2.021				
12.239	2.042	12.985	2.025				
12.239	2.046	12.985	2.029				
12.239	2.050	12.985	2.033				
12.239	2.054	12.985	2.038				
12.239	2.058	12.985	2.042				
12.239	2.063	12.985	2.046				
12.239	2.067	12.985	2.050				
12.239	2.071	12.985	2.054				
12.239	2.075	12.985	2.058				

12.239	2.079	12.985	2.063				
12.239	2.083	12.985	2.067				
12.239	2.088	12.985	2.071				
12.239	2.092	12.985	2.075				
12.239	2.096	12.985	2.079				
12.239	2.100	12.985	2.083				
12.239	2.104	12.985	2.088				
12.239	2.108	12.985	2.092				
12.239	2.113	12.985	2.096				
12.239	2.117	12.985	2.100				
12.239	2.121	12.985	2.104				
12.239	2.125	12.985	2.108				
12.239	2.129	12.985	2.113				
12.239	2.133	12.985	2.117				
12.239	2.138	12.985	2.121				
12.239	2.142	12.985	2.125				
12.239	2.146	12.985	2.129				
12.239	2.150	12.985	2.133				
12.239	2.154	12.985	2.138				
12.239	2.158	12.985	2.142				
12.239	2.163	12.985	2.146				
12.239	2.167	12.985	2.150				
12.239	2.171	12.985	2.154				
12.239	2.175	12.985	2.158				
12.239	2.179	12.985	2.163				
12.239	2.183	12.985	2.167				
12.239	2.188	12.985	2.171				
12.239	2.192	12.985	2.175				
12.239	2.196	12.985	2.179				
12.239	2.200	12.985	2.183				
12.239	2.204	12.985	2.188				
12.239	2.208	12.985	2.192				
12.239	2.213	12.985	2.196				
12.239	2.217	12.985	2.200				
12.239	2.221	12.985	2.204				
12.239	2.225	12.985	2.208				
12.239	2.229	12.985	2.213				
12.239	2.233	12.985	2.217				
12.239	2.238	12.985	2.221				
12.239	2.242	12.985	2.225				
12.239	2.246	12.985	2.229				
12.239	2.250	12.985	2.233				
12.239	2.254	12.985	2.238				
12.239	2.258	12.985	2.242				
12.239	2.263	12.985	2.246				
12.239	2.267	12.985	2.250				
12.239	2.271	12.985	2.254				
12.239	2.275	12.985	2.258				
12.239	2.279	12.985	2.263				
12.239	2.283	12.985	2.267				
12.239	2.288	12.985	2.271				
12.239	2.292	12.985	2.275				
12.239	2.296	12.985	2.279				
12.239	2.300	12.985	2.283				
12.239	2.304	12.985	2.288				
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12.239	2.317	12.985	2.300				
12.239	2.321	12.985	2.304				
12.239	2.325	13.134	2.308				
12.239	2.329	12.985	2.313				
12.388	2.333	13.134	2.317				
12.239	2.338	13.134	2.321				
12.239	2.342	12.985	2.325				
12.239	2.346	12.985	2.329				
12.388	2.350	12.985	2.333				
12.239	2.354	13.134	2.338				
12.239	2.358	12.985	2.342				
12.239	2.363	13.134	2.346				
12.239	2.367	13.134	2.350				
12.388	2.371	13.134	2.354				
12.239	2.375	13.134	2.358				
12.239	2.379	13.134	2.363				
12.239	2.383	13.134	2.367				
12.239	2.388	13.134	2.371				
12.239	2.392	13.134	2.375				
12.239	2.396	13.134	2.379				
12.239	2.400	13.134	2.383				
12.239	2.404	13.134	2.388				
12.239	2.408	12.985	2.392				
12.239	2.413	13.134	2.396				
12.388	2.417	13.134	2.400				
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12.239	2.433	13.134	2.417				
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12.239	2.442	13.134	2.425				
12.239	2.446	13.134	2.429				
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12.239	2.475	13.134	2.458				
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12.239	2.492	13.134	2.475				
12.239	2.496	13.134	2.479				
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12.239	2.513	13.134	2.496				
12.239	2.517	13.134	2.500				
12.388	2.521	13.134	2.504				
12.388	2.525	13.134	2.508				
12.388	2.529	13.134	2.513				
12.388	2.533	13.134	2.517				
12.388	2.538	13.134	2.521				
12.388	2.542	13.134	2.525				

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12.388	2.550	13.134	2.533				
12.388	2.554	13.134	2.538				
12.388	2.558	13.134	2.542				
12.388	2.563	13.134	2.546				
12.388	2.567	13.134	2.550				
12.388	2.571	13.134	2.554				
12.388	2.575	13.134	2.558				
12.388	2.579	13.134	2.563				
12.388	2.583	13.134	2.567				
12.388	2.588	13.134	2.571				
12.388	2.592	13.134	2.575				
12.388	2.596	13.134	2.579				
12.388	2.600	13.134	2.583				
12.388	2.604	13.134	2.588				
12.388	2.608	13.134	2.592				
12.388	2.613	13.134	2.596				
12.388	2.617	13.134	2.600				
12.388	2.621	13.134	2.604				
12.388	2.625	13.134	2.608				
12.388	2.629	13.134	2.613				
12.388	2.633	13.134	2.617				
12.388	2.638	13.134	2.621				
12.388	2.642	13.134	2.625				
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12.388	2.650	13.134	2.633				
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12.388	2.658	13.134	2.642				
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12.388	2.671	13.134	2.654				
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12.388	2.679	13.134	2.663				
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12.388	2.713	13.134	2.696				
12.388	2.717	13.134	2.700				
12.388	2.721	13.134	2.704				
12.388	2.725	13.134	2.708				
12.388	2.729	13.134	2.713				
12.388	2.733	13.134	2.717				
12.388	2.738	13.134	2.721				
12.388	2.742	13.134	2.725				
12.388	2.746	13.134	2.729				
12.388	2.750	13.134	2.733				
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12.388	2.758	13.134	2.742				
12.388	2.763	13.134	2.746				
12.388	2.767	13.134	2.750				
12.388	2.771	13.134	2.754				
12.388	2.775	13.134	2.758				

12.388	2.779	13.134	2.763				
12.388	2.783	13.134	2.767				
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12.388	2.792	13.134	2.775				
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12.388	2.808	13.134	2.792				
12.388	2.813	13.134	2.796				
12.388	2.817	13.134	2.800				
12.388	2.821	13.134	2.804				
12.388	2.825	13.134	2.808				
12.388	2.829	13.134	2.813				
12.388	2.833	13.134	2.817				
12.388	2.838	13.134	2.821				
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12.388	2.871	13.284	2.854				
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12.388	2.879	13.284	2.863				
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12.388	2.942	13.284	2.925				
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12.388	2.971	13.284	2.954				
12.388	2.975	13.284	2.958				
12.388	2.979	13.284	2.963				
12.537	2.983	13.284	2.967				
12.537	2.988	13.284	2.971				
12.388	2.992	13.284	2.975				
12.537	2.996	13.284	2.979				
12.537	3.000	13.284	2.983				
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12.537	3.008	13.284	2.992				

12.388	3.013	13.284	2.996				
12.388	3.017	13.284	3.000				
12.537	3.021	13.284	3.004				
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12.388	3.042	13.284	3.025				
12.388	3.046	13.284	3.029				
12.537	3.050	13.284	3.033				
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12.537	3.063	13.284	3.046				
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12.388	3.075	13.284	3.058				
12.388	3.079	13.284	3.063				
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12.388	3.108	13.284	3.092				
12.388	3.113	13.284	3.096				
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12.537	3.121	13.284	3.104				
12.537	3.125	13.284	3.108				
12.388	3.129	13.284	3.113				
12.537	3.133	13.284	3.117				
12.388	3.138	13.284	3.121				
12.388	3.142	13.284	3.125				
12.537	3.146	13.284	3.129				
12.537	3.150	13.284	3.133				
12.388	3.154	13.284	3.138				
12.388	3.158	13.284	3.142				
12.388	3.163	13.284	3.146				
12.537	3.167	13.284	3.150				
12.537	3.171	13.284	3.154				
12.537	3.175	13.284	3.158				
12.537	3.179	13.284	3.163				
12.537	3.183	13.284	3.167				
12.537	3.188	13.284	3.171				
12.537	3.192	13.284	3.175				
12.537	3.196	13.284	3.179				
12.537	3.200	13.284	3.183				
12.537	3.204	13.284	3.188				
12.537	3.208	13.284	3.192				
12.537	3.213	13.284	3.196				
12.537	3.217	13.284	3.200				
12.537	3.221	13.284	3.204				
12.537	3.225	13.284	3.208				
12.537	3.229	13.284	3.213				
12.537	3.233	13.284	3.217				
12.537	3.238	13.284	3.221				
12.537	3.242	13.284	3.225				

12.537	3.246	13.284	3.229				
12.537	3.250	13.284	3.233				
12.537	3.254	13.284	3.238				
12.537	3.258	13.284	3.242				
12.537	3.263	13.284	3.246				
12.537	3.267	13.284	3.250				
12.537	3.271	13.284	3.254				
12.537	3.275	13.284	3.258				
12.537	3.279	13.284	3.263				
12.537	3.283	13.284	3.267				
12.537	3.288	13.284	3.271				
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12.537	3.296	13.284	3.279				
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12.537	3.304	13.284	3.288				
12.537	3.308	13.284	3.292				
12.537	3.313	13.284	3.296				
12.537	3.317	13.284	3.300				
12.537	3.321	13.284	3.304				
12.537	3.325	13.284	3.308				
12.537	3.329	13.284	3.313				
12.537	3.333	13.284	3.317				
12.537	3.338	13.284	3.321				
12.537	3.342	13.284	3.325				
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12.537	3.358	13.284	3.342				
12.537	3.363	13.284	3.346				
12.537	3.367	13.284	3.350				
12.537	3.371	13.284	3.354				
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12.537	3.379	13.284	3.363				
12.537	3.383	13.284	3.367				
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12.537	3.454	13.284	3.438				
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12.537	3.496	13.284	3.479				
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12.537	3.671	13.433	3.654				
12.537	3.675	13.433	3.658				
12.537	3.679	13.433	3.663				
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12.836	4.833	13.582	4.817				
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12.836	4.863	13.582	4.846				
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12.836	4.942	13.582	4.925				
12.836	4.946	13.582	4.929				
12.836	4.950	13.582	4.933				
12.836	4.954	13.582	4.938				
12.836	4.958	13.582	4.942				
12.836	4.963	13.582	4.946				
12.836	4.967	13.582	4.950				
12.836	4.971	13.582	4.954				
12.836	4.975	13.582	4.958				
12.836	4.979	13.582	4.963				
12.836	4.983	13.433	4.967				
12.836	4.988	13.582	4.971				
12.836	4.992	13.582	4.975				
12.836	4.996	13.582	4.979				
12.836	5.000	13.582	4.983				
12.836	5.004	13.582	4.988				
12.836	5.008	13.582	4.992				
12.836	5.013	13.582	4.996				
12.836	5.017	13.582	5.000				
12.836	5.021	13.582	5.004				
12.836	5.025	13.582	5.008				
12.836	5.029	13.582	5.013				
12.836	5.033	13.582	5.017				
12.836	5.038	13.582	5.021				
12.836	5.042	13.582	5.025				
12.836	5.046	13.731	5.029				
12.836	5.050	13.582	5.033				
12.836	5.054	13.582	5.038				
12.836	5.058	13.582	5.042				
12.836	5.063	13.582	5.046				
12.836	5.067	13.582	5.050				
12.836	5.071	13.582	5.054				
12.836	5.075	13.582	5.058				
12.836	5.079	13.582	5.063				
12.836	5.083	13.582	5.067				
12.836	5.088	13.433	5.071				
12.836	5.092	13.582	5.075				
12.836	5.096	13.433	5.079				
12.836	5.100	13.433	5.083				
12.836	5.104	13.433	5.088				
12.836	5.108	13.433	5.092				

12.836	5.113	13.433	5.096				
12.836	5.117	13.433	5.100				
12.836	5.121	13.433	5.104				
12.836	5.125	13.433	5.108				
12.836	5.129	13.284	5.113				
12.836	5.133	13.433	5.117				
12.836	5.138	13.433	5.121				
12.836	5.142	13.433	5.125				
12.836	5.146	13.433	5.129				
12.836	5.150	13.284	5.133				
12.836	5.154	13.433	5.138				
12.836	5.158	13.433	5.142				
12.836	5.163	13.433	5.146				
12.836	5.167	13.433	5.150				
12.836	5.171	13.433	5.154				
12.836	5.175	13.433	5.158				
12.836	5.179	13.433	5.163				
12.836	5.183	13.433	5.167				
12.836	5.188	13.433	5.171				
12.836	5.192	13.433	5.175				
12.836	5.196	13.433	5.179				
12.836	5.200	13.433	5.183				
12.836	5.204	13.433	5.188				
12.836	5.208	13.433	5.192				
12.836	5.213	13.433	5.196				
12.836	5.217	13.433	5.200				
12.836	5.221	13.433	5.204				
12.836	5.225	13.433	5.208				
12.836	5.229	13.433	5.213				
12.836	5.233	13.433	5.217				
12.836	5.238	13.433	5.221				
12.836	5.242	13.433	5.225				
12.836	5.246	13.433	5.229				
12.836	5.250	13.433	5.233				
12.985	5.254	13.433	5.238				
12.836	5.258	13.433	5.242				
12.836	5.263	13.433	5.246				
12.836	5.267	13.433	5.250				
12.836	5.271	13.433	5.254				
12.836	5.275	13.433	5.258				
12.836	5.279	13.433	5.263				
12.836	5.283	13.433	5.267				
12.836	5.288	13.433	5.271				
12.836	5.292	13.433	5.275				
12.836	5.296	13.433	5.279				
12.836	5.300	13.433	5.283				
12.836	5.304	13.433	5.288				
12.836	5.308	13.433	5.292				
12.836	5.313	13.433	5.296				
12.836	5.317	13.433	5.300				
12.836	5.321	13.433	5.304				
12.836	5.325	13.433	5.308				
12.836	5.329	13.582	5.313				
12.836	5.333	13.582	5.317				
12.836	5.338	13.582	5.321				
12.836	5.342	13.433	5.325				

12.836	5.346	13.433	5.329				
12.836	5.350	13.433	5.333				
12.836	5.354	13.433	5.338				
12.836	5.358	13.433	5.342				
12.836	5.363	13.582	5.346				
12.836	5.367	13.582	5.350				
12.836	5.371	13.582	5.354				
12.836	5.375	13.582	5.358				
12.836	5.379	13.582	5.363				
12.836	5.383	13.582	5.367				
12.836	5.388	13.582	5.371				
12.836	5.392	13.582	5.375				
12.836	5.396	13.582	5.379				
12.836	5.400	13.582	5.383				
12.985	5.404	13.582	5.388				
12.836	5.408	13.582	5.392				
12.836	5.413	13.582	5.396				
12.836	5.417	13.582	5.400				
12.836	5.421	13.582	8.000				
12.836	5.425	13.582	12.000				
12.836	5.429	13.582	16.000				
12.836	5.433	13.582	20.000				
12.836	5.438	13.582	24.000				
12.836	5.442						
12.836	5.446						
12.836	5.450						
12.985	5.454						
12.985	5.458						
12.985	5.463						
12.985	5.467						
12.985	5.471						
12.985	5.475						
12.985	5.479						
12.985	5.483						
12.985	5.488						
12.985	5.492						
12.985	5.496						
12.985	5.500						
12.985	5.504						
12.985	5.508						
12.985	5.513						
12.985	5.517						
12.985	5.521						
12.985	5.525						
12.985	5.529						
12.985	5.533						
12.985	5.538						
12.985	5.542						
12.985	5.546						
12.985	5.550						
12.985	5.554						
12.985	5.558						
12.985	5.563						
12.985	5.567						
12.985	5.571						
12.985	5.575						

12.985	5.579						
12.985	5.583						
12.985	5.588						
12.985	5.592						
12.985	5.596						
12.985	5.600						
12.985	5.604						
12.985	5.608						
12.985	5.613						
12.836	5.617						
12.836	5.621						
12.985	5.625						
12.836	5.629						
12.836	5.633						
12.985	5.638						
12.836	5.642						
12.836	5.646						
12.985	5.650						
12.985	5.654						
12.985	5.658						
12.985	5.663						
12.985	5.667						
12.985	5.671						
12.985	5.675						
12.985	5.679						
12.985	5.683						
12.985	5.688						
12.985	5.692						
12.985	5.696						
12.985	5.700						
12.985	5.704						
12.985	5.708						
12.985	5.713						
12.985	5.717						
12.985	5.721						
12.985	5.725						
12.985	5.729						
12.985	5.733						
12.985	5.738						
12.985	5.742						
12.985	5.746						
12.985	5.750						
12.985	5.754						
12.985	5.758						
12.985	5.763						
12.985	5.767						
12.985	5.771						
12.985	5.775						
12.985	5.779						
12.985	5.783						
12.985	5.788						
12.985	5.792						
12.985	5.796						
12.985	5.800						
12.985	5.804						
12.985	5.808						

12.985	5.813						
12.985	5.817						
12.985	5.821						
12.985	5.825						
12.985	5.829						
12.985	5.833						
12.985	5.838						
12.985	5.842						
12.985	5.846						
12.985	5.850						
12.985	5.854						
12.985	5.858						
12.985	5.863						
12.985	5.867						
12.985	5.871						
12.985	5.875						
12.985	5.879						
12.985	5.883						
12.985	5.888						
12.985	5.892						
12.985	5.896						
12.985	5.900						
12.985	5.904						
12.985	5.908						
12.985	5.913						
12.985	5.917						
12.985	5.921						
12.985	5.925						
12.985	5.929						
12.985	5.933						
12.985	5.938						
12.985	5.942						
12.985	5.946						
12.985	5.950						
12.985	5.954						
12.985	5.958						
12.985	5.963						
12.985	5.967						
12.985	5.971						
12.985	5.975						
12.985	5.979						
12.985	5.983						
12.985	5.988						
12.985	5.992						
12.985	5.996						
12.985	6.000						
12.985	6.004						
12.985	6.008						
12.985	6.013						
12.985	6.017						
12.985	6.021						
12.985	6.025						
12.985	6.029						
12.985	6.033						
12.985	6.038						
12.985	6.042						

12.985	6.046						
12.985	6.050						
12.985	6.054						
12.985	6.058						
12.985	6.063						
12.985	6.067						
12.985	6.071						
12.985	6.075						
12.985	6.079						
12.985	6.083						
12.985	6.088						
12.985	6.092						
12.985	6.096						
12.985	6.100						
12.985	6.104						
12.985	6.108						
12.985	6.113						
12.985	6.117						
12.985	6.121						
13.134	8.000						
13.433	12.000						
13.582	16.000						
13.582	20.000						
13.582	24.000						

72% of degree of saturation

100kPa							
Equilibrium stage		Consolidation stage		Shearing stage			
Matric suction/(kPa)	Time/(hr)	Matric suction/(kPa)	Time/(hr)	Matric suction/(kPa)	Time/(hr)	Matric suction/(kPa)	Shear strain/(%)
0.000	0.000	17.910	0.000	17.910	0.000	17.910	0.000
1.642	0.004	17.761	0.000	17.761	0.004	17.761	0.250
4.030	0.008	17.761	0.001	17.761	0.008	17.761	0.500
6.119	0.013	17.612	0.002	17.761	0.013	17.761	0.750
7.761	0.017	17.612	0.003	17.761	0.017	17.761	1.000
8.955	0.021	16.567	0.004	17.761	0.021	17.761	1.250
10.000	0.025	15.970	0.008	17.761	0.025	17.761	1.500
10.896	0.029	15.821	0.013	17.761	0.029	17.761	1.750
11.493	0.033	15.672	0.017	17.761	0.033	17.761	2.000
11.642	0.038	15.522	0.021	17.761	0.038	17.761	2.500
12.090	0.042	15.522	0.025	17.761	0.042	17.612	3.000
12.537	0.046	15.522	0.029	17.761	0.046	17.463	3.500
12.687	0.050	15.522	0.033	17.761	0.050	17.463	4.000
12.985	0.054	15.522	0.038	17.761	0.054	17.313	5.000
13.284	0.058	15.522	0.042	17.761	0.058	17.015	6.000
13.433	0.063	15.522	0.046	17.761	0.063	16.866	7.000
13.582	0.067	15.522	0.050	17.761	0.067	16.567	8.000
13.731	0.071	15.522	0.054	17.761	0.071	16.567	9.000
13.881	0.075	15.522	0.058	17.761	0.075	16.716	10.000
13.881	0.079	15.522	0.063	17.761	0.079	16.866	11.000
14.030	0.083	15.522	0.067	17.761	0.083	17.164	12.000
14.179	0.088	15.672	0.071	17.761	0.088	17.761	13.000
14.179	0.092	15.672	0.075	17.761	0.092	17.463	14.000
14.328	0.096	15.672	0.079	17.761	0.096		
14.328	0.100	15.672	0.083	17.761	0.100		
14.478	0.104	15.821	0.088	17.761	0.104		
14.478	0.108	15.821	0.092	17.761	0.108		
14.478	0.113	15.821	0.096	17.761	0.113		
14.478	0.117	15.821	0.100	17.761	0.117		
14.627	0.121	15.821	0.104	17.761	0.121		
14.627	0.125	15.821	0.108	17.761	0.125		
14.627	0.129	15.821	0.113	17.761	0.129		
14.627	0.133	15.821	0.117	17.761	0.133		
14.627	0.138	15.821	0.121	17.761	0.138		
14.627	0.142	15.821	0.125	17.761	0.142		
14.627	0.146	15.821	0.129	17.761	0.146		
14.627	0.150	15.821	0.133	17.761	0.150		
14.627	0.154	15.672	0.138	17.761	0.154		
14.627	0.158	15.672	0.142	17.761	0.158		
14.627	0.163	15.672	0.146	17.761	0.163		
14.776	0.167	15.821	0.150	17.761	0.167		
14.776	0.171	15.821	0.154	17.761	0.171		
14.776	0.175	15.821	0.158	17.761	0.175		
14.776	0.179	15.821	0.163	17.761	0.179		
14.776	0.183	15.821	0.167	17.761	0.183		
14.776	0.188	15.821	0.171	17.761	0.188		
14.776	0.192	15.821	0.175	17.761	0.192		
14.776	0.196	15.821	0.179	17.761	0.196		
14.776	0.200	15.821	0.183	17.761	0.200		
14.776	0.204	15.821	0.188	17.761	0.204		
14.776	0.208	15.821	0.192	17.612	0.208		

14.776	0.213	15.970	0.196	17.612	0.213		
14.776	0.217	15.970	0.200	17.612	0.217		
14.776	0.221	15.970	0.204	17.612	0.221		
14.776	0.225	15.970	0.208	17.612	0.225		
14.776	0.229	15.970	0.213	17.612	0.229		
14.776	0.233	15.970	0.217	17.612	0.233		
14.776	0.238	15.970	0.221	17.612	0.238		
14.776	0.242	15.970	0.225	17.612	0.242		
14.776	0.246	15.970	0.229	17.612	0.246		
14.776	0.250	15.970	0.233	17.612	0.250		
14.776	0.254	15.970	0.238	17.612	0.254		
14.776	0.258	15.970	0.242	17.612	0.258		
14.776	0.263	15.970	0.246	17.612	0.263		
14.776	0.267	15.970	0.250	17.463	0.267		
14.776	0.271	15.970	0.254	17.463	0.271		
14.776	0.275	15.970	0.258	17.463	0.275		
14.776	0.279	15.970	0.263	17.463	0.279		
14.776	0.283	15.970	0.267	17.463	0.283		
14.776	0.288	15.821	0.271	17.463	0.288		
14.776	0.292	15.970	0.275	17.463	0.292		
14.776	0.296	15.821	0.279	17.463	0.296		
14.776	0.300	15.821	0.283	17.463	0.300		
14.776	0.304	15.821	0.288	17.463	0.304		
14.776	0.308	15.821	0.292	17.463	0.308		
14.925	0.313	15.821	0.296	17.463	0.313		
14.776	0.317	15.821	0.300	17.463	0.317		
14.925	0.321	15.821	0.304	17.463	0.321		
14.925	0.325	15.821	0.308	17.463	0.325		
14.925	0.329	15.821	0.313	17.463	0.329		
14.925	0.333	15.821	0.317	17.463	0.333		
14.925	0.338	15.821	0.321	17.463	0.338		
14.925	0.342	15.821	0.325	17.313	0.342		
14.925	0.346	15.821	0.329	17.313	0.346		
14.925	0.350	15.821	0.333	17.313	0.350		
14.925	0.354	15.821	0.338	17.463	0.354		
14.925	0.358	15.970	0.342	17.313	0.358		
14.925	0.363	15.970	0.346	17.313	0.363		
14.925	0.367	15.970	0.350	17.313	0.367		
14.925	0.371	15.970	0.354	17.313	0.371		
14.925	0.375	15.970	0.358	17.313	0.375		
14.925	0.379	15.970	0.363	17.463	0.379		
14.925	0.383	15.970	0.367	17.313	0.383		
14.925	0.388	15.970	0.371	17.313	0.388		
14.925	0.392	16.119	0.375	17.313	0.392		
14.925	0.396	16.119	0.379	17.313	0.396		
14.925	0.400	16.119	0.383	17.313	0.400		
14.925	0.404	16.119	0.388	17.313	0.404		
14.925	0.408	15.970	0.392	17.313	0.408		
15.075	0.413	16.119	0.396	17.313	0.413		
15.075	0.417	15.970	0.400	17.313	0.417		
15.075	0.421	15.970	0.404	17.313	0.421		
15.075	0.425	15.970	0.408	17.313	0.425		
15.075	0.429	15.970	0.413	17.313	0.429		
15.075	0.433	15.970	0.417	17.313	0.433		
15.075	0.438	15.970	0.421	17.313	0.438		
15.075	0.442	15.970	0.425	17.164	0.442		

15.075	0.446	15.970	0.429	17.164	0.446		
15.075	0.450	16.119	0.433	17.164	0.450		
15.075	0.454	16.119	0.438	17.164	0.454		
15.075	0.458	16.119	0.442	17.164	0.458		
15.075	0.463	16.119	0.446	17.164	0.463		
15.075	0.467	16.119	0.450	17.164	0.467		
15.075	0.471	16.119	0.454	17.164	0.471		
15.075	0.475	16.119	0.458	17.164	0.475		
15.075	0.479	16.119	0.463	17.015	0.479		
15.075	0.483	16.119	0.467	17.015	0.483		
15.224	0.488	16.119	0.471	17.015	0.488		
15.224	0.492	15.970	0.475	17.015	0.492		
15.224	0.496	15.970	0.479	17.015	0.496		
15.224	0.500	15.970	0.483	17.015	0.500		
15.224	0.504	15.970	0.488	17.015	0.504		
15.224	0.508	15.970	0.492	17.015	0.508		
15.224	0.513	15.970	0.496	17.015	0.513		
15.224	0.517	16.119	0.500	17.015	0.517		
15.224	0.521	16.119	0.504	17.015	0.521		
15.224	0.525	16.119	0.508	17.015	0.525		
15.224	0.529	16.119	0.513	16.866	0.529		
15.224	0.533	16.119	0.517	16.866	0.533		
15.224	0.538	16.119	0.521	16.866	0.538		
15.224	0.542	16.119	0.525	16.866	0.542		
15.224	0.546	16.119	0.529	16.866	0.546		
15.224	0.550	16.119	0.533	16.866	0.550		
15.224	0.554	16.119	0.538	16.866	0.554		
15.224	0.558	16.269	0.542	16.866	0.558		
15.224	0.563	16.269	0.546	16.866	0.563		
15.224	0.567	16.269	0.550	16.866	0.567		
15.224	0.571	16.269	0.554	16.716	0.571		
15.224	0.575	16.269	0.558	16.716	0.575		
15.224	0.579	16.269	0.563	16.716	0.579		
15.224	0.583	16.269	0.567	16.716	0.583		
15.224	0.588	16.269	0.571	16.716	0.588		
15.224	0.592	16.269	0.575	16.716	0.592		
15.224	0.596	16.269	0.579	16.716	0.596		
15.373	0.600	16.119	0.583	16.716	0.600		
15.373	0.604	16.119	0.588	16.716	0.604		
15.373	0.608	16.119	0.592	16.716	0.608		
15.373	0.613	16.119	0.596	16.716	0.613		
15.373	0.617	16.119	0.600	16.716	0.617		
15.373	0.621	16.269	0.604	16.716	0.621		
15.373	0.625	16.269	0.608	16.716	0.625		
15.373	0.629	16.269	0.613	16.567	0.629		
15.373	0.633	16.269	0.617	16.567	0.633		
15.373	0.638	16.269	0.621	16.567	0.638		
15.373	0.642	16.269	0.625	16.567	0.642		
15.373	0.646	16.269	0.629	16.716	0.646		
15.373	0.650	16.269	0.633	16.567	0.650		
15.373	0.654	16.269	0.638	16.716	0.654		
15.373	0.658	16.269	0.642	16.567	0.658		
15.373	0.663	16.269	0.646	16.567	0.663		
15.373	0.667	16.119	0.650	16.567	0.667		
15.373	0.671	16.119	0.654	16.567	0.671		
15.373	0.675	16.119	0.658	16.567	0.675		

15.373	0.679	16.269	0.663	16.567	0.679		
15.373	0.683	16.269	0.667	16.567	0.683		
15.373	0.688	16.269	0.671	16.567	0.688		
15.373	0.692	16.269	0.675	16.567	0.692		
15.373	0.696	16.269	0.679	16.567	0.696		
15.373	0.700	16.269	0.683	16.567	0.700		
15.373	0.704	16.269	0.688	16.567	0.704		
15.522	0.708	16.269	0.692	16.567	0.708		
15.522	0.713	16.418	0.696	16.567	0.713		
15.522	0.717	16.418	0.700	16.567	0.717		
15.522	0.721	16.418	0.704	16.567	0.721		
15.522	0.725	16.418	0.708	16.567	0.725		
15.522	0.729	16.418	0.713	16.567	0.729		
15.522	0.733	16.418	0.717	16.567	0.733		
15.522	0.738	16.418	0.721	16.567	0.738		
15.522	0.742	16.418	0.725	16.567	0.742		
15.522	0.746	16.418	0.729	16.567	0.746		
15.522	0.750	16.418	0.733	16.567	0.750		
15.522	0.754	16.418	0.738	16.567	0.754		
15.522	0.758	16.418	0.742	16.567	0.758		
15.522	0.763	16.418	0.746	16.567	0.763		
15.522	0.767	16.418	0.750	16.567	0.767		
15.522	0.771	16.418	0.754	16.567	0.771		
15.522	0.775	16.418	0.758	16.567	0.775		
15.522	0.779	16.418	0.763	16.567	0.779		
15.522	0.783	16.418	0.767	16.567	0.783		
15.522	0.788	16.418	0.771	16.567	0.788		
15.522	0.792	16.418	0.775	16.567	0.792		
15.522	0.796	16.418	0.779	16.716	0.796		
15.522	0.800	16.418	0.783	16.716	0.800		
15.522	0.804	16.269	0.788	16.716	0.804		
15.522	0.808	16.269	0.792	16.716	0.808		
15.522	0.813	16.269	0.796	16.716	0.813		
15.522	0.817	16.418	0.800	16.716	0.817		
15.522	0.821	16.418	0.804	16.716	0.821		
15.522	0.825	16.418	0.808	16.716	0.825		
15.522	0.829	16.418	0.813	16.716	0.829		
15.522	0.833	16.418	0.817	16.716	0.833		
15.522	0.838	16.418	0.821	16.716	0.838		
15.672	0.842	16.418	0.825	16.716	0.842		
15.672	0.846	16.418	0.829	16.866	0.846		
15.672	0.850	16.418	0.833	16.866	0.850		
15.672	0.854	16.418	0.838	16.866	0.854		
15.672	0.858	16.418	0.842	16.866	0.858		
15.522	0.863	16.418	0.846	16.866	0.863		
15.522	0.867	16.418	0.850	16.866	0.867		
15.672	0.871	16.269	0.854	16.866	0.871		
15.672	0.875	16.269	0.858	16.866	0.875		
15.672	0.879	16.269	0.863	16.866	0.879		
15.672	0.883	16.269	0.867	16.866	0.883		
15.672	0.888	16.269	0.871	16.866	0.888		
15.672	0.892	16.269	0.875	16.866	0.892		
15.522	0.896	16.269	0.879	16.866	0.896		
15.522	0.900	16.269	0.883	17.015	0.900		
15.672	0.904	16.418	0.888	17.015	0.904		
15.672	0.908	16.418	0.892	17.015	0.908		

15.672	0.913	16.418	0.896	17.015	0.913		
15.672	0.917	16.418	0.900	17.015	0.917		
15.672	0.921	16.418	0.904	17.015	0.921		
15.672	0.925	16.418	0.908	17.015	0.925		
15.672	0.929	16.418	0.913	17.015	0.929		
15.672	0.933	16.418	0.917	17.164	0.933		
15.672	0.938	16.418	0.921	17.164	0.938		
15.672	0.942	16.418	0.925	17.164	0.942		
15.672	0.946	16.418	0.929	17.164	0.946		
15.672	0.950	16.418	0.933	17.164	0.950		
15.672	0.954	16.418	0.938	17.164	0.954		
15.672	0.958	16.418	0.942	17.164	0.958		
15.672	0.963	16.418	0.946	17.164	0.963		
15.672	0.967	16.418	0.950	17.313	0.967		
15.672	0.971	16.418	0.954	17.313	0.971		
15.672	0.975	16.418	0.958	17.313	0.975		
15.672	0.979	16.418	0.963	17.313	0.979		
15.672	0.983	16.418	0.967	17.313	0.983		
15.672	0.988	16.418	0.971	17.313	0.988		
15.672	0.992	16.418	0.975	17.313	0.992		
15.672	0.996	16.567	0.979	17.313	0.996		
15.672	1.000	16.567	0.983	17.313	1.000		
15.821	1.004	16.567	0.988	17.313	1.004		
15.821	1.008	16.567	0.992	17.313	1.008		
15.821	1.013	16.567	0.996	17.313	1.013		
15.821	1.017	16.567	1.000	17.463	1.017		
15.821	1.021	16.567	1.004	17.463	1.021		
15.821	1.025	16.567	1.008	17.463	1.025		
15.821	1.029	16.567	1.013	17.463	1.029		
15.821	1.033	16.567	1.017	17.463	1.033		
15.821	1.038	16.567	1.021	17.612	1.038		
15.821	1.042	16.567	1.025	17.761	1.042		
15.821	1.046	16.567	1.029	17.612	1.046		
15.821	1.050	16.567	1.033	17.612	1.050		
15.821	1.054	16.567	1.038	17.612	1.054		
15.821	1.058	16.567	1.042	17.612	1.058		
15.821	1.063	16.567	1.046	17.463	1.063		
15.821	1.067	16.567	1.050	17.463	1.067		
15.821	1.071	16.567	1.054	17.612	1.071		
15.821	1.075	16.567	1.058	17.612	1.075		
15.821	1.079	16.567	1.063	17.612	1.079		
15.672	1.083	16.567	1.067	17.612	1.083		
15.821	1.088	16.567	1.071	17.612	1.088		
15.821	1.092	16.567	1.075	17.612	1.092		
15.821	1.096	16.567	1.079	15.075	1.096		
15.821	1.100	16.567	1.083	16.866	1.100		
15.821	1.104	16.567	1.088	17.015	1.104		
15.821	1.108	16.567	1.092	17.313	1.108		
15.821	1.113	16.567	1.096	17.313	1.113		
15.821	1.117	16.567	1.100	17.463	1.117		
15.821	1.121	16.567	1.104	17.463	1.121		
15.821	1.125	16.567	1.108	17.463	1.125		
15.821	1.129	16.567	1.113	17.612	1.129		
15.821	1.133	16.567	1.117	17.612	1.133		
15.821	1.138	16.567	1.121	17.612	1.138		
15.821	1.142	16.567	1.125	17.612	1.142		

15.821	1.146	16.567	1.129	17.612	1.146		
15.970	1.150	16.567	1.133	17.612	1.150		
15.821	1.154	16.716	1.138	17.612	1.154		
15.821	1.158	16.716	1.142	17.612	1.158		
15.821	1.163	16.716	1.146	17.612	1.163		
15.821	1.167	16.716	1.150	17.612	1.167		
15.821	1.171	16.716	1.154	17.612	1.171		
15.821	1.175	16.716	1.158	17.761	1.175		
15.821	1.179	16.716	1.163	17.761	1.179		
15.970	1.183	16.716	1.167	17.761	1.183		
15.970	1.188	16.716	1.171	17.761	1.188		
15.970	1.192	16.716	1.175	17.761	1.192		
15.970	1.196	16.716	1.179	17.761	1.196		
15.970	1.200	16.716	1.183	17.761	1.200		
15.970	1.204	16.716	1.188	17.761	1.204		
15.970	1.208	16.716	1.192	17.761	1.208		
15.970	1.213	16.716	1.196	17.761	1.213		
15.970	1.217	16.716	1.200	17.761	1.217		
15.970	1.221	16.716	1.204	17.761	1.221		
15.970	1.225	16.716	1.208	17.761	1.225		
15.970	1.229	16.716	1.213	17.761	1.229		
15.970	1.233	16.716	1.217	17.910	1.233		
15.821	1.238	16.716	1.221	17.761	1.238		
15.970	1.242	16.716	1.225	17.761	1.242		
15.970	1.246	16.716	1.229	17.761	1.246		
15.970	1.250	16.716	1.233				
15.970	1.254	16.716	1.238				
15.970	1.258	16.716	1.242				
15.970	1.263	16.716	1.246				
15.970	1.267	16.716	1.250				
15.970	1.271	16.716	1.254				
15.970	1.275	16.716	1.258				
15.970	1.279	16.716	1.263				
15.970	1.283	16.716	1.267				
15.970	1.288	16.716	1.271				
15.970	1.292	16.716	1.275				
15.970	1.296	16.716	1.279				
15.970	1.300	16.716	1.283				
15.970	1.304	16.716	1.288				
15.970	1.308	16.866	1.292				
15.970	1.313	16.866	1.296				
15.970	1.317	16.866	1.300				
15.970	1.321	16.866	1.304				
15.970	1.325	16.866	1.308				
15.970	1.329	16.866	1.313				
15.970	1.333	16.866	1.317				
15.970	1.338	16.866	1.321				
16.119	1.342	16.866	1.325				
16.119	1.346	16.716	1.329				
16.119	1.350	16.716	1.333				
15.970	1.354	16.716	1.338				
16.119	1.358	16.716	1.342				
16.119	1.363	16.716	1.346				
16.119	1.367	16.716	1.350				
16.119	1.371	16.716	1.354				
16.119	1.375	16.716	1.358				

16.119	1.379	16.716	1.363				
16.119	1.383	16.716	1.367				
16.119	1.388	16.716	1.371				
16.119	1.392	16.716	1.375				
16.119	1.396	16.716	1.379				
16.119	1.400	16.716	1.383				
16.119	1.404	16.716	1.388				
16.119	1.408	16.716	1.392				
16.119	1.413	16.716	1.396				
16.119	1.417	16.716	1.400				
16.119	1.421	16.716	1.404				
16.119	1.425	16.716	1.408				
16.119	1.429	16.716	1.413				
16.119	1.433	16.716	1.417				
16.119	1.438	16.716	1.421				
16.119	1.442	16.866	1.425				
16.119	1.446	16.866	1.429				
16.119	1.450	16.866	1.433				
16.119	1.454	16.866	1.438				
16.119	1.458	16.866	1.442				
16.119	1.463	16.866	1.446				
16.119	1.467	16.866	1.450				
16.119	1.471	16.866	1.454				
16.119	1.475	16.866	1.458				
16.119	1.479	16.866	1.463				
16.119	1.483	16.866	1.467				
16.119	1.488	16.866	1.471				
16.119	1.492	16.866	1.475				
16.119	1.496	16.866	1.479				
16.119	1.500	16.866	1.483				
16.119	1.504	16.866	1.488				
16.119	1.508	16.716	1.492				
16.119	1.513	16.716	1.496				
16.119	1.517	16.716	1.500				
16.119	1.521	16.716	1.504				
16.119	1.525	16.716	1.508				
16.119	1.529	16.866	1.513				
16.119	1.533	16.866	1.517				
16.119	1.538	16.866	1.521				
16.269	1.542	16.866	1.525				
16.119	1.546	16.866	1.529				
16.119	1.550	16.866	1.533				
16.269	1.554	16.866	1.538				
16.119	1.558	16.866	1.542				
16.269	1.563	16.866	1.546				
16.269	1.567	16.866	1.550				
16.269	1.571	17.015	1.554				
16.269	1.575	17.015	1.558				
16.119	1.579	17.015	1.563				
16.269	1.583	17.015	1.567				
16.269	1.588	17.015	1.571				
16.269	1.592	17.015	1.575				
16.269	1.596	17.015	1.579				
16.269	1.600	17.015	1.583				
16.269	1.604	16.866	1.588				
16.269	1.608	16.866	1.592				

16.269	1.613	16.866	1.596				
16.269	1.617	16.866	1.600				
16.269	1.621	16.866	1.604				
16.269	1.625	16.866	1.608				
16.269	1.629	16.866	1.613				
16.269	1.633	16.866	1.617				
16.269	1.638	16.866	1.621				
16.269	1.642	16.866	1.625				
16.269	1.646	16.866	1.629				
16.269	1.650	16.866	1.633				
16.269	1.654	16.866	1.638				
16.269	1.658	16.866	1.642				
16.269	1.663	16.866	1.646				
16.119	1.667	16.866	1.650				
16.269	1.671	16.866	1.654				
16.269	1.675	16.866	1.658				
16.269	1.679	16.866	1.663				
16.269	1.683	16.866	1.667				
16.269	1.688	17.015	1.671				
16.269	1.692	17.015	1.675				
16.269	1.696	17.015	1.679				
16.269	1.700	17.015	1.683				
16.269	1.704	17.015	1.688				
16.269	1.708	17.015	1.692				
16.269	1.713	17.015	1.696				
16.269	1.717	17.015	1.700				
16.269	1.721	17.015	1.704				
16.269	1.725	17.015	1.708				
16.269	1.729	16.866	1.713				
16.269	1.733	17.015	1.717				
16.269	1.738	16.866	1.721				
16.119	1.742	16.866	1.725				
16.119	1.746	16.866	1.729				
16.269	1.750	16.866	1.733				
16.269	1.754	16.866	1.738				
16.269	1.758	16.866	1.742				
16.269	1.763	16.866	1.746				
16.269	1.767	16.866	1.750				
16.269	1.771	16.866	1.754				
16.269	1.775	16.866	1.758				
16.269	1.779	16.866	1.763				
16.269	1.783	16.866	1.767				
16.269	1.788	17.015	1.771				
16.418	1.792	17.015	1.775				
16.418	1.796	17.015	1.779				
16.269	1.800	17.015	1.783				
16.269	1.804	17.015	1.788				
16.269	1.808	17.015	1.792				
16.269	1.813	17.015	1.796				
16.269	1.817	17.015	1.800				
16.269	1.821	17.015	1.804				
16.418	1.825	17.015	1.808				
16.418	1.829	17.015	1.813				
16.418	1.833	17.015	1.817				
16.269	1.838	17.015	1.821				
16.418	1.842	17.015	1.825				

16.418	1.846	17.015	1.829				
16.418	1.850	17.015	1.833				
16.418	1.854	17.015	1.838				
16.269	1.858	17.015	1.842				
16.418	1.863	17.015	1.846				
16.418	1.867	17.015	1.850				
16.418	1.871	17.015	1.854				
16.418	1.875	17.015	1.858				
16.418	1.879	17.015	1.863				
16.269	1.883	17.015	1.867				
16.269	1.888	17.015	1.871				
16.269	1.892	17.015	1.875				
16.269	1.896	17.015	1.879				
16.269	1.900	17.015	1.883				
16.269	1.904	17.015	1.888				
16.269	1.908	17.015	1.892				
16.269	1.913	17.015	1.896				
16.418	1.917	17.015	1.900				
16.269	1.921	17.015	1.904				
16.418	1.925	17.015	1.908				
16.418	1.929	17.015	1.913				
16.418	1.933	17.015	1.917				
16.418	1.938	17.015	1.921				
16.418	1.942	17.015	1.925				
16.418	1.946	17.015	1.929				
16.418	1.950	17.015	1.933				
16.418	1.954	17.015	1.938				
16.418	1.958	17.015	1.942				
16.418	1.963	17.015	1.946				
16.418	1.967	17.015	1.950				
16.418	1.971	17.015	1.954				
16.418	1.975	17.015	1.958				
16.418	1.979	17.015	1.963				
16.418	1.983	17.015	1.967				
16.418	1.988	17.015	1.971				
16.418	1.992	17.015	1.975				
16.418	1.996	17.015	1.979				
16.418	2.000	17.015	1.983				
16.418	2.004	17.015	1.988				
16.418	2.008	17.015	1.992				
16.418	2.013	17.015	1.996				
16.418	2.017	17.015	2.000				
16.418	2.021	17.015	2.004				
16.418	2.025	17.015	2.008				
16.418	2.029	17.164	2.013				
16.567	2.033	17.164	2.017				
16.567	2.038	17.164	2.021				
16.567	2.042	17.164	2.025				
16.567	2.046	17.164	2.029				
16.418	2.050	17.164	2.033				
16.418	2.054	17.164	2.038				
16.418	2.058	17.164	2.042				
16.418	2.063	17.164	2.046				
16.418	2.067	17.164	2.050				
16.418	2.071	17.164	2.054				
16.418	2.075	17.164	2.058				

16.418	2.079	17.164	2.063				
16.418	2.083	17.164	2.067				
16.418	2.088	17.164	2.071				
16.418	2.092	17.164	2.075				
16.418	2.096	17.164	2.079				
16.418	2.100	17.164	2.083				
16.567	2.104	17.164	2.088				
16.567	2.108	17.015	2.092				
16.567	2.113	17.164	2.096				
16.567	2.117	17.015	2.100				
16.567	2.121	17.015	2.104				
16.418	2.125	17.015	2.108				
16.418	2.129	17.015	2.113				
16.418	2.133	17.015	2.117				
16.418	2.138	17.015	2.121				
16.418	2.142	17.015	2.125				
16.418	2.146	17.015	2.129				
16.418	2.150	17.015	2.133				
16.418	2.154	17.015	2.138				
16.418	2.158	17.015	2.142				
16.418	2.163	17.164	2.146				
16.119	2.167	17.164	2.150				
15.970	2.171	17.164	2.154				
16.269	2.175	17.164	2.158				
16.418	2.179	17.164	2.163				
16.418	2.183	17.164	2.167				
16.418	2.188	17.164	2.171				
16.418	2.192	17.164	2.175				
16.418	2.196	17.164	2.179				
16.418	2.200	17.164	2.183				
16.418	2.204	17.164	2.188				
16.418	2.208	17.164	2.192				
16.418	2.213	17.164	2.196				
16.418	2.217	17.164	2.200				
16.418	2.221	17.164	2.204				
16.567	2.225	17.164	2.208				
16.567	2.229	17.164	2.213				
16.567	2.233	17.164	2.217				
16.567	2.238	17.164	2.221				
16.567	2.242	17.164	2.225				
16.567	2.246	17.164	2.229				
16.567	2.250	17.164	2.233				
16.567	2.254	17.164	2.238				
16.567	2.258	17.164	2.242				
16.567	2.263	17.164	2.246				
16.567	2.267	17.164	2.250				
16.567	2.271	17.164	2.254				
16.567	2.275	17.164	2.258				
16.567	2.279	17.164	2.263				
16.567	2.283	17.164	2.267				
16.567	2.288	17.164	2.271				
16.567	2.292	17.164	2.275				
16.567	2.296	17.164	2.279				
16.567	2.300	17.164	2.283				
16.567	2.304	17.164	2.288				
16.567	2.308	17.164	2.292				

16.567	2.313	17.164	2.296				
16.567	2.317	17.164	2.300				
16.567	2.321	17.164	2.304				
16.567	2.325	17.164	2.308				
16.567	2.329	17.164	2.313				
16.567	2.333	17.164	2.317				
16.567	2.338	17.164	2.321				
16.567	2.342	17.164	2.325				
16.567	2.346	17.313	2.329				
16.567	2.350	17.313	2.333				
16.567	2.354	17.313	2.338				
16.567	2.358	17.313	2.342				
16.567	2.363	17.313	2.346				
16.567	2.367	17.313	2.350				
16.567	2.371	17.313	2.354				
16.567	2.375	17.313	2.358				
16.567	2.379	17.313	2.363				
16.567	2.383	17.313	2.367				
16.567	2.388	17.313	2.371				
16.716	2.392	17.313	2.375				
16.716	2.396	17.313	2.379				
16.716	2.400	17.313	2.383				
16.716	2.404	17.313	2.388				
16.716	2.408	17.313	2.392				
16.716	2.413	17.313	2.396				
16.716	2.417	17.313	2.400				
16.716	2.421	17.164	2.404				
16.716	2.425	17.164	2.408				
16.716	2.429	17.164	2.413				
16.716	2.433	17.164	2.417				
16.716	2.438	17.164	2.421				
16.716	2.442	17.164	2.425				
16.716	2.446	17.164	2.429				
16.716	2.450	17.164	2.433				
16.716	2.454	17.313	2.438				
16.716	2.458	17.313	2.442				
16.716	2.463	17.313	2.446				
16.716	2.467	17.313	2.450				
16.716	2.471	17.313	2.454				
16.716	2.475	17.313	2.458				
16.716	2.479	17.313	2.463				
16.716	2.483	17.313	2.467				
16.716	2.488	17.313	2.471				
16.716	2.492	17.313	2.475				
16.716	2.496	17.313	2.479				
16.567	2.500	17.313	2.483				
16.567	2.504	17.313	2.488				
16.716	2.508	17.313	2.492				
16.716	2.513	17.313	2.496				
16.716	2.517	17.313	2.500				
16.716	2.521	17.313	2.504				
16.716	2.525	17.313	2.508				
16.716	2.529	17.313	2.513				
16.716	2.533	17.313	2.517				
16.716	2.538	17.313	2.521				
16.716	2.542	17.313	2.525				

16.716	2.546	17.313	2.529				
16.716	2.550	17.313	2.533				
16.716	2.554	17.313	2.538				
16.716	2.558	17.313	2.542				
16.716	2.563	17.313	2.546				
16.716	2.567	17.313	2.550				
16.716	2.571	17.313	2.554				
16.716	2.575	17.313	2.558				
16.716	2.579	17.313	2.563				
16.716	2.583	17.313	2.567				
16.716	2.588	17.313	2.571				
16.716	2.592	17.313	2.575				
16.716	2.596	17.313	2.579				
16.716	2.600	17.313	2.583				
16.716	2.604	17.313	2.588				
16.716	2.608	17.313	2.592				
16.716	2.613	17.313	2.596				
16.716	2.617	17.313	2.600				
16.716	2.621	17.313	2.604				
16.716	2.625	17.313	2.608				
16.716	2.629	17.313	2.613				
16.716	2.633	17.313	2.617				
16.716	2.638	17.313	2.621				
16.716	2.642	17.313	2.625				
16.716	2.646	17.313	2.629				
16.716	2.650	17.313	2.633				
16.716	2.654	17.313	2.638				
16.716	2.658	17.313	2.642				
16.716	2.663	17.313	2.646				
16.716	2.667	17.313	2.650				
16.716	2.671	17.313	2.654				
16.716	2.675	17.313	2.658				
16.716	2.679	17.313	2.663				
16.567	2.683	17.313	2.667				
16.567	2.688	17.313	2.671				
16.567	2.692	17.313	2.675				
16.567	2.696	17.313	2.679				
16.567	2.700	17.313	2.683				
16.567	2.704	17.313	2.688				
16.567	2.708	17.313	2.692				
16.567	2.713	17.313	2.696				
16.567	2.717	17.313	2.700				
16.567	2.721	17.313	2.704				
16.567	2.725	17.313	2.708				
16.567	2.729	17.313	2.713				
16.716	2.733	17.313	2.717				
16.716	2.738	17.313	2.721				
16.716	2.742	17.313	2.725				
16.716	2.746	17.313	2.729				
16.716	2.750	17.313	2.733				
16.716	2.754	17.313	2.738				
16.716	2.758	17.313	2.742				
16.716	2.763	17.313	2.746				
16.716	2.767	17.313	2.750				
16.716	2.771	17.313	2.754				
16.716	2.775	17.313	2.758				

16.716	2.779	17.313	2.763				
16.716	2.783	17.313	2.767				
16.716	2.788	17.313	2.771				
16.716	2.792	17.313	2.775				
16.716	2.796	17.313	2.779				
16.716	2.800	17.463	2.783				
16.716	2.804	17.463	2.788				
16.716	2.808	17.463	2.792				
16.716	2.813	17.463	2.796				
16.716	2.817	17.463	2.800				
16.716	2.821	17.463	2.804				
16.716	2.825	17.463	2.808				
16.716	2.829	17.463	2.813				
16.716	2.833	17.463	2.817				
16.716	2.838	17.463	2.821				
16.716	2.842	17.463	2.825				
16.716	2.846	17.463	2.829				
16.716	2.850	17.463	2.833				
16.716	2.854	17.463	2.838				
16.866	2.858	17.463	2.842				
16.866	2.863	17.463	2.846				
16.866	2.867	17.463	2.850				
16.866	2.871	17.463	2.854				
16.866	2.875	17.463	2.858				
16.866	2.879	17.463	2.863				
16.866	2.883	17.463	2.867				
16.866	2.888	17.313	2.871				
16.866	2.892	17.313	2.875				
16.866	2.896	17.313	2.879				
16.866	2.900	17.313	2.883				
16.866	2.904	17.313	2.888				
16.866	2.908	17.313	2.892				
16.866	2.913	17.313	2.896				
16.866	2.917	17.313	2.900				
16.716	2.921	17.313	2.904				
16.716	2.925	17.313	2.908				
16.866	2.929	17.313	2.913				
16.866	2.933	17.313	2.917				
16.716	2.938	17.313	2.921				
16.716	2.942	17.313	2.925				
16.866	2.946	17.313	2.929				
16.866	2.950	17.313	2.933				
16.866	2.954	17.313	2.938				
16.866	2.958	17.463	2.942				
16.866	2.963	17.463	2.946				
16.866	2.967	17.463	2.950				
16.866	2.971	17.463	2.954				
16.866	2.975	17.463	2.958				
16.866	2.979	17.463	2.963				
16.866	2.983	17.463	2.967				
16.866	2.988	17.463	2.971				
16.866	2.992	17.463	2.975				
16.866	2.996	17.463	2.979				
16.866	3.000	17.463	2.983				
16.866	3.004	17.463	2.988				
16.866	3.008	17.463	2.992				

16.866	3.013	17.463	2.996				
16.866	3.017	17.463	3.000				
16.866	3.021	17.463	3.004				
16.866	3.025	17.463	3.008				
16.866	3.029	17.463	3.013				
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16.866	3.038	17.463	3.021				
16.866	3.042	17.463	3.025				
16.866	3.046	17.463	3.029				
16.866	3.050	17.463	3.033				
16.866	3.054	17.463	3.038				
16.866	3.058	17.463	3.042				
16.866	3.063	17.463	3.046				
16.716	3.067	17.463	3.050				
16.716	3.071	17.463	3.054				
16.716	3.075	17.463	3.058				
16.716	3.079	17.463	3.063				
16.716	3.083	17.463	3.067				
16.716	3.088	17.463	3.071				
16.716	3.092	17.463	3.075				
16.716	3.096	17.612	3.079				
16.716	3.100	17.612	3.083				
16.716	3.104	17.612	3.088				
16.716	3.108	17.612	3.092				
16.716	3.113	17.463	3.096				
16.716	3.117	17.463	3.100				
16.716	3.121	17.463	3.104				
16.716	3.125	17.463	3.108				
16.716	3.129	17.463	3.113				
16.716	3.133	17.463	3.117				
16.716	3.138	17.463	3.121				
16.716	3.142	17.463	3.125				
16.716	3.146	17.463	3.129				
16.716	3.150	17.463	3.133				
16.716	3.154	17.463	3.138				
16.716	3.158	17.463	3.142				
16.716	3.163	17.463	3.146				
16.716	3.167	17.463	3.150				
16.716	3.171	17.463	3.154				
16.716	3.175	17.463	3.158				
16.716	3.179	17.463	3.163				
16.716	3.183	17.463	3.167				
16.716	3.188	17.463	3.171				
16.716	3.192	17.463	3.175				
16.716	3.196	17.463	3.179				
16.716	3.200	17.463	3.183				
16.716	3.204	17.463	3.188				
16.716	3.208	17.463	3.192				
16.716	3.213	17.463	3.196				
16.716	3.217	17.463	3.200				
16.716	3.221	17.463	3.204				
16.716	3.225	17.612	3.208				
16.716	3.229	17.612	3.213				
16.716	3.233	17.612	3.217				
16.716	3.238	17.612	3.221				
16.716	3.242	17.612	3.225				

16.716	3.246	17.612	3.229				
16.716	3.250	17.463	3.233				
16.716	3.254	17.463	3.238				
16.716	3.258	17.463	3.242				
16.716	3.263	17.463	3.246				
16.716	3.267	17.463	3.250				
16.716	3.271	17.463	3.254				
16.716	3.275	17.463	3.258				
16.716	3.279	17.463	3.263				
16.716	3.283	17.463	3.267				
16.716	3.288	17.463	3.271				
16.716	3.292	17.463	3.275				
16.716	3.296	17.463	3.279				
16.716	3.300	17.463	3.283				
16.716	3.304	17.463	3.288				
16.716	3.308	17.463	3.292				
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16.716	3.321	17.463	3.304				
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16.716	3.329	17.463	3.313				
16.716	3.333	17.463	3.317				
16.716	3.338	17.463	3.321				
16.716	3.342	17.463	3.325				
16.716	3.346	17.463	3.329				
16.716	3.350	17.463	3.333				
16.716	3.354	17.463	3.338				
16.716	3.358	17.463	3.342				
16.716	3.363	17.612	3.346				
16.716	3.367	17.612	3.350				
16.716	3.371	17.612	3.354				
16.716	3.375	17.612	3.358				
16.716	3.379	17.612	3.363				
16.716	3.383	17.612	3.367				
16.716	3.388	17.612	3.371				
16.716	3.392	17.612	3.375				
16.716	3.396	17.612	3.379				
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16.716	3.408	17.612	3.392				
16.716	3.413	17.612	3.396				
16.716	3.417	17.612	3.400				
16.716	3.421	17.612	3.404				
16.716	3.425	17.612	3.408				
16.716	3.429	17.612	3.413				
16.716	3.433	17.612	3.417				
16.716	3.438	17.612	3.421				
16.716	3.442	17.612	3.425				
16.716	3.446	17.612	3.429				
16.716	3.450	17.612	3.433				
16.716	3.454	17.612	3.438				
16.716	3.458	17.612	3.442				
16.716	3.463	17.612	3.446				
16.716	3.467	17.612	3.450				
16.716	3.471	17.612	3.454				
16.716	3.475	17.612	3.458				

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16.716	3.483	17.612	3.467				
16.716	3.488	17.612	3.471				
16.716	3.492	17.612	3.475				
16.716	3.496	17.612	3.479				
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16.567	3.525	17.612	3.508				
16.567	3.529	17.612	3.513				
16.567	3.533	17.612	3.517				
16.567	3.538	17.612	3.521				
16.567	3.542	17.761	3.525				
16.567	3.546	17.761	3.529				
16.567	3.550	17.761	3.533				
16.567	3.554	17.761	3.538				
16.567	3.558	17.761	3.542				
16.567	3.563	17.761	3.546				
16.567	3.567	17.761	3.550				
16.716	3.571	17.761	3.554				
16.567	3.575	17.761	3.558				
16.716	3.579	17.761	3.563				
16.716	3.583	17.761	3.567				
16.567	3.588	17.761	3.571				
16.567	3.592	17.761	3.575				
16.567	3.596	17.612	3.579				
16.567	3.600	17.612	3.583				
16.567	3.604	17.612	3.588				
16.567	3.608	17.612	3.592				
16.567	3.613	17.612	3.596				
16.567	3.617	17.612	3.600				
16.567	3.621	17.612	3.604				
16.567	3.625	17.612	3.608				
16.567	3.629	17.612	3.613				
16.567	3.633	17.612	3.617				
16.567	3.638	17.612	3.621				
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16.567	3.650	17.612	3.633				
16.567	3.654	17.612	3.638				
16.567	3.658	17.612	3.642				
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16.567	3.671	17.612	3.654				
16.567	3.675	17.612	3.658				
16.567	3.679	17.612	3.663				
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16.567	3.688	17.612	3.671				
16.567	3.692	17.612	3.675				
16.567	3.696	17.612	3.679				
16.567	3.700	17.761	3.683				
16.567	3.704	17.761	3.688				
16.567	3.708	17.761	3.692				

16.567	3.713	17.761	3.696				
16.567	3.717	17.761	3.700				
16.567	3.721	17.761	3.704				
16.567	3.725	17.761	3.708				
16.567	3.729	17.761	3.713				
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16.567	3.738	17.761	3.721				
16.567	3.742	17.761	3.725				
16.567	3.746	17.761	3.729				
16.567	3.750	17.761	3.733				
16.567	3.754	17.761	3.738				
16.567	3.758	17.761	3.742				
16.567	3.763	17.761	3.746				
16.567	3.767	17.761	3.750				
16.567	3.771	17.761	3.754				
16.567	3.775	17.761	3.758				
16.567	3.779	17.761	3.763				
16.567	3.783	17.761	3.767				
16.567	3.788	17.761	3.771				
16.567	3.792	17.761	3.775				
16.567	3.796	17.761	3.779				
16.567	3.800	17.761	3.783				
16.567	3.804	17.761	3.788				
16.567	3.808	17.612	3.792				
16.567	3.813	17.612	3.796				
16.567	3.817	17.612	3.800				
16.567	3.821	17.761	3.804				
16.567	3.825	17.761	3.808				
16.567	3.829	17.761	3.813				
16.567	3.833	17.761	3.817				
16.567	3.838	17.761	3.821				
16.567	3.842	17.761	3.825				
16.567	3.846	17.761	3.829				
16.567	3.850	17.761	3.833				
16.567	3.854	17.761	3.838				
16.567	3.858	17.761	3.842				
16.567	3.863	17.761	3.846				
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16.567	3.871	17.761	3.854				
16.567	3.875	17.761	3.858				
16.567	3.879	17.761	3.863				
16.567	3.883	17.761	3.867				
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16.567	3.900	17.761	3.883				
16.567	3.904	17.761	3.888				
16.567	3.908	17.761	3.892				
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16.567	3.921	17.761	3.904				
16.567	3.925	17.761	3.908				
16.567	3.929	17.761	3.913				
16.567	3.933	17.761	3.917				
16.567	3.938	17.761	3.921				
16.567	3.942	17.761	3.925				

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16.567	3.950	17.761	3.933				
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16.567	3.958	17.761	3.942				
16.567	3.963	17.761	3.946				
16.567	3.967	17.761	3.950				
16.567	3.971	17.761	3.954				
16.567	3.975	17.761	3.958				
16.567	3.979	17.761	3.963				
16.567	3.983	17.761	3.967				
16.567	3.988	17.761	3.971				
16.567	3.992	17.761	3.975				
16.567	3.996	17.761	3.979				
16.567	4.000	17.761	3.983				
16.567	4.004	17.761	3.988				
16.567	4.008	17.761	3.992				
16.567	4.013	17.761	3.996				
16.567	4.017	17.761	4.000				
16.567	4.021	17.761	4.004				
16.567	4.025	17.761	4.008				
16.567	4.029	17.761	4.013				
16.567	4.033	17.761	4.017				
16.567	4.038	17.761	4.021				
16.567	4.042	17.761	4.025				
16.567	4.046	17.761	4.029				
16.567	4.050	17.761	4.033				
16.567	4.054	17.761	4.038				
16.567	4.058	17.761	4.042				
16.567	4.063	17.761	4.046				
16.567	4.067	17.761	4.050				
16.567	4.071	17.761	4.054				
16.567	4.075	17.761	4.058				
16.567	4.079	17.761	4.063				
16.567	4.083	17.761	4.067				
16.567	4.088	17.761	4.071				
16.567	4.092	17.761	4.075				
16.567	4.096	17.761	4.079				
16.567	4.100	17.761	4.083				
16.567	4.104	17.761	4.088				
16.567	4.108	17.761	4.092				
16.567	4.113	17.761	4.096				
16.567	4.117	17.761	4.100				
16.567	4.121	17.761	4.104				
16.567	4.125	17.761	4.108				
16.567	4.129	17.761	4.113				
16.567	4.133	17.761	4.117				
16.567	4.138	17.761	4.121				
16.567	4.142	17.761	4.125				
16.567	4.146	17.761	4.129				
16.567	4.150	17.761	4.133				
16.567	4.154	17.761	4.138				
16.567	4.158	17.761	4.142				
16.567	4.163	17.761	4.146				
16.567	4.167	17.761	4.150				
16.567	4.171	17.761	4.154				
16.567	4.175	17.761	4.158				

16.567	4.179	17.761	4.163				
16.567	4.183	17.761	4.167				
16.567	4.188	17.761	4.171				
16.567	4.192	17.761	4.175				
16.567	4.196	17.761	4.179				
16.567	4.200	17.761	4.183				
16.567	4.204	17.761	4.188				
16.567	4.208	17.761	4.192				
16.567	4.213	17.761	4.196				
16.567	4.217	17.761	4.200				
16.567	4.221	17.761	4.204				
16.567	4.225	17.761	4.208				
16.567	4.229	17.761	4.213				
16.567	4.233	17.761	4.217				
16.567	4.238	17.761	4.221				
16.567	4.242	17.761	4.225				
16.567	4.246	17.761	4.229				
16.567	4.250	17.761	4.233				
16.567	4.254	17.761	4.238				
16.567	4.258	17.761	4.242				
16.567	4.263	17.761	4.246				
16.567	4.267	17.761	4.250				
16.567	4.271	17.761	4.254				
16.567	4.275	17.761	4.258				
16.567	4.279	17.761	4.263				
16.567	4.283	17.761	4.267				
16.567	4.288	17.761	4.271				
16.567	4.292	17.761	4.275				
16.567	4.296	17.761	4.279				
16.567	4.300	17.761	4.283				
16.567	4.304	17.761	4.288				
16.567	4.308	17.761	4.292				
16.567	4.313	17.761	4.296				
16.567	4.317	17.761	4.300				
16.567	4.321	17.761	4.304				
16.567	4.325	17.761	4.308				
16.567	4.329	17.761	4.313				
16.567	4.333	17.761	4.317				
16.567	4.338	17.761	4.321				
16.567	4.342	17.761	4.325				
16.567	4.346	17.761	4.329				
16.567	4.350	17.761	4.333				
16.567	4.354	17.761	4.338				
16.567	4.358	17.761	4.342				
16.567	4.363	17.761	4.346				
16.567	4.367	17.761	4.350				
16.567	4.371	17.761	4.354				
16.567	4.375	17.761	4.358				
16.567	4.379	17.761	4.363				
16.567	4.383	17.761	4.367				
16.567	4.388	17.761	4.371				
16.567	4.392	17.761	4.375				
16.567	4.396	17.761	4.379				
16.567	4.400	17.761	4.383				
16.567	4.404	17.910	4.388				
16.567	4.408	17.910	4.392				

16.567	4.413	17.910	4.396				
16.567	4.417	17.761	4.400				
16.567	4.421	17.761	4.404				
16.567	4.425	17.761	4.408				
16.567	4.429	17.761	4.413				
16.567	4.433	17.761	4.417				
16.567	4.438	17.761	4.421				
16.567	4.442	17.761	4.425				
16.567	4.446	17.761	4.429				
16.567	4.450	17.761	4.433				
16.567	4.454	17.761	4.438				
16.567	4.458	17.761	4.442				
16.567	4.463	17.761	4.446				
16.567	4.467	17.761	4.450				
16.567	4.471	17.761	4.454				
16.567	4.475	17.910	4.458				
16.567	4.479	17.910	4.463				
16.567	4.483	17.761	4.467				
16.567	4.488	17.910	4.471				
16.567	4.492	17.761	4.475				
16.567	4.496	17.761	4.479				
16.567	4.500	17.761	4.483				
16.567	4.504	17.761	4.488				
16.567	4.508	17.761	4.492				
16.567	4.513	17.910	4.496				
16.567	4.517	17.910	4.500				
16.567	4.521	17.761	4.504				
16.567	4.525	17.761	4.508				
16.567	4.529	17.761	4.513				
16.567	4.533	17.761	4.517				
16.567	4.538	17.761	4.521				
16.567	4.542	17.761	4.525				
16.567	4.546	17.761	4.529				
16.567	4.550	17.761	4.533				
16.567	4.554	17.761	4.538				
16.567	4.558	17.761	4.542				
16.567	4.563	17.910	4.546				
16.567	4.567	17.910	4.550				
16.567	4.571	17.910	4.554				
16.567	4.575	17.910	4.558				
16.567	4.579	17.910	4.563				
16.567	4.583	17.910	4.567				
16.567	4.588	17.910	4.571				
16.567	4.592	17.910	4.575				
16.567	4.596	17.910	4.579				
16.567	4.600	17.910	4.583				
16.567	4.604	17.910	4.588				
16.567	4.608	17.910	4.592				
16.567	4.613	17.910	4.596				
16.567	4.617	17.910	4.600				
16.567	4.621	17.910	4.604				
16.567	4.625	17.910	4.608				
16.567	4.629	17.910	4.613				
16.567	4.633	17.910	4.617				
16.567	4.638	17.910	4.621				
16.567	4.642	17.910	4.625				

16.567	4.646	17.910	4.629				
16.567	4.650	17.910	4.633				
16.567	4.654	17.910	4.638				
16.567	4.658	17.910	4.642				
16.567	4.663	17.910	4.646				
16.567	4.667	17.910	4.650				
16.567	4.671	17.910	4.654				
16.567	4.675	17.910	4.658				
16.567	4.679	17.910	4.663				
16.567	4.683	17.910	4.667				
16.567	4.688	17.910	4.671				
16.567	4.692	17.910	4.675				
16.567	4.696	17.910	4.679				
16.567	4.700	17.910	4.683				
16.567	4.704	17.910	4.688				
16.567	4.708	17.910	4.692				
16.567	4.713	17.910	4.696				
16.567	4.717	17.910	4.700				
16.567	4.721	17.910	4.704				
16.567	4.725	17.910	4.708				
16.567	4.729	17.910	4.713				
16.567	4.733	17.910	4.717				
16.567	4.738	17.910	4.721				
16.567	4.742	17.910	4.725				
16.567	4.746	17.910	4.729				
16.567	4.750	17.910	4.733				
16.567	4.754	17.910	4.738				
16.567	4.758	17.910	4.742				
16.567	4.763	17.910	4.746				
16.567	4.767	17.910	4.750				
16.567	4.771	17.910	4.754				
16.567	4.775	17.910	4.758				
16.567	4.779	17.910	4.763				
16.567	4.783	17.910	4.767				
16.567	4.788	17.910	4.771				
16.567	4.792	17.910	4.775				
16.567	4.796	17.910	4.779				
16.567	4.800	17.910	4.783				
16.567	4.804	17.910	4.788				
16.567	4.808	17.910	4.792				
16.567	4.813	17.910	4.796				
16.567	4.817	17.910	4.800				
16.567	4.821	17.910	4.804				
16.567	4.825	17.910	4.808				
16.567	4.829	17.910	4.813				
16.567	4.833	17.910	4.817				
16.567	4.838	17.910	4.821				
16.567	4.842	17.910	4.825				
16.567	4.846	17.910	4.829				
16.567	4.850	17.910	4.833				
16.567	4.854	17.910	4.838				
16.567	4.858	17.910	4.842				
16.567	4.863	17.910	4.846				
16.567	4.867	17.910	4.850				
16.567	4.871	17.910	4.854				
16.567	4.875	17.910	4.858				

