



October 30, 2020

To Whom It May Concern,

It is my great pleasure to provide Mr. Beshoy Riad a reference letter for his application to the 2020 TriDurLE Outstanding Student Award. I am currently Beshoy's adviser for his PhD and know his academic capability and personality very well. I strongly believe that he is an excellent candidate for this Outstanding Student Award.

My association with Beshoy started in 2017 when he came to the Missouri University of Science and Technology (Missouri S&T) to pursue his PhD degree under my supervision. As you can see from Beshoy's resume, he has several years of working experience before he come to Missouri S&T. I am familiar with his MS adviser who also spoke highly of him in terms of both research potential and personality. Beshoy's academic record before coming to Missouri S&T was superb. This was the reason why I made an offer to bring him to my research group without any hesitation.

I was impressed with Beshoy in every aspect soon after he arrived at Missouri S&T to start his graduate studies. His performance while at Missouri S&T remained exceptional. I served as his instructor in the graduate courses CE6001 "Unsaturated Soil Mechanics" and CE6716 "Soil Stabilization." Beshoy was one of the top students in these large graduate courses, and he earned an "A" in each course. Beshoy is smart, hardworking, and mature. He has developed a sound understanding of the theory underlying each of the key engineering principles, but at the same time he is keen to understand their practical impact. Beshoy has a critical mind, and he possesses a sound understanding of mechanics, mathematics, and engineering. Beshoy is an independent thinker. He is inquisitive and asks sophisticated questions. He can clearly perform sound research. Beshoy has unlimited potential for making significant contributions in civil engineering. There is nothing his mind cannot grasp.

Beshoy's greatest strengths are his innate intelligence, scientific maturity, and engineering judgment. In this regard, he is our best graduate student in recent years. He strengthened and broadened his skill sets by completing courses in his major field of geotechnical engineering and in his minor fields of unsaturated soil mechanics. While working as research assistant at Missouri S&T, Beshoy served as the Teaching Assistant for CE3715 "Fundamental of Geotechnical Engineering." He did a wonderful job to teach the students how to perform laboratory tests in our geotechnical labs.

At present, Beshoy is working on a TriDurLE project entitled "Numerical Simulation of Pavement Installed with Wicking Geotextile in Responses to Climatic Conditions." As you know, water within pavement layers is a principal cause of pavement deterioration. Conventional drainage system relies on gravity to drain the gravity water only. It cannot drain the capillary water out of the pavement structure. Consequently, not matter how well the road is constructed, it will unavoidably deteriorate with time due to increase in water content caused by capillary rise and other factors. Recently, a novel wicking fabric was used to effectively absorb and remove the capillary water in the pavement structure by taking advantage of the less than 99% of RH in the atmosphere. By connecting the soils inside the pavement with atmosphere

and continuously removing capillary water, we can use the same or weaker material to achieve the same or much better performance in the pavement structure. Most importantly, we could have a sustainable pavement system which will not degrade with time. Instead the performance might be improved with time if the drying process is continued. This will have significant impact on our transportation infrastructure and Beshoy is trying his best to make the game-change technique into reality. In this project, Beshoy will be working on advanced climate-vegetation-soil-geosynthetic interaction numerical simulations to validate the working mechanisms of the wicking geotextile. His excellent work in all areas has led to four journal papers in prestigious journals in geotechnical engineering, and 3 peer-reviewed conference proceedings. He has received three awards

Beshoy is a genuine, decent, energetic, and very likeable person. He has a warm personality and gets along very well with all of the people here. Beshoy is a team player. He does some of his work independently, but shares it and works well as part of my larger research team and among other Ph.D. students at Missouri S&T. Everyone enjoys having him here. I would unreservedly recommend Beshoy for his application for the 2020 TriDurLE Outstanding Student Award. I do not have the least doubt that he will succeed in whatever he wants. If you would like further elaboration, please feel free to contact me.

Yours very truly,



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