**PW 02: POROSITY AND Compactness**

1. **POROSITY**

**1- Objective of the experiment**
Measure the porosity of a granulate.

**2. Necessary Materials**

* A heat source
* A scale
* A flat metal container.
* Water
* Cloth

**3. Materials Used**

* A sample of gravel
* A sample of sand

**4. Procedure**

* Weigh the dry sample of 1 kg, referred to as M0.
* Place the sample in cold water and bring to a boil for 2 hours to expel air from the pores and saturate with water.
* Remove the sample from the water and wipe each grain with a cloth.
* Weigh the new mass, referred to as M1.
* Calculate the porosity:

$$P\left(\%\right)=\frac{M\_{1}-M\_{0}}{M\_{0}}\*100$$

**WORK REQUIRED**

* Fill in the tables
* Comment on the results
* Make a conclusion

**Table 1: Porosity of Gravel**

| **Designation** | **Test 1** | **Test 2** | **Test 3** | **Average** |
| --- | --- | --- | --- | --- |
| M0 |  |  |  |  |
| M1 |  |  |  |  |
| p |  |  |  |  |

**Table 2: Porosity of Sand**

| **Designation** | **Test 1** | **Test 2** | **Test 3** | **Average** |
| --- | --- | --- | --- | --- |
| M0 |  |  |  |  |
| M1 |  |  |  |  |
| p |  |  |  |  |

1. **Compactness**

**Objective of the experiment**
Measure the compactness of a granulate.

**2. Necessary Materials**

* A graduated cylinder
* A funnel
* A scale
* Water

**3. Materials Used**

* A sample of sand.
* A sample of gravel

**4. Procedure**

1. Weigh a quantity of dry material and pour it (without compacting) into a graduated cylinder.
2. Note the level reached, representing the apparent volume of the material, referred to as V.
3. In a second graduated cylinder, place a volume V' of water.
4. Pour the sand from the first graduated cylinder into the second one.
5. Note the new water level, referred to as V1.
6. Calculate the compactness using the formula:
7. C = $\frac{(V1-V^{'})}{V}$

**WORK REQUIRED**

* Fill in the tables with the collected data.
* Comment on the results obtained.
* Write a conclusion regarding the results of compactness for both gravel and sand.

**Table 1: Compactness of Gravel**

| **Designation** | **Test 1** | **Test 2** | **Test 3** | **Average** |
| --- | --- | --- | --- | --- |
| V |  |  |  |  |
| V’ |  |  |  |  |
| V1 |  |  |  |  |
| C |  |  |  |  |

**Table 2: Compactness of Sand**

| **Designation** | **Test 1** | **Test 2** | **Test 3** | **Average** |
| --- | --- | --- | --- | --- |
| V |  |  |  |  |
| V’ |  |  |  |  |
| V1 |  |  |  |  |
| C |  |  |  |  |