BIOGRAPHICAL SKETCH

Prince Turkson was born on December 19, 1988 and grew up in Accra, Ghana. He graduated with Honors in B.S Civil Engineering from Kwame Nkrumah University of Science and Technology, Ghana, in June 2011. After his Bachelors, he worked with WBHO Construction Ltd, gaining first-hand experience in mine tailings dam and general earthworks construction. Prince gained admission into Tennessee Technological University to pursue a Master's degree in Civil Engineering in Fall 2017, with sub-discipline specialization in Geotechnical Engineering. He loves watching and playing soccer, and enjoys travelling.

EDUCATION

BSc. Civil Engineering

Kwame Nkrumah University of Science and Technology, Ghana

2007 – 2011

College of Engineering

TENNESSEE TECH

The Department of

Civil and Environmental Engineering

Announces the Thesis Defense

of

Prince Turkson

In Partial Fulfillment of the Requirements

For the degree of

Masters in Civil Engineering

Friday, November 9, 2018

7:30 AM

Held in

PRESCOTT HALL ROOM 425

FIELD OF STUDY

Civil and Environmental Engineering

THESIS TOPIC

Effect of initial suction and levee foundation conditions on the saturated zone during flooding for rapid drawdown analysis

EXAMINING COMMITTEE

Dr. Daniel VandenBerge – Chairperson

Dr. Alfred Kalyanapu

Dr. Joseph Asante

ABSTRACT

Transient seepage analysis of rapid drawdown (RDD) loading condition for dams and levees assumes a state of full saturation prior to drawdown. This assumption is likely incorrect for levees due to the relatively short duration of floods prior to drawdown; and hence requires that methods be developed to estimate the extent of saturated zone within levees after floods for undrained rapid drawdown analysis. Levees can be founded on soils with a range of permeability, and therefore it is important to investigate how levee foundations influence levee through-seepage under transient conditions. Also the initial conditions of a levee prior to flooding play an important role in estimating the hydraulic conductivity of soils as seepage progresses through levees under transient conditions. The Duncan, Wright and Wong (DWW) multistage method for undrained RDD analysis requires an analyst to specify the position of the phreatic surface prior to drawdown, and often times engineers have assumed steady state flow conditions for analysis of levees. As part of a broader research commenced by Poston (2018), this thesis presents methods for predicting the position of the phreatic surface within levees at the start of drawdown by considering: (i) levee foundation soils and (ii) initial soil suction within levees.

The method will allow for the prediction of start to drawdown phreatic surface for undrained RDD analysis, and may be applied to varying levee conditions and flood scenarios.