16.567	4.879	17.910	4.863				
16.567	4.883	17.910	4.867				
16.567	4.888	17.910	4.871				
16.567	4.892	17.910	4.875				
16.567	4.896	17.910	4.879				
16.567	4.900	17.910	4.883				
16.567	4.904	17.910	4.888				
16.567	4.908	17.910	4.892				
16.567	4.913	17.910	4.896				
16.567	4.917	17.910	4.900				
16.567	4.921	17.910	4.904				
16.567	4.925	17.910	4.908				
16.567	4.929	17.910	4.913				
16.567	4.933	17.910	4.917				
16.567	4.938	17.910	4.921				
16.567	4.942	17.910	4.925				
16.567	4.946	17.910	4.929				
16.567	4.950	17.910	4.933				
16.567	4.954	17.910	4.938				
16.567	4.958	17.910	4.942				
16.567	4.963	17.910	4.946				
16.567	4.967	17.910	4.950				
16.567	4.971	17.910	4.954				
16.567	4.975	17.910	4.958				
16.567	4.979	17.910	4.963				
16.567	4.983	17.910	4.967				
16.567	4.988	17.910	4.971				
16.567	4.992	17.910	4.975				
16.567	4.996	17.910	4.979				
16.567	5.000	17.910	4.983				
16.567	5.004	17.910	4.988				
16.567	5.008	17.910	4.992				
16.567	5.013	17.910	4.996				
16.567	5.017	17.910	5.000				
16.567	5.021	17.910	5.004				
16.567	5.025	17.910	5.008				
16.567	5.029	17.910	5.013				
16.567	5.033	17.910	5.017				
16.567	5.038	17.910	5.021				
16.567	5.042	17.910	5.025				
16.567	5.046	17.910	5.029				
16.567	5.050	17.910	5.033				
16.567	5.054	17.910	5.038				
16.567	5.058	17.910	5.042				
16.567	5.063	17.910	5.046				
16.567	5.067	17.910	5.050				
16.567	5.071	17.910	5.054				
16.567	5.075	17.910	5.058				
16.567	5.079	17.910	5.063				
16.567	5.083	17.910	5.067				
16.567	5.088	17.910	5.071				
16.567	5.092	17.910	5.075				
16.567	5.096	17.910	5.079				
16.567	5.100	17.910	5.083				
16.567	5.104	17.910	5.088				
16.567	5.108	17.910	5.092				

16.567	5.113	17.910	5.096				
16.567	5.117	17.910	5.100				
16.567	5.121	17.910	5.104				
16.567	5.125	17.910	5.108				
16.567	5.129	17.910	5.113				
16.567	5.133	17.910	5.117				
16.567	5.138	17.910	5.121				
16.567	5.142	17.910	5.125				
16.567	5.146	17.910	5.129				
16.567	5.150	17.910	5.133				
16.567	5.154	17.910	5.138				
16.567	5.158	17.910	5.142				
16.567	5.163	17.910	5.146				
16.567	5.167	17.910	5.150				
16.567	5.171	17.910	5.154				
16.567	5.175	17.910	5.158				
16.567	5.179	17.910	5.163				
16.567	5.183	17.910	5.167				
16.567	5.188	17.910	5.171				
16.567	5.192	17.910	5.175				
16.567	5.196	17.910	5.179				
16.567	5.200	17.910	5.183				
16.567	5.204	17.910	5.188				
16.567	5.208	17.910	5.192				
16.567	5.213	17.910	8.000				
16.567	5.217	17.910	12.000				
16.567	5.221	17.910	16.000				
16.567	5.225	17.910	20.000				
16.567	5.229	17.910	24.000				
16.567	5.233						
16.567	5.238						
16.567	5.242						
16.567	5.246						
16.567	5.250						
16.567	5.254						
16.567	5.258						
16.567	5.263						
16.567	5.267						
16.567	5.271						
16.567	5.275						
16.567	5.279						
16.567	5.283						
16.567	5.288						
16.567	5.292						
16.567	5.296						
16.567	5.300						
16.567	5.304						
16.567	5.308						
16.567	5.313						
16.567	5.317						
16.567	5.321						
16.567	5.325						
16.567	5.329						
16.567	5.333						
16.567	5.338						
16.567	5.342						

16.567	5.346						
16.567	5.350						
16.567	5.354						
16.567	5.358						
16.567	5.363						
16.567	5.367						
16.567	5.371						
16.567	5.375						
16.567	5.379						
16.567	5.383						
16.567	5.388						
16.567	5.392						
16.567	5.396						
16.567	5.400						
16.567	5.404						
16.567	5.408						
16.567	5.413						
16.567	5.417						
16.567	5.421						
16.567	5.425						
16.567	5.429						
16.567	5.433						
16.567	5.438						
16.567	5.442						
16.567	5.446						
16.567	5.450						
16.567	5.454						
16.567	5.458						
16.567	5.463						
16.567	5.467						
16.567	5.471						
16.567	5.475						
16.567	5.479						
16.567	5.483						
16.567	5.488						
16.716	5.492						
16.716	5.496						
16.716	5.500						
16.567	5.504						
16.567	5.508						
16.567	5.513						
16.567	5.517						
16.567	5.521						
16.567	5.525						
16.567	5.529						
16.567	5.533						
16.567	5.538						
16.567	5.542						
16.567	5.546						
16.716	5.550						
16.567	5.554						
16.567	5.558						
16.567	5.563						
16.716	5.567						
16.716	5.571						
16.716	5.575						

16.716	5.579						
16.716	5.583						
16.716	5.588						
16.716	5.592						
16.716	5.596						
16.716	5.600						
16.716	5.604						
16.567	5.608						
16.567	5.613						
16.567	5.617						
16.567	5.621						
16.567	5.625						
16.567	5.629						
16.567	5.633						
16.567	5.638						
16.567	5.642						
16.567	5.646						
16.567	5.650						
16.567	5.654						
16.567	5.658						
16.567	5.663						
16.567	5.667						
16.716	5.671						
16.716	5.675						
16.716	5.679						
16.716	5.683						
16.716	5.688						
16.716	5.692						
16.716	5.696						
16.716	5.700						
16.716	5.704						
16.567	5.708						
16.567	5.713						
16.567	5.717						
16.567	5.721						
16.716	5.725						
16.567	5.729						
16.567	5.733						
16.567	5.738						
16.567	5.742						
16.567	5.746						
16.567	5.750						
16.716	5.754						
16.716	5.758						
16.716	5.763						
16.716	5.767						
16.716	5.771						
16.716	5.775						
16.716	5.779						
16.716	5.783						
16.716	5.788						
16.716	5.792						
16.716	5.796						
16.716	5.800						
16.716	5.804						
16.716	5.808						

16.716	5.813						
16.567	5.817						
16.716	5.821						
16.716	5.825						
16.567	5.829						
16.716	5.833						
16.716	5.838						
16.716	5.842						
16.716	5.846						
16.716	5.850						
16.567	5.854						
16.716	5.858						
16.716	5.863						
16.716	5.867						
16.716	5.871						
16.716	5.875						
16.716	5.879						
16.716	5.883						
16.716	5.888						
16.716	5.892						
16.716	5.896						
16.716	5.900						
16.716	5.904						
16.716	5.908						
16.716	5.913						
16.716	5.917						
16.716	5.921						
16.716	5.925						
16.567	5.929						
16.716	5.933						
16.716	5.938						
16.716	5.942						
16.716	5.946						
16.716	5.950						
16.716	5.954						
16.716	5.958						
16.716	5.963						
16.716	5.967						
16.716	5.971						
16.716	5.975						
16.716	5.979						
16.716	5.983						
16.716	5.988						
16.716	5.992						
16.716	5.996						
16.716	6.000						
16.716	6.004						
16.716	6.008						
16.716	6.013						
16.716	6.017						
16.716	6.021						
16.716	6.025						
16.716	6.029						
16.716	6.033						
16.716	6.038						
16.716	6.042						

16.716	6.046						
16.716	6.050						
16.716	6.054						
16.716	6.058						
16.716	6.063						
16.716	6.067						
16.716	6.071						
16.716	6.075						
16.716	6.079						
16.716	6.083						
16.716	6.088						
16.716	6.092						
16.716	6.096						
16.716	6.100						
16.716	6.104						
16.716	6.108						
16.716	6.113						
16.716	6.117						
16.716	6.121						
16.716	6.125						
16.716	6.129						
17.164	8.000						
17.463	12.000						
17.761	16.000						
18.060	20.000						
18.060	24.000						

72% of degree of saturation

150kPa							
Equilibrium stage		**Consolidation stage**		**Shearing stage**			
Matric suction/(kPa)	**Time/(hr)**	**Matric suction/(kPa)**	**Time/(hr)**	**Matric suction/(kPa)**	**Time/(hr)**	**Matric suction/(kPa)**	**Shear strain/(%)**
0.000	0.000	84.627	0.000	84.627	0.000	84.627	0.000
6.567	0.004	84.328	0.000	84.627	0.004	84.478	0.250
21.194	0.008	83.881	0.001	84.627	0.008	84.478	0.500
35.672	0.013	83.433	0.002	84.627	0.013	84.328	0.750
41.194	0.017	82.388	0.003	84.478	0.017	84.179	1.000
47.313	0.021	81.791	0.004	84.478	0.021	84.179	1.250
54.478	0.025	81.343	0.008	84.478	0.025	84.179	1.500
58.806	0.029	81.045	0.013	84.478	0.029	83.731	1.750
61.343	0.033	80.746	0.017	84.627	0.033	83.433	2.000
62.985	0.038	80.597	0.021	84.478	0.038	83.134	2.500
64.179	0.042	80.448	0.025	84.478	0.042	82.836	3.000
65.075	0.046	80.299	0.029	84.478	0.046	82.239	3.500
65.373	0.050	80.149	0.033	84.478	0.050	81.493	4.000
66.418	0.054	80.000	0.038	84.478	0.054	80.746	5.000
67.015	0.058	79.851	0.042	84.328	0.058	79.254	6.000
67.463	0.063	79.851	0.046	84.328	0.063	79.403	7.000
68.060	0.067	79.701	0.050	84.328	0.067	79.254	8.000
68.507	0.071	79.701	0.054	84.328	0.071	78.955	9.000
68.955	0.075	79.552	0.058	84.328	0.075	79.403	10.000
69.403	0.079	79.552	0.063	84.179	0.079	79.403	11.000
69.851	0.083	79.403	0.067	84.179	0.083	79.403	12.000
70.149	0.088	79.403	0.071	84.179	0.088		
70.448	0.092	79.254	0.075	84.179	0.092		
70.746	0.096	79.254	0.079	84.179	0.096		
71.045	0.100	79.104	0.083	84.179	0.100		
71.343	0.104	79.104	0.088	84.179	0.104		
71.493	0.108	79.104	0.092	84.179	0.108		
71.642	0.113	78.955	0.096	84.179	0.113		
71.642	0.117	78.955	0.100	84.179	0.117		
71.791	0.121	78.806	0.104	84.179	0.121		
71.940	0.125	78.806	0.108	84.179	0.125		
72.090	0.129	78.806	0.113	84.030	0.129		
72.239	0.133	78.806	0.117	84.030	0.133		
72.239	0.138	78.806	0.121	83.881	0.138		
72.388	0.142	78.657	0.125	83.731	0.142		
72.537	0.146	78.657	0.129	83.582	0.146		
72.537	0.150	78.657	0.133	83.582	0.150		
72.687	0.154	78.657	0.138	83.433	0.154		
72.836	0.158	78.507	0.142	83.433	0.158		
72.985	0.163	78.507	0.146	83.433	0.163		
72.985	0.167	78.507	0.150	83.433	0.167		
73.134	0.171	78.507	0.154	83.284	0.171		
73.134	0.175	78.358	0.158	83.284	0.175		
73.134	0.179	78.358	0.163	83.284	0.179		
73.284	0.183	78.358	0.167	83.284	0.183		
73.284	0.188	78.358	0.171	83.284	0.188		
73.284	0.192	78.806	0.175	83.284	0.192		
73.433	0.196	78.209	0.179	83.134	0.196		
73.433	0.200	77.910	0.183	83.134	0.200		
73.433	0.204	77.910	0.188	83.134	0.204		
73.582	0.208	77.910	0.192	82.985	0.208		

72.985	0.213	77.910	0.196	82.985	0.213		
73.433	0.217	77.910	0.200	82.985	0.217		
72.985	0.221	77.910	0.204	82.985	0.221		
73.433	0.225	77.910	0.208	82.985	0.225		
73.433	0.229	77.910	0.213	82.985	0.229		
73.582	0.233	77.910	0.217	82.985	0.233		
73.582	0.238	77.910	0.221	82.836	0.238		
73.582	0.242	77.910	0.225	82.836	0.242		
73.731	0.246	77.910	0.229	82.388	0.246		
73.731	0.250	77.910	0.233	82.537	0.250		
73.731	0.254	77.910	0.238	82.537	0.254		
73.731	0.258	77.910	0.242	82.537	0.258		
73.881	0.263	77.910	0.246	82.687	0.263		
73.881	0.267	77.910	0.250	82.537	0.267		
73.881	0.271	77.910	0.254	82.388	0.271		
73.881	0.275	77.910	0.258	82.388	0.275		
74.030	0.279	77.910	0.263	82.239	0.279		
74.030	0.283	77.910	0.267	82.090	0.283		
74.030	0.288	77.910	0.271	82.090	0.288		
74.030	0.292	77.910	0.275	81.940	0.292		
74.179	0.296	77.761	0.279	81.940	0.296		
74.179	0.300	77.761	0.283	81.791	0.300		
74.179	0.304	77.761	0.288	81.791	0.304		
74.179	0.308	77.761	0.292	81.642	0.308		
74.179	0.313	77.761	0.296	81.642	0.313		
74.179	0.317	77.761	0.300	81.493	0.317		
74.328	0.321	77.761	0.304	81.493	0.321		
74.328	0.325	77.761	0.308	81.493	0.325		
74.328	0.329	77.761	0.313	81.493	0.329		
74.328	0.333	77.910	0.317	81.493	0.333		
74.328	0.338	77.910	0.321	81.343	0.338		
74.328	0.342	77.910	0.325	81.194	0.342		
74.328	0.346	77.910	0.329	81.194	0.346		
74.328	0.350	77.910	0.333	81.194	0.350		
74.478	0.354	77.910	0.338	81.194	0.354		
74.478	0.358	77.910	0.342	81.194	0.358		
74.478	0.363	77.910	0.346	81.194	0.363		
74.478	0.367	77.910	0.350	81.194	0.367		
74.478	0.371	77.910	0.354	81.045	0.371		
74.627	0.375	77.910	0.358	81.045	0.375		
74.627	0.379	77.910	0.363	80.896	0.379		
74.627	0.383	77.761	0.367	80.896	0.383		
74.627	0.388	77.910	0.371	80.746	0.388		
74.627	0.392	77.910	0.375	80.746	0.392		
74.776	0.396	77.910	0.379	80.746	0.396		
74.776	0.400	77.910	0.383	80.746	0.400		
74.776	0.404	77.910	0.388	80.597	0.404		
74.776	0.408	77.910	0.392	80.597	0.408		
74.776	0.413	77.910	0.396	80.597	0.413		
74.925	0.417	77.910	0.400	80.448	0.417		
74.925	0.421	77.910	0.404	80.299	0.421		
74.925	0.425	77.910	0.408	80.299	0.425		
74.925	0.429	77.910	0.413	80.299	0.429		
75.075	0.433	77.910	0.417	80.149	0.433		
75.075	0.438	77.910	0.421	80.000	0.438		
75.075	0.442	77.910	0.425	80.000	0.442		

75.075	0.446	77.910	0.429	79.851	0.446		
75.075	0.450	77.910	0.433	79.851	0.450		
75.075	0.454	77.761	0.438	79.851	0.454		
75.224	0.458	77.761	0.442	79.701	0.458		
75.224	0.463	77.761	0.446	79.552	0.463		
75.224	0.467	77.761	0.450	79.552	0.467		
75.224	0.471	77.761	0.454	79.403	0.471		
74.328	0.475	77.761	0.458	79.403	0.475		
75.075	0.479	77.910	0.463	79.254	0.479		
75.224	0.483	77.910	0.467	79.254	0.483		
75.224	0.488	77.910	0.471	79.254	0.488		
75.224	0.492	77.910	0.475	79.104	0.492		
75.373	0.496	77.910	0.479	78.955	0.496		
75.373	0.500	77.910	0.483	79.104	0.500		
75.373	0.504	77.910	0.488	79.104	0.504		
75.373	0.508	77.910	0.492	79.254	0.508		
75.373	0.513	77.910	0.496	79.254	0.513		
75.522	0.517	77.910	0.500	79.254	0.517		
75.522	0.521	77.910	0.504	79.254	0.521		
75.522	0.525	77.910	0.508	79.254	0.525		
75.522	0.529	77.910	0.513	79.254	0.529		
75.522	0.533	77.910	0.517	79.254	0.533		
75.522	0.538	77.910	0.521	79.254	0.538		
75.672	0.542	77.910	0.525	79.254	0.542		
75.672	0.546	77.910	0.529	79.403	0.546		
75.672	0.550	77.910	0.533	79.403	0.550		
75.672	0.554	77.910	0.538	79.403	0.554		
75.672	0.558	77.910	0.542	79.403	0.558		
75.672	0.563	77.910	0.546	79.254	0.563		
75.672	0.567	77.910	0.550	79.254	0.567		
75.672	0.571	77.910	0.554	79.403	0.571		
75.821	0.575	77.910	0.558	79.403	0.575		
75.821	0.579	77.910	0.563	79.403	0.579		
75.821	0.583	77.910	0.567	79.403	0.583		
75.821	0.588	77.910	0.571	79.403	0.588		
75.821	0.592	77.910	0.575	79.403	0.592		
75.821	0.596	78.060	0.579	79.403	0.596		
75.970	0.600	78.060	0.583	79.552	0.600		
75.970	0.604	78.060	0.588	79.403	0.604		
75.970	0.608	78.060	0.592	79.403	0.608		
75.970	0.613	78.060	0.596	79.403	0.613		
76.119	0.617	78.060	0.600	79.403	0.617		
76.119	0.621	78.060	0.604	79.552	0.621		
76.119	0.625	78.060	0.608	79.403	0.625		
76.119	0.629	78.060	0.613	79.403	0.629		
76.119	0.633	78.060	0.617	79.403	0.633		
76.119	0.638	78.060	0.621	79.254	0.638		
76.269	0.642	78.060	0.625	79.254	0.642		
76.269	0.646	78.060	0.629	79.254	0.646		
76.269	0.650	78.060	0.633	79.254	0.650		
76.269	0.654	78.060	0.638	79.104	0.654		
76.269	0.658	78.060	0.642	79.104	0.658		
76.269	0.663	78.060	0.646	79.104	0.663		
76.418	0.667	78.060	0.650	79.104	0.667		
76.418	0.671	78.060	0.654	78.955	0.671		
76.418	0.675	78.060	0.658	78.955	0.675		

76.418	0.679	78.060	0.663	78.955	0.679		
76.418	0.683	78.060	0.667	78.806	0.683		
76.567	0.688	78.060	0.671	78.806	0.688		
76.567	0.692	77.910	0.675	78.806	0.692		
76.567	0.696	77.910	0.679	78.806	0.696		
76.567	0.700	77.910	0.683	78.806	0.700		
76.567	0.704	77.910	0.688	78.806	0.704		
76.567	0.708	77.910	0.692	78.806	0.708		
76.716	0.713	77.910	0.696	78.806	0.713		
76.716	0.717	77.910	0.700	78.955	0.717		
76.716	0.721	77.910	0.704	78.955	0.721		
76.716	0.725	77.910	0.708	79.104	0.725		
76.716	0.729	77.910	0.713	79.104	0.729		
76.716	0.733	78.060	0.717	79.104	0.733		
76.716	0.738	78.060	0.721	79.254	0.738		
76.716	0.742	78.060	0.725	79.254	0.742		
76.866	0.746	78.060	0.729	79.254	0.746		
76.866	0.750	78.060	0.733	79.254	0.750		
76.866	0.754	78.060	0.738	79.254	0.754		
76.866	0.758	78.060	0.742	79.254	0.758		
76.866	0.763	78.060	0.746	79.403	0.763		
76.866	0.767	78.060	0.750	79.403	0.767		
77.015	0.771	78.060	0.754	79.403	0.771		
77.015	0.775	78.060	0.758	79.403	0.775		
77.015	0.779	78.060	0.763	79.403	0.779		
77.164	0.783	78.060	0.767	79.403	0.783		
77.164	0.788	78.060	0.771	79.403	0.788		
77.164	0.792	78.060	0.775	79.403	0.792		
77.164	0.796	78.060	0.779	79.403	0.796		
77.164	0.800	78.209	0.783	79.403	0.800		
77.313	0.804	78.209	0.788	79.403	0.804		
77.313	0.808	78.209	0.792	79.403	0.808		
77.313	0.813	78.209	0.796	79.403	0.813		
77.313	0.817	78.209	0.800	79.403	0.817		
77.463	0.821	78.209	0.804	79.403	0.821		
77.463	0.825	78.209	0.808	79.403	0.825		
77.463	0.829	78.209	0.813	79.403	0.829		
77.463	0.833	78.209	0.817	79.403	0.833		
77.612	0.838	78.209	0.821	79.403	0.838		
77.612	0.842	78.209	0.825	79.403	0.842		
77.612	0.846	78.209	0.829	79.403	0.846		
77.612	0.850	78.209	0.833	79.403	0.850		
77.612	0.854	78.209	0.838	79.403	0.854		
77.612	0.858	78.209	0.842	79.403	0.858		
77.612	0.863	78.209	0.846	79.403	0.863		
77.612	0.867	78.209	0.850	79.403	0.867		
77.761	0.871	78.209	0.854	79.403	0.871		
77.761	0.875	78.209	0.858	79.403	0.875		
77.164	0.879	78.358	0.863	79.403	0.879		
77.761	0.883	78.358	0.867	79.403	0.883		
77.910	0.888	78.358	0.871	79.403	0.888		
77.910	0.892	78.209	0.875	79.403	0.892		
77.910	0.896	78.358	0.879	79.403	0.896		
77.910	0.900	78.358	0.883	79.403	0.900		
78.060	0.904	78.358	0.888	79.403	0.904		
78.060	0.908	78.358	0.892	79.403	0.908		

78.060	0.913	78.358	0.896	79.403	0.913		
78.060	0.917	78.358	0.900	79.403	0.917		
78.209	0.921	78.358	0.904	79.403	0.921		
78.209	0.925	78.358	0.908	79.403	0.925		
78.060	0.929	78.358	0.913	79.403	0.929		
78.060	0.933	78.358	0.917	79.403	0.933		
78.209	0.938	78.358	0.921	79.403	0.938		
78.209	0.942	78.358	0.925	79.403	0.942		
78.209	0.946	78.358	0.929	79.403	0.946		
78.507	0.950	78.358	0.933	79.403	0.950		
77.910	0.954	78.358	0.938	79.403	0.954		
77.313	0.958	78.358	0.942	79.403	0.958		
77.761	0.963	78.358	0.946				
77.463	0.967	78.358	0.950				
77.761	0.971	78.358	0.954				
77.910	0.975	78.358	0.958				
78.060	0.979	78.358	0.963				
78.060	0.983	78.358	0.967				
78.060	0.988	78.358	0.971				
78.209	0.992	78.358	0.975				
78.209	0.996	78.358	0.979				
78.209	1.000	78.358	0.983				
78.209	1.004	78.507	0.988				
78.209	1.008	78.507	0.992				
78.209	1.013	78.507	0.996				
78.209	1.017	78.507	1.000				
78.209	1.021	78.507	1.004				
78.209	1.025	78.507	1.008				
78.358	1.029	78.358	1.013				
78.358	1.033	78.358	1.017				
78.358	1.038	78.507	1.021				
78.358	1.042	78.507	1.025				
78.358	1.046	78.507	1.029				
78.358	1.050	78.507	1.033				
78.358	1.054	78.507	1.038				
78.358	1.058	78.507	1.042				
78.358	1.063	78.507	1.046				
78.358	1.067	78.507	1.050				
78.358	1.071	78.507	1.054				
78.507	1.075	78.507	1.058				
78.507	1.079	78.507	1.063				
78.507	1.083	78.507	1.067				
78.507	1.088	78.507	1.071				
78.507	1.092	78.507	1.075				
78.507	1.096	78.507	1.079				
78.507	1.100	78.507	1.083				
78.507	1.104	78.507	1.088				
78.507	1.108	78.507	1.092				
78.507	1.113	78.507	1.096				
78.507	1.117	78.507	1.100				
78.507	1.121	78.507	1.104				
78.507	1.125	78.507	1.108				
78.507	1.129	78.507	1.113				
78.507	1.133	78.507	1.117				
78.507	1.138	78.507	1.121				
78.657	1.142	78.507	1.125				

78.657	1.146	78.507	1.129				
78.657	1.150	78.507	1.133				
78.657	1.154	78.507	1.138				
78.657	1.158	78.507	1.142				
78.657	1.163	78.507	1.146				
78.657	1.167	78.507	1.150				
78.657	1.171	78.507	1.154				
78.657	1.175	78.507	1.158				
78.657	1.179	78.507	1.163				
78.657	1.183	78.507	1.167				
78.657	1.188	78.507	1.171				
78.657	1.192	78.507	1.175				
78.657	1.196	78.507	1.179				
78.657	1.200	78.507	1.183				
78.657	1.204	78.507	1.188				
78.657	1.208	78.507	1.192				
78.657	1.213	78.507	1.196				
78.657	1.217	78.657	1.200				
78.657	1.221	78.657	1.204				
78.657	1.225	78.657	1.208				
78.657	1.229	78.657	1.213				
78.657	1.233	78.657	1.217				
78.657	1.238	78.657	1.221				
78.657	1.242	78.657	1.225				
78.657	1.246	78.657	1.229				
78.806	1.250	78.657	1.233				
78.806	1.254	78.657	1.238				
78.806	1.258	78.657	1.242				
78.806	1.263	78.657	1.246				
78.806	1.267	78.657	1.250				
78.806	1.271	78.657	1.254				
78.806	1.275	79.701	2.000				
78.806	1.279	80.746	4.000				
78.806	1.283	81.791	8.000				
78.806	1.288	82.836	12.000				
78.806	1.292	83.881	16.000				
78.806	1.296	84.627	20.000				
78.806	1.300	84.627	24.000				
78.806	1.304						
78.955	1.308						
78.955	1.313						
78.955	1.317						
78.955	1.321						
78.955	1.325						
78.955	1.329						
78.955	1.333						
78.955	1.338						
78.955	1.342						
78.955	1.346						
78.955	1.350						
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78.955	1.358						
78.955	1.363						
78.955	1.367						
78.955	1.371						
78.955	1.375						

78.955	1.379						
78.955	1.383						
78.955	1.388						
78.955	1.392						
78.955	1.396						
78.955	1.400						
78.955	1.404						
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79.104	1.413						
79.104	1.417						
79.104	1.421						
79.104	1.425						
79.104	1.429						
79.104	1.433						
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79.104	1.483						
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79.104	1.492						
79.104	1.496						
79.104	1.500						
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79.254	1.508						
79.254	1.513						
79.254	1.517						
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79.254	1.525						
79.254	1.529						
79.254	1.533						
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79.254	1.542						
79.254	1.546						
79.254	1.550						
79.254	1.554						
79.254	1.558						
79.254	1.563						
79.254	1.567						
79.254	1.571						
79.254	1.575						
79.254	1.579						
79.254	1.583						
79.403	1.588						
79.403	1.592						
79.403	1.596						
79.403	1.600						
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83.582	4.929						
83.582	4.933						
83.582	4.938						
83.582	4.942						
83.582	4.946						
83.582	4.950						
83.582	4.954						
83.582	4.958						
83.582	4.963						
83.582	4.967						
83.582	4.971						
83.582	4.975						
83.582	4.979						
83.582	4.983						
83.582	4.988						
83.582	4.992						
83.582	4.996						
83.582	5.000						
83.582	5.004						
83.582	5.008						
83.582	5.013						
83.582	5.017						
83.582	5.021						
83.582	5.025						
83.582	5.029						
83.582	5.033						
83.582	5.038						
83.582	5.042						
83.582	5.046						
83.582	5.050						
83.582	5.054						
83.582	5.058						
83.582	5.063						
83.582	5.067						
83.731	5.071						
83.731	5.075						
83.731	5.079						
83.731	5.083						
83.731	5.088						
83.731	5.092						
83.731	5.096						
83.731	5.100						
83.731	5.104						
83.731	5.108						

83.731	5.113						
83.731	5.117						
83.731	5.121						
83.731	5.125						
83.731	5.129						
83.731	5.133						
83.881	5.138						
83.881	5.142						
83.881	5.146						
83.881	5.150						
83.881	5.154						
83.881	5.158						
83.881	5.163						
83.881	5.167						
83.881	5.171						
83.881	5.175						
83.881	5.179						
83.881	5.183						
83.881	5.188						
83.881	5.192						
83.881	5.196						
83.881	5.200						
83.881	5.204						
83.881	5.208						
83.881	5.213						
83.881	5.217						
83.881	5.221						
83.881	5.225						
83.881	5.229						
83.881	5.233						
83.881	5.238						
83.881	5.242						
83.881	5.246						
83.881	5.250						
83.881	5.254						
83.881	5.258						
83.881	5.263						
83.881	5.267						
83.881	5.271						
83.881	5.275						
83.881	5.279						
83.881	5.283						
84.179	8.000						
84.478	12.000						
84.627	16.000						
84.627	20.000						
84.627	24.000						

72% of degree of saturation

200kPa							
Equilibrium stage		Consolidation stage		Shearing stage			
Matric suction/(kPa)	Time/(hr)	Matric suction/(kPa)	Time/(hr)	Matric suction/(kPa)	Time/(hr)	Matric suction/(kPa)	Shear strain/(%)
0.000	0.000	106.716	0.000	106.716	0.000	106.716	0.000
4.179	0.004	106.418	0.000	106.716	0.004	106.716	0.250
6.418	0.008	105.970	0.001	106.716	0.008	106.567	0.500
8.806	0.013	105.522	0.002	106.716	0.013	105.672	0.750
10.597	0.017	105.075	0.003	106.716	0.017	104.328	1.000
12.090	0.021	103.731	0.004	106.716	0.021	102.985	1.250
13.433	0.025	101.493	0.008	106.716	0.025	101.940	1.500
14.627	0.029	99.403	0.013	106.716	0.029	100.746	1.750
15.522	0.033	97.612	0.017	106.716	0.033	100.000	2.000
16.119	0.038	96.418	0.021	106.716	0.038	98.060	2.500
16.716	0.042	95.672	0.025	106.567	0.042	96.567	3.000
17.761	0.046	95.075	0.029	106.418	0.046	95.373	3.500
19.104	0.050	94.627	0.033	106.269	0.050	94.179	4.000
20.448	0.054	94.179	0.038	105.970	0.054	92.090	5.000
21.940	0.058	94.030	0.042	105.672	0.058	90.746	6.000
23.433	0.063	93.731	0.046	105.373	0.063	90.299	7.000
25.075	0.067	93.582	0.050	105.224	0.067	89.851	8.000
26.716	0.071	93.433	0.054	104.925	0.071		
28.507	0.075	93.284	0.058	104.627	0.075		
30.448	0.079	93.134	0.063	104.328	0.079		
32.388	0.083	92.985	0.067	104.030	0.083		
34.179	0.088	92.985	0.071	103.731	0.088		
36.119	0.092	92.985	0.075	103.433	0.092		
38.060	0.096	92.985	0.079	103.284	0.096		
39.851	0.100	92.836	0.083	102.985	0.100		
41.791	0.104	92.836	0.088	102.836	0.104		
43.582	0.108	92.687	0.092	102.537	0.108		
45.075	0.113	92.537	0.096	102.388	0.113		
46.567	0.117	92.537	0.100	102.090	0.117		
48.060	0.121	92.537	0.104	101.940	0.121		
49.552	0.125	92.388	0.108	101.642	0.125		
50.746	0.129	92.388	0.113	101.493	0.129		
52.090	0.133	92.537	0.117	101.194	0.133		
53.433	0.138	92.388	0.121	100.896	0.138		
54.776	0.142	92.388	0.125	100.746	0.142		
55.970	0.146	92.239	0.129	100.448	0.146		
57.164	0.150	92.239	0.133	100.299	0.150		
58.358	0.154	92.239	0.138	100.149	0.154		
59.552	0.158	92.239	0.142	100.000	0.158		
60.746	0.163	92.239	0.146	99.851	0.163		
61.791	0.167	92.239	0.150	99.701	0.167		
62.985	0.171	92.388	0.154	99.403	0.171		
64.030	0.175	92.388	0.158	99.254	0.175		
65.075	0.179	92.388	0.163	99.104	0.179		
65.970	0.183	92.239	0.167	98.955	0.183		
67.015	0.188	92.239	0.171	98.657	0.188		
67.910	0.192	92.239	0.175	98.507	0.192		
68.806	0.196	92.239	0.179	98.358	0.196		
69.701	0.200	92.239	0.183	98.060	0.200		
70.597	0.204	92.239	0.188	97.910	0.204		
71.493	0.208	92.239	0.192	97.761	0.208		

72.239	0.213	92.239	0.196	97.612	0.213		
72.985	0.217	92.239	0.200	97.463	0.217		
73.731	0.221	92.090	0.204	97.313	0.221		
74.478	0.225	91.940	0.208	97.164	0.225		
75.224	0.229	91.940	0.213	97.015	0.229		
75.970	0.233	91.940	0.217	96.866	0.233		
76.567	0.238	91.940	0.221	96.716	0.238		
77.313	0.242	92.090	0.225	96.567	0.242		
77.910	0.246	92.090	0.229	96.418	0.246		
78.507	0.250	92.090	0.233	96.269	0.250		
79.104	0.254	92.090	0.238	96.119	0.254		
79.701	0.258	92.090	0.242	95.970	0.258		
80.299	0.263	92.090	0.246	95.970	0.263		
80.746	0.267	92.090	0.250	95.821	0.267		
81.343	0.271	91.940	0.254	95.672	0.271		
81.791	0.275	91.940	0.258	95.522	0.275		
82.239	0.279	91.940	0.263	95.373	0.279		
82.687	0.283	92.090	0.267	95.224	0.283		
82.985	0.288	92.090	0.271	95.075	0.288		
83.433	0.292	92.090	0.275	94.925	0.292		
83.731	0.296	91.940	0.279	94.776	0.296		
84.179	0.300	91.940	0.283	94.627	0.300		
84.478	0.304	91.940	0.288	94.478	0.304		
84.776	0.308	91.940	0.292	94.478	0.308		
85.224	0.313	92.090	0.296	94.328	0.313		
85.522	0.317	92.090	0.300	94.179	0.317		
85.821	0.321	92.090	0.304	94.179	0.321		
85.970	0.325	92.090	0.308	94.030	0.325		
86.269	0.329	92.090	0.313	93.881	0.329		
86.567	0.333	92.090	0.317	93.582	0.333		
86.866	0.338	91.940	0.321	93.433	0.338		
87.015	0.342	91.940	0.325	93.284	0.342		
87.164	0.346	91.940	0.329	93.134	0.346		
87.313	0.350	91.940	0.333	93.134	0.350		
87.612	0.354	92.090	0.338	92.985	0.354		
87.761	0.358	92.090	0.342	92.836	0.358		
87.910	0.363	92.090	0.346	92.836	0.363		
88.060	0.367	92.090	0.350	92.687	0.367		
88.209	0.371	92.090	0.354	92.537	0.371		
88.209	0.375	92.090	0.358	92.388	0.375		
88.358	0.379	92.090	0.363	92.388	0.379		
88.507	0.383	92.090	0.367	92.239	0.383		
88.507	0.388	92.090	0.371	92.239	0.388		
88.657	0.392	92.090	0.375	92.239	0.392		
88.806	0.396	92.239	0.379	92.090	0.396		
88.955	0.400	92.239	0.383	92.090	0.400		
88.955	0.404	92.090	0.388	91.940	0.404		
89.104	0.408	92.090	0.392	91.940	0.408		
89.104	0.413	91.940	0.396	91.791	0.413		
89.254	0.417	91.940	0.400	91.791	0.417		
89.403	0.421	91.940	0.404	91.642	0.421		
89.403	0.425	91.940	0.408	91.493	0.425		
89.552	0.429	91.940	0.413	91.493	0.429		
89.552	0.433	91.940	0.417	91.343	0.433		
89.701	0.438	91.940	0.421	91.343	0.438		
89.851	0.442	91.940	0.425	91.194	0.442		

89.851	0.446	91.940	0.429	91.194	0.446		
90.000	0.450	91.940	0.433	91.045	0.450		
90.000	0.454	91.940	0.438	91.045	0.454		
90.149	0.458	91.940	0.442	91.045	0.458		
90.149	0.463	91.940	0.446	91.045	0.463		
90.299	0.467	92.090	0.450	90.896	0.467		
90.299	0.471	92.090	0.454	90.896	0.471		
90.448	0.475	92.090	0.458	90.896	0.475		
90.448	0.479	92.090	0.463	90.746	0.479		
90.597	0.483	92.090	0.467	90.746	0.483		
90.597	0.488	92.090	0.471	90.746	0.488		
90.597	0.492	92.090	0.475	90.746	0.492		
90.746	0.496	92.090	0.479	90.746	0.496		
90.746	0.500	92.239	0.483	90.597	0.500		
90.896	0.504	92.239	0.488	90.597	0.504		
90.896	0.508	92.239	0.492	90.597	0.508		
91.045	0.513	92.239	0.496	90.597	0.513		
91.045	0.517	92.239	0.500	90.597	0.517		
91.194	0.521	92.090	0.504	90.448	0.521		
91.194	0.525	92.090	0.508	90.448	0.525		
91.194	0.529	92.090	0.513	90.448	0.529		
91.343	0.533	92.090	0.517	90.448	0.533		
91.343	0.538	92.090	0.521	90.448	0.538		
91.493	0.542	92.090	0.525	90.448	0.542		
91.493	0.546	91.940	0.529	90.299	0.546		
91.493	0.550	91.940	0.533	90.299	0.550		
91.642	0.554	91.791	0.538	90.448	0.554		
91.642	0.558	91.791	0.542	90.299	0.558		
91.642	0.563	91.940	0.546	90.299	0.563		
91.791	0.567	91.940	0.550	90.299	0.567		
91.791	0.571	91.940	0.554	90.299	0.571		
91.791	0.575	91.940	0.558	90.299	0.575		
91.940	0.579	91.940	0.563	90.149	0.579		
91.940	0.583	91.940	0.567	90.149	0.583		
91.940	0.588	91.940	0.571	90.149	0.588		
92.090	0.592	92.090	0.575	90.149	0.592		
92.090	0.596	92.239	0.579	90.149	0.596		
92.239	0.600	92.388	0.583	90.149	0.600		
92.239	0.604	92.388	0.588	90.149	0.604		
92.388	0.608	92.388	0.592	90.149	0.608		
92.388	0.613	92.239	0.596	90.000	0.613		
92.388	0.617	92.239	0.600	90.000	0.617		
92.537	0.621	92.239	0.604	90.000	0.621		
92.537	0.625	92.239	0.608	90.000	0.625		
92.687	0.629	92.239	0.613	90.000	0.629		
92.836	0.633	92.388	0.617	90.000	0.633		
92.985	0.638	92.388	0.621	89.851	0.638		
93.134	0.642	92.537	0.625	89.851	0.642		
93.284	0.646	92.537	0.629	89.851	0.646		
93.433	0.650	92.537	0.633	89.851	0.650		
93.582	0.654	92.388	0.638	89.851	0.654		
93.731	0.658	92.388	0.642				
93.881	0.663	92.388	0.646				
94.030	0.667	92.388	0.650				
94.179	0.671	92.388	0.654				
94.328	0.675	92.388	0.658				

94.328	0.679	92.239	0.663				
94.478	0.683	92.239	0.667				
94.627	0.688	92.388	0.671				
94.627	0.692	92.388	0.675				
94.776	0.696	92.388	0.679				
94.776	0.700	92.388	0.683				
94.925	0.704	92.388	0.688				
94.925	0.708	92.239	0.692				
94.925	0.713	92.090	0.696				
94.925	0.717	92.090	0.700				
95.075	0.721	92.090	0.704				
95.075	0.725	92.090	0.708				
95.075	0.729	92.090	0.713				
95.224	0.733	92.090	0.717				
95.075	0.738	92.090	0.721				
95.224	0.742	92.090	0.725				
95.224	0.746	92.090	0.729				
95.075	0.750	91.940	0.733				
95.075	0.754	91.940	0.738				
95.075	0.758	91.940	0.742				
95.224	0.763	91.940	0.746				
95.224	0.767	91.791	0.750				
95.224	0.771	91.791	0.754				
95.224	0.775	91.940	0.758				
95.224	0.779	91.940	0.763				
95.224	0.783	92.090	0.767				
95.224	0.788	92.090	0.771				
95.373	0.792	92.239	0.775				
95.373	0.796	92.239	0.779				
95.522	0.800	92.388	0.783				
95.522	0.804	92.537	0.788				
95.522	0.808	92.687	0.792				
95.522	0.813	92.836	0.796				
95.522	0.817	92.985	0.800				
95.522	0.821	93.134	0.804				
95.522	0.825	93.284	0.808				
95.373	0.829	93.284	0.813				
95.373	0.833	93.284	0.817				
95.373	0.838	93.284	0.821				
95.373	0.842	93.134	0.825				
95.373	0.846	92.985	0.829				
95.373	0.850	92.985	0.833				
95.373	0.854	92.985	0.838				
95.373	0.858	93.134	0.842				
95.224	0.863	93.134	0.846				
95.373	0.867	93.134	0.850				
95.373	0.871	93.134	0.854				
95.373	0.875	93.134	0.858				
95.373	0.879	93.134	0.863				
95.522	0.883	93.134	0.867				
95.522	0.888	93.134	0.871				
95.522	0.892	93.134	0.875				
95.522	0.896	93.134	0.879				
95.522	0.900	92.985	0.883				
95.522	0.904	92.985	0.888				
95.522	0.908	92.985	0.892				

95.522	0.913	92.985	0.896				
95.522	0.917	92.985	0.900				
95.522	0.921	92.985	0.904				
95.522	0.925	92.836	0.908				
95.522	0.929	92.836	0.913				
95.522	0.933	92.836	0.917				
95.522	0.938	92.687	0.921				
95.522	0.942	92.836	0.925				
95.522	0.946	92.836	0.929				
95.522	0.950	92.836	0.933				
95.522	0.954	92.687	0.938				
95.522	0.958	92.388	0.942				
95.672	0.963	92.239	0.946				
95.672	0.967	91.940	0.950				
95.672	0.971	91.791	0.954				
95.672	0.975	91.493	0.958				
95.672	0.979	91.343	0.963				
95.672	0.983	91.194	0.967				
95.821	0.988	91.045	0.971				
95.672	0.992	91.045	0.975				
95.672	0.996	91.045	0.979				
95.821	1.000	91.045	0.983				
95.821	1.004	91.045	0.988				
95.821	1.008	91.194	0.992				
95.821	1.013	91.194	0.996				
95.970	1.017	91.194	1.000				
95.970	1.021	91.194	1.004				
95.970	1.025	91.343	1.008				
95.970	1.029	91.343	1.013				
95.970	1.033	91.343	1.017				
95.970	1.038	91.493	1.021				
95.970	1.042	91.493	1.025				
96.119	1.046	91.493	1.029				
96.119	1.050	91.493	1.033				
96.119	1.054	91.493	1.038				
96.119	1.058	91.493	1.042				
96.119	1.063	91.493	1.046				
96.119	1.067	91.493	1.050				
96.119	1.071	91.493	1.054				
96.119	1.075	91.493	1.058				
96.119	1.079	91.493	1.063				
96.119	1.083	91.493	1.067				
96.119	1.088	91.493	1.071				
96.269	1.092	91.493	1.075				
96.269	1.096	91.493	1.079				
96.269	1.100	91.493	1.083				
96.269	1.104	91.493	1.088				
96.269	1.108	91.493	1.092				
96.269	1.113	91.493	1.096				
96.269	1.117	91.493	1.100				
96.418	1.121	91.493	1.104				
96.418	1.125	91.493	1.108				
96.418	1.129	91.493	1.113				
96.418	1.133	91.493	1.117				
96.418	1.138	91.493	1.121				
96.418	1.142	91.493	1.125				

96.567	1.146	91.493	1.129				
96.567	1.150	91.493	1.133				
96.567	1.154	91.493	1.138				
96.567	1.158	91.493	1.142				
96.716	1.163	91.493	1.146				
96.716	1.167	91.493	1.150				
96.716	1.171	91.493	1.154				
96.716	1.175	91.642	1.158				
96.716	1.179	91.642	1.163				
96.716	1.183	91.791	1.167				
96.716	1.188	91.940	1.171				
96.866	1.192	91.940	1.175				
96.866	1.196	92.090	1.179				
96.866	1.200	92.090	1.183				
96.866	1.204	92.090	1.188				
96.866	1.208	92.090	1.192				
96.866	1.213	92.239	1.196				
96.866	1.217	92.239	1.200				
96.866	1.221	92.239	1.204				
96.866	1.225	92.239	1.208				
96.866	1.229	92.239	1.213				
97.015	1.233	92.239	1.217				
97.015	1.238	92.090	1.221				
97.015	1.242	92.090	1.225				
97.015	1.246	92.090	1.229				
97.015	1.250	92.090	1.233				
97.015	1.254	92.090	1.238				
97.015	1.258	92.090	1.242				
97.164	1.263	92.090	1.246				
97.164	1.267	92.090	1.250				
97.164	1.271	92.090	1.254				
97.164	1.275	92.090	1.258				
97.164	1.279	91.940	1.263				
97.164	1.283	91.940	1.267				
97.164	1.288	91.940	1.271				
97.313	1.292	91.940	1.275				
97.313	1.296	91.940	1.275				
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		94.328	1.612				
		94.478	1.613				
		95.672	2.000				
		97.463	4.000				
		99.851	8.000				
		101.791	12.000				
		104.030	16.000				
		105.672	20.000				
		106.716	24.000				

81% of degree of saturation

50kPa							
Equilibrium stage		Consolidation stage		Shearing stage			
Matric suction/(kPa)	Time/(hr)	Matric suction/(kPa)	Time/(hr)	Matric suction/(kPa)	Time/(hr)	Matric suction/(kPa)	Shear strain/(%)
0.000	0.000	6.418	0.000	6.418	0.000	6.418	0.000
0.597	0.004	6.269	0.000	6.418	0.004	6.418	0.250
1.194	0.008	6.119	0.001	6.418	0.008	6.418	0.500
1.642	0.013	5.970	0.002	6.418	0.013	6.567	0.750
1.940	0.017	5.672	0.003	6.418	0.017	6.418	1.000
2.090	0.021	5.373	0.004	6.418	0.021	6.567	1.250
2.239	0.025	5.970	0.008	6.418	0.025	6.567	1.500
2.388	0.029	5.970	0.013	6.418	0.029	6.716	1.750
2.687	0.033	5.970	0.017	6.418	0.033	6.716	2.000
2.836	0.038	5.970	0.021	6.418	0.038	7.015	2.500
2.985	0.042	5.970	0.025	6.418	0.042	7.164	3.000
3.134	0.046	5.970	0.029	6.567	0.046	7.164	3.500
3.284	0.050	5.970	0.033	6.567	0.050	7.313	4.000
3.433	0.054	5.970	0.038	6.567	0.054	7.612	5.000
3.582	0.058	5.970	0.042	6.567	0.058	7.910	6.000
3.731	0.063	5.970	0.046	6.567	0.063	8.060	7.000
3.881	0.067	5.970	0.050	6.567	0.067	8.358	8.000
3.881	0.071	5.970	0.054	6.567	0.071	8.806	9.000
4.030	0.075	5.970	0.058	6.418	0.075	9.104	10.000
4.179	0.079	5.970	0.063	6.418	0.079	9.552	11.000
4.179	0.083	5.970	0.067	6.418	0.083	9.851	12.000
4.328	0.088	6.119	0.071	6.418	0.088	10.000	13.000
4.328	0.092	6.119	0.075	6.418	0.092	10.448	14.000
4.478	0.096	6.119	0.079	6.567	0.096	10.597	15.000
4.478	0.100	6.119	0.083	6.567	0.100		
4.478	0.104	6.119	0.088	6.567	0.104		
4.627	0.108	6.119	0.092	6.567	0.108		
4.627	0.113	6.119	0.096	6.567	0.113		
4.627	0.117	6.119	0.100	6.567	0.117		
4.627	0.121	6.119	0.104	6.567	0.121		
4.627	0.125	6.119	0.108	6.567	0.125		
4.627	0.129	6.119	0.113	6.567	0.129		
4.627	0.133	6.119	0.117	6.567	0.133		
4.627	0.138	6.119	0.121	6.716	0.138		
4.627	0.142	6.119	0.125	6.716	0.142		
4.627	0.146	6.119	0.129	6.716	0.146		
4.776	0.150	6.119	0.133	6.716	0.150		
4.776	0.154	6.119	0.138	6.716	0.154		
4.776	0.158	6.119	0.142	6.716	0.158		
4.776	0.163	6.119	0.146	6.716	0.163		
4.776	0.167	6.119	0.150	6.866	0.167		
4.776	0.171	6.119	0.154	6.866	0.171		
4.776	0.175	6.119	0.158	6.866	0.175		
4.776	0.179	6.119	0.163	6.866	0.179		
4.776	0.183	6.119	0.167	6.866	0.183		
4.776	0.188	6.119	0.171	6.866	0.188		
4.776	0.192	6.119	0.175	6.866	0.192		
4.776	0.196	6.119	0.179	7.015	0.196		
4.776	0.200	6.119	0.183	7.015	0.200		
4.776	0.204	6.269	0.188	7.015	0.204		
4.776	0.208	6.269	0.192	7.015	0.208		
4.776	0.213	6.269	0.196	7.015	0.213		
4.776	0.217	6.269	0.200	7.015	0.217		

4.776	0.221	6.269	0.204	7.015	0.221		
4.776	0.225	6.269	0.208	7.015	0.225		
4.776	0.229	6.269	0.213	7.015	0.229		
4.776	0.233	6.269	0.217	7.164	0.233		
4.776	0.238	6.269	0.221	7.164	0.238		
4.776	0.242	6.269	0.225	7.164	0.242		
4.776	0.246	6.269	0.229	7.164	0.246		
4.776	0.250	6.269	0.233	7.164	0.250		
4.776	0.254	6.269	0.238	7.164	0.254		
4.776	0.258	6.269	0.242	7.164	0.258		
4.776	0.263	6.269	0.246	7.164	0.263		
4.776	0.267	6.269	0.250	7.164	0.267		
4.776	0.271	6.269	0.254	7.164	0.271		
4.776	0.275	6.269	0.258	7.164	0.275		
4.776	0.279	6.269	0.263	7.164	0.279		
4.776	0.283	6.269	0.267	7.164	0.283		
4.776	0.288	6.269	0.271	7.164	0.288		
4.776	0.292	6.269	0.275	7.164	0.292		
4.776	0.296	6.269	0.279	7.313	0.296		
4.776	0.300	6.269	0.283	7.313	0.300		
4.776	0.304	6.269	0.288	7.313	0.304		
4.776	0.308	6.269	0.292	7.313	0.308		
4.776	0.313	6.269	0.296	7.313	0.313		
4.776	0.317	6.269	0.300	7.313	0.317		
4.776	0.321	6.269	0.304	7.313	0.321		
4.776	0.325	6.269	0.308	7.313	0.325		
4.776	0.329	6.269	0.313	7.313	0.329		
4.776	0.333	6.269	0.317	7.463	0.333		
4.776	0.338	6.269	0.321	7.463	0.338		
4.776	0.342	6.269	0.325	7.463	0.342		
4.776	0.346	6.418	0.329	7.463	0.346		
4.776	0.350	6.418	0.333	7.463	0.350		
4.776	0.354	6.418	0.338	7.463	0.354		
4.776	0.358	6.418	0.342	7.463	0.358		
4.776	0.363	6.418	0.346	7.463	0.363		
4.776	0.367	6.418	0.350	7.463	0.367		
4.776	0.371	6.418	0.354	7.463	0.371		
4.776	0.375	6.418	0.358	7.463	0.375		
4.776	0.379	6.418	0.363	7.463	0.379		
4.776	0.383	6.418	0.367	7.463	0.383		
4.776	0.388	6.418	0.371	7.463	0.388		
4.776	0.392	6.418	0.375	7.612	0.392		
4.776	0.396	6.418	0.379	7.612	0.396		
4.776	0.400	6.418	0.383	7.612	0.400		
4.776	0.404	6.418	0.388	7.612	0.404		
4.776	0.408	6.418	0.392	7.612	0.408		
4.776	0.413	6.418	0.396	7.612	0.413		
4.776	0.417	6.418	0.400	7.612	0.417		
4.776	0.421	6.418	0.404	7.612	0.421		
4.776	0.425	6.418	0.408	7.612	0.425		
4.776	0.429	6.418	0.413	7.612	0.429		
4.776	0.433	6.418	0.417	7.761	0.433		
4.776	0.438	6.418	0.421	7.761	0.438		
4.776	0.442	6.418	0.425	7.761	0.442		
4.776	0.446	6.418	0.429	7.761	0.446		
4.776	0.450	6.418	0.433	7.761	0.450		
4.776	0.454	6.418	0.438	7.761	0.454		
4.776	0.458	6.418	0.442	7.761	0.458		

4.776	0.463	6.418	0.446	7.761	0.463		
4.776	0.467	6.418	0.450	7.761	0.467		
4.776	0.471	6.418	0.454	7.910	0.471		
4.776	0.475	6.418	0.458	7.761	0.475		
4.776	0.479	6.418	0.463	7.910	0.479		
4.776	0.483	6.418	0.467	7.761	0.483		
4.776	0.488	6.418	0.471	7.910	0.488		
4.776	0.492	6.418	0.475	7.910	0.492		
4.776	0.496	6.418	0.479	7.910	0.496		
4.776	0.500	6.418	0.483	7.910	0.500		
4.776	0.504	6.418	0.488	7.910	0.504		
4.776	0.508	6.418	0.492	7.910	0.508		
4.776	0.513	6.418	0.496	7.910	0.513		
4.776	0.517	6.567	0.500	7.910	0.517		
4.776	0.521	6.567	0.504	7.910	0.521		
4.776	0.525	6.567	0.508	7.910	0.525		
4.776	0.529	6.567	0.513	8.060	0.529		
4.776	0.533	6.567	0.517	8.060	0.533		
4.776	0.538	6.567	0.521	8.060	0.538		
4.776	0.542	6.567	0.525	8.060	0.542		
4.776	0.546	6.567	0.529	8.060	0.546		
4.776	0.550	6.567	0.533	8.060	0.550		
4.776	0.554	6.567	0.538	8.060	0.554		
4.776	0.558	6.567	0.542	8.060	0.558		
4.776	0.563	6.567	0.546	8.060	0.563		
4.776	0.567	6.567	0.550	8.060	0.567		
4.776	0.571	6.567	0.554	8.209	0.571		
4.776	0.575	6.567	0.558	8.209	0.575		
4.776	0.579	6.567	0.563	8.209	0.579		
4.776	0.583	6.567	0.567	8.209	0.583		
4.776	0.588	6.567	0.571	8.209	0.588		
4.776	0.592	6.567	0.575	8.209	0.592		
4.776	0.596	6.567	0.579	8.209	0.596		
4.776	0.600	6.567	0.583	8.209	0.600		
4.776	0.604	6.567	0.588	8.358	0.604		
4.776	0.608	6.567	0.592	8.358	0.608		
4.776	0.613	6.567	0.596	8.358	0.613		
4.776	0.617	6.567	0.600	8.358	0.617		
4.776	0.621	6.567	0.604	8.358	0.621		
4.776	0.625	6.567	0.608	8.358	0.625		
4.776	0.629	6.567	0.613	8.358	0.629		
4.776	0.633	6.567	0.617	8.358	0.633		
4.776	0.638	6.567	0.621	8.358	0.638		
4.776	0.642	6.567	0.625	8.358	0.642		
4.925	0.646	6.567	0.629	8.507	0.646		
4.925	0.650	6.567	0.633	8.507	0.650		
4.925	0.654	6.567	0.638	8.507	0.654		
4.925	0.658	6.567	0.642	8.507	0.658		
4.925	0.663	6.567	0.646	8.657	0.663		
4.925	0.667	6.567	0.650	8.507	0.667		
4.925	0.671	6.567	0.654	8.507	0.671		
4.925	0.675	6.567	0.658	8.507	0.675		
4.925	0.679	6.567	0.663	8.507	0.679		
4.925	0.683	6.567	0.667	8.657	0.683		
4.925	0.688	6.567	0.671	8.657	0.688		
4.925	0.692	6.567	0.675	8.657	0.692		
4.925	0.696	6.567	0.679	8.657	0.696		
4.925	0.700	6.567	0.683	8.657	0.700		

4.925	0.704	6.567	0.688	8.657	0.704		
4.925	0.708	6.567	0.692	8.806	0.708		
4.925	0.713	6.567	0.696	8.806	0.713		
4.925	0.717	6.567	0.700	8.806	0.717		
4.925	0.721	6.567	0.704	8.806	0.721		
4.925	0.725	6.567	0.708	8.806	0.725		
4.925	0.729	6.567	0.713	8.806	0.729		
4.925	0.733	6.567	0.717	8.806	0.733		
4.925	0.738	6.567	0.721	8.806	0.738		
4.925	0.742	6.567	0.725	8.806	0.742		
4.925	0.746	6.567	0.729	8.806	0.746		
4.925	0.750	6.567	0.733	8.955	0.750		
4.925	0.754	6.567	0.738	8.955	0.754		
5.224	2.000	6.567	0.742	8.955	0.758		
5.522	4.000	6.567	0.746	8.955	0.763		
5.821	8.000	6.567	0.750	8.955	0.767		
6.119	12.000	6.567	0.754	9.104	0.771		
6.269	16.000	6.567	0.758	9.104	0.775		
6.418	20.000	6.567	0.763	9.104	0.779		
6.418	24.000	6.567	0.767	9.104	0.783		
		6.567	0.771	9.104	0.788		
		6.567	0.775	9.104	0.792		
		6.567	0.779	9.104	0.796		
		6.567	0.783	9.104	0.800		
		6.567	0.788	9.254	0.804		
		6.567	0.792	9.104	0.808		
		6.567	0.796	9.254	0.813		
		6.567	0.800	9.254	0.817		
		6.567	0.804	9.254	0.821		
		6.567	0.808	9.254	0.825		
		6.567	0.813	9.254	0.829		
		6.567	0.817	9.254	0.833		
		6.567	0.821	9.254	0.838		
		6.567	0.825	9.403	0.842		
		6.567	0.829	9.403	0.846		
		6.567	0.833	9.403	0.850		
		6.567	0.838	9.403	0.854		
		6.567	0.842	9.403	0.858		
		6.567	0.846	9.403	0.863		
		6.567	0.850	9.552	0.867		
		6.567	0.854	9.552	0.871		
		6.567	0.858	9.552	0.875		
		6.567	0.863	9.552	0.879		
		6.567	0.867	9.552	0.883		
		6.567	0.871	9.552	0.888		
		6.567	0.875	9.552	0.892		
		6.567	0.879	9.701	0.896		
		6.567	0.883	9.701	0.900		
		6.567	0.888	9.701	0.904		
		6.567	0.892	9.701	0.908		
		6.567	0.896	9.701	0.913		
		6.567	0.900	9.701	0.917		
		6.567	0.904	9.701	0.921		
		6.567	0.908	9.701	0.925		
		6.567	0.913	9.701	0.929		
		6.567	0.917	9.701	0.933		
		6.567	0.921	9.851	0.938		
		6.567	0.925	9.851	0.942		

		6.567	0.929	9.851	0.946		
		6.567	0.933	9.851	0.950		
		6.567	0.938	9.851	0.954		
		6.567	0.942	9.851	0.958		
		6.567	0.946	9.851	0.963		
		6.567	0.950	9.851	0.967		
		6.567	0.954	9.851	0.971		
		6.567	0.958	9.851	0.975		
		6.567	0.963	9.851	0.979		
		6.567	0.967	9.851	0.983		
		6.567	0.971	9.851	0.988		
		6.567	0.975	9.851	0.992		
		6.567	0.979	10.000	0.996		
		6.567	0.983	9.851	1.000		
		6.567	0.988	10.000	1.004		
		6.567	0.992	10.000	1.008		
		6.567	0.996	10.000	1.013		
		6.567	1.000	10.000	1.017		
		6.567	1.004	10.000	1.021		
		6.567	1.008	10.000	1.025		
		6.567	1.013	10.000	1.029		
		6.567	1.017	10.000	1.033		
		6.567	1.021	10.000	1.038		
		6.418	1.025	10.000	1.042		
		6.418	1.029	10.000	1.046		
		6.418	1.033	10.149	1.050		
		6.418	1.038	10.149	1.054		
		6.418	1.042	10.149	1.058		
		6.567	1.046	10.149	1.063		
		6.567	1.050	10.149	1.067		
		6.418	1.054	10.149	1.071		
		6.418	1.058	10.149	1.075		
		6.418	1.063	10.149	1.079		
		6.418	1.067	10.149	1.083		
		6.418	1.071	10.149	1.088		
		6.418	1.075	10.149	1.092		
		6.418	1.079	10.299	1.096		
		6.418	1.083	10.149	1.100		
		6.418	1.088	10.299	1.104		
		6.418	1.092	10.299	1.108		
		6.418	1.096	10.299	1.113		
		6.418	1.100	10.299	1.117		
		6.418	1.104	10.448	1.121		
		6.418	1.108	10.448	1.125		
		6.418	1.113	10.448	1.129		
		6.418	1.117	10.448	1.133		
		6.418	1.121	10.448	1.138		
		6.418	1.125	10.448	1.142		
		6.418	1.129	10.597	1.146		
		6.418	1.133	10.597	1.150		
		6.418	1.138	10.597	1.154		
		6.418	1.142	10.597	1.158		
		6.418	1.146	10.597	1.163		
		6.418	1.150	10.597	1.167		
		6.418	1.154	10.597	1.171		
		6.418	1.158	10.597	1.175		
		6.418	1.163	10.597	1.179		
		6.418	1.167	10.597	1.183		

		6.418	1.171	10.597	1.188		
		6.418	1.175	10.597	1.192		
		6.418	1.179	10.597	1.196		
		6.418	1.183	10.597	1.200		
		6.418	1.188				
		6.418	1.192				
		6.418	1.196				
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		6.418	1.204				
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		6.716	1.883					
		6.716	1.888					
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		6.716	1.925					
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		6.716	1.938					
		6.716	1.942					
		6.716	1.946					
		6.716	1.950					
		6.716	1.954					
		6.716	1.958					
		6.716	1.963					
		6.716	1.967					
		6.716	1.971					
		6.716	1.975					
		6.716	1.979					
		6.716	1.983					
		6.716	1.988					
		6.716	1.992					
		6.716	1.996					
		6.716	2.000					
		6.716	2.004					
		6.716	2.008					
		6.716	2.013					
		6.716	2.017					
		6.716	2.021					
		6.716	2.025					
		6.716	2.029					
		6.716	2.033					
		6.716	2.038					
		6.716	2.042					
		6.716	2.046					
		6.716	2.050					
		6.716	2.054					
		6.716	2.058					
		6.716	2.063					
		6.716	2.067					
		6.716	2.071					
		6.716	2.075					
		6.716	2.079					
		6.716	2.083					
		6.716	2.088					
		6.716	2.092					
		6.716	2.096					
		6.716	2.100					
		6.716	2.104					
		6.716	2.108					
		6.716	2.113					
		6.716	2.117					
		6.716	2.121					
		6.716	2.125					
		6.716	2.129					
		6.716	2.133					

		6.716	2.138				
		6.716	2.142				
		6.716	2.146				
		6.716	2.150				
		6.716	2.154				
		6.716	2.158				
		6.716	2.163				
		6.716	2.167				
		6.716	2.171				
		6.716	2.175				
		6.716	2.179				
		6.716	2.183				
		6.716	2.188				
		6.716	2.192				
		6.716	2.196				
		6.716	2.200				
		6.716	2.204				
		6.716	2.208				
		6.866	2.213				
		6.866	2.217				
		6.716	2.221				
		6.716	2.225				
		6.866	2.229				
		6.866	2.233				
		6.866	2.238				
		6.866	2.242				
		6.866	2.246				
		6.866	2.250				
		6.866	2.254				
		6.866	2.258				
		6.866	2.263				
		6.866	2.267				
		6.866	2.271				
		6.866	2.275				
		6.866	2.279				
		6.866	2.283				
		6.866	2.288				
		6.866	2.292				
		6.866	2.296				
		6.866	2.300				
		6.866	2.304				
		6.866	2.308				
		6.866	2.313				
		6.866	2.317				
		6.866	2.321				
		6.866	2.325				
		6.866	2.329				
		6.866	2.333				
		6.866	2.338				
		6.866	2.342				
		6.866	2.346				
		6.866	2.350				
		6.866	2.354				
		6.866	2.358				
		6.866	2.363				
		6.866	2.367				
		6.866	2.371				
		6.866	2.375				

		6.866	2.379				
		6.866	2.383				
		6.866	2.388				
		6.866	2.392				
		6.866	2.396				
		6.866	2.400				
		6.866	2.404				
		6.866	2.408				
		6.866	2.413				
		6.866	2.417				
		6.866	2.421				
		6.866	2.425				
		6.866	2.429				
		6.866	2.433				
		6.866	2.438				
		6.866	2.442				
		6.866	2.446				
		6.866	2.450				
		6.866	2.454				
		6.866	2.458				
		6.866	2.463				
		6.866	2.467				
		6.866	2.471				
		6.866	2.475				
		6.866	2.479				
		6.866	2.483				
		6.866	2.488				
		6.866	2.492				
		6.866	2.496				
		6.866	2.500				
		6.866	2.504				
		6.716	2.508				
		6.716	2.513				
		6.716	2.517				
		6.716	2.521				
		6.716	2.525				
		6.716	2.529				
		6.716	2.533				
		6.716	2.538				
		6.716	2.542				
		6.716	2.546				
		6.716	2.550				
		6.716	2.554				
		6.716	2.558				
		6.716	2.563				
		6.716	2.567				
		6.716	2.571				
		6.716	2.575				
		6.716	2.579				
		6.716	2.583				
		6.716	2.588				
		6.716	2.592				
		6.716	2.596				
		6.716	2.600				
		6.716	2.604				
		6.716	2.608				
		6.716	2.613				
		6.716	2.617				

		6.716	2.621				
		6.716	2.625				
		6.716	2.629				
		6.716	2.633				
		6.716	2.638				
		6.716	2.642				
		6.716	2.646				
		6.716	2.650				
		6.716	2.654				
		6.716	2.658				
		6.716	2.663				
		6.716	2.667				
		6.716	2.671				
		6.716	2.675				
		6.716	2.679				
		6.716	2.683				
		6.716	2.688				
		6.716	2.692				
		6.716	2.696				
		6.716	2.700				
		6.716	2.704				
		6.567	2.708				
		6.567	2.713				
		6.716	2.717				
		6.716	2.721				
		6.716	2.725				
		6.567	2.729				
		6.567	2.733				
		6.567	2.738				
		6.567	2.742				
		6.567	2.746				
		6.567	2.750				
		6.567	2.754				
		6.567	2.758				
		6.567	2.763				
		6.567	2.767				
		6.567	2.771				
		6.567	2.775				
		6.567	2.779				
		6.567	2.783				
		6.567	2.788				
		6.567	2.792				
		6.567	2.796				
		6.567	2.800				
		6.567	2.804				
		6.567	2.808				
		6.567	2.813				
		6.567	2.817				
		6.567	2.821				
		6.567	2.825				
		6.567	2.829				
		6.567	2.833				
		6.567	2.838				
		6.567	2.842				
		6.567	2.846				
		6.567	2.850				
		6.567	2.854				
		6.567	2.858				

		6.567	2.863				
		6.567	2.867				
		6.567	2.871				
		6.567	2.875				
		6.567	2.879				
		6.418	2.883				
		6.418	2.888				
		6.418	2.892				
		6.418	2.896				
		6.418	2.900				
		6.418	2.904				
		6.418	2.908				
		6.418	2.913				
		6.418	2.917				
		6.418	2.921				
		6.418	2.925				
		6.418	2.929				
		6.418	2.933				
		6.418	2.938				
		6.418	2.942				
		6.418	2.946				
		6.418	2.950				
		6.418	2.954				
		6.418	2.958				
		6.418	2.963				
		6.418	2.967				
		6.418	4.000				
		6.418	8.000				
		6.418	12.000				
		6.418	16.000				
		6.418	20.000				
		6.418	24.000				

81% of degree of saturation

100kPa							
Equilibrium stage		Consolidation stage		Shearing stage			
Matric suction/(kPa)	Time/(hr)	Matric suction/(kPa)	Time/(hr)	Matric suction/(kPa)	Time/(hr)	Matric suction/(kPa)	Shear strain/(%)
0.000	0.000	17.015	0.000	17.910	0.000	17.910	0.000
1.642	0.004	16.269	0.000	17.910	0.004	17.910	0.250
3.284	0.008	15.821	0.001	17.910	0.008	18.060	0.500
4.627	0.013	15.522	0.002	17.910	0.013	18.060	0.750
7.015	0.017	15.373	0.003	17.910	0.017	18.209	1.000
8.358	0.021	14.328	0.004	17.910	0.021	18.358	1.250
9.701	0.025	14.328	0.008	17.910	0.025	18.358	1.500
11.045	0.029	14.478	0.013	17.910	0.029	18.507	1.750
12.388	0.033	14.478	0.017	18.060	0.033	18.507	2.000
13.433	0.038	14.627	0.021	18.060	0.038	18.657	2.500
14.179	0.042	14.627	0.025	18.060	0.042	18.806	3.000
14.776	0.046	14.776	0.029	18.060	0.046	18.806	3.500
14.925	0.050	14.776	0.033	18.060	0.050	19.104	4.000
14.925	0.054	14.776	0.038	18.060	0.054	20.000	5.000
15.075	0.058	14.925	0.042	18.060	0.058	20.597	6.000
15.075	0.063	14.925	0.046	18.060	0.063	20.896	7.000
15.075	0.067	14.925	0.050	18.209	0.067	20.896	8.000
15.224	0.071	14.925	0.054	18.209	0.071	20.896	9.000
15.224	0.075	14.925	0.058	18.209	0.075		
15.224	0.079	15.075	0.063	18.209	0.079		
15.224	0.083	15.075	0.067	18.209	0.083		
15.224	0.088	15.075	0.071	18.209	0.088		
15.224	0.092	15.075	0.075	18.209	0.092		
15.224	0.096	15.075	0.079	18.209	0.096		
15.224	0.100	15.075	0.083	18.358	0.100		
15.224	0.104	15.224	0.088	18.358	0.104		
15.224	0.108	15.224	0.092	18.358	0.108		
15.224	0.113	15.224	0.096	18.358	0.113		
15.224	0.117	15.224	0.100	18.358	0.117		
15.224	0.121	15.224	0.104	18.358	0.121		
15.224	0.125	15.224	0.108	18.358	0.125		
15.224	0.129	15.224	0.113	18.358	0.129		
15.224	0.133	15.373	0.117	18.358	0.133		
15.224	0.138	15.373	0.121	18.358	0.138		
15.224	0.142	15.373	0.125	18.507	0.142		
15.224	0.146	15.373	0.129	18.507	0.146		
15.373	0.150	15.373	0.133	18.507	0.150		
15.373	0.154	15.373	0.138	18.507	0.154		
15.373	0.158	15.522	0.142	18.507	0.158		
15.373	0.163	15.522	0.146	18.507	0.163		
15.373	0.167	15.522	0.150	18.507	0.167		
15.373	0.171	15.821	0.154	18.507	0.171		
15.373	0.175	15.522	0.158	18.507	0.175		
15.373	0.179	15.522	0.163	18.507	0.179		
15.373	0.183	15.672	0.167	18.657	0.183		
15.373	0.188	15.672	0.171	18.657	0.188		
15.373	0.192	15.672	0.175	18.657	0.192		
15.373	0.196	15.672	0.179	18.657	0.196		
15.373	0.200	15.672	0.183	18.657	0.200		
15.373	0.204	15.672	0.188	18.657	0.204		
15.373	0.208	15.672	0.192	18.657	0.208		

