REBUPLIC OF TURKEY
ESKISEHIR OSMANGAZI UNIVERSITY
DEPARTMENT OF CIVIL ENG. AND ARCH.
CIVIL ENG. DIVISION

15.08.2018

Dear Prof. Ing. **Jaroslav Menčík**, CSc., the Head of the Commision,

I would like to express my gratitude and appreciation for assigning me as a reviewer of the dissertation titled 'Analysis of Mechanically Stabilized Earth Wall, Reinforced Earth Structures' written by Eren Balaban and supervised by Dr. Aleš Šmejda. The work presented in the thesis has a lot of work and is definitely ready to defend. Some comments will be presented in the following part. The first part will answer some questions required to evaluate the thesis and the second part will conclude some notes that I think it would improve the writing and backbone of the thesis.

Should you have any question/comment do not hesitate to contact me.

Sincerely..

Ass.Prof.Dr. Kamil B. AFACAN, Vice Chair
Department of Civil Eng. and Arch.
Civil Engineering Division

REBUPLIC OF TURKEY
ESKISEHIR OSMANGAZI UNIVERSITY
DEPARTMENT OF CIVIL ENG. AND ARCH.
CIVIL ENG. DIVISION

Part 1:

a) **up-to dateness of the topic**

The topic is an interesting and hot topic and widely studied all over the world. Mostly there is some FEM modeling or lab testing in PhD thesises but this dissertation combines them together therefore it is a great set of work.

b) **selected methods of writing**

There are some minor notes that would improve the writing but overall is good.

c) **whether the work fulfilled the objectives**

I read and evaluated the proposal and it definitely fulfilled the purpose of the studies.

d) **the results of the dissertation thesis adding whether and what new findings it has brought**

The need of the calibration of the FEM is always there and this kind of studies help to improve FEM models or new material models. The dissertation shows how much lab testing and finite element methods correlates and they have generally a good match. There are new lab data that would help constitute new material models to be used in FEM.

e) **significance for profession or scientific development**

It does not only consist of analysis comparing the lab and FEM estimations about the Mechanically Stabilized Walls but also helps engineers how to model their design in practice.

f) **the extend and quality of the published works related to the dissertation thesis**

There are more than enough literature studies in the thesis and most of them are really good publications. I would also expect 2 SCI-Index publications from this thesis.

g) **whether the dissertation thesis meets the requirements for creative scientific work for awarding the title Ph.D.**

For PhD title, there are two parts that should qualify a good percentage. First part is the academic studies (literature, purpose of the work, lab studies, FEM models, etc.) and in my opinion, this dissertation qualifies as creative enough to be awarded the Phd title. The second part is the oral exam and I am sure he will do great on that, too.

REBUPLIC OF TURKEY
ESKISEHIR OSMANGAZI UNIVERSITY
DEPARTMENT OF CIVIL ENG. AND ARCH.
CIVIL ENG. DIVISION

Part 2:

As a curious reader, I have some questions to be answered. I believe these answers help readers to understand the topic better. There are also some problems with the general format of the text along with the grammar and comments are presented below.

1- There is enough explaination about the literature studies and their conflictions with the reality however the purpose of the study is not well explained in the chapter 3. What does this study explain clearly that was not properly worked in the literature? The difference between the literature and this study should be clarified precisely.

2- The chapter of methods and methology seems a bit weak to show the test program in a PhD thesis. I would suggest Eren to start with an introduction: what tests he should run to understand the behavior of backfills. Then he can list the tests he run with different amount of the mixtures etc.

3- Regarding the part 5.2, I would expect some explanation of Abaqus. It would be fair to give some credit to the finite element method.

4- What does the y-axis stand for in Figure 5.6?

5- As a preparation to the possible paper publication, I would suggest to show a screen shot of the abaqus modeling comparing to the experiments.

6- Table 5.9 and 5.10 are good to compare FEM and experiment results. The first line of Table 5.10 can be misinterpreted that 0.46 kPa of cohesion of sand can be considered as 0 therefore the difference should not be reported as %100.

7- The sketch of designed walls should be shown at the beginning of the chapter 6. Phd thesises are like explanatory books therefore I would explain a bit the calculations in detail presented in Table 6.1 and Table 6.2.

8- Page 36 and 37 show some formulations about the geotextile capacity. It would be better to talk about geotextiles and the calculation of their strength in chapter even before the test program.

9- The figure 6.1 shows the horizontal displacements recorded in the lab for differen mixtures and some of the loading levels are missing. Did the walls fail already? If so, it should be mentioned in the text. Another thing is that the y axis should be straightened.
10- How did you decide the percentages of the tire mixtures? From the experimental results, %5 of tire mixtures would be a better option compared to %30 in order to understand the waste effect on the horizontal displacement.
11- The mechanisms of settlement of clay and sand are different. How much settlement did you estimate for clay and sand before the experiments? Are they reasonable?
12- Table 6.18 shows the properties of the soil used in the Plaxis. How did you estimate the modulus of elasticity of the soil layers?
13- It would be good to show a screenshot of results of Plaxis model presented in Table 6.20.
14- What does FHWA method offer? It should be explained in the literature review part.
15- How were the factor of safities evaluated? Did you use Plaxis or Abacus or something else? There is no reference to the fem.
16- How were the modulus of elasticities estimated in Table 7.1 and 7.2?

Grammar/Structure

17- No comma after because
18- Literature studies, especially experimental ones, should be explained in past tense.
19- Two consequiteve sentence or paragraphs should not start with the same structure of the sentence.
20- At page 7, there needs to be an indent for the first and the last paragraphs
21- No comma after it is seen that or it is observed that
22- In chapter 4, lines are not justified.
23- The seperator is not clear. Sometimes comma is used, sometimes point. It should be consistent throughout the text. Table 5.8 is a very clear example.
24- If simple present was chosen to explain the text, then it should be continued as so. Sometimes the tense changes to past present.
25- kN/m^2/m is not a well presentation it should be either kPa/m or $kN/m^2/m$ in Table 6.3.
26- The y axis of Figure 6.5 a-b should be corrected.
27- In Table 6.20, the font size should be corrected.
28- Table 6.29 and Table 6.30 should include the units of the forces