

# Agenda

Presented by Michael Perlow Jr., P.E.

### Structure Loads, Soils, Groundwater and Drainage

Structural foundation, slab, basement, retaining wall loading  
Extreme weather, man's activities, geohazard impacts  
Soil mechanics and structures

- Soil properties
- Groundwater and site drainage
- Underground utilities and roof drains
- Foundation bearing capacity and settlement
- Soil loads on basement and retaining walls

### Foundation Design and Construction

Design-construction shallow, deep and intermediate foundations  
Continuous wall footings, column footings types  
Overview of basement walls types, construction, and design  
Overview of retaining wall types, construction, and design  
Foundation underpinning using micropiles, helical piles

### Evaluation of Foundation - Slab Damage and Repair Alternatives

Inspection, monitoring, and damage assessment

- |                      |                       |
|----------------------|-----------------------|
| • Settlement         | • Frost heave         |
| • Expansive soils    | • Shrinkage           |
| • Subsurface erosion | • Sinkhole subsidence |
| • Mine subsidence    | • Pumping-dewatering  |
| • Cracking           | • Utility failures    |

Repair methods and example case histories

- |                |                      |
|----------------|----------------------|
| • Piers, piles | • Soil tiebacks      |
| • Underpinning | • Ground improvement |

### Evaluation of Wall Damage and Repair Alternatives

Inspection, monitoring, and damage assessment

- |                                                   |                    |
|---------------------------------------------------|--------------------|
| • Settlement                                      | • Frost loading    |
| • Expansive soils                                 | • Shrinkage        |
| • Poor drainage                                   | • Utility failures |
| • Failure of connections to supporting diaphragms |                    |

Repair methods and example case histories

- |                 |                        |
|-----------------|------------------------|
| • Piers, piles  | • Soil tiebacks        |
| • Carbon fibers | • Soldier beams        |
| • Crack repair  | • Secant-tangent walls |
| • Underpinning  | • Reconstruction       |

Foundation Damage Assessment and  
Repair Alternatives: Science, Materials and Techniques  
Wallingford, CT - Thursday, July 25, 2019

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## Learning Objectives

**You'll be able to:**

**Consider** soil conditions on building sites.

**Determine** bearing capacity and understand the effects of settlement and consolidation.

**Explore** continuous wall footings, column footings, basement walls and retaining walls.

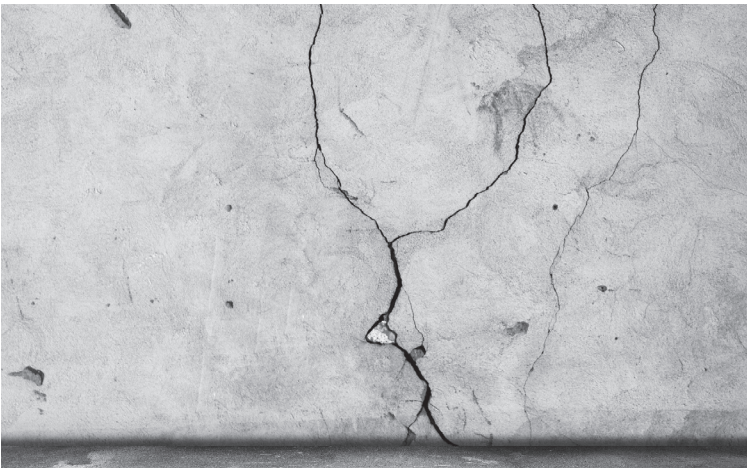
**Evaluate** damage caused by settlement, frost heave, expansive soils, and shrinkage.

**Review** repair techniques, including soil tiebacks, carbon fibers, crack repair, and underpinning.



# Foundation Damage Assessment and Repair Alternatives: Science, Materials and Techniques

Wallingford, CT - Thursday, July 25, 2019



**Review** the science of foundation design deep foundations, basements and slabs

**Consider** soil conditions, slope stability, excavation and drainage **Analyze** repair options, including piers, piles, carbon fibers, soil tiebacks and soldier beams

**Explore** damage to shallow and

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Mr. Perlow is a retired civil & geotechnical engineer with more than 45 years of experience in engineering geology, geotechnical engineering and failure investigations. He is a registered professional engineer and a graduate of Lehigh University with BSCE and MSCE degrees. He is also the author of some 35 technical publications and has presented at numerous conferences, seminars, and meetings. Mr. Perlow retired from full-time consulting in January 2016 and continues to work part-time in retirement. He provides continuing education seminars and webinars on foundation damage assessment & repair and is completing a three-year applied research effort on drilled foundation limit state pile capacity verification along with a book on geo-environmental hazard risk management. Mr. Perlow has extensive foundation failure assessment-repair experience associated with major sinkhole stabilization projects, utility main breaks and geo-environmental hazard triggered failures. He has directed geologic, geophysical, groundwater quality, and geotechnical investigations for major projects including the \$100 million AT&T Solid State Technology Center, Interstate 78 through the Schantz Spring Aquifer in Lehigh County PA, Lehigh Valley Regional Postal Facility as well as the Vera Cruz Road and Macungie sinkhole collapses. Mr. Perlow also has extensive marine geotechnical experience with coastal, offshore and university research projects.

“Excellent seminar.” – *Structural Engineer*  
 “Excellent presentation.” – *Mechanical Engineer*  
 “Very knowledgeable instructor.” – *Environmental Engineer*  
 “Fascinating case studies.” – *Architect*



## Registration