15.373	0.213	15.672	0.196	18.657	0.213		
15.373	0.217	15.672	0.200	18.657	0.217		
15.373	0.221	15.672	0.204	18.657	0.221		
15.373	0.225	15.672	0.208	18.657	0.225		
15.373	0.229	15.672	0.213	18.657	0.229		
15.373	0.233	15.672	0.217	18.657	0.233		
15.373	0.238	15.672	0.221	18.806	0.238		
15.373	0.242	15.672	0.225	18.806	0.242		
15.373	0.246	15.672	0.229	18.806	0.246		
15.522	0.250	15.821	0.233	18.806	0.250		
15.522	0.254	15.522	0.238	18.806	0.254		
15.522	0.258	15.522	0.242	18.806	0.258		
15.522	0.263	15.672	0.246	18.806	0.263		
15.522	0.267	15.672	0.250	18.806	0.267		
15.522	0.271	15.672	0.254	18.806	0.271		
15.522	0.275	15.672	0.258	18.806	0.275		
15.522	0.279	15.672	0.263	18.806	0.279		
15.522	0.283	15.672	0.267	18.806	0.283		
15.522	0.288	15.672	0.271	18.955	0.288		
15.522	0.292	15.672	0.275	18.955	0.292		
15.522	0.296	15.672	0.279	18.955	0.296		
15.522	0.300	15.672	0.283	18.955	0.300		
15.522	0.304	15.672	0.288	18.955	0.304		
15.522	0.308	15.672	0.292	18.955	0.308		
15.522	0.313	15.672	0.296	18.955	0.313		
15.522	0.317	15.672	0.300	19.104	0.317		
15.522	0.321	15.821	0.304	19.104	0.321		
15.522	0.325	15.672	0.308	19.104	0.325		
15.522	0.329	15.672	0.313	19.254	0.329		
15.522	0.333	15.672	0.317	19.254	0.333		
15.522	0.338	15.821	0.321	19.254	0.338		
15.522	0.342	15.821	0.325	19.403	0.342		
15.522	0.346	15.821	0.329	19.403	0.346		
15.522	0.350	15.821	0.333	19.403	0.350		
15.522	0.354	15.821	0.338	19.552	0.354		
15.522	0.358	15.821	0.342	19.552	0.358		
15.522	0.363	15.821	0.346	19.552	0.363		
15.522	0.367	15.821	0.350	19.552	0.367		
15.672	0.371	15.821	0.354	19.701	0.371		
15.522	0.375	15.821	0.358	19.552	0.375		
15.672	0.379	15.821	0.363	19.701	0.379		
15.672	0.383	15.821	0.367	19.701	0.383		
15.672	0.388	15.821	0.371	19.851	0.388		
15.672	0.392	15.821	0.375	19.851	0.392		
15.672	0.396	15.821	0.379	19.851	0.396		
15.672	0.400	15.821	0.383	20.000	0.400		
15.672	0.404	15.821	0.388	20.000	0.404		
15.672	0.408	15.821	0.392	20.000	0.408		
15.672	0.413	15.821	0.396	20.000	0.413		
15.672	0.417	15.970	0.400	20.000	0.417		
15.672	0.421	15.970	0.404	20.149	0.421		
15.672	0.425	15.970	0.408	20.149	0.425		
15.672	0.429	15.970	0.413	20.149	0.429		
15.672	0.433	15.970	0.417	20.149	0.433		
15.672	0.438	15.970	0.421	20.299	0.438		
15.672	0.442	15.970	0.425	20.299	0.442		

15.672	0.446	15.970	0.429	20.299	0.446		
15.672	0.450	15.970	0.433	20.299	0.450		
15.672	0.454	15.970	0.438	20.299	0.454		
15.672	0.458	15.970	0.442	20.448	0.458		
15.672	0.463	15.970	0.446	20.448	0.463		
15.672	0.467	15.970	0.450	20.448	0.467		
15.672	0.471	15.970	0.454	20.448	0.471		
15.672	0.475	15.970	0.458	20.448	0.475		
15.672	0.479	15.970	0.463	20.597	0.479		
15.672	0.483	15.970	0.467	20.597	0.483		
15.672	0.488	15.970	0.471	20.597	0.488		
15.672	0.492	15.970	0.475	20.597	0.492		
15.672	0.496	15.970	0.479	20.597	0.496		
15.672	0.500	15.970	0.483	20.597	0.500		
15.821	0.504	15.970	0.488	20.746	0.504		
15.821	0.508	15.970	0.492	20.746	0.508		
15.672	0.513	15.970	0.496	20.746	0.513		
15.672	0.517	15.970	0.500	20.746	0.517		
15.672	0.521	15.970	0.504	20.746	0.521		
15.672	0.525	16.119	0.508	20.746	0.525		
15.672	0.529	15.970	0.513	20.746	0.529		
15.672	0.533	16.119	0.517	20.746	0.533		
15.672	0.538	16.119	0.521	20.746	0.538		
15.672	0.542	16.119	0.525	20.746	0.542		
15.672	0.546	15.970	0.529	20.896	0.546		
15.672	0.550	15.970	0.533	20.896	0.550		
15.672	0.554	15.970	0.538	20.896	0.554		
15.672	0.558	15.970	0.542	20.896	0.558		
15.672	0.563	15.970	0.546	20.896	0.563		
15.672	0.567	15.970	0.550	20.896	0.567		
15.672	0.571	15.970	0.554	20.896	0.571		
15.672	0.575	15.970	0.558	20.896	0.575		
15.672	0.579	15.970	0.563	20.896	0.579		
15.821	0.583	15.970	0.567	20.896	0.583		
15.821	0.588	16.119	0.571	20.896	0.588		
15.821	0.592	16.119	0.575	20.896	0.592		
15.821	0.596	16.119	0.579	20.896	0.596		
15.821	0.600	16.119	0.583	20.896	0.600		
15.821	0.604	16.119	0.588	20.896	0.604		
15.821	0.608	16.119	0.592	20.896	0.608		
15.821	0.613	16.119	0.596	20.896	0.613		
15.821	0.617	16.119	0.600	20.896	0.617		
15.821	0.621	16.119	0.604	20.896	0.621		
15.672	0.625	16.119	0.608	20.896	0.625		
15.672	0.629	16.119	0.613	20.896	0.629		
15.672	0.633	16.119	0.617	20.896	0.633		
15.672	0.638	16.119	0.621	20.896	0.638		
15.672	0.642	16.119	0.625	20.896	0.642		
15.672	0.646	16.119	0.629	20.896	0.646		
15.672	0.650	16.119	0.633	20.896	0.650		
15.672	0.654	16.119	0.638	20.896	0.654		
15.672	0.658	16.119	0.642	20.896	0.658		
15.672	0.663	16.119	0.646	20.896	0.663		
15.672	0.667	16.119	0.650	20.896	0.667		
15.821	0.671	16.119	0.654	20.896	0.671		
15.821	0.675	16.119	0.658	20.896	0.675		

15.821	0.679	16.119	0.663	20.896	0.679		
15.821	0.683	16.119	0.667	20.896	0.683		
15.821	0.688	16.269	0.671	20.896	0.688		
15.821	0.692	16.269	0.675	20.896	0.692		
15.821	0.696	16.269	0.679	20.896	0.696		
15.821	0.700	16.269	0.683	20.896	0.700		
15.821	0.704	16.269	0.688	20.896	0.704		
15.821	0.708	16.269	0.692	20.896	0.708		
15.821	0.713	16.269	0.696	20.896	0.713		
15.821	0.717	16.269	0.700	20.896	0.717		
15.821	0.721	16.269	0.704	20.896	0.721		
15.821	0.725	16.269	0.708	20.896	0.725		
15.821	0.729	16.269	0.713	20.896	0.729		
15.821	0.733	16.269	0.717				
15.821	0.738	16.269	0.721				
15.821	0.742	16.269	0.725				
15.821	0.746	16.269	0.729				
15.821	0.750	16.269	0.733				
15.821	0.754	16.269	0.738				
15.821	0.758	16.269	0.742				
15.821	0.763	16.269	0.746				
15.821	0.767	16.269	0.750				
15.821	0.771	16.269	0.754				
15.821	0.775	16.269	0.758				
15.821	0.779	16.269	0.763				
15.821	0.783	16.269	0.767				
15.821	0.788	16.269	0.771				
15.821	0.792	16.269	0.775				
15.821	0.796	16.269	0.779				
15.821	0.800	16.269	0.783				
15.821	0.804	16.269	0.788				
15.821	0.808	16.269	0.792				
15.970	0.813	16.418	0.796				
15.970	0.817	16.418	0.800				
15.970	0.821	16.418	0.804				
15.970	0.825	16.418	0.808				
15.970	0.829	16.418	0.813				
15.970	0.833	16.418	0.817				
15.970	0.838	16.418	0.821				
15.970	0.842	16.418	0.825				
15.970	0.846	16.418	0.829				
15.970	0.850	16.418	0.833				
15.970	0.854	16.418	0.838				
15.970	0.858	16.418	0.842				
15.970	0.863	16.418	0.846				
15.970	0.867	16.418	0.850				
15.970	0.871	16.418	0.854				
15.970	0.875	16.418	0.858				
15.970	0.879	16.418	0.863				
15.970	0.883	16.418	0.867				
15.821	0.888	16.418	0.871				
15.970	0.892	16.418	0.875				
15.970	0.896	16.418	0.879				
15.970	0.900	16.418	0.883				
15.970	0.904	16.418	0.888				
15.970	0.908	16.418	0.892				

15.970	0.913	16.418	0.896				
15.970	0.917	16.418	0.900				
15.970	0.921	16.418	0.904				
15.970	0.925	16.418	0.908				
15.970	0.929	16.418	0.913				
15.970	0.933	16.418	0.917				
15.970	0.938	16.418	0.921				
15.970	0.942	16.418	0.925				
15.970	0.946	16.418	0.929				
15.970	0.950	16.418	0.933				
15.970	0.954	16.418	0.938				
15.970	0.958	16.418	0.942				
15.970	0.963	16.418	0.946				
15.970	0.967	16.418	0.950				
15.970	0.971	16.418	0.954				
15.970	0.975	16.418	0.958				
15.970	0.979	16.418	0.963				
15.970	0.983	16.418	0.967				
15.970	0.988	16.418	0.971				
15.970	0.992	16.418	0.975				
15.970	0.996	16.418	0.979				
15.970	1.000	16.567	0.983				
15.970	1.004	16.567	0.988				
15.970	1.008	16.567	0.992				
15.970	1.013	16.567	0.996				
15.970	1.017	16.567	1.000				
15.970	1.021	16.567	1.004				
15.970	1.025	16.567	1.008				
15.970	1.029	16.567	1.013				
15.970	1.033	16.567	1.017				
15.970	1.038	16.567	1.021				
15.970	1.042	16.567	1.025				
15.970	1.046	16.567	1.029				
15.970	1.050	16.567	1.033				
15.970	1.054	16.567	1.038				
15.970	1.058	16.567	1.042				
15.970	1.063	16.567	1.046				
15.970	1.067	16.567	1.050				
15.970	1.071	16.567	1.054				
15.970	1.075	16.567	1.058				
15.970	1.079	16.567	1.063				
15.970	1.083	16.567	1.067				
15.970	1.088	16.567	1.071				
15.970	1.092	16.567	1.075				
15.970	1.096	16.567	1.079				
15.970	1.100	16.567	1.083				
15.970	1.104	16.567	1.088				
15.970	1.108	16.567	1.092				
15.970	1.113	16.567	1.096				
16.119	1.117	16.567	1.100				
16.119	1.121	16.567	1.104				
16.119	1.125	16.567	1.108				
16.119	1.129	16.567	1.113				
16.119	1.133	16.567	1.117				
16.119	1.138	16.567	1.121				
16.119	1.142	16.567	1.125				

16.119	1.146	16.567	1.129				
16.119	1.150	16.567	1.133				
16.119	1.154	16.567	1.138				
16.119	1.158	16.567	1.142				
16.119	1.163	16.567	1.146				
16.119	1.167	16.567	1.150				
16.119	1.171	16.567	1.154				
16.119	1.175	16.567	1.158				
16.119	1.179	16.567	1.163				
16.119	1.183	16.567	1.167				
16.119	1.188	16.567	1.171				
16.119	1.192	16.716	1.175				
16.119	1.196	16.716	1.179				
16.119	1.200	16.716	1.183				
16.119	1.204	16.716	1.188				
16.119	1.208	16.716	1.192				
16.119	1.213	16.716	1.196				
16.119	1.217	16.716	1.200				
16.119	1.221	16.716	1.204				
16.119	1.225	16.716	1.208				
16.119	1.229	16.716	1.213				
16.119	1.233	16.716	1.217				
16.119	1.238	16.716	1.221				
16.119	1.242	16.716	1.225				
16.119	1.246	16.716	1.229				
16.119	1.250	16.716	1.233				
16.119	1.254	16.716	1.238				
16.119	1.258	16.716	1.242				
16.119	1.263	16.716	1.246				
16.119	1.267	16.716	1.250				
16.119	1.271	16.716	1.254				
16.119	1.275	16.716	1.258				
16.119	1.279	16.716	1.263				
16.119	1.283	16.716	1.267				
16.119	1.288	16.716	1.271				
16.119	1.292	16.716	1.275				
16.119	1.296	16.716	1.279				
16.119	1.300	16.716	1.283				
16.119	1.304	16.716	1.288				
16.119	1.308	16.716	1.292				
16.119	1.313	16.716	1.296				
16.119	1.317	16.716	1.300				
16.119	1.321	16.716	1.304				
16.119	1.325	16.716	1.308				
16.119	1.329	16.716	1.313				
16.119	1.333	16.716	1.317				
16.119	1.338	16.716	1.321				
16.119	1.342	16.716	1.325				
16.119	1.346	16.716	1.329				
16.119	1.350	16.716	1.333				
16.119	1.354	16.716	1.338				
16.119	1.358	16.716	1.342				
16.119	1.363	16.716	1.346				
16.119	1.367	16.716	1.350				
16.119	1.371	16.716	1.354				
16.119	1.375	16.716	1.358				

16.119	1.379	16.716	1.363				
16.119	1.383	16.716	1.367				
16.119	1.388	16.716	1.371				
16.119	1.392	16.716	1.375				
16.119	1.396	16.866	1.379				
16.119	1.400	16.866	1.383				
16.119	1.404	16.866	1.388				
16.119	1.408	16.866	1.392				
16.119	1.413	16.866	1.396				
16.119	1.417	16.866	1.400				
16.119	1.421	16.866	1.404				
16.119	1.425	16.866	1.408				
16.119	1.429	16.866	1.413				
16.119	1.433	16.866	1.417				
16.119	1.438	16.866	1.421				
16.119	1.442	16.866	1.425				
16.119	1.446	16.866	1.429				
16.119	1.450	16.866	1.433				
16.119	1.454	16.866	1.438				
16.119	1.458	16.866	1.442				
16.269	1.463	16.866	1.446				
16.269	1.467	16.866	1.450				
16.269	1.471	16.866	1.454				
16.269	1.475	16.866	1.458				
16.269	1.479	16.866	1.463				
16.269	1.483	16.866	1.467				
16.269	1.488	16.866	1.471				
16.119	1.492	16.866	1.475				
16.119	1.496	16.866	1.479				
16.119	1.500	16.866	1.483				
16.119	1.504	16.866	1.488				
16.119	1.508	16.866	1.492				
16.119	1.513	16.866	1.496				
16.119	1.517	16.866	1.500				
16.119	1.521	16.866	1.504				
16.119	1.525	16.866	1.508				
16.119	1.529	16.866	1.513				
16.119	1.533	16.866	1.517				
16.119	1.538	16.866	1.521				
16.269	1.542	16.866	1.525				
16.269	1.546	16.866	1.529				
16.269	1.550	16.866	1.533				
16.269	1.554	16.866	1.538				
16.269	1.558	16.866	1.542				
16.269	1.563	16.866	1.546				
16.269	1.567	16.866	1.550				
16.269	1.571	16.866	1.554				
16.269	1.575	16.866	1.558				
16.269	1.579	16.866	1.563				
16.269	1.583	16.866	1.567				
16.269	1.588	16.866	1.571				
16.269	1.592	16.866	1.575				
16.269	1.596	16.866	1.579				
16.269	1.600	16.866	1.583				
16.269	1.604	16.866	1.588				
16.269	1.608	16.866	1.592				

16.269	1.613	16.866	1.596				
16.269	1.617	16.866	1.600				
16.269	1.621	16.866	1.604				
16.269	1.625	16.866	1.608				
16.269	1.629	16.866	1.613				
16.269	1.633	17.015	1.617				
16.269	1.638	17.015	1.621				
16.269	1.642	17.015	1.625				
16.269	1.646	17.015	1.629				
16.269	1.650	17.015	1.633				
16.269	1.654	16.866	1.638				
16.269	1.658	16.866	1.642				
16.269	1.663	16.866	1.646				
16.269	1.667	17.015	1.650				
16.269	1.671	17.015	1.654				
16.269	1.675	16.866	1.658				
16.269	1.679	16.866	1.663				
16.269	1.683	17.015	1.667				
16.269	1.688	16.866	1.671				
16.269	1.692	17.015	1.675				
16.269	1.696	17.015	1.679				
16.269	1.700	17.015	1.683				
16.269	1.704	17.015	1.688				
16.269	1.708	16.866	1.692				
16.269	1.713	16.866	1.696				
16.269	1.717	16.866	1.700				
16.269	1.721	16.866	1.704				
16.269	1.725	16.866	1.708				
16.269	1.729	16.866	1.713				
16.269	1.733	16.866	1.717				
16.269	1.738	16.866	1.721				
16.269	1.742	16.866	1.725				
16.269	1.746	16.866	1.729				
16.269	1.750	16.866	1.733				
16.269	1.754	16.716	1.738				
16.269	1.758	16.716	1.742				
16.269	1.763	16.716	1.746				
16.269	1.767	16.716	1.750				
16.269	1.771	16.716	1.754				
16.269	1.775	16.716	1.758				
16.269	1.779	16.716	1.763				
16.269	1.783	16.716	1.767				
16.269	1.788	16.716	1.771				
16.269	1.792	16.716	1.775				
16.269	1.796	16.716	1.779				
16.269	1.800	16.716	1.783				
16.269	1.804	16.716	1.788				
16.269	1.808	16.716	1.792				
16.269	1.813	16.716	1.796				
16.269	1.817	16.716	1.800				
16.269	1.821	16.716	1.804				
16.269	1.825	16.716	1.808				
16.269	1.829	16.716	1.813				
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16.269	1.838	16.716	1.821				
16.269	1.842	16.716	1.825				

16.269	1.846	16.716	1.829				
16.269	1.850	16.716	1.833				
16.269	1.854	16.716	1.838				
16.269	1.858	16.716	1.842				
16.269	1.863	16.716	1.846				
16.269	1.867	16.716	1.850				
16.269	1.871	16.716	1.854				
16.269	1.875	16.716	1.858				
16.269	1.879	16.716	1.863				
16.269	1.883	16.716	1.867				
16.418	1.888	16.716	1.871				
16.418	1.892	16.716	1.875				
16.418	1.896	16.716	1.879				
16.418	1.900	16.716	1.883				
16.418	1.904	16.716	1.888				
16.418	1.908	16.716	1.892				
16.418	1.913	16.716	1.896				
16.418	1.917	16.716	1.900				
16.418	1.921	16.716	1.904				
16.418	1.925	16.716	1.908				
16.269	1.929	16.716	1.913				
16.269	1.933	16.716	1.917				
16.269	1.938	16.716	1.921				
16.269	1.942	16.716	1.925				
16.269	1.946	16.716	1.929				
16.269	1.950	16.716	1.933				
16.418	1.954	16.716	1.938				
16.418	1.958	16.716	1.942				
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16.418	1.967	16.716	1.950				
16.418	1.971	16.716	1.954				
16.418	1.975	16.716	1.958				
16.418	1.979	16.716	1.963				
16.418	1.983	16.716	1.967				
16.418	1.988	16.716	1.971				
16.418	1.992	16.916	4.000				
16.418	1.996	17.174	8.000				
16.418	2.000	17.326	12.000				
16.418	2.004	17.510	16.000				
16.418	2.008	17.750	20.000				
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16.269	2.075						

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16.418	2.092						
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16.716	3.121						
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16.716	3.129						
16.716	3.133						
16.716	3.138						
16.716	3.142						
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16.716	3.158						
16.716	3.163						
16.716	3.167						
16.716	3.171						
16.716	3.175						
16.716	3.179						
16.716	3.183						
16.716	3.188						
16.716	3.192						
16.866	3.196						
16.866	3.200						
16.866	3.204						
16.866	3.208						
16.866	3.213						
16.866	3.217						
16.866	3.221						
16.866	3.225						
16.866	3.229						
16.866	3.233						
16.866	3.238						
16.866	3.242						

16.866	3.246						
16.866	3.250						
16.866	3.254						
16.866	3.258						
16.866	3.263						
16.866	3.267						
16.866	3.271						
16.866	3.275						
16.866	3.279						
16.866	3.283						
16.866	3.288						
16.866	3.292						
16.866	3.296						
16.866	3.300						
16.866	3.304						
16.866	3.308						
16.866	3.313						
16.866	3.317						
16.866	3.321						
16.866	3.325						
16.866	3.329						
16.866	3.333						
16.866	3.338						
16.866	3.342						
16.866	3.346						
16.866	3.350						
16.866	3.354						
16.866	3.358						
16.866	3.363						
16.866	3.367						
16.866	3.371						
16.866	3.375						
16.866	3.379						
16.866	3.383						
16.866	3.388						
16.866	3.392						
16.866	3.396						
16.866	3.400						
16.866	3.404						
16.866	3.408						
16.866	3.413						
16.866	3.417						
16.866	3.421						
16.866	3.425						
16.866	3.429						
16.866	3.433						
16.866	3.438						
17.015	3.442						
17.015	3.446						
17.015	3.450						
17.015	3.454						
17.015	3.458						
17.015	3.463						
17.015	3.467						
17.015	3.471						
17.015	3.475						

17.015	3.479						
16.866	3.483						
16.866	3.488						
16.866	3.492						
16.866	3.496						
16.866	3.500						
16.866	3.504						
16.866	3.508						
16.866	3.513						
16.866	3.517						
16.866	3.521						
16.866	3.525						
16.866	3.529						
16.866	3.533						
17.015	3.538						
17.015	3.542						
17.015	3.546						
17.015	3.550						
17.015	3.554						
17.015	3.558						
17.015	3.563						
17.015	3.567						
17.015	3.571						
17.015	3.575						
17.015	3.579						
17.015	3.583						
17.015	3.588						
17.015	3.592						
17.015	3.596						
17.015	3.600						
17.015	3.604						
17.015	3.608						
17.015	3.613						
17.015	3.617						
17.015	3.621						
17.015	3.625						
17.015	3.629						
17.015	3.633						
17.015	3.638						
17.015	3.642						
17.015	3.646						
17.015	3.650						
17.015	3.654						
17.015	3.658						
17.015	3.663						
17.015	3.667						
17.015	3.671						
17.015	3.675						
17.015	3.679						
17.015	3.683						
17.015	3.688						
17.015	3.692						
17.015	3.696						
17.015	3.700						
17.015	3.704						
17.015	3.708						

17.015	3.713						
17.015	3.717						
17.015	3.721						
17.015	3.725						
17.015	3.729						
17.015	3.733						
17.015	3.738						
17.015	3.742						
17.015	3.746						
17.015	3.750						
17.015	3.754						
17.015	3.758						
17.015	3.763						
17.015	3.767						
17.015	3.771						
17.015	3.775						
17.015	3.779						
17.015	3.783						
17.015	3.788						
17.015	3.792						
17.015	3.796						
17.015	3.800						
17.015	3.804						
17.015	3.808						
17.015	3.813						
17.015	3.817						
17.015	3.821						
17.015	3.825						
17.015	3.829						
17.015	3.833						
17.015	3.838						
17.015	3.842						
17.015	3.846						
17.015	3.850						
17.015	3.854						
17.015	3.858						
17.015	3.863						
17.015	3.867						
17.164	4.000						
17.463	8.000						
17.612	12.000						
17.761	16.000						
17.910	20.000						
17.910	24.000						

81% of degree of saturation

150kPa							
Equilibrium stage		Consolidation stage		Shearing stage			
Matric suction/(kPa)	Time/(hr)	Matric suction/(kPa)	Time/(hr)	Matric suction/(kPa)	Time/(hr)	Matric suction/(kPa)	Shear strain/(%)
0.000	0.000	37.164	0.000	37.164	0.000	37.164	0.000
4.925	0.004	37.015	0.000	37.164	0.004	37.164	0.250
8.507	0.008	36.567	0.001	37.164	0.008	37.015	0.500
13.582	0.013	35.821	0.002	37.164	0.013	36.567	0.750
17.313	0.017	34.179	0.003	37.164	0.017	35.672	1.000
20.299	0.021	31.493	0.004	37.164	0.021	34.776	1.250
22.090	0.025	31.343	0.008	37.164	0.025	34.179	1.500
23.433	0.029	31.493	0.013	37.164	0.029	33.881	1.750
24.328	0.033	31.493	0.017	37.164	0.033	33.582	2.000
25.224	0.038	31.493	0.021	37.164	0.038	33.433	2.500
25.970	0.042	31.493	0.025	37.015	0.042	33.134	3.000
26.716	0.046	31.642	0.029	37.015	0.046	33.134	3.500
27.313	0.050	31.642	0.033	36.866	0.050	33.134	4.000
27.761	0.054	31.642	0.038	36.716	0.054	33.433	5.000
28.209	0.058	31.642	0.042	36.567	0.058	33.731	6.000
28.507	0.063	31.791	0.046	36.418	0.063	33.582	7.000
28.955	0.067	31.791	0.050	36.119	0.067	33.134	8.000
29.104	0.071	31.791	0.054	35.970	0.071	32.985	9.000
29.403	0.075	31.791	0.058	35.821	0.075		
29.552	0.079	31.940	0.063	35.672	0.079		
29.701	0.083	31.940	0.067	35.373	0.083		
29.701	0.088	31.940	0.071	35.224	0.088		
29.851	0.092	31.940	0.075	35.075	0.092		
30.000	0.096	32.090	0.079	34.925	0.096		
30.000	0.100	32.090	0.083	34.776	0.100		
30.149	0.104	32.090	0.088	34.627	0.104		
30.149	0.108	32.090	0.092	34.478	0.108		
30.299	0.113	32.090	0.096	34.328	0.113		
30.299	0.117	32.090	0.100	34.328	0.117		
30.299	0.121	32.090	0.104	34.179	0.121		
30.448	0.125	32.090	0.108	34.179	0.125		
30.448	0.129	32.090	0.113	34.030	0.129		
30.448	0.133	32.090	0.117	34.030	0.133		
30.597	0.138	32.090	0.121	34.030	0.138		
30.597	0.142	32.090	0.125	33.881	0.142		
30.597	0.146	32.090	0.129	33.881	0.146		
30.746	0.150	32.090	0.133	33.731	0.150		
30.746	0.154	32.239	0.138	33.731	0.154		
30.746	0.158	32.239	0.142	33.582	0.158		
30.746	0.163	32.239	0.146	33.582	0.163		
30.896	0.167	32.239	0.150	33.433	0.167		
30.896	0.171	32.239	0.154	33.433	0.171		
30.896	0.175	32.239	0.158	33.433	0.175		
30.896	0.179	32.239	0.163	33.433	0.179		
30.896	0.183	32.239	0.167	33.433	0.183		
30.896	0.188	32.239	0.171	33.433	0.188		
31.045	0.192	32.239	0.175	33.433	0.192		
31.045	0.196	32.239	0.179	33.433	0.196		
31.045	0.200	32.239	0.183	33.433	0.200		
31.045	0.204	32.239	0.188	33.433	0.204		
31.045	0.208	32.239	0.192	33.433	0.208		
31.194	0.213	32.239	0.196	33.433	0.213		

31.194	0.217	32.239	0.200	33.433	0.217		
31.194	0.221	32.239	0.204	33.433	0.221		
31.194	0.225	32.239	0.208	33.284	0.225		
31.194	0.229	32.239	0.213	33.284	0.229		
31.194	0.233	32.388	0.217	33.284	0.233		
31.343	0.238	32.388	0.221	33.134	0.238		
31.343	0.242	32.388	0.225	33.134	0.242		
31.343	0.246	32.388	0.229	33.134	0.246		
31.343	0.250	32.388	0.233	33.134	0.250		
31.343	0.254	32.388	0.238	33.134	0.254		
31.343	0.258	32.388	0.242	33.134	0.258		
31.343	0.263	32.388	0.246	33.134	0.263		
31.343	0.267	32.388	0.250	33.134	0.267		
31.493	0.271	32.388	0.254	33.134	0.271		
31.493	0.275	32.388	0.258	33.134	0.275		
31.493	0.279	32.388	0.263	33.134	0.279		
31.493	0.283	32.388	0.267	33.134	0.283		
31.493	0.288	32.388	0.271	33.134	0.288		
31.493	0.292	32.388	0.275	33.134	0.292		
31.493	0.296	32.388	0.279	33.134	0.296		
31.493	0.300	32.388	0.283	33.134	0.300		
31.493	0.304	32.388	0.288	33.284	0.304		
31.493	0.308	32.388	0.292	33.284	0.308		
31.642	0.313	32.537	0.296	33.134	0.313		
31.642	0.317	32.388	0.300	33.134	0.317		
31.642	0.321	32.388	0.304	33.134	0.321		
31.642	0.325	32.388	0.308	33.134	0.325		
31.642	0.329	32.537	0.313	33.134	0.329		
31.642	0.333	32.537	0.317	33.134	0.333		
31.642	0.338	32.537	0.321	33.134	0.338		
31.642	0.342	32.537	0.325	33.134	0.342		
31.642	0.346	32.537	0.329	33.134	0.346		
31.642	0.350	32.537	0.333	33.284	0.350		
31.791	0.354	32.537	0.338	33.284	0.354		
31.791	0.358	32.537	0.342	33.284	0.358		
31.791	0.363	32.537	0.346	33.284	0.363		
31.791	0.367	32.537	0.350	33.284	0.367		
31.791	0.371	32.537	0.354	33.284	0.371		
31.791	0.375	32.537	0.358	33.284	0.375		
31.791	0.379	32.537	0.363	33.284	0.379		
31.791	0.383	32.537	0.367	33.284	0.383		
31.791	0.388	32.537	0.371	33.433	0.388		
31.791	0.392	32.537	0.375	33.433	0.392		
31.791	0.396	32.537	0.379	33.433	0.396		
31.791	0.400	32.537	0.383	33.433	0.400		
31.791	0.404	32.537	0.388	33.582	0.404		
31.940	0.408	32.537	0.392	33.582	0.408		
31.940	0.413	32.537	0.396	33.582	0.413		
31.940	0.417	32.537	0.400	33.582	0.417		
31.940	0.421	32.537	0.404	33.582	0.421		
31.940	0.425	32.537	0.408	33.731	0.425		
31.940	0.429	32.537	0.413	33.731	0.429		
31.940	0.433	32.537	0.417	33.731	0.433		
31.940	0.438	32.537	0.421	33.731	0.438		
31.940	0.442	32.537	0.425	33.731	0.442		
31.940	0.446	32.537	0.429	33.731	0.446		
31.940	0.450	32.537	0.433	33.731	0.450		

31.940	0.454	32.537	0.438	33.731	0.454		
31.940	0.458	32.537	0.442	33.731	0.458		
32.090	0.463	32.537	0.446	33.731	0.463		
32.090	0.467	32.537	0.450	33.731	0.467		
32.090	0.471	32.537	0.454	33.731	0.471		
32.090	0.475	32.537	0.458	33.731	0.475		
32.090	0.479	32.537	0.463	33.731	0.479		
32.090	0.483	32.537	0.467	33.731	0.483		
32.090	0.488	32.537	0.471	33.731	0.488		
32.090	0.492	32.537	0.475	33.731	0.492		
32.090	0.496	32.537	0.479	33.731	0.496		
32.090	0.500	32.537	0.483	33.582	0.500		
32.090	0.504	32.537	0.488	33.582	0.504		
32.239	0.508	32.687	0.492	33.582	0.508		
32.239	0.513	32.687	0.496	33.582	0.513		
32.239	0.517	32.687	0.500	33.582	0.517		
32.239	0.521	32.687	0.504	33.582	0.521		
32.239	0.525	32.687	0.508	33.582	0.525		
32.239	0.529	32.687	0.513	33.582	0.529		
32.239	0.533	32.687	0.517	33.582	0.533		
32.239	0.538	32.687	0.521	33.582	0.538		
32.239	0.542	32.687	0.525	33.582	0.542		
32.239	0.546	32.687	0.529	33.582	0.546		
32.239	0.550	32.687	0.533	33.582	0.550		
32.239	0.554	32.687	0.538	33.582	0.554		
32.239	0.558	32.687	0.542	33.582	0.558		
32.388	0.563	32.687	0.546	33.582	0.563		
32.388	0.567	32.687	0.550	33.582	0.567		
32.388	0.571	32.687	0.554	33.582	0.571		
32.388	0.575	32.687	0.558	33.582	0.575		
32.388	0.579	32.836	0.563	33.582	0.579		
32.388	0.583	32.836	0.567	33.582	0.583		
32.388	0.588	32.836	0.571	33.582	0.588		
32.388	0.592	32.836	0.575	33.582	0.592		
32.388	0.596	32.836	0.579	33.433	0.596		
32.388	0.600	32.836	0.583	32.537	0.600		
32.388	0.604	32.836	0.588	32.985	0.604		
32.388	0.608	32.836	0.592	33.134	0.608		
32.388	0.613	32.836	0.596	33.284	0.613		
32.388	0.617	32.836	0.600	33.284	0.617		
32.388	0.621	32.836	0.604	33.284	0.621		
32.388	0.625	32.836	0.608	33.284	0.625		
32.388	0.629	32.687	0.613	33.284	0.629		
32.388	0.633	32.687	0.617	33.284	0.633		
32.388	0.638	32.687	0.621	33.284	0.638		
32.388	0.642	32.687	0.625	33.134	0.642		
32.537	0.646	32.687	0.629	33.134	0.646		
32.537	0.650	32.687	0.633	33.134	0.650		
32.537	0.654	32.687	0.638	33.134	0.654		
32.537	0.658	32.687	0.642	33.134	0.658		
32.537	0.663	32.687	0.646	33.134	0.663		
32.537	0.667	32.687	0.650	33.134	0.667		
32.537	0.671	32.687	0.654	33.134	0.671		
32.537	0.675	32.687	0.658	33.134	0.675		
32.537	0.679	32.687	0.663	33.134	0.679		
32.537	0.683	32.687	0.667	33.134	0.683		
32.537	0.688	32.687	0.671	32.985	0.688		

32.537	0.692	32.687	0.675	32.985	0.692		
32.687	0.696	32.687	0.679	32.985	0.696		
32.537	0.700	32.687	0.683	32.985	0.700		
32.687	0.704	32.687	0.688	32.985	0.704		
32.687	0.708	32.687	0.692	32.985	0.708		
32.687	0.713	32.687	0.696	32.985	0.713		
32.687	0.717	32.687	0.700	32.985	0.717		
32.687	0.721	32.687	0.704	32.985	0.721		
32.687	0.725	32.687	0.708				
32.687	0.729	32.687	0.713				
32.687	0.733	32.687	0.717				
32.687	0.738	32.687	0.721				
32.687	0.742	32.687	0.725				
32.687	0.746	32.687	0.729				
32.687	0.750	32.687	0.733				
32.687	0.754	32.687	0.738				
32.687	0.758	32.836	0.742				
32.687	0.763	32.836	0.746				
32.687	0.767	32.836	0.750				
32.687	0.771	32.836	0.754				
32.836	0.775	32.836	0.758				
32.836	0.779	32.836	0.763				
32.836	0.783	32.836	0.767				
32.836	0.788	32.836	0.771				
32.836	0.792	32.836	0.775				
32.836	0.796	32.836	0.779				
32.836	0.800	32.836	0.783				
32.836	0.804	32.836	0.788				
32.836	0.808	32.836	0.792				
32.836	0.813	32.836	0.796				
32.836	0.817	32.836	0.800				
32.836	0.821	32.836	0.804				
32.836	0.825	32.836	0.808				
32.836	0.829	32.836	0.813				
32.836	0.833	32.836	0.817				
32.836	0.838	32.836	0.821				
32.836	0.842	32.836	0.825				
32.985	0.846	32.836	0.829				
32.985	0.850	32.836	0.833				
32.985	0.854	32.836	0.838				
32.985	0.858	32.836	0.842				
32.985	0.863	32.836	0.846				
32.985	0.867	32.836	0.850				
32.985	0.871	32.836	0.854				
32.985	0.875	32.836	0.858				
32.985	0.879	32.836	0.863				
32.985	0.883	32.836	0.867				
32.985	0.888	32.836	0.871				
32.985	0.892	32.836	0.875				
32.985	0.896	32.836	0.879				
32.985	0.900	32.836	0.883				
33.134	0.904	32.836	0.888				
33.134	0.908	32.836	0.892				
33.134	0.913	32.836	0.896				
33.134	0.917	32.836	0.900				
33.134	0.921	32.836	0.904				
33.134	0.925	32.836	0.908				

33.134	0.929	32.836	0.913				
33.134	0.933	32.836	0.917				
33.134	0.938	32.836	0.921				
33.134	0.942	32.836	0.925				
33.134	0.946	32.836	0.929				
33.134	0.950	32.836	0.933				
33.134	0.954	32.836	0.938				
33.134	0.958	32.836	0.942				
33.134	0.963	32.836	0.946				
33.134	0.967	32.836	0.950				
33.134	0.971	32.836	0.954				
33.134	0.975	32.836	0.958				
33.134	0.979	32.836	0.963				
33.134	0.983	32.836	0.967				
33.134	0.988	32.836	0.971				
33.134	0.992	32.836	0.975				
33.134	0.996	32.836	0.979				
33.134	1.000	32.836	0.983				
33.134	1.004	32.836	0.988				
33.134	1.008	32.836	0.992				
33.134	1.013	32.836	0.996				
33.134	1.017	32.836	1.000				
33.284	1.021	32.836	1.004				
33.284	1.025	32.836	1.008				
33.284	1.029	32.836	1.013				
33.284	1.033	32.836	1.017				
33.284	1.038	32.836	1.021				
33.284	1.042	32.836	1.025				
33.284	1.046	32.836	1.029				
33.284	1.050	32.836	1.033				
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33.284	1.063	32.836	1.046				
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33.433	1.163	32.836	1.146				

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33.582	1.229	32.687	1.213				
33.582	1.233	32.687	1.217				
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33.881	1.442	32.836	1.425				
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33.881	1.454	32.836	1.438				
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34.179	1.663	32.687	1.646				
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35.672	8.000	32.836	1.925				
36.269	12.000	32.836	1.929				
37.164	16.000	32.836	1.933				
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		33.284	3.221				
		33.284	3.225				
		33.284	3.229				
		33.134	3.233				
		33.284	3.238				
		33.284	3.242				
		33.284	3.246				
		33.284	3.250				
		33.284	3.254				
		33.284	3.258				
		33.134	3.263				
		33.134	3.267				
		33.134	3.271				
		33.284	3.275				
		33.134	3.279				
		33.134	3.283				

		33.134	3.288				
		33.284	3.292				
		33.284	3.296				
		33.284	3.300				
		33.284	3.304				
		33.284	3.308				
		33.134	3.313				
		33.134	3.317				
		33.284	3.321				
		33.284	3.325				
		33.134	3.329				
		33.284	3.333				
		33.284	3.338				
		33.284	3.342				
		33.134	3.346				
		33.284	3.350				
		33.284	3.354				
		33.284	3.358				
		33.284	3.363				
		33.284	3.367				
		33.284	3.371				
		33.284	3.375				
		33.284	3.379				
		33.284	3.383				
		33.284	3.388				
		33.284	3.392				
		33.284	3.396				
		33.284	3.400				
		33.284	3.404				
		33.284	3.408				
		33.284	3.413				
		33.284	3.417				
		33.284	3.421				
		33.284	3.425				
		33.284	3.429				
		33.284	3.433				
		33.284	3.438				
		33.284	3.442				
		33.284	3.446				
		33.284	3.450				
		33.284	3.454				
		33.284	3.458				
		33.284	3.463				
		33.284	3.467				
		33.284	3.471				
		33.284	3.475				
		33.284	3.479				
		33.284	3.483				
		33.284	3.488				
		33.284	3.492				
		33.284	3.496				
		33.284	3.500				
		33.284	3.504				
		33.284	3.508				
		33.284	3.513				
		33.284	3.517				
		33.284	3.521				

		33.284	3.525				
		33.284	3.529				
		33.284	3.533				
		33.284	3.538				
		33.284	3.542				
		33.284	3.546				
		33.284	3.550				
		33.284	3.554				
		33.284	3.558				
		33.284	3.563				
		33.284	3.567				
		33.433	3.571				
		33.433	3.575				
		33.284	3.579				
		33.433	3.583				
		33.433	3.588				
		33.284	3.592				
		33.284	3.596				
		33.284	3.600				
		33.284	3.604				
		33.284	3.608				
		33.284	3.613				
		33.284	3.617				
		33.284	3.621				
		33.433	3.625				
		33.284	3.629				
		33.284	3.633				
		33.433	3.638				
		33.433	3.642				
		33.284	3.646				
		33.284	3.650				
		33.284	3.654				
		33.284	3.658				
		33.433	3.663				
		33.433	3.667				
		33.433	3.671				
		33.433	3.675				
		33.433	3.679				
		33.433	3.683				
		33.433	3.688				
		33.284	3.692				
		33.284	3.696				
		33.433	3.700				
		33.433	3.704				
		33.433	3.708				
		33.433	3.713				
		33.433	3.717				
		33.433	3.721				
		33.433	3.725				
		33.433	3.729				
		33.433	3.733				
		33.433	3.738				
		33.433	3.742				
		33.433	3.746				
		33.433	3.750				
		33.433	3.754				
		33.433	3.758				

		33.433	3.763				
		33.433	3.767				
		33.433	3.771				
		33.433	3.775				
		33.433	3.779				
		33.433	3.783				
		33.433	3.788				
		33.433	3.792				
		33.433	3.796				
		33.433	3.800				
		33.433	3.804				
		33.433	3.808				
		33.433	3.813				
		33.433	3.817				
		33.433	3.821				
		33.433	3.825				
		33.433	3.829				
		33.433	3.833				
		33.433	3.838				
		33.433	3.842				
		33.433	3.846				
		33.433	3.850				
		33.433	3.854				
		33.433	3.858				
		33.433	3.863				
		33.433	3.867				
		33.433	3.871				
		33.433	3.875				
		33.433	3.879				
		33.433	3.883				
		33.433	3.888				
		33.433	3.892				
		33.433	3.896				
		33.433	3.900				
		33.433	3.904				
		33.433	3.908				
		33.433	3.913				
		33.433	3.917				
		33.433	3.921				
		33.433	3.925				
		33.433	3.929				
		33.433	3.933				
		33.582	3.938				
		33.582	3.942				
		33.582	3.946				
		33.582	3.950				
		33.582	3.954				
		33.582	3.958				
		33.582	3.963				
		33.582	3.967				
		33.582	3.971				
		33.731	3.975				
		33.731	3.979				
		33.731	3.983				
		33.731	3.988				
		33.731	3.992				
		33.731	3.996				

		33.731	4.000				
		33.731	4.004				
		33.731	4.008				
		33.731	4.013				
		33.881	4.017				
		33.731	4.021				
		33.731	4.025				
		33.881	4.029				
		33.881	4.033				
		33.881	4.038				
		33.881	4.042				
		33.881	4.046				
		33.881	4.050				
		33.881	4.054				
		33.881	4.058				
		33.881	4.063				
		33.881	4.067				
		33.731	4.071				
		33.731	4.075				
		33.731	4.079				
		33.731	4.083				
		33.731	4.088				
		33.731	4.092				
		33.731	4.096				
		33.731	4.100				
		33.731	4.104				
		33.731	4.108				
		33.731	4.113				
		33.731	4.117				
		33.731	4.121				
		33.731	4.125				
		33.731	4.129				
		33.731	4.133				
		33.731	4.138				
		33.731	4.142				
		33.731	4.146				
		33.731	4.150				
		33.731	4.154				
		33.731	4.158				
		33.731	4.163				
		33.731	4.167				
		33.731	4.171				
		33.731	4.175				
		33.731	4.179				
		33.731	4.183				
		33.731	4.188				
		33.881	4.192				
		33.881	4.196				
		33.881	4.200				
		33.881	4.204				
		33.881	4.208				
		33.881	4.213				
		33.881	4.217				
		33.881	4.221				
		33.881	4.225				
		33.881	4.229				
		33.881	4.233				

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		33.881	4.242				
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		33.881	4.250				
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		33.881	4.279				
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		33.881	4.292				
		33.881	4.296				
		33.881	4.300				
		33.881	4.304				
		33.881	4.308				
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		33.881	4.329				
		33.881	4.333				
		33.881	4.338				
		33.881	4.342				
		33.881	4.346				
		33.881	4.350				
		33.881	4.354				
		33.881	4.358				
		33.881	4.363				
		33.881	4.367				
		33.881	4.371				
		33.881	4.375				
		33.881	4.379				
		33.881	4.383				
		33.881	4.388				
		33.881	4.392				
		33.881	4.396				
		33.881	4.400				
		33.881	4.404				
		33.881	4.408				
		33.881	4.413				
		33.881	4.417				
		33.881	4.421				
		33.881	4.425				
		33.881	4.429				
		33.881	4.433				
		33.881	4.438				
		33.881	4.442				
		33.881	4.446				
		33.881	4.450				
		33.881	4.454				
		33.881	4.458				
		33.881	4.463				
		33.881	4.467				
		33.881	4.471				

		33.881	4.475				
		33.881	4.479				
		33.881	4.483				
		33.881	4.488				
		33.881	4.492				
		33.881	4.496				
		33.881	4.500				
		33.881	4.504				
		33.881	4.508				
		33.881	4.513				
		33.881	4.517				
		33.881	4.521				
		33.881	4.525				
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		33.881	4.533				
		33.881	4.538				
		33.881	4.542				
		33.881	4.546				
		33.881	4.550				
		33.881	4.554				
		33.881	4.558				
		33.881	4.563				
		33.881	4.567				
		33.881	4.571				
		33.881	4.575				
		33.881	4.579				
		33.881	4.583				
		33.881	4.588				
		33.881	4.592				
		33.881	4.596				
		33.881	4.600				
		33.881	4.604				
		33.881	4.608				
		33.881	4.613				
		33.881	4.617				
		33.881	4.621				
		33.881	4.625				
		33.881	4.629				
		33.881	4.633				
		33.881	4.638				
		33.881	4.642				
		33.881	4.646				
		33.881	4.650				
		33.881	4.654				
		33.881	4.658				
		34.030	4.663				
		33.881	4.667				
		34.030	4.671				
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		34.030	4.679				
		34.030	4.683				
		34.030	4.688				
		34.030	4.692				
		34.030	4.696				
		34.030	4.700				
		34.030	4.704				
		33.881	4.708				

		34.030	4.713				
		33.881	4.717				
		34.030	4.721				
		33.881	4.725				
		33.881	4.729				
		34.030	4.733				
		33.881	4.738				
		33.881	4.742				
		33.881	4.746				
		33.881	4.750				
		33.881	4.754				
		33.881	4.758				
		33.881	4.763				
		33.881	4.767				
		33.881	4.771				
		34.030	4.775				
		34.030	4.779				
		34.030	4.783				
		34.030	4.788				
		33.881	4.792				
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		34.030	4.800				
		34.030	4.804				
		34.030	4.808				
		34.030	4.813				
		34.030	4.817				
		34.030	4.821				
		34.030	4.825				
		34.030	4.829				
		34.030	4.833				
		34.030	4.838				
		34.030	4.842				
		34.030	4.846				
		34.030	4.850				
		34.030	4.854				
		34.030	4.858				
		34.030	4.863				
		34.030	4.867				
		34.030	4.871				
		34.030	4.875				
		34.030	4.879				
		34.030	4.883				
		34.030	4.888				
		34.030	4.892				
		34.030	4.896				
		34.030	4.900				
		34.030	4.904				
		34.030	4.908				
		34.030	4.913				
		34.030	4.917				
		34.030	4.921				
		34.030	4.925				
		34.030	4.929				
		34.030	4.933				
		34.030	4.938				
		34.030	4.942				
		34.030	4.946				

		34.030	4.950				
		34.030	4.954				
		34.030	4.958				
		34.030	4.963				
		34.030	4.967				
		34.030	4.971				
		34.030	4.975				
		34.030	4.979				
		34.030	4.983				
		34.030	4.988				
		34.030	4.992				
		34.030	4.996				
		34.030	5.000				
		34.030	5.004				
		34.030	5.008				
		34.030	5.013				
		34.030	5.017				
		34.030	5.021				
		34.030	5.025				
		34.030	5.029				
		34.030	5.033				
		34.030	5.038				
		34.030	5.042				
		34.030	5.046				
		34.030	5.050				
		34.030	5.054				
		34.030	5.058				
		34.030	5.063				
		34.030	5.067				
		34.030	5.071				
		34.030	5.075				
		34.030	5.079				
		34.030	5.083				
		34.030	5.088				
		34.030	5.092				
		34.030	5.096				
		34.030	5.100				
		34.030	5.104				
		34.030	5.108				
		34.030	5.113				
		34.030	5.117				
		34.030	5.121				
		34.030	5.125				
		34.030	5.129				
		34.030	5.133				
		34.030	5.138				
		34.030	5.142				
		34.030	5.146				
		34.030	5.150				
		34.030	5.154				
		34.030	5.158				
		34.030	5.163				
		34.030	5.167				
		34.030	5.171				
		34.030	5.175				
		34.030	5.179				
		34.030	5.183				

		34.030	5.188				
		34.030	5.192				
		34.030	5.196				
		34.030	5.200				
		34.030	5.204				
		34.030	5.208				
		34.030	5.213				
		34.030	5.217				
		34.030	5.221				
		34.030	5.225				
		34.030	5.229				
		34.030	5.233				
		34.030	5.238				
		34.179	5.242				
		34.179	5.246				
		34.179	5.250				
		34.179	5.254				
		34.179	5.258				
		34.179	5.263				
		34.179	5.267				
		34.179	5.271				
		34.179	5.275				
		34.179	5.279				
		34.179	5.283				
		34.179	5.288				
		34.179	5.292				
		34.179	5.296				
		34.179	5.300				
		34.030	5.304				
		34.030	5.308				
		34.030	5.313				
		34.030	5.317				
		34.030	5.321				
		34.179	5.325				
		34.179	5.329				
		34.179	5.333				
		34.179	5.338				
		34.179	5.342				
		34.179	5.346				
		34.179	5.350				
		34.179	5.354				
		34.179	5.358				
		34.179	5.363				
		34.179	5.367				
		34.179	5.371				
		34.179	5.375				
		34.179	5.379				
		34.179	5.383				
		34.179	5.388				
		34.179	5.392				
		34.179	5.396				
		34.179	5.400				
		34.179	5.404				
		34.179	5.408				
		34.179	5.413				
		34.179	5.417				
		34.179	5.421				

		34.179	5.425				
		34.179	5.429				
		34.179	5.433				
		34.179	5.438				
		34.179	5.442				
		34.179	5.446				
		34.179	5.450				
		34.179	5.454				
		34.179	5.458				
		34.179	5.463				
		34.179	5.467				
		34.179	5.471				
		34.179	5.475				
		34.179	5.479				
		34.179	5.483				
		34.179	5.488				
		34.179	5.492				
		34.179	5.496				
		34.179	5.500				
		34.179	5.504				
		34.179	5.508				
		34.179	5.513				
		34.179	5.517				
		34.179	5.521				
		34.179	5.525				
		34.179	5.529				
		34.179	5.533				
		34.179	5.538				
		34.179	5.542				
		34.179	5.546				
		34.179	5.550				
		34.179	5.554				
		34.179	5.558				
		34.179	5.563				
		34.179	5.567				
		34.179	5.571				
		34.179	5.575				
		34.179	5.579				
		34.179	5.583				
		35.075	8.000				
		36.119	12.000				
		37.164	16.000				
		37.164	20.000				
		37.164	24.000				

81% of degree of saturation

200kPa							
Equilibrium stage		Consolidation stage		Shearing stage			
Matric suction/(kPa)	Time/(hr)	Matric suction/(kPa)	Time/(hr)	Matric suction/(kPa)	Time/(hr)	Matric suction/(kPa)	Shear strain/(%)
0.000	0.000	27.164	0.000	27.164	0.000	27.164	0.000
1.493	0.004	25.224	0.000	27.164	0.004	27.164	0.250
3.134	0.008	23.433	0.001	27.164	0.008	27.164	0.500
4.478	0.013	21.940	0.002	27.164	0.013	27.164	0.750
5.821	0.017	20.746	0.003	27.164	0.017	27.164	1.000
7.164	0.021	19.552	0.004	27.164	0.021	27.164	1.250
8.507	0.025	19.851	0.008	27.164	0.025	27.015	1.500
10.000	0.029	19.851	0.013	27.164	0.029	27.164	1.750
12.836	0.033	20.000	0.017	27.164	0.033	27.164	2.000
12.687	0.038	20.149	0.021	27.164	0.038	26.866	2.500
14.030	0.042	20.149	0.025	27.164	0.042	26.716	3.000
15.373	0.046	20.299	0.029	27.164	0.046	26.269	3.500
16.418	0.050	20.299	0.033	27.164	0.050	26.119	4.000
17.313	0.054	20.448	0.038	27.164	0.054	25.970	5.000
18.060	0.058	20.448	0.042	27.164	0.058	25.672	6.000
18.806	0.063	20.448	0.046	27.164	0.063	25.373	7.000
19.254	0.067	20.597	0.050	27.164	0.067	25.373	8.000
19.851	0.071	20.597	0.054	27.164	0.071	25.522	9.000
20.299	0.075	20.746	0.058	27.164	0.075	25.672	10.000
20.597	0.079	20.746	0.063	27.164	0.079	25.522	11.000
21.045	0.083	20.746	0.067	27.164	0.083	25.373	12.000
21.343	0.088	20.746	0.071	27.164	0.088		
21.493	0.092	20.746	0.075	27.164	0.092		
21.642	0.096	20.896	0.079	27.164	0.096		
21.940	0.100	20.896	0.083	27.164	0.100		
21.940	0.104	20.896	0.088	27.164	0.104		
22.090	0.108	21.045	0.092	27.164	0.108		
22.239	0.113	21.045	0.096	27.164	0.113		
22.388	0.117	21.045	0.100	27.015	0.117		
22.388	0.121	21.045	0.104	27.015	0.121		
22.537	0.125	21.045	0.108	27.015	0.125		
22.537	0.129	21.194	0.113	27.164	0.129		
22.687	0.133	21.194	0.117	27.164	0.133		
22.687	0.138	21.194	0.121	27.164	0.138		
22.687	0.142	21.194	0.125	27.164	0.142		
22.836	0.146	21.194	0.129	27.164	0.146		
22.836	0.150	21.343	0.133	27.164	0.150		
22.836	0.154	21.343	0.138	27.164	0.154		
22.985	0.158	21.343	0.142	27.164	0.158		
22.985	0.163	21.343	0.146	27.015	0.163		
22.985	0.167	21.343	0.150	27.015	0.167		
22.985	0.171	21.343	0.154	27.015	0.171		
23.134	0.175	21.343	0.158	27.015	0.175		
23.134	0.179	21.343	0.163	26.866	0.179		
23.134	0.183	21.493	0.167	26.866	0.183		
23.134	0.188	21.493	0.171	26.866	0.188		
23.134	0.192	21.493	0.175	26.866	0.192		
23.134	0.196	21.493	0.179	26.866	0.196		
23.134	0.200	21.493	0.183	26.866	0.200		
23.284	0.204	21.493	0.188	26.866	0.204		
23.284	0.208	21.493	0.192	26.866	0.208		

23.284	0.213	21.493	0.196	26.716	0.213		
23.284	0.217	21.493	0.200	26.716	0.217		
23.284	0.221	21.493	0.204	26.716	0.221		
23.284	0.225	21.493	0.208	26.716	0.225		
23.284	0.229	21.642	0.213	26.716	0.229		
23.284	0.233	21.642	0.217	26.716	0.233		
23.433	0.238	21.642	0.221	26.716	0.238		
23.433	0.242	21.642	0.225	26.716	0.242		
23.433	0.246	21.642	0.229	26.567	0.246		
23.433	0.250	21.642	0.233	26.567	0.250		
23.433	0.254	21.642	0.238	26.567	0.254		
23.433	0.258	21.642	0.242	26.418	0.258		
23.433	0.263	21.642	0.246	26.418	0.263		
23.433	0.267	21.642	0.250	26.418	0.267		
23.433	0.271	21.791	0.254	26.418	0.271		
23.433	0.275	21.791	0.258	26.269	0.275		
23.433	0.279	21.791	0.263	26.269	0.279		
23.433	0.283	21.791	0.267	26.269	0.283		
23.433	0.288	21.791	0.271	26.269	0.288		
23.582	0.292	21.791	0.275	26.269	0.292		
23.582	0.296	21.791	0.279	26.119	0.296		
23.582	0.300	21.791	0.283	26.119	0.300		
23.582	0.304	21.791	0.288	26.119	0.304		
23.582	0.308	21.791	0.292	26.119	0.308		
23.582	0.313	21.791	0.296	26.119	0.313		
23.582	0.317	21.791	0.300	26.119	0.317		
23.582	0.321	21.791	0.304	26.119	0.321		
23.582	0.325	21.791	0.308	26.119	0.325		
23.582	0.329	21.791	0.313	26.119	0.329		
23.582	0.333	21.791	0.317	26.119	0.333		
23.582	0.338	21.791	0.321	26.119	0.338		
23.582	0.342	21.940	0.325	26.119	0.342		
23.582	0.346	21.940	0.329	26.119	0.346		
23.582	0.350	21.791	0.333	26.119	0.350		
23.582	0.354	21.940	0.338	26.119	0.354		
23.582	0.358	21.940	0.342	26.119	0.358		
23.731	0.363	21.940	0.346	26.119	0.363		
23.731	0.367	21.940	0.350	26.119	0.367		
23.731	0.371	21.940	0.354	25.970	0.371		
23.731	0.375	21.940	0.358	25.970	0.375		
23.731	0.379	21.940	0.363	25.970	0.379		
23.731	0.383	21.940	0.367	25.970	0.383		
23.731	0.388	21.940	0.371	25.970	0.388		
23.731	0.392	21.940	0.375	25.970	0.392		
23.731	0.396	21.940	0.379	25.821	0.396		
23.731	0.400	21.940	0.383	25.970	0.400		
23.731	0.404	22.090	0.388	25.821	0.404		
23.731	0.408	21.940	0.392	25.821	0.408		
23.731	0.413	22.090	0.396	25.821	0.413		
23.731	0.417	22.090	0.400	25.821	0.417		
23.731	0.421	22.090	0.404	25.821	0.421		
23.731	0.425	22.090	0.408	25.821	0.425		
23.731	0.429	22.090	0.413	25.821	0.429		
23.731	0.433	22.090	0.417	25.821	0.433		
23.731	0.438	22.090	0.421	25.821	0.438		
23.731	0.442	22.090	0.425	25.821	0.442		

23.731	0.446	22.090	0.429	25.821	0.446		
23.731	0.450	22.090	0.433	25.821	0.450		
23.731	0.454	22.090	0.438	25.672	0.454		
23.731	0.458	22.090	0.442	25.672	0.458		
23.731	0.463	22.090	0.446	25.672	0.463		
23.731	0.467	22.090	0.450	25.672	0.467		
23.881	0.471	22.090	0.454	25.672	0.471		
23.881	0.475	22.090	0.458	25.672	0.475		
23.881	0.479	22.090	0.463	25.672	0.479		
23.881	0.483	22.090	0.467	25.672	0.483		
23.881	0.488	22.090	0.471	25.672	0.488		
23.881	0.492	22.090	0.475	25.672	0.492		
23.881	0.496	22.090	0.479	25.672	0.496		
23.881	0.500	22.090	0.483	25.672	0.500		
23.881	0.504	22.239	0.488	25.672	0.504		
23.881	0.508	22.239	0.492	25.672	0.508		
23.881	0.513	22.239	0.496	25.522	0.513		
23.881	0.517	22.090	0.500	25.522	0.517		
23.881	0.521	22.239	0.504	25.522	0.521		
23.881	0.525	22.239	0.508	25.522	0.525		
23.881	0.529	22.239	0.513	25.522	0.529		
23.881	0.533	22.239	0.517	25.522	0.533		
23.881	0.538	22.239	0.521	25.522	0.538		
23.881	0.542	22.239	0.525	25.522	0.542		
23.881	0.546	22.239	0.529	25.522	0.546		
23.881	0.550	22.239	0.533	25.373	0.550		
23.881	0.554	22.239	0.538	25.373	0.554		
23.881	0.558	22.239	0.542	25.373	0.558		
23.881	0.563	22.239	0.546	25.373	0.563		
23.881	0.567	22.239	0.550	25.373	0.567		
23.881	0.571	22.239	0.554	25.373	0.571		
23.881	0.575	22.239	0.558	25.373	0.575		
23.881	0.579	22.239	0.563	25.373	0.579		
23.881	0.583	22.239	0.567	25.373	0.583		
23.881	0.588	22.239	0.571	25.373	0.588		
23.881	0.592	22.239	0.575	25.373	0.592		
23.881	0.596	22.239	0.579	25.373	0.596		
23.881	0.600	22.239	0.583	25.373	0.600		
23.881	0.604	22.239	0.588	25.373	0.604		
23.881	0.608	22.239	0.592	25.373	0.608		
23.881	0.613	22.388	0.596	25.373	0.613		
23.881	0.617	22.239	0.600	25.373	0.617		
23.881	0.621	22.388	0.604	25.373	0.621		
23.881	0.625	22.388	0.608	25.373	0.625		
23.881	0.629	22.388	0.613	25.373	0.629		
23.881	0.633	22.388	0.617	25.373	0.633		
23.881	0.638	22.388	0.621	25.373	0.638		
23.881	0.642	22.388	0.625	25.373	0.642		
23.881	0.646	22.388	0.629	25.373	0.646		
24.030	0.650	22.388	0.633	25.373	0.650		
24.030	0.654	22.388	0.638	25.373	0.654		
24.030	0.658	22.388	0.642	25.373	0.658		
24.030	0.663	22.388	0.646	25.373	0.663		
24.030	0.667	22.388	0.650	25.522	0.667		
24.030	0.671	22.388	0.654	25.522	0.671		
24.030	0.675	22.388	0.658	25.522	0.675		

24.030	0.679	22.388	0.663	25.522	0.679		
24.030	0.683	22.388	0.667	25.522	0.683		
24.030	0.688	22.388	0.671	25.522	0.688		
24.030	0.692	22.388	0.675	25.522	0.692		
24.030	0.696	22.388	0.679	25.522	0.696		
24.030	0.700	22.388	0.683	25.522	0.700		
24.030	0.704	22.388	0.688	25.522	0.704		
24.030	0.708	22.388	0.692	25.522	0.708		
24.030	0.713	22.388	0.696	25.522	0.713		
24.030	0.717	22.388	0.700	25.522	0.717		
24.030	0.721	22.388	0.704	25.522	0.721		
24.179	0.725	22.388	0.708	25.672	0.725		
24.179	0.729	22.388	0.713	25.672	0.729		
24.179	0.733	22.388	0.717	25.672	0.733		
24.179	0.738	22.537	0.721	25.672	0.738		
24.179	0.742	22.537	0.725	25.672	0.742		
24.179	0.746	22.537	0.729	25.672	0.746		
24.179	0.750	22.537	0.733	25.672	0.750		
24.179	0.754	22.537	0.738	25.672	0.754		
24.179	0.758	22.537	0.742	25.672	0.758		
24.179	0.763	22.537	0.746	25.672	0.763		
24.179	0.767	22.537	0.750	25.672	0.767		
24.179	0.771	22.537	0.754	25.672	0.771		
24.179	0.775	22.537	0.758	25.672	0.775		
24.179	0.779	22.537	0.763	25.672	0.779		
24.179	0.783	22.537	0.767	25.672	0.783		
24.179	0.788	22.537	0.771	25.672	0.788		
24.179	0.792	22.537	0.775	25.672	0.792		
24.179	0.796	22.537	0.779	25.672	0.796		
24.179	0.800	22.537	0.783	25.672	0.800		
24.179	0.804	22.537	0.788	25.672	0.804		
24.179	0.808	22.537	0.792	25.522	0.808		
24.179	0.813	22.537	0.796	25.522	0.813		
24.179	0.817	22.537	0.800	25.522	0.817		
24.179	0.821	22.537	0.804	25.522	0.821		
24.179	0.825	22.537	0.808	25.522	0.825		
24.179	0.829	22.537	0.813	25.522	0.829		
24.179	0.833	22.537	0.817	25.522	0.833		
24.179	0.838	22.537	0.821	25.522	0.838		
24.179	0.842	22.537	0.825	25.522	0.842		
24.179	0.846	22.537	0.829	25.522	0.846		
24.328	0.850	22.537	0.833	25.522	0.850		
24.328	0.854	22.537	0.838	25.522	0.854		
24.328	0.858	22.537	0.842	25.522	0.858		
24.328	0.863	22.537	0.846	25.522	0.863		
24.328	0.867	22.537	0.850	25.522	0.867		
24.328	0.871	22.537	0.854	25.522	0.871		
24.328	0.875	22.537	0.858	25.522	0.875		
24.328	0.879	22.537	0.863	25.522	0.879		
24.328	0.883	22.537	0.867	25.522	0.883		
24.328	0.888	22.537	0.871	25.522	0.888		
24.328	0.892	22.537	0.875	25.522	0.892		
24.328	0.896	22.537	0.879	25.522	0.896		
24.328	0.900	22.537	0.883	25.522	0.900		
24.328	0.904	22.537	0.888	25.522	0.904		
24.328	0.908	22.537	0.892	25.522	0.908		

24.328	0.913	22.687	0.896	25.522	0.913		
24.328	0.917	22.537	0.900	25.522	0.917		
24.328	0.921	22.537	0.904	25.522	0.921		
24.328	0.925	22.537	0.908	25.522	0.925		
24.328	0.929	22.537	0.913	25.522	0.929		
24.328	0.933	22.537	0.917	25.522	0.933		
24.328	0.938	22.537	0.921	25.522	0.938		
24.328	0.942	22.537	0.925	25.522	0.942		
24.328	0.946	22.537	0.929	25.522	0.946		
24.328	0.950	22.687	0.933	25.522	0.950		
24.328	0.954	22.687	0.938	25.373	0.954		
24.328	0.958	22.687	0.942	25.373	0.958		
24.328	0.963	22.687	0.946	25.522	0.963		
24.328	0.967	22.687	0.950	25.522	0.967		
24.328	0.971	22.687	0.954	25.522	0.971		
24.478	0.975	22.687	0.958	25.522	0.975		
24.478	0.979	22.687	0.963	25.522	0.979		
24.478	0.983	22.687	0.967	25.522	0.983		
24.478	0.988	22.687	0.971	25.522	0.988		
24.328	0.992	22.687	0.975	25.522	0.992		
24.478	0.996	22.687	0.979	25.522	0.996		
24.478	1.000	22.687	0.983	25.522	1.000		
24.478	1.004	22.687	0.988	25.522	1.004		
24.478	1.008	22.687	0.992	25.522	1.008		
24.478	1.013	22.687	0.996	25.672	1.013		
24.478	1.017	22.687	1.000	25.672	1.017		
24.478	1.021	22.687	1.004	25.672	1.021		
24.478	1.025	22.687	1.008	25.672	1.025		
24.478	1.029	22.687	1.013	25.672	1.029		
24.478	1.033	22.687	1.017				
24.478	1.038	22.687	1.021				
24.478	1.042	22.687	1.025				
24.478	1.046	22.687	1.029				
24.478	1.050	22.687	1.033				
24.478	1.054	22.687	1.038				
24.478	1.058	22.687	1.042				
24.478	1.063	22.687	1.046				
24.478	1.067	22.687	1.050				
24.478	1.071	22.687	1.054				
24.478	1.075	22.687	1.058				
24.478	1.079	22.687	1.063				
24.478	1.083	22.687	1.067				
24.478	1.088	22.687	1.071				
24.478	1.092	22.687	1.075				
24.478	1.096	22.687	1.079				
24.478	1.100	22.687	1.083				
24.478	1.104	22.687	1.088				
24.478	1.108	22.687	1.092				
24.478	1.113	22.687	1.096				
24.478	1.117	22.687	1.100				
24.478	1.121	22.687	1.104				
24.627	1.125	22.687	1.108				
24.627	1.129	22.687	1.113				
24.627	1.133	22.687	1.117				
24.627	1.138	22.687	1.121				
24.627	1.142	22.836	1.125				

24.627	1.146	22.687	1.129				
24.627	1.150	22.836	1.133				
24.627	1.154	22.836	1.138				
24.627	1.158	22.836	1.142				
24.627	1.163	22.836	1.146				
24.627	1.167	22.836	1.150				
24.627	1.171	22.836	1.154				
24.627	1.175	22.836	1.158				
24.627	1.179	22.836	1.163				
24.627	1.183	22.836	1.167				
24.478	1.188	22.836	1.171				
24.478	1.192	22.836	1.175				
24.478	1.196	22.836	1.179				
24.478	1.200	22.836	1.183				
24.478	1.204	22.836	1.188				
24.478	1.208	22.836	1.192				
24.627	1.213	22.836	1.196				
24.627	1.217	22.836	1.200				
24.627	1.221	22.836	1.204				
24.627	1.225	22.836	1.208				
24.627	1.229	22.836	1.213				
24.627	1.233	22.836	1.217				
24.627	1.238	22.836	1.221				
24.627	1.242	22.836	1.225				
24.627	1.246	22.836	1.229				
24.627	1.250	22.836	1.233				
24.627	1.254	22.836	1.238				
24.627	1.258	22.836	1.242				
24.627	1.263	22.836	1.246				
24.627	1.267	22.836	1.250				
24.627	1.271	22.836	1.254				
24.627	1.275	22.836	1.258				
24.627	1.279	22.836	1.263				
24.627	1.283	22.836	1.267				
24.627	1.288	22.836	1.271				
24.627	1.292	22.836	1.275				
24.627	1.296	22.836	1.279				
24.627	1.300	22.836	1.283				
24.627	1.304	22.836	1.288				
24.627	1.308	22.836	1.292				
24.627	1.313	22.836	1.296				
24.627	1.317	22.836	1.300				
24.627	1.321	22.836	1.304				
24.627	1.325	22.836	1.308				
24.627	1.329	22.836	1.313				
24.627	1.333	22.836	1.317				
24.627	1.338	22.836	1.321				
24.627	1.342	22.836	1.325				
24.627	1.346	22.836	1.329				
24.627	1.350	22.836	1.333				
24.627	1.354	22.836	1.338				
24.627	1.358	22.836	1.342				
24.627	1.363	22.836	1.346				
24.627	1.367	22.836	1.350				
24.627	1.371	22.836	1.354				
24.627	1.375	22.836	1.358				

24.627	1.379	22.836	1.363				
24.627	1.383	22.836	1.367				
24.627	1.388	22.836	1.371				
24.627	1.392	22.836	1.375				
24.627	1.396	22.836	1.379				
24.627	1.400	22.836	1.383				
24.627	1.404	22.836	1.388				
24.627	1.408	22.836	1.392				
24.627	1.413	22.836	1.396				
24.627	1.417	22.836	1.400				
24.627	1.421	22.985	1.404				
24.627	1.425	22.836	1.408				
24.627	1.429	22.836	1.413				
24.627	1.433	22.985	1.417				
24.627	1.438	22.985	1.421				
24.627	1.442	22.985	1.425				
24.627	1.446	22.985	1.429				
24.627	1.450	22.985	1.433				
24.627	1.454	22.985	1.438				
24.627	1.458	22.985	1.442				
24.627	1.463	22.985	1.446				
24.627	1.467	22.985	1.450				
24.627	1.471	22.985	1.454				
24.478	1.475	22.985	1.458				
24.478	1.479	22.985	1.463				
24.478	1.483	22.985	1.467				
24.478	1.488	22.985	1.471				
24.478	1.492	22.985	1.475				
24.478	1.496	22.985	1.479				
24.478	1.500	22.985	1.483				
24.478	1.504	22.985	1.488				
24.627	1.508	22.985	1.492				
24.478	1.513	22.985	1.496				
24.478	1.517	22.985	1.500				
24.478	1.521	22.985	1.504				
24.478	1.525	22.985	1.508				
24.478	1.529	22.985	1.513				
24.478	1.533	22.985	1.517				
24.478	1.538	22.985	1.521				
24.478	1.542	22.985	1.525				
24.478	1.546	22.985	1.529				
24.478	1.550	22.985	1.533				
24.478	1.554	22.985	1.538				
24.478	1.558	22.985	1.542				
24.478	1.563	22.985	1.546				
24.478	1.567	22.985	1.550				
24.478	1.571	22.985	1.554				
24.478	1.575	22.985	1.558				
24.478	1.579	22.985	1.563				
24.478	1.583	22.985	1.567				
24.478	1.588	22.985	1.571				
24.478	1.592	22.985	1.575				
24.478	1.596	22.985	1.579				
24.478	1.600	22.985	1.583				
24.478	1.604	22.985	1.588				
24.478	1.608	22.985	1.592				

