Need for Engineering Investigations - Scope and Expectations

Prof. (Dr.) Hardeep Singh Rai
Dean Testing and Consultancy
Guru Nanak Dev Engg. College, Ludhiana

Geotechnical Investigations and Ground Improvement with Geosynthetics for Structural and Construction Engineers
Dec 09, 2015

Engineering Projects

- Project owner identifies a location and arrange finance. Chooses Project Manager (PM) / Architect
- PM chooses various Professionals / Consultants (Structural, GeoTechnical, Survey etc.)
- Land Surveyor surveys land and draws the contours.

Engineering Projects

- PM uses topographical maps → Plans
- GeoTechnical Engineer: Investigate Subsurface → Structural Engineer

Design objective

- Achievement of an acceptable probability that the structure will perform satisfactorily for the intended purpose during the design life.
- With the appropriate degree of safety, the structure should sustain all the loads and deformations during the construction and its designed life and also have adequate resistance to accidental loads and fire.

Expectations from GeoTechnical Engineer

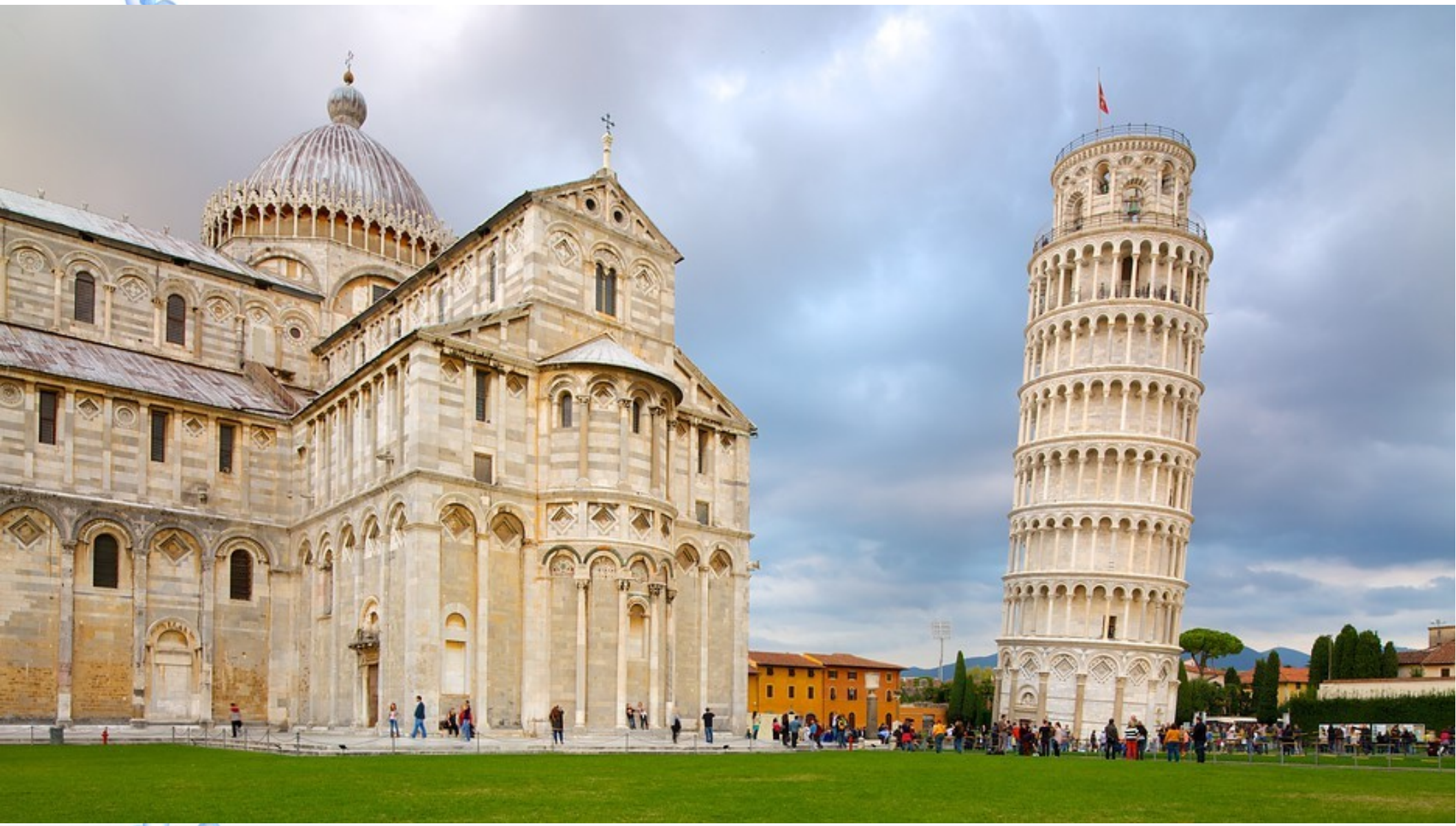
- Type of foundation
- Depth of foundation
- Load carrying capacity of soil
- Settlement of footing
  - Differential settlement
- Behaviour of soil under dynamic forces
- Liquefaction potential

Expectations from GeoTechnical Engineer

- Safety of adjoining structures
- Index and Engineering properties
- Silt factor
- Modulus of subgrade reaction
- Permeability
- Soil resistivity

Expectations from GeoTechnical Engineer

- Classification of sub-strata
- Type of soil (Type I (Hard), II (Medium), III (Soft) as used in IS 1893 - 2002)
- Water Table (Quality of water)
- Harmful chemicals
- Possible variations
- Lateral force
- Improving soil



Scope

- Need of project
- Resources allocated