ISSMGE - TC201

Geotechnical Aspects of Dikes and Levees

Newsletter July 2018

Dear TC member,

This is the fifteenth newsletter of the ISSMGE Technical Committee 201: geotechnical aspects of dikes and levees. The intention of the newsletter is to keep all members informed on coming activities of our TC and the ISSMGE.

Cor Zwanenburg (Chairman TC201)
Martin Pohl (Secretary TC201)

1. Proposal for up-date terms of reference

It has been a while ago that the terms of reference, ToR, of our TC have been updated. The ambition is to have an updated ToR after the summer holidays. Please send your comments to the proposal for updated ToR, as shown below, before September 10th to Cor Zwanenburg (cor.zwanenburg@deltares.nl). After collected the comments, the new updated ToR will be published on the website from September 11th .

Proposed update:

Objective 1: Dissemination

Discussion on state of the art techniques and developing the science and engineering in order to increase fundamental understanding and modelling of strength, deformation and erosion behaviour of soils and failure processes of water retaining structures like dikes, dunes, (underwater) dams. The gained fundamental understanding is essential for designing and building future proof dikes. Especially for urban areas, with limited space and large number of lives and economic value to protect, the design of future proof dikes faces serious challenges. For these conditions hard elements, like sheet pile walls or semi hard elements, like soil mixing techniques are required to construct water retaining structures that fulfil the design criteria. This opens a new discussion on soil – structure interaction at extreme loading conditions.

Objective 2: Guidelines and Recommendations

Producing technical reports and encouraging international trainings, workshops and meetings in this research field and exchange experience and ideas on improving communication to other researchers, public and politics for more alertness and awareness.

Objective 3: Conference Assistance

Contributions to the international congresses of the society to increase the quality of design by including experience, such as large scale tests, case histories, failures, measurements, simulations and artificial knowledge. For future events TC201 will organize a workshop during the Pan American conference, Canjun, Mexico 2019 and contribute to the ECSMGE conference in Reykjavik 2019.

Objective 4: Industry links

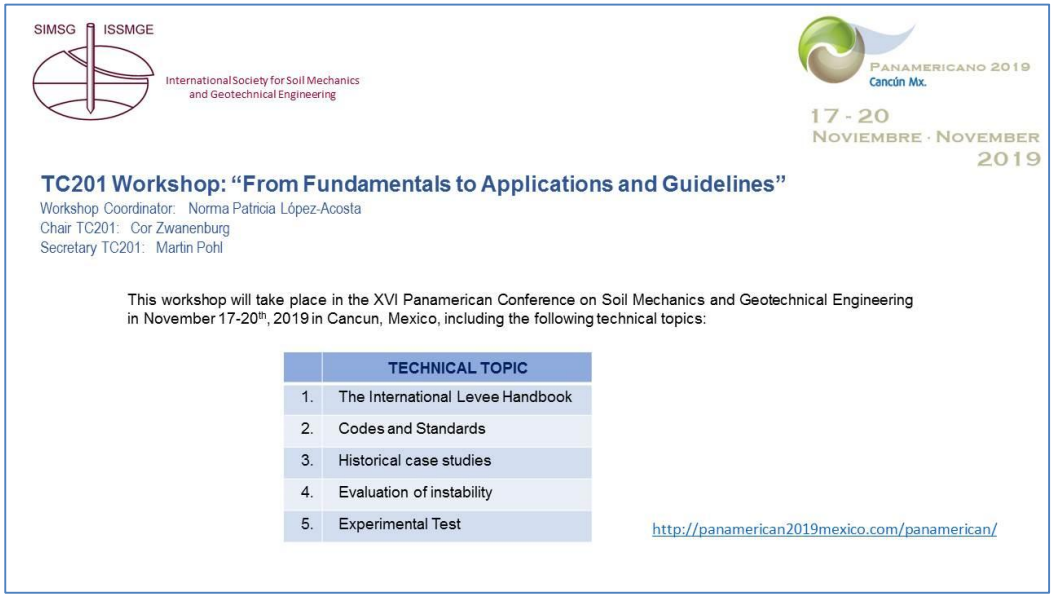
Producing technical reports and encouraging international trainings, workshops and meetings in this research field and exchange experience and ideas on improving communication to other researchers, public and politics for more alertness and awareness.