24.478	1.613	22.985	1.596				
24.478	1.617	22.985	1.600				
24.478	1.621	22.985	1.604				
24.478	1.625	22.985	1.608				
24.478	1.629	22.985	1.613				
24.478	1.633	22.985	1.617				
24.478	1.638	22.985	1.621				
24.478	1.642	22.985	1.625				
24.478	1.646	22.985	1.629				
24.478	1.650	22.985	1.633				
24.478	1.654	22.985	1.638				
24.478	1.658	22.985	1.642				
24.478	1.663	22.985	1.646				
24.478	1.667	22.985	1.650				
24.478	1.671	22.985	1.654				
24.478	1.675	22.985	1.658				
24.478	1.679	22.985	1.663				
24.478	1.683	22.985	1.667				
24.478	1.688	22.985	1.671				
24.478	1.692	22.985	1.675				
24.478	1.696	22.985	1.679				
24.478	1.700	22.985	1.683				
24.478	1.704	22.985	1.688				
24.478	1.708	22.985	1.692				
24.478	1.713	22.985	1.696				
24.478	1.717	22.985	1.700				
24.478	1.721	22.985	1.704				
24.478	1.725	22.985	1.708				
24.478	1.729	22.985	1.713				
24.478	1.733	22.985	1.717				
24.478	1.738	22.985	1.721				
24.478	1.742	22.985	1.725				
24.478	1.746	22.985	1.729				
24.478	1.750	22.985	1.733				
24.478	1.754	22.985	1.738				
24.478	1.758	22.985	1.742				
24.478	1.763	22.985	1.746				
24.478	1.767	22.985	1.750				
24.478	1.771	22.985	1.754				
24.478	1.775	22.985	1.758				
24.478	1.779	22.985	1.763				
24.478	1.783	22.985	1.767				
24.478	1.788	22.985	1.771				
24.478	1.792	22.985	1.775				
24.478	1.796	22.985	1.779				
24.478	1.800	22.985	1.783				
24.478	1.804	22.985	1.788				
24.478	1.808	22.985	1.792				
24.478	1.813	22.985	1.796				
24.478	1.817	22.985	1.800				
24.478	1.821	22.985	1.804				
24.478	1.825	22.985	1.808				
24.478	1.829	23.134	1.813				
24.478	1.833	22.985	1.817				
24.478	1.838	23.134	1.821				
24.478	1.842	22.985	1.825				

24.478	1.846	22.985	1.829				
24.478	1.850	22.985	1.833				
24.478	1.854	22.985	1.838				
24.478	1.858	22.985	1.842				
24.478	1.863	22.985	1.846				
24.478	1.867	22.985	1.850				
24.478	1.871	23.134	1.854				
24.478	1.875	22.985	1.858				
24.478	1.879	23.134	1.863				
24.478	1.883	23.134	1.867				
24.478	1.888	23.134	1.871				
24.478	1.892	23.134	1.875				
24.478	1.896	23.134	1.879				
24.478	1.900	23.134	1.883				
24.478	1.904	23.134	1.888				
24.478	1.908	23.134	1.892				
24.478	1.913	23.134	1.896				
24.478	1.917	23.134	1.900				
24.478	1.921	23.134	1.904				
24.478	1.925	23.134	1.908				
24.478	1.929	23.134	1.913				
24.478	1.933	23.134	1.917				
24.478	1.938	23.134	1.921				
24.478	1.942	23.134	1.925				
24.478	1.946	23.134	1.929				
24.478	1.950	23.134	1.933				
24.478	1.954	23.134	1.938				
24.478	1.958	23.134	1.942				
24.478	1.963	23.134	1.946				
24.328	1.967	23.134	1.950				
24.328	1.971	23.134	1.954				
24.328	1.975	23.134	1.958				
24.328	1.979	23.134	1.963				
24.328	1.983	23.134	1.967				
24.328	1.988	23.134	1.971				
24.328	1.992	23.134	1.975				
24.328	1.996	23.134	1.979				
24.328	2.000	23.134	1.983				
24.328	2.004	23.134	1.988				
24.328	2.008	23.134	1.992				
24.328	2.013	23.134	1.996				
24.328	2.017	23.134	2.000				
24.328	2.021	23.134	2.004				
24.328	2.025	23.134	2.008				
24.478	2.029	23.134	2.013				
24.328	2.033	23.134	2.017				
24.478	2.038	23.134	2.021				
24.478	2.042	23.134	2.025				
24.478	2.046	23.134	2.029				
24.478	2.050	23.134	2.033				
24.328	2.054	23.134	2.038				
24.328	2.058	23.134	2.042				
24.328	2.063	23.134	2.046				
24.478	2.067	23.134	2.050				
24.478	2.071	23.134	2.054				
24.478	2.075	23.134	2.058				

24.478	2.079	23.134	2.063				
24.478	2.083	23.134	2.067				
24.478	2.088	23.134	2.071				
24.478	2.092	23.134	2.075				
24.478	2.096	23.134	2.079				
24.478	2.100	23.134	2.083				
24.478	2.104	23.134	2.088				
24.478	2.108	23.134	2.092				
24.478	2.113	23.134	2.096				
24.478	2.117	23.134	2.100				
24.478	2.121	23.134	2.104				
24.478	2.125	23.134	2.108				
24.478	2.129	23.134	2.113				
24.478	2.133	23.134	2.117				
24.478	2.138	23.134	2.121				
24.478	2.142	23.284	2.125				
24.478	2.146	23.134	2.129				
24.478	2.150	23.134	2.133				
24.478	2.154	23.134	2.138				
24.478	2.158	23.134	2.142				
24.478	2.163	23.284	2.146				
24.478	2.167	23.284	2.150				
24.478	2.171	23.134	2.154				
24.627	2.175	23.134	2.158				
24.627	2.179	23.284	2.163				
24.627	2.183	23.284	2.167				
24.627	2.188	23.284	2.171				
24.627	2.192	23.284	2.175				
24.627	2.196	23.284	2.179				
24.627	2.200	23.284	2.183				
24.627	2.204	23.284	2.188				
24.627	2.208	23.284	2.192				
24.627	2.213	23.284	2.196				
24.627	2.217	23.284	2.200				
24.627	2.221	23.284	2.204				
24.627	2.225	23.284	2.208				
24.627	2.229	23.284	2.213				
24.627	2.233	23.284	2.217				
24.627	2.238	23.284	2.221				
24.627	2.242	23.284	2.225				
24.627	2.246	23.284	2.229				
24.627	2.250	23.284	2.233				
24.627	2.254	23.284	2.238				
24.627	2.258	23.284	2.242				
24.627	2.263	23.284	2.246				
24.627	2.267	23.284	2.250				
24.627	2.271	23.284	2.254				
24.627	2.275	23.284	2.258				
24.627	2.279	23.284	2.263				
24.627	2.283	23.284	2.267				
24.627	2.288	23.284	2.271				
24.627	2.292	23.284	2.275				
24.627	2.296	23.284	2.279				
24.627	2.300	23.284	2.283				
24.627	2.304	23.284	2.288				
24.627	2.308	23.284	2.292				

24.627	2.313	23.284	2.296				
24.627	2.317	23.284	2.300				
24.627	2.321	23.284	2.304				
24.776	2.325	23.284	2.308				
24.627	2.329	23.284	2.313				
24.627	2.333	23.284	2.317				
24.627	2.338	23.284	2.321				
24.627	2.342	23.284	2.325				
24.627	2.346	23.284	2.329				
24.627	2.350	23.284	2.333				
24.627	2.354	23.284	2.338				
24.776	2.358	23.284	2.342				
24.776	2.363	23.284	2.346				
24.776	2.367	23.284	2.350				
24.776	2.371	23.284	2.354				
24.776	2.375	23.284	2.358				
24.776	2.379	23.284	2.363				
24.776	2.383	23.284	2.367				
24.776	2.388	23.284	2.371				
24.776	2.392	23.284	2.375				
24.776	2.396	23.284	2.379				
24.776	2.400	23.284	2.383				
24.776	2.404	23.284	2.388				
24.776	2.408	23.284	2.392				
24.776	2.413	23.284	2.396				
24.776	2.417	23.284	2.400				
24.776	2.421	23.284	2.404				
24.776	2.425	23.284	2.408				
24.776	2.429	23.284	2.413				
24.776	2.433	23.284	2.417				
24.776	2.438	23.284	2.421				
24.776	2.442	23.284	2.425				
24.776	2.446	23.284	2.429				
24.776	2.450	23.284	2.433				
24.776	2.454	23.284	2.438				
24.776	2.458	23.284	2.442				
24.776	2.463	23.284	2.446				
24.776	2.467	23.284	2.450				
24.776	2.471	23.284	2.454				
24.776	2.475	23.284	2.458				
24.776	2.479	23.284	2.463				
24.776	2.483	23.284	2.467				
24.776	2.488	23.284	2.471				
24.776	2.492	23.284	2.475				
24.776	2.496	23.284	2.479				
24.776	2.500	23.284	2.483				
24.776	2.504	23.284	2.488				
24.776	2.508	23.284	2.492				
24.776	2.513	23.284	2.496				
24.776	2.517	23.284	2.500				
24.776	2.521	23.284	2.504				
24.776	2.525	23.284	2.508				
24.776	2.529	23.284	2.513				
24.776	2.533	23.284	2.517				
24.776	2.538	23.284	2.521				
24.776	2.542	23.284	2.525				

24.776	2.546	23.284	2.529				
24.776	2.550	23.284	2.533				
24.776	2.554	23.284	2.538				
24.776	2.558	23.284	2.542				
24.776	2.563	23.284	2.546				
24.776	2.567	23.284	2.550				
24.776	2.571	23.284	2.554				
24.776	2.575	23.284	2.558				
24.776	2.579	23.284	2.563				
24.776	2.583	23.284	2.567				
24.776	2.588	23.284	2.571				
24.776	2.592	23.284	2.575				
24.776	2.596	23.284	2.579				
24.776	2.600	23.284	2.583				
24.776	2.604	23.284	2.588				
24.776	2.608	23.284	2.592				
24.776	2.613	23.433	2.596				
24.776	2.617	23.284	2.600				
24.776	2.621	23.284	2.604				
24.776	2.625	23.433	2.608				
24.776	2.629	23.433	2.613				
24.776	2.633	23.433	2.617				
24.776	2.638	23.433	2.621				
24.776	2.642	23.433	2.625				
24.776	2.646	23.433	2.629				
24.776	2.650	23.433	2.633				
24.776	2.654	23.433	2.638				
24.776	2.658	23.433	2.642				
24.776	2.663	23.433	2.646				
24.776	2.667	23.433	2.650				
24.776	2.671	23.433	2.654				
24.776	2.675	23.433	2.658				
24.776	2.679	23.433	2.663				
24.776	2.683	23.433	2.667				
24.776	2.688	23.433	2.671				
24.776	2.692	23.433	2.675				
24.776	2.696	23.433	2.679				
24.776	2.700	23.433	2.683				
24.776	2.704	23.433	2.688				
24.776	2.708	23.433	2.692				
24.776	2.713	23.433	2.696				
24.776	2.717	23.433	2.700				
24.776	2.721	23.433	2.704				
24.776	2.725	23.433	2.708				
24.776	2.729	23.433	2.713				
24.776	2.733	23.433	2.717				
24.776	2.738	23.433	2.721				
24.776	2.742	23.433	2.725				
24.776	2.746	23.433	2.729				
24.776	2.750	23.433	2.733				
24.776	2.754	23.433	2.738				
24.776	2.758	23.433	2.742				
24.925	2.763	23.433	2.746				
24.776	2.767	23.433	2.750				
24.925	2.771	23.433	2.754				
24.776	2.775	23.433	2.758				

24.776	2.779	23.433	2.763				
24.776	2.783	23.433	2.767				
24.776	2.788	23.433	2.771				
24.776	2.792	23.433	2.775				
24.776	2.796	23.433	2.779				
24.776	2.800	23.433	2.783				
24.776	2.804	23.433	2.788				
24.776	2.808	23.433	2.792				
24.925	2.813	23.433	2.796				
24.776	2.817	23.433	2.800				
24.925	2.821	23.433	2.804				
24.925	2.825	23.433	2.808				
24.925	2.829	23.433	2.813				
24.925	2.833	23.433	2.817				
24.925	2.838	23.433	2.821				
24.925	2.842	23.433	2.825				
24.925	2.846	23.433	2.829				
24.925	2.850	23.433	2.833				
24.925	2.854	23.433	2.838				
24.925	2.858	23.433	2.842				
24.925	2.863	23.433	2.846				
24.925	2.867	23.433	2.850				
24.925	2.871	23.433	2.854				
24.925	2.875	23.433	2.858				
24.925	2.879	23.433	2.863				
24.925	2.883	23.433	2.867				
24.925	2.888	23.433	2.871				
24.925	2.892	23.433	2.875				
24.925	2.896	23.433	2.879				
24.925	2.900	23.433	2.883				
24.925	2.904	23.433	2.888				
24.925	2.908	23.433	2.892				
24.925	2.913	23.433	2.896				
24.925	2.917	23.433	2.900				
24.925	2.921	23.433	2.904				
24.925	2.925	23.433	2.908				
24.925	2.929	23.433	2.913				
24.925	2.933	23.433	2.917				
24.925	2.938	23.433	2.921				
24.925	2.942	23.433	2.925				
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24.776	2.963	23.433	2.946				
24.776	2.967	23.433	2.950				
24.776	2.971	23.433	2.954				
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24.776	2.979	23.433	2.963				
24.776	2.983	23.433	2.967				
24.776	2.988	23.433	2.971				
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24.776	2.996	23.433	2.979				
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24.776	3.079	23.433	3.063				
24.925	3.083	23.582	3.067				
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24.925	3.092	23.582	3.075				
24.925	3.096	23.582	3.079				
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24.925	3.133	23.433	3.117				
24.925	3.138	23.582	3.121				
24.925	3.142	23.582	3.125				
24.925	3.146	23.582	3.129				
24.925	3.150	23.582	3.133				
24.925	3.154	23.582	3.138				
24.925	3.158	23.582	3.142				
24.925	3.163	23.582	3.146				
24.925	3.167	23.582	3.150				
24.925	3.171	23.582	3.154				
24.925	3.175	23.582	3.158				
24.925	3.179	23.582	3.163				
24.925	3.183	23.582	3.167				
24.925	3.188	23.582	3.171				
24.925	3.192	23.582	3.175				
24.776	3.196	23.582	3.179				
24.925	3.200	23.582	3.183				
24.925	3.204	23.582	3.188				
24.776	3.208	23.582	3.192				
24.925	3.213	23.582	3.196				
24.925	3.217	23.582	3.200				
24.776	3.221	23.582	3.204				
24.776	3.225	23.582	3.208				
24.776	3.229	23.582	3.213				
24.776	3.233	23.582	3.217				
24.776	3.238	23.582	3.221				
24.776	3.242	23.582	3.225				

24.776	3.246	23.582	3.229				
24.925	3.250	23.582	3.233				
24.925	3.254	23.582	3.238				
24.925	3.258	23.582	3.242				
24.776	3.263	23.582	3.246				
24.776	3.267	23.582	3.250				
24.776	3.271	23.582	3.254				
24.925	3.275	23.582	3.258				
24.776	3.279	23.582	3.263				
24.776	3.283	23.582	3.267				
24.776	3.288	23.582	3.271				
24.925	3.292	23.582	3.275				
24.925	3.296	23.582	3.279				
24.776	3.300	23.582	3.283				
24.776	3.304	23.582	3.288				
24.776	3.308	23.582	3.292				
24.776	3.313	23.582	3.296				
24.925	3.317	23.582	3.300				
24.925	3.321	23.582	3.304				
24.776	3.325	23.582	3.308				
24.776	3.329	23.582	3.313				
24.776	3.333	23.582	3.317				
24.776	3.338	23.582	3.321				
24.776	3.342	23.582	3.325				
24.776	3.346	23.582	3.329				
24.925	3.350	23.582	3.333				
24.925	3.354	23.582	3.338				
24.776	3.358	23.582	3.342				
24.776	3.363	23.582	3.346				
24.776	3.367	23.582	3.350				
24.925	3.371	23.582	3.354				
24.776	3.375	23.582	3.358				
24.925	3.379	23.582	3.363				
24.925	3.383	23.582	3.367				
24.925	3.388	23.582	3.371				
24.925	3.392	23.582	3.375				
24.925	3.396	23.582	3.379				
24.925	3.400	23.582	3.383				
24.776	3.404	23.582	3.388				
24.776	3.408	23.582	3.392				
24.776	3.413	23.582	3.396				
24.776	3.417	23.582	3.400				
24.776	3.421	23.582	3.404				
24.776	3.425	23.582	3.408				
24.776	3.429	23.582	3.413				
24.776	3.433	23.582	3.417				
24.776	3.438	23.582	3.421				
24.776	3.442	23.582	3.425				
24.776	3.446	23.582	3.429				
24.776	3.450	23.582	3.433				
24.776	3.454	23.582	3.438				
24.776	3.458	23.582	3.442				
24.776	3.463	23.582	3.446				
24.776	3.467	23.582	3.450				
24.776	3.471	23.582	3.454				
24.776	3.475	23.582	3.458				

24.776	3.479	23.582	3.463				
24.776	3.483	23.582	3.467				
24.776	3.488	23.582	3.471				
24.776	3.492	23.582	3.475				
24.776	3.496	23.582	3.479				
24.776	3.500	23.582	3.483				
24.776	3.504	23.582	3.488				
24.776	3.508	23.582	3.492				
24.776	3.513	23.582	3.496				
24.776	3.517	23.582	3.500				
24.776	3.521	23.582	3.504				
24.776	3.525	23.582	3.508				
24.776	3.529	23.582	3.513				
24.776	3.533	23.582	3.517				
24.776	3.538	23.582	3.521				
24.776	3.542	23.582	3.525				
24.776	3.546	23.582	3.529				
24.776	3.550	23.582	3.533				
24.776	3.554	23.582	3.538				
24.776	3.558	23.582	3.542				
24.776	3.563	23.582	3.546				
24.776	3.567	23.582	3.550				
24.776	3.571	23.582	3.554				
24.776	3.575	23.582	3.558				
24.776	3.579	23.582	3.563				
24.776	3.583	23.582	3.567				
24.776	3.588	23.582	3.571				
24.776	3.592	23.582	3.575				
24.776	3.596	23.582	3.579				
24.776	3.600	23.582	3.583				
24.776	3.604	23.731	3.588				
24.776	3.608	23.731	3.592				
24.776	3.613	23.582	3.596				
24.776	3.617	23.582	3.600				
24.776	3.621	23.731	3.604				
24.776	3.625	23.731	3.608				
24.776	3.629	23.731	3.613				
24.776	3.633	23.731	3.617				
24.925	3.638	23.582	3.621				
24.925	3.642	23.582	3.625				
24.925	3.646	23.582	3.629				
24.776	3.650	23.731	3.633				
24.925	3.654	23.582	3.638				
24.925	3.658	23.731	3.642				
24.925	3.663	23.582	3.646				
24.925	3.667	23.582	3.650				
24.925	3.671	23.582	3.654				
24.925	3.675	23.731	3.658				
24.925	3.679	23.582	3.663				
24.925	3.683	23.731	3.667				
24.925	3.688	23.731	3.671				
24.925	3.692	23.582	3.675				
24.925	3.696	23.731	3.679				
24.925	3.700	23.731	3.683				
24.925	3.704	23.731	3.688				
24.925	3.708	23.731	3.692				

24.925	3.713	23.731	3.696				
24.925	3.717	23.731	3.700				
24.925	3.721	23.731	3.704				
24.925	3.725	23.731	3.708				
24.925	3.729	23.731	3.713				
24.925	3.733	23.731	3.717				
24.925	3.738	23.731	3.721				
24.925	3.742	23.731	3.725				
24.925	3.746	23.731	3.729				
24.925	3.750	23.731	3.733				
24.925	3.754	23.731	3.738				
24.925	3.758	23.731	3.742				
24.925	3.763	23.731	3.746				
24.925	3.767	23.731	3.750				
24.925	3.771	23.731	3.754				
24.925	3.775	23.731	3.758				
24.925	3.779	23.731	3.763				
24.925	3.783	23.731	3.767				
24.925	3.788	23.731	3.771				
24.925	3.792	23.731	3.775				
24.925	3.796	23.731	3.779				
24.925	3.800	23.731	3.783				
24.925	3.804	23.731	3.788				
24.925	3.808	23.731	3.792				
24.925	3.813	23.731	3.796				
24.925	3.817	23.731	3.800				
24.925	3.821	23.731	3.804				
24.925	3.825	23.731	3.808				
24.925	3.829	23.731	3.813				
24.925	3.833	23.731	3.817				
24.925	3.838	23.731	3.821				
24.925	3.842	23.731	3.825				
24.925	3.846	23.881	3.829				
24.925	3.850	23.731	3.833				
24.925	3.854	23.731	3.838				
24.925	3.858	23.731	3.842				
24.925	3.863	23.731	3.846				
24.925	3.867	23.731	3.850				
24.925	3.871	23.731	3.854				
24.925	3.875	23.731	3.858				
24.925	3.879	23.731	3.863				
24.925	3.883	23.731	3.867				
24.925	3.888	23.731	3.871				
24.925	3.892	23.731	3.875				
24.925	3.896	23.731	3.879				
24.925	3.900	23.731	3.883				
24.925	3.904	23.731	3.888				
24.925	3.908	23.731	3.892				
24.925	3.913	23.731	3.896				
24.925	3.917	23.731	3.900				
24.925	3.921	23.731	3.904				
24.925	3.925	23.881	3.908				
24.925	3.929	23.881	3.913				
24.925	3.933	23.881	3.917				
24.925	3.938	23.881	3.921				
24.925	3.942	23.881	3.925				

24.925	3.946	23.881	3.929				
24.925	3.950	23.881	3.933				
24.925	3.954	23.881	3.938				
24.925	3.958	23.881	3.942				
24.925	3.963	23.881	3.946				
24.925	3.967	23.881	3.950				
24.925	3.971	23.881	3.954				
24.925	3.975	23.881	3.958				
25.075	4.000	23.881	3.963				
25.821	8.000	23.881	3.967				
26.418	12.000	23.881	3.971				
27.164	16.000	23.881	3.975				
27.164	20.000	23.881	3.979				
27.164	24.000	23.881	3.983				
		23.881	3.988				
		23.881	3.992				
		23.881	3.996				
		23.881	4.000				
		23.881	4.004				
		23.881	4.008				
		23.881	4.013				
		23.881	4.017				
		23.881	4.021				
		24.030	4.025				
		24.030	4.029				
		24.030	4.033				
		24.030	4.038				
		24.030	4.042				
		24.030	4.046				
		24.030	4.050				
		24.030	4.054				
		24.030	4.058				
		24.030	4.063				
		24.030	4.067				
		24.030	4.071				
		24.030	4.075				
		24.030	4.079				
		24.030	4.083				
		24.030	4.088				
		24.030	4.092				
		24.030	4.096				
		24.179	4.100				
		24.179	4.104				
		24.179	4.108				
		24.179	4.113				
		24.179	4.117				
		24.179	4.121				
		24.179	4.125				
		24.179	4.129				
		24.179	4.133				
		24.179	4.138				
		24.179	4.142				
		24.179	4.146				
		24.179	4.150				
		24.179	4.154				
		24.179	4.158				

		24.328	4.163				
		24.328	4.167				
		24.328	4.171				
		24.328	4.175				
		24.328	4.179				
		24.328	4.183				
		24.328	4.188				
		24.328	4.192				
		24.328	4.196				
		24.328	4.200				
		24.328	4.204				
		24.328	4.208				
		24.328	4.213				
		24.328	4.217				
		24.328	4.221				
		24.328	4.225				
		24.478	4.229				
		24.478	4.233				
		24.478	4.238				
		24.478	4.242				
		24.478	4.246				
		24.478	4.250				
		24.478	4.254				
		24.478	4.258				
		24.478	4.263				
		24.478	4.267				
		24.478	4.271				
		24.478	4.275				
		24.478	4.279				
		24.478	4.283				
		24.478	4.288				
		24.478	4.292				
		24.627	4.296				
		24.627	4.300				
		24.627	4.304				
		24.627	4.308				
		24.627	4.313				
		24.627	4.317				
		24.627	4.321				
		24.627	4.325				
		24.627	4.329				
		24.627	4.333				
		24.627	4.338				
		24.627	4.342				
		24.627	4.346				
		24.627	4.350				
		24.627	4.354				
		24.627	4.358				
		24.627	4.363				
		24.627	4.367				
		24.776	4.371				
		24.776	4.375				
		24.776	4.379				
		24.776	4.383				
		24.776	4.388				
		24.776	4.392				

		24.776	4.396				
		24.776	4.400				
		24.776	4.404				
		24.776	4.408				
		24.776	4.413				
		24.776	4.417				
		24.776	4.421				
		24.776	4.425				
		24.776	4.429				
		24.776	4.433				
		24.776	4.438				
		24.776	4.442				
		24.776	4.446				
		24.776	4.450				
		24.925	4.454				
		24.925	4.458				
		24.925	4.463				
		24.925	4.467				
		24.925	4.471				
		24.925	4.475				
		24.925	4.479				
		24.925	4.483				
		24.925	4.488				
		24.925	4.492				
		24.925	4.496				
		24.925	4.500				
		24.925	4.504				
		24.925	4.508				
		24.925	4.513				
		24.925	4.517				
		24.925	4.521				
		24.925	4.525				
		25.075	4.529				
		25.075	4.533				
		25.075	4.538				
		25.075	4.542				
		25.075	4.546				
		25.075	4.550				
		25.075	4.554				
		25.075	4.558				
		25.075	4.563				
		25.075	4.567				
		25.075	4.571				
		25.075	4.575				
		25.075	4.579				
		25.075	4.583				
		25.075	4.588				
		25.075	4.592				
		25.075	4.596				
		25.075	4.600				
		25.075	4.604				
		25.075	4.608				
		25.075	4.613				
		25.075	4.617				
		25.075	4.621				
		25.075	4.625				

		25.075	4.629				
		25.075	4.633				
		25.075	4.638				
		25.075	4.642				
		25.075	4.646				
		25.075	4.650				
		25.075	4.654				
		25.075	4.658				
		25.075	4.663				
		25.075	4.667				
		25.075	4.671				
		25.075	4.675				
		25.075	4.679				
		25.224	4.683				
		25.224	4.688				
		25.224	4.692				
		25.224	4.696				
		25.224	4.700				
		25.224	4.704				
		25.224	4.708				
		25.224	4.713				
		25.224	4.717				
		25.224	4.721				
		25.224	4.725				
		25.224	4.729				
		25.224	4.733				
		25.224	4.738				
		25.224	4.742				
		25.224	4.746				
		25.373	4.750				
		25.373	4.754				
		25.373	4.758				
		25.373	4.763				
		25.373	4.767				
		25.373	4.771				
		25.373	4.775				
		25.373	4.779				
		25.373	4.783				
		25.373	4.788				
		25.373	4.792				
		25.373	4.796				
		25.373	4.800				
		25.373	4.804				
		25.373	4.808				
		25.522	4.813				
		25.522	4.817				
		25.522	4.821				
		25.522	4.825				
		25.522	4.829				
		25.522	4.833				
		25.522	4.838				
		25.522	4.842				
		25.522	4.846				
		25.522	4.850				
		25.522	4.854				
		25.522	4.858				

		25.522	4.863				
		25.522	4.867				
		25.522	4.871				
		25.522	4.875				
		25.522	4.879				
		25.522	4.883				
		25.522	4.888				
		25.522	4.892				
		25.522	4.896				
		25.522	4.900				
		25.522	4.904				
		25.522	4.908				
		25.522	4.913				
		25.522	4.917				
		25.522	4.921				
		25.522	4.925				
		25.522	4.929				
		25.522	4.933				
		25.522	4.938				
		25.672	4.942				
		25.672	4.946				
		25.672	4.950				
		25.672	4.954				
		25.672	4.958				
		25.672	4.963				
		25.672	4.967				
		25.672	4.971				
		25.672	4.975				
		25.672	4.979				
		25.672	4.983				
		25.672	4.988				
		25.672	4.992				
		25.672	4.996				
		25.672	5.000				
		25.672	5.004				
		25.672	5.008				
		25.672	5.013				
		25.672	5.017				
		25.821	5.021				
		25.821	5.025				
		25.821	5.029				
		25.821	5.033				
		25.821	5.038				
		25.821	5.042				
		25.821	5.046				
		25.821	5.050				
		25.821	5.054				
		25.821	5.058				
		25.821	5.063				
		25.821	5.067				
		25.821	5.071				
		25.821	5.075				
		25.821	5.079				
		25.821	5.083				
		25.821	5.088				
		25.821	5.092				

		25.821	5.096				
		25.821	5.100				
		25.821	5.104				
		25.821	5.108				
		25.821	5.113				
		25.821	5.117				
		25.821	5.121				
		25.821	5.125				
		25.821	5.129				
		25.821	5.133				
		25.821	5.138				
		25.821	5.142				
		25.821	5.146				
		25.821	5.150				
		25.821	5.154				
		25.821	5.158				
		25.821	5.163				
		25.821	5.167				
		25.821	5.171				
		25.821	5.175				
		25.821	5.179				
		25.821	5.183				
		25.821	5.188				
		25.821	5.192				
		25.821	5.196				
		25.821	5.200				
		25.821	5.204				
		25.821	5.208				
		25.821	5.213				
		25.821	5.217				
		25.821	5.221				
		25.821	5.225				
		25.821	5.229				
		25.821	5.233				
		25.821	5.238				
		25.821	5.242				
		25.821	5.246				
		25.821	5.250				
		25.821	5.254				
		25.821	5.258				
		25.821	5.263				
		25.821	5.267				
		25.821	5.271				
		25.821	5.275				
		25.821	5.279				
		25.821	5.283				
		25.821	5.288				
		25.821	5.292				
		25.970	5.296				
		25.970	5.300				
		25.970	5.304				
		25.970	5.308				
		25.970	5.313				
		25.970	5.317				
		25.970	5.321				
		25.970	5.325				

		25.970	5.329				
		25.970	5.333				
		25.970	5.338				
		25.970	5.342				
		25.970	5.346				
		25.970	5.350				
		25.970	5.354				
		25.970	5.358				
		25.970	5.363				
		25.970	5.367				
		25.970	5.371				
		26.119	5.375				
		26.119	5.379				
		26.119	5.383				
		26.119	5.388				
		26.119	5.392				
		26.119	5.396				
		26.119	5.400				
		26.119	5.404				
		26.119	5.408				
		26.119	5.413				
		26.119	5.417				
		26.119	5.421				
		26.119	5.425				
		26.119	5.429				
		26.119	5.433				
		26.119	5.438				
		26.119	5.442				
		26.119	5.446				
		26.119	5.450				
		26.119	5.454				
		26.119	5.458				
		26.119	5.463				
		26.119	5.467				
		26.119	5.471				
		26.119	5.475				
		26.119	5.479				
		26.119	5.483				
		26.119	5.488				
		26.119	5.492				
		26.269	5.496				
		26.269	5.500				
		26.269	5.504				
		26.269	5.508				
		26.269	5.513				
		26.269	5.517				
		26.269	5.521				
		26.269	5.525				
		26.269	5.529				
		26.269	5.533				
		26.269	5.538				
		26.269	5.542				
		26.269	5.546				
		26.269	5.550				
		26.269	5.554				
		26.269	5.558				

		26.269	5.563				
		26.269	5.567				
		26.269	5.571				
		26.269	5.575				
		26.269	5.579				
		26.269	5.583				
		26.269	5.588				
		26.269	5.592				
		26.716	8.000				
		27.164	16.000				
		27.164	20.000				
		27.164	24.000				

92% of degree of saturation

50kPa							
Equilibrium stage		Consolidation stage		Shearing stage			
Matric suction/(kPa)	Time/(hr)	Matric suction/(kPa)	Time/(hr)	Matric suction/(kPa)	Time/(hr)	Matric suction/(kPa)	Shear strain/(%)
0.000	0.000	3.134	0.000	3.134	0.000	3.134	0.000
0.448	0.004	2.687	0.000	3.134	0.004	3.134	0.250
1.194	0.008	2.239	0.001	3.134	0.008	3.134	0.500
1.493	0.013	1.642	0.002	3.134	0.013	3.134	0.750
1.642	0.017	1.642	0.003	3.134	0.017	3.134	1.000
1.791	0.021	1.940	0.004	3.134	0.021	3.134	1.250
1.791	0.025	1.940	0.008	3.134	0.025	2.985	1.500
1.940	0.029	1.940	0.013	3.134	0.029	2.836	1.750
1.940	0.033	1.940	0.017	3.134	0.033	2.687	2.000
1.940	0.038	1.940	0.021	3.134	0.038	2.388	2.500
1.940	0.042	1.940	0.025	3.134	0.042	2.388	3.000
1.940	0.046	1.940	0.029	3.134	0.046	2.388	3.500
1.940	0.050	1.940	0.033	3.134	0.050	2.239	4.000
1.940	0.054	1.940	0.038	3.134	0.054	2.090	5.000
1.940	0.058	1.940	0.042	3.134	0.058	2.090	6.000
1.940	0.063	1.940	0.046	3.134	0.063	2.090	7.000
1.940	0.067	1.940	0.050	3.134	0.067	1.940	8.000
1.940	0.071	1.940	0.054	3.134	0.071	1.940	9.000
1.940	0.075	1.940	0.058	3.134	0.075	2.090	10.000
1.940	0.079	1.940	0.063	3.134	0.079	2.090	11.000
1.940	0.083	1.940	0.067	3.134	0.083	2.090	12.000
1.940	0.088	1.940	0.071	3.134	0.088	2.239	13.000
1.940	0.092	1.940	0.075	3.134	0.092	2.388	14.000
1.940	0.096	1.940	0.079	3.134	0.096		
1.940	0.100	1.940	0.083	3.134	0.100		
1.940	0.104	1.940	0.088	3.134	0.104		
1.940	0.108	1.940	0.092	2.985	0.108		
1.940	0.113	1.940	0.096	2.985	0.113		
1.940	0.117	1.940	0.100	2.985	0.117		
1.940	0.121	1.940	0.104	2.985	0.121		
1.940	0.125	1.940	0.108	2.985	0.125		
1.940	0.129	1.940	0.113	2.985	0.129		
1.940	0.133	1.940	0.117	2.985	0.133		
1.940	0.138	1.940	0.121	2.836	0.138		
1.940	0.142	1.940	0.125	2.836	0.142		
1.940	0.146	1.940	0.129	2.836	0.146		
1.940	0.150	1.940	0.133	2.836	0.150		
1.940	0.154	1.940	0.138	2.836	0.154		
1.940	0.158	1.940	0.142	2.687	0.158		
2.090	0.163	1.940	0.146	2.687	0.163		
1.940	0.167	1.940	0.150	2.687	0.167		
1.940	0.171	1.940	0.154	2.537	0.171		
2.090	0.175	1.940	0.158	2.537	0.175		
1.940	0.179	1.940	0.163	2.537	0.179		
2.090	0.183	1.940	0.167	2.537	0.183		
2.090	0.188	1.940	0.171	2.537	0.188		
2.090	0.192	2.090	0.175	2.388	0.192		
2.090	0.196	3.284	0.179	2.388	0.196		
2.090	0.200	3.284	0.183	2.388	0.200		
2.090	0.204	1.940	0.188	2.388	0.204		

2.090	0.208	1.940	0.192	2.388	0.208		
2.090	0.213	1.940	0.196	2.388	0.213		
2.090	0.217	1.940	0.200	2.388	0.217		
2.090	0.221	1.940	0.204	2.388	0.221		
2.090	0.225	1.940	0.208	2.388	0.225		
2.090	0.229	1.940	0.213	2.388	0.229		
2.090	0.233	1.940	0.217	2.388	0.233		
2.090	0.238	1.940	0.221	2.388	0.238		
2.090	0.242	1.940	0.225	2.388	0.242		
2.090	0.246	1.940	0.229	2.388	0.246		
2.090	0.250	1.940	0.233	2.388	0.250		
2.090	0.254	1.940	0.238	2.388	0.254		
2.090	0.258	1.940	0.242	2.388	0.258		
2.090	0.263	1.940	0.246	2.388	0.263		
2.090	0.267	1.940	0.250	2.388	0.267		
2.090	0.271	1.940	0.254	2.388	0.271		
2.090	0.275	1.940	0.258	2.388	0.275		
2.090	0.279	1.940	0.263	2.388	0.279		
2.090	0.283	1.940	0.267	2.388	0.283		
2.090	0.288	1.940	0.271	2.239	0.288		
2.090	0.292	1.940	0.275	2.239	0.292		
2.090	0.296	1.940	0.279	2.239	0.296		
2.090	0.300	1.940	0.283	2.239	0.300		
2.090	0.304	1.940	0.288	2.239	0.304		
2.090	0.308	1.940	0.292	2.239	0.308		
2.090	0.313	1.940	0.296	2.239	0.313		
2.090	0.317	1.940	0.300	2.239	0.317		
2.090	0.321	1.940	0.304	2.239	0.321		
2.090	0.325	1.940	0.308	2.239	0.325		
2.090	0.329	1.940	0.313	2.239	0.329		
2.090	0.333	1.940	0.317	2.239	0.333		
2.090	0.338	1.940	0.321	2.239	0.338		
2.090	0.342	1.940	0.325	2.239	0.342		
2.090	0.346	1.940	0.329	2.239	0.346		
2.090	0.350	1.940	0.333	2.239	0.350		
2.090	0.354	1.940	0.338	2.239	0.354		
2.090	0.358	1.940	0.342	2.239	0.358		
2.090	0.363	1.940	0.346	2.239	0.363		
2.090	0.367	1.940	0.350	2.239	0.367		
2.090	0.371	1.940	0.354	2.239	0.371		
2.090	0.375	1.940	0.358	2.239	0.375		
2.090	0.379	1.940	0.363	2.239	0.379		
2.090	0.383	1.940	0.367	2.090	0.383		
2.090	0.388	1.940	0.371	2.090	0.388		
2.090	0.392	1.940	0.375	2.090	0.392		
2.090	0.396	1.940	0.379	2.090	0.396		
2.090	0.400	1.940	0.383	2.090	0.400		
2.090	0.404	1.940	0.388	2.090	0.404		
2.090	0.408	1.940	0.392	2.090	0.408		
2.090	0.413	2.090	0.396	2.090	0.413		
2.239	0.417	1.940	0.400	2.090	0.417		
2.239	0.421	1.940	0.404	2.090	0.421		
2.239	0.425	2.090	0.408	2.090	0.425		
2.239	0.429	2.090	0.413	2.090	0.429		
2.239	0.433	1.940	0.417	2.090	0.433		

2.239	0.438	1.940	0.421	2.090	0.438		
2.239	0.442	1.940	0.425	2.090	0.442		
2.239	0.446	1.940	0.429	2.090	0.446		
2.239	0.450	1.940	0.433	2.090	0.450		
2.239	0.454	1.940	0.438	2.090	0.454		
2.239	0.458	1.940	0.442	2.090	0.458		
2.239	0.463	1.940	0.446	2.090	0.463		
2.239	0.467	1.940	0.450	2.090	0.467		
2.239	0.471	1.940	0.454	2.090	0.471		
2.239	0.475	1.940	0.458	2.090	0.475		
2.239	0.479	2.090	0.463	2.090	0.479		
2.239	0.483	1.940	0.467	2.090	0.483		
2.239	0.488	2.090	0.471	2.090	0.488		
2.239	0.492	2.090	0.475	2.090	0.492		
2.239	0.496	1.940	0.479	2.090	0.496		
2.239	0.500	1.940	0.483	2.090	0.500		
2.239	0.504	1.940	0.488	2.090	0.504		
2.239	0.508	2.090	0.492	2.090	0.508		
2.239	0.513	2.090	0.496	2.090	0.513		
2.239	0.517	2.090	0.500	2.090	0.517		
2.239	0.521	2.090	0.504	2.090	0.521		
2.239	0.525	2.090	0.508	2.090	0.525		
2.239	0.529	2.090	0.513	2.090	0.529		
2.239	0.533	1.940	0.517	2.090	0.533		
2.239	0.538	2.090	0.521	2.090	0.538		
2.239	0.542	2.090	0.525	2.090	0.542		
2.239	0.546	2.090	0.529	2.090	0.546		
2.239	0.550	2.090	0.533	2.090	0.550		
2.239	0.554	2.090	0.538	1.940	0.554		
2.239	0.558	2.090	0.542	2.090	0.558		
2.239	0.563	2.090	0.546	2.090	0.563		
2.239	0.567	2.090	0.550	2.090	0.567		
2.239	0.571	2.090	0.554	1.940	0.571		
2.239	0.575	2.090	0.558	1.940	0.575		
2.239	0.579	2.090	0.563	1.940	0.579		
2.239	0.583	2.090	0.567	1.940	0.583		
2.239	0.588	2.090	0.571	2.090	0.588		
2.239	0.592	2.090	0.575	1.940	0.592		
2.239	0.596	2.090	0.579	1.940	0.596		
2.239	0.600	2.090	0.583	1.940	0.600		
2.239	0.604	2.090	0.588	1.940	0.604		
2.239	0.608	2.090	0.592	1.940	0.608		
2.239	0.613	2.090	0.596	1.940	0.613		
2.239	0.617	2.090	0.600	1.940	0.617		
2.239	0.621	2.090	0.604	1.940	0.621		
2.239	0.625	2.090	0.608	1.940	0.625		
2.239	0.629	2.090	0.613	1.940	0.629		
2.239	0.633	2.090	0.617	1.940	0.633		
2.239	0.638	2.090	0.621	1.940	0.638		
2.239	0.642	2.090	0.625	1.940	0.642		
2.239	0.646	2.090	0.629	1.940	0.646		
2.239	0.650	2.090	0.633	1.940	0.650		
2.239	0.654	2.090	0.638	1.940	0.654		
2.239	0.658	2.090	0.642	1.940	0.658		
2.239	0.663	2.090	0.646	1.940	0.663		

2.239	0.667	2.090	0.650	1.940	0.667		
2.239	0.671	2.090	0.654	1.940	0.671		
2.388	0.675	2.090	0.658	1.940	0.675		
2.239	0.679	2.090	0.663	1.940	0.679		
2.388	0.683	2.090	0.667	1.940	0.683		
2.388	0.688	2.090	0.671	1.940	0.688		
2.388	0.692	2.090	0.675	1.940	0.692		
2.388	0.696	2.090	0.679	1.940	0.696		
2.388	0.700	2.090	0.683	1.940	0.700		
2.388	0.704	2.090	0.688	1.940	0.704		
2.388	0.708	2.090	0.692	1.940	0.708		
2.388	0.713	2.090	0.696	1.940	0.713		
2.388	0.717	2.090	0.700	1.940	0.717		
2.388	0.721	2.090	0.704	1.940	0.721		
2.388	0.725	2.090	0.708	1.940	0.725		
2.388	0.729	2.090	0.713	1.940	0.729		
2.388	0.733	2.090	0.717	1.940	0.733		
2.388	0.738	2.090	0.721	1.940	0.738		
2.388	0.742	2.090	0.725	1.940	0.742		
2.388	0.746	2.090	0.729	1.940	0.746		
2.388	0.750	2.090	0.733	1.940	0.750		
2.388	0.754	2.090	0.738	1.940	0.754		
2.388	0.758	2.090	0.742	1.940	0.758		
2.388	0.763	2.090	0.746	1.940	0.763		
2.388	0.767	2.090	0.750	1.940	0.767		
2.388	0.771	2.090	0.754	1.940	0.771		
2.388	0.775	2.090	0.758	1.940	0.775		
2.388	0.779	2.090	0.763	1.940	0.779		
2.388	0.783	2.090	0.767	1.940	0.783		
2.388	0.788	2.090	0.771	1.940	0.788		
2.388	0.792	2.090	0.775	1.940	0.792		
2.388	0.796	2.090	0.779	2.090	0.796		
2.388	0.800	2.090	0.783	2.090	0.800		
2.388	0.804	2.090	0.788	2.090	0.804		
2.388	0.808	2.090	0.792	2.090	0.808		
2.388	0.813	2.090	0.796	2.090	0.813		
2.388	0.817	2.090	0.800	1.940	0.817		
2.388	0.821	2.090	0.804	2.090	0.821		
2.388	0.825	2.090	0.808	1.940	0.825		
2.388	0.829	2.090	0.813	1.940	0.829		
2.388	0.833	2.090	0.817	2.090	0.833		
2.388	0.838	2.090	0.821	2.090	0.838		
2.388	0.842	2.090	0.825	2.090	0.842		
2.388	0.846	2.090	0.829	2.090	0.846		
2.388	0.850	2.090	0.833	2.090	0.850		
2.388	0.854	2.090	0.838	1.940	0.854		
2.388	0.858	2.090	0.842	2.090	0.858		
2.388	0.863	2.090	0.846	2.090	0.863		
2.388	0.867	2.090	0.850	2.090	0.867		
2.388	0.871	2.090	0.854	2.090	0.871		
2.388	0.875	2.090	0.858	2.090	0.875		
2.388	0.879	2.090	0.863	2.090	0.879		
2.388	0.883	2.090	0.867	2.090	0.883		
2.388	0.888	2.090	0.871	2.090	0.888		
2.388	0.892	2.090	0.875	2.090	0.892		

2.388	0.896	2.090	0.879	2.090	0.896		
2.388	0.900	2.090	0.883	2.090	0.900		
2.388	0.904	2.090	0.888	2.090	0.904		
2.388	0.908	2.090	0.892	2.090	0.908		
2.388	0.913	2.090	0.896	2.090	0.913		
2.388	0.917	2.090	0.900	2.090	0.917		
2.388	0.921	2.090	0.904	2.090	0.921		
2.388	0.925	2.090	0.908	2.090	0.925		
2.388	0.929	2.090	0.913	2.090	0.929		
2.388	0.933	2.090	0.917	2.090	0.933		
2.388	0.938	2.090	0.921	2.090	0.938		
2.388	0.942	2.090	0.925	2.090	0.942		
2.388	0.946	2.090	0.929	2.090	0.946		
2.388	0.950	2.090	0.933	2.090	0.950		
2.388	0.954	2.090	0.938	2.090	0.954		
2.388	0.958	2.090	0.942	2.239	0.958		
2.388	0.963	2.090	0.946	2.090	0.963		
2.388	0.967	2.090	0.950	2.239	0.967		
2.388	0.971	2.090	0.954	2.090	0.971		
2.388	0.975	2.090	0.958	2.090	0.975		
2.388	0.979	2.090	0.963	2.090	0.979		
2.388	0.983	2.090	0.967	2.090	0.983		
2.388	0.988	2.090	0.971	2.239	0.988		
2.388	0.992	2.090	0.975	2.239	0.992		
2.388	0.996	2.090	0.979	2.239	0.996		
2.388	1.000	2.090	0.983	2.239	1.000		
2.388	1.004	2.090	0.988	2.239	1.004		
2.537	1.008	2.090	0.992	2.239	1.008		
2.388	1.013	2.090	0.996	2.239	1.013		
2.388	1.017	2.090	1.000	2.239	1.017		
2.388	1.021	2.090	1.004	2.239	1.021		
2.388	1.025	2.090	1.008	2.239	1.025		
2.388	1.029	2.090	1.013	2.239	1.029		
2.537	1.033	2.090	1.017	2.239	1.033		
2.388	1.038	2.090	1.021	2.239	1.038		
2.537	1.042	2.090	1.025	2.239	1.042		
2.388	1.046	2.090	1.029	2.239	1.046		
2.537	1.050	2.090	1.033	2.239	1.050		
2.537	1.054	2.090	1.038	2.239	1.054		
2.537	1.058	2.090	1.042	2.239	1.058		
2.537	1.063	2.090	1.046	2.239	1.063		
2.537	1.067	2.090	1.050	2.239	1.067		
2.537	1.071	2.090	1.054	2.239	1.071		
2.537	1.075	2.090	1.058	2.239	1.075		
2.537	1.079	2.090	1.063	2.239	1.079		
2.537	1.083	2.090	1.067	2.239	1.083		
2.537	1.088	2.090	1.071	2.239	1.088		
2.537	1.092	2.090	1.075	2.239	1.092		
2.537	1.096	2.090	1.079	2.239	1.096		
2.537	1.100	2.090	1.083	2.239	1.100		
2.537	1.104	2.090	1.088	2.388	1.104		
2.537	1.108	2.090	1.092	2.388	1.108		
2.537	1.113	2.090	1.096	2.388	1.113		
2.537	1.117	2.090	1.100	2.388	1.117		
2.537	1.121	2.090	1.104	2.388	1.121		

2.537	1.125	2.090	1.108	2.388	1.125		
2.537	1.129	2.090	1.113	2.388	1.129		
2.537	1.133	2.090	1.117	2.388	1.133		
2.537	1.138	2.090	1.121	2.388	1.138		
2.537	1.142	2.090	1.125	2.388	1.142		
2.537	1.146	2.090	1.129	2.388	1.146		
2.537	1.150	2.090	1.133	2.388	1.150		
2.537	1.154	2.090	1.138	2.388	1.154		
2.537	1.158	2.090	1.142	2.388	1.158		
2.537	1.163	2.090	1.146	2.388	1.163		
2.537	1.167	2.090	1.150	2.388	1.167		
2.537	1.171	2.239	1.154	2.388	1.171		
2.537	1.175	2.090	1.158	2.388	1.175		
2.537	1.179	2.239	1.163	2.388	1.179		
2.537	1.183	2.090	1.167	2.388	1.183		
2.537	1.188	2.239	1.171	2.388	1.188		
2.537	1.192	2.239	1.175	2.388	1.192		
2.537	1.196	2.239	1.179	2.388	1.196		
2.537	1.200	2.239	1.183	2.388	1.200		
2.537	1.204	2.239	1.188	2.388	1.204		
2.537	1.208	2.239	1.192	2.388	1.208		
2.537	1.213	2.090	1.196	2.388	1.213		
2.537	1.217	2.239	1.200	2.388	1.217		
2.537	1.221	2.239	1.204				
2.537	1.225	2.239	1.208				
2.537	1.229	2.239	1.213				
2.537	1.233	2.239	1.217				
2.537	1.238	2.239	1.221				
2.537	1.242	2.239	1.225				
2.537	1.246	2.239	1.229				
2.537	1.250	2.239	1.233				
2.537	1.254	2.239	1.238				
2.537	1.258	2.239	1.242				
2.537	1.263	2.239	1.246				
2.537	1.267	2.239	1.250				
2.537	1.271	2.239	1.254				
2.537	1.275	2.239	1.258				
2.537	1.279	2.239	1.263				
2.537	1.283	2.239	1.267				
2.537	1.288	2.239	1.271				
2.537	1.292	2.239	1.275				
2.537	1.296	2.239	1.279				
2.537	1.300	2.239	1.283				
2.537	1.304	2.239	1.288				
2.537	1.308	2.239	1.292				
2.537	1.313	2.239	1.296				
2.537	1.317	2.239	1.300				
2.537	1.321	2.239	1.304				
2.537	1.325	2.239	1.308				
2.537	1.329	2.239	1.313				
2.537	1.333	2.239	1.317				
2.537	1.338	2.239	1.321				
2.537	1.342	2.239	1.325				
2.537	1.346	2.239	1.329				
2.537	1.350	2.239	1.333				

2.537	1.354	2.239	1.338				
2.537	1.358	2.239	1.342				
2.537	1.363	2.239	1.346				
2.537	1.367	2.239	1.350				
2.537	1.371	2.239	1.354				
2.537	1.375	2.239	1.358				
2.537	1.379	2.239	1.363				
2.537	1.383	2.239	1.367				
2.537	1.388	2.239	1.371				
2.537	1.392	2.239	1.375				
2.537	1.396	2.239	1.379				
2.537	1.400	2.239	1.383				
2.537	1.404	2.239	1.388				
2.537	1.408	2.239	1.392				
2.537	1.413	2.239	1.396				
2.537	1.417	2.239	1.400				
2.537	1.421	2.239	1.404				
2.537	1.425	2.239	1.408				
2.537	1.429	2.239	1.413				
2.537	1.433	2.239	1.417				
2.537	1.438	2.239	1.421				
2.537	1.442	2.239	1.425				
2.537	1.446	2.239	1.429				
2.537	1.450	2.239	1.433				
2.537	1.454	2.239	1.438				
2.537	1.458	2.239	1.442				
2.537	1.463	2.239	1.446				
2.537	1.467	2.239	1.450				
2.537	1.471	2.239	1.454				
2.687	1.475	2.239	1.458				
2.537	1.479	2.239	1.463				
2.687	1.483	2.239	1.467				
2.687	1.488	2.239	1.471				
2.687	1.492	2.239	1.475				
2.687	1.496	2.239	1.479				
2.687	1.500	2.239	1.483				
2.687	1.504	2.239	1.488				
2.687	1.508	2.239	1.492				
2.687	1.513	2.239	1.496				
2.687	1.517	2.239	1.500				
2.537	1.521	2.239	1.504				
2.687	1.525	2.239	1.508				
2.537	1.529	2.239	1.513				
2.687	1.533	2.239	1.517				
2.687	1.538	2.239	1.521				
2.687	1.542	2.239	1.525				
2.687	1.546	2.239	1.529				
2.687	1.550	2.239	1.533				
2.687	1.554	2.239	1.538				
2.687	1.558	2.239	1.542				
2.687	1.563	2.239	1.546				
2.687	1.567	2.239	1.550				
2.687	1.571	2.239	1.554				
2.687	1.575	2.239	1.558				
2.687	1.579	2.239	1.563				

2.687	1.583	2.239	1.567				
2.687	1.588	2.239	1.571				
2.687	1.592	2.239	1.575				
2.687	1.596	2.239	1.579				
2.687	1.600	2.239	1.583				
2.687	1.604	2.239	1.588				
2.687	1.608	2.239	1.592				
2.687	1.613	2.239	1.596				
2.687	1.617	2.239	1.600				
2.687	1.621	2.239	1.604				
2.687	1.625	2.239	1.608				
2.687	1.629	2.239	1.613				
2.687	1.633	2.239	1.617				
2.687	1.638	2.239	1.621				
2.687	1.642	2.239	1.625				
2.687	1.646	2.239	1.629				
2.687	1.650	2.239	1.633				
2.687	1.654	2.239	1.638				
2.687	1.658	2.239	1.642				
2.687	1.663	2.239	1.646				
2.687	1.667	2.239	1.650				
2.687	1.671	2.239	1.654				
2.687	1.675	2.239	1.658				
2.687	1.679	2.239	1.663				
2.687	1.683	2.239	1.667				
2.687	1.688	2.239	1.671				
2.687	1.692	2.239	1.675				
2.687	1.696	2.239	1.679				
2.687	1.700	2.239	1.683				
2.687	1.704	2.239	1.688				
2.687	1.708	2.239	1.692				
2.687	1.713	2.239	1.696				
2.687	1.717	2.239	1.700				
2.687	1.721	2.239	1.704				
2.687	1.725	2.239	1.708				
2.687	1.729	2.239	1.713				
2.687	1.733	2.239	1.717				
2.687	1.738	2.239	1.721				
2.687	1.742	2.239	1.725				
2.687	1.746	2.239	1.729				
2.687	1.750	2.239	1.733				
2.687	1.754	2.239	1.738				
2.687	1.758	2.239	1.742				
2.687	1.763	2.239	1.746				
2.687	1.767	2.239	1.750				
2.687	1.771	2.239	1.754				
2.687	1.775	2.239	1.758				
2.687	1.779	2.239	1.763				
2.687	1.783	2.239	1.767				
2.687	1.788	2.239	1.771				
2.687	1.792	2.239	1.775				
2.687	1.796	2.239	1.779				
2.687	1.800	2.239	1.783				
2.687	1.804	2.239	1.788				
2.687	1.808	2.239	1.792				

2.687	1.813	2.239	1.796				
2.687	1.817	2.239	1.800				
2.687	1.821	2.239	1.804				
2.687	1.825	2.239	1.808				
2.687	1.829	2.239	1.813				
2.687	1.833	2.239	1.817				
2.687	1.838	2.239	1.821				
2.687	1.842	2.239	1.825				
2.687	1.846	2.239	1.829				
2.687	1.850	2.239	1.833				
2.687	1.854	2.239	1.838				
2.687	1.858	2.239	1.842				
2.687	1.863	2.239	1.846				
2.687	1.867	2.239	1.850				
2.687	1.871	2.239	1.854				
2.687	1.875	2.239	1.858				
2.687	1.879	2.239	1.863				
2.687	1.883	2.239	1.867				
2.687	1.888	2.239	1.871				
2.687	1.892	2.239	1.875				
2.687	1.896	2.239	1.879				
2.687	1.900	2.239	1.883				
2.687	1.904	2.239	1.888				
2.687	1.908	2.239	1.892				
2.687	1.913	2.239	1.896				
2.687	1.917	2.239	1.900				
2.687	1.921	2.239	1.904				
2.687	1.925	2.239	1.908				
2.687	1.929	2.239	1.913				
2.687	1.933	2.239	1.917				
2.687	1.938	2.239	1.921				
2.687	1.942	2.239	1.925				
2.687	1.946	2.239	1.929				
2.687	1.950	2.239	1.933				
2.687	1.954	2.239	1.938				
2.687	1.958	2.239	1.942				
2.687	1.963	2.239	1.946				
2.687	1.967	2.239	1.950				
2.687	1.971	2.239	1.954				
2.687	1.975	2.239	1.958				
2.687	1.979	2.239	1.963				
2.687	1.983	2.239	1.967				
2.687	1.988	2.239	1.971				
2.687	1.992	2.239	1.975				
2.687	1.996	2.239	1.979				
2.687	2.000	2.239	1.983				
2.687	2.004	2.239	1.988				
2.687	2.008	2.239	1.992				
2.687	2.013	2.239	1.996				
2.687	2.017	2.239	2.000				
2.687	2.021	2.239	2.004				
2.687	2.025	2.239	2.008				
2.687	2.029	2.239	2.013				
2.687	2.033	2.239	2.017				
2.687	2.038	2.239	2.021				

2.687	2.042	2.239	2.025				
2.687	2.046	2.239	2.029				
2.687	2.050	2.239	2.033				
2.687	2.054	2.239	2.038				
2.687	2.058	2.239	2.042				
2.687	2.063	2.239	2.046				
2.836	2.067	2.239	2.050				
2.687	2.071	2.239	2.054				
2.687	2.075	2.239	2.058				
2.687	2.079	2.239	2.063				
2.836	2.083	2.239	2.067				
2.836	2.088	2.239	2.071				
2.836	2.092	2.239	2.075				
2.836	2.096	2.239	2.079				
2.836	2.100	2.388	2.083				
2.836	2.104	2.239	2.088				
2.836	2.108	2.239	2.092				
2.687	2.113	2.388	2.096				
2.687	2.117	2.388	2.100				
2.836	2.121	2.388	2.104				
2.836	2.125	2.388	2.108				
2.836	2.129	2.388	2.113				
2.836	2.133	2.388	2.117				
2.836	2.138	2.388	2.121				
2.836	2.142	2.239	2.125				
2.836	2.146	2.388	2.129				
2.836	2.150	2.239	2.133				
2.836	2.154	2.388	2.138				
2.836	2.158	2.239	2.142				
2.836	2.163	2.388	2.146				
2.836	2.167	2.239	2.150				
2.836	2.171	2.388	2.154				
2.836	2.175	2.388	2.158				
2.836	2.179	2.388	2.163				
2.836	2.183	2.388	2.167				
2.836	2.188	2.388	2.171				
2.836	2.192	2.239	2.175				
2.836	2.196	2.388	2.179				
2.836	2.200	2.388	2.183				
2.836	2.204	2.388	2.188				
2.836	2.208	2.388	2.192				
2.836	2.213	2.388	2.196				
2.836	2.217	2.388	2.200				
2.836	2.221	2.388	2.204				
2.836	2.225	2.388	2.208				
2.836	2.229	2.388	2.213				
2.836	2.233	2.388	2.217				
2.836	2.238	2.388	2.221				
2.836	2.242	2.388	2.225				
2.836	2.246	2.388	2.229				
2.836	2.250	2.388	2.233				
2.836	2.254	2.388	2.238				
2.836	2.258	2.388	2.242				
2.836	2.263	2.388	2.246				
2.836	2.267	2.388	2.250				

2.836	2.271	2.388	2.254				
2.836	2.275	2.388	2.258				
2.836	2.279	2.388	2.263				
2.836	2.283	2.388	2.267				
2.836	2.288	2.388	2.271				
2.836	2.292	2.388	2.275				
2.836	2.296	2.388	2.279				
2.836	2.300	2.388	2.283				
2.836	2.304	2.388	2.288				
2.836	2.308	2.388	2.292				
2.836	2.313	2.388	2.296				
2.836	2.317	2.388	2.300				
2.836	2.321	2.388	2.304				
2.836	2.325	2.388	2.308				
2.836	2.329	2.388	2.313				
2.836	2.333	2.388	2.317				
2.836	2.338	2.388	2.321				
2.836	2.342	2.388	2.325				
2.836	2.346	2.388	2.329				
2.836	2.350	2.388	2.333				
2.836	2.354	2.388	2.338				
2.836	2.358	2.388	2.342				
2.836	2.363	2.388	2.346				
2.836	2.367	2.388	2.350				
2.836	2.371	2.388	2.354				
2.836	2.375	2.388	2.358				
2.836	2.379	2.388	2.363				
2.836	2.383	2.388	2.367				
2.836	2.388	2.388	2.371				
2.836	2.392	2.388	2.375				
2.836	2.396	2.388	2.379				
2.836	2.400	2.388	2.383				
2.836	2.404	2.388	2.388				
2.836	2.408	2.388	2.392				
2.836	2.413	2.388	2.396				
2.836	2.417	2.388	2.400				
2.836	2.421	2.388	2.404				
2.836	2.425	2.388	2.408				
2.836	2.429	2.388	2.413				
2.836	2.433	2.388	2.417				
2.836	2.438	2.388	2.421				
2.836	2.442	2.388	2.425				
2.836	2.446	2.388	2.429				
2.836	2.450	2.388	2.433				
2.836	2.454	2.388	2.438				
2.836	2.458	2.388	2.442				
2.836	2.463	2.388	2.446				
2.836	2.467	2.388	2.450				
2.836	2.471	2.388	2.454				
2.836	2.475	2.388	2.458				
2.836	2.479	2.388	2.463				
2.836	2.483	2.388	2.467				
2.836	2.488	2.388	2.471				
2.836	2.492	2.388	2.475				
2.836	2.496	2.388	2.479				

2.836	2.500	2.388	2.483				
2.836	2.504	2.388	2.488				
2.836	2.508	2.388	2.492				
2.836	2.513	2.388	2.496				
2.836	2.517	2.388	2.500				
2.836	2.521	2.388	2.504				
2.836	2.525	2.388	2.508				
2.836	2.529	2.388	2.513				
2.836	2.533	2.388	2.517				
2.836	2.538	2.388	2.521				
2.836	2.542	2.388	2.525				
2.836	2.546	2.388	2.529				
2.836	2.550	2.388	2.533				
2.836	2.554	2.388	2.538				
2.836	2.558	2.388	2.542				
2.836	2.563	2.388	2.546				
2.836	2.567	2.388	2.550				
2.836	2.571	2.388	2.554				
2.836	2.575	2.388	2.558				
2.836	2.579	2.388	2.563				
2.836	2.583	2.388	2.567				
2.836	2.588	2.388	2.571				
2.836	2.592	2.388	2.575				
2.836	2.596	2.388	2.579				
2.836	2.600	2.388	2.583				
2.836	2.604	2.388	2.588				
2.836	2.608	2.388	2.592				
2.836	2.613	2.388	2.596				
2.836	2.617	2.388	2.600				
2.836	2.621	2.388	2.604				
2.836	2.625	2.388	2.608				
2.836	2.629	2.388	2.613				
2.836	2.633	2.388	2.617				
2.836	2.638	2.388	2.621				
2.836	2.642	2.388	2.625				
2.836	2.646	2.388	2.629				
2.836	2.650	2.388	2.633				
2.836	2.654	2.388	2.638				
2.836	2.658	2.388	2.642				
2.836	2.663	2.388	2.646				
2.836	2.667	2.388	2.650				
2.836	2.671	2.388	2.654				
2.836	2.675	2.388	2.658				
2.836	2.679	2.388	2.663				
2.836	2.683	2.388	2.667				
2.836	2.688	2.388	2.671				
2.836	2.692	2.388	2.675				
2.836	2.696	2.388	2.679				
2.836	2.700	2.388	2.683				
2.836	2.704	2.388	2.688				
2.836	2.708	2.388	2.692				
2.836	2.713	2.388	2.696				
2.836	2.717	2.388	2.700				
2.836	2.721	2.388	2.704				
2.836	2.725	2.388	2.708				

2.836	2.729	2.388	2.713				
2.836	2.733	2.388	2.717				
2.836	2.738	2.388	2.721				
2.836	2.742	2.388	2.725				
2.836	2.746	2.388	2.729				
2.836	2.750	2.388	2.733				
2.836	2.754	2.388	2.738				
2.836	2.758	2.388	2.742				
2.836	2.763	2.388	2.746				
2.836	2.767	2.388	2.750				
2.836	2.771	2.388	2.754				
2.836	2.775	2.388	2.758				
2.836	2.779	2.388	2.763				
2.836	2.783	2.388	2.767				
2.836	2.788	2.388	2.771				
2.836	2.792	2.388	2.775				
2.836	2.796	2.537	2.779				
2.836	2.800	2.537	2.783				
2.836	2.804	2.537	2.788				
2.836	2.808	2.388	2.792				
2.836	2.813	2.388	2.796				
2.985	2.817	2.388	2.800				
2.836	2.821	2.388	2.804				
2.985	2.825	2.388	2.808				
2.836	2.829	2.537	2.813				
2.985	2.833	2.388	2.817				
2.985	2.838	2.537	2.821				
2.985	2.842	2.537	2.825				
2.985	2.846	2.388	2.829				
2.985	2.850	2.537	2.833				
2.985	2.854	2.537	2.838				
2.985	2.858	2.388	2.842				
2.985	2.863	2.537	2.846				
2.985	2.867	2.388	2.850				
2.985	2.871	2.388	2.854				
2.985	2.875	2.388	2.858				
2.985	2.879	2.537	2.863				
2.985	2.883	2.388	2.867				
2.985	2.888	2.537	2.871				
2.985	2.892	2.537	2.875				
2.985	2.896	2.537	2.879				
2.985	2.900	2.537	2.883				
2.985	2.904	2.537	2.888				
2.985	2.908	2.388	2.892				
2.985	2.913	2.537	2.896				
2.985	2.917	2.537	2.900				
2.985	2.921	2.537	2.904				
2.985	2.925	2.537	2.908				
2.985	2.929	2.537	2.913				
2.985	2.933	2.537	2.917				
2.985	2.938	2.537	2.921				
2.985	2.942	2.537	2.925				
2.985	2.946	2.537	2.929				
2.985	2.950	2.537	2.933				
2.985	2.954	2.537	2.938				

2.985	2.958	2.537	2.942				
2.985	2.963	2.537	2.946				
2.985	2.967	2.537	2.950				
2.985	2.971	2.537	2.954				
2.985	2.975	2.537	2.958				
2.985	2.979	2.537	2.963				
2.985	2.983	2.537	2.967				
2.985	2.988	2.537	2.971				
2.985	2.992	2.537	2.975				
2.985	2.996	2.537	2.979				
2.985	3.000	2.537	2.983				
2.985	3.004	2.537	2.988				
2.985	3.008	2.537	2.992				
2.985	3.013	2.537	2.996				
2.985	3.017	2.537	3.000				
2.985	3.021	2.537	3.004				
2.985	3.025	2.537	3.008				
2.985	3.029	2.537	3.013				
2.985	3.033	2.537	3.017				
2.985	3.038	2.537	3.021				
2.985	3.042	2.537	3.025				
2.985	3.046	2.537	3.029				
2.985	3.050	2.537	3.033				
2.985	3.054	2.537	3.038				
2.985	3.058	2.537	3.042				
2.985	3.063	2.537	3.046				
2.985	3.067	2.537	3.050				
2.985	3.071	2.537	3.054				
2.985	3.075	2.537	3.058				
2.985	3.079	2.537	3.063				
2.985	3.083	2.537	3.067				
2.985	3.088	2.537	3.071				
2.985	3.092	2.537	3.075				
2.985	3.096	2.537	3.079				
2.985	3.100	2.537	3.083				
2.985	3.104	2.537	3.088				
2.985	3.108	2.537	3.092				
2.985	3.113	2.537	3.096				
2.985	3.117	2.537	3.100				
2.985	3.121	2.537	3.104				
2.985	3.125	2.537	3.108				
2.985	3.129	2.537	3.113				
2.985	3.133	2.537	3.117				
2.985	3.138	2.537	3.121				
2.985	3.142	2.537	3.125				
2.985	3.146	2.537	3.129				
2.985	3.150	2.537	3.133				
2.985	3.154	2.537	3.138				
2.985	3.158	2.537	3.142				
2.985	3.163	2.537	3.146				
2.985	3.167	2.537	3.150				
2.985	3.171	2.537	3.154				
2.985	3.175	2.537	3.158				
2.985	3.179	2.537	3.163				
2.985	3.183	2.537	3.167				

2.985	3.188	2.537	3.171				
2.985	3.192	2.537	3.175				
2.985	3.196	2.537	3.179				
2.985	3.200	2.537	3.183				
2.985	3.204	2.537	3.188				
2.985	3.208	2.537	3.192				
2.985	3.213	2.537	3.196				
2.985	3.217	2.537	3.200				
2.985	3.221	2.537	3.204				
2.985	3.225	2.537	3.208				
2.985	3.229	2.537	3.213				
2.985	3.233	2.537	3.217				
2.985	3.238	2.537	3.221				
2.985	3.242	2.537	3.225				
2.985	3.246	2.537	3.229				
2.985	3.250	2.537	3.233				
2.985	3.254	2.537	3.238				
2.985	3.258	2.537	3.242				
2.985	3.263	2.537	3.246				
2.985	3.267	2.537	3.250				
2.985	3.271	2.537	3.254				
2.985	3.275	2.537	3.258				
2.985	3.279	2.537	3.263				
2.985	3.283	2.537	3.267				
2.985	3.288	2.537	3.271				
2.985	3.292	2.537	3.275				
2.985	3.296	2.537	3.279				
2.985	3.300	2.537	3.283				
2.985	3.304	2.537	3.288				
2.985	3.308	2.537	3.292				
2.985	3.313	2.537	3.296				
2.985	3.317	2.537	3.300				
2.985	3.321	2.537	3.304				
2.985	3.325	2.537	3.308				
2.985	3.329	2.537	3.313				
2.985	3.333	2.537	3.317				
2.985	3.338	2.537	3.321				
2.985	3.342	2.537	3.325				
2.985	3.346	2.537	3.329				
2.985	3.350	2.537	3.333				
2.985	3.354	2.537	3.338				
2.985	3.358	2.537	3.342				
2.985	3.363	2.537	3.346				
2.985	3.367	2.537	3.350				
2.985	3.371	2.537	3.354				
2.985	3.375	2.537	3.358				
2.985	3.379	2.537	3.363				
2.985	3.383	2.537	3.367				
2.985	3.388	2.537	3.371				
2.985	3.392	2.537	3.375				
2.985	3.396	2.537	3.379				
2.985	3.400	2.537	3.383				
2.985	3.404	2.537	3.388				
2.985	3.408	2.537	3.392				
2.985	3.413	2.537	3.396				

