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Faculty of Civil Engineering
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Opponent's review of the Doctoral Thesis

Candidate   J. Zitny

Title of the doctoral thesis   Probabilistic Assessment of Equilibrium of Steel Railway Bridges based on Wind Tunnel Testing, Traffic and Wind Records

Study Programme phD

Tutor   Prof. Ing. Pavel Ryjacek

Opponent   Prof. Dr.-Ing. Dimitris Diamantidis

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Topicality of the doctoral thesis theme
Commentary: The probabilistic examination of the equilibrium of steel railway bridges based on performed wind tunnel tests is a very appropriate topic for a phD research; it is worth of investigation and provides results of practical use for code and standards development.

☒ excellent	☐ above average	☐ average	☐ below average	☐ poor

Fulfilment of the doctoral thesis objectives
Commentary: The thesis has in general a clear set up. The candidate demonstrates creative abilities in his research field and the thesis meets the required standard of a doctoral thesis to justify the award of a PhD by meeting its defined objectives.

☐ excellent	☒ above average	☐ average	☐ below average	☐ poor

Research methods and procedures
Commentary: The research methods used in the dissertation are well structured and the obtained results are correctly interpreted. The methods include wind tunnel tests, probabilistic modelling and implementation in standards. The various parts of the thesis are thereby connected in a logical and rational fashion. A conclusion part of each chapter could be beneficial.

☐ excellent	☒ above average	☐ average	☐ below average	☐ poor

Results of the doctoral thesis – dissertant's concrete achievements
Commentary: The thesis represents a contribution to the scientific basis. Some of the results could be presented in a more clear way (see comments below) and also for example: i) what are the experimental uncertainties in the tests or ii) are the max and min values in the box plots quantiles?

☐ excellent	☒ above average	☐ average	☐ below average	☐ poor

Importance for practice and for development within a branch of science

Commentary: The innovative results have a usuful implementation in practice and especially in design and assessment standards such as the future generation of the Eurocodes.

☐ excellent ☒ above average ☐ average ☐ below average ☐ poor

Formal layout of the doctoral thesis and the level of language used

Commentary: The language used is acceptable; however with respect to the layout, style and associated level of precision improvements are necessary to clarify and justify better the obtained results as well as the used parameters. The examiner points below under remarks some of these points, but recommends a thorough check of the complete thesis from this viewpoint.

☐ excellent ☐ above average ☒ average ☐ below average ☐ poor

Statement on compliance with citation ethics

The literature review is concise, covering the main relevant theories and empirical studies in this area. The list of references proves the sufficient familiarity of the Candidate with the scientific literature. The own part of research is clear and highlighted through the whole thesis.

Remarks

The examiner points below some technical/editorial points for improvement:

a) Introduction: present a brief summary of each chapter;

b) clarify the terms chapter and section in the text; (example chapter 5.12.5.4.4?? page 5)

c) explain n, p, m in the figure (Figure 2.4)

d) chapter 3 is very short (mainly points) and can be integrated in chapter 2;

e) Table 4.1 is crucial: explain b/dtot for example in the used bridge data; is d used for depth or for height: clarify through a list of symbols. also v in page 50 or V?

f) Figure 5.1: delete climatic in the title

g) refer in Figures 5.11, 5.12,… to Table 4.2 for train categories; Figures should be each one self readable

h) Correct title of Fig. 5.28 to be compatible with the text (part a) and b));

i) mention/explain Figures 5.29, 5.30, 5.31, 5.34, 5.35, 5.36 and 5.38 in the text;

j) Figures 5.39, 5.40: truss spacing in mm and not m;

k) Chapter 6: explain b/dtot with reference to Table 1: see e);

l) Figure 6.1: explain dotted lines; it is a crucial figure should be better explained with reference to b/dtot;

m) page 82: Figure 6.2 right plot? not clear;

n) Figures 9.6 to 9.13: use larger lettering for notations of axes, explain utilization level (better word ratio) use the in title words in addition to the symbols for vb,lim, note somewhere that I to V are wind zones.

o) Figure 9.15: illustrate zw (center of wind…), depth, etc..in order to better explain the example calculation;

o) split conclusions into three parts i) wind and wind tunnel analyses b) probabilistic reliability analyses c) recommendations for future research.

p) some numbered pages appear blanc, in others the distance of text to the bottom varies significantly; the page number is in a too far up position.

q) present a list of symbols!

r) each figure should be self explenatory also in terms of symbols; several figures merged in one should be denoted with a), b), …..

s) check references for compatibility: conference title to be provided in words including location, use pp. or not etc…

Final assessment of the doctoral thesis

The thesis is focused on an important topic and contains a number of useful research findings. After a successful defence, it is recommended to award the Candidate with the title Ph.D.

Following a successful defence of the doctoral thesis I recommend the granting of the Ph.D. degree

yes ☒ *no* ☐

Date: Regensburg
14/04/2023

Opponent's signature: ...