Experiment Details

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| Department Name | Environmental |
| Class | T.Y.BTech |
| Semester | 5th |
| Subject Name | Geo-technical laboratory |
| Experiment No. | 01 |
| Experiment Name | Determination of Water content ( by oven drying method) |

Version History

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| --- | --- | --- | --- | --- |
| Sr. No. | Version Number | Created By | Approved By | Date |
| 1 | v1.0 | Abhishek Karmarkar | Faculty Name | 07/10/2001 |
|  |  |  |  |  |

AIM:

To Determine Water content ( by oven drying method)

THEORY:

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| * + 1. The water content or the moisture content is defined as a ratio of percentage of the mass of water in a given soil mass to the mass of solid particles.     2. It is the fundamental parameter and useful property which affects the soil properties like degree of saturation,density, shear strength, consistency, compaction and consolidation.     3. In almost all the soil tests,determination of water content is a must. |
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| Oven drying method is considered to be the standard and accurate method, though it takes long time. By oven drying, using infrared Lamp torsion balance moisture meter and using calcium carbide moisture meter. |

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PRE TEST:

1. Does water content of soil matter when it is used for the various functions ?
2. **yes**
3. no
4. can’t say
5. maybe
6. which of the following has a more water content ?
7. **soil**
8. silt
9. clay
10. none
11. more the water content ; soil is more
12. good
13. **saturated**
14. unsaturated
15. None of the above
16. water content more than the limit gives extra benefits ?
17. true
18. **false**
19. maybe
20. none
21. high water content may cause increase in salinity of the soil ?
22. **true**
23. false
24. maybe
25. none

PROCEDURE:

1. Clean and dry the container and lid.

1. Weigh it accurately with lid and record its mass (M1) in gm.
2. Take approximately the required quantity of soil as mentioned below depending upon the particle size of soil sample.
3. Crumble the soil and place it loosely in the container.
4. Weigh the container with