2.985	3.417	2.537	3.400				
2.985	3.421	2.537	3.404				
2.985	3.425	2.537	3.408				
2.985	3.429	2.537	3.413				
2.985	3.433	2.537	3.417				
2.985	3.438	2.537	3.421				
2.985	3.442	2.537	3.425				
2.985	3.446	2.537	3.429				
2.985	3.450	2.537	3.433				
2.985	3.454	2.537	3.438				
2.985	3.458	2.537	3.442				
2.985	3.463	2.537	3.446				
2.985	3.467	2.537	3.450				
2.985	3.471	2.537	3.454				
2.985	3.475	2.537	3.458				
2.985	3.479	2.537	3.463				
2.985	3.483	2.537	3.467				
2.985	3.488	2.537	3.471				
2.985	3.492	2.537	3.475				
2.985	3.496	2.537	3.479				
2.985	3.500	2.537	3.483				
2.985	3.504	2.537	3.488				
2.985	3.508	2.537	3.492				
2.985	3.513	2.537	3.496				
2.985	3.517	2.537	3.500				
2.985	3.521	2.537	3.504				
2.985	3.525	2.537	3.508				
2.985	3.529	2.537	3.513				
2.985	3.533	2.537	3.517				
2.985	3.538	2.537	3.521				
2.985	3.542	2.537	3.525				
2.985	3.546	2.537	3.529				
2.985	3.550	2.537	3.533				
2.985	3.554	2.537	3.538				
2.985	3.558	2.537	3.542				
2.985	3.563	2.537	3.546				
2.985	3.567	2.537	3.550				
2.985	3.571	2.537	3.554				
2.985	3.575	2.537	3.558				
2.985	3.579	2.537	3.563				
2.985	3.583	2.537	3.567				
2.985	3.588	2.537	3.571				
2.985	3.592	2.537	3.575				
2.985	3.596	2.537	3.579				
2.985	3.600	2.537	3.583				
2.985	3.604	2.537	3.588				
2.985	3.608	2.537	3.592				
2.985	3.613	2.537	3.596				
2.985	3.617	2.537	3.600				
2.985	3.621	2.537	3.604				
2.985	3.625	2.537	3.608				
2.985	3.629	2.537	3.613				
2.985	3.633	2.537	3.617				
2.985	3.638	2.537	3.621				
2.985	3.642	2.537	3.625				

2.985	3.646	2.537	3.629				
2.985	3.650	2.537	3.633				
2.985	3.654	2.537	3.638				
2.985	3.658	2.537	3.642				
2.985	3.663	2.537	3.646				
2.985	3.667	2.537	3.650				
2.985	3.671	2.537	3.654				
2.985	3.675	2.537	3.658				
2.985	3.679	2.537	3.663				
2.985	3.683	2.537	3.667				
2.985	3.688	2.537	3.671				
2.985	3.692	2.537	3.675				
2.985	3.696	2.537	3.679				
2.985	3.700	2.537	3.683				
2.985	3.704	2.537	3.688				
2.985	3.708	2.537	3.692				
2.985	3.713	2.537	3.696				
2.985	3.717	2.537	3.700				
2.985	3.721	2.537	3.704				
2.985	3.725	2.537	3.708				
2.985	3.729	2.537	3.713				
2.985	3.733	2.537	3.717				
2.985	3.738	2.537	3.721				
2.985	3.742	2.537	3.725				
2.985	3.746	2.537	3.729				
2.985	3.750	2.537	3.733				
2.985	3.754	2.537	3.738				
2.985	3.758	2.537	3.742				
2.985	3.763	2.537	3.746				
2.985	3.767	2.537	3.750				
2.985	3.771	2.537	3.754				
2.985	3.775	2.537	3.758				
2.985	3.779	2.537	3.763				
2.985	3.783	2.537	3.767				
2.985	3.788	2.537	3.771				
2.985	3.792	2.537	3.775				
2.985	3.796	2.537	3.779				
2.985	3.800	2.537	3.783				
2.985	3.804	2.537	3.788				
2.985	3.808	2.537	3.792				
2.985	3.813	2.687	3.796				
2.985	3.817	2.537	3.800				
2.985	3.821	2.537	3.804				
2.985	3.825	2.537	3.808				
2.985	3.829	2.537	3.813				
2.985	3.833	2.537	3.817				
2.985	3.838	2.537	3.821				
2.985	3.842	2.687	3.825				
2.985	3.846	2.537	3.829				
2.985	3.850	2.537	3.833				
2.985	3.854	2.687	3.838				
2.985	3.858	2.537	3.842				
2.985	3.863	2.537	3.846				
2.985	3.867	2.537	3.850				
2.985	3.871	2.537	3.854				

2.985	3.875	2.537	3.858				
2.985	3.879	2.537	3.863				
2.985	3.883	2.687	3.867				
2.985	3.888	2.537	3.871				
2.985	3.892	2.687	3.875				
2.985	3.896	2.687	3.879				
2.985	3.900	2.687	3.883				
2.985	3.904	2.537	3.888				
2.985	3.908	2.537	3.892				
2.985	3.913	2.537	3.896				
2.985	3.917	2.537	3.900				
2.985	3.921	2.537	3.904				
2.985	3.925	2.537	3.908				
2.985	3.929	2.537	3.913				
2.985	3.933	2.537	3.917				
2.985	3.938	2.537	3.921				
2.985	3.942	2.537	3.925				
2.985	3.946	2.537	3.929				
2.985	3.950	2.537	3.933				
2.985	3.954	2.537	3.938				
2.985	3.958	2.537	3.942				
2.985	3.963	2.537	3.946				
2.985	3.967	2.537	3.950				
2.985	3.971	2.537	3.954				
2.985	3.975	2.537	3.958				
2.985	3.979	2.537	3.963				
2.985	3.983	2.537	3.967				
2.985	3.988	2.537	3.971				
2.985	3.992	2.537	3.975				
2.985	3.996	2.537	3.979				
2.985	4.000	2.537	3.983				
2.985	4.004	2.537	3.988				
2.985	4.008	2.537	3.992				
2.985	4.013	2.537	3.996				
2.985	4.017	2.537	4.000				
2.985	4.021	2.537	4.004				
2.985	4.025	2.537	4.008				
2.985	4.029	2.537	4.013				
2.985	4.033	2.537	4.017				
2.985	4.038	2.537	4.021				
2.985	4.042	2.537	4.025				
2.985	4.046	2.537	4.029				
2.985	4.050	2.537	4.033				
2.985	4.054	2.537	4.038				
2.985	4.058	2.537	4.042				
2.985	4.063	2.537	4.046				
2.985	4.067	2.537	4.050				
2.985	4.071	2.537	4.054				
2.985	4.075	2.537	4.058				
3.134	4.079	2.537	4.063				
2.985	4.083	2.537	4.067				
2.985	4.088	2.537	4.071				
2.985	4.092	2.537	4.075				
2.985	4.096	2.537	4.079				
2.985	4.100	2.537	4.083				

2.985	4.104	2.537	4.088				
2.985	4.108	2.537	4.092				
2.985	4.113	2.537	4.096				
3.134	4.117	2.537	4.100				
2.985	4.121	2.537	4.104				
2.985	4.125	2.537	4.108				
3.134	4.129	2.537	4.113				
3.134	4.133	2.537	4.117				
2.985	4.138	2.537	4.121				
2.985	4.142	2.537	4.125				
2.985	4.146	2.537	4.129				
3.134	4.150	2.537	4.133				
2.985	4.154	2.537	4.138				
3.134	4.158	2.537	4.142				
3.134	4.163	2.537	4.146				
3.134	4.167	2.537	4.150				
3.134	4.171	2.537	4.154				
3.134	4.175	2.537	4.158				
2.985	4.179	2.537	4.163				
2.985	4.183	2.537	4.167				
3.134	4.188	2.537	4.171				
3.134	4.192	2.537	4.175				
3.134	4.196	2.537	4.179				
2.985	4.200	2.537	4.183				
3.134	4.204	2.537	4.188				
2.985	4.208	2.537	4.192				
3.134	4.213	2.537	4.196				
2.985	4.217	2.537	4.200				
3.134	4.221	2.537	4.204				
2.985	4.225	2.537	4.208				
3.134	4.229	2.537	4.213				
2.985	4.233	2.537	4.217				
2.985	4.238	2.537	4.221				
2.985	4.242	2.537	4.225				
3.134	4.246	2.537	4.229				
3.134	4.250	2.537	4.233				
3.134	4.254	2.537	4.238				
2.985	4.258	2.537	4.242				
3.134	4.263	2.537	4.246				
2.985	4.267	2.537	4.250				
3.134	4.271	2.537	4.254				
3.134	4.275	2.537	4.258				
3.134	4.279	2.537	4.263				
3.134	4.283	2.537	4.267				
3.134	4.288	2.537	4.271				
3.134	4.292	2.537	4.275				
3.134	4.296	2.537	4.279				
3.134	4.300	2.537	4.283				
3.134	4.304	2.537	4.288				
3.134	4.308	2.537	4.292				
3.134	4.313	2.537	4.296				
3.134	4.317	2.537	4.300				
3.134	4.321	2.537	4.304				
2.985	4.325	2.537	4.308				
2.985	4.329	2.537	4.313				

3.134	4.333	2.537	4.317				
2.985	4.338	2.388	4.321				
2.985	4.342	2.537	4.325				
2.985	4.346	2.388	4.329				
2.985	4.350	2.388	4.333				
2.985	4.354	2.388	4.338				
2.985	4.358	2.388	4.342				
2.985	4.363	2.537	4.346				
2.985	4.367	2.388	4.350				
2.985	4.371	2.537	4.354				
2.985	4.375	2.388	4.358				
3.134	4.379	2.388	4.363				
2.985	4.383	2.388	4.367				
2.985	4.388	2.388	4.371				
2.985	4.392	2.388	4.375				
2.985	4.396	2.388	4.379				
2.985	4.400	2.388	4.383				
2.985	4.404	2.388	4.388				
2.985	4.408	2.537	4.392				
3.134	4.413	2.388	4.396				
2.985	4.417	2.388	4.400				
2.985	4.421	2.388	4.404				
2.985	4.425	2.388	4.408				
3.134	4.429	2.388	4.413				
2.985	4.433	2.388	4.417				
3.134	4.438	2.388	4.421				
3.134	4.442	2.388	4.425				
3.134	4.446	2.388	4.429				
3.134	4.450	2.388	4.433				
3.134	4.454	2.388	4.438				
3.134	4.458	2.388	4.442				
3.134	4.463	2.388	4.446				
3.134	4.467	2.388	4.450				
3.134	4.471	2.388	4.454				
3.134	4.475	2.388	4.458				
3.134	4.479	2.388	4.463				
3.134	4.483	2.388	4.467				
2.985	4.488	2.388	4.471				
2.985	4.492	2.388	4.475				
2.985	4.496	2.388	4.479				
2.985	4.500	2.388	4.483				
2.985	4.504	2.388	4.488				
2.985	4.508	2.388	4.492				
2.985	4.513	2.388	4.496				
2.985	4.517	2.388	4.500				
2.985	4.521	2.388	4.504				
2.985	4.525	2.388	4.508				
2.985	4.529	2.388	4.513				
2.985	4.533	2.388	4.517				
2.985	4.538	2.388	4.521				
2.985	4.542	2.388	4.525				
2.985	4.546	2.388	4.529				
2.985	4.550	2.388	4.533				
2.985	4.554	2.388	4.538				
2.985	4.558	2.388	4.542				

2.985	4.563	2.388	4.546				
2.985	4.567	2.388	4.550				
2.985	4.571	2.388	4.554				
2.985	4.575	2.388	4.558				
2.985	4.579	2.388	4.563				
2.985	4.583	2.388	4.567				
2.985	4.588	2.388	4.571				
2.985	4.592	2.388	4.575				
2.985	4.596	2.388	4.579				
2.985	4.600	2.388	4.583				
2.985	4.604	2.388	4.588				
2.985	4.608	2.388	4.592				
2.985	4.613	2.388	4.596				
2.985	4.617	2.388	4.600				
2.985	4.621	2.388	4.604				
2.985	4.625	2.388	4.608				
2.985	4.629	2.388	4.613				
2.985	4.633	2.388	4.617				
2.985	4.638	2.388	4.621				
2.985	4.642	2.388	4.625				
2.985	4.646	2.388	4.629				
2.985	4.650	2.388	4.633				
2.985	4.654	2.388	4.638				
2.985	4.658	2.388	4.642				
2.985	4.663	2.388	4.646				
2.985	4.667	2.388	4.650				
2.985	4.671	2.388	4.654				
2.985	4.675	2.388	4.658				
2.985	4.679	2.388	4.663				
2.985	4.683	2.388	4.667				
2.985	4.688	2.388	4.671				
2.836	4.692	2.388	4.675				
2.985	4.696	2.388	4.679				
2.836	4.700	2.388	4.683				
2.836	4.704	2.388	4.688				
2.836	4.708	2.388	4.692				
2.836	4.713	2.388	4.696				
2.836	4.717	2.388	4.700				
2.836	4.721	2.388	4.704				
2.836	4.725	2.388	4.708				
2.836	4.729	2.388	4.713				
2.836	4.733	2.388	4.717				
2.836	4.738	2.388	4.721				
2.836	4.742	2.388	4.725				
2.836	4.746	2.388	4.729				
2.836	4.750	2.388	4.733				
2.836	4.754	2.388	4.738				
2.836	4.758	2.388	4.742				
2.836	4.763	2.388	4.746				
2.836	4.767	2.388	4.750				
2.836	4.771	2.388	4.754				
2.836	4.775	2.388	4.758				
2.836	4.779	2.388	4.763				
2.836	4.783	2.388	4.767				
2.836	4.788	2.388	4.771				

2.836	4.792	2.388	4.775				
2.836	4.796	2.388	4.779				
2.836	4.800	2.388	4.783				
2.836	4.804	2.388	4.788				
2.836	4.808	2.388	4.792				
2.836	4.813	2.388	4.796				
2.836	4.817	2.388	4.800				
2.836	4.821	2.388	4.804				
2.836	4.825	2.388	4.808				
2.836	4.829	2.388	4.813				
2.836	4.833	2.388	4.817				
2.836	4.838	2.388	4.821				
2.836	4.842	2.388	4.825				
2.836	4.846	2.388	4.829				
2.836	4.850	2.388	4.833				
2.836	4.854	2.388	4.838				
2.836	4.858	2.388	4.842				
2.836	4.863	2.388	4.846				
2.836	4.867	2.388	4.850				
2.836	4.871	2.388	4.854				
2.836	4.875	2.388	4.858				
2.836	4.879	2.388	4.863				
2.836	4.883	2.388	4.867				
2.836	4.888	2.388	4.871				
2.836	4.892	2.388	4.875				
2.836	4.896	2.388	4.879				
2.836	4.900	2.388	4.883				
2.836	4.904	2.388	4.888				
2.836	4.908	2.388	4.892				
2.836	4.913	2.388	4.896				
2.836	4.917	2.388	4.900				
2.836	4.921	2.388	4.904				
2.836	4.925	2.388	4.908				
2.836	4.929	2.388	4.913				
2.836	4.933	2.388	4.917				
2.836	4.938	2.388	4.921				
2.836	4.942	2.388	4.925				
2.836	4.946	2.388	4.929				
2.836	4.950	2.388	4.933				
2.836	4.954	2.388	4.938				
2.836	4.958	2.388	4.942				
2.836	4.963	2.388	4.946				
2.836	4.967	2.388	4.950				
2.836	4.971	2.388	4.954				
2.836	4.975	2.388	4.958				
2.836	4.979	2.388	4.963				
2.836	4.983	2.388	4.967				
2.985	4.988	2.388	4.971				
2.985	4.992	2.388	4.975				
2.985	4.996	2.388	4.979				
2.985	5.000	2.388	4.983				
2.985	5.004	2.388	4.988				
2.985	5.008	2.388	4.992				
2.985	5.013	2.388	4.996				
2.985	5.017	2.388	5.000				

2.985	5.021	2.388	5.004				
2.985	5.025	2.388	5.008				
2.985	5.029	2.388	5.013				
2.985	5.033	2.388	5.017				
2.985	5.038	2.388	5.021				
2.985	5.042	2.388	5.025				
2.985	5.046	2.388	5.029				
2.985	5.050	2.388	5.033				
2.985	5.054	2.388	5.038				
2.985	5.058	2.388	5.042				
2.985	5.063	2.388	5.046				
2.985	5.067	2.388	5.050				
2.985	5.071	2.388	5.054				
2.985	5.075	2.388	5.058				
2.985	5.079	2.388	5.063				
2.985	5.083	2.388	5.067				
2.985	5.088	2.388	5.071				
2.985	5.092	2.388	5.075				
2.985	5.096	2.388	5.079				
2.985	5.100	2.388	5.083				
2.985	5.104	2.388	5.088				
2.985	5.108	2.388	5.092				
2.985	5.113	2.388	5.096				
2.985	5.117	2.388	5.100				
2.985	5.121	2.388	5.104				
2.985	5.125	2.388	5.108				
2.985	5.129	2.388	5.113				
2.985	5.133	2.388	5.117				
2.985	5.138	2.388	5.121				
2.985	5.142	2.388	5.125				
2.985	5.146	2.388	5.129				
2.985	5.150	2.388	5.133				
2.985	5.154	2.388	5.138				
2.985	5.158	2.388	5.142				
2.985	5.163	2.388	5.146				
2.985	5.167	2.388	5.150				
2.985	5.171	2.388	5.154				
2.985	5.175	2.388	5.158				
2.985	5.179	2.388	5.163				
2.985	5.183	2.388	5.167				
2.985	5.188	2.388	5.171				
2.985	5.192	2.388	5.175				
2.985	5.196	2.388	5.179				
2.985	5.200	2.388	5.183				
2.985	5.204	2.388	5.188				
2.985	5.208	2.388	5.192				
2.985	5.213	2.388	5.196				
2.985	5.217	2.388	5.200				
2.985	5.221	2.388	5.204				
2.985	5.225	2.388	5.208				
2.985	5.229	2.388	5.213				
2.985	5.233	2.388	5.217				
2.985	5.238	2.388	5.221				
2.985	5.242	2.388	5.225				
2.985	5.246	2.388	5.229				

2.985	5.250	2.388	5.233				
2.985	5.254	2.388	5.238				
2.985	5.258	2.388	5.242				
2.985	5.263	2.388	5.246				
2.985	5.267	2.388	5.250				
2.985	5.271	2.388	5.254				
2.985	5.275	2.388	5.258				
2.985	5.279	2.388	5.263				
2.985	5.283	2.388	5.267				
2.985	5.288	2.388	5.271				
2.985	5.292	2.388	5.275				
2.985	5.296	2.388	5.279				
2.985	5.300	2.388	5.283				
2.985	5.304	2.388	5.288				
2.985	5.308	2.388	5.292				
2.985	5.313	2.388	5.296				
2.985	5.317	2.388	5.300				
2.985	5.321	2.388	5.304				
2.985	5.325	2.388	5.308				
2.985	5.329	2.388	5.313				
2.985	5.333	2.388	5.317				
2.985	5.338	2.388	5.321				
2.985	5.342	2.388	5.325				
2.985	5.346	2.388	5.329				
2.985	5.350	2.388	5.333				
2.985	8.000	2.388	5.338				
3.134	12.000	2.388	5.342				
3.134	16.000	2.388	5.346				
3.134	20.000	2.388	5.350				
3.134	24.000	2.388	5.354				
		2.388	5.358				
		2.388	5.363				
		2.388	5.367				
		2.388	5.371				
		2.388	5.375				
		2.388	5.379				
		2.388	5.383				
		2.388	5.388				
		2.388	5.392				
		2.388	5.396				
		2.388	5.400				
		2.388	5.404				
		2.388	5.408				
		2.388	5.413				
		2.388	5.417				
		2.388	5.421				
		2.388	5.425				
		2.388	5.429				
		2.388	5.433				
		2.388	5.438				
		2.388	5.442				
		2.388	5.446				
		2.388	5.450				
		2.388	5.454				
		2.388	5.458				

		2.388	5.463				
		2.388	5.467				
		2.388	5.471				
		2.388	5.475				
		2.388	5.479				
		2.388	5.483				
		2.388	5.488				
		2.388	5.492				
		2.388	5.496				
		2.388	5.500				
		2.388	5.504				
		2.388	5.508				
		2.388	5.513				
		2.388	5.517				
		2.388	5.521				
		2.388	5.525				
		2.388	5.529				
		2.388	5.533				
		2.388	5.538				
		2.388	5.542				
		2.388	5.546				
		2.388	5.550				
		2.388	5.554				
		2.388	5.558				
		2.388	5.563				
		2.388	5.567				
		2.388	5.571				
		2.388	5.575				
		2.388	5.579				
		2.388	5.583				
		2.388	5.588				
		2.388	5.592				
		2.388	5.596				
		2.388	5.600				
		2.388	5.604				
		2.388	5.608				
		2.388	5.613				
		2.388	5.617				
		2.388	5.621				
		2.388	5.625				
		2.388	5.629				
		2.388	5.633				
		2.388	5.638				
		2.388	5.642				
		2.388	5.646				
		2.388	5.650				
		2.388	5.654				
		2.388	5.658				
		2.388	5.663				
		2.388	5.667				
		2.388	5.671				
		2.388	5.675				
		2.388	5.679				
		2.388	5.683				
		2.388	5.688				

		2.388	5.692				
		2.388	5.696				
		2.388	5.700				
		2.388	5.704				
		2.388	5.708				
		2.388	5.713				
		2.388	5.717				
		2.388	5.721				
		2.388	5.725				
		2.388	5.729				
		2.388	5.733				
		2.388	5.738				
		2.388	5.742				
		2.388	5.746				
		2.388	5.750				
		2.388	5.754				
		2.388	5.758				
		2.388	5.763				
		2.388	5.767				
		2.388	5.771				
		2.388	5.775				
		2.388	5.779				
		2.388	5.783				
		2.388	5.788				
		2.388	5.792				
		2.388	5.796				
		2.388	5.800				
		2.388	5.804				
		2.388	5.808				
		2.388	5.813				
		2.388	5.817				
		2.388	5.821				
		2.388	5.825				
		2.388	5.829				
		2.388	5.833				
		2.388	5.838				
		2.388	5.842				
		2.388	5.846				
		2.388	5.850				
		2.388	5.854				
		2.388	5.858				
		2.388	5.863				
		2.388	5.867				
		2.388	5.871				
		2.388	5.875				
		2.388	5.879				
		2.388	5.883				
		2.388	5.888				
		2.388	5.892				
		2.388	5.896				
		2.388	5.900				
		2.388	5.904				
		2.388	5.908				
		2.388	5.913				
		2.388	5.917				

		2.388	5.921				
		2.388	5.925				
		2.388	5.929				
		2.388	5.933				
		2.388	5.938				
		2.388	5.942				
		2.388	5.946				
		2.388	5.950				
		2.388	5.954				
		2.388	5.958				
		2.388	5.963				
		2.388	5.967				
		2.388	5.971				
		2.388	5.975				
		2.388	5.979				
		2.388	5.983				
		2.388	5.988				
		2.388	5.992				
		2.388	5.996				
		2.388	6.000				
		2.388	6.004				
		2.388	6.008				
		2.388	6.013				
		2.388	6.017				
		2.388	6.021				
		2.388	6.025				
		2.388	6.029				
		2.388	6.033				
		2.388	6.038				
		2.388	6.042				
		2.388	6.046				
		2.388	6.050				
		2.388	6.054				
		2.388	6.058				
		2.388	6.063				
		2.388	6.067				
		2.388	6.071				
		2.388	6.075				
		2.388	6.079				
		2.388	6.083				
		2.388	6.088				
		2.388	6.092				
		2.388	6.096				
		2.388	6.100				
		2.388	6.104				
		2.388	6.108				
		2.388	6.113				
		2.388	6.117				
		2.388	6.121				
		2.388	6.125				
		2.388	6.129				
		2.388	6.133				
		2.388	6.138				
		2.388	6.142				
		2.388	6.146				

		2.388	6.150				
		2.388	6.154				
		2.388	6.158				
		2.388	6.163				
		2.388	6.167				
		2.388	6.171				
		2.388	6.175				
		2.388	6.179				
		2.388	6.183				
		2.388	6.188				
		2.388	6.192				
		2.388	6.196				
		2.388	6.200				
		2.388	6.204				
		2.388	6.208				
		2.388	6.213				
		2.388	6.217				
		2.388	6.221				
		2.388	6.225				
		2.388	6.229				
		2.388	6.233				
		2.388	6.238				
		2.388	6.242				
		2.388	6.246				
		2.537	6.250				
		2.537	6.254				
		2.537	6.258				
		2.537	6.263				
		2.537	6.267				
		2.537	6.271				
		2.537	6.275				
		2.537	6.279				
		2.537	6.283				
		2.537	6.288				
		2.537	6.292				
		2.687	8.000				
		2.836	12.000				
		2.985	16.000				
		3.134	20.000				
		3.134	24.000				

92% of degree of saturation

100kPa							
Equilibrium stage		Consolidation stage		Shearing stage			
Matric suction/(kPa)	Time/(hr)	Matric suction/(kPa)	Time/(hr)	Matric suction/(kPa)	Time/(hr)	Matric suction/(kPa)	Shear strain/(%)
0.000	0.000	2.687	0.000	2.687	0.000	2.687	0.000
0.746	0.004	2.537	0.000	2.687	0.004	2.687	0.250
1.343	0.008	2.388	0.001	2.687	0.008	2.687	0.500
1.493	0.013	2.239	0.002	2.687	0.013	2.687	0.750
1.493	0.017	1.642	0.003	2.687	0.017	2.537	1.000
1.493	0.021	1.343	0.004	2.687	0.021	2.537	1.250
1.642	0.025	1.493	0.008	2.687	0.025	2.537	1.500
1.642	0.029	1.642	0.013	2.687	0.029	2.537	1.750
1.642	0.033	1.791	0.017	2.687	0.033	2.537	2.000
1.642	0.038	1.791	0.021	2.687	0.038	2.388	2.500
1.642	0.042	1.940	0.025	2.687	0.042	2.388	3.000
1.642	0.046	1.940	0.029	2.687	0.046	2.239	3.500
1.642	0.050	1.940	0.033	2.687	0.050	2.239	4.000
1.642	0.054	1.940	0.038	2.687	0.054	2.388	5.000
1.642	0.058	1.940	0.042	2.687	0.058	2.537	6.000
1.642	0.063	1.940	0.046	2.687	0.063	2.537	7.000
1.642	0.067	1.940	0.050	2.687	0.067	2.537	8.000
1.642	0.071	1.940	0.054	2.687	0.071	2.537	9.000
1.642	0.075	1.940	0.058	2.537	0.075	2.537	10.000
1.642	0.079	1.940	0.063	2.537	0.079		
1.642	0.083	1.940	0.067	2.537	0.083		
1.642	0.088	1.940	0.071	2.537	0.088		
1.642	0.092	1.940	0.075	2.537	0.092		
1.642	0.096	1.940	0.079	2.537	0.096		
1.642	0.100	1.940	0.083	2.537	0.100		
1.642	0.104	1.940	0.088	2.537	0.104		
1.642	0.108	1.940	0.092	2.537	0.108		
1.642	0.113	1.940	0.096	2.537	0.113		
1.642	0.117	1.940	0.100	2.537	0.117		
1.642	0.121	1.940	0.104	2.537	0.121		
1.642	0.125	1.940	0.108	2.537	0.125		
1.642	0.129	1.940	0.113	2.537	0.129		
1.642	0.133	1.940	0.117	2.537	0.133		
1.642	0.138	1.940	0.121	2.537	0.138		
1.642	0.142	1.940	0.125	2.537	0.142		
1.642	0.146	1.940	0.129	2.537	0.146		
1.642	0.150	1.940	0.133	2.537	0.150		
1.642	0.154	1.940	0.138	2.537	0.154		
1.642	0.158	1.940	0.142	2.537	0.158		
1.642	0.163	1.940	0.146	2.537	0.163		
1.642	0.167	1.940	0.150	2.537	0.167		
1.642	0.171	1.940	0.154	2.388	0.171		
1.642	0.175	1.940	0.158	2.388	0.175		
1.642	0.179	1.940	0.163	2.388	0.179		
1.642	0.183	1.940	0.167	2.388	0.183		
1.642	0.188	1.940	0.171	2.388	0.188		
1.642	0.192	1.940	0.175	2.388	0.192		
1.642	0.196	1.940	0.179	2.388	0.196		
1.642	0.200	1.940	0.183	2.388	0.200		
1.642	0.204	1.940	0.188	2.388	0.204		
1.642	0.208	1.940	0.192	2.388	0.208		

1.642	0.213	1.940	0.196	2.388	0.213		
1.642	0.217	1.940	0.200	2.388	0.217		
1.642	0.221	1.940	0.204	2.388	0.221		
1.642	0.225	1.940	0.208	2.388	0.225		
1.642	0.229	1.940	0.213	2.388	0.229		
1.642	0.233	1.940	0.217	2.388	0.233		
1.642	0.238	1.940	0.221	2.388	0.238		
1.642	0.242	1.940	0.225	2.388	0.242		
1.642	0.246	1.940	0.229	2.239	0.246		
1.642	0.250	1.940	0.233	2.239	0.250		
1.642	0.254	1.940	0.238	2.388	0.254		
1.642	0.258	1.940	0.242	2.239	0.258		
1.642	0.263	1.940	0.246	2.239	0.263		
1.642	0.267	1.940	0.250	2.239	0.267		
1.642	0.271	1.940	0.254	2.239	0.271		
1.642	0.275	1.940	0.258	2.239	0.275		
1.642	0.279	1.940	0.263	2.239	0.279		
1.642	0.283	1.940	0.267	2.239	0.283		
1.642	0.288	1.940	0.271	2.239	0.288		
1.642	0.292	1.940	0.275	2.239	0.292		
1.642	0.296	1.940	0.279	2.239	0.296		
1.642	0.300	1.940	0.283	2.239	0.300		
1.642	0.304	1.940	0.288	2.239	0.304		
1.642	0.308	1.940	0.292	2.239	0.308		
1.642	0.313	1.940	0.296	2.239	0.313		
1.642	0.317	1.940	0.300	2.239	0.317		
1.642	0.321	1.940	0.304	2.239	0.321		
1.642	0.325	1.940	0.308	2.239	0.325		
1.642	0.329	1.940	0.313	2.239	0.329		
1.642	0.333	1.940	0.317	2.239	0.333		
1.642	0.338	1.940	0.321	2.239	0.338		
1.642	0.342	1.940	0.325	2.239	0.342		
1.642	0.346	1.940	0.329	2.239	0.346		
1.642	0.350	1.940	0.333	2.239	0.350		
1.642	0.354	1.940	0.338	2.239	0.354		
1.642	0.358	1.940	0.342	2.239	0.358		
1.642	0.363	1.940	0.346	2.239	0.363		
1.642	0.367	1.940	0.350	2.239	0.367		
1.642	0.371	1.940	0.354	2.239	0.371		
1.642	0.375	1.940	0.358	2.239	0.375		
1.642	0.379	1.940	0.363	2.388	0.379		
1.642	0.383	1.940	0.367	2.388	0.383		
1.642	0.388	1.940	0.371	2.388	0.388		
1.642	0.392	1.940	0.375	2.388	0.392		
1.642	0.396	1.940	0.379	2.388	0.396		
1.642	0.400	1.940	0.383	2.388	0.400		
1.642	0.404	1.940	0.388	2.388	0.404		
1.642	0.408	1.940	0.392	2.388	0.408		
1.642	0.413	1.940	0.396	2.388	0.413		
1.642	0.417	1.940	0.400	2.388	0.417		
1.642	0.421	1.940	0.404	2.388	0.421		
1.642	0.425	1.940	0.408	2.388	0.425		
1.642	0.429	1.940	0.413	2.388	0.429		
1.791	0.433	1.940	0.417	2.388	0.433		
1.791	0.438	1.940	0.421	2.388	0.438		
1.791	0.442	1.940	0.425	2.388	0.442		

1.642	0.446	1.940	0.429	2.388	0.446		
1.791	0.450	1.940	0.433	2.388	0.450		
1.791	0.454	1.940	0.438	2.388	0.454		
1.791	0.458	1.940	0.442	2.388	0.458		
1.791	0.463	1.940	0.446	2.388	0.463		
1.791	0.467	1.940	0.450	2.388	0.467		
1.791	0.471	1.940	0.454	2.388	0.471		
1.791	0.475	1.940	0.458	2.388	0.475		
1.791	0.479	1.940	0.463	2.537	0.479		
1.791	0.483	1.940	0.467	2.537	0.483		
1.791	0.488	2.090	0.471	2.537	0.488		
1.791	0.492	2.090	0.475	2.537	0.492		
1.791	0.496	2.090	0.479	2.537	0.496		
1.791	0.500	2.090	0.483	2.537	0.500		
1.791	0.504	2.090	0.488	2.537	0.504		
1.791	0.508	2.090	0.492	2.537	0.508		
1.791	0.513	2.090	0.496	2.537	0.513		
1.791	0.517	2.090	0.500	2.537	0.517		
1.791	0.521	2.090	0.504	2.537	0.521		
1.791	0.525	2.090	0.508	2.537	0.525		
1.791	0.529	2.090	0.513	2.537	0.529		
1.791	0.533	2.090	0.517	2.537	0.533		
1.791	0.538	2.090	0.521	2.537	0.538		
1.791	0.542	2.090	0.525	2.537	0.542		
1.791	0.546	2.090	0.529	2.537	0.546		
1.791	0.550	2.090	0.533	2.537	0.550		
1.791	0.554	2.090	0.538	2.537	0.554		
1.791	0.558	2.090	0.542	2.537	0.558		
1.791	0.563	2.090	0.546	2.537	0.563		
1.791	0.567	2.090	0.550	2.537	0.567		
1.791	0.571	2.090	0.554	2.537	0.571		
1.791	0.575	2.090	0.558	2.537	0.575		
1.791	0.579	2.090	0.563	2.537	0.579		
1.791	0.583	2.090	0.567	2.537	0.583		
1.791	0.588	2.090	0.571	2.537	0.588		
1.791	0.592	2.090	0.575	2.537	0.592		
1.791	0.596	2.090	0.579	2.537	0.596		
1.791	0.600	2.090	0.583	2.537	0.600		
1.791	0.604	2.090	0.588	2.537	0.604		
1.791	0.608	2.090	0.592	2.537	0.608		
1.791	0.613	2.090	0.596	2.537	0.613		
1.791	0.617	2.090	0.600	2.537	0.617		
1.791	0.621	2.090	0.604	2.537	0.621		
1.791	0.625	2.090	0.608	2.537	0.625		
1.791	0.629	2.090	0.613	2.537	0.629		
1.791	0.633	2.090	0.617	2.537	0.633		
1.791	0.638	2.090	0.621	2.537	0.638		
1.791	0.642	2.090	0.625	2.537	0.642		
1.791	0.646	2.090	0.629	2.537	0.646		
1.791	0.650	2.090	0.633	2.537	0.650		
1.791	0.654	2.090	0.638	2.537	0.654		
1.791	0.658	2.090	0.642	2.537	0.658		
1.791	0.663	2.090	0.646	2.537	0.663		
1.791	0.667	2.090	0.650	2.537	0.667		
1.791	0.671	2.090	0.654	2.537	0.671		
1.791	0.675	2.090	0.658	2.537	0.675		

1.791	0.679	2.090	0.663	2.537	0.679		
1.791	0.683	2.090	0.667	2.537	0.683		
1.791	0.688	2.090	0.671	2.537	0.688		
1.791	0.692	2.090	0.675	2.537	0.692		
1.791	0.696	2.090	0.679	2.537	0.696		
1.791	0.700	2.090	0.683	2.537	0.700		
1.791	0.704	2.090	0.688	2.537	0.704		
1.791	0.708	2.090	0.692	2.537	0.708		
1.791	0.713	2.090	0.696	2.537	0.713		
1.791	0.717	2.090	0.700	2.537	0.717		
1.791	0.721	2.090	0.704	2.537	0.721		
1.791	0.725	2.090	0.708	2.388	0.725		
1.791	0.729	2.090	0.713	2.388	0.729		
1.791	0.733	2.090	0.717	2.388	0.733		
1.791	0.738	2.090	0.721	2.388	0.738		
1.791	0.742	2.090	0.725	2.388	0.742		
1.791	0.746	2.090	0.729	2.388	0.746		
1.791	0.750	2.090	0.733	2.537	0.750		
1.791	0.754	2.090	0.738	2.537	0.754		
1.791	0.758	2.090	0.742	2.537	0.758		
1.791	0.763	2.090	0.746	2.537	0.763		
1.791	0.767	2.090	0.750	2.537	0.767		
1.791	0.771	2.090	0.754	2.537	0.771		
1.791	0.775	2.090	0.758	2.537	0.775		
1.791	0.779	2.090	0.763	2.537	0.779		
1.791	0.783	2.090	0.767	2.537	0.783		
1.791	0.788	2.090	0.771	2.537	0.788		
1.791	0.792	2.090	0.775	2.537	0.792		
1.791	0.796	2.090	0.779	2.537	0.796		
1.791	0.800	2.090	0.783	2.537	0.800		
1.791	0.804	2.090	0.788	2.537	0.804		
1.791	0.808	2.090	0.792	2.537	0.808		
1.791	0.813	2.090	0.796	2.537	0.813		
1.791	0.817	2.090	0.800	2.537	0.817		
1.791	0.821	2.090	0.804	2.537	0.821		
1.791	0.825	2.090	0.808	2.537	0.825		
1.791	0.829	2.090	0.813	2.537	0.829		
1.791	0.833	2.090	0.817	2.537	0.833		
1.791	0.838	2.090	0.821	2.537	0.838		
1.791	0.842	2.090	0.825	2.537	0.842		
1.791	0.846	2.090	0.829	2.537	0.846		
1.791	0.850	2.090	0.833	2.388	0.850		
1.791	0.854	2.090	0.838	2.388	0.854		
1.791	0.858	2.090	0.842	2.388	0.858		
1.791	0.863	2.090	0.846	2.388	0.863		
1.791	0.867	2.090	0.850	2.388	0.867		
1.791	0.871	2.090	0.854	2.388	0.871		
1.791	0.875	2.090	0.858	2.388	0.875		
1.791	0.879	2.090	0.863	2.388	0.879		
1.791	0.883	2.090	0.867	2.388	0.883		
1.791	0.888	2.090	0.871	2.388	0.888		
1.791	0.892	2.090	0.875	2.388	0.892		
1.791	0.896	2.090	0.879	2.388	0.896		
1.791	0.900	2.090	0.883	2.388	0.900		
1.791	0.904	2.090	0.888	2.388	0.904		
1.791	0.908	2.090	0.892	2.090	0.908		

1.791	0.913	2.090	0.896	2.090	0.913		
1.791	0.917	2.090	0.900	1.791	0.917		
1.791	0.921	2.090	0.904	1.940	0.921		
1.791	0.925	2.090	0.908	1.940	0.925		
1.791	0.929	2.090	0.913	2.836	0.929		
1.791	0.933	2.090	0.917	2.239	0.933		
1.791	0.938	2.090	0.921	2.537	0.938		
1.791	0.942	2.090	0.925	2.985	0.942		
1.791	0.946	2.090	0.929	3.284	0.946		
1.791	0.950	2.090	0.933	3.881	0.950		
1.791	0.954	2.090	0.938				
1.791	0.958	2.090	0.942				
1.791	0.963	2.090	0.946				
1.791	0.967	2.090	0.950				
1.791	0.971	2.090	0.954				
1.940	0.975	2.090	0.958				
1.940	0.979	2.090	0.963				
1.791	0.983	2.090	0.967				
1.791	0.988	2.090	0.971				
1.940	0.992	2.090	0.975				
1.791	0.996	2.090	0.979				
1.791	1.000	2.090	0.983				
1.791	1.004	2.090	0.988				
1.791	1.008	2.090	0.992				
1.791	1.013	2.090	0.996				
1.940	1.017	2.090	1.000				
1.791	1.021	2.090	1.004				
1.940	1.025	2.090	1.008				
1.791	1.029	2.090	1.013				
1.940	1.033	2.090	1.017				
1.940	1.038	2.090	1.021				
1.940	1.042	2.090	1.025				
1.791	1.046	2.090	1.029				
1.940	1.050	2.090	1.033				
1.940	1.054	2.090	1.038				
1.940	1.058	2.090	1.042				
1.940	1.063	2.090	1.046				
1.940	1.067	2.090	1.050				
1.940	1.071	2.090	1.054				
1.940	1.075	2.090	1.058				
1.940	1.079	2.090	1.063				
1.940	1.083	2.090	1.067				
1.940	1.088	2.090	1.071				
1.940	1.092	2.090	1.075				
1.940	1.096	2.090	1.079				
1.940	1.100	2.090	1.083				
1.940	1.104	2.090	1.088				
1.940	1.108	2.090	1.092				
1.940	1.113	2.090	1.096				
1.940	1.117	2.090	1.100				
1.940	1.121	2.090	1.104				
1.940	1.125	2.090	1.108				
1.940	1.129	2.090	1.113				
1.940	1.133	2.090	1.117				
1.940	1.138	2.090	1.121				
1.940	1.142	2.090	1.125				

1.940	1.146	2.090	1.129				
1.940	1.150	2.090	1.133				
1.940	1.154	2.090	1.138				
1.940	1.158	2.090	1.142				
1.940	1.163	2.090	1.146				
1.940	1.167	2.090	1.150				
1.940	1.171	2.090	1.154				
1.940	1.175	2.090	1.158				
1.940	1.179	2.090	1.163				
1.940	1.183	2.090	1.167				
1.940	1.188	2.090	1.171				
1.940	1.192	2.090	1.175				
1.940	1.196	2.090	1.179				
1.940	1.200	2.090	1.183				
1.940	1.204	2.090	1.188				
1.940	1.208	2.090	1.192				
1.940	1.213	2.090	1.196				
1.940	1.217	2.090	1.200				
1.940	1.221	2.090	1.204				
1.940	1.225	2.090	1.208				
1.940	1.229	2.090	1.213				
1.940	1.233	2.090	1.217				
1.940	1.238	2.090	1.221				
1.940	1.242	2.090	1.225				
1.940	1.246	2.090	1.229				
1.940	1.250	2.090	1.233				
1.940	1.254	2.090	1.238				
1.940	1.258	2.090	1.242				
1.940	1.263	2.090	1.246				
1.940	1.267	2.090	1.250				
1.940	1.271	2.090	1.254				
1.940	1.275	2.090	1.258				
1.940	1.279	2.090	1.263				
1.940	1.283	2.090	1.267				
1.940	1.288	2.090	1.271				
1.940	1.292	2.090	1.275				
1.940	1.296	2.090	1.279				
1.940	1.300	2.090	1.283				
1.940	1.304	2.090	1.288				
1.940	1.308	2.090	1.292				
1.940	1.313	2.090	1.296				
1.940	1.317	2.090	1.300				
1.940	1.321	2.090	1.304				
1.940	1.325	2.090	1.308				
1.940	1.329	2.090	1.313				
1.940	1.333	2.090	1.317				
1.940	1.338	2.090	1.321				
1.940	1.342	2.090	1.325				
1.940	1.346	2.090	1.329				
1.940	1.350	2.090	1.333				
1.940	1.354	2.090	1.338				
1.940	1.358	2.090	1.342				
1.940	1.363	2.090	1.346				
1.940	1.367	2.090	1.350				
1.940	1.371	2.090	1.354				
1.940	1.375	2.090	1.358				

1.940	1.379	2.090	1.363				
1.940	1.383	2.090	1.367				
1.940	1.388	2.090	1.371				
1.940	1.392	2.090	1.375				
1.940	1.396	2.090	1.379				
1.940	1.400	2.090	1.383				
1.940	1.404	2.090	1.388				
1.940	1.408	2.090	1.392				
1.940	1.413	2.090	1.396				
1.940	1.417	2.090	1.400				
1.940	1.421	2.090	1.404				
1.940	1.425	2.090	1.408				
1.940	1.429	2.090	1.413				
1.940	1.433	2.090	1.417				
1.940	1.438	2.090	1.421				
1.940	1.442	2.090	1.425				
1.940	1.446	2.090	1.429				
1.940	1.450	2.090	1.433				
1.940	1.454	2.090	1.438				
1.940	1.458	2.090	1.442				
1.940	1.463	2.090	1.446				
1.940	1.467	2.090	1.450				
1.940	1.471	2.090	1.454				
1.940	1.475	2.090	1.458				
1.940	1.479	2.090	1.463				
1.940	1.483	2.090	1.467				
1.940	1.488	2.090	1.471				
1.940	1.492	2.090	1.475				
1.940	1.496	2.090	1.479				
1.940	1.500	2.090	1.483				
1.940	1.504	2.090	1.488				
1.940	1.508	2.090	1.492				
1.940	1.513	2.090	1.496				
1.940	1.517	2.090	1.500				
1.940	1.521	2.090	1.504				
1.940	1.525	2.090	1.508				
1.940	1.529	2.090	1.513				
1.940	1.533	2.090	1.517				
1.940	1.538	2.090	1.521				
1.940	1.542	2.090	1.525				
1.940	1.546	2.090	1.529				
1.940	1.550	2.090	1.533				
1.940	1.554	2.090	1.538				
1.940	1.558	2.090	1.542				
1.940	1.563	2.090	1.546				
1.940	1.567	2.090	1.550				
1.940	1.571	2.090	1.554				
1.940	1.575	2.090	1.558				
1.940	1.579	2.090	1.563				
1.940	1.583	2.090	1.567				
1.940	1.588	2.090	1.571				
1.940	1.592	2.090	1.575				
1.940	1.596	2.090	1.579				
1.940	1.600	2.090	1.583				
1.940	1.604	2.090	1.588				
1.940	1.608	2.090	1.592				

1.940	1.613	2.090	1.596				
1.940	1.617	2.090	1.600				
1.940	1.621	2.090	1.604				
1.940	1.625	2.090	1.608				
1.940	1.629	2.090	1.613				
1.940	1.633	2.090	1.617				
1.940	1.638	2.090	1.621				
1.940	1.642	2.090	1.625				
1.940	1.646	2.090	1.629				
1.940	1.650	2.090	1.633				
1.940	1.654	2.090	1.638				
1.940	1.658	2.090	1.642				
1.940	1.663	2.090	1.646				
1.940	1.667	2.090	1.650				
1.940	1.671	2.090	1.654				
1.940	1.675	2.090	1.658				
1.940	1.679	2.090	1.663				
1.940	1.683	2.090	1.667				
1.940	1.688	2.090	1.671				
1.940	1.692	2.090	1.675				
1.940	1.696	2.090	1.679				
1.940	1.700	2.090	1.683				
1.940	1.704	2.090	1.688				
1.940	1.708	2.090	1.692				
1.940	1.713	2.090	1.696				
1.940	1.717	2.090	1.700				
1.940	1.721	2.090	1.704				
1.940	1.725	2.090	1.708				
1.940	1.729	2.090	1.713				
1.940	1.733	2.090	1.717				
1.940	1.738	2.090	1.721				
1.940	1.742	2.090	1.725				
1.940	1.746	2.090	1.729				
1.940	1.750	2.090	1.733				
1.940	1.754	2.090	1.738				
1.940	1.758	2.239	1.742				
1.940	1.763	2.090	1.746				
1.940	1.767	2.090	1.750				
1.940	1.771	2.239	1.754				
1.940	1.775	2.239	1.758				
1.940	1.779	2.239	1.763				
1.940	1.783	2.239	1.767				
1.940	1.788	2.239	1.771				
1.940	1.792	2.239	1.775				
1.940	1.796	2.239	1.779				
2.090	1.800	2.239	1.783				
1.940	1.804	2.090	1.788				
2.090	1.808	2.090	1.792				
1.940	1.813	2.239	1.796				
1.940	1.817	2.090	1.800				
1.940	1.821	2.239	1.804				
1.940	1.825	2.239	1.808				
2.090	1.829	2.090	1.813				
1.940	1.833	2.090	1.817				
1.940	1.838	2.239	1.821				
1.940	1.842	2.090	1.825				

1.940	1.846	2.090	1.829				
2.090	1.850	2.090	1.833				
1.940	1.854	2.090	1.838				
2.090	1.858	2.090	1.842				
2.090	1.863	2.090	1.846				
2.090	1.867	2.090	1.850				
2.090	1.871	2.090	1.854				
2.090	1.875	2.090	1.858				
2.090	1.879	2.090	1.863				
2.090	1.883	2.090	1.867				
2.090	1.888	2.090	1.871				
2.090	1.892	2.090	1.875				
2.090	1.896	2.090	1.879				
2.090	1.900	2.090	1.883				
2.090	1.904	2.090	1.888				
2.090	1.908	2.090	1.892				
2.090	1.913	2.090	1.896				
2.090	1.917	2.090	1.900				
2.090	1.921	2.090	1.904				
2.090	1.925	2.090	1.908				
2.090	1.929	2.090	1.913				
2.090	1.933	2.090	1.917				
2.090	1.938	2.090	1.921				
2.090	1.942	2.090	1.925				
2.090	1.946	2.090	1.929				
2.090	1.950	2.090	1.933				
2.090	1.954	2.090	1.938				
2.090	1.958	2.090	1.942				
2.090	1.963	2.090	1.946				
2.090	1.967	2.090	1.950				
2.090	1.971	2.090	1.954				
2.090	1.975	2.090	1.958				
2.090	1.979	2.090	1.963				
2.090	1.983	2.090	1.967				
2.090	1.988	2.090	1.971				
2.090	1.992	2.090	1.975				
2.090	1.996	2.090	1.979				
2.090	2.000	2.090	1.983				
2.090	2.004	2.090	1.988				
2.090	2.008	2.090	1.992				
2.090	2.013	2.090	1.996				
2.090	2.017	2.239	2.000				
2.090	2.021	2.090	2.004				
2.090	2.025	2.239	2.008				
2.090	2.029	2.239	2.013				
2.090	2.033	2.239	2.017				
2.090	2.038	2.239	2.021				
2.090	2.042	2.239	2.025				
2.090	2.046	2.239	2.029				
2.090	2.050	2.239	2.033				
2.090	2.054	2.239	2.038				
2.090	2.058	2.239	2.042				
2.090	2.063	2.239	2.046				
2.090	2.067	2.239	2.050				
2.090	2.071	2.239	2.054				
2.090	2.075	2.239	2.058				

2.090	2.079	2.239	2.063				
2.090	2.083	2.239	2.067				
2.090	2.088	2.239	2.071				
2.090	2.092	2.239	2.075				
2.090	2.096	2.239	2.079				
2.090	2.100	2.239	2.083				
2.090	2.104	2.239	2.088				
2.090	2.108	2.239	2.092				
2.090	2.113	2.239	2.096				
2.090	2.117	2.239	2.100				
2.090	2.121	2.239	2.104				
2.090	2.125	2.239	2.108				
2.090	2.129	2.239	2.113				
2.090	2.133	2.239	2.117				
2.090	2.138	2.239	2.121				
2.090	2.142	2.239	2.125				
2.090	2.146	2.239	2.129				
2.090	2.150	2.239	2.133				
2.090	2.154	2.239	2.138				
2.090	2.158	2.239	2.142				
2.090	2.163	2.239	2.146				
2.090	2.167	2.239	2.150				
2.090	2.171	2.239	2.154				
2.090	2.175	2.239	2.158				
2.090	2.179	2.239	2.163				
2.090	2.183	2.239	2.167				
2.090	2.188	2.239	2.171				
2.090	2.192	2.239	2.175				
2.090	2.196	2.239	2.179				
2.090	2.200	2.239	2.183				
2.090	2.204	2.239	2.188				
2.090	2.208	2.239	2.192				
2.090	2.213	2.239	2.196				
2.090	2.217	2.239	2.200				
2.090	2.221	2.239	2.204				
2.090	2.225	2.239	2.208				
2.090	2.229	2.239	2.213				
2.090	2.233	2.239	2.217				
2.090	2.238	2.239	2.221				
2.090	2.242	2.239	2.225				
2.090	2.246	2.239	2.229				
2.090	2.250	2.239	2.233				
2.090	2.254	2.239	2.238				
2.090	2.258	2.239	2.242				
2.090	2.263	2.239	2.246				
2.090	2.267	2.239	2.250				
2.090	2.271	2.239	2.254				
2.090	2.275	2.239	2.258				
2.090	2.279	2.239	2.263				
2.090	2.283	2.239	2.267				
2.090	2.288	2.239	2.271				
2.090	2.292	2.239	2.275				
2.090	2.296	2.239	2.279				
2.090	2.300	2.239	2.283				
2.090	2.304	2.239	2.288				
2.090	2.308	2.239	2.292				

2.090	2.313	2.239	2.296				
2.090	2.317	2.239	2.300				
2.090	2.321	2.239	2.304				
2.090	2.325	2.239	2.308				
2.090	2.329	2.239	2.313				
2.090	2.333	2.239	2.317				
2.090	2.338	2.239	2.321				
2.090	2.342	2.239	2.325				
2.090	2.346	2.239	2.329				
2.090	2.350	2.239	2.333				
2.090	2.354	2.239	2.338				
2.090	2.358	2.239	2.342				
2.090	2.363	2.239	2.346				
2.090	2.367	2.239	2.350				
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2.090	2.375	2.239	2.358				
2.090	2.379	2.239	2.363				
2.090	2.383	2.239	2.367				
2.090	2.388	2.239	2.371				
2.090	2.392	2.239	2.375				
2.090	2.396	2.239	2.379				
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2.090	2.404	2.239	2.388				
2.090	2.408	2.239	2.392				
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2.090	2.417	2.239	2.400				
2.090	2.421	2.239	2.404				
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2.090	2.429	2.239	2.413				
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2.090	2.454	2.239	2.438				
2.090	2.458	2.239	2.442				
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2.090	2.529	2.388	2.513				
2.090	2.533	2.388	2.517				
2.090	2.538	2.388	2.521				
2.090	2.542	2.388	2.525				

2.090	2.546	2.388	2.529				
2.090	2.550	2.388	2.533				
2.090	2.554	2.388	2.538				
2.090	2.558	2.388	2.542				
2.090	2.563	2.388	2.546				
2.090	2.567	2.388	2.550				
2.090	2.571	2.388	2.554				
2.090	2.575	2.388	2.558				
2.090	2.579	2.388	2.563				
2.090	2.583	2.388	2.567				
2.090	2.588	2.388	2.571				
2.090	2.592	2.388	2.575				
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2.090	2.600	2.388	2.583				
2.090	2.604	2.388	2.588				
2.090	2.608	2.388	2.592				
2.090	2.613	2.388	2.596				
2.090	2.617	2.388	2.600				
2.090	2.621	2.388	2.604				
2.090	2.625	2.388	2.608				
2.239	2.629	2.388	2.613				
2.090	2.633	2.388	2.617				
2.239	2.638	2.388	2.621				
2.239	2.642	2.388	2.625				
2.090	2.646	2.388	2.629				
2.090	2.650	2.388	2.633				
2.239	2.654	2.388	2.638				
2.090	2.658	2.388	2.642				
2.239	2.663	2.388	2.646				
2.090	2.667	2.388	2.650				
2.090	2.671	2.388	2.654				
2.090	2.675	2.388	2.658				
2.090	2.679	2.388	2.663				
2.090	2.683	2.388	2.667				
2.090	2.688	2.388	2.671				
2.090	2.692	2.388	2.675				
2.090	2.696	2.388	2.679				
2.239	2.700	2.388	2.683				
2.090	2.704	2.388	2.688				
2.090	2.708	2.388	2.692				
2.090	2.713	2.388	2.696				
2.239	2.717	2.388	2.700				
2.090	2.721	2.388	2.704				
2.239	2.725	2.388	2.708				
2.090	2.729	2.388	2.713				
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2.239	2.738	2.388	2.721				
2.239	2.742	2.388	2.725				
2.239	2.746	2.388	2.729				
2.239	2.750	2.388	2.733				
2.239	2.754	2.388	2.738				
2.090	2.758	2.388	2.742				
2.090	2.763	2.388	2.746				
2.239	2.767	2.388	2.750				
2.090	2.771	2.388	2.754				
2.090	2.775	2.388	2.758				

2.090	2.779	2.388	2.763				
2.090	2.783	2.388	2.767				
2.239	2.788	2.388	2.771				
2.090	2.792	2.388	2.775				
2.090	2.796	2.388	2.779				
2.090	2.800	2.388	2.783				
2.090	2.804	2.388	2.788				
2.090	2.808	2.388	2.792				
2.090	2.813	2.388	2.796				
2.090	2.817	2.388	2.800				
2.090	2.821	2.388	2.804				
2.090	2.825	2.388	2.808				
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2.239	2.833	2.388	2.817				
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2.239	2.850	2.388	2.833				
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2.239	2.858	2.388	2.842				
2.239	2.863	2.388	2.846				
2.239	2.867	2.388	2.850				
2.239	2.871	2.388	2.854				
2.239	2.875	2.388	2.858				
2.239	2.879	2.537	2.863				
2.239	2.883	2.388	2.867				
2.239	2.888	2.537	2.871				
2.239	2.892	2.537	2.875				
2.239	2.896	2.537	2.879				
2.239	2.900	2.537	2.883				
2.239	2.904	2.537	2.888				
2.239	2.908	2.537	2.892				
2.239	2.913	2.537	2.896				
2.239	2.917	2.537	2.900				
2.239	2.921	2.537	2.904				
2.239	2.925	2.537	2.908				
2.239	2.929	2.537	2.913				
2.239	2.933	2.388	2.917				
2.239	2.938	2.537	2.921				
2.239	2.942	2.537	2.925				
2.239	2.946	2.537	2.929				
2.239	2.950	2.537	2.933				
2.239	2.954	2.537	2.938				
2.239	2.958	2.537	2.942				
2.239	2.963	2.537	2.946				
2.239	2.967	2.537	2.950				
2.239	2.971	2.537	2.954				
2.239	2.975	2.537	2.958				
2.239	2.979	2.537	2.963				
2.239	2.983	2.537	2.967				
2.239	2.988	2.537	2.971				
2.239	2.992	2.537	2.975				
2.239	2.996	2.537	2.979				
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2.239	3.071	2.537	3.054				
2.239	3.075	2.537	3.058				
2.239	3.079	2.537	3.063				
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2.239	3.088	2.537	3.071				
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2.239	3.138	2.537	3.121				
2.239	3.142	2.537	3.125				
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2.239	3.158	2.537	3.142				
2.239	3.163	2.537	3.146				
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2.090	3.179	2.537	3.163				
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2.090	3.196	2.537	3.179				
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2.239	4.654						
2.239	4.658						
2.239	4.663						
2.239	4.667						
2.239	4.671						
2.239	4.675						
2.239	4.679						
2.239	4.683						
2.239	4.688						
2.239	4.692						
2.239	4.696						
2.239	4.700						
2.239	4.704						
2.239	4.708						
2.239	4.713						
2.239	4.717						
2.239	4.721						
2.239	4.725						
2.239	4.729						
2.239	4.733						
2.239	4.738						
2.239	4.742						
2.239	4.746						
2.239	4.750						
2.239	4.754						
2.239	4.758						
2.239	4.763						
2.239	4.767						
2.239	4.771						
2.239	4.775						
2.239	4.779						
2.239	4.783						
2.239	4.788						
2.239	4.792						
2.239	4.796						
2.239	4.800						
2.239	4.804						
2.239	4.808						
2.239	4.813						
2.239	4.817						
2.239	4.821						
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2.239	4.833						
2.239	4.838						
2.239	4.842						
2.239	4.846						
2.239	4.850						
2.239	4.854						
2.239	4.858						
2.239	4.863						
2.239	4.867						
2.239	4.871						
2.239	4.875						

2.239	4.879						
2.239	4.883						
2.239	4.888						
2.239	4.892						
2.239	4.896						
2.239	4.900						
2.239	4.904						
2.239	4.908						
2.239	4.913						
2.239	4.917						
2.239	4.921						
2.239	4.925						
2.239	4.929						
2.239	4.933						
2.239	4.938						
2.239	4.942						
2.239	4.946						
2.239	4.950						
2.239	4.954						
2.239	4.958						
2.239	4.963						
2.239	4.967						
2.239	4.971						
2.239	4.975						
2.239	4.979						
2.239	4.983						
2.239	4.988						
2.239	4.992						
2.239	4.996						
2.239	5.000						
2.239	5.004						
2.239	5.008						
2.239	5.013						
2.239	5.017						
2.239	5.021						
2.239	5.025						
2.239	5.029						
2.239	5.033						
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2.239	5.042						
2.239	5.046						
2.239	5.050						
2.239	5.054						
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2.239	5.067						
2.239	5.071						
2.239	5.075						
2.239	5.079						
2.239	5.083						
2.239	5.088						
2.239	5.092						
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2.239	5.100						
2.239	5.104						
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2.239	5.113						
2.239	5.117						
2.239	5.121						
2.239	5.125						
2.239	5.129						
2.239	5.133						
2.239	5.138						
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2.239	5.146						
2.239	5.150						
2.239	5.154						
2.239	5.158						
2.239	5.163						
2.239	5.167						
2.239	5.171						
2.239	5.175						
2.239	5.179						
2.239	5.183						
2.239	5.188						
2.239	5.192						
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2.239	5.208						
2.239	5.213						
2.239	5.217						
2.239	5.221						
2.239	5.225						
2.239	5.229						
2.239	5.233						
2.239	5.238						
2.239	5.242						
2.239	5.246						
2.239	5.250						
2.239	5.254						
2.239	5.258						
2.239	5.263						
2.239	5.267						
2.239	5.271						
2.239	5.275						
2.239	5.279						
2.239	5.283						
2.239	5.288						
2.239	5.292						
2.239	5.296						
2.239	5.300						
2.239	5.304						
2.239	5.308						
2.239	5.313						
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2.239	5.375						
2.239	5.379						
2.239	5.383						
2.239	5.388						
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2.239	5.396						
2.239	5.400						
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2.239	5.413						
2.239	5.417						
2.239	5.421						
2.239	5.425						
2.239	5.429						
2.239	5.433						
2.239	5.438						
2.239	5.442						
2.239	5.446						
2.239	5.450						
2.239	5.454						
2.239	5.458						
2.239	5.463						
2.239	5.467						
2.239	5.471						
2.239	5.475						
2.239	5.479						
2.239	5.483						
2.239	5.488						
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2.239	5.500						
2.239	5.504						
2.239	5.508						
2.239	5.513						
2.239	5.517						
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2.239	5.529						
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2.239	5.542						
2.239	5.546						
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2.239	5.579						
2.239	5.583						
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2.239	6.038						
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2.239	6.063						
2.239	6.067						
2.239	6.071						
2.239	6.075						
2.239	6.079						
2.239	6.083						
2.239	6.088						
2.239	6.092						
2.239	6.096						
2.239	6.100						
2.239	6.104						
2.239	6.108						
2.239	6.113						
2.239	6.117						
2.239	6.121						
2.239	6.125						
2.239	6.129						
2.388	8.000						
2.537	12.000						
2.537	16.000						
2.687	20.000						
2.687	24.000						

92% of degree of saturation

150kPa							
Equilibrium stage		Consolidation stage		Shearing stage			
Matric suction/(kPa)	Time/(hr)	Matric suction/(kPa)	Time/(hr)	Matric suction/(kPa)	Time/(hr)	Matric suction/(kPa)	Shear strain/(%)
0.000	0.000	2.985	0.000	2.985	0.000	2.985	0.000
0.299	0.004	2.388	0.000	2.985	0.004	2.985	0.250
0.448	0.008	1.940	0.001	2.985	0.008	3.284	0.500
0.597	0.013	1.343	0.002	2.985	0.013	2.985	0.750
0.746	0.017	1.343	0.003	2.985	0.017	2.836	1.000
0.896	0.021	1.194	0.004	2.985	0.021	2.836	1.250
1.045	0.025	1.194	0.008	2.985	0.025	2.687	1.500
1.194	0.029	1.045	0.013	2.985	0.029	2.537	1.750
1.343	0.033	1.045	0.017	2.985	0.033	2.388	2.000
1.343	0.038	1.045	0.021	3.134	0.038	2.239	2.500
1.493	0.042	1.045	0.025	3.284	0.042	2.090	3.000
1.493	0.046	1.045	0.029	3.284	0.046	1.940	3.500
1.493	0.050	1.045	0.033	3.134	0.050	1.791	4.000
1.493	0.054	1.045	0.038	2.985	0.054	1.642	5.000
1.493	0.058	1.045	0.042	2.985	0.058	1.343	6.000
1.642	0.063	1.045	0.046	2.985	0.063	1.194	7.000
1.642	0.067	1.045	0.050	2.985	0.067	1.194	8.000
1.642	0.071	1.045	0.054	2.985	0.071	1.045	9.000
1.642	0.075	1.045	0.058	2.985	0.075	1.045	10.000
1.791	0.079	1.045	0.063	2.836	0.079	1.045	11.000
1.642	0.083	1.045	0.067	2.836	0.083	1.045	12.000
1.642	0.088	1.045	0.071	2.836	0.088	1.045	13.000
1.642	0.092	1.045	0.075	2.985	0.092	1.045	14.000
1.791	0.096	1.045	0.079	2.836	0.096	1.045	15.000
1.791	0.100	1.045	0.083	2.836	0.100	1.940	16.000
1.791	0.104	1.045	0.088	2.836	0.104		
1.791	0.108	0.896	0.092	2.687	0.108		
1.791	0.113	0.896	0.096	2.687	0.113		
1.791	0.117	0.896	0.100	2.687	0.117		
1.791	0.121	0.896	0.104	2.687	0.121		
1.791	0.125	1.045	0.108	2.537	0.125		
1.642	0.129	0.896	0.113	2.537	0.129		
1.791	0.133	0.896	0.117	2.537	0.133		
1.791	0.138	0.896	0.121	2.537	0.138		
1.791	0.142	0.896	0.125	2.537	0.142		
1.791	0.146	0.896	0.129	2.537	0.146		
1.791	0.150	0.896	0.133	2.388	0.150		
1.791	0.154	0.896	0.138	2.388	0.154		
1.791	0.158	0.896	0.142	2.388	0.158		
1.791	0.163	0.896	0.146	2.388	0.163		
1.791	0.167	1.045	0.150	2.388	0.167		
1.791	0.171	0.896	0.154	2.388	0.171		
1.791	0.175	0.896	0.158	2.388	0.175		
1.791	0.179	0.896	0.163	2.388	0.179		
1.791	0.183	0.896	0.167	2.239	0.183		
1.791	0.188	0.896	0.171	2.239	0.188		
1.791	0.192	0.896	0.175	2.239	0.192		
1.791	0.196	0.896	0.179	2.239	0.196		
1.791	0.200	0.896	0.183	2.239	0.200		
1.791	0.204	0.896	0.188	2.239	0.204		
1.791	0.208	0.896	0.192	2.239	0.208		

1.791	0.213	0.896	0.196	2.239	0.213		
1.791	0.217	0.896	0.200	2.090	0.217		
1.791	0.221	0.896	0.204	2.090	0.221		
1.791	0.225	0.896	0.208	2.090	0.225		
1.791	0.229	0.896	0.213	2.090	0.229		
1.791	0.233	0.896	0.217	2.090	0.233		
1.791	0.238	0.896	0.221	2.090	0.238		
1.791	0.242	0.896	0.225	2.090	0.242		
1.791	0.246	0.896	0.229	2.090	0.246		
1.791	0.250	0.896	0.233	2.090	0.250		
1.791	0.254	0.896	0.238	2.090	0.254		
1.791	0.258	0.896	0.242	2.090	0.258		
1.791	0.263	0.896	0.246	2.090	0.263		
1.791	0.267	0.896	0.250	1.940	0.267		
1.791	0.271	0.896	0.254	1.940	0.271		
1.791	0.275	0.896	0.258	1.940	0.275		
1.791	0.279	0.896	0.263	1.940	0.279		
1.791	0.283	0.896	0.267	1.940	0.283		
1.791	0.288	0.896	0.271	1.940	0.288		
1.791	0.292	0.896	0.275	1.940	0.292		
1.791	0.296	0.896	0.279	1.940	0.296		
1.791	0.300	0.896	0.283	1.940	0.300		
1.791	0.304	0.896	0.288	1.940	0.304		
1.791	0.308	0.896	0.292	1.791	0.308		
1.791	0.313	0.896	0.296	1.791	0.313		
1.791	0.317	0.896	0.300	1.791	0.317		
1.791	0.321	0.896	0.304	1.791	0.321		
1.791	0.325	0.896	0.308	1.791	0.325		
1.791	0.329	0.896	0.313	1.791	0.329		
1.940	0.333	0.896	0.317	1.791	0.333		
1.791	0.338	0.896	0.321	1.791	0.338		
1.791	0.342	0.896	0.325	1.791	0.342		
1.791	0.346	0.896	0.329	1.791	0.346		
1.791	0.350	0.896	0.333	1.791	0.350		
1.940	0.354	0.896	0.338	1.791	0.354		
1.791	0.358	0.896	0.342	1.791	0.358		
1.791	0.363	0.896	0.346	1.642	0.363		
1.791	0.367	0.896	0.350	1.642	0.367		
1.791	0.371	0.896	0.354	1.642	0.371		
1.940	0.375	0.896	0.358	1.642	0.375		
1.940	0.379	0.896	0.363	1.642	0.379		
1.940	0.383	0.896	0.367	1.642	0.383		
1.940	0.388	0.896	0.371	1.642	0.388		
1.940	0.392	0.896	0.375	1.642	0.392		
1.940	0.396	0.896	0.379	1.642	0.396		
1.791	0.400	0.896	0.383	1.642	0.400		
1.940	0.404	0.896	0.388	1.642	0.404		
1.791	0.408	0.896	0.392	1.642	0.408		
1.791	0.413	0.896	0.396	1.642	0.413		
1.940	0.417	0.896	0.400	1.493	0.417		
1.940	0.421	0.896	0.404	1.493	0.421		
1.940	0.425	0.896	0.408	1.493	0.425		
1.940	0.429	0.896	0.413	1.493	0.429		
1.940	0.433	0.896	0.417	1.493	0.433		
1.791	0.438	0.896	0.421	1.493	0.438		
1.791	0.442	0.896	0.425	1.493	0.442		

1.940	0.446	0.896	0.429	1.493	0.446		
1.940	0.450	0.896	0.433	1.493	0.450		
1.940	0.454	0.896	0.438	1.493	0.454		
1.940	0.458	0.896	0.442	1.493	0.458		
1.940	0.463	0.896	0.446	1.343	0.463		
1.940	0.467	0.896	0.450	1.343	0.467		
1.940	0.471	1.045	0.454	1.343	0.471		
1.940	0.475	0.896	0.458	1.343	0.475		
1.940	0.479	0.896	0.463	1.343	0.479		
1.940	0.483	0.896	0.467	1.493	0.483		
1.940	0.488	0.896	0.471	1.343	0.488		
1.940	0.492	0.896	0.475	1.343	0.492		
1.940	0.496	0.896	0.479	1.343	0.496		
1.940	0.500	0.896	0.483	1.343	0.500		
1.940	0.504	0.896	0.488	1.343	0.504		
1.940	0.508	0.896	0.492	1.343	0.508		
1.940	0.513	0.896	0.496	1.343	0.513		
1.940	0.517	0.896	0.500	1.343	0.517		
1.940	0.521	0.896	0.504	1.343	0.521		
1.940	0.525	0.896	0.508	1.343	0.525		
1.940	0.529	0.896	0.513	1.343	0.529		
1.940	0.533	0.896	0.517	1.343	0.533		
1.940	0.538	0.896	0.521	1.343	0.538		
1.940	0.542	0.896	0.525	1.343	0.542		
1.940	0.546	0.896	0.529	1.343	0.546		
1.940	0.550	1.045	0.533	1.343	0.550		
1.940	0.554	0.896	0.538	1.194	0.554		
1.940	0.558	0.896	0.542	1.194	0.558		
1.940	0.563	0.896	0.546	1.194	0.563		
1.940	0.567	0.896	0.550	1.194	0.567		
1.940	0.571	0.896	0.554	1.194	0.571		
1.940	0.575	1.045	0.558	1.194	0.575		
1.940	0.579	0.896	0.563	1.194	0.579		
1.940	0.583	0.896	0.567	1.194	0.583		
1.940	0.588	1.045	0.571	1.194	0.588		
1.940	0.592	0.896	0.575	1.194	0.592		
1.940	0.596	0.896	0.579	1.194	0.596		
1.940	0.600	0.896	0.583	1.194	0.600		
1.940	0.604	0.896	0.588	1.194	0.604		
1.940	0.608	0.896	0.592	1.194	0.608		
1.940	0.613	0.896	0.596	1.194	0.613		
1.940	0.617	1.045	0.600	1.194	0.617		
1.940	0.621	0.896	0.604	1.194	0.621		
1.940	0.625	0.896	0.608	1.194	0.625		
1.940	0.629	0.896	0.613	1.194	0.629		
1.940	0.633	0.896	0.617	1.194	0.633		
1.940	0.638	0.896	0.621	1.194	0.638		
1.940	0.642	0.896	0.625	1.194	0.642		
1.940	0.646	0.896	0.629	1.045	0.646		
1.940	0.650	0.896	0.633	1.194	0.650		
1.940	0.654	0.896	0.638	1.194	0.654		
1.940	0.658	0.896	0.642	1.045	0.658		
1.940	0.663	0.896	0.646	1.045	0.663		
1.940	0.667	0.896	0.650	1.045	0.667		
1.940	0.671	0.896	0.654	1.045	0.671		
1.940	0.675	0.896	0.658	1.045	0.675		

