

**GSI W-25 Webinar Entitled:  
“Soil Consolidation Using Wick Drains, aka PVD’s”**

Webinar Overview

Wick drains, also called prefabricated vertical drains or PVDs, consist of a drainage core encapsulated by a geotextile which serves both as a filter and separator. They are typically 100 mm (4.0 in.) wide by 10 mm (3/8 in.) thick and are on spools of up to 300 m (1000 ft.) in length. Their use is to rapidly consolidate saturated fine grained foundation soils. At this point in time, they have completely replaced sand drains for such purposes. Most ground modification contractors are fully aware of the technology. The webinar will begin with calculating the installation stresses during various parts of the procedure. The geotechnical design process insofar as calculating the time for 90% consolidation will be presented transitioning from Terzaghi-to-Barron-to Hansbo methods. This is followed by four issues which are somewhat tenuous and remain to be clarified.

Lastly, a completely new issue of recognizing that wick drains will reinforce foundation soils by virtue of their intrinsic tensile strength is presented. This is illustrated in the context of a major failure which used sand drains. While the increase in FS-value is quite small, there are options presented to enhance the value. The study was first published in 2017 and is extremely revealing.

Learning Objectives

Participants will learn how wick drains are installed along with the stressed induced in doing so. They will then learn about consolidation design in three-stages which have been developed over time leading to the current Hansbo method. Insight into four remaining issues and concerns will be daylighted with remedies for each. Lastly, a major case history failure using sand drains will be counterpointed against using wick drains which would probably have avoided such a major incident from occurring.

Webinar Benefits

1. Understand the origin and geotechnical background of in-situ consolidation of fine-grained foundation soils
2. Understand why wick drains have gained universal acceptance using these geosynthetic materials
3. Understand the various wick drain design methodologies
4. Be exposed to the latest research needs that are available
5. Appreciate the tensile strength that wick drains afford to reinforcing soft foundations soils and how this feature can be incorporated in design

Intended Audiences

Owners of saturated fine-grained foundation soil sites in both the public and private sectors; federal, state and regional geotechnical, transportation, and environmental engineers; engineers from municipal districts and townships; private and municipal land developers, architectural and landscape designers; general civil consulting engineers; testing laboratories servicing these

organizations; manufacturers and representatives of wick drain materials; ground modification contractors; academic and research groups; and others desiring technically related information on this important aspect of our constructed infrastructure.

### Specific Topics Covered

1. Background and Overview of Wick Drains
2. Installation Practices
3. Mobilized Stresses During Installation
4. Terzaghi-Barron-Hansbo Consolidation Theories
5. Remaining Wick Drain Issues and Concerns
6. Foundation Soil Reinforcement Using the Tensile Strength of Wick Drains
7. Generic Wick Drain Specification

### Webinar Instructor

Dr. George R. Koerner is the director of the Geosynthetic Institute, a position that he has held since 2014. George's interest in geosynthetics spans his entire professional life from undergraduate work in the 1980's to the present. He holds his PH.D. in Civil, Architectural and Environmental Engineering from Drexel University in Philadelphia. George's master thesis was on direct shear testing of geosynthetic interfaces and his doctoral dissertation was on landfill leachate clogging of soil and geosynthetic filters. Both are regularly cited to this day.

Dr. George Koerner is a Professional Engineer in both Pennsylvania and New Jersey, and is an ASQC Quality Auditor. During his 30-years of geosynthetic activities, Dr. Koerner's output has been tremendous and he has to his credit the following publications:

- Books Edited or Co-Edited – 15
- Journal Papers – 18
- Symposium and Conference Publications – 40
- Book Chapters and Published Reports – 4
- Miscellaneous Articles – 30

The Geosynthetic Institute is a nonprofit research and development organization dedicated to the proper use of geosynthetics in its myriad applications. As director of the Geosynthetic Institute, Dr. George Koerner is also in charge of the laboratory accreditation and inspection certification programs.