2. New Member
Sarat Das (Professor, Civil Engineering Department, Indian Institute of Technology(ISM), India) has been nominated as a member to TC201. We warmly welcome Sarat Das and are looking forward to a close collaboration.

3. Joint paper; "Lessons learned from dike failures in the past" is published
One of the TC201 ambitions is to encourage writing (joint) publications. As announced in previous newsletters a selection of TC201 members has produced a joint paper entitled: "Lessons learned from dike failures in the past" for the ISSMGE international journal on geotechnical case histories.

The paper has recently been accepted and is available through:
https://www.geocasehistoriesjournal.org/pub

4. TC201 Workshop during the 16th Pan American Conference on Soil Mechanics and Geotechnical Engineering, Canjun November 2019

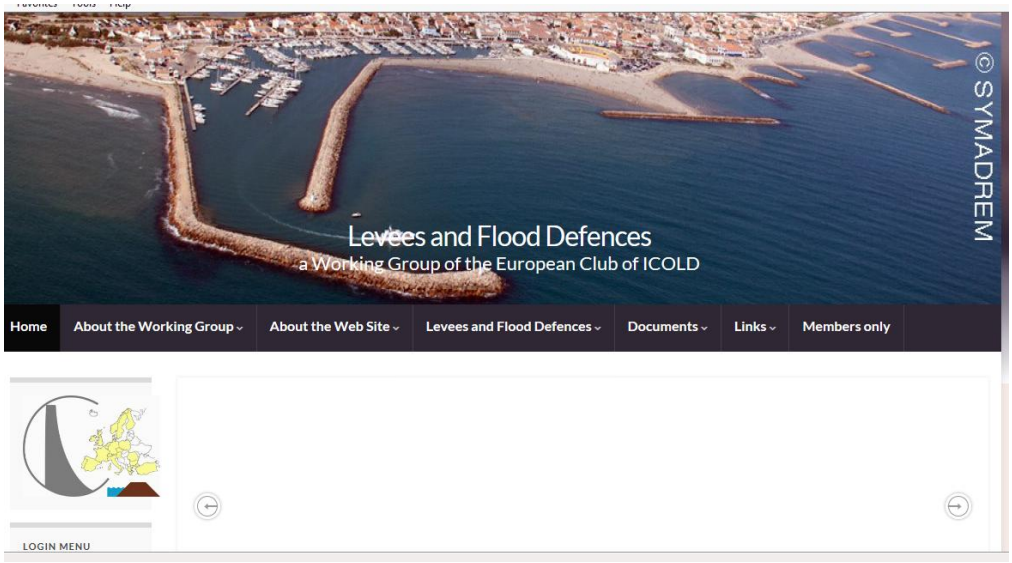


The workshop will be focused on the application of the International Levee Handbook in practice. The workshop is concentrated around five topics:

- The international levee handbook
- Codes and Standards
- Historical case studies
- Evaluation and of instability
- Experimental test

TC201 is looking for dedicated and experienced speakers on these topics. If you have any suggestion please contact Norma Patricia López Acosta; NLopezA@iingen.unam.mx.

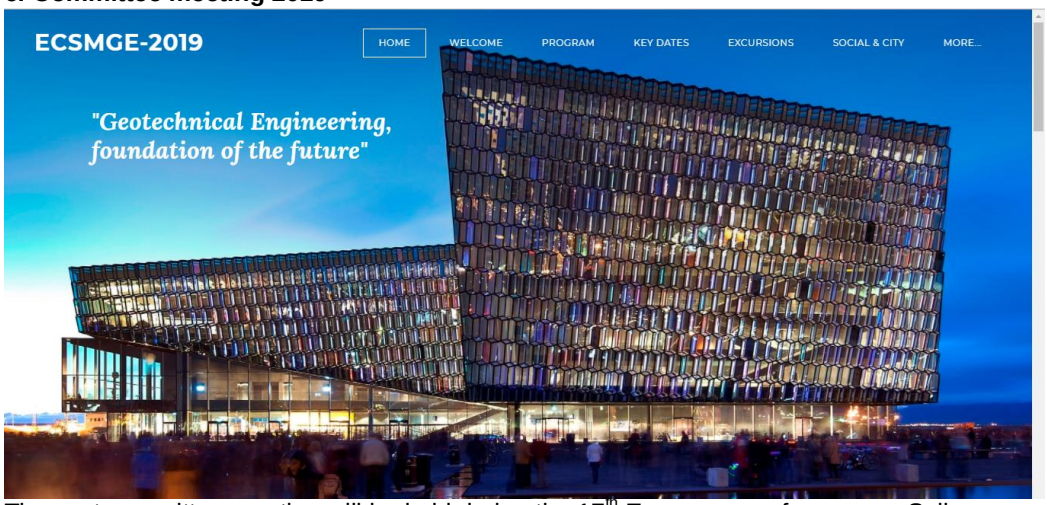
5. European working group on levees under ICOLD (EUCOLD)