1.940	0.679	0.896	0.663	1.045	0.679		
1.940	0.683	0.896	0.667	1.045	0.683		
1.940	0.688	0.896	0.671	1.045	0.688		
1.940	0.692	1.045	0.675	1.045	0.692		
1.940	0.696	1.045	0.679	1.194	0.696		
1.940	0.700	1.045	0.683	1.194	0.700		
1.940	0.704	0.896	0.688	1.045	0.704		
1.940	0.708	1.045	0.692	1.045	0.708		
1.940	0.713	1.045	0.696	1.045	0.713		
1.940	0.717	1.045	0.700	1.045	0.717		
1.940	0.721	1.045	0.704	1.045	0.721		
1.940	0.725	1.045	0.708	1.045	0.725		
1.940	0.729	1.045	0.713	1.045	0.729		
1.940	0.733	1.045	0.717	1.045	0.733		
1.940	0.738	1.045	0.721	1.045	0.738		
1.940	0.742	0.896	0.725	1.045	0.742		
1.940	0.746	1.045	0.729	1.045	0.746		
2.090	0.750	1.045	0.733	1.045	0.750		
2.090	0.754	1.045	0.738	1.045	0.754		
2.090	0.758	1.045	0.742	1.045	0.758		
2.090	0.763	1.045	0.746	1.045	0.763		
2.090	0.767	1.045	0.750	1.045	0.767		
2.090	0.771	1.045	0.754	1.045	0.771		
2.090	0.775	1.045	0.758	1.045	0.775		
2.090	0.779	1.045	0.763	1.045	0.779		
2.090	0.783	1.045	0.767	1.045	0.783		
2.090	0.788	1.045	0.771	1.045	0.788		
2.090	0.792	1.045	0.775	1.045	0.792		
2.090	0.796	1.045	0.779	1.045	0.796		
2.090	0.800	1.045	0.783	1.045	0.800		
2.090	0.804	1.045	0.788	1.045	0.804		
2.090	0.808	1.045	0.792	1.045	0.808		
2.090	0.813	1.045	0.796	1.045	0.813		
2.090	0.817	1.045	0.800	1.045	0.817		
2.090	0.821	1.045	0.804	1.045	0.821		
2.090	0.825	1.045	0.808	1.045	0.825		
2.090	0.829	1.045	0.813	1.045	0.829		
2.090	0.833	1.045	0.817	1.045	0.833		
2.090	0.838	1.045	0.821	1.045	0.838		
2.090	0.842	1.045	0.825	1.045	0.842		
2.090	0.846	1.045	0.829	1.045	0.846		
2.090	0.850	1.045	0.833	1.045	0.850		
2.090	0.854	1.045	0.838	1.045	0.854		
2.090	0.858	1.045	0.842	1.045	0.858		
2.090	0.863	1.045	0.846	1.045	0.863		
2.090	0.867	1.045	0.850	1.045	0.867		
2.090	0.871	1.045	0.854	1.045	0.871		
2.090	0.875	1.045	0.858	1.045	0.875		
2.090	0.879	1.045	0.863	1.045	0.879		
2.090	0.883	1.045	0.867	1.045	0.883		
2.090	0.888	1.045	0.871	1.045	0.888		
2.090	0.892	1.045	0.875	1.045	0.892		
2.090	0.896	1.045	0.879	1.045	0.896		
2.090	0.900	1.045	0.883	1.045	0.900		
2.090	0.904	1.045	0.888	1.045	0.904		
2.090	0.908	1.045	0.892	1.045	0.908		

2.090	0.913	1.045	0.896	1.045	0.913		
2.090	0.917	1.045	0.900	1.045	0.917		
2.090	0.921	1.045	0.904	1.045	0.921		
2.090	0.925	1.045	0.908	1.045	0.925		
2.090	0.929	1.045	0.913	1.045	0.929		
2.090	0.933	1.045	0.917	1.045	0.933		
2.090	0.938	1.045	0.921	1.045	0.938		
2.090	0.942	1.045	0.925	1.045	0.942		
2.090	0.946	1.045	0.929	1.045	0.946		
2.090	0.950	1.045	0.933	1.045	0.950		
2.090	0.954	1.045	0.938	1.045	0.954		
2.090	0.958	1.045	0.942	1.045	0.958		
2.090	0.963	1.045	0.946	1.045	0.963		
2.090	0.967	1.045	0.950	1.045	0.967		
2.090	0.971	1.045	0.954	1.045	0.971		
2.090	0.975	1.045	0.958	1.045	0.975		
2.090	0.979	1.045	0.963	1.045	0.979		
2.090	0.983	1.045	0.967	1.045	0.983		
2.090	0.988	1.045	0.971	1.045	0.988		
2.090	0.992	1.045	0.975	1.045	0.992		
2.090	0.996	1.045	0.979	1.045	0.996		
2.090	1.000	1.045	0.983	1.045	1.000		
2.090	1.004	1.045	0.988	1.045	1.004		
2.090	1.008	1.045	0.992	1.045	1.008		
2.090	1.013	1.045	0.996	1.045	1.013		
2.090	1.017	1.045	1.000	1.045	1.017		
2.090	1.021	1.045	1.004	1.045	1.021		
2.090	1.025	1.045	1.008	1.045	1.025		
2.090	1.029	1.045	1.013	1.045	1.029		
2.090	1.033	1.045	1.017	1.045	1.033		
2.090	1.038	1.045	1.021	1.045	1.038		
2.090	1.042	1.045	1.025	1.045	1.042		
2.090	1.046	1.045	1.029	1.045	1.046		
2.090	1.050	1.045	1.033	1.045	1.050		
2.090	1.054	1.045	1.038	1.045	1.054		
2.090	1.058	1.045	1.042	1.045	1.058		
2.090	1.063	1.045	1.046	1.045	1.063		
2.090	1.067	1.045	1.050	1.045	1.067		
2.090	1.071	1.045	1.054	1.045	1.071		
2.090	1.075	1.045	1.058	1.045	1.075		
2.090	1.079	1.045	1.063	1.045	1.079		
2.090	1.083	1.045	1.067	1.045	1.083		
2.090	1.088	1.045	1.071	1.045	1.088		
2.090	1.092	1.045	1.075	1.045	1.092		
2.090	1.096	1.045	1.079	1.045	1.096		
2.090	1.100	1.045	1.083	1.045	1.100		
2.090	1.104	1.045	1.088	1.045	1.104		
2.090	1.108	1.045	1.092	1.045	1.108		
2.090	1.113	1.045	1.096	1.045	1.113		
2.090	1.117	1.045	1.100	1.045	1.117		
2.239	1.121	1.045	1.104	1.045	1.121		
2.090	1.125	1.045	1.108	1.045	1.125		
2.090	1.129	1.045	1.113	1.045	1.129		
2.090	1.133	1.045	1.117	1.045	1.133		
2.090	1.138	1.045	1.121	1.045	1.138		
2.090	1.142	1.045	1.125	1.045	1.142		

2.090	1.146	1.045	1.129	1.045	1.146		
2.090	1.150	1.045	1.133	1.045	1.150		
2.090	1.154	1.045	1.138	1.045	1.154		
2.090	1.158	1.045	1.142	1.045	1.158		
2.090	1.163	1.045	1.146	1.045	1.163		
2.090	1.167	1.045	1.150	1.045	1.167		
2.090	1.171	1.045	1.154	1.045	1.171		
2.090	1.175	1.045	1.158	1.045	1.175		
2.239	1.179	1.045	1.163	1.045	1.179		
2.239	1.183	1.045	1.167	1.045	1.183		
2.090	1.188	1.045	1.171	1.045	1.188		
2.239	1.192	1.045	1.175	1.045	1.192		
2.239	1.196	1.045	1.179	1.045	1.196		
2.090	1.200	1.045	1.183	1.045	1.200		
2.090	1.204	1.045	1.188	1.045	1.204		
2.090	1.208	1.045	1.192	1.045	1.208		
2.090	1.213	1.045	1.196	1.045	1.213		
2.239	1.217	1.045	1.200	1.045	1.217		
2.090	1.221	1.045	1.204	1.045	1.221		
2.239	1.225	1.045	1.208	1.045	1.225		
2.239	1.229	1.045	1.213	1.045	1.229		
2.239	1.233	1.045	1.217	1.045	1.233		
2.239	1.238	1.045	1.221	1.343	1.238		
2.239	1.242	1.045	1.225	1.343	1.242		
2.239	1.246	1.045	1.229	1.343	1.246		
2.239	1.250	1.045	1.233	1.343	1.250		
2.239	1.254	1.045	1.238	1.343	1.254		
2.239	1.258	1.045	1.242	1.343	1.258		
2.239	1.263	1.045	1.246	1.343	1.263		
2.239	1.267	1.045	1.250	1.642	1.267		
2.239	1.271	1.045	1.254	1.642	1.271		
2.239	1.275	1.045	1.258	1.642	1.275		
2.090	1.279	1.045	1.263	1.940	1.279		
2.239	1.283	1.045	1.267	1.940	1.283		
2.090	1.288	1.045	1.271				
2.239	1.292	1.045	1.275				
2.239	1.296	1.045	1.279				
2.239	1.300	1.045	1.283				
2.239	1.304	1.045	1.288				
2.090	1.308	1.045	1.292				
2.239	1.313	1.045	1.296				
2.239	1.317	1.045	1.300				
2.239	1.321	1.045	1.304				
2.239	1.325	1.045	1.308				
2.239	1.329	1.045	1.313				
2.239	1.333	1.045	1.317				
2.239	1.338	1.045	1.321				
2.239	1.342	1.045	1.325				
2.239	1.346	1.045	1.329				
2.239	1.350	1.045	1.333				
2.239	1.354	1.045	1.338				
2.239	1.358	1.045	1.342				
2.239	1.363	1.045	1.346				
2.239	1.367	1.045	1.350				
2.239	1.371	1.045	1.354				
2.239	1.375	1.045	1.358				

2.239	1.379	1.045	1.363				
2.239	1.383	1.045	1.367				
2.239	1.388	1.045	1.371				
2.239	1.392	1.045	1.375				
2.239	1.396	1.045	1.379				
2.239	1.400	1.045	1.383				
2.239	1.404	1.045	1.388				
2.239	1.408	1.045	1.392				
2.239	1.413	1.045	1.396				
2.239	1.417	1.045	1.400				
2.239	1.421	1.045	1.404				
2.239	1.425	1.045	1.408				
2.239	1.429	1.045	1.413				
2.239	1.433	1.045	1.417				
2.239	1.438	1.045	1.421				
2.239	1.442	1.045	1.425				
2.239	1.446	1.045	1.429				
2.239	1.450	1.045	1.433				
2.239	1.454	1.045	1.438				
2.239	1.458	1.045	1.442				
2.239	1.463	1.045	1.446				
2.239	1.467	1.045	1.450				
2.239	1.471	1.045	1.454				
2.239	1.475	1.045	1.458				
2.239	1.479	1.045	1.463				
2.239	1.483	1.045	1.467				
2.239	1.488	1.045	1.471				
2.239	1.492	1.045	1.475				
2.239	1.496	1.045	1.479				
2.239	1.500	1.045	1.483				
2.239	1.504	1.045	1.488				
2.239	1.508	1.045	1.492				
2.239	1.513	1.045	1.496				
2.239	1.517	1.045	1.500				
2.239	1.521	1.045	1.504				
2.239	1.525	1.045	1.508				
2.239	1.529	1.045	1.513				
2.239	1.533	1.045	1.517				
2.239	1.538	1.045	1.521				
2.239	1.542	1.045	1.525				
2.239	1.546	1.045	1.529				
2.239	1.550	1.045	1.533				
2.239	1.554	1.045	1.538				
2.239	1.558	1.045	1.542				
2.239	1.563	1.045	1.546				
2.239	1.567	1.045	1.550				
2.239	1.571	1.045	1.554				
2.239	1.575	1.045	1.558				
2.239	1.579	1.045	1.563				
2.239	1.583	1.045	1.567				
2.239	1.588	1.045	1.571				
2.239	1.592	1.045	1.575				
2.239	1.596	1.045	1.579				
2.239	1.600	1.045	1.583				
2.239	1.604	1.045	1.588				
2.239	1.608	1.045	1.592				

2.239	1.613	1.045	1.596				
2.239	1.617	1.194	1.600				
2.239	1.621	1.045	1.604				
2.239	1.625	1.194	1.608				
2.239	1.629	1.194	1.613				
2.239	1.633	1.194	1.617				
2.239	1.638	1.194	1.621				
2.239	1.642	1.194	1.625				
2.239	1.646	1.194	1.629				
2.239	1.650	1.194	1.633				
2.239	1.654	1.194	1.638				
2.239	1.658	1.194	1.642				
2.239	1.663	1.194	1.646				
2.239	1.667	1.194	1.650				
2.239	1.671	1.194	1.654				
2.239	1.675	1.194	1.658				
2.239	1.679	1.194	1.663				
2.239	1.683	1.194	1.667				
2.239	1.688	1.194	1.671				
2.239	1.692	1.194	1.675				
2.239	1.696	1.194	1.679				
2.239	1.700	1.194	1.683				
2.239	1.704	1.194	1.688				
2.239	1.708	1.194	1.692				
2.239	1.713	1.194	1.696				
2.239	1.717	1.194	1.700				
2.239	1.721	1.194	1.704				
2.239	1.725	1.194	1.708				
2.239	1.729	1.194	1.713				
2.239	1.733	1.194	1.717				
2.239	1.738	1.194	1.721				
2.239	1.742	1.194	1.725				
2.239	1.746	1.194	1.729				
2.239	1.750	1.194	1.733				
2.239	1.754	1.194	1.738				
2.239	1.758	1.194	1.742				
2.239	1.763	1.194	1.746				
2.239	1.767	1.194	1.750				
2.239	1.771	1.194	1.754				
2.239	1.775	1.194	1.758				
2.239	1.779	1.194	1.763				
2.239	1.783	1.194	1.767				
2.239	1.788	1.343	1.771				
2.239	1.792	1.343	1.775				
2.239	1.796	1.343	1.779				
2.239	1.800	1.194	1.783				
2.239	1.804	1.343	1.788				
2.239	1.808	1.343	1.792				
2.239	1.813	1.343	1.796				
2.239	1.817	1.343	1.800				
2.239	1.821	1.343	1.804				
2.239	1.825	1.343	1.808				
2.239	1.829	1.343	1.813				
2.239	1.833	1.343	1.817				
2.239	1.838	1.343	1.821				
2.239	1.842	1.343	1.825				

2.239	1.846	1.343	1.829				
2.239	1.850	1.343	1.833				
2.239	1.854	1.343	1.838				
2.239	1.858	1.343	1.842				
2.239	1.863	1.343	1.846				
2.239	1.867	1.343	1.850				
2.239	1.871	1.343	1.854				
2.239	1.875	1.343	1.858				
2.239	1.879	1.343	1.863				
2.239	1.883	1.343	1.867				
2.239	1.888	1.343	1.871				
2.239	1.892	1.343	1.875				
2.239	1.896	1.343	1.879				
2.239	1.900	1.343	1.883				
2.239	1.904	1.343	1.888				
2.239	1.908	1.343	1.892				
2.239	1.913	1.343	1.896				
2.239	1.917	1.343	1.900				
2.239	1.921	1.343	1.904				
2.239	1.925	1.343	1.908				
2.239	1.929	1.343	1.913				
2.239	1.933	1.343	1.917				
2.239	1.938	1.343	1.921				
2.239	1.942	1.343	1.925				
2.239	1.946	1.343	1.929				
2.239	1.950	1.343	1.933				
2.239	1.954	1.343	1.938				
2.239	1.958	1.493	1.942				
2.239	1.963	1.493	1.946				
2.239	1.967	1.493	1.950				
2.239	1.971	1.493	1.954				
2.239	1.975	1.493	1.958				
2.239	1.979	1.493	1.963				
2.239	1.983	1.493	1.967				
2.239	1.988	1.493	1.971				
2.239	1.992	1.493	1.975				
2.239	1.996	1.343	1.979				
2.239	2.000	1.493	1.983				
2.239	2.004	1.493	1.988				
2.239	2.008	1.493	1.992				
2.239	2.013	1.493	1.996				
2.239	2.017	1.343	2.000				
2.239	2.021	1.493	2.004				
2.239	2.025	1.343	2.008				
2.239	2.029	1.343	2.013				
2.239	2.033	1.343	2.017				
2.239	2.038	1.343	2.021				
2.239	2.042	1.343	2.025				
2.239	2.046	1.343	2.029				
2.239	2.050	1.493	2.033				
2.239	2.054	1.343	2.038				
2.239	2.058	1.343	2.042				
2.239	2.063	1.343	2.046				
2.239	2.067	1.343	2.050				
2.239	2.071	1.343	2.054				
2.239	2.075	1.343	2.058				

2.239	2.079	1.343	2.063				
2.239	2.083	1.343	2.067				
2.239	2.088	1.343	2.071				
2.239	2.092	1.343	2.075				
2.239	2.096	1.343	2.079				
2.239	2.100	1.343	2.083				
2.239	2.104	1.343	2.088				
2.239	2.108	1.343	2.092				
2.239	2.113	1.343	2.096				
2.239	2.117	1.343	2.100				
2.239	2.121	1.343	2.104				
2.239	2.125	1.343	2.108				
2.239	2.129	1.343	2.113				
2.239	2.133	1.343	2.117				
2.239	2.138	1.343	2.121				
2.239	2.142	1.343	2.125				
2.239	2.146	1.343	2.129				
2.239	2.150	1.343	2.133				
2.239	2.154	1.343	2.138				
2.239	2.158	1.343	2.142				
2.239	2.163	1.343	2.146				
2.239	2.167	1.343	2.150				
2.239	2.171	1.343	2.154				
2.239	2.175	1.343	2.158				
2.239	2.179	1.343	2.163				
2.239	2.183	1.343	2.167				
2.239	2.188	1.343	2.171				
2.239	2.192	1.343	2.175				
2.239	2.196	1.343	2.179				
2.239	2.200	1.343	2.183				
2.239	2.204	1.343	2.188				
2.239	2.208	1.343	2.192				
2.388	2.213	1.343	2.196				
2.388	2.217	1.343	2.200				
2.239	2.221	1.343	2.204				
2.239	2.225	1.343	2.208				
2.388	2.229	1.343	2.213				
2.388	2.233	1.343	2.217				
2.388	2.238	1.343	2.221				
2.388	2.242	1.343	2.225				
2.388	2.246	1.343	2.229				
2.388	2.250	1.343	2.233				
2.388	2.254	1.343	2.238				
2.239	2.258	1.343	2.242				
2.239	2.263	1.343	2.246				
2.239	2.267	1.343	2.250				
2.239	2.271	1.343	2.254				
2.388	2.275	1.343	2.258				
2.388	2.279	1.343	2.263				
2.388	2.283	1.343	2.267				
2.388	2.288	1.343	2.271				
2.239	2.292	1.343	2.275				
2.388	2.296	1.343	2.279				
2.388	2.300	1.343	2.283				
2.388	2.304	1.343	2.288				
2.388	2.308	1.343	2.292				

2.388	2.313	1.343	2.296				
2.388	2.317	1.343	2.300				
2.388	2.321	1.343	2.304				
2.388	2.325	1.343	2.308				
2.388	2.329	1.343	2.313				
2.388	2.333	1.343	2.317				
2.388	2.338	1.343	2.321				
2.388	2.342	1.343	2.325				
2.388	2.346	1.343	2.329				
2.388	2.350	1.343	2.333				
2.388	2.354	1.343	2.338				
2.388	2.358	1.343	2.342				
2.388	2.363	1.343	2.346				
2.388	2.367	1.343	2.350				
2.388	2.371	1.343	2.354				
2.388	2.375	1.343	2.358				
2.388	2.379	1.343	2.363				
2.388	2.383	1.343	2.367				
2.388	2.388	1.343	2.371				
2.388	2.392	1.343	2.375				
2.388	2.396	1.343	2.379				
2.388	2.400	1.343	2.383				
2.388	2.404	1.343	2.388				
2.388	2.408	1.343	2.392				
2.388	2.413	1.343	2.396				
2.388	2.417	1.343	2.400				
2.388	2.421	1.343	2.404				
2.388	2.425	1.343	2.408				
2.388	2.429	1.343	2.413				
2.388	2.433	1.343	2.417				
2.388	2.438	1.343	2.421				
2.388	2.442	1.343	2.425				
2.388	2.446	1.343	2.429				
2.388	2.450	1.343	2.433				
2.388	2.454	1.343	2.438				
2.388	2.458	1.343	2.442				
2.388	2.463	1.343	2.446				
2.388	2.467	1.343	2.450				
2.388	2.471	1.343	2.454				
2.388	2.475	1.343	2.458				
2.388	2.479	1.343	2.463				
2.388	2.483	1.343	2.467				
2.388	2.488	1.343	2.471				
2.388	2.492	1.343	2.475				
2.388	2.496	1.343	2.479				
2.388	2.500	1.343	2.483				
2.388	2.504	1.343	2.488				
2.388	2.508	1.343	2.492				
2.388	2.513	1.343	2.496				
2.388	2.517	1.343	2.500				
2.388	2.521	1.343	2.504				
2.388	2.525	1.343	2.508				
2.388	2.529	1.343	2.513				
2.388	2.533	1.343	2.517				
2.388	2.538	1.343	2.521				
2.388	2.542	1.343	2.525				

2.388	2.546	1.343	2.529				
2.388	2.550	1.343	2.533				
2.388	2.554	1.343	2.538				
2.388	2.558	1.343	2.542				
2.388	2.563	1.343	2.546				
2.388	2.567	1.343	2.550				
2.388	2.571	1.343	2.554				
2.388	2.575	1.343	2.558				
2.388	2.579	1.343	2.563				
2.388	2.583	1.343	2.567				
2.388	2.588	1.343	2.571				
2.388	2.592	1.343	2.575				
2.388	2.596	1.343	2.579				
2.388	2.600	1.343	2.583				
2.388	2.604	1.343	2.588				
2.388	2.608	1.343	2.592				
2.388	2.613	1.343	2.596				
2.388	2.617	1.343	2.600				
2.388	2.621	1.343	2.604				
2.388	2.625	1.343	2.608				
2.388	2.629	1.343	2.613				
2.388	2.633	1.343	2.617				
2.388	2.638	1.343	2.621				
2.388	2.642	1.343	2.625				
2.388	2.646	1.343	2.629				
2.388	2.650	1.343	2.633				
2.388	2.654	1.343	2.638				
2.388	2.658	1.343	2.642				
2.388	2.663	1.343	2.646				
2.388	2.667	1.343	2.650				
2.388	2.671	1.343	2.654				
2.388	2.675	1.343	2.658				
2.388	2.679	1.343	2.663				
2.388	2.683	1.343	2.667				
2.388	2.688	1.343	2.671				
2.388	2.692	1.343	2.675				
2.388	2.696	1.343	2.679				
2.388	2.700	1.343	2.683				
2.388	2.704	1.343	2.688				
2.388	2.708	1.343	2.692				
2.388	2.713	1.343	2.696				
2.388	2.717	1.343	2.700				
2.388	2.721	1.343	2.704				
2.388	2.725	1.343	2.708				
2.388	2.729	1.343	2.713				
2.388	2.733	1.343	2.717				
2.388	2.738	1.343	2.721				
2.388	2.742	1.343	2.725				
2.388	2.746	1.343	2.729				
2.388	2.750	1.343	2.733				
2.388	2.754	1.343	2.738				
2.388	2.758	1.343	2.742				
2.388	2.763	1.343	2.746				
2.388	2.767	1.343	2.750				
2.388	2.771	1.343	2.754				
2.388	2.775	1.343	2.758				

2.388	2.779	1.343	2.763				
2.388	2.783	1.343	2.767				
2.388	2.788	1.343	2.771				
2.388	2.792	1.343	2.775				
2.388	2.796	1.343	2.779				
2.388	2.800	1.343	2.783				
2.388	2.804	1.343	2.788				
2.388	2.808	1.343	2.792				
2.388	2.813	1.343	2.796				
2.388	2.817	1.343	2.800				
2.388	2.821	1.343	2.804				
2.388	2.825	1.343	2.808				
2.388	2.829	1.343	2.813				
2.388	2.833	1.343	2.817				
2.388	2.838	1.343	2.821				
2.388	2.842	1.343	2.825				
2.388	2.846	1.343	2.829				
2.388	2.850	1.343	2.833				
2.388	2.854	1.343	2.838				
2.388	2.858	1.343	2.842				
2.388	2.863	1.343	2.846				
2.388	2.867	1.343	2.850				
2.388	2.871	1.343	2.854				
2.388	2.875	1.343	2.858				
2.388	2.879	1.343	2.863				
2.388	2.883	1.343	2.867				
2.388	2.888	1.343	2.871				
2.388	2.892	1.343	2.875				
2.388	2.896	1.343	2.879				
2.388	2.900	1.343	2.883				
2.388	2.904	1.343	2.888				
2.388	2.908	1.343	2.892				
2.388	2.913	1.343	2.896				
2.388	2.917	1.343	2.900				
2.388	2.921	1.343	2.904				
2.388	2.925	1.343	2.908				
2.388	2.929	1.343	2.913				
2.388	2.933	1.343	2.917				
2.388	2.938	1.343	2.921				
2.388	2.942	1.343	2.925				
2.388	2.946	1.343	2.929				
2.388	2.950	1.343	2.933				
2.388	2.954	1.343	2.938				
2.388	2.958	1.343	2.942				
2.388	2.963	1.343	2.946				
2.388	2.967	1.343	2.950				
2.388	2.971	1.343	2.954				
2.388	2.975	1.343	2.958				
2.388	2.979	1.343	2.963				
2.388	2.983	1.343	2.967				
2.388	2.988	1.343	2.971				
2.388	2.992	1.343	2.975				
2.388	2.996	1.343	2.979				
2.388	3.000	1.343	2.983				
2.388	3.004	1.343	2.988				
2.388	3.008	1.343	2.992				

2.388	3.013	1.343	2.996				
2.388	3.017	1.343	3.000				
2.388	3.021	1.343	3.004				
2.388	3.025	1.343	3.008				
2.388	3.029	1.343	3.013				
2.388	3.033	1.343	3.017				
2.388	3.038	1.343	3.021				
2.388	3.042	1.343	3.025				
2.388	3.046	1.343	3.029				
2.388	3.050	1.343	3.033				
2.388	3.054	1.343	3.038				
2.388	3.058	1.343	3.042				
2.388	3.063	1.343	3.046				
2.388	3.067	1.343	3.050				
2.388	3.071	1.343	3.054				
2.388	3.075	1.343	3.058				
2.388	3.079	1.343	3.063				
2.388	3.083	1.343	3.067				
2.388	3.088	1.343	3.071				
2.388	3.092	1.343	3.075				
2.388	3.096	1.343	3.079				
2.388	3.100	1.343	3.083				
2.388	3.104	1.343	3.088				
2.388	3.108	1.343	3.092				
2.388	3.113	1.343	3.096				
2.388	3.117	1.343	3.100				
2.537	3.121	1.343	3.104				
2.388	3.125	1.343	3.108				
2.537	3.129	1.343	3.113				
2.537	3.133	1.343	3.117				
2.537	3.138	1.343	3.121				
2.537	3.142	1.343	3.125				
2.537	3.146	1.343	3.129				
2.388	3.150	1.343	3.133				
2.537	3.154	1.343	3.138				
2.537	3.158	1.343	3.142				
2.537	3.163	1.343	3.146				
2.537	3.167	1.343	3.150				
2.537	3.171	1.343	3.154				
2.537	3.175	1.343	3.158				
2.537	3.179	1.343	3.163				
2.537	3.183	1.343	3.167				
2.687	4.000	1.343	3.171				
2.687	8.000	1.343	3.175				
2.836	12.000	1.343	3.179				
2.836	16.000	1.343	3.183				
2.985	20.000	1.343	3.188				
2.985	24.000	1.343	3.192				
		1.343	3.196				
		1.343	3.200				
		1.343	3.204				
		1.343	3.208				
		1.343	3.213				
		1.343	3.217				
		1.343	3.221				
		1.343	3.225				

		1.343	3.229				
		1.343	3.233				
		1.343	3.238				
		1.343	3.242				
		1.343	3.246				
		1.343	3.250				
		1.343	3.254				
		1.343	3.258				
		1.343	3.263				
		1.343	3.267				
		1.343	3.271				
		1.343	3.275				
		1.343	3.279				
		1.343	3.283				
		1.343	3.288				
		1.343	3.292				
		1.343	3.296				
		1.343	3.300				
		1.343	3.304				
		1.343	3.308				
		1.343	3.313				
		1.343	3.317				
		1.343	3.321				
		1.343	3.325				
		1.343	3.329				
		1.343	3.333				
		1.343	3.338				
		1.343	3.342				
		1.343	3.346				
		1.343	3.350				
		1.343	3.354				
		1.343	3.358				
		1.343	3.363				
		1.343	3.367				
		1.343	3.371				
		1.343	3.375				
		1.343	3.379				
		1.343	3.383				
		1.343	3.388				
		1.343	3.392				
		1.343	3.396				
		1.343	3.400				
		1.343	3.404				
		1.343	3.408				
		1.493	3.413				
		1.493	3.417				
		1.343	3.421				
		1.343	3.425				
		1.343	3.429				
		1.343	3.433				
		1.343	3.438				
		1.343	3.442				
		1.343	3.446				
		1.343	3.450				
		1.343	3.454				
		1.343	3.458				

		1.343	3.463				
		1.343	3.467				
		1.493	3.471				
		1.493	3.475				
		1.493	3.479				
		1.493	3.483				
		1.493	3.488				
		1.493	3.492				
		1.493	3.496				
		1.493	3.500				
		1.493	3.504				
		1.493	3.508				
		1.493	3.513				
		1.493	3.517				
		1.493	3.521				
		1.493	3.525				
		1.493	3.529				
		1.493	3.533				
		1.493	3.538				
		1.493	3.542				
		1.493	3.546				
		1.493	3.550				
		1.493	3.554				
		1.642	3.558				
		1.642	3.563				
		1.642	3.567				
		1.642	3.571				
		1.642	3.575				
		1.642	3.579				
		1.642	3.583				
		1.642	3.588				
		1.642	3.592				
		1.642	3.596				
		1.642	3.600				
		1.642	3.604				
		1.642	3.608				
		1.642	3.613				
		1.642	3.617				
		1.642	3.621				
		1.642	3.625				
		1.642	3.629				
		1.642	3.633				
		1.642	3.638				
		1.642	3.642				
		1.642	3.646				
		1.642	3.650				
		1.642	3.654				
		1.642	3.658				
		1.642	3.663				
		1.642	3.667				
		1.642	3.671				
		1.642	3.675				
		1.642	3.679				
		1.642	3.683				
		1.642	3.688				
		1.642	3.692				

		1.642	3.696				
		1.642	3.700				
		1.642	3.704				
		1.642	3.708				
		1.642	3.713				
		1.642	3.717				
		1.642	3.721				
		1.642	3.725				
		1.642	3.729				
		1.642	3.733				
		1.642	3.738				
		1.642	3.742				
		1.642	3.746				
		1.642	3.750				
		1.642	3.754				
		1.791	3.758				
		1.791	3.763				
		1.791	3.767				
		1.791	3.771				
		1.791	3.775				
		1.791	3.779				
		1.791	3.783				
		1.791	3.788				
		1.791	3.792				
		1.791	3.796				
		1.791	3.800				
		1.791	3.804				
		1.791	3.808				
		1.791	3.813				
		1.791	3.817				
		1.791	3.821				
		1.791	3.825				
		1.791	3.829				
		1.791	3.833				
		1.791	3.838				
		1.791	3.842				
		1.791	3.846				
		1.791	3.850				
		1.791	3.854				
		1.791	3.858				
		1.791	3.863				
		1.791	3.867				
		1.791	3.871				
		1.791	3.875				
		1.791	3.879				
		1.791	3.883				
		1.791	3.888				
		1.791	3.892				
		1.791	3.896				
		1.791	3.900				
		1.791	3.904				
		1.791	3.908				
		1.791	3.913				
		1.791	3.917				
		1.791	3.921				
		1.791	3.925				

		1.791	3.929				
		1.791	3.933				
		1.791	3.938				
		1.791	3.942				
		1.791	3.946				
		1.791	3.950				
		1.791	3.954				
		1.791	3.958				
		1.791	3.963				
		1.791	3.967				
		1.791	3.971				
		1.791	3.975				
		1.791	3.979				
		1.791	3.983				
		1.791	3.988				
		1.791	3.992				
		1.791	3.996				
		1.791	4.000				
		1.791	8.000				
		1.642	12.000				
		2.090	16.000				
		2.388	20.000				
		2.985	24.000				

92% of degree of saturation

200kPa							
Equilibrium stage		Consolidation stage		Shearing stage			
Matric suction/(kPa)	Time/(hr)	Matric suction/(kPa)	Time/(hr)	Matric suction/(kPa)	Time/(hr)	Matric suction/(kPa)	Shear strain/(%)
0.000	0.000	2.836	0.000	2.836	0.000	2.836	0.000
0.149	0.004	2.090	0.000	2.836	0.004	2.836	0.250
0.299	0.008	1.791	0.001	2.836	0.008	2.537	0.500
0.448	0.013	1.343	0.002	2.836	0.013	2.537	0.750
0.448	0.017	1.343	0.003	2.836	0.017	2.537	1.000
0.597	0.021	0.746	0.004	2.836	0.021	2.388	1.250
0.597	0.025	0.597	0.008	2.836	0.025	2.388	1.500
0.597	0.029	0.597	0.013	2.687	0.029	2.388	1.750
0.597	0.033	0.597	0.017	2.687	0.033	2.239	2.000
0.597	0.038	0.597	0.021	2.687	0.038	2.090	2.500
0.746	0.042	0.597	0.025	2.537	0.042	2.090	3.000
0.746	0.046	0.597	0.029	2.537	0.046	1.940	3.500
0.746	0.050	0.597	0.033	2.537	0.050	1.940	4.000
0.746	0.054	0.597	0.038	2.537	0.054	1.642	5.000
0.746	0.058	0.597	0.042	2.537	0.058	1.493	6.000
0.746	0.063	0.597	0.046	2.537	0.063	1.045	7.000
0.746	0.067	0.597	0.050	2.537	0.067	0.597	8.000
0.746	0.071	0.597	0.054	2.537	0.071	0.597	9.000
0.746	0.075	0.597	0.058	2.537	0.075	0.448	10.000
0.896	0.079	0.597	0.063	2.537	0.079	0.448	11.000
0.896	0.083	0.597	0.067	2.537	0.083	0.448	12.000
0.896	0.088	0.597	0.071	2.537	0.088	0.448	13.000
0.896	0.092	0.597	0.075	2.388	0.092	0.299	14.000
0.896	0.096	0.597	0.079	2.388	0.096	0.448	15.000
0.896	0.100	0.597	0.083	2.388	0.100		
0.896	0.104	0.597	0.088	2.388	0.104		
0.896	0.108	0.597	0.092	2.388	0.108		
0.896	0.113	0.597	0.096	2.388	0.113		
0.896	0.117	0.597	0.100	2.388	0.117		
0.896	0.121	0.597	0.104	2.388	0.121		
1.045	0.125	0.597	0.108	2.388	0.125		
1.045	0.129	0.597	0.113	2.388	0.129		
1.045	0.133	0.597	0.117	2.388	0.133		
1.045	0.138	0.597	0.121	2.388	0.138		
1.045	0.142	0.597	0.125	2.388	0.142		
1.045	0.146	0.597	0.129	2.388	0.146		
1.045	0.150	0.597	0.133	2.388	0.150		
1.045	0.154	0.597	0.138	2.239	0.154		
1.045	0.158	0.597	0.142	2.239	0.158		
1.045	0.163	0.597	0.146	2.239	0.163		
1.045	0.167	0.597	0.150	2.239	0.167		
1.045	0.171	0.597	0.154	2.239	0.171		
1.194	0.175	0.597	0.158	2.239	0.175		
1.194	0.179	0.597	0.163	2.239	0.179		
1.194	0.183	0.597	0.167	2.239	0.183		
1.194	0.188	0.746	0.171	2.239	0.188		
1.194	0.192	0.746	0.175	2.239	0.192		
1.194	0.196	0.746	0.179	2.239	0.196		
1.194	0.200	0.746	0.183	2.090	0.200		
1.194	0.204	0.746	0.188	2.090	0.204		
1.194	0.208	0.746	0.192	2.090	0.208		
1.194	0.213	0.746	0.196	2.090	0.213		
1.194	0.217	0.746	0.200	2.090	0.217		
1.194	0.221	0.746	0.204	2.090	0.221		
1.194	0.225	0.746	0.208	2.090	0.225		
1.343	0.229	0.746	0.213	2.090	0.229		
1.343	0.233	0.746	0.217	2.090	0.233		
1.343	0.238	0.746	0.221	2.090	0.238		

1.343	0.242	0.746	0.225	2.090	0.242		
1.343	0.246	0.746	0.229	2.090	0.246		
1.343	0.250	0.746	0.233	2.090	0.250		
1.343	0.254	0.746	0.238	1.940	0.254		
1.343	0.258	0.746	0.242	1.940	0.258		
1.343	0.263	0.746	0.246	1.940	0.263		
1.343	0.267	0.746	0.250	1.940	0.267		
1.343	0.271	0.746	0.254	1.940	0.271		
1.343	0.275	0.746	0.258	1.940	0.275		
1.343	0.279	0.746	0.263	1.940	0.279		
1.343	0.283	0.746	0.267	1.940	0.283		
1.343	0.288	0.746	0.271	1.940	0.288		
1.343	0.292	0.746	0.275	1.940	0.292		
1.493	0.296	0.746	0.279	1.940	0.296		
1.493	0.300	0.746	0.283	1.940	0.300		
1.493	0.304	0.746	0.288	1.940	0.304		
1.493	0.308	0.746	0.292	1.940	0.308		
1.493	0.313	0.746	0.296	1.940	0.313		
1.493	0.317	0.746	0.300	1.940	0.317		
1.493	0.321	0.746	0.304	1.940	0.321		
1.493	0.325	0.746	0.308	1.940	0.325		
1.493	0.329	0.746	0.313	1.940	0.329		
1.493	0.333	0.746	0.317	1.940	0.333		
1.493	0.338	0.746	0.321	1.940	0.338		
1.493	0.342	0.746	0.325	1.940	0.342		
1.493	0.346	0.746	0.329	1.940	0.346		
1.493	0.350	0.746	0.333	1.940	0.350		
1.493	0.354	0.746	0.338	1.940	0.354		
1.493	0.358	0.746	0.342	1.940	0.358		
1.493	0.363	0.746	0.346	1.940	0.363		
1.493	0.367	0.746	0.350	1.791	0.367		
1.493	0.371	0.746	0.354	1.791	0.371		
1.493	0.375	0.746	0.358	1.791	0.375		
1.493	0.379	0.746	0.363	1.791	0.379		
1.642	0.383	0.896	0.367	1.791	0.383		
1.642	0.388	0.896	0.371	1.791	0.388		
1.642	0.392	0.896	0.375	1.791	0.392		
1.642	0.396	0.896	0.379	1.791	0.396		
1.642	0.400	0.896	0.383	1.642	0.400		
1.642	0.404	0.896	0.388	1.642	0.404		
1.642	0.408	0.896	0.392	1.642	0.408		
1.642	0.413	0.896	0.396	1.642	0.413		
1.642	0.417	0.896	0.400	1.642	0.417		
1.642	0.421	0.896	0.404	1.642	0.421		
1.642	0.425	0.896	0.408	1.642	0.425		
1.642	0.429	0.896	0.413	1.642	0.429		
1.642	0.433	0.896	0.417	1.642	0.433		
1.642	0.438	0.896	0.421	1.493	0.438		
1.791	0.442	0.896	0.425	1.493	0.442		
1.791	0.446	0.896	0.429	1.493	0.446		
1.791	0.450	0.896	0.433	1.493	0.450		
1.791	0.454	0.896	0.438	1.493	0.454		
1.791	0.458	0.896	0.442	1.493	0.458		
1.791	0.463	0.896	0.446	1.493	0.463		
1.791	0.467	0.896	0.450	1.493	0.467		
1.791	0.471	0.896	0.454	1.493	0.471		
1.791	0.475	0.896	0.458	1.493	0.475		
1.791	0.479	0.896	0.463	1.493	0.479		
1.791	0.483	0.896	0.467	1.343	0.483		
1.791	0.488	0.896	0.471	1.343	0.488		
1.791	0.492	0.896	0.475	1.493	0.492		
1.791	0.496	0.896	0.479	1.343	0.496		

1.791	0.500	0.896	0.483	1.343	0.500		
1.791	0.504	0.896	0.488	1.343	0.504		
1.940	0.508	0.896	0.492	1.343	0.508		
1.940	0.513	0.896	0.496	1.194	0.513		
1.940	0.517	0.896	0.500	1.194	0.517		
1.940	0.521	0.896	0.504	1.194	0.521		
1.940	0.525	0.896	0.508	1.194	0.525		
1.940	0.529	0.896	0.513	1.194	0.529		
1.940	0.533	0.896	0.517	1.194	0.533		
1.940	0.538	0.896	0.521	1.194	0.538		
1.940	0.542	0.896	0.525	1.194	0.542		
1.940	0.546	0.896	0.529	1.045	0.546		
1.940	0.550	0.896	0.533	1.045	0.550		
1.940	0.554	0.896	0.538	1.045	0.554		
1.940	0.558	0.896	0.542	1.045	0.558		
1.940	0.563	0.896	0.546	1.194	0.563		
2.090	0.567	0.896	0.550	1.045	0.567		
2.090	0.571	0.896	0.554	0.896	0.571		
2.090	0.575	0.896	0.558	0.896	0.575		
2.090	0.579	0.896	0.563	0.896	0.579		
2.090	0.583	0.896	0.567	0.896	0.583		
2.090	0.588	0.896	0.571	0.896	0.588		
2.090	0.592	0.896	0.575	0.896	0.592		
2.090	0.596	0.896	0.579	0.746	0.596		
2.090	0.600	0.896	0.583	0.746	0.600		
2.090	0.604	0.896	0.588	0.746	0.604		
2.090	0.608	0.896	0.592	0.746	0.608		
2.090	0.613	0.896	0.596	0.746	0.613		
2.090	0.617	0.896	0.600	0.746	0.617		
2.090	0.621	0.896	0.604	0.746	0.621		
2.090	0.625	0.896	0.608	0.746	0.625		
2.090	0.629	0.896	0.613	0.597	0.629		
2.090	0.633	0.896	0.617	0.597	0.633		
2.090	0.638	0.896	0.621	0.597	0.638		
2.090	0.642	0.896	0.625	0.597	0.642		
2.090	0.646	0.896	0.629	0.597	0.646		
2.090	0.650	0.896	0.633	0.597	0.650		
2.090	0.654	0.896	0.638	0.597	0.654		
2.090	0.658	0.896	0.642	0.597	0.658		
2.090	0.663	0.896	0.646	0.597	0.663		
2.090	0.667	0.896	0.650	0.597	0.667		
2.090	0.671	0.896	0.654	0.597	0.671		
2.090	0.675	0.896	0.658	0.746	0.675		
2.090	0.679	0.896	0.663	0.597	0.679		
2.090	0.683	0.896	0.667	0.597	0.683		
2.090	0.688	0.896	0.671	0.597	0.688		
2.090	0.692	0.896	0.675	0.597	0.692		
2.090	0.696	0.896	0.679	0.597	0.696		
2.090	0.700	0.896	0.683	0.597	0.700		
2.090	0.704	0.896	0.688	0.597	0.704		
2.090	0.708	0.896	0.692	0.597	0.708		
2.090	0.713	1.045	0.696	0.597	0.713		
2.090	0.717	1.045	0.700	0.597	0.717		
2.090	0.721	1.045	0.704	0.597	0.721		
2.090	0.725	1.045	0.708	0.597	0.725		
2.090	0.729	1.045	0.713	0.597	0.729		
2.090	0.733	1.045	0.717	0.448	0.733		
2.090	0.738	1.045	0.721	0.448	0.738		
2.090	0.742	1.045	0.725	0.448	0.742		
2.090	0.746	1.045	0.729	0.448	0.746		
2.239	0.750	1.045	0.733	0.448	0.750		
2.239	0.754	1.045	0.738	0.448	0.754		

2.239	0.758	1.045	0.742	0.448	0.758		
2.239	0.763	1.045	0.746	0.448	0.763		
2.239	0.767	1.045	0.750	0.448	0.767		
2.239	0.771	1.045	0.754	0.448	0.771		
2.239	0.775	1.045	0.758	0.448	0.775		
2.239	0.779	1.045	0.763	0.448	0.779		
2.239	0.783	1.045	0.767	0.448	0.783		
2.239	0.788	1.045	0.771	0.448	0.788		
2.239	0.792	1.045	0.775	0.448	0.792		
2.239	0.796	1.045	0.779	0.448	0.796		
2.239	0.800	1.045	0.783	0.448	0.800		
2.239	0.804	1.045	0.788	0.448	0.804		
2.239	0.808	1.045	0.792	0.448	0.808		
2.239	0.813	1.045	0.796	0.448	0.813		
2.239	0.817	1.045	0.800	0.448	0.817		
2.239	0.821	1.045	0.804	0.448	0.821		
2.239	0.825	1.045	0.808	0.448	0.825		
2.239	0.829	1.045	0.813	0.448	0.829		
2.239	0.833	1.045	0.817	0.448	0.833		
2.239	0.838	1.045	0.821	0.448	0.838		
2.239	0.842	1.045	0.825	0.448	0.842		
2.239	0.846	1.045	0.829	0.448	0.846		
2.239	0.850	1.045	0.833	0.448	0.850		
2.239	0.854	1.045	0.838	0.448	0.854		
2.239	0.858	1.045	0.842	0.448	0.858		
2.239	0.863	1.045	0.846	0.448	0.863		
2.239	0.867	1.045	0.850	0.448	0.867		
2.239	0.871	1.045	0.854	0.448	0.871		
2.239	0.875	1.045	0.858	0.448	0.875		
2.239	0.879	1.045	0.863	0.448	0.879		
2.239	0.883	1.045	0.867	0.448	0.883		
2.239	0.888	1.045	0.871	0.448	0.888		
2.239	0.892	1.045	0.875	0.448	0.892		
2.239	0.896	1.045	0.879	0.448	0.896		
2.239	0.900	1.045	0.883	0.448	0.900		
2.239	0.904	1.194	0.888	0.448	0.904		
2.239	0.908	1.194	0.892	0.448	0.908		
2.239	0.913	1.194	0.896	0.448	0.913		
2.239	0.917	1.194	0.900	0.448	0.917		
2.239	0.921	1.194	0.904	0.448	0.921		
2.239	0.925	1.194	0.908	0.448	0.925		
2.239	0.929	1.194	0.913	0.448	0.929		
2.239	0.933	1.194	0.917	0.448	0.933		
2.239	0.938	1.194	0.921	0.448	0.938		
2.239	0.942	1.194	0.925	0.448	0.942		
2.239	0.946	1.194	0.929	0.448	0.946		
2.239	0.950	1.194	0.933	0.448	0.950		
2.239	0.954	1.194	0.938	0.448	0.954		
2.239	0.958	1.194	0.942	0.448	0.958		
2.239	0.963	1.194	0.946	0.448	0.963		
2.239	0.967	1.194	0.950	0.448	0.967		
2.239	0.971	1.194	0.954	0.448	0.971		
2.239	0.975	1.194	0.958	0.448	0.975		
2.239	0.979	1.194	0.963	0.448	0.979		
2.239	0.983	1.194	0.967	0.448	0.983		
2.239	0.988	1.194	0.971	0.448	0.988		
2.239	0.992	1.194	0.975	0.448	0.992		
2.239	0.996	1.194	0.979	0.448	0.996		
2.239	1.000	1.194	0.983	0.448	1.000		
2.239	1.004	1.194	0.988	0.448	1.004		
2.239	1.008	1.194	0.992	0.448	1.008		
2.239	1.013	1.194	0.996	0.448	1.013		

2.239	1.017	1.194	1.000	0.448	1.017		
2.239	1.021	1.194	1.004	0.448	1.021		
2.239	1.025	1.194	1.008	0.448	1.025		
2.239	1.029	1.194	1.013	0.448	1.029		
2.239	1.033	1.194	1.017	0.448	1.033		
2.239	1.038	1.194	1.021	0.448	1.038		
2.239	1.042	1.194	1.025	0.448	1.042		
2.239	1.046	1.194	1.029	0.448	1.046		
2.239	1.050	1.194	1.033	0.448	1.050		
2.239	1.054	1.194	1.038	0.448	1.054		
2.239	1.058	1.194	1.042	0.299	1.058		
2.239	1.063	1.194	1.046	0.299	1.063		
2.239	1.067	1.194	1.050	0.299	1.067		
2.239	1.071	1.194	1.054	0.299	1.071		
2.239	1.075	1.194	1.058	0.299	1.075		
2.239	1.079	1.194	1.063	0.299	1.079		
2.239	1.083	1.194	1.067	0.299	1.083		
2.239	1.088	1.194	1.071	0.299	1.088		
2.239	1.092	1.194	1.075	0.299	1.092		
2.239	1.096	1.194	1.079	0.299	1.096		
2.239	1.100	1.194	1.083	0.299	1.100		
2.239	1.104	1.194	1.088	0.299	1.104		
2.239	1.108	1.194	1.092	0.299	1.108		
2.239	1.113	1.194	1.096	0.299	1.113		
2.239	1.117	1.194	1.100	0.299	1.117		
2.388	1.121	1.194	1.104	0.299	1.121		
2.239	1.125	1.194	1.108	0.299	1.125		
2.239	1.129	1.194	1.113	0.299	1.129		
2.239	1.133	1.194	1.117	0.299	1.133		
2.239	1.138	1.194	1.121	0.299	1.138		
2.239	1.142	1.194	1.125	0.299	1.142		
2.239	1.146	1.194	1.129	0.299	1.146		
2.239	1.150	1.194	1.133	0.299	1.150		
2.239	1.154	1.343	1.138	0.299	1.154		
2.239	1.158	1.343	1.142	0.299	1.158		
2.239	1.163	1.343	1.146	0.299	1.163		
2.239	1.167	1.343	1.150	0.299	1.167		
2.239	1.171	1.343	1.154	0.299	1.171		
2.239	1.175	1.343	1.158	0.299	1.175		
2.388	1.179	1.343	1.163	0.299	1.179		
2.388	1.183	1.343	1.167	0.448	1.183		
2.239	1.188	1.343	1.171	0.448	1.188		
2.388	1.192	1.343	1.175	0.448	1.192		
2.388	1.196	1.343	1.179	0.448	1.196		
2.239	1.200	1.343	1.183	0.448	1.200		
2.239	1.204	1.343	1.188	0.448	1.204		
2.239	1.208	1.343	1.192	0.448	1.208		
2.239	1.213	1.343	1.196	0.448	1.213		
2.388	1.217	1.343	1.200	0.448	1.217		
2.239	1.221	1.343	1.204	0.448	1.221		
2.388	1.225	1.343	1.208	0.448	1.225		
2.388	1.229	1.343	1.213	0.448	1.229		
2.388	1.233	1.343	1.217	0.448	1.233		
2.388	1.238	1.343	1.221	0.448	1.238		
2.388	1.242	1.343	1.225	0.448	1.242		
2.388	1.246	1.343	1.229	0.448	1.246		
2.388	1.250	1.343	1.233	0.448	1.250		
2.388	1.254	1.343	1.238	0.448	1.254		
2.388	1.258	1.343	1.242	0.448	1.258		
2.388	1.263	1.343	1.246	0.448	1.263		
2.388	1.267	1.343	1.250	0.448	1.267		
2.388	1.271	1.343	1.254	0.448	1.271		

2.388	1.275	1.343	1.258	0.448	1.275		
2.239	1.279	1.343	1.263	0.448	1.279		
2.388	1.283	1.343	1.267	0.448	1.283		
2.239	1.288	1.343	1.271	0.448	1.288		
2.388	1.292	1.343	1.275	0.448	1.292		
2.388	1.296	1.343	1.275	0.448	1.296		
2.388	1.300	1.343	1.276	0.448	1.300		
2.388	1.304	1.343	1.276	0.448	1.304		
2.239	1.308	1.343	1.276	0.448	1.308		
2.388	1.313	1.343	1.276	0.448	1.313		
2.388	1.317	1.343	1.277	0.448	1.317		
2.388	1.321	1.343	1.277	0.448	1.321		
2.388	1.325	1.343	1.277	0.448	1.325		
2.388	1.329	1.343	1.278	0.448	1.329		
2.388	1.333	1.343	1.278	0.448	1.333		
2.388	1.338	1.343	1.278	0.448	1.338		
2.388	1.342	1.343	1.278	0.448	1.342		
2.388	1.346	1.343	1.279	0.448	1.346		
2.388	1.350	1.343	1.279	0.448	1.350		
2.388	1.354	1.343	1.279	0.448	1.354		
2.388	1.358	1.343	1.279	0.448	1.358		
2.388	1.363	1.343	1.280	0.448	1.363		
2.388	1.367	1.343	1.280	0.448	1.367		
2.388	1.371	1.343	1.280	0.448	1.371		
2.388	1.375	1.343	1.281	0.448	1.375		
2.388	1.379	1.343	1.281	0.448	1.379		
2.388	1.383	1.343	1.281	0.448	1.383		
2.388	1.388	1.343	1.281	0.448	1.388		
2.388	1.392	1.343	1.282	0.448	1.392		
2.388	1.396	1.343	1.282	0.448	1.396		
2.388	1.400	1.343	1.282	0.448	1.400		
2.388	1.404	1.343	1.283	0.448	1.404		
2.388	1.408	1.343	1.283	0.448	1.408		
2.388	1.413	1.343	1.283	0.448	1.413		
2.388	1.417	1.343	1.283	0.448	1.417		
2.388	1.421	1.343	1.284	0.448	1.421		
2.388	1.425	1.343	1.284	0.448	1.425		
2.388	1.429	1.343	1.284	0.448	1.429		
2.388	1.433	1.343	1.284	0.448	1.433		
2.388	1.438	1.343	1.285	0.448	1.438		
2.388	1.442	1.343	1.285	0.448	1.442		
2.388	1.446	1.343	1.285	0.448	1.446		
2.388	1.450	1.343	1.286	0.448	1.450		
2.388	1.454	1.343	1.286	0.448	1.454		
2.388	1.458	1.343	1.286	0.448	1.458		
2.388	1.463	1.343	1.286	0.597	1.463		
2.388	1.467	1.343	1.287	0.448	1.467		
2.388	1.471	1.343	1.287	0.448	1.471		
2.388	1.475	1.343	1.287	0.448	1.475		
2.388	1.479	1.343	1.288	0.448	1.479		
2.388	1.483	1.343	1.288	0.448	1.483		
2.388	1.488	1.343	1.288	0.448	1.488		
2.388	1.492	1.343	1.288	0.597	1.492		
2.388	1.496	1.343	1.289	0.597	1.496		
2.388	1.500	1.343	1.289	0.597	1.500		
2.388	1.504	1.343	1.289	0.597	1.504		
2.388	1.508	1.343	1.289	0.597	1.508		
2.388	1.513	1.343	1.290	0.597	1.513		
2.388	1.517	1.343	1.290	0.597	1.517		
2.388	1.521	1.343	1.290	0.597	1.521		
2.388	1.525	1.343	1.291	0.597	1.525		
2.388	1.529	1.343	1.291	0.597	1.529		

2.388	1.533	1.343	1.291	1.194	1.533		
2.388	1.538	1.343	1.291	1.194	1.538		
2.388	1.542	1.343	1.292	1.194	1.542		
2.388	1.546	1.343	1.292				
2.388	1.550	1.343	1.292				
2.388	1.554	1.343	1.293				
2.388	1.558	1.343	1.293				
2.388	1.563	1.343	1.293				
2.388	1.567	1.343	1.293				
2.388	1.571	1.343	1.294				
2.388	1.575	1.343	1.294				
2.388	1.579	1.343	1.294				
2.388	1.583	1.343	1.294				
2.388	1.588	1.343	1.295				
2.388	1.592	1.343	1.295				
2.388	1.596	1.343	1.295				
2.388	1.600	1.343	1.296				
2.388	1.604	1.343	1.296				
2.388	1.608	1.343	1.296				
2.388	1.613	1.343	1.296				
2.388	1.617	1.343	1.297				
2.388	1.621	1.343	1.297				
2.388	1.625	1.343	1.297				
2.388	1.629	1.343	1.298				
2.388	1.633	1.343	1.298				
2.388	1.638	1.343	1.298				
2.388	1.642	1.343	1.298				
2.388	1.646	1.343	1.299				
2.388	1.650	1.343	1.299				
2.388	1.654	1.343	1.299				
2.388	1.658	1.343	1.299				
2.388	1.663	1.343	1.300				
2.388	1.667	1.343	1.300				
2.388	1.671	1.343	1.300				
2.388	1.675	1.343	1.301				
2.388	1.679	1.343	1.301				
2.388	1.683	1.343	1.301				
2.388	1.688	1.343	1.301				
2.388	1.692	1.343	1.302				
2.388	1.696	1.343	1.302				
2.388	1.700	1.343	1.302				
2.388	1.704	1.343	1.303				
2.388	1.708	1.343	1.303				
2.388	1.713	1.343	1.303				
2.388	1.717	1.343	1.303				
2.388	1.721	1.343	1.304				
2.388	1.725	1.343	1.304				
2.388	1.729	1.343	1.304				
2.388	1.733	1.343	1.304				
2.388	1.738	1.343	1.305				
2.388	1.742	1.343	1.305				
2.388	1.746	1.343	1.305				
2.388	1.750	1.343	1.306				
2.388	1.754	1.343	1.306				
2.388	1.758	1.343	1.306				
2.388	1.763	1.343	1.306				
2.388	1.767	1.343	1.307				
2.388	1.771	1.343	1.307				
2.388	1.775	1.343	1.307				
2.388	1.779	1.343	1.308				
2.388	1.783	1.343	1.308				
2.388	1.788	1.343	1.308				

2.388	1.792	1.343	1.308				
2.388	1.796	1.343	1.309				
2.388	1.800	1.343	1.309				
2.388	1.804	1.343	1.309				
2.388	1.808	1.343	1.309				
2.388	1.813	1.343	1.310				
2.388	1.817	1.343	1.310				
2.388	1.821	1.343	1.310				
2.388	1.825	1.343	1.311				
2.388	1.829	1.343	1.311				
2.388	1.833	1.343	1.311				
2.388	1.838	1.343	1.311				
2.388	1.842	1.343	1.312				
2.388	1.846	1.343	1.312				
2.388	1.850	1.343	1.312				
2.388	1.854	1.343	1.313				
2.388	1.858	1.343	1.313				
2.388	1.863	1.343	1.313				
2.388	1.867	1.343	1.313				
2.388	1.871	1.343	1.314				
2.388	1.875	1.343	1.314				
2.388	1.879	1.343	1.314				
2.388	1.883	1.343	1.314				
2.388	1.888	1.343	1.315				
2.388	1.892	1.343	1.315				
2.388	1.896	1.343	1.315				
2.388	1.900	1.343	1.316				
2.388	1.904	1.343	1.316				
2.388	1.908	1.343	1.316				
2.388	1.913	1.343	1.316				
2.388	1.917	1.343	1.317				
2.388	1.921	1.343	1.317				
2.388	1.925	1.343	1.317				
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2.388	1.942	1.343	1.318				
2.388	1.946	1.343	1.319				
2.388	1.950	1.343	1.319				
2.388	1.954	1.343	1.319				
2.388	1.958	1.343	1.319				
2.388	1.963	1.343	1.320				
2.388	1.967	1.343	1.320				
2.388	1.971	1.343	1.320				
2.388	1.975	1.343	1.321				
2.388	1.979	1.343	1.321				
2.388	1.983	1.343	1.321				
2.388	1.988	1.343	1.321				
2.388	1.992	1.343	1.322				
2.388	1.996	1.343	1.322				
2.388	2.000	1.343	1.322				
2.388	2.004	1.343	1.323				
2.388	2.008	1.343	1.323				
2.388	2.013	1.343	1.323				
2.388	2.017	1.343	1.323				
2.388	2.021	1.343	1.324				
2.388	2.025	1.343	1.324				
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2.388	2.033	1.343	1.324				
2.388	2.038	1.343	1.325				
2.388	2.042	1.343	1.325				
2.388	2.046	1.343	1.325				

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2.388	2.054	1.343	1.326				
2.388	2.058	1.343	1.326				
2.388	2.063	1.343	1.326				
2.388	2.067	1.343	1.327				
2.388	2.071	1.343	1.327				
2.388	2.075	1.343	1.327				
2.388	2.079	1.343	1.328				
2.388	2.083	1.343	1.328				
2.388	2.088	1.343	1.328				
2.388	2.092	1.343	1.328				
2.388	2.096	1.343	1.329				
2.388	2.100	1.343	1.329				
2.388	2.104	1.343	1.329				
2.388	2.108	1.343	1.329				
2.388	2.113	1.343	1.330				
2.388	2.117	1.343	1.330				
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2.388	2.138	1.343	1.331				
2.388	2.142	1.343	1.332				
2.388	2.146	1.343	1.332				
2.388	2.150	1.343	1.332				
2.388	2.154	1.343	1.333				
2.388	2.158	1.343	1.333				
2.388	2.163	1.343	1.333				
2.388	2.167	1.343	1.333				
2.388	2.171	1.343	1.334				
2.388	2.175	1.343	1.334				
2.388	2.179	1.343	1.334				
2.388	2.183	1.343	1.334				
2.388	2.188	1.343	1.335				
2.388	2.192	1.343	1.335				
2.388	2.196	1.343	1.335				
2.388	2.200	1.343	1.336				
2.388	2.204	1.343	1.336				
2.388	2.208	1.343	1.336				
2.537	2.213	1.343	1.336				
2.537	2.217	1.343	1.337				
2.388	2.221	1.343	1.337				
2.388	2.225	1.343	1.337				
2.537	2.229	1.343	1.338				
2.537	2.233	1.343	1.338				
2.537	2.238	1.343	1.338				
2.537	2.242	1.343	1.338				
2.537	2.246	1.343	1.339				
2.537	2.250	1.343	1.339				
2.537	2.254	1.343	1.339				
2.388	2.258	1.343	1.339				
2.388	2.263	1.343	1.340				
2.388	2.267	1.343	1.340				
2.388	2.271	1.343	1.340				
2.537	2.275	1.343	1.341				
2.537	2.279	1.343	1.341				
2.537	2.283	1.343	1.341				
2.537	2.288	1.343	1.341				
2.388	2.292	1.343	1.342				
2.537	2.296	1.343	1.342				
2.537	2.300	1.343	1.342				
2.537	2.304	1.343	1.343				

2.537	2.308	1.343	1.343				
2.537	2.313	1.343	1.343				
2.537	2.317	1.343	1.343				
2.537	2.321	1.343	1.344				
2.537	2.325	1.343	1.344				
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2.537	2.333	1.343	1.344				
2.537	2.338	1.343	1.345				
2.537	2.342	1.343	1.345				
2.537	2.346	1.343	1.345				
2.537	2.350	1.343	1.346				
2.537	2.354	1.343	1.346				
2.537	2.358	1.343	1.346				
2.537	2.363	1.343	1.346				
2.537	2.367	1.343	1.347				
2.537	2.371	1.343	1.347				
2.537	2.375	1.343	1.347				
2.537	2.379	1.343	1.348				
2.537	2.383	1.343	1.348				
2.537	2.388	1.343	1.348				
2.537	2.392	1.343	1.348				
2.537	2.396	1.343	1.349				
2.537	2.400	1.343	1.349				
2.537	2.404	1.343	1.349				
2.537	2.408	1.343	1.349				
2.537	2.413	1.343	1.350				
2.537	2.417	1.343	1.350				
2.537	2.421	1.343	1.350				
2.537	2.425	1.343	1.351				
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2.537	2.433	1.343	1.351				
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2.537	2.446	1.343	1.352				
2.537	2.450	1.343	1.352				
2.537	2.454	1.343	1.353				
2.537	2.458	1.343	1.353				
2.537	2.463	1.343	1.353				
2.537	2.467	1.343	1.353				
2.537	2.471	1.343	1.354				
2.537	2.475	1.343	1.354				
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2.537	2.492	1.343	1.355				
2.537	2.496	1.343	1.355				
2.537	2.500	1.343	1.356				
2.537	2.504	1.343	1.356				
2.537	2.508	1.343	1.356				
2.537	2.513	1.343	1.356				
2.537	2.517	1.343	1.357				
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2.537	2.525	1.343	1.357				
2.537	2.529	1.343	1.358				
2.537	2.533	1.343	1.358				
2.537	2.538	1.343	1.358				
2.537	2.542	1.343	1.358				
2.537	2.546	1.343	1.359				
2.537	2.550	1.343	1.359				
2.537	2.554	1.343	1.359				
2.537	2.558	1.343	1.359				
2.537	2.563	1.343	1.360				

2.537	2.567	1.343	1.360				
2.537	2.571	1.343	1.360				
2.537	2.575	1.343	1.361				
2.537	2.579	1.343	1.361				
2.537	2.583	1.343	1.361				
2.537	2.588	1.343	1.361				
2.537	2.592	1.343	1.362				
2.537	2.596	1.343	1.362				
2.537	2.600	1.343	1.362				
2.537	2.604	1.343	1.363				
2.537	2.608	1.343	1.363				
2.537	2.613	1.343	1.363				
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2.537	2.621	1.343	1.364				
2.537	2.625	1.343	1.364				
2.537	2.629	1.343	1.364				
2.537	2.633	1.343	1.364				
2.537	2.638	1.343	1.365				
2.537	2.642	1.343	1.365				
2.537	2.646	1.343	1.365				
2.537	2.650	1.343	1.366				
2.537	2.654	1.343	1.366				
2.537	2.658	1.343	1.366				
2.537	2.663	1.343	1.366				
2.537	2.667	1.343	1.367				
2.537	2.671	1.343	1.367				
2.537	2.675	1.343	1.367				
2.537	2.679	1.343	1.368				
2.537	2.683	1.343	1.368				
2.537	2.688	1.343	1.368				
2.537	2.692	1.343	1.368				
2.537	2.696	1.343	1.369				
2.537	2.700	1.343	1.369				
2.537	2.704	1.343	1.369				
2.537	2.708	1.343	1.369				
2.537	2.713	1.343	1.370				
2.537	2.717	1.343	1.370				
2.537	2.721	1.343	1.370				
2.537	2.725	1.343	1.371				
2.537	2.729	1.343	1.371				
2.537	2.733	1.343	1.371				
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2.537	2.754	1.343	1.373				
2.537	2.758	1.343	1.373				
2.537	2.763	1.343	1.373				
2.537	2.767	1.343	1.373				
2.537	2.771	1.343	1.374				
2.537	2.775	1.343	1.374				
2.537	2.779	1.343	1.374				
2.537	2.783	1.343	1.374				
2.537	2.788	1.343	1.375				
2.537	2.792	1.343	1.375				
2.537	2.796	1.343	1.375				
2.537	2.800	1.343	1.376				
2.537	2.804	1.343	1.376				
2.537	2.808	1.343	1.376				
2.537	2.813	1.343	1.376				
2.537	2.817	1.343	1.377				
2.537	2.821	1.343	1.377				

2.537	2.825	1.343	1.377				
2.537	2.829	1.343	1.378				
2.537	2.833	1.343	1.378				
2.537	2.838	1.343	1.378				
2.537	2.842	1.343	1.378				
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2.537	2.871	1.343	1.380				
2.537	2.875	1.343	1.381				
2.537	2.879	1.343	1.381				
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2.537	2.925	1.343	1.384				
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2.537	2.963	1.343	1.386				
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2.537	2.992	1.343	1.388				
2.537	2.996	1.343	1.389				
2.537	3.000	1.343	1.389				
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2.537	3.050	1.343	1.392				
2.537	3.054	1.343	1.393				
2.537	3.058	1.343	1.393				
2.537	3.063	1.343	1.393				
2.537	3.067	1.343	1.393				
2.537	3.071	1.343	1.394				
2.537	3.075	1.343	1.394				
2.537	3.079	1.343	1.394				

2.537	3.083	1.343	1.394				
2.537	3.088	1.343	1.395				
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2.537	3.096	1.343	1.395				
2.537	3.100	1.343	1.396				
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2.537	3.113	1.343	1.396				
2.537	3.117	1.343	1.397				
2.537	3.121	1.343	1.397				
2.537	3.125	1.343	1.397				
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2.537	3.138	1.343	1.398				
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2.687	3.154	1.343	1.399				
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2.687	3.167	1.343	1.400				
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2.687	3.175	1.343	1.401				
2.687	3.179	1.343	1.401				
2.687	3.183	1.343	1.401				
2.836	3.188	1.343	1.401				
2.836	3.192	1.343	1.402				
2.836	3.196	1.343	1.402				
2.836	3.200	1.343	1.402				
2.836	3.204	1.343	1.403				
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2.836	4.000	1.343	1.404				
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2.836	12.000	1.343	1.405				
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		1.493	1.612				
		1.493	1.613				
		1.493	2.000				
		1.940	4.000				
		2.388	8.000				
		2.687	12.000				
		2.836	16.000				
		2.836	20.000				
		2.836	24.000				

Annex 4

Permeability function test results

Drying path - SILTY SAND

Time/ (hr)	Soil weight/(g)	Matric suction (top)/ (kPa)	Matric suction (middle)/ (kPa)	Weight of water/ (g)	Gravimetric water content/(%)	Volumetric water content/(%)
0	650.79	0.000	0.000	173.79	36.43	48.68
1	649.86	0.746	0.758	172.86	36.24	48.42
2	648.97	0.896	0.909	171.97	36.05	48.17
3	648.35	1.045	1.061	171.35	35.92	48.00
4	647.31	1.045	1.061	170.31	35.70	47.70
5	646.54	1.045	1.212	169.54	35.54	47.49
6	645.85	1.045	1.212	168.85	35.40	47.30
7	645.49	1.045	1.212	168.49	35.32	47.20
8	645.13	1.045	1.212	168.13	35.25	47.09
9	644.77	1.045	1.212	167.77	35.17	46.99
10	644.41	1.045	1.212	167.41	35.10	46.89
11	644.05	1.045	1.212	167.05	35.02	46.79
12	643.69	1.194	1.364	166.69	34.95	46.69
13	643.33	1.343	1.515	166.33	34.87	46.59
14	642.97	1.493	1.667	165.97	34.80	46.49
15	642.61	1.642	1.818	165.61	34.72	46.39
16	642.25	1.940	2.121	165.25	34.64	46.29
17	641.89	2.090	2.273	164.89	34.57	46.19
18	641.53	2.239	2.424	164.53	34.49	46.09
19	641.17	2.388	2.576	164.17	34.42	45.99
20	640.81	2.537	2.727	163.81	34.34	45.88
21	640.45	2.687	2.879	163.45	34.27	45.78
22	640.09	2.687	2.879	163.09	34.19	45.68
23	639.73	2.836	3.030	162.73	34.12	45.58
24	639.37	2.985	3.182	162.37	34.04	45.48
25	639.01	3.134	3.333	162.01	33.97	45.38
26	638.56	3.134	3.485	161.56	33.87	45.25
27	638.22	3.582	3.939	161.22	33.80	45.16
28	637.87	3.731	4.091	160.87	33.73	45.06
29	637.52	3.881	4.091	160.52	33.65	44.96
30	637.15	4.030	4.394	160.15	33.57	44.86
31	636.77	4.030	4.394	159.77	33.49	44.75
32	636.46	4.030	4.394	159.46	33.43	44.66
33	636.16	4.478	4.697	159.16	33.37	44.58
34	635.86	4.627	4.848	158.86	33.30	44.50
35	635.56	4.925	5.152	158.56	33.24	44.41
36	635.26	5.075	5.303	158.26	33.18	44.33
37	634.96	5.373	5.606	157.96	33.12	44.24
38	634.66	5.672	5.909	157.66	33.05	44.16
39	634.36	5.970	6.212	157.36	32.99	44.08
40	634.06	6.269	6.515	157.06	32.93	43.99

41	633.76	6.269	6.515	156.76	32.86	43.91
42	633.46	6.567	6.818	156.46	32.80	43.82
43	633.16	6.716	6.970	156.16	32.74	43.74
44	632.86	6.567	6.818	155.86	32.68	43.66
45	632.43	5.970	6.061	155.43	32.58	43.54
46	631.91	6.418	6.818	154.91	32.48	43.39
47	631.58	6.716	7.121	154.58	32.41	43.30
48	631.26	7.015	6.970	154.26	32.34	43.21
49	630.79	7.313	7.576	153.79	32.24	43.08
50	630.26	7.612	7.879	153.26	32.13	42.93
51	629.70	7.910	8.182	152.70	32.01	42.77
52	629.19	8.358	8.485	152.19	31.91	42.63
53	628.63	8.358	8.636	151.63	31.79	42.47
54	628.24	8.657	8.939	151.24	31.71	42.36
55	627.86	8.806	9.091	150.86	31.63	42.26
56	627.48	8.955	9.242	150.48	31.55	42.15
57	627.11	9.104	9.394	150.11	31.47	42.05
58	626.76	9.254	9.545	149.76	31.40	41.95
59	626.39	9.403	9.697	149.39	31.32	41.84
60	626.03	9.701	10.000	149.03	31.24	41.74
61	625.68	10.000	10.303	148.68	31.17	41.65
62	625.33	10.299	10.606	148.33	31.10	41.55
63	624.98	10.597	10.909	147.98	31.02	41.45
64	624.63	10.896	11.212	147.63	30.95	41.35
65	624.28	11.194	11.364	147.28	30.88	41.25
66	623.94	11.343	11.667	146.94	30.81	41.16
67	623.59	11.493	11.818	146.59	30.73	41.06
68	623.25	11.791	11.970	146.25	30.66	40.96
69	622.94	11.791	12.121	145.94	30.60	40.88
70	622.62	11.940	12.273	145.62	30.53	40.79
71	622.21	12.388	12.576	145.21	30.44	40.67
72	621.82	12.985	13.182	144.82	30.36	40.56
73	621.43	13.731	13.636	144.43	30.28	40.46
74	620.87	14.478	13.939	143.87	30.16	40.30
75	620.11	15.224	14.091	143.11	30.00	40.09
76	619.38	15.821	13.939	142.38	29.85	39.88
77	618.93	16.567	14.394	141.93	29.75	39.75
78	618.45	17.164	14.848	141.45	29.65	39.62
79	617.98	17.463	15.152	140.98	29.56	39.49
80	617.55	17.910	15.303	140.55	29.47	39.37
81	617.14	18.507	15.909	140.14	29.38	39.25
82	616.74	18.955	16.364	139.74	29.30	39.14
83	616.36	19.552	16.970	139.36	29.22	39.03
84	615.98	20.149	17.576	138.98	29.14	38.93
85	615.60	20.597	18.030	138.60	29.06	38.82
86	615.20	21.045	18.485	138.20	28.97	38.71
87	614.82	21.642	19.091	137.82	28.89	38.60
88	614.44	22.090	19.545	137.44	28.81	38.50

89	614.07	22.537	20.000	137.07	28.74	38.39
90	613.52	22.836	20.303	136.52	28.62	38.24
91	613.06	23.134	20.606	136.06	28.52	38.11
92	612.72	23.433	20.909	135.72	28.45	38.02
93	611.92	23.881	21.364	134.92	28.29	37.79
94	611.30	24.478	21.970	134.30	28.16	37.62
95	610.59	25.373	22.879	133.59	28.01	37.42
96	609.03	26.269	23.788	132.03	27.68	36.98
97	608.43	27.313	24.697	131.43	27.55	36.81
98	607.83	28.358	25.152	130.83	27.43	36.65
99	606.64	29.254	25.606	129.64	27.18	36.31
100	606.10	29.851	26.212	129.10	27.06	36.16
101	605.58	30.299	26.364	128.58	26.96	36.02
102	605.25	30.597	26.667	128.25	26.89	35.92
103	604.92	31.045	27.121	127.92	26.82	35.83
104	604.68	31.493	27.576	127.68	26.77	35.76
105	604.50	32.090	28.182	127.50	26.73	35.71
106	604.31	32.687	28.788	127.31	26.69	35.66
107	604.07	33.582	29.697	127.07	26.64	35.59
108	603.83	34.478	30.606	126.83	26.59	35.52
109	603.59	35.522	31.667	126.59	26.54	35.46
110	603.30	36.567	32.727	126.30	26.48	35.38
111	602.94	37.612	33.788	125.94	26.40	35.28
112	602.58	38.507	34.697	125.58	26.33	35.18
113	602.22	39.552	35.758	125.22	26.25	35.08
114	601.86	40.448	36.667	124.86	26.18	34.97
115	601.50	41.493	37.727	124.50	26.10	34.87
116	601.14	42.388	38.636	124.14	26.03	34.77
117	600.78	43.134	39.394	123.78	25.95	34.67
118	600.42	43.731	40.000	123.42	25.88	34.57
119	600.06	44.627	40.909	123.06	25.80	34.47
120	599.70	45.522	41.818	122.70	25.72	34.37
121	599.34	46.567	42.273	122.34	25.65	34.27
122	598.98	47.761	42.879	121.98	25.57	34.17
123	598.62	48.955	43.939	121.62	25.50	34.07
124	598.26	50.149	45.000	121.26	25.42	33.97
125	597.89	51.343	46.212	120.89	25.34	33.86
126	597.07	52.537	47.424	120.07	25.17	33.63
127	596.74	53.731	48.636	119.74	25.10	33.54
128	596.41	54.925	49.848	119.41	25.03	33.45
129	596.08	56.119	51.061	119.08	24.96	33.35
130	595.86	57.313	52.273	118.86	24.92	33.29
131	595.57	58.507	53.485	118.57	24.86	33.21
132	595.26	59.851	54.848	118.26	24.79	33.12
133	594.95	61.194	56.212	117.95	24.73	33.04
134	594.63	62.687	57.727	117.63	24.66	32.95
135	594.32	64.030	59.091	117.32	24.60	32.86
136	594.03	65.373	60.455	117.03	24.53	32.78

137	593.75	66.567	61.667	116.75	24.48	32.70
138	593.47	67.910	63.030	116.47	24.42	32.62
139	593.20	69.104	64.242	116.20	24.36	32.55
140	592.92	70.448	65.606	115.92	24.30	32.47
141	592.67	71.493	66.667	115.67	24.25	32.40
142	592.41	72.687	67.879	115.41	24.19	32.33
143	592.06	74.179	68.939	115.06	24.12	32.23
144	591.76	76.119	69.848	114.76	24.06	32.14
145	591.40	78.955	72.727	114.40	23.98	32.04
146	590.90	81.940	75.758	113.90	23.88	31.90
147	590.39	84.925	78.788	113.39	23.77	31.76
148	589.83	87.761	81.667	112.83	23.65	31.60
149	589.43	90.597	84.545	112.43	23.57	31.49
150	589.13	91.791	85.758	112.13	23.51	31.41
151	588.80	93.582	87.576	111.80	23.44	31.32
152	588.44	95.821	89.848	111.44	23.36	31.21
153	588.12	97.463	91.515	111.12	23.30	31.12
154	587.83	99.403	93.485	110.83	23.23	31.04

Drying path - SILTY SAND contd….

