

CONTACT STRESS IN CIVIL ENGINEERING



Introduction

Why are all these large constructions standing, stable and straight?



Skyscrapers



Bridges



Dams

How are these constructions supported?

Civil Engineering field is enormous

An area of civil engineering that focuses on working under ground is called **Geotechnical Engineering**



- **Geotechnical engineering** is a field of engineering concerned with the properties and materials of the Earth.
- Geotechnical engineers work with data from soil and rock samples to specify the requirements for design and construction of engineered structures.

These structures include **shallow foundations (footings), deep foundations (piles and drilled piers)**, retaining walls, dams, embankments, tunnels, etc.

Let's **CONCENTRATE** on *Foundations*

Foundations systems in civil engineering

What is the purpose of building *a foundation*?

Provide stability to the structure:

a

Support the structure's load

b

Reduce the contact stress on the ground

c

Cost efficiency





Designing a foundation

There are several things to consider when designing/
building a *foundation*?



1 Soil profile (layers, water, etc.)



2 Load



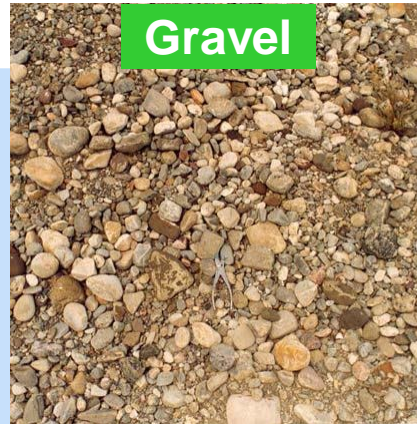
3 Importance and service of structure

Defining a *type* of foundation

1 Understand our *type of soil*



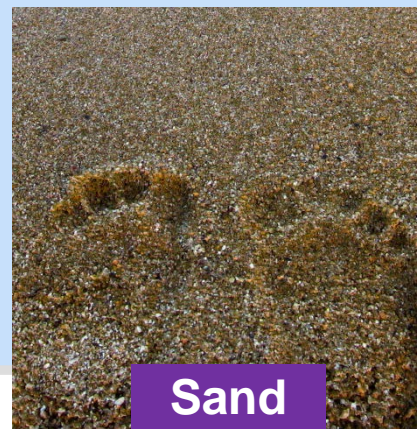
Rock



Gravel



Clay

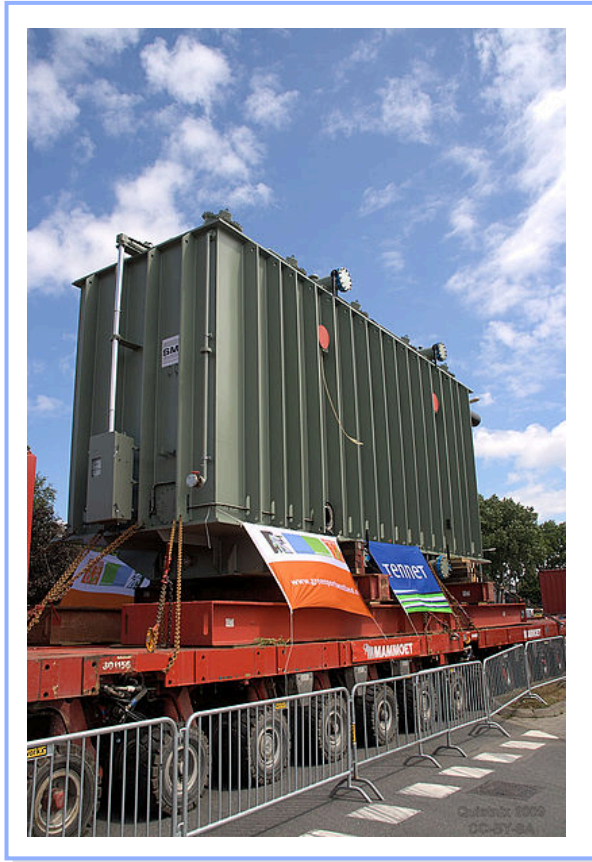


Sand

Before designing the foundation, soil profile and its behavior are determined.

Defining a *type* of foundation

2 Know your *load*



Defining a *type* of foundation

3 Define the importance and service of the structure



What does this mean for us?

Our weight can be found
by using a scale



The area of our foot can be found
by tracing its outline on graph
paper and counting the squares
within the outline

$$\text{Stress } (\sigma) = \frac{\text{Weight}}{\text{Area}} = \frac{\text{Your weight}}{\text{Area of your feet}}$$