The European Levee Initiative has been launched. An important item will be the library/database of case histories, which also is presented in the workshop as the SAFElevee initiative-wg4. This initiative is supported by the European working group on levees under ICOLD (EUCOLD). TC201 has the intention to actively support this initiative and will encourage TC members to come forward with relevant cases. Visit the website http://lfd-eurcold.irstea.fr/ for more information.

Our colleague and TC201 member Rémy Tourment is actively joining EUCOLD and can be reached for questions and suggestions for his website. (remy.tourment@irstea.fr)

6. Committee meeting 2019



The next committee meeting will be held during the 17th European conference on Soil Mechanics and Geotechnical Engineering, ECSMGE, Rekjavik, September 1st - 6th 2019, http://www.ecsmge-2019.com/

Details of the committee meeting will be announced later.

7. TC201 Session in the 17th ECSMGE 2019
During the 17th European Conference on Soil Mechanics and Geotechnical Engineering, ECSMGE, Reykjavik, TC201 has been giving the opportunity to organize session. This session will involve the papers submitted for the conference in the field of dikes and levees.

8. ISSMGE website
The ISSMGE has launched a new website. It provides a lot of useful information and is really worth visiting. However, for TC201 still little content can be found. We will be working on further improvement of the TC201 page. Members are encouraged to come forward with ideas and relevant content.

The archived webinars can be found on http://www.issmge.org/media/recorded-webinars
The TC members are encouraged to further promote watching the webinars.

9. Interesting projects
This section provides the opportunity to share highlights of interesting projects. In this newsletter some attention is given to the full scale field tests near Eemdijk, the Netherlands. Author: Meindert Van.

Full Scale Dike Test reinforced by a Sheet Pile Wall
The climate is changing, the sea level is rising and the Netherlands are subsiding. Never before has the Netherlands been faced with the need for such a major programme of dike upgrades. Recently the standards have been made stricter and so one third of the primary Dutch dikes now fail to meet the new safety requirements. A total of no less than 1,100 km will require strengthening between 2018 and 2028. That can only be achieved within budget, and with the minimum impact for people living on and near the dikes, by using smart, innovative solutions.

A reinforced Wall with a sheet pile wall is tested At the Location Eemdijk in The Netherlands. In this full scale test is studied how dikes behave in extreme conditions such as high water levels in, under and along the dike. Sheet pile walls in dikes are the most chosen option for not removing nearby houses in a densely populated country like the Netherlands. However, sheet pile walls are relatively expensive compared with berm solutions. The sheet pile wall test will allow us to optimise the type and thickness of the sheet piles, resulting in major savings in the dike reinforcement projects.

In the sheet pile wall reinforced dike test, the deformation behaviour and the strength of a structure is studied. In addition, also a reference dike without sheet piles is tested and a number of smaller push over test on sheet piles in the ground are executed. The test is executed by the POVM (projects research on Macro Stability) in close collaboration with the Vallei en Veluwe water authority, Deltares research institute, experts from many Dutch consultancy firms, private bodies, Universities and government authorities. Also experts from USA and Korea are involved.

The Macro Stability test is part of the national Flood Risk Management Programme in which Rijkswaterstaat collaborates with the water authorities. In the years to come, the Flood Risk Management Programme will be facing the challenge of completing more than 1100 km of dikes, and 256 locks and pumping stations before 2028 in 300 projects throughout the Netherlands: along the coast, the major rivers and lakes. The Flood Risk Management Programme has earmarked € 7.4 billion for this operation.

left: Areal view of Eemdijk test, left the reference test and right the sheet pile wall test before the sheet piles were installed, right: Sheet pile push over tests

Test view, after failure of the sheet pile wall.

9. Next Newsletter

The next newsletter will be send around at December. Please provide all available information, like TC related publications, news, research, to the secretary Martin Pohl, martin.pohl@baw.de.