Total head, $(z\text{-}s/\gamma_w)_{Top}$ /(m)	Total head, $(z\text{-}s/\gamma_w)_{Middle}$ /(m)	Head difference, $(z\text{-}s/\gamma_w)$/(m)	Hydraulic gradient, i	Volume change/ (ml)	Velocity/ (m/s)	Hydraulic conductivity/ (m/s)
0.0475	0.0255	0.0220	1.0000	0.00	-	-
-0.0286	-0.0517	0.0232	1.0524	0.93	5.93E-08	5.63E-08
-0.0438	-0.0672	0.0234	1.0629	1.82	5.80E-08	5.46E-08
-0.0590	-0.0826	0.0236	1.0733	2.44	5.18E-08	4.83E-08
-0.0590	-0.0826	0.0236	1.0733	3.48	5.54E-08	5.17E-08
-0.0590	-0.0981	0.0391	1.7754	4.25	5.42E-08	3.05E-08
-0.0590	-0.0981	0.0391	1.7754	4.94	5.24E-08	2.95E-08
-0.0590	-0.0981	0.0391	1.7754	5.30	4.82E-08	2.72E-08
-0.0590	-0.0981	0.0391	1.7754	5.66	4.51E-08	2.54E-08
-0.0590	-0.0981	0.0391	1.7754	6.02	4.26E-08	2.40E-08
-0.0590	-0.0981	0.0391	1.7754	6.38	4.06E-08	2.29E-08
-0.0590	-0.0981	0.0391	1.7754	6.74	3.90E-08	2.20E-08
-0.0742	-0.1135	0.0393	1.7859	7.10	3.77E-08	2.11E-08
-0.0894	-0.1289	0.0395	1.7963	7.46	3.65E-08	2.03E-08
-0.1046	-0.1444	0.0398	1.8068	7.82	3.56E-08	1.97E-08
-0.1199	-0.1598	0.0400	1.8173	8.18	3.47E-08	1.91E-08
-0.1503	-0.1907	0.0404	1.8383	8.54	3.40E-08	1.85E-08
-0.1655	-0.2062	0.0407	1.8487	8.90	3.33E-08	1.80E-08
-0.1807	-0.2216	0.0409	1.8592	9.26	3.28E-08	1.76E-08
-0.1959	-0.2371	0.0411	1.8697	9.62	3.23E-08	1.72E-08
-0.2111	-0.2525	0.0414	1.8802	9.98	3.18E-08	1.69E-08
-0.2264	-0.2680	0.0416	1.8907	10.34	3.14E-08	1.66E-08
-0.2264	-0.2680	0.0416	1.8907	10.70	3.10E-08	1.64E-08
-0.2416	-0.2834	0.0418	1.9011	11.06	3.06E-08	1.61E-08
-0.2568	-0.2988	0.0421	1.9116	11.42	3.03E-08	1.59E-08
-0.2720	-0.3143	0.0423	1.9221	11.78	3.00E-08	1.56E-08
-0.2720	-0.3297	0.0577	2.6241	12.23	3.00E-08	1.14E-08
-0.3176	-0.3761	0.0584	2.6556	12.57	2.97E-08	1.12E-08
-0.3329	-0.3915	0.0587	2.6660	12.92	2.94E-08	1.10E-08
-0.3481	-0.3915	0.0434	1.9745	13.27	2.92E-08	1.48E-08
-0.3633	-0.4224	0.0591	2.6870	13.64	2.90E-08	1.08E-08
-0.3633	-0.4224	0.0591	2.6870	14.02	2.88E-08	1.07E-08
-0.3633	-0.4224	0.0591	2.6870	14.33	2.85E-08	1.06E-08
-0.4089	-0.4533	0.0444	2.0164	14.63	2.83E-08	1.40E-08
-0.4241	-0.4687	0.0446	2.0269	14.93	2.80E-08	1.38E-08
-0.4546	-0.4996	0.0451	2.0478	15.23	2.77E-08	1.35E-08
-0.4698	-0.5151	0.0453	2.0583	15.53	2.75E-08	1.34E-08
-0.5002	-0.5460	0.0457	2.0793	15.83	2.73E-08	1.31E-08
-0.5306	-0.5769	0.0462	2.1002	16.13	2.70E-08	1.29E-08
-0.5611	-0.6077	0.0467	2.1212	16.43	2.68E-08	1.27E-08
-0.5915	-0.6386	0.0471	2.1421	16.73	2.67E-08	1.24E-08

-0.5915	-0.6386	0.0471	2.1421	17.03	2.65E-08	1.24E-08
-0.6219	-0.6695	0.0476	2.1631	17.33	2.63E-08	1.22E-08
-0.6372	-0.6850	0.0478	2.1736	17.63	2.61E-08	1.20E-08
-0.6219	-0.6695	0.0476	2.1631	17.93	2.60E-08	1.20E-08
-0.5611	-0.5923	0.0312	1.4191	18.36	2.60E-08	1.83E-08
-0.6067	-0.6695	0.0628	2.8547	18.88	2.62E-08	9.16E-09
-0.6372	-0.7004	0.0633	2.8756	19.21	2.60E-08	9.06E-09
-0.6676	-0.6850	0.0174	0.7904	19.53	2.59E-08	3.28E-08
-0.6980	-0.7467	0.0487	2.2155	20.00	2.60E-08	1.17E-08
-0.7284	-0.7776	0.0492	2.2364	20.53	2.62E-08	1.17E-08
-0.7589	-0.8085	0.0497	2.2574	21.09	2.64E-08	1.17E-08
-0.8045	-0.8394	0.0349	1.5868	21.60	2.65E-08	1.67E-08
-0.8045	-0.8549	0.0504	2.2888	22.16	2.66E-08	1.16E-08
-0.8349	-0.8858	0.0508	2.3098	22.55	2.66E-08	1.15E-08
-0.8502	-0.9012	0.0510	2.3203	22.93	2.66E-08	1.14E-08
-0.8654	-0.9166	0.0513	2.3307	23.31	2.65E-08	1.14E-08
-0.8806	-0.9321	0.0515	2.3412	23.68	2.65E-08	1.13E-08
-0.8958	-0.9475	0.0517	2.3517	24.03	2.64E-08	1.12E-08
-0.9110	-0.9630	0.0520	2.3622	24.40	2.64E-08	1.12E-08
-0.9414	-0.9939	0.0524	2.3831	24.76	2.63E-08	1.10E-08
-0.9719	-1.0248	0.0529	2.4041	25.11	2.62E-08	1.09E-08
-1.0023	-1.0556	0.0534	2.4250	25.46	2.62E-08	1.08E-08
-1.0327	-1.0865	0.0538	2.4460	25.81	2.61E-08	1.07E-08
-1.0632	-1.1174	0.0543	2.4670	26.16	2.60E-08	1.06E-08
-1.0936	-1.1329	0.0393	1.7859	26.51	2.60E-08	1.46E-08
-1.1088	-1.1638	0.0550	2.4984	26.85	2.59E-08	1.04E-08
-1.1240	-1.1792	0.0552	2.5089	27.20	2.59E-08	1.03E-08
-1.1544	-1.1947	0.0402	1.8278	27.54	2.58E-08	1.41E-08
-1.1544	-1.2101	0.0557	2.5298	27.85	2.57E-08	1.02E-08
-1.1697	-1.2255	0.0559	2.5403	28.17	2.56E-08	1.01E-08
-1.2153	-1.2564	0.0411	1.8697	28.58	2.56E-08	1.37E-08
-1.2762	-1.3182	0.0421	1.9116	28.97	2.56E-08	1.34E-08
-1.3522	-1.3645	0.0123	0.5599	29.36	2.56E-08	1.80E-08
-1.4283	-1.3954	-0.0329	-1.4938	29.92	2.58E-08	1.72E-08
-1.5044	-1.4109	-0.0935	-4.2496	30.68	2.61E-08	6.13E-09
-1.5652	-1.3954	-0.1698	-7.7179	31.41	2.63E-08	3.41E-09
-1.6413	-1.4418	-0.1995	-9.0696	31.86	2.64E-08	2.91E-09
-1.7022	-1.4881	-0.2141	-9.7297	32.34	2.64E-08	2.72E-09
-1.7326	-1.5190	-0.2136	-9.7088	32.81	2.65E-08	2.73E-09
-1.7782	-1.5344	-0.2438	-11.0814	33.24	2.65E-08	2.39E-09
-1.8391	-1.5962	-0.2429	-11.0395	33.65	2.65E-08	2.40E-09
-1.8847	-1.6426	-0.2422	-11.0081	34.05	2.65E-08	2.40E-09
-1.9456	-1.7043	-0.2413	-10.9662	34.43	2.64E-08	2.41E-09
-2.0065	-1.7661	-0.2403	-10.9243	34.81	2.64E-08	2.42E-09
-2.0521	-1.8125	-0.2396	-10.8928	35.19	2.64E-08	2.42E-09
-2.0977	-1.8588	-0.2390	-10.8614	35.59	2.64E-08	2.43E-09
-2.1586	-1.9206	-0.2380	-10.8195	35.97	2.63E-08	2.44E-09
-2.2042	-1.9669	-0.2373	-10.7881	36.35	2.63E-08	2.44E-09

-2.2499	-2.0132	-0.2366	-10.7566	36.72	2.63E-08	2.44E-09
-2.2803	-2.0441	-0.2362	-10.7357	37.27	2.64E-08	2.46E-09
-2.3107	-2.0750	-0.2357	-10.7147	37.73	2.64E-08	2.47E-09
-2.3412	-2.1059	-0.2353	-10.6937	38.07	2.64E-08	2.47E-09
-2.3868	-2.1522	-0.2346	-10.6623	38.87	2.66E-08	2.50E-09
-2.4477	-2.2140	-0.2336	-10.6204	39.49	2.68E-08	2.52E-09
-2.5390	-2.3067	-0.2323	-10.5575	40.20	2.70E-08	2.55E-09
-2.6302	-2.3994	-0.2309	-10.4947	41.76	2.77E-08	2.64E-09
-2.7367	-2.4920	-0.2447	-11.1234	42.36	2.78E-08	2.50E-09
-2.8432	-2.5384	-0.3049	-13.8582	42.96	2.79E-08	2.02E-09
-2.9345	-2.5847	-0.3498	-15.9014	44.15	2.84E-08	1.79E-09
-2.9954	-2.6465	-0.3489	-15.8595	44.69	2.85E-08	1.80E-09
-3.0410	-2.6619	-0.3791	-17.2322	45.21	2.85E-08	1.66E-09
-3.0715	-2.6928	-0.3786	-17.2112	45.54	2.85E-08	1.65E-09
-3.1171	-2.7391	-0.3780	-17.1798	45.87	2.84E-08	1.65E-09
-3.1627	-2.7855	-0.3773	-17.1484	46.11	2.83E-08	1.65E-09
-3.2236	-2.8473	-0.3763	-17.1065	46.29	2.81E-08	1.64E-09
-3.2845	-2.9090	-0.3754	-17.0645	46.48	2.79E-08	1.64E-09
-3.3758	-3.0017	-0.3740	-17.0017	46.72	2.78E-08	1.64E-09
-3.4670	-3.0944	-0.3727	-16.9388	46.96	2.77E-08	1.64E-09
-3.5735	-3.2025	-0.3710	-16.8654	47.20	2.76E-08	1.64E-09
-3.6800	-3.3106	-0.3694	-16.7921	47.49	2.75E-08	1.64E-09
-3.7865	-3.4187	-0.3678	-16.7188	47.85	2.75E-08	1.64E-09
-3.8778	-3.5114	-0.3664	-16.6559	48.21	2.74E-08	1.65E-09
-3.9843	-3.6195	-0.3648	-16.5825	48.57	2.74E-08	1.65E-09
-4.0756	-3.7122	-0.3634	-16.5197	48.93	2.73E-08	1.66E-09
-4.1821	-3.8203	-0.3618	-16.4463	49.29	2.73E-08	1.66E-09
-4.2734	-3.9130	-0.3604	-16.3834	49.65	2.73E-08	1.66E-09
-4.3495	-3.9902	-0.3593	-16.3311	50.01	2.72E-08	1.67E-09
-4.4103	-4.0520	-0.3584	-16.2891	50.37	2.72E-08	1.67E-09
-4.5016	-4.1446	-0.3570	-16.2263	50.73	2.72E-08	1.67E-09
-4.5929	-4.2373	-0.3556	-16.1634	51.09	2.71E-08	1.68E-09
-4.6994	-4.2836	-0.4158	-18.8982	51.45	2.71E-08	1.43E-09
-4.8211	-4.3454	-0.4757	-21.6226	51.81	2.71E-08	1.25E-09
-4.9428	-4.4535	-0.4893	-22.2408	52.17	2.70E-08	1.22E-09
-5.0646	-4.5617	-0.5029	-22.8590	52.53	2.70E-08	1.18E-09
-5.1863	-4.6852	-0.5011	-22.7752	52.90	2.70E-08	1.18E-09
-5.3080	-4.8088	-0.4992	-22.6914	53.72	2.72E-08	1.20E-09
-5.4297	-4.9323	-0.4974	-22.6075	54.05	2.71E-08	1.20E-09
-5.5514	-5.0559	-0.4955	-22.5237	54.38	2.71E-08	1.20E-09
-5.6731	-5.1795	-0.4937	-22.4399	54.71	2.70E-08	1.20E-09
-5.7948	-5.3030	-0.4918	-22.3561	54.93	2.69E-08	1.20E-09
-5.9166	-5.4266	-0.4900	-22.2722	55.22	2.69E-08	1.21E-09
-6.0535	-5.5656	-0.4879	-22.1779	55.53	2.68E-08	1.21E-09
-6.1904	-5.7046	-0.4858	-22.0836	55.84	2.68E-08	1.21E-09
-6.3426	-5.8590	-0.4835	-21.9788	56.16	2.67E-08	1.22E-09
-6.4795	-5.9980	-0.4815	-21.8845	56.47	2.67E-08	1.22E-09
-6.6164	-6.1370	-0.4794	-21.7902	56.76	2.66E-08	1.22E-09

-6.7381	-6.2606	-0.4775	-21.7064	57.04	2.65E-08	1.22E-09
-6.8751	-6.3996	-0.4755	-21.6121	57.32	2.65E-08	1.22E-09
-6.9968	-6.5232	-0.4736	-21.5283	57.59	2.64E-08	1.23E-09
-7.1337	-6.6622	-0.4715	-21.4340	57.87	2.63E-08	1.23E-09
-7.2402	-6.7703	-0.4699	-21.3606	58.12	2.63E-08	1.23E-09
-7.3619	-6.8938	-0.4681	-21.2768	58.38	2.62E-08	1.23E-09
-7.5141	-7.0020	-0.5121	-23.2782	58.73	2.62E-08	1.12E-09
-7.7119	-7.0946	-0.6172	-28.0562	59.03	2.61E-08	9.31E-10
-8.0009	-7.3881	-0.6129	-27.8572	59.39	2.61E-08	9.37E-10
-8.3052	-7.6970	-0.6082	-27.6476	59.89	2.61E-08	9.45E-10
-8.6095	-8.0059	-0.6036	-27.4380	60.40	2.62E-08	9.54E-10
-8.8986	-8.2993	-0.5993	-27.2389	60.96	2.62E-08	9.64E-10
-9.1877	-8.5928	-0.5949	-27.0398	61.36	2.62E-08	9.70E-10
-9.3094	-8.7164	-0.5930	-26.9560	61.66	2.62E-08	9.72E-10
-9.4920	-8.9017	-0.5903	-26.8303	61.99	2.62E-08	9.75E-10
-9.7202	-9.1334	-0.5868	-26.6731	62.35	2.61E-08	9.80E-10
-9.8875	-9.3033	-0.5843	-26.5578	62.67	2.61E-08	9.83E-10
-10.0853	-9.5040	-0.5813	-26.4216	62.96	2.61E-08	9.86E-10

Drying path - SANDY SILT

Time/ (hr)	Soil weight/(g)	Matric suction (top)/ (kPa)	Matric suction (middle)/ (kPa)	Weight of water/ (g)	Gravimetric water content/(%)	Volumetric water content/(%)
0	579.52	0.000	0.000	195.22	50.80	54.68
1	579.23	0.900	0.597	194.93	50.72	54.60
2	579.03	1.061	0.746	194.73	50.67	54.54
3	578.68	1.212	0.896	194.38	50.58	54.45
4	578.26	1.364	1.045	193.96	50.47	54.33
5	577.88	1.364	0.896	193.58	50.37	54.22
6	577.67	1.212	0.896	193.37	50.32	54.16
7	577.48	1.212	0.746	193.18	50.27	54.11
8	577.28	1.212	0.746	192.98	50.22	54.05
9	577.07	1.212	0.746	192.77	50.16	53.99
10	576.84	1.212	0.746	192.54	50.10	53.93
11	576.62	1.212	0.896	192.32	50.04	53.87
12	576.42	1.364	1.045	192.12	49.99	53.81
13	576.17	1.515	1.045	191.87	49.93	53.74
14	575.93	1.364	0.896	191.63	49.86	53.68
15	575.68	1.515	1.045	191.38	49.80	53.61
16	575.44	1.515	1.045	191.14	49.74	53.54
17	575.18	1.515	1.045	190.88	49.67	53.47
18	574.93	1.515	1.045	190.63	49.60	53.40
19	574.64	1.515	1.045	190.34	49.53	53.31
20	574.27	1.515	1.194	189.97	49.43	53.21
21	573.93	1.818	1.343	189.63	49.34	53.12
22	573.41	1.818	1.493	189.11	49.21	52.97
23	572.97	1.970	1.493	188.67	49.09	52.85
24	572.49	2.121	1.791	188.19	48.97	52.71
25	571.99	2.424	1.940	187.69	48.84	52.57
26	571.49	2.576	2.239	187.19	48.71	52.43
27	570.97	2.727	2.239	186.67	48.57	52.29
28	570.40	2.727	2.388	186.10	48.43	52.13
29	570.12	2.727	2.239	185.82	48.35	52.05
30	569.83	2.727	2.239	185.53	48.28	51.97
31	569.57	2.727	2.239	185.27	48.21	51.89
32	569.31	2.576	2.090	185.01	48.14	51.82
33	569.03	2.576	2.090	184.73	48.07	51.74
34	568.74	2.576	2.090	184.44	47.99	51.66
35	568.55	2.727	2.239	184.25	47.94	51.61
36	568.26	2.879	2.388	183.96	47.87	51.53
37	568.00	2.879	2.388	183.70	47.80	51.45
38	567.74	3.030	2.537	183.44	47.73	51.38
39	567.47	3.030	2.687	183.17	47.66	51.31
40	567.21	3.182	2.687	182.91	47.60	51.23
41	566.95	3.182	2.687	182.65	47.53	51.16
42	566.68	3.182	2.687	182.38	47.46	51.09

43	566.42	3.182	2.687	182.12	47.39	51.01
44	566.16	3.182	2.687	181.86	47.32	50.94
45	565.89	3.182	2.687	181.59	47.25	50.86
46	565.63	3.333	2.687	181.33	47.18	50.79
47	565.37	3.333	2.836	181.07	47.12	50.72
48	565.10	3.485	2.985	180.80	47.05	50.64
49	564.84	3.636	3.134	180.54	46.98	50.57
50	564.58	3.788	3.284	180.28	46.91	50.50
51	564.31	3.788	3.284	180.01	46.84	50.42
52	564.11	3.939	3.433	179.81	46.79	50.36
53	563.88	3.939	3.433	179.58	46.73	50.30
54	563.65	3.788	3.284	179.35	46.67	50.24
55	563.42	3.788	3.284	179.12	46.61	50.17
56	563.18	3.788	3.284	178.88	46.55	50.10
57	562.94	3.788	3.284	178.64	46.48	50.04
58	562.70	3.939	3.433	178.40	46.42	49.97
59	562.46	4.091	3.582	178.16	46.36	49.90
60	562.21	4.242	3.731	177.91	46.29	49.83
61	561.97	4.394	3.881	177.67	46.23	49.77
62	561.72	4.545	3.881	177.42	46.17	49.70
63	561.48	4.545	4.030	177.18	46.10	49.63
64	561.23	4.545	4.030	176.93	46.04	49.56
65	560.99	4.545	4.030	176.69	45.98	49.49
66	560.75	4.545	4.030	176.45	45.91	49.42
67	560.51	4.545	4.030	176.21	45.85	49.36
68	560.15	4.848	4.179	175.85	45.76	49.26
69	559.54	5.152	4.627	175.24	45.60	49.08
70	558.72	5.909	5.373	174.42	45.39	48.86
71	557.92	6.061	5.373	173.62	45.18	48.63
72	557.51	6.212	5.522	173.21	45.07	48.52
73	557.07	6.364	5.821	172.77	44.96	48.39
74	556.63	6.515	5.970	172.33	44.84	48.27
75	556.00	6.667	6.119	171.70	44.68	48.09
76	555.77	6.667	6.119	171.47	44.62	48.03
77	555.55	6.667	6.119	171.25	44.56	47.97
78	555.32	6.667	6.119	171.02	44.50	47.90
79	555.10	6.667	6.119	170.80	44.44	47.84
80	554.87	6.667	6.119	170.57	44.39	47.78
81	554.65	6.667	6.119	170.35	44.33	47.71
82	554.42	6.818	6.119	170.12	44.27	47.65
83	554.20	6.970	6.269	169.90	44.21	47.59
84	553.97	7.121	6.418	169.67	44.15	47.53
85	553.75	7.273	6.716	169.45	44.09	47.46
86	553.53	7.424	6.866	169.23	44.03	47.40
87	553.30	7.576	6.866	169.00	43.98	47.34
88	553.08	7.576	7.015	168.78	43.92	47.27
89	552.85	7.727	7.015	168.55	43.86	47.21
90	552.63	7.727	7.015	168.33	43.80	47.15

91	552.40	7.727	7.164	168.10	43.74	47.09
92	552.18	7.727	7.164	167.88	43.68	47.02
93	551.95	7.879	7.164	167.65	43.63	46.96
94	551.75	7.879	7.313	167.45	43.57	46.90
95	551.54	8.030	7.463	167.24	43.52	46.84
96	551.32	8.182	7.612	167.02	43.46	46.78
97	551.10	8.485	7.761	166.80	43.40	46.72
98	550.89	8.636	7.910	166.59	43.35	46.66
99	550.69	8.636	8.060	166.39	43.30	46.61
100	550.47	8.788	8.209	166.17	43.24	46.54
101	550.25	8.939	8.209	165.95	43.18	46.48
102	550.02	8.939	8.358	165.72	43.12	46.42
103	549.80	9.091	8.358	165.50	43.07	46.36
104	549.57	9.091	8.358	165.27	43.01	46.29
105	549.34	9.242	8.507	165.04	42.95	46.23
106	549.12	9.242	8.657	164.82	42.89	46.17
107	548.89	9.394	8.806	164.59	42.83	46.10
108	548.67	9.697	8.955	164.37	42.77	46.04
109	548.44	9.848	9.104	164.14	42.71	45.98
110	548.22	10.000	9.403	163.92	42.65	45.91
111	547.98	10.152	9.552	163.68	42.59	45.85
112	547.72	10.303	9.701	163.42	42.52	45.77
113	547.43	10.606	9.851	163.13	42.45	45.69
114	547.14	10.606	10.000	162.84	42.37	45.61
115	546.68	11.364	10.597	162.38	42.25	45.48
116	545.91	12.121	11.343	161.61	42.05	45.27
117	545.07	13.182	12.388	160.77	41.83	45.03
118	544.25	13.939	13.134	159.95	41.62	44.80
119	543.47	14.697	13.731	159.17	41.42	44.58
120	542.73	15.455	14.478	158.43	41.23	44.38
121	542.00	16.212	15.224	157.70	41.04	44.17
122	541.39	16.818	15.970	157.09	40.88	44.00
123	540.70	17.576	16.567	156.40	40.70	43.81
124	540.26	17.273	16.418	155.96	40.58	43.68
125	539.95	17.576	16.716	155.65	40.50	43.60
126	539.64	17.727	16.866	155.34	40.42	43.51
127	539.35	17.879	17.015	155.05	40.35	43.43
128	539.07	18.030	17.164	154.77	40.27	43.35
129	538.79	18.182	17.313	154.49	40.20	43.27
130	538.54	18.485	17.612	154.24	40.14	43.20
131	538.31	18.636	17.761	154.01	40.08	43.14
132	538.06	19.091	18.209	153.76	40.01	43.07
133	537.82	19.394	18.507	153.52	39.95	43.00
134	537.59	19.697	18.806	153.29	39.89	42.94
135	537.35	20.000	19.104	153.05	39.83	42.87
136	537.11	20.303	19.403	152.81	39.76	42.80
137	536.86	20.606	19.701	152.56	39.70	42.73
138	536.61	20.909	19.851	152.31	39.63	42.66

139	536.32	22.121	21.045	152.02	39.56	42.58
140	535.36	23.939	22.836	151.06	39.31	42.31
141	534.48	25.303	24.328	150.18	39.08	42.07
142	533.66	26.061	25.075	149.36	38.87	41.84
143	533.22	26.667	25.522	148.92	38.75	41.71
144	532.83	27.424	26.269	148.53	38.65	41.60
145	532.40	28.182	27.015	148.10	38.54	41.48
146	531.93	29.091	27.910	147.63	38.42	41.35
147	531.47	29.848	28.657	147.17	38.30	41.22
148	530.99	30.909	29.552	146.69	38.17	41.09
149	530.51	31.364	30.149	146.21	38.05	40.95
150	530.23	31.667	30.597	145.93	37.97	40.88
151	529.98	31.970	30.746	145.68	37.91	40.81
152	529.73	32.273	31.194	145.43	37.84	40.73
153	529.46	32.727	31.493	145.16	37.77	40.66
154	529.20	33.182	31.940	144.90	37.70	40.59
155	528.93	33.788	32.537	144.63	37.63	40.51
156	528.63	34.394	33.134	144.33	37.56	40.43
157	528.33	35.152	33.881	144.03	37.48	40.34
158	528.04	35.758	34.478	143.74	37.40	40.26
159	527.75	36.212	35.075	143.45	37.33	40.18
160	527.46	36.818	35.672	143.16	37.25	40.10
161	527.17	37.424	36.269	142.87	37.18	40.02
162	526.88	38.030	36.866	142.58	37.10	39.94
163	526.59	38.788	37.612	142.29	37.03	39.86
164	526.06	41.061	39.403	141.76	36.89	39.71
165	525.25	42.879	41.343	140.95	36.68	39.48
166	524.63	44.394	42.836	140.33	36.52	39.31
167	524.12	45.909	44.328	139.82	36.38	39.16
168	523.65	47.273	45.672	139.35	36.26	39.03
169	523.19	48.485	46.866	138.89	36.14	38.90
170	522.70	49.697	48.209	138.40	36.01	38.77
171	522.28	51.061	49.552	137.98	35.90	38.65
172	521.83	52.121	50.597	137.53	35.79	38.52
173	521.38	53.485	51.940	137.08	35.67	38.40
174	520.91	54.697	53.134	136.61	35.55	38.26
175	520.60	55.152	53.731	136.30	35.47	38.18
176	520.39	55.606	54.179	136.09	35.41	38.12
177	520.16	56.212	54.776	135.86	35.35	38.05
178	519.92	56.818	55.373	135.62	35.29	37.99
179	519.66	57.727	56.269	135.36	35.22	37.91
180	519.41	58.485	57.015	135.11	35.16	37.84
181	519.15	59.394	57.910	134.85	35.09	37.77
182	518.90	60.152	58.806	134.60	35.02	37.70
183	518.65	61.061	59.552	134.35	34.96	37.63
184	518.41	61.818	60.299	134.11	34.90	37.56
185	518.17	62.576	61.045	133.87	34.83	37.50
186	517.92	63.333	61.791	133.62	34.77	37.43

187	517.66	64.394	62.836	133.36	34.70	37.35
188	517.29	65.758	64.030	132.99	34.61	37.25
189	516.90	66.970	65.373	132.60	34.50	37.14
190	516.55	68.333	66.866	132.25	34.41	37.04
191	516.14	70.152	68.507	131.84	34.31	36.93
192	515.68	72.121	70.448	131.38	34.19	36.80
193	515.15	74.242	72.537	130.85	34.05	36.65
194	514.66	76.364	74.627	130.36	33.92	36.51
195	514.17	78.333	76.567	129.87	33.79	36.38
196	513.68	80.455	78.657	129.38	33.67	36.24
197	513.16	82.576	80.746	128.86	33.53	36.09
198	512.63	84.545	82.687	128.33	33.39	35.95
199	512.21	86.061	84.179	127.91	33.28	35.83
200	511.91	87.121	85.224	127.61	33.21	35.74
201	511.59	88.182	86.269	127.29	33.12	35.65
202	511.28	89.394	87.463	126.98	33.04	35.57
203	510.96	90.455	88.507	126.66	32.96	35.48
204	510.73	91.515	89.552	126.43	32.90	35.41
205	510.48	92.576	90.597	126.18	32.83	35.34
206	510.23	93.485	91.493	125.93	32.77	35.27
207	509.96	94.545	92.537	125.66	32.70	35.20
208	509.68	95.606	93.582	125.38	32.63	35.12
209	509.42	96.667	94.627	125.12	32.56	35.05
210	509.15	97.727	95.672	124.85	32.49	34.97
211	508.89	98.636	96.567	124.59	32.42	34.90

Drying path - SANDY SILT contd….

Total head, $(z\text{-}s/\gamma_w)_{Top}$ /(m)	**Total head, $(z\text{-}s/\gamma_w)_{Middle}$ /(m)**	**Head difference, $(z\text{-}s/\gamma_w)$/(m)**	**Hydraulic gradient, i**	**Volume change/ (ml)**	**Velocity/ (m/s)**	**Hydraulic conductivity/ (m/s)**
0.0475	0.0255	0.0220	1.0000	0.00	-	-
-0.0442	-0.0354	-0.0089	-0.4039	0.29	1.85E-08	4.58E-08
-0.0606	-0.0506	-0.0100	-0.4565	0.49	1.56E-08	3.42E-08
-0.0761	-0.0658	-0.0103	-0.4670	0.84	1.78E-08	3.82E-08
-0.0915	-0.0810	-0.0105	-0.4774	1.26	2.01E-08	4.20E-08
-0.0915	-0.0658	-0.0257	-1.1690	1.64	2.09E-08	1.79E-08
-0.0761	-0.0658	-0.0103	-0.4670	1.85	1.96E-08	4.21E-08
-0.0761	-0.0506	-0.0255	-1.1585	2.04	1.86E-08	1.60E-08
-0.0761	-0.0506	-0.0255	-1.1585	2.24	1.78E-08	1.54E-08
-0.0761	-0.0506	-0.0255	-1.1585	2.45	1.73E-08	1.50E-08
-0.0761	-0.0506	-0.0255	-1.1585	2.68	1.71E-08	1.47E-08
-0.0761	-0.0658	-0.0103	-0.4670	2.90	1.68E-08	3.60E-08
-0.0915	-0.0810	-0.0105	-0.4774	3.10	1.65E-08	3.45E-08
-0.1069	-0.0810	-0.0259	-1.1795	3.35	1.64E-08	1.39E-08
-0.0915	-0.0658	-0.0257	-1.1690	3.59	1.63E-08	1.40E-08
-0.1069	-0.0810	-0.0259	-1.1795	3.84	1.63E-08	1.38E-08
-0.1069	-0.0810	-0.0259	-1.1795	4.08	1.62E-08	1.38E-08
-0.1069	-0.0810	-0.0259	-1.1795	4.34	1.63E-08	1.38E-08
-0.1069	-0.0810	-0.0259	-1.1795	4.59	1.62E-08	1.38E-08
-0.1069	-0.0810	-0.0259	-1.1795	4.88	1.64E-08	1.39E-08
-0.1069	-0.0962	-0.0107	-0.4879	5.25	1.67E-08	3.43E-08
-0.1378	-0.1114	-0.0264	-1.2004	5.59	1.70E-08	1.41E-08
-0.1378	-0.1266	-0.0112	-0.5089	6.11	1.77E-08	3.48E-08
-0.1533	-0.1266	-0.0266	-1.2109	6.55	1.81E-08	1.50E-08
-0.1687	-0.1571	-0.0117	-0.5298	7.03	1.87E-08	3.52E-08
-0.1996	-0.1723	-0.0273	-1.2423	7.53	1.92E-08	1.54E-08
-0.2151	-0.2027	-0.0123	-0.5613	8.03	1.97E-08	3.51E-08
-0.2305	-0.2027	-0.0278	-1.2633	8.55	2.02E-08	1.60E-08
-0.2305	-0.2179	-0.0126	-0.5717	9.12	2.08E-08	3.63E-08
-0.2305	-0.2027	-0.0278	-1.2633	9.40	2.07E-08	1.64E-08
-0.2305	-0.2027	-0.0278	-1.2633	9.69	2.06E-08	1.63E-08
-0.2305	-0.2027	-0.0278	-1.2633	9.95	2.05E-08	1.62E-08
-0.2151	-0.1875	-0.0276	-1.2528	10.21	2.03E-08	1.62E-08
-0.2151	-0.1875	-0.0276	-1.2528	10.49	2.03E-08	1.62E-08
-0.2151	-0.1875	-0.0276	-1.2528	10.78	2.02E-08	1.61E-08
-0.2305	-0.2027	-0.0278	-1.2633	10.97	2.00E-08	1.58E-08
-0.2460	-0.2179	-0.0280	-1.2738	11.26	1.99E-08	1.56E-08
-0.2460	-0.2179	-0.0280	-1.2738	11.52	1.98E-08	1.56E-08
-0.2614	-0.2331	-0.0283	-1.2843	11.78	1.98E-08	1.54E-08
-0.2614	-0.2484	-0.0130	-0.5927	12.05	1.97E-08	3.32E-08
-0.2768	-0.2484	-0.0285	-1.2947	12.31	1.96E-08	1.51E-08
-0.2768	-0.2484	-0.0285	-1.2947	12.57	1.95E-08	1.51E-08
-0.2768	-0.2484	-0.0285	-1.2947	12.84	1.95E-08	1.50E-08

-0.2768	-0.2484	-0.0285	-1.2947	13.10	1.94E-08	1.50E-08
-0.2768	-0.2484	-0.0285	-1.2947	13.36	1.94E-08	1.49E-08
-0.2768	-0.2484	-0.0285	-1.2947	13.63	1.93E-08	1.49E-08
-0.2923	-0.2484	-0.0439	-1.9968	13.89	1.92E-08	9.64E-09
-0.2923	-0.2636	-0.0287	-1.3052	14.15	1.92E-08	1.47E-08
-0.3077	-0.2788	-0.0289	-1.3157	14.42	1.91E-08	1.45E-08
-0.3232	-0.2940	-0.0292	-1.3262	14.68	1.91E-08	1.44E-08
-0.3386	-0.3092	-0.0294	-1.3367	14.94	1.90E-08	1.42E-08
-0.3386	-0.3092	-0.0294	-1.3367	15.21	1.90E-08	1.42E-08
-0.3541	-0.3244	-0.0296	-1.3471	15.41	1.89E-08	1.40E-08
-0.3541	-0.3244	-0.0296	-1.3471	15.64	1.88E-08	1.40E-08
-0.3386	-0.3092	-0.0294	-1.3367	15.87	1.87E-08	1.40E-08
-0.3386	-0.3092	-0.0294	-1.3367	16.10	1.87E-08	1.40E-08
-0.3386	-0.3092	-0.0294	-1.3367	16.34	1.86E-08	1.39E-08
-0.3386	-0.3092	-0.0294	-1.3367	16.58	1.85E-08	1.39E-08
-0.3541	-0.3244	-0.0296	-1.3471	16.82	1.85E-08	1.37E-08
-0.3695	-0.3396	-0.0299	-1.3576	17.06	1.84E-08	1.36E-08
-0.3850	-0.3549	-0.0301	-1.3681	17.31	1.84E-08	1.34E-08
-0.4004	-0.3701	-0.0303	-1.3786	17.55	1.83E-08	1.33E-08
-0.4158	-0.3701	-0.0458	-2.0806	17.80	1.83E-08	8.79E-09
-0.4158	-0.3853	-0.0306	-1.3890	18.04	1.82E-08	1.31E-08
-0.4158	-0.3853	-0.0306	-1.3890	18.29	1.82E-08	1.31E-08
-0.4158	-0.3853	-0.0306	-1.3890	18.53	1.82E-08	1.31E-08
-0.4158	-0.3853	-0.0306	-1.3890	18.77	1.81E-08	1.30E-08
-0.4158	-0.3853	-0.0306	-1.3890	19.01	1.81E-08	1.30E-08
-0.4467	-0.4005	-0.0462	-2.1016	19.37	1.82E-08	8.64E-09
-0.4776	-0.4461	-0.0315	-1.4310	19.98	1.85E-08	1.29E-08
-0.5549	-0.5222	-0.0326	-1.4833	20.80	1.89E-08	1.28E-08
-0.5703	-0.5222	-0.0481	-2.1854	21.60	1.94E-08	8.87E-09
-0.5857	-0.5374	-0.0483	-2.1959	22.01	1.95E-08	8.87E-09
-0.6012	-0.5679	-0.0333	-1.5148	22.45	1.96E-08	1.29E-08
-0.6166	-0.5831	-0.0336	-1.5253	22.89	1.97E-08	1.29E-08
-0.6321	-0.5983	-0.0338	-1.5357	23.52	2.00E-08	1.30E-08
-0.6321	-0.5983	-0.0338	-1.5357	23.75	1.99E-08	1.30E-08
-0.6321	-0.5983	-0.0338	-1.5357	23.97	1.98E-08	1.29E-08
-0.6321	-0.5983	-0.0338	-1.5357	24.20	1.98E-08	1.29E-08
-0.6321	-0.5983	-0.0338	-1.5357	24.42	1.97E-08	1.28E-08
-0.6321	-0.5983	-0.0338	-1.5357	24.65	1.96E-08	1.28E-08
-0.6321	-0.5983	-0.0338	-1.5357	24.87	1.96E-08	1.27E-08
-0.6475	-0.5983	-0.0492	-2.2378	25.10	1.95E-08	8.71E-09
-0.6630	-0.6135	-0.0495	-2.2483	25.32	1.94E-08	8.65E-09
-0.6784	-0.6287	-0.0497	-2.2587	25.55	1.94E-08	8.58E-09
-0.6939	-0.6592	-0.0347	-1.5777	25.77	1.93E-08	1.22E-08
-0.7093	-0.6744	-0.0349	-1.5881	25.99	1.93E-08	1.21E-08
-0.7247	-0.6744	-0.0504	-2.2902	26.22	1.92E-08	8.39E-09
-0.7247	-0.6896	-0.0352	-1.5986	26.44	1.91E-08	1.20E-08
-0.7402	-0.6896	-0.0506	-2.3007	26.67	1.91E-08	8.30E-09
-0.7402	-0.6896	-0.0506	-2.3007	26.89	1.90E-08	8.28E-09

-0.7402	-0.7048	-0.0354	-1.6091	27.12	1.90E-08	1.18E-08
-0.7402	-0.7048	-0.0354	-1.6091	27.34	1.89E-08	1.18E-08
-0.7556	-0.7048	-0.0508	-2.3111	27.57	1.89E-08	8.17E-09
-0.7556	-0.7200	-0.0356	-1.6196	27.77	1.88E-08	1.16E-08
-0.7711	-0.7352	-0.0359	-1.6300	27.98	1.88E-08	1.15E-08
-0.7865	-0.7504	-0.0361	-1.6405	28.20	1.87E-08	1.14E-08
-0.8174	-0.7657	-0.0518	-2.3530	28.42	1.87E-08	7.93E-09
-0.8329	-0.7809	-0.0520	-2.3635	28.63	1.86E-08	7.88E-09
-0.8329	-0.7961	-0.0368	-1.6720	28.83	1.86E-08	1.11E-08
-0.8483	-0.8113	-0.0370	-1.6824	29.05	1.85E-08	1.10E-08
-0.8638	-0.8113	-0.0525	-2.3845	29.27	1.85E-08	7.74E-09
-0.8638	-0.8265	-0.0372	-1.6929	29.50	1.84E-08	1.09E-08
-0.8792	-0.8265	-0.0527	-2.3950	29.72	1.84E-08	7.68E-09
-0.8792	-0.8265	-0.0527	-2.3950	29.95	1.84E-08	7.66E-09
-0.8946	-0.8417	-0.0529	-2.4054	30.18	1.83E-08	7.61E-09
-0.8946	-0.8569	-0.0377	-1.7139	30.40	1.83E-08	1.07E-08
-0.9101	-0.8722	-0.0379	-1.7244	30.63	1.82E-08	1.06E-08
-0.9410	-0.8874	-0.0536	-2.4369	30.85	1.82E-08	7.47E-09
-0.9564	-0.9026	-0.0538	-2.4474	31.08	1.82E-08	7.42E-09
-0.9719	-0.9330	-0.0389	-1.7663	31.30	1.81E-08	1.03E-08
-0.9873	-0.9482	-0.0391	-1.7767	31.54	1.81E-08	1.02E-08
-1.0028	-0.9634	-0.0393	-1.7872	31.80	1.81E-08	1.01E-08
-1.0336	-0.9787	-0.0550	-2.4997	32.09	1.81E-08	7.24E-09
-1.0336	-0.9939	-0.0398	-1.8082	32.38	1.81E-08	1.00E-08
-1.1109	-1.0547	-0.0561	-2.5521	32.84	1.82E-08	7.13E-09
-1.1881	-1.1308	-0.0573	-2.6045	33.61	1.85E-08	7.09E-09
-1.2962	-1.2373	-0.0589	-2.6779	34.45	1.88E-08	7.01E-09
-1.3734	-1.3134	-0.0601	-2.7303	35.27	1.90E-08	6.98E-09
-1.4507	-1.3742	-0.0764	-3.4742	36.05	1.93E-08	5.56E-09
-1.5279	-1.4503	-0.0776	-3.5266	36.79	1.95E-08	5.54E-09
-1.6051	-1.5264	-0.0787	-3.5790	37.52	1.98E-08	5.52E-09
-1.6669	-1.6024	-0.0644	-2.9294	38.13	1.99E-08	6.80E-09
-1.7441	-1.6633	-0.0808	-3.6733	38.82	2.01E-08	5.48E-09
-1.7132	-1.6481	-0.0651	-2.9608	39.26	2.02E-08	6.81E-09
-1.7441	-1.6785	-0.0656	-2.9817	39.57	2.02E-08	6.77E-09
-1.7596	-1.6937	-0.0658	-2.9922	39.88	2.02E-08	6.74E-09
-1.7750	-1.7089	-0.0661	-3.0027	40.17	2.02E-08	6.71E-09
-1.7905	-1.7242	-0.0663	-3.0132	40.45	2.01E-08	6.68E-09
-1.8059	-1.7394	-0.0665	-3.0237	40.73	2.01E-08	6.65E-09
-1.8368	-1.7698	-0.0670	-3.0446	40.98	2.01E-08	6.60E-09
-1.8522	-1.7850	-0.0672	-3.0551	41.21	2.00E-08	6.56E-09
-1.8986	-1.8307	-0.0679	-3.0865	41.46	2.00E-08	6.48E-09
-1.9295	-1.8611	-0.0684	-3.1075	41.70	2.00E-08	6.43E-09
-1.9603	-1.8915	-0.0688	-3.1284	41.93	1.99E-08	6.37E-09
-1.9912	-1.9219	-0.0693	-3.1494	42.17	1.99E-08	6.32E-09
-2.0221	-1.9524	-0.0697	-3.1704	42.41	1.99E-08	6.27E-09
-2.0530	-1.9828	-0.0702	-3.1913	42.66	1.98E-08	6.22E-09
-2.0839	-1.9980	-0.0859	-3.9038	42.91	1.98E-08	5.08E-09

-2.2075	-2.1197	-0.0877	-3.9877	43.20	1.98E-08	4.97E-09
-2.3928	-2.3023	-0.0905	-4.1134	44.16	2.01E-08	4.89E-09
-2.5318	-2.4545	-0.0774	-3.5161	45.04	2.04E-08	5.79E-09
-2.6090	-2.5305	-0.0785	-3.5685	45.86	2.06E-08	5.77E-09
-2.6708	-2.5762	-0.0946	-4.3020	46.30	2.06E-08	4.80E-09
-2.7480	-2.6522	-0.0958	-4.3544	46.69	2.07E-08	4.74E-09
-2.8253	-2.7283	-0.0969	-4.4068	47.12	2.07E-08	4.70E-09
-2.9179	-2.8196	-0.0983	-4.4697	47.59	2.08E-08	4.65E-09
-2.9952	-2.8957	-0.0995	-4.5220	48.05	2.08E-08	4.61E-09
-3.1033	-2.9870	-0.1163	-5.2870	48.53	2.09E-08	3.95E-09
-3.1496	-3.0478	-0.1018	-4.6268	49.01	2.10E-08	4.53E-09
-3.1805	-3.0935	-0.0870	-3.9562	49.29	2.09E-08	5.29E-09
-3.2114	-3.1087	-0.1027	-4.6687	49.54	2.09E-08	4.48E-09
-3.2423	-3.1543	-0.0880	-3.9981	49.79	2.09E-08	5.22E-09
-3.2886	-3.1847	-0.1039	-4.7211	50.06	2.08E-08	4.42E-09
-3.3349	-3.2304	-0.1046	-4.7526	50.32	2.08E-08	4.38E-09
-3.3967	-3.2912	-0.1055	-4.7945	50.59	2.08E-08	4.34E-09
-3.4585	-3.3521	-0.1064	-4.8364	50.89	2.08E-08	4.30E-09
-3.5357	-3.4282	-0.1076	-4.8888	51.19	2.08E-08	4.25E-09
-3.5975	-3.4890	-0.1085	-4.9307	51.48	2.08E-08	4.21E-09
-3.6438	-3.5499	-0.0940	-4.2706	51.77	2.07E-08	4.86E-09
-3.7056	-3.6108	-0.0949	-4.3125	52.06	2.07E-08	4.81E-09
-3.7674	-3.6716	-0.0958	-4.3544	52.35	2.07E-08	4.76E-09
-3.8292	-3.7325	-0.0967	-4.3963	52.64	2.07E-08	4.71E-09
-3.9064	-3.8085	-0.0979	-4.4487	52.93	2.07E-08	4.65E-09
-4.1381	-3.9911	-0.1470	-6.6806	53.46	2.08E-08	3.11E-09
-4.3234	-4.1889	-0.1345	-6.1147	54.27	2.10E-08	3.43E-09
-4.4779	-4.3410	-0.1368	-6.2195	54.89	2.11E-08	3.39E-09
-4.6323	-4.4932	-0.1391	-6.3243	55.40	2.11E-08	3.34E-09
-4.7713	-4.6301	-0.1412	-6.4186	55.87	2.12E-08	3.30E-09
-4.8949	-4.7518	-0.1431	-6.5024	56.33	2.12E-08	3.27E-09
-5.0185	-4.8888	-0.1297	-5.8947	56.82	2.13E-08	3.61E-09
-5.1575	-5.0257	-0.1318	-5.9890	57.24	2.13E-08	3.56E-09
-5.2656	-5.1322	-0.1334	-6.0624	57.69	2.14E-08	3.53E-09
-5.4046	-5.2691	-0.1354	-6.1567	58.14	2.14E-08	3.48E-09
-5.5281	-5.3908	-0.1373	-6.2405	58.61	2.15E-08	3.44E-09
-5.5745	-5.4517	-0.1228	-5.5804	58.92	2.15E-08	3.84E-09
-5.6208	-5.4973	-0.1235	-5.6118	59.13	2.14E-08	3.81E-09
-5.6826	-5.5582	-0.1244	-5.6537	59.36	2.14E-08	3.78E-09
-5.7444	-5.6191	-0.1253	-5.6956	59.60	2.13E-08	3.75E-09
-5.8370	-5.7103	-0.1267	-5.7585	59.86	2.13E-08	3.70E-09
-5.9143	-5.7864	-0.1278	-5.8109	60.11	2.13E-08	3.66E-09
-6.0069	-5.8777	-0.1292	-5.8737	60.37	2.13E-08	3.62E-09
-6.0842	-5.9690	-0.1152	-5.2346	60.62	2.12E-08	4.05E-09
-6.1768	-6.0451	-0.1318	-5.9890	60.87	2.12E-08	3.54E-09
-6.2540	-6.1211	-0.1329	-6.0414	61.11	2.12E-08	3.50E-09
-6.3313	-6.1972	-0.1341	-6.0938	61.35	2.11E-08	3.47E-09
-6.4085	-6.2733	-0.1352	-6.1462	61.60	2.11E-08	3.43E-09

-6.5166	-6.3798	-0.1368	-6.2195	61.86	2.11E-08	3.39E-09
-6.6556	-6.5015	-0.1541	-7.0054	62.23	2.11E-08	3.01E-09
-6.7792	-6.6384	-0.1407	-6.3977	62.62	2.11E-08	3.30E-09
-6.9182	-6.7906	-0.1276	-5.8004	62.97	2.11E-08	3.64E-09
-7.1035	-6.9579	-0.1456	-6.6177	63.38	2.11E-08	3.20E-09
-7.3043	-7.1557	-0.1486	-6.7539	63.84	2.12E-08	3.14E-09
-7.5205	-7.3687	-0.1518	-6.9006	64.37	2.13E-08	3.08E-09
-7.7368	-7.5817	-0.1550	-7.0473	64.86	2.13E-08	3.02E-09
-7.9375	-7.7795	-0.1580	-7.1835	65.35	2.14E-08	2.97E-09
-8.1538	-7.9925	-0.1613	-7.3302	65.84	2.14E-08	2.92E-09
-8.3700	-8.2055	-0.1645	-7.4769	66.36	2.15E-08	2.87E-09
-8.5708	-8.4033	-0.1675	-7.6131	66.89	2.15E-08	2.83E-09
-8.7252	-8.5554	-0.1698	-7.7179	67.31	2.16E-08	2.79E-09
-8.8334	-8.6619	-0.1714	-7.7913	67.61	2.15E-08	2.76E-09
-8.9415	-8.7685	-0.1730	-7.8646	67.93	2.15E-08	2.74E-09
-9.0650	-8.8902	-0.1749	-7.9484	68.24	2.15E-08	2.71E-09
-9.1731	-8.9967	-0.1765	-8.0218	68.56	2.15E-08	2.68E-09
-9.2813	-9.1032	-0.1781	-8.0951	68.79	2.15E-08	2.65E-09
-9.3894	-9.2097	-0.1797	-8.1685	69.04	2.15E-08	2.63E-09
-9.4820	-9.3010	-0.1811	-8.2314	69.29	2.14E-08	2.60E-09
-9.5902	-9.4075	-0.1827	-8.3047	69.56	2.14E-08	2.58E-09
-9.6983	-9.5140	-0.1843	-8.3781	69.84	2.14E-08	2.55E-09
-9.8064	-9.6205	-0.1859	-8.4514	70.10	2.14E-08	2.53E-09
-9.9145	-9.7270	-0.1875	-8.5247	70.37	2.14E-08	2.50E-09
-10.0072	-9.8182	-0.1889	-8.5876	70.63	2.13E-08	2.48E-09

Wetting path - SILTY SAND

Time/ (hr)	Soil weight/(g)	Matric suction (top)/ (kPa)	Matric suction (middle)/ (kPa)	Weight of water/ (g)	Gravimetric water content/(%)	Volumetric water content/(%)
0.000	564.68	99.552	92.537	87.68	18.38	24.56
0.004	564.87	99.552	92.537	87.87	18.42	24.61
0.008	565.06	99.552	92.537	88.06	18.46	24.67
0.013	565.25	99.552	92.537	88.25	18.50	24.72
0.017	565.45	99.552	92.537	88.45	18.54	24.77
0.021	565.64	99.552	92.537	88.64	18.58	24.83
0.025	565.83	99.552	92.537	88.83	18.62	24.88
0.029	566.02	99.403	92.537	89.02	18.66	24.94
0.033	566.22	99.403	92.537	89.22	18.70	24.99
0.038	566.41	99.403	92.537	89.41	18.74	25.04
0.042	566.60	99.403	92.537	89.60	18.78	25.10
0.046	566.79	99.403	92.537	89.79	18.82	25.15
0.050	566.99	99.254	92.537	89.99	18.87	25.21
0.054	567.18	99.254	92.388	90.18	18.91	25.26
0.058	567.37	99.254	92.388	90.37	18.95	25.31
0.063	567.56	99.254	92.388	90.56	18.99	25.37
0.067	567.76	99.254	92.388	90.76	19.03	25.42
0.071	567.95	99.254	92.388	90.95	19.07	25.47
0.075	568.14	99.104	92.388	91.14	19.11	25.53
0.079	568.33	99.104	92.388	91.33	19.15	25.58
0.083	568.53	99.104	92.388	91.53	19.19	25.64
0.088	568.72	99.104	92.388	91.72	19.23	25.69
0.092	568.91	99.104	92.388	91.91	19.27	25.74
0.096	569.10	98.955	92.239	92.10	19.31	25.80
0.100	569.29	98.955	92.239	92.29	19.35	25.85
0.104	569.49	98.955	92.239	92.49	19.39	25.91
0.108	569.68	98.955	92.239	92.68	19.43	25.96
0.113	569.87	98.806	92.239	92.87	19.47	26.01
0.117	570.06	98.806	92.239	93.06	19.51	26.07
0.121	570.26	98.806	92.239	93.26	19.55	26.12
0.125	570.45	98.806	92.090	93.45	19.59	26.18
0.129	570.64	98.657	92.090	93.64	19.63	26.23
0.133	570.83	98.657	92.090	93.83	19.67	26.28
0.138	571.03	98.657	92.090	94.03	19.71	26.34
0.142	571.22	98.657	92.090	94.22	19.75	26.39
0.146	571.41	98.507	91.940	94.41	19.79	26.44
0.150	571.60	98.507	91.940	94.60	19.83	26.50
0.154	571.80	98.507	91.940	94.80	19.87	26.55
0.158	571.99	98.358	91.940	94.99	19.91	26.61
0.163	572.18	98.358	91.940	95.18	19.95	26.66
0.167	572.37	98.358	91.791	95.37	19.99	26.71
0.171	572.57	98.209	91.791	95.57	20.03	26.77
0.175	572.76	98.209	91.791	95.76	20.07	26.82
0.179	572.95	98.060	91.791	95.95	20.12	26.88

0.183	573.14	98.060	91.791	96.14	20.16	26.93
0.188	573.33	97.910	91.642	96.33	20.20	26.98
0.192	573.53	97.910	91.642	96.53	20.24	27.04
0.196	573.72	97.761	91.642	96.72	20.28	27.09
0.200	573.91	97.761	91.642	96.91	20.32	27.15
0.204	574.10	97.612	91.642	97.10	20.36	27.20
0.208	574.30	97.612	91.493	97.30	20.40	27.25
0.213	574.49	97.463	91.493	97.49	20.44	27.31
0.217	574.68	97.463	91.493	97.68	20.48	27.36
0.221	574.87	97.313	91.493	97.87	20.52	27.41
0.225	575.07	97.313	91.493	98.07	20.56	27.47
0.229	575.26	97.164	91.493	98.26	20.60	27.52
0.233	575.45	97.164	91.343	98.45	20.64	27.58
0.238	575.64	97.015	91.343	98.64	20.68	27.63
0.242	575.84	97.015	91.343	98.84	20.72	27.68
0.246	576.03	96.866	91.343	99.03	20.76	27.74
0.250	576.22	96.866	91.343	99.22	20.80	27.79
0.254	576.41	96.716	91.194	99.41	20.84	27.85
0.258	576.61	96.716	91.194	99.61	20.88	27.90
0.263	576.80	96.567	91.194	99.80	20.92	27.95
0.267	576.99	96.567	91.194	99.99	20.96	28.01
0.271	577.18	96.418	91.194	100.18	21.00	28.06
0.275	577.38	96.119	91.194	100.38	21.04	28.12
0.279	577.57	95.821	91.045	100.57	21.08	28.17
0.283	577.76	95.522	91.045	100.76	21.12	28.22
0.288	577.95	95.224	91.045	100.95	21.16	28.28
0.292	578.14	94.925	91.045	101.14	21.20	28.33
0.296	578.34	94.627	91.045	101.34	21.24	28.38
0.300	578.53	94.328	90.896	101.53	21.28	28.44
0.304	578.72	94.030	90.896	101.72	21.33	28.49
0.308	578.91	93.731	90.896	101.91	21.37	28.55
0.313	579.11	93.433	90.896	102.11	21.41	28.60
0.317	579.30	93.134	90.746	102.30	21.45	28.65
0.321	579.49	92.836	90.746	102.49	21.49	28.71
0.325	579.68	92.537	90.746	102.68	21.53	28.76
0.329	579.88	92.239	90.597	102.88	21.57	28.82
0.333	580.07	91.940	90.597	103.07	21.61	28.87
0.338	580.26	91.642	90.597	103.26	21.65	28.92
0.342	580.45	91.343	90.448	103.45	21.69	28.98
0.346	580.65	91.045	90.448	103.65	21.73	29.03
0.350	580.84	90.746	90.448	103.84	21.77	29.09
0.354	581.03	90.448	90.299	104.03	21.81	29.14
0.358	581.22	90.149	90.299	104.22	21.85	29.19
0.363	581.42	89.851	90.299	104.42	21.89	29.25
0.367	581.61	89.552	90.149	104.61	21.93	29.30
0.371	581.80	89.254	90.149	104.80	21.97	29.35
0.375	581.99	88.955	90.149	104.99	22.01	29.41
0.379	582.18	88.657	90.000	105.18	22.05	29.46
0.383	582.38	88.358	90.000	105.38	22.09	29.52

0.388	582.57	88.060	89.851	105.57	22.13	29.57
0.392	582.76	87.761	89.851	105.76	22.17	29.62
0.396	582.95	87.463	89.701	105.95	22.21	29.68
0.400	583.15	87.164	89.552	106.15	22.25	29.73
0.404	583.34	86.866	89.552	106.34	22.29	29.79
0.408	583.53	86.567	89.254	106.53	22.33	29.84
0.413	583.72	86.269	88.955	106.72	22.37	29.89
0.417	583.92	85.970	88.657	106.92	22.41	29.95
0.421	584.11	85.672	88.358	107.11	22.45	30.00
0.425	584.30	85.373	88.060	107.30	22.49	30.06
0.429	584.49	84.925	87.761	107.49	22.54	30.11
0.433	584.69	84.627	87.463	107.69	22.58	30.16
0.438	584.88	84.179	87.164	107.88	22.62	30.22
0.442	585.07	83.731	86.866	108.07	22.66	30.27
0.446	585.26	83.284	86.567	108.26	22.70	30.32
0.450	585.46	82.687	86.269	108.46	22.74	30.38
0.454	585.65	82.239	85.970	108.65	22.78	30.43
0.458	585.84	81.791	85.522	108.84	22.82	30.49
0.463	586.03	81.343	85.224	109.03	22.86	30.54
0.467	586.22	80.746	84.776	109.22	22.90	30.59
0.471	586.42	80.149	84.328	109.42	22.94	30.65
0.475	586.61	79.701	83.881	109.61	22.98	30.70
0.479	586.80	79.104	83.284	109.80	23.02	30.76
0.483	586.99	78.507	82.836	109.99	23.06	30.81
0.488	587.19	77.910	82.388	110.19	23.10	30.86
0.492	587.38	77.463	81.940	110.38	23.14	30.92
0.496	587.57	76.866	81.343	110.57	23.18	30.97
0.500	587.76	76.269	80.746	110.76	23.22	31.03
0.504	587.96	75.672	80.299	110.96	23.26	31.08
0.508	588.15	75.075	79.701	111.15	23.30	31.13
0.513	588.34	74.328	79.104	111.34	23.34	31.19
0.517	588.53	73.731	78.507	111.53	23.38	31.24
0.521	588.73	72.985	78.060	111.73	23.42	31.29
0.525	588.92	72.388	77.463	111.92	23.46	31.35
0.529	589.11	71.642	76.866	112.11	23.50	31.40
0.533	589.30	70.896	76.269	112.30	23.54	31.46
0.538	589.50	70.149	75.672	112.50	23.58	31.51
0.542	589.69	69.254	74.925	112.69	23.62	31.56
0.546	589.88	68.507	74.328	112.88	23.66	31.62
0.550	590.07	67.612	73.582	113.07	23.70	31.67
0.554	590.26	66.716	72.985	113.26	23.75	31.73
0.558	590.46	66.567	72.239	113.46	23.79	31.78
0.563	590.65	66.418	71.493	113.65	23.83	31.83
0.567	590.84	66.269	70.746	113.84	23.87	31.89
0.571	591.03	65.075	69.851	114.03	23.91	31.94
0.575	591.23	63.433	69.104	114.23	23.95	31.99
0.579	591.42	61.791	68.209	114.42	23.99	32.05
0.583	591.61	60.149	67.313	114.61	24.03	32.10
0.588	591.80	58.657	66.418	114.80	24.07	32.16

0.592	592.00	57.612	65.522	115.00	24.11	32.21
0.596	592.19	56.418	64.478	115.19	24.15	32.26
0.600	592.38	55.075	63.582	115.38	24.19	32.32
0.604	592.57	53.881	62.537	115.57	24.23	32.37
0.608	592.77	52.537	61.493	115.77	24.27	32.43
0.613	592.96	51.343	60.448	115.96	24.31	32.48
0.617	593.15	50.000	59.254	116.15	24.35	32.53
0.621	593.34	48.507	58.209	116.34	24.39	32.59
0.625	593.54	47.164	57.015	116.54	24.43	32.64
0.629	593.73	45.672	55.672	116.73	24.47	32.70
0.633	593.92	44.328	54.478	116.92	24.51	32.75
0.638	594.11	42.836	53.134	117.11	24.55	32.80
0.642	594.31	41.343	51.940	117.31	24.59	32.86
0.646	594.50	39.851	50.597	117.50	24.63	32.91
0.650	594.69	38.358	49.104	117.69	24.67	32.96
0.654	594.88	36.866	47.761	117.88	24.71	33.02
0.658	595.07	35.373	46.269	118.07	24.75	33.07
0.663	595.27	34.030	44.925	118.27	24.79	33.13
0.667	595.46	32.687	43.433	118.46	24.83	33.18
0.671	595.65	32.239	41.940	118.65	24.87	33.23
0.675	595.84	31.791	40.448	118.84	24.91	33.29
0.679	596.04	31.343	38.955	119.04	24.96	33.34
0.683	596.23	30.149	37.463	119.23	25.00	33.40
0.688	596.42	28.955	37.015	119.42	25.04	33.45
0.692	596.61	27.761	36.567	119.61	25.08	33.50
0.696	596.81	25.970	36.119	119.81	25.12	33.56
0.700	597.00	24.179	35.672	120.00	25.16	33.61
0.704	597.19	22.537	34.179	120.19	25.20	33.67
0.708	597.38	21.642	32.239	120.38	25.24	33.72
0.713	597.58	20.896	30.448	120.58	25.28	33.77
0.717	597.77	20.299	27.910	120.77	25.32	33.83
0.721	597.96	19.552	25.970	120.96	25.36	33.88
0.725	598.15	18.955	24.925	121.15	25.40	33.93
0.729	598.35	18.060	24.030	121.35	25.44	33.99
0.733	598.54	17.164	23.134	121.54	25.48	34.04
0.738	598.73	16.269	22.239	121.73	25.52	34.10
0.742	598.92	15.373	21.343	121.92	25.56	34.15
0.746	599.11	14.478	20.448	122.11	25.60	34.20
0.750	599.31	13.881	19.552	122.31	25.64	34.26
0.754	599.50	13.284	18.657	122.50	25.68	34.31
0.758	599.69	12.687	17.761	122.69	25.72	34.37
0.763	599.88	12.090	16.866	122.88	25.76	34.42
0.767	600.08	11.493	15.970	123.08	25.80	34.47
0.771	600.27	10.896	15.075	123.27	25.84	34.53
0.775	600.46	10.746	14.179	123.46	25.88	34.58
0.779	600.65	10.597	13.582	123.65	25.92	34.64
0.783	600.85	10.448	12.985	123.85	25.96	34.69
0.788	601.04	10.000	12.388	124.04	26.00	34.74
0.792	601.23	8.955	11.791	124.23	26.04	34.80

0.796	601.42	7.313	11.194	124.42	26.08	34.85
0.800	601.62	6.716	10.597	124.62	26.12	34.90
0.804	601.81	6.119	10.000	124.81	26.17	34.96
0.808	602.00	5.522	9.403	125.00	26.21	35.01
0.813	602.19	5.224	8.806	125.19	26.25	35.07
0.817	602.39	4.925	8.209	125.39	26.29	35.12
0.821	602.58	4.627	7.612	125.58	26.33	35.17
0.825	602.77	4.328	7.015	125.77	26.37	35.23
0.829	602.96	4.030	6.418	125.96	26.41	35.28
0.833	603.15	3.731	5.821	126.15	26.45	35.34
0.838	603.35	3.433	5.224	126.35	26.49	35.39
0.842	603.54	3.134	4.925	126.54	26.53	35.44
0.846	603.73	2.836	4.627	126.73	26.57	35.50
0.850	603.92	2.537	4.328	126.92	26.61	35.55
0.854	604.12	2.388	4.030	127.12	26.65	35.61
0.858	604.31	2.239	3.731	127.31	26.69	35.66
0.863	604.50	2.090	3.433	127.50	26.73	35.71
0.867	604.69	1.940	3.134	127.69	26.77	35.77
0.871	604.89	1.791	2.836	127.89	26.81	35.82
0.875	605.08	1.642	2.537	128.08	26.85	35.87
0.879	605.27	1.493	2.239	128.27	26.89	35.93
0.883	605.46	1.343	2.090	128.46	26.93	35.98
0.888	605.66	1.194	1.940	128.66	26.97	36.04
0.892	605.85	1.045	1.791	128.85	27.01	36.09
0.896	606.04	0.896	1.642	129.04	27.05	36.14
0.900	606.23	0.746	1.493	129.23	27.09	36.20
0.904	606.43	0.597	1.343	129.43	27.13	36.25
0.908	606.62	0.448	1.194	129.62	27.17	36.31
0.913	606.81	0.299	1.045	129.81	27.21	36.36
0.917	607.00	0.149	0.896	130.00	27.25	36.41
0.921	607.19	0.100	0.746	130.19	27.29	36.47
0.925	607.39	0.000	0.597	130.39	27.33	36.52
0.929	607.58	0.000	0.448	130.58	27.38	36.58
0.933	607.77	0.000	0.299	130.77	27.42	36.63
0.938	607.96	0.000	0.149	130.96	27.46	36.68
0.942	608.16	0.000	0.100	131.16	27.50	36.74
0.946	608.35	0.000	0.000	131.35	27.54	36.79
0.950	608.54	0.000	0.000	131.54	27.58	36.84
0.954	608.73	0.000	0.000	131.73	27.62	36.90
0.958	608.93	0.000	0.000	131.93	27.66	36.95
0.963	609.12	0.000	0.000	132.12	27.70	37.01
0.967	609.31	0.000	0.000	132.31	27.74	37.06
0.971	609.50	0.000	0.000	132.50	27.78	37.11
0.975	609.70	0.000	0.000	132.70	27.82	37.17
0.979	609.89	0.000	0.000	132.89	27.86	37.22
0.983	610.08	0.000	0.000	133.08	27.90	37.28
0.988	610.27	0.000	0.000	133.27	27.94	37.33
0.992	610.47	0.000	0.000	133.47	27.98	37.38
0.996	610.66	0.000	0.000	133.66	28.02	37.44

1.000	610.85	0.000	0.000	133.85	28.06	37.49
1.004	611.04	0.000	0.000	134.04	28.10	37.55
1.008	611.24	0.000	0.000	134.24	28.14	37.60
1.013	611.43	0.000	0.000	134.43	28.18	37.65
1.017	611.62	0.000	0.000	134.62	28.22	37.71
1.021	611.81	0.000	0.000	134.81	28.26	37.76
1.025	612.00	0.000	0.000	135.00	28.30	37.81
1.029	612.20	0.000	0.000	135.20	28.34	37.87
1.033	612.39	0.000	0.000	135.39	28.38	37.92
1.038	612.58	0.000	0.000	135.58	28.42	37.98
1.042	612.77	0.000	0.000	135.77	28.46	38.03
1.046	612.97	0.000	0.000	135.97	28.50	38.08
1.050	613.16	0.000	0.000	136.16	28.54	38.14
1.054	613.35	0.000	0.000	136.35	28.59	38.19
1.058	613.54	0.000	0.000	136.54	28.63	38.25
1.063	613.74	0.000	0.000	136.74	28.67	38.30
1.067	613.93	0.000	0.000	136.93	28.71	38.35
1.071	614.12	0.000	0.000	137.12	28.75	38.41
1.075	614.31	0.000	0.000	137.31	28.79	38.46
1.079	614.51	0.000	0.000	137.51	28.83	38.52
1.083	614.70	0.000	0.000	137.70	28.87	38.57

Wetting path - SILTY SAND contd….

