PANAMGEO CHILE 2024
17th PAN-AMERICAN CONFERENCE ON SOIL MECHANICS AND GEOTECHNICAL ENGINEERING | 2nd LATIN-AMERICAN REGIONAL CONFERENCE OF IAEG
LA SERENA • CHILE / NOVEMBER 12 - 16, 2024

Short Course | Dam Safety: Internal erosion adn filter design (The short course will be in english)

- **Jonathan Fannin**, PhD, PEng, FEIC, Professor of Civil Engineering
- **Ricardo Moffat,** PhD, Associate Professor Universidad Adolfo Ibáñez

| **DATE:** november 12, 2024 | **DURATION:** Full Day

| **MINIMUM PARTICIPANTS: 15** | **MAXIMUM PARTICIPANTS: 30**

FEE: USD 350

INTRODUCTION/SUMMARY

Learning objectives for this 1-day short course on internal erosion of dams, dikes, levees, and their foundations are:

- the basis of current design practice for granular filters;
- mechanisms of internal erosion described in USBR/USACE, FEMA, and ICOLD guidance;
- the use and limitations of empirical methods to assess susceptibility of zoned materials to internal erosion;
- the basis for interpretation of laboratory tests to characterize internal erosion;
- the significance of recent advances in a mechanics-based explanation of internal erosion processes;
- lessons-learned from analysis of sinkhole activity at a case-study embankment dam; and,
- the basis of current design practice for geotextile filters in dam engineering.

The morning session commences with Terzaghi's design of granular filters. The development of his empirical approach is reviewed, over subsequent decades, to yield a confident understanding of current design practice. The US National Engineering Handbook Chap. 26 practice for "Gradation design of sand and gravel filters" is then applied to the Coursier Dam in British Columbia, where internal erosion and sinkhole activity led to its decommissioning in 2004. Thereafter, the recent USBR/USACE/FEMA and ICOLD guidance on internal erosion is reviewed, with consideration given to implications for embankment dams, such as Coursier Dam, which do not satisfy current design practice.

In the afternoon session, select empirical methods are used to assess the susceptibility to internal erosion of embankment fill and foundation soils at Coursier Dam. Following a review of laboratory tests recommended by ICOLD, results of continuing erosion filter tests on soils from the Couriser damsite are presented and discussed. Consideration is then given to our current mechanics-based understanding of internal erosion processes, and the value of emerging theoretical insights for an informed use of design guidelines and associated risk-informed decision making. Thereafter, the alternative of specifying a geotextile filter is examined within the context of design practice in dam engineering.

SPEAKERS

Jonathan Fannin

Jonathan Fannin has a longstanding involvement with industry-sponsored research of internal erosion in embankment dams, and related specialist consulting assignments on dams in Canada, the USA, South America, and Europe. In his teaching practice at the University of British Columbia, he has twice received a Killam Prize for teaching excellence, and was also a recipient of the President's Teaching Award (Engineers and Geoscientists of British Columbia).

Prof Ricardo Moffat

Ricardo Moffat has been a professor at the University of Chile and Universidad Adolfo Ibáñez for over 25 years. He was awarded the best teacher award from the University of Chile. As a consultant engineer, he has been involved in a large number of geotechnical mining-related problems concerning the stability of tailings dams, waste dumps, and slope stability, among others. His research topics include internal erosion, in-situ testing, rock mechanics, and in-situ monitoring.