Total head, $(z\text{-}s/\gamma_w)_{Top}$ /(m)	Total head, $(z\text{-}s/\gamma_w)_{Middle}$ /(m)	Head difference, $(z\text{-}s/\gamma_w)$/(m)	Hydraulic gradient, i	Volume change/ (ml)	Velocity/ (m/s)	Hydraulic conductivity/ (m/s)
-10.1005	-9.4075	-0.6931	-31.5036	0.00	-	-
-10.1005	-9.4075	-0.6931	-31.5036	0.19	2.94E-06	9.34E-08
-10.1005	-9.4075	-0.6931	-31.5036	0.38	2.94E-06	9.34E-08
-10.1005	-9.4075	-0.6931	-31.5036	0.58	2.94E-06	9.34E-08
-10.1005	-9.4075	-0.6931	-31.5036	0.77	2.94E-06	9.34E-08
-10.1005	-9.4075	-0.6931	-31.5036	0.96	2.94E-06	9.34E-08
-10.1005	-9.4075	-0.6931	-31.5036	1.15	2.94E-06	9.34E-08
-10.0853	-9.4075	-0.6779	-30.8120	1.35	2.94E-06	9.55E-08
-10.0853	-9.4075	-0.6779	-30.8120	1.54	2.94E-06	9.55E-08
-10.0853	-9.4075	-0.6779	-30.8120	1.73	2.94E-06	9.55E-08
-10.0853	-9.4075	-0.6779	-30.8120	1.92	2.94E-06	9.55E-08
-10.0853	-9.4075	-0.6779	-30.8120	2.12	2.94E-06	9.55E-08
-10.0701	-9.4075	-0.6627	-30.1205	2.31	2.94E-06	9.77E-08
-10.0701	-9.3922	-0.6779	-30.8120	2.50	2.94E-06	9.55E-08
-10.0701	-9.3922	-0.6779	-30.8120	2.69	2.94E-06	9.55E-08
-10.0701	-9.3922	-0.6779	-30.8120	2.89	2.94E-06	9.55E-08
-10.0701	-9.3922	-0.6779	-30.8120	3.08	2.94E-06	9.55E-08
-10.0701	-9.3922	-0.6779	-30.8120	3.27	2.94E-06	9.55E-08
-10.0549	-9.3922	-0.6627	-30.1205	3.46	2.94E-06	9.77E-08
-10.0549	-9.3922	-0.6627	-30.1205	3.66	2.94E-06	9.77E-08
-10.0549	-9.3922	-0.6627	-30.1205	3.85	2.94E-06	9.77E-08
-10.0549	-9.3922	-0.6627	-30.1205	4.04	2.94E-06	9.77E-08
-10.0549	-9.3922	-0.6627	-30.1205	4.23	2.94E-06	9.77E-08
-10.0397	-9.3770	-0.6627	-30.1205	4.42	2.94E-06	9.77E-08
-10.0397	-9.3770	-0.6627	-30.1205	4.62	2.94E-06	9.77E-08
-10.0397	-9.3770	-0.6627	-30.1205	4.81	2.94E-06	9.77E-08
-10.0397	-9.3770	-0.6627	-30.1205	5.00	2.94E-06	9.77E-08
-10.0245	-9.3770	-0.6474	-29.4289	5.19	2.94E-06	1.00E-07
-10.0245	-9.3770	-0.6474	-29.4289	5.39	2.94E-06	1.00E-07
-10.0245	-9.3770	-0.6474	-29.4289	5.58	2.94E-06	1.00E-07
-10.0245	-9.3618	-0.6627	-30.1205	5.77	2.94E-06	9.77E-08
-10.0092	-9.3618	-0.6474	-29.4289	5.96	2.94E-06	1.00E-07
-10.0092	-9.3618	-0.6474	-29.4289	6.16	2.94E-06	1.00E-07
-10.0092	-9.3618	-0.6474	-29.4289	6.35	2.94E-06	1.00E-07
-10.0092	-9.3618	-0.6474	-29.4289	6.54	2.94E-06	1.00E-07
-9.9940	-9.3466	-0.6474	-29.4289	6.73	2.94E-06	1.00E-07
-9.9940	-9.3466	-0.6474	-29.4289	6.93	2.94E-06	1.00E-07
-9.9940	-9.3466	-0.6474	-29.4289	7.12	2.94E-06	1.00E-07
-9.9788	-9.3466	-0.6322	-28.7373	7.31	2.94E-06	1.02E-07
-9.9788	-9.3466	-0.6322	-28.7373	7.50	2.94E-06	1.02E-07
-9.9788	-9.3314	-0.6474	-29.4289	7.70	2.94E-06	1.00E-07
-9.9636	-9.3314	-0.6322	-28.7373	7.89	2.94E-06	1.02E-07
-9.9636	-9.3314	-0.6322	-28.7373	8.08	2.94E-06	1.02E-07
-9.9484	-9.3314	-0.6170	-28.0458	8.27	2.94E-06	1.05E-07

-9.9484	-9.3314	-0.6170	-28.0458	8.47	2.94E-06	1.05E-07
-9.9332	-9.3162	-0.6170	-28.0458	8.66	2.94E-06	1.05E-07
-9.9332	-9.3162	-0.6170	-28.0458	8.85	2.94E-06	1.05E-07
-9.9180	-9.3162	-0.6018	-27.3542	9.04	2.94E-06	1.08E-07
-9.9180	-9.3162	-0.6018	-27.3542	9.23	2.94E-06	1.08E-07
-9.9027	-9.3162	-0.5866	-26.6626	9.43	2.94E-06	1.10E-07
-9.9027	-9.3010	-0.6018	-27.3542	9.62	2.94E-06	1.08E-07
-9.8875	-9.3010	-0.5866	-26.6626	9.81	2.94E-06	1.10E-07
-9.8875	-9.3010	-0.5866	-26.6626	10.00	2.94E-06	1.10E-07
-9.8723	-9.3010	-0.5714	-25.9711	10.20	2.94E-06	1.13E-07
-9.8723	-9.3010	-0.5714	-25.9711	10.39	2.94E-06	1.13E-07
-9.8571	-9.3010	-0.5561	-25.2795	10.58	2.94E-06	1.16E-07
-9.8571	-9.2857	-0.5714	-25.9711	10.77	2.94E-06	1.13E-07
-9.8419	-9.2857	-0.5561	-25.2795	10.97	2.94E-06	1.16E-07
-9.8419	-9.2857	-0.5561	-25.2795	11.16	2.94E-06	1.16E-07
-9.8267	-9.2857	-0.5409	-24.5879	11.35	2.94E-06	1.20E-07
-9.8267	-9.2857	-0.5409	-24.5879	11.54	2.94E-06	1.20E-07
-9.8115	-9.2705	-0.5409	-24.5879	11.74	2.94E-06	1.20E-07
-9.8115	-9.2705	-0.5409	-24.5879	11.93	2.94E-06	1.20E-07
-9.7962	-9.2705	-0.5257	-23.8964	12.12	2.94E-06	1.23E-07
-9.7962	-9.2705	-0.5257	-23.8964	12.31	2.94E-06	1.23E-07
-9.7810	-9.2705	-0.5105	-23.2048	12.51	2.94E-06	1.27E-07
-9.7506	-9.2705	-0.4801	-21.8217	12.70	2.94E-06	1.35E-07
-9.7202	-9.2553	-0.4649	-21.1301	12.89	2.94E-06	1.39E-07
-9.6897	-9.2553	-0.4344	-19.7470	13.08	2.94E-06	1.49E-07
-9.6593	-9.2553	-0.4040	-18.3638	13.27	2.94E-06	1.60E-07
-9.6289	-9.2553	-0.3736	-16.9807	13.47	2.94E-06	1.73E-07
-9.5985	-9.2553	-0.3431	-15.5976	13.66	2.94E-06	1.89E-07
-9.5680	-9.2401	-0.3279	-14.9060	13.85	2.94E-06	1.97E-07
-9.5376	-9.2401	-0.2975	-13.5229	14.04	2.94E-06	2.18E-07
-9.5072	-9.2401	-0.2671	-12.1398	14.24	2.94E-06	2.42E-07
-9.4767	-9.2401	-0.2366	-10.7566	14.43	2.94E-06	2.32E-07
-9.4463	-9.2249	-0.2214	-10.0651	14.62	2.94E-06	2.29E-07
-9.4159	-9.2249	-0.1910	-8.6819	14.81	2.94E-06	2.40E-07
-9.3855	-9.2249	-0.1606	-7.2988	15.01	2.94E-06	2.60E-07
-9.3550	-9.2097	-0.1454	-6.6072	15.20	2.94E-06	2.17E-07
-9.3246	-9.2097	-0.1149	-5.2241	15.39	2.94E-06	2.19E-07
-9.2942	-9.2097	-0.0845	-3.8410	15.58	2.94E-06	2.37E-07
-9.2637	-9.1945	-0.0693	-3.1494	15.78	2.94E-06	2.19E-07
-9.2333	-9.1945	-0.0389	-1.7663	15.97	2.94E-06	2.34E-07
-9.2029	-9.1945	-0.0084	-0.3831	16.16	2.94E-06	2.40E-07
-9.1725	-9.1792	0.0068	0.3084	16.35	2.94E-06	2.46E-07
-9.1420	-9.1792	0.0372	1.6916	16.55	2.94E-06	2.00E-07
-9.1116	-9.1792	0.0676	3.0747	16.74	2.94E-06	2.19E-07
-9.0812	-9.1640	0.0829	3.7663	16.93	2.94E-06	2.70E-07
-9.0507	-9.1640	0.1133	5.1494	17.12	2.94E-06	3.10E-07
-9.0203	-9.1640	0.1437	6.5325	17.31	2.94E-06	3.05E-07
-8.9899	-9.1488	0.1589	7.2241	17.51	2.94E-06	2.50E-07
-8.9595	-9.1488	0.1894	8.6072	17.70	2.94E-06	3.42E-07

-8.9290	-9.1336	0.2046	9.2988	17.89	2.94E-06	3.16E-07
-8.8986	-9.1336	0.2350	10.6819	18.08	2.94E-06	2.75E-07
-8.8682	-9.1184	0.2502	11.3735	18.28	2.94E-06	2.59E-07
-8.8377	-9.1032	0.2654	12.0651	18.47	2.94E-06	2.44E-07
-8.8073	-9.1032	0.2959	13.4482	18.66	2.94E-06	2.19E-07
-8.7769	-9.0727	0.2959	13.4482	18.85	2.94E-06	2.19E-07
-8.7465	-9.0423	0.2959	13.4482	19.05	2.94E-06	2.19E-07
-8.7160	-9.0119	0.2959	13.4482	19.24	2.94E-06	2.19E-07
-8.6856	-8.9815	0.2959	13.4482	19.43	2.94E-06	2.19E-07
-8.6552	-8.9510	0.2959	13.4482	19.62	2.94E-06	2.19E-07
-8.6095	-8.9206	0.3111	14.1398	19.82	2.94E-06	2.08E-07
-8.5791	-8.8902	0.3111	14.1398	20.01	2.94E-06	2.08E-07
-8.5334	-8.8597	0.3263	14.8313	20.20	2.94E-06	1.98E-07
-8.4878	-8.8293	0.3415	15.5229	20.39	2.94E-06	1.90E-07
-8.4422	-8.7989	0.3567	16.2144	20.59	2.94E-06	1.81E-07
-8.3813	-8.7685	0.3871	17.5976	20.78	2.94E-06	1.67E-07
-8.3357	-8.7380	0.4024	18.2891	20.97	2.94E-06	1.61E-07
-8.2900	-8.6924	0.4024	18.2891	21.16	2.94E-06	1.61E-07
-8.2444	-8.6619	0.4176	18.9807	21.35	2.94E-06	1.55E-07
-8.1835	-8.6163	0.4328	19.6723	21.55	2.94E-06	1.50E-07
-8.1227	-8.5707	0.4480	20.3638	21.74	2.94E-06	1.44E-07
-8.0770	-8.5250	0.4480	20.3638	21.93	2.94E-06	1.44E-07
-8.0162	-8.4642	0.4480	20.3638	22.12	2.94E-06	1.44E-07
-7.9553	-8.4185	0.4632	21.0554	22.32	2.94E-06	1.40E-07
-7.8944	-8.3729	0.4784	21.7470	22.51	2.94E-06	1.35E-07
-7.8488	-8.3272	0.4784	21.7470	22.70	2.94E-06	1.35E-07
-7.7879	-8.2664	0.4784	21.7470	22.89	2.94E-06	1.35E-07
-7.7271	-8.2055	0.4784	21.7470	23.09	2.94E-06	1.35E-07
-7.6662	-8.1599	0.4936	22.4385	23.28	2.94E-06	1.31E-07
-7.6054	-8.0990	0.4936	22.4385	23.47	2.94E-06	1.31E-07
-7.5293	-8.0382	0.5089	23.1301	23.66	2.94E-06	1.27E-07
-7.4684	-7.9773	0.5089	23.1301	23.86	2.94E-06	1.27E-07
-7.3924	-7.9317	0.5393	24.5132	24.05	2.94E-06	1.20E-07
-7.3315	-7.8708	0.5393	24.5132	24.24	2.94E-06	1.20E-07
-7.2554	-7.8099	0.5545	25.2048	24.43	2.94E-06	1.17E-07
-7.1794	-7.7491	0.5697	25.8964	24.63	2.94E-06	1.14E-07
-7.1033	-7.6882	0.5849	26.5879	24.82	2.94E-06	1.11E-07
-7.0120	-7.6122	0.6001	27.2795	25.01	2.94E-06	1.08E-07
-6.9359	-7.5513	0.6154	27.9711	25.20	2.94E-06	1.05E-07
-6.8446	-7.4752	0.6306	28.6626	25.40	2.94E-06	1.03E-07
-6.7534	-7.4144	0.6610	30.0458	25.59	2.94E-06	9.79E-08
-6.7381	-7.3383	0.6001	27.2795	25.78	2.94E-06	1.08E-07
-6.7229	-7.2622	0.5393	24.5132	25.97	2.94E-06	1.20E-07
-6.7077	-7.1861	0.4784	21.7470	26.16	2.94E-06	1.35E-07
-6.5860	-7.0949	0.5089	23.1301	26.36	2.94E-06	1.27E-07
-6.4186	-7.0188	0.6001	27.2795	26.55	2.94E-06	1.08E-07
-6.2513	-6.9275	0.6762	30.7373	26.74	2.94E-06	9.57E-08
-6.0839	-6.8362	0.7523	34.1952	26.93	2.94E-06	8.60E-08
-5.9318	-6.7449	0.8132	36.9614	27.13	2.94E-06	7.96E-08

-5.8253	-6.6536	0.8284	37.6530	27.32	2.94E-06	7.81E-08
-5.7036	-6.5471	0.8436	38.3446	27.51	2.94E-06	7.67E-08
-5.5666	-6.4559	0.8892	40.4193	27.70	2.94E-06	7.28E-08
-5.4449	-6.3494	0.9044	41.1108	27.90	2.94E-06	7.16E-08
-5.3080	-6.2429	0.9349	42.4939	28.09	2.94E-06	6.92E-08
-5.1863	-6.1364	0.9501	43.1855	28.28	2.94E-06	6.81E-08
-5.0493	-6.0146	0.9653	43.8771	28.47	2.94E-06	6.71E-08
-4.8972	-5.9081	1.0109	45.9518	28.67	2.94E-06	6.40E-08
-4.7603	-5.7864	1.0262	46.6433	28.86	2.94E-06	6.31E-08
-4.6081	-5.6495	1.0414	47.3349	29.05	2.94E-06	6.22E-08
-4.4712	-5.5278	1.0566	48.0265	29.24	2.94E-06	6.13E-08
-4.3190	-5.3908	1.0718	48.7180	29.44	2.94E-06	6.04E-08
-4.1669	-5.2691	1.1022	50.1012	29.63	2.94E-06	5.87E-08
-4.0148	-5.1322	1.1174	50.7927	29.82	2.94E-06	5.79E-08
-3.8626	-4.9801	1.1174	50.7927	30.01	2.94E-06	5.79E-08
-3.7105	-4.8431	1.1327	51.4843	30.20	2.94E-06	5.71E-08
-3.5583	-4.6910	1.1327	51.4843	30.40	2.94E-06	5.71E-08
-3.4214	-4.5540	1.1327	51.4843	30.59	2.94E-06	5.71E-08
-3.2845	-4.4019	1.1174	50.7927	30.78	2.94E-06	5.79E-08
-3.2388	-4.2498	1.0109	45.9518	30.97	2.94E-06	6.40E-08
-3.1932	-4.0976	0.9044	41.1108	31.17	2.94E-06	7.16E-08
-3.1475	-3.9455	0.7979	36.2699	31.36	2.94E-06	8.11E-08
-3.0258	-3.7933	0.7675	34.8867	31.55	2.94E-06	8.43E-08
-2.9041	-3.7477	0.8436	38.3446	31.74	2.94E-06	7.67E-08
-2.7824	-3.7020	0.9197	41.8024	31.94	2.94E-06	7.04E-08
-2.5998	-3.6564	1.0566	48.0265	32.13	2.94E-06	6.13E-08
-2.4172	-3.6108	1.1935	54.2506	32.32	2.94E-06	5.42E-08
-2.2499	-3.4586	1.2087	54.9421	32.51	2.94E-06	5.36E-08
-2.1586	-3.2608	1.1022	50.1012	32.71	2.94E-06	5.87E-08
-2.0825	-3.0782	0.9957	45.2602	32.90	2.94E-06	6.50E-08
-2.0217	-2.8196	0.7979	36.2699	33.09	2.94E-06	8.11E-08
-1.9456	-2.6218	0.6762	30.7373	33.28	2.94E-06	9.57E-08
-1.8847	-2.5153	0.6306	28.6626	33.48	2.94E-06	1.03E-07
-1.7934	-2.4240	0.6306	28.6626	33.67	2.94E-06	1.03E-07
-1.7022	-2.3327	0.6306	28.6626	33.86	2.94E-06	1.03E-07
-1.6109	-2.2415	0.6306	28.6626	34.05	2.94E-06	1.03E-07
-1.5196	-2.1502	0.6306	28.6626	34.24	2.94E-06	1.03E-07
-1.4283	-2.0589	0.6306	28.6626	34.44	2.94E-06	1.03E-07
-1.3674	-1.9676	0.6001	27.2795	34.63	2.94E-06	1.08E-07
-1.3066	-1.8763	0.5697	25.8964	34.82	2.94E-06	1.14E-07
-1.2457	-1.7850	0.5393	24.5132	35.01	2.94E-06	1.20E-07
-1.1849	-1.6937	0.5089	23.1301	35.21	2.94E-06	1.27E-07
-1.1240	-1.6024	0.4784	21.7470	35.40	2.94E-06	1.35E-07
-1.0632	-1.5112	0.4480	20.3638	35.59	2.94E-06	1.44E-07
-1.0479	-1.4199	0.3719	16.9060	35.78	2.94E-06	1.74E-07
-1.0327	-1.3590	0.3263	14.8313	35.98	2.94E-06	1.98E-07
-1.0175	-1.2982	0.2806	12.7566	36.17	2.94E-06	2.31E-07
-0.9719	-1.2373	0.2654	12.0651	36.36	2.94E-06	2.44E-07
-0.8654	-1.1764	0.3111	14.1398	36.55	2.94E-06	2.08E-07

-0.6980	-1.1156	0.4176	18.9807	36.75	2.94E-06	1.55E-07
-0.6372	-1.0547	0.4176	18.9807	36.94	2.94E-06	1.55E-07
-0.5763	-0.9939	0.4176	18.9807	37.13	2.94E-06	1.55E-07
-0.5154	-0.9330	0.4176	18.9807	37.32	2.94E-06	1.55E-07
-0.4850	-0.8722	0.3871	17.5976	37.52	2.94E-06	1.67E-07
-0.4546	-0.8113	0.3567	16.2144	37.71	2.94E-06	1.81E-07
-0.4241	-0.7504	0.3263	14.8313	37.90	2.94E-06	1.98E-07
-0.3937	-0.6896	0.2959	13.4482	38.09	2.94E-06	2.19E-07
-0.3633	-0.6287	0.2654	12.0651	38.28	2.94E-06	2.44E-07
-0.3329	-0.5679	0.2350	10.6819	38.48	2.94E-06	2.75E-07
-0.3024	-0.5070	0.2046	9.2988	38.67	2.94E-06	3.16E-07
-0.2720	-0.4766	0.2046	9.2988	38.86	2.94E-06	3.16E-07
-0.2416	-0.4461	0.2046	9.2988	39.05	2.94E-06	3.16E-07
-0.2111	-0.4157	0.2046	9.2988	39.25	2.94E-06	3.16E-07
-0.1959	-0.3853	0.1894	8.6072	39.44	2.94E-06	3.42E-07
-0.1807	-0.3549	0.1741	7.9157	39.63	2.94E-06	3.72E-07
-0.1655	-0.3244	0.1589	7.2241	39.82	2.94E-06	4.07E-07
-0.1503	-0.2940	0.1437	6.5325	40.02	2.94E-06	4.50E-07
-0.1351	-0.2636	0.1285	5.8410	40.21	2.94E-06	5.04E-07
-0.1199	-0.2331	0.1133	5.1494	40.40	2.94E-06	5.71E-07
-0.1046	-0.2027	0.0981	4.4578	40.59	2.94E-06	6.60E-07
-0.0894	-0.1875	0.0981	4.4578	40.79	2.94E-06	6.60E-07
-0.0742	-0.1723	0.0981	4.4578	40.98	2.94E-06	6.60E-07
-0.0590	-0.1571	0.0981	4.4578	41.17	2.94E-06	6.60E-07
-0.0438	-0.1419	0.0981	4.4578	41.36	2.94E-06	6.60E-07
-0.0286	-0.1266	0.0981	4.4578	41.56	2.94E-06	6.60E-07
-0.0134	-0.1114	0.0981	4.4578	41.75	2.94E-06	6.60E-07
0.0019	-0.0962	0.0981	4.4578	41.94	2.94E-06	6.60E-07
0.0171	-0.0810	0.0981	4.4578	42.13	2.94E-06	6.60E-07
0.0323	-0.0658	0.0981	4.4578	42.33	2.94E-06	6.60E-07
0.0373	-0.0506	0.0879	3.9945	42.52	2.94E-06	7.37E-07
0.0475	-0.0354	0.0829	3.7663	42.71	2.94E-06	7.81E-07
0.0475	-0.0201	0.0676	3.0747	42.90	2.94E-06	9.57E-07
0.0475	-0.0049	0.0524	2.3831	43.09	2.94E-06	1.23E-06
0.0475	0.0103	0.0372	1.6916	43.29	2.94E-06	1.74E-06
0.0475	0.0153	0.0322	1.4633	43.48	2.94E-06	2.01E-06
0.0475	0.0255	0.0220	1.0000	43.67	2.94E-06	2.94E-06
0.0475	0.0255	0.0220	1.0000	43.86	2.94E-06	2.94E-06
0.0475	0.0255	0.0220	1.0000	44.06	2.94E-06	2.94E-06
0.0475	0.0255	0.0220	1.0000	44.25	2.94E-06	2.94E-06
0.0475	0.0255	0.0220	1.0000	44.44	2.94E-06	2.94E-06
0.0475	0.0255	0.0220	1.0000	44.63	2.94E-06	2.94E-06
0.0475	0.0255	0.0220	1.0000	44.83	2.94E-06	2.94E-06
0.0475	0.0255	0.0220	1.0000	45.02	2.94E-06	2.94E-06
0.0475	0.0255	0.0220	1.0000	45.21	2.94E-06	2.94E-06
0.0475	0.0255	0.0220	1.0000	45.40	2.94E-06	2.94E-06
0.0475	0.0255	0.0220	1.0000	45.60	2.94E-06	2.94E-06
0.0475	0.0255	0.0220	1.0000	45.79	2.94E-06	2.94E-06
0.0475	0.0255	0.0220	1.0000	45.98	2.94E-06	2.94E-06

0.0475	0.0255	0.0220	1.0000	46.17	2.94E-06	2.94E-06
0.0475	0.0255	0.0220	1.0000	46.37	2.94E-06	2.94E-06
0.0475	0.0255	0.0220	1.0000	46.56	2.94E-06	2.94E-06
0.0475	0.0255	0.0220	1.0000	46.75	2.94E-06	2.94E-06
0.0475	0.0255	0.0220	1.0000	46.94	2.94E-06	2.94E-06
0.0475	0.0255	0.0220	1.0000	47.13	2.94E-06	2.94E-06
0.0475	0.0255	0.0220	1.0000	47.33	2.94E-06	2.94E-06
0.0475	0.0255	0.0220	1.0000	47.52	2.94E-06	2.94E-06
0.0475	0.0255	0.0220	1.0000	47.71	2.94E-06	2.94E-06
0.0475	0.0255	0.0220	1.0000	47.90	2.94E-06	2.94E-06
0.0475	0.0255	0.0220	1.0000	48.10	2.94E-06	2.94E-06
0.0475	0.0255	0.0220	1.0000	48.29	2.94E-06	2.94E-06
0.0475	0.0255	0.0220	1.0000	48.48	2.94E-06	2.94E-06
0.0475	0.0255	0.0220	1.0000	48.67	2.94E-06	2.94E-06
0.0475	0.0255	0.0220	1.0000	48.87	2.94E-06	2.94E-06
0.0475	0.0255	0.0220	1.0000	49.06	2.94E-06	2.94E-06
0.0475	0.0255	0.0220	1.0000	49.25	2.94E-06	2.94E-06
0.0475	0.0255	0.0220	1.0000	49.44	2.94E-06	2.94E-06
0.0475	0.0255	0.0220	1.0000	49.64	2.94E-06	2.94E-06
0.0475	0.0255	0.0220	1.0000	49.83	2.94E-06	2.94E-06
0.0475	0.0255	0.0220	1.0000	50.02	2.94E-06	2.94E-06

Wetting path - SANDY SILT

Time/ (hr)	Soil weight/(g)	Matric suction (top)/ (kPa)	Matric suction (middle)/ (kPa)	Weight of water/ (g)	Gravimetric water content/(%)	Volumetric water content/(%)
0.000	517.97	98.971	95.075	133.67	34.78	37.44
0.004	518.19	98.824	95.075	133.89	34.84	37.50
0.008	518.41	98.824	95.075	134.11	34.90	37.56
0.013	518.62	98.676	95.075	134.32	34.95	37.62
0.017	518.84	98.676	95.075	134.54	35.01	37.69
0.021	519.06	98.529	95.075	134.76	35.07	37.75
0.025	519.28	98.529	95.075	134.98	35.12	37.81
0.029	519.50	98.382	95.075	135.20	35.18	37.87
0.033	519.71	98.382	95.075	135.41	35.24	37.93
0.038	519.93	98.235	94.925	135.63	35.29	37.99
0.042	520.15	98.235	94.925	135.85	35.35	38.05
0.046	520.37	98.088	94.925	136.07	35.41	38.11
0.050	520.59	98.088	94.925	136.29	35.46	38.17
0.054	520.80	97.941	94.925	136.50	35.52	38.23
0.058	521.02	97.941	94.776	136.72	35.58	38.30
0.063	521.24	97.794	94.776	136.94	35.63	38.36
0.067	521.46	97.794	94.776	137.16	35.69	38.42
0.071	521.67	97.647	94.776	137.37	35.75	38.48
0.075	521.89	97.647	94.776	137.59	35.80	38.54
0.079	522.11	97.500	94.776	137.81	35.86	38.60
0.083	522.33	97.500	94.627	138.03	35.92	38.66
0.088	522.55	97.353	94.627	138.25	35.97	38.72
0.092	522.76	97.353	94.627	138.46	36.03	38.78
0.096	522.98	97.206	94.627	138.68	36.09	38.84
0.100	523.20	97.059	94.478	138.90	36.14	38.91
0.104	523.42	96.912	94.478	139.12	36.20	38.97
0.108	523.64	96.765	94.328	139.34	36.26	39.03
0.113	523.85	96.618	94.179	139.55	36.31	39.09
0.117	524.07	96.471	93.881	139.77	36.37	39.15
0.121	524.29	96.324	93.582	139.99	36.43	39.21
0.125	524.51	96.176	93.284	140.21	36.48	39.27
0.129	524.73	96.029	92.985	140.43	36.54	39.33
0.133	524.94	95.882	91.493	140.64	36.60	39.39
0.138	525.16	95.735	89.701	140.86	36.65	39.46
0.142	525.38	95.588	87.910	141.08	36.71	39.52
0.146	525.60	95.441	85.821	141.30	36.77	39.58
0.150	525.82	95.294	83.731	141.52	36.82	39.64
0.154	526.03	94.559	81.642	141.73	36.88	39.70
0.158	526.25	93.088	79.552	141.95	36.94	39.76
0.163	526.47	90.294	77.761	142.17	36.99	39.82
0.167	526.69	86.471	75.821	142.39	37.05	39.88
0.171	526.90	82.941	74.030	142.60	37.11	39.94

0.175	527.12	78.824	72.090	142.82	37.16	40.00
0.179	527.34	73.235	70.149	143.04	37.22	40.07
0.183	527.56	67.647	68.060	143.26	37.28	40.13
0.188	527.78	62.206	65.970	143.48	37.33	40.19
0.192	527.99	55.735	64.030	143.69	37.39	40.25
0.196	528.21	48.676	61.791	143.91	37.45	40.31
0.200	528.43	41.471	59.552	144.13	37.50	40.37
0.204	528.65	35.147	57.015	144.35	37.56	40.43
0.208	528.87	30.000	54.328	144.57	37.62	40.49
0.213	529.08	25.882	51.493	144.78	37.67	40.55
0.217	529.30	22.500	48.806	145.00	37.73	40.62
0.221	529.52	20.000	46.269	145.22	37.79	40.68
0.225	529.74	18.235	43.881	145.44	37.84	40.74
0.229	529.96	17.206	41.791	145.66	37.90	40.80
0.233	530.17	16.324	40.000	145.87	37.96	40.86
0.238	530.39	15.294	37.015	146.09	38.02	40.92
0.242	530.61	14.412	34.478	146.31	38.07	40.98
0.246	530.83	13.235	32.090	146.53	38.13	41.04
0.250	531.05	12.206	29.552	146.75	38.19	41.10
0.254	531.26	11.176	27.164	146.96	38.24	41.16
0.258	531.48	10.294	24.627	147.18	38.30	41.23
0.263	531.70	9.559	23.582	147.40	38.36	41.29
0.267	531.92	8.971	22.985	147.62	38.41	41.35
0.271	532.14	8.382	21.119	147.84	38.47	41.41
0.275	532.35	7.794	19.075	148.05	38.53	41.47
0.279	532.57	7.353	17.030	148.27	38.58	41.53
0.283	532.79	6.765	14.985	148.49	38.64	41.59
0.288	533.01	6.324	14.179	148.71	38.70	41.65
0.292	533.22	6.029	13.373	148.92	38.75	41.71
0.296	533.44	5.588	12.567	149.14	38.81	41.77
0.300	533.66	5.147	11.761	149.36	38.87	41.84
0.304	533.88	5.000	10.955	149.58	38.92	41.90
0.308	534.10	4.706	9.851	149.80	38.98	41.96
0.313	534.31	4.412	9.552	150.01	39.04	42.02
0.317	534.53	4.265	9.254	150.23	39.09	42.08
0.321	534.75	3.971	8.955	150.45	39.15	42.14
0.325	534.97	3.824	8.657	150.67	39.21	42.20
0.329	535.19	3.676	7.761	150.89	39.26	42.26
0.333	535.40	3.529	7.463	151.10	39.32	42.32
0.338	535.62	3.382	7.164	151.32	39.38	42.39
0.342	535.84	3.235	6.866	151.54	39.43	42.45
0.346	536.06	3.088	6.567	151.76	39.49	42.51
0.350	536.28	2.941	6.269	151.98	39.55	42.57
0.354	536.49	2.794	5.970	152.19	39.60	42.63
0.358	536.71	2.647	5.672	152.41	39.66	42.69
0.363	536.93	2.500	5.373	152.63	39.72	42.75
0.367	537.15	2.353	5.075	152.85	39.77	42.81
0.371	537.37	2.206	4.776	153.07	39.83	42.87

0.375	537.58	2.059	4.478	153.28	39.89	42.93
0.379	537.80	1.912	4.179	153.50	39.94	43.00
0.383	538.02	1.765	3.881	153.72	40.00	43.06
0.388	538.24	1.618	3.582	153.94	40.06	43.12
0.392	538.45	1.618	3.433	154.15	40.11	43.18
0.396	538.67	1.618	3.284	154.37	40.17	43.24
0.400	538.89	1.471	3.134	154.59	40.23	43.30
0.404	539.11	1.471	2.985	154.81	40.28	43.36
0.408	539.33	1.471	2.836	155.03	40.34	43.42
0.413	539.54	1.471	2.836	155.24	40.40	43.48
0.417	539.76	1.471	2.687	155.46	40.45	43.55
0.421	539.98	1.471	2.687	155.68	40.51	43.61
0.425	540.20	1.471	2.537	155.90	40.57	43.67
0.429	540.42	1.471	2.537	156.12	40.62	43.73
0.433	540.63	1.471	2.537	156.33	40.68	43.79
0.438	540.85	1.471	2.388	156.55	40.74	43.85
0.442	541.07	1.324	2.388	156.77	40.79	43.91
0.446	541.29	1.324	2.239	156.99	40.85	43.97
0.450	541.51	1.324	2.239	157.21	40.91	44.03
0.454	541.72	1.324	2.239	157.42	40.96	44.09
0.458	541.94	1.324	2.090	157.64	41.02	44.16
0.463	542.16	1.324	2.090	157.86	41.08	44.22
0.467	542.38	1.324	2.090	158.08	41.13	44.28
0.471	542.60	1.324	1.940	158.30	41.19	44.34
0.475	542.81	1.176	1.940	158.51	41.25	44.40
0.479	543.03	1.176	1.940	158.73	41.30	44.46
0.483	543.25	1.176	1.791	158.95	41.36	44.52
0.488	543.47	1.176	1.791	159.17	41.42	44.58
0.492	543.69	1.176	1.791	159.39	41.47	44.64
0.496	543.90	1.176	1.642	159.60	41.53	44.70
0.500	544.12	1.176	1.642	159.82	41.59	44.77
0.504	544.34	1.176	1.642	160.04	41.64	44.83
0.508	544.56	1.176	1.493	160.26	41.70	44.89
0.513	544.77	1.176	1.493	160.47	41.76	44.95
0.517	544.99	1.029	1.493	160.69	41.81	45.01
0.521	545.21	1.029	1.493	160.91	41.87	45.07
0.525	545.43	1.029	1.343	161.13	41.93	45.13
0.529	545.65	1.029	1.343	161.35	41.98	45.19
0.533	545.86	1.029	1.343	161.56	42.04	45.25
0.538	546.08	1.029	1.343	161.78	42.10	45.32
0.542	546.30	1.029	1.343	162.00	42.15	45.38
0.546	546.52	1.029	1.343	162.22	42.21	45.44
0.550	546.74	1.029	1.343	162.44	42.27	45.50
0.554	546.95	1.029	1.194	162.65	42.32	45.56
0.558	547.17	1.029	1.194	162.87	42.38	45.62
0.563	547.39	1.029	1.194	163.09	42.44	45.68
0.567	547.61	1.029	1.194	163.31	42.49	45.74
0.571	547.83	1.029	1.194	163.53	42.55	45.80

0.575	548.04	1.029	1.194	163.74	42.61	45.86
0.579	548.26	1.029	1.194	163.96	42.67	45.93
0.583	548.48	1.029	1.045	164.18	42.72	45.99
0.588	548.70	0.882	1.045	164.40	42.78	46.05
0.592	548.92	0.882	1.045	164.62	42.84	46.11
0.596	549.13	0.882	1.045	164.83	42.89	46.17
0.600	549.35	0.882	1.045	165.05	42.95	46.23
0.604	549.57	0.882	1.045	165.27	43.01	46.29
0.608	549.79	0.735	0.896	165.49	43.06	46.35
0.613	550.01	0.735	0.896	165.71	43.12	46.41
0.617	550.22	0.735	0.896	165.92	43.18	46.48
0.621	550.44	0.735	0.896	166.14	43.23	46.54
0.625	550.66	0.735	0.896	166.36	43.29	46.60
0.629	550.88	0.735	0.896	166.58	43.35	46.66
0.633	551.09	0.735	0.896	166.79	43.40	46.72
0.638	551.31	0.735	0.896	167.01	43.46	46.78
0.642	551.53	0.588	0.896	167.23	43.52	46.84
0.646	551.75	0.588	0.896	167.45	43.57	46.90
0.650	551.97	0.588	0.896	167.67	43.63	46.96
0.654	552.18	0.588	0.896	167.88	43.69	47.02
0.658	552.40	0.588	0.896	168.10	43.74	47.09
0.663	552.62	0.588	0.896	168.32	43.80	47.15
0.667	552.84	0.588	0.896	168.54	43.86	47.21
0.671	553.06	0.588	0.896	168.76	43.91	47.27
0.675	553.27	0.588	0.896	168.97	43.97	47.33
0.679	553.49	0.441	0.896	169.19	44.03	47.39
0.683	553.71	0.441	0.746	169.41	44.08	47.45
0.688	553.93	0.441	0.746	169.63	44.14	47.51
0.692	554.15	0.441	0.746	169.85	44.20	47.57
0.696	554.36	0.441	0.746	170.06	44.25	47.63
0.700	554.58	0.441	0.746	170.28	44.31	47.70
0.704	554.80	0.441	0.746	170.50	44.37	47.76
0.708	555.02	0.294	0.746	170.72	44.42	47.82
0.713	555.24	0.294	0.746	170.94	44.48	47.88
0.717	555.45	0.294	0.746	171.15	44.54	47.94
0.721	555.67	0.294	0.746	171.37	44.59	48.00
0.725	555.89	0.294	0.746	171.59	44.65	48.06
0.729	556.11	0.294	0.746	171.81	44.71	48.12
0.733	556.32	0.294	0.746	172.02	44.76	48.18
0.738	556.54	0.294	0.746	172.24	44.82	48.25
0.742	556.76	0.294	0.746	172.46	44.88	48.31
0.746	556.98	0.294	0.746	172.68	44.93	48.37
0.750	557.20	0.294	0.597	172.90	44.99	48.43
0.754	557.41	0.294	0.597	173.11	45.05	48.49
0.758	557.63	0.147	0.746	173.33	45.10	48.55
0.763	557.85	0.294	0.597	173.55	45.16	48.61
0.767	558.07	0.147	0.597	173.77	45.22	48.67
0.771	558.29	0.147	0.597	173.99	45.27	48.73

0.775	558.50	0.147	0.597	174.20	45.33	48.79
0.779	558.72	0.147	0.597	174.42	45.39	48.86
0.783	558.94	0.147	0.597	174.64	45.44	48.92
0.788	559.16	0.147	0.597	174.86	45.50	48.98
0.792	559.38	0.147	0.597	175.08	45.56	49.04
0.796	559.59	0.147	0.597	175.29	45.61	49.10
0.800	559.81	0.147	0.597	175.51	45.67	49.16
0.804	560.03	0.147	0.597	175.73	45.73	49.22
0.808	560.25	0.147	0.597	175.95	45.78	49.28
0.813	560.47	0.147	0.597	176.17	45.84	49.34
0.817	560.68	0.147	0.597	176.38	45.90	49.41
0.821	560.90	0.147	0.597	176.60	45.95	49.47
0.825	561.12	0.100	0.597	176.82	46.01	49.53
0.829	561.34	0.000	0.597	177.04	46.07	49.59
0.833	561.56	0.000	0.597	177.26	46.12	49.65
0.838	561.77	0.000	0.597	177.47	46.18	49.71
0.842	561.99	0.000	0.597	177.69	46.24	49.77
0.846	562.21	0.000	0.597	177.91	46.29	49.83
0.850	562.43	0.000	0.597	178.13	46.35	49.89
0.854	562.64	0.000	0.597	178.34	46.41	49.95
0.858	562.86	0.000	0.597	178.56	46.46	50.02
0.863	563.08	0.000	0.597	178.78	46.52	50.08
0.867	563.30	0.000	0.448	179.00	46.58	50.14
0.871	563.52	0.000	0.448	179.22	46.63	50.20
0.875	563.73	0.000	0.448	179.43	46.69	50.26
0.879	563.95	0.000	0.448	179.65	46.75	50.32
0.883	564.17	0.000	0.448	179.87	46.80	50.38
0.888	564.39	0.000	0.448	180.09	46.86	50.44
0.892	564.61	0.000	0.448	180.31	46.92	50.50
0.896	564.82	0.000	0.448	180.52	46.97	50.56
0.900	565.04	0.000	0.448	180.74	47.03	50.63
0.904	565.26	0.000	0.448	180.96	47.09	50.69
0.908	565.48	0.000	0.448	181.18	47.14	50.75
0.913	565.70	0.000	0.299	181.40	47.20	50.81
0.917	565.91	0.000	0.299	181.61	47.26	50.87
0.921	566.13	0.000	0.299	181.83	47.31	50.93
0.925	566.35	0.000	0.299	182.05	47.37	50.99
0.929	566.57	0.000	0.299	182.27	47.43	51.05
0.933	566.79	0.000	0.299	182.49	47.49	51.11
0.938	567.00	0.000	0.299	182.70	47.54	51.18
0.942	567.22	0.000	0.299	182.92	47.60	51.24
0.946	567.44	0.000	0.149	183.14	47.66	51.30
0.950	567.66	0.000	0.149	183.36	47.71	51.36
0.954	567.87	0.000	0.149	183.57	47.77	51.42
0.958	568.09	0.000	0.149	183.79	47.83	51.48
0.963	568.31	0.000	0.149	184.01	47.88	51.54
0.967	568.53	0.000	0.149	184.23	47.94	51.60
0.971	568.75	0.000	0.149	184.45	48.00	51.66

0.975	568.96	0.000	0.149	184.66	48.05	51.72
0.979	569.18	0.000	0.100	184.88	48.11	51.79
0.983	569.40	0.000	0.000	185.10	48.17	51.85
0.988	569.62	0.000	0.000	185.32	48.22	51.91
0.992	569.84	0.000	0.000	185.54	48.28	51.97
0.996	570.05	0.000	0.000	185.75	48.34	52.03
1.000	570.27	0.000	0.000	185.97	48.39	52.09
1.004	570.49	0.000	0.000	186.19	48.45	52.15

Wetting path - SANDY SILT contd….

Total head, $(z-s/\gamma_w)_{Top}$ /(m)	Total head, $(z-s/\gamma_w)_{Middle}$ /(m)	Head difference, $(z-s/\gamma_w)$/(m)	Hydraulic gradient, i	Volume change/ (ml)	Velocity/ (m/s)	Hydraulic conductivity/ (m/s)
-10.0412	-9.6661	-0.3751	-17.0519	0.00	-	-
-10.0263	-9.6661	-0.3602	-16.3705	0.22	3.33E-06	2.04E-07
-10.0263	-9.6661	-0.3602	-16.3705	0.44	3.33E-06	2.04E-07
-10.0113	-9.6661	-0.3452	-15.6891	0.65	3.33E-06	2.12E-07
-10.0113	-9.6661	-0.3452	-15.6891	0.87	3.33E-06	2.12E-07
-9.9963	-9.6661	-0.3302	-15.0077	1.09	3.33E-06	2.22E-07
-9.9963	-9.6661	-0.3302	-15.0077	1.31	3.33E-06	2.22E-07
-9.9813	-9.6661	-0.3152	-14.3263	1.53	3.33E-06	2.33E-07
-9.9813	-9.6661	-0.3152	-14.3263	1.74	3.33E-06	2.33E-07
-9.9663	-9.6509	-0.3154	-14.3365	1.96	3.33E-06	2.32E-07
-9.9663	-9.6509	-0.3154	-14.3365	2.18	3.33E-06	2.32E-07
-9.9513	-9.6509	-0.3004	-13.6551	2.40	3.33E-06	2.44E-07
-9.9513	-9.6509	-0.3004	-13.6551	2.62	3.33E-06	2.44E-07
-9.9363	-9.6509	-0.2854	-12.9737	2.83	3.33E-06	2.57E-07
-9.9363	-9.6357	-0.3006	-13.6653	3.05	3.33E-06	2.44E-07
-9.9213	-9.6357	-0.2856	-12.9839	3.27	3.33E-06	2.57E-07
-9.9213	-9.6357	-0.2856	-12.9839	3.49	3.33E-06	2.57E-07
-9.9063	-9.6357	-0.2707	-12.3025	3.70	3.33E-06	2.71E-07
-9.9063	-9.6357	-0.2707	-12.3025	3.92	3.33E-06	2.71E-07
-9.8913	-9.6357	-0.2557	-11.6211	4.14	3.33E-06	2.87E-07
-9.8913	-9.6205	-0.2709	-12.3126	4.36	3.33E-06	2.71E-07
-9.8763	-9.6205	-0.2559	-11.6312	4.58	3.33E-06	2.87E-07
-9.8763	-9.6205	-0.2559	-11.6312	4.79	3.33E-06	2.87E-07
-9.8614	-9.6205	-0.2409	-10.9499	5.01	3.33E-06	3.04E-07
-9.8464	-9.6052	-0.2411	-10.9600	5.23	3.33E-06	3.04E-07
-9.8314	-9.6052	-0.2261	-10.2786	5.45	3.33E-06	3.24E-07
-9.8164	-9.5900	-0.2264	-10.2888	5.67	3.33E-06	3.24E-07
-9.8014	-9.5748	-0.2266	-10.2990	5.88	3.33E-06	3.24E-07
-9.7864	-9.5444	-0.2420	-11.0007	6.10	3.33E-06	3.03E-07
-9.7714	-9.5140	-0.2575	-11.7024	6.32	3.33E-06	2.85E-07
-9.7564	-9.4835	-0.2729	-12.4042	6.54	3.33E-06	2.69E-07
-9.7414	-9.4531	-0.2883	-13.1059	6.76	3.33E-06	2.54E-07
-9.7264	-9.3010	-0.4255	-19.3402	6.97	3.33E-06	1.72E-07
-9.7114	-9.1184	-0.5931	-26.9576	7.19	3.33E-06	1.24E-07
-9.6965	-8.9358	-0.7606	-34.5750	7.41	3.33E-06	9.64E-08
-9.6815	-8.7228	-0.9587	-43.5755	7.63	3.33E-06	7.65E-08
-9.6665	-8.5098	-1.1567	-52.5760	7.85	3.33E-06	6.34E-08
-9.5915	-8.2968	-1.2947	-58.8510	8.06	3.33E-06	5.66E-08
-9.4416	-8.0838	-1.3578	-61.7189	8.28	3.33E-06	5.40E-08
-9.1568	-7.9012	-1.2556	-57.0712	8.50	3.33E-06	5.84E-08
-8.7670	-7.7034	-1.0636	-48.3453	8.72	3.33E-06	6.89E-08
-8.4073	-7.5209	-0.8864	-40.2905	8.93	3.33E-06	8.27E-08

-7.9875	-7.3231	-0.6644	-30.2018	9.15	3.33E-06	1.10E-07
-7.4179	-7.1253	-0.2926	-13.2991	9.37	3.33E-06	2.51E-07
-6.8482	-6.9123	0.0641	2.9120	9.59	3.33E-06	2.24E-07
-6.2936	-6.6993	0.4057	18.4417	9.81	3.33E-06	1.41E-07
-5.6340	-6.5015	0.8675	39.4328	10.02	3.33E-06	8.45E-08
-4.9144	-6.2733	1.3589	61.7663	10.24	3.33E-06	5.40E-08
-4.1799	-6.0451	1.8652	84.7812	10.46	3.33E-06	3.93E-08
-3.5353	-5.7864	2.2511	102.3246	10.68	3.33E-06	3.26E-08
-3.0106	-5.5126	2.5020	113.7252	10.90	3.33E-06	2.93E-08
-2.5909	-5.2235	2.6326	119.6646	11.11	3.33E-06	2.79E-08
-2.2461	-4.9496	2.7035	122.8885	11.33	3.33E-06	2.71E-08
-1.9912	-4.6910	2.6997	122.7156	11.55	3.33E-06	2.72E-08
-1.8113	-4.4475	2.6362	119.8273	11.77	3.33E-06	2.78E-08
-1.7064	-4.2345	2.5281	114.9151	11.99	3.33E-06	2.90E-08
-1.6165	-4.0520	2.4355	110.7047	12.20	3.33E-06	3.01E-08
-1.5115	-3.7477	2.2361	101.6432	12.42	3.33E-06	3.28E-08
-1.4216	-3.4890	2.0674	93.9749	12.64	3.33E-06	3.55E-08
-1.3017	-3.2456	1.9439	88.3610	12.86	3.33E-06	3.77E-08
-1.1967	-2.9870	1.7902	81.3742	13.08	3.33E-06	4.10E-08
-1.0918	-2.7435	1.6517	75.0789	13.29	3.33E-06	4.44E-08
-1.0018	-2.4849	1.4830	67.4107	13.51	3.33E-06	4.94E-08
-0.9269	-2.3784	1.4515	65.9767	13.73	3.33E-06	5.05E-08
-0.8669	-2.3175	1.4506	65.9360	13.95	3.33E-06	5.05E-08
-0.8070	-2.1273	1.3204	60.0170	14.17	3.33E-06	5.55E-08
-0.7470	-1.9189	1.1719	53.2681	14.38	3.33E-06	6.26E-08
-0.7020	-1.7105	1.0084	45.8379	14.60	3.33E-06	7.27E-08
-0.6421	-1.5020	0.8600	39.0890	14.82	3.33E-06	8.53E-08
-0.5971	-1.4199	0.8228	37.3987	15.04	3.33E-06	8.91E-08
-0.5671	-1.3377	0.7706	35.0271	15.25	3.33E-06	9.52E-08
-0.5221	-1.2556	0.7334	33.3368	15.47	3.33E-06	1.00E-07
-0.4772	-1.1734	0.6962	31.6465	15.69	3.33E-06	1.05E-07
-0.4622	-1.0912	0.6291	28.5935	15.91	3.33E-06	1.17E-07
-0.4322	-0.9787	0.5465	24.8387	16.13	3.33E-06	1.34E-07
-0.4022	-0.9482	0.5460	24.8183	16.34	3.33E-06	1.34E-07
-0.3872	-0.9178	0.5306	24.1166	16.56	3.33E-06	1.38E-07
-0.3572	-0.8874	0.5301	24.0963	16.78	3.33E-06	1.38E-07
-0.3423	-0.8569	0.5147	23.3945	17.00	3.33E-06	1.42E-07
-0.3273	-0.7657	0.4384	19.9265	17.22	3.33E-06	1.67E-07
-0.3123	-0.7352	0.4229	19.2248	17.43	3.33E-06	1.73E-07
-0.2973	-0.7048	0.4075	18.5231	17.65	3.33E-06	1.80E-07
-0.2823	-0.6744	0.3921	17.8213	17.87	3.33E-06	1.87E-07
-0.2673	-0.6439	0.3766	17.1196	18.09	3.33E-06	1.95E-07
-0.2523	-0.6135	0.3612	16.4178	18.31	3.33E-06	2.00E-07
-0.2373	-0.5831	0.3458	15.7161	18.52	3.33E-06	2.12E-07
-0.2223	-0.5526	0.3303	15.0144	18.74	3.33E-06	2.22E-07
-0.2073	-0.5222	0.3149	14.3126	18.96	3.33E-06	2.33E-07
-0.1924	-0.4918	0.2994	13.6109	19.18	3.33E-06	2.45E-07
-0.1774	-0.4614	0.2840	12.9092	19.40	3.33E-06	2.58E-07

-0.1624	-0.4309	0.2686	12.2074	19.61	3.33E-06	2.73E-07
-0.1474	-0.4005	0.2531	11.5057	19.83	3.33E-06	2.90E-07
-0.1324	-0.3701	0.2377	10.8040	20.05	3.33E-06	3.08E-07
-0.1174	-0.3396	0.2222	10.1022	20.27	3.33E-06	3.30E-07
-0.1174	-0.3244	0.2070	9.4107	20.48	3.33E-06	3.54E-07
-0.1174	-0.3092	0.1918	8.7191	20.70	3.33E-06	3.82E-07
-0.1024	-0.2940	0.1916	8.7089	20.92	3.33E-06	3.83E-07
-0.1024	-0.2788	0.1764	8.0174	21.14	3.33E-06	4.16E-07
-0.1024	-0.2636	0.1612	7.3258	21.36	3.33E-06	4.55E-07
-0.1024	-0.2636	0.1612	7.3258	21.57	3.33E-06	4.55E-07
-0.1024	-0.2484	0.1460	6.6342	21.79	3.33E-06	5.02E-07
-0.1024	-0.2484	0.1460	6.6342	22.01	3.33E-06	5.02E-07
-0.1024	-0.2331	0.1307	5.9427	22.23	3.33E-06	5.61E-07
-0.1024	-0.2331	0.1307	5.9427	22.45	3.33E-06	5.61E-07
-0.1024	-0.2331	0.1307	5.9427	22.66	3.33E-06	5.61E-07
-0.1024	-0.2179	0.1155	5.2511	22.88	3.33E-06	6.35E-07
-0.0874	-0.2179	0.1305	5.9325	23.10	3.33E-06	5.62E-07
-0.0874	-0.2027	0.1153	5.2409	23.32	3.33E-06	6.36E-07
-0.0874	-0.2027	0.1153	5.2409	23.54	3.33E-06	6.36E-07
-0.0874	-0.2027	0.1153	5.2409	23.75	3.33E-06	6.36E-07
-0.0874	-0.1875	0.1001	4.5494	23.97	3.33E-06	7.33E-07
-0.0874	-0.1875	0.1001	4.5494	24.19	3.33E-06	7.33E-07
-0.0874	-0.1875	0.1001	4.5494	24.41	3.33E-06	7.33E-07
-0.0874	-0.1723	0.0849	3.8578	24.63	3.33E-06	8.64E-07
-0.0724	-0.1723	0.0999	4.5392	24.84	3.33E-06	7.34E-07
-0.0724	-0.1723	0.0999	4.5392	25.06	3.33E-06	7.34E-07
-0.0724	-0.1571	0.0846	3.8476	25.28	3.33E-06	8.66E-07
-0.0724	-0.1571	0.0846	3.8476	25.50	3.33E-06	8.66E-07
-0.0724	-0.1571	0.0846	3.8476	25.72	3.33E-06	8.66E-07
-0.0724	-0.1419	0.0694	3.1561	25.93	3.33E-06	1.06E-06
-0.0724	-0.1419	0.0694	3.1561	26.15	3.33E-06	1.06E-06
-0.0724	-0.1419	0.0694	3.1561	26.37	3.33E-06	1.06E-06
-0.0724	-0.1266	0.0542	2.4645	26.59	3.33E-06	1.35E-06
-0.0724	-0.1266	0.0542	2.4645	26.80	3.33E-06	1.35E-06
-0.0574	-0.1266	0.0692	3.1459	27.02	3.33E-06	1.06E-06
-0.0574	-0.1266	0.0692	3.1459	27.24	3.33E-06	1.06E-06
-0.0574	-0.1114	0.0540	2.4543	27.46	3.33E-06	1.36E-06
-0.0574	-0.1114	0.0540	2.4543	27.68	3.33E-06	1.36E-06
-0.0574	-0.1114	0.0540	2.4543	27.89	3.33E-06	1.36E-06
-0.0574	-0.1114	0.0540	2.4543	28.11	3.33E-06	1.36E-06
-0.0574	-0.1114	0.0540	2.4543	28.33	3.33E-06	1.36E-06
-0.0574	-0.1114	0.0540	2.4543	28.55	3.33E-06	1.36E-06
-0.0574	-0.1114	0.0540	2.4543	28.77	3.33E-06	1.36E-06
-0.0574	-0.0962	0.0388	1.7628	28.98	3.33E-06	1.89E-06
-0.0574	-0.0962	0.0388	1.7628	29.20	3.33E-06	1.89E-06
-0.0574	-0.0962	0.0388	1.7628	29.42	3.33E-06	1.89E-06
-0.0574	-0.0962	0.0388	1.7628	29.64	3.33E-06	1.89E-06
-0.0574	-0.0962	0.0388	1.7628	29.86	3.33E-06	1.89E-06

-0.0574	-0.0962	0.0388	1.7628	30.07	3.33E-06	1.89E-06
-0.0574	-0.0962	0.0388	1.7628	30.29	3.33E-06	1.89E-06
-0.0574	-0.0810	0.0236	1.0712	30.51	3.33E-06	3.11E-06
-0.0424	-0.0810	0.0386	1.7526	30.73	3.33E-06	1.90E-06
-0.0424	-0.0810	0.0386	1.7526	30.95	3.33E-06	1.90E-06
-0.0424	-0.0810	0.0386	1.7526	31.16	3.33E-06	1.90E-06
-0.0424	-0.0810	0.0386	1.7526	31.38	3.33E-06	1.90E-06
-0.0424	-0.0810	0.0386	1.7526	31.60	3.33E-06	1.90E-06
-0.0275	-0.0658	0.0383	1.7424	31.82	3.33E-06	1.91E-06
-0.0275	-0.0658	0.0383	1.7424	32.04	3.33E-06	1.91E-06
-0.0275	-0.0658	0.0383	1.7424	32.25	3.33E-06	1.91E-06
-0.0275	-0.0658	0.0383	1.7424	32.47	3.33E-06	1.91E-06
-0.0275	-0.0658	0.0383	1.7424	32.69	3.33E-06	1.91E-06
-0.0275	-0.0658	0.0383	1.7424	32.91	3.33E-06	1.91E-06
-0.0275	-0.0658	0.0383	1.7424	33.12	3.33E-06	1.91E-06
-0.0275	-0.0658	0.0383	1.7424	33.34	3.33E-06	1.91E-06
-0.0125	-0.0658	0.0533	2.4238	33.56	3.33E-06	1.38E-06
-0.0125	-0.0658	0.0533	2.4238	33.78	3.33E-06	1.38E-06
-0.0125	-0.0658	0.0533	2.4238	34.00	3.33E-06	1.38E-06
-0.0125	-0.0658	0.0533	2.4238	34.21	3.33E-06	1.38E-06
-0.0125	-0.0658	0.0533	2.4238	34.43	3.33E-06	1.38E-06
-0.0125	-0.0658	0.0533	2.4238	34.65	3.33E-06	1.38E-06
-0.0125	-0.0658	0.0533	2.4238	34.87	3.33E-06	1.38E-06
-0.0125	-0.0658	0.0533	2.4238	35.09	3.33E-06	1.38E-06
-0.0125	-0.0658	0.0533	2.4238	35.30	3.33E-06	1.38E-06
0.0025	-0.0658	0.0683	3.1052	35.52	3.33E-06	1.07E-06
0.0025	-0.0506	0.0531	2.4136	35.74	3.33E-06	1.38E-06
0.0025	-0.0506	0.0531	2.4136	35.96	3.33E-06	1.38E-06
0.0025	-0.0506	0.0531	2.4136	36.18	3.33E-06	1.38E-06
0.0025	-0.0506	0.0531	2.4136	36.39	3.33E-06	1.38E-06
0.0025	-0.0506	0.0531	2.4136	36.61	3.33E-06	1.38E-06
0.0025	-0.0506	0.0531	2.4136	36.83	3.33E-06	1.38E-06
0.0175	-0.0506	0.0681	3.0950	37.05	3.33E-06	1.08E-06
0.0175	-0.0506	0.0681	3.0950	37.27	3.33E-06	1.08E-06
0.0175	-0.0506	0.0681	3.0950	37.48	3.33E-06	1.08E-06
0.0175	-0.0506	0.0681	3.0950	37.70	3.33E-06	1.08E-06
0.0175	-0.0506	0.0681	3.0950	37.92	3.33E-06	1.08E-06
0.0175	-0.0506	0.0681	3.0950	38.14	3.33E-06	1.08E-06
0.0175	-0.0506	0.0681	3.0950	38.35	3.33E-06	1.08E-06
0.0175	-0.0506	0.0681	3.0950	38.57	3.33E-06	1.08E-06
0.0175	-0.0506	0.0681	3.0950	38.79	3.33E-06	1.08E-06
0.0175	-0.0506	0.0681	3.0950	39.01	3.33E-06	1.08E-06
0.0175	-0.0354	0.0529	2.4035	39.23	3.33E-06	1.39E-06
0.0175	-0.0354	0.0529	2.4035	39.44	3.33E-06	1.39E-06
0.0325	-0.0506	0.0831	3.7764	39.66	3.33E-06	8.83E-07
0.0175	-0.0354	0.0529	2.4035	39.88	3.33E-06	1.39E-06
0.0325	-0.0354	0.0679	3.0849	40.10	3.33E-06	1.08E-06
0.0325	-0.0354	0.0679	3.0849	40.32	3.33E-06	1.08E-06

0.0325	-0.0354	0.0679	3.0849	40.53	3.33E-06	1.08E-06
0.0325	-0.0354	0.0679	3.0849	40.75	3.33E-06	1.08E-06
0.0325	-0.0354	0.0679	3.0849	40.97	3.33E-06	1.08E-06
0.0325	-0.0354	0.0679	3.0849	41.19	3.33E-06	1.08E-06
0.0325	-0.0354	0.0679	3.0849	41.41	3.33E-06	1.08E-06
0.0325	-0.0354	0.0679	3.0849	41.62	3.33E-06	1.08E-06
0.0325	-0.0354	0.0679	3.0849	41.84	3.33E-06	1.08E-06
0.0325	-0.0354	0.0679	3.0849	42.06	3.33E-06	1.08E-06
0.0325	-0.0354	0.0679	3.0849	42.28	3.33E-06	1.08E-06
0.0325	-0.0354	0.0679	3.0849	42.50	3.33E-06	1.08E-06
0.0325	-0.0354	0.0679	3.0849	42.71	3.33E-06	1.08E-06
0.0325	-0.0354	0.0679	3.0849	42.93	3.33E-06	1.08E-06
0.0373	-0.0354	0.0727	3.3029	43.15	3.33E-06	1.01E-06
0.0475	-0.0354	0.0829	3.7663	43.37	3.33E-06	8.85E-07
0.0475	-0.0354	0.0829	3.7663	43.59	3.33E-06	8.85E-07
0.0475	-0.0354	0.0829	3.7663	43.80	3.33E-06	8.85E-07
0.0475	-0.0354	0.0829	3.7663	44.02	3.33E-06	8.85E-07
0.0475	-0.0354	0.0829	3.7663	44.24	3.33E-06	8.85E-07
0.0475	-0.0354	0.0829	3.7663	44.46	3.33E-06	8.85E-07
0.0475	-0.0354	0.0829	3.7663	44.67	3.33E-06	8.85E-07
0.0475	-0.0354	0.0829	3.7663	44.89	3.33E-06	8.85E-07
0.0475	-0.0354	0.0829	3.7663	45.11	3.33E-06	8.85E-07
0.0475	-0.0201	0.0676	3.0747	45.33	3.33E-06	1.08E-06
0.0475	-0.0201	0.0676	3.0747	45.55	3.33E-06	1.08E-06
0.0475	-0.0201	0.0676	3.0747	45.76	3.33E-06	1.08E-06
0.0475	-0.0201	0.0676	3.0747	45.98	3.33E-06	1.08E-06
0.0475	-0.0201	0.0676	3.0747	46.20	3.33E-06	1.08E-06
0.0475	-0.0201	0.0676	3.0747	46.42	3.33E-06	1.08E-06
0.0475	-0.0201	0.0676	3.0747	46.64	3.33E-06	1.08E-06
0.0475	-0.0201	0.0676	3.0747	46.85	3.33E-06	1.08E-06
0.0475	-0.0201	0.0676	3.0747	47.07	3.33E-06	1.08E-06
0.0475	-0.0201	0.0676	3.0747	47.29	3.33E-06	1.08E-06
0.0475	-0.0201	0.0676	3.0747	47.51	3.33E-06	1.08E-06
0.0475	-0.0049	0.0524	2.3831	47.73	3.33E-06	1.40E-06
0.0475	-0.0049	0.0524	2.3831	47.94	3.33E-06	1.40E-06
0.0475	-0.0049	0.0524	2.3831	48.16	3.33E-06	1.40E-06
0.0475	-0.0049	0.0524	2.3831	48.38	3.33E-06	1.40E-06
0.0475	-0.0049	0.0524	2.3831	48.60	3.33E-06	1.40E-06
0.0475	-0.0049	0.0524	2.3831	48.82	3.33E-06	1.40E-06
0.0475	-0.0049	0.0524	2.3831	49.03	3.33E-06	1.40E-06
0.0475	-0.0049	0.0524	2.3831	49.25	3.33E-06	1.40E-06
0.0475	0.0103	0.0372	1.6916	49.47	3.33E-06	1.97E-06
0.0475	0.0103	0.0372	1.6916	49.69	3.33E-06	1.97E-06
0.0475	0.0103	0.0372	1.6916	49.90	3.33E-06	1.97E-06
0.0475	0.0103	0.0372	1.6916	50.12	3.33E-06	1.97E-06
0.0475	0.0103	0.0372	1.6916	50.34	3.33E-06	1.97E-06
0.0475	0.0103	0.0372	1.6916	50.56	3.33E-06	1.97E-06
0.0475	0.0103	0.0372	1.6916	50.78	3.33E-06	1.97E-06

0.0475	0.0103	0.0372	1.6916	50.99	3.33E-06	1.97E-06
0.0475	0.0153	0.0322	1.4633	51.21	3.33E-06	2.28E-06
0.0475	0.0255	0.0220	1.0000	51.43	3.33E-06	3.33E-06
0.0475	0.0255	0.0220	1.0000	51.65	3.33E-06	3.33E-06
0.0475	0.0255	0.0220	1.0000	51.87	3.33E-06	3.33E-06
0.0475	0.0255	0.0220	1.0000	52.08	3.33E-06	3.33E-06
0.0475	0.0255	0.0220	1.0000	52.30	3.33E-06	3.33E-06
0.0475	0.0255	0.0220	1.0000	52.52	3.33E-06	3.33E-06

Annex 5

Arya & Paris method results

Arya & Paris method detailed test results for soil type 01 (SILTY SAND)

Particle diameter/ (mm)	Model parameter, α	Passing percentage/(%)	θv_i, (%) (Arya)	θv_i*, (%) (Arya & Paris)	Matric suction, $(u_a\text{-}u_w)$ /(kPa)
9.5000	0.50	97.17	50.451	50.451	0.1
6.3000	0.90	95.31	49.025	49.738	0.1
4.7500	1.10	92.83	48.084	48.554	0.1
2.0000	2.00	84.22	46.832	47.458	0.5
1.1800	2.60	74.21	42.492	44.662	6.3
0.6000	2.36	51.27	37.440	39.966	54.8
0.4250	2.34	41.04	25.867	31.653	84.3
0.3000	2.22	35.04	20.706	23.287	107.8
0.2120	2.05	30.32	17.680	19.193	124.1
0.1500	1.90	26.51	15.294	16.487	137.1
0.0630	1.54	20.28	13.376	14.335	148.5
0.0441	1.53	19.06	10.229	11.802	171.9
0.0319	1.42	16.62	9.615	9.922	178.7
0.0228	1.38	15.40	8.385	9.000	203.7
0.0165	1.32	12.96	7.770	8.078	245.6
0.0121	1.32	11.75	6.541	7.156	344.9
0.0087	1.28	10.53	5.926	6.233	408.6
0.0063	1.25	7.53	5.311	5.619	551.9
0.0045	1.30	6.31	3.799	4.555	1241.9
0.0032	1.30	5.70	3.184	3.492	1837.7
0.0023	1.28	4.48	2.877	3.031	2711.5
0.0020	1.30	3.83	2.262	2.570	3684.6
0.0010	1.27	0.00	1.930	2.096	9135.9

Arya & Paris method detailed test results for soil type 02 (SANDY SILT)

Particle diameter/ (mm)	**Model parameter, α**	**Passing percentage/(%)**	**θv_i, (%) (Arya)**	**θv_i^*, (%) (Arya & Paris)**	**Matric suction, $(u_a - u_w)$ /(kPa)**
2.0000	0.70	97.94	53.695	53.695	0.1
1.1800	1.20	91.05	52.586	53.141	0.4
0.6000	1.70	82.31	48.889	50.738	4.1
0.4250	1.90	77.68	44.197	46.543	12.1
0.3000	1.95	74.69	41.710	42.953	26.7
0.2120	1.75	70.00	40.102	40.906	33.8
0.1500	1.65	64.44	37.586	38.844	47.0
0.0630	1.39	54.85	34.600	36.093	60.8
0.0429	1.38	51.90	29.452	32.026	83.5
0.0311	1.32	46.10	27.868	28.660	103.0
0.0222	1.29	43.90	24.753	26.311	117.5
0.0158	1.24	41.00	23.572	24.163	134.4
0.0117	1.20	38.10	22.015	22.794	146.2
0.0085	1.16	33.40	20.458	21.236	163.0
0.0061	1.15	29.00	17.934	19.196	222.5
0.0044	1.15	26.10	15.572	16.753	325.7
0.0031	1.15	23.10	14.014	14.793	493.1
0.0022	1.15	20.20	12.404	13.209	743.0
0.0012	1.15	19.20	10.846	11.625	1424.7
0.0010	1.15	0.00	10.309	10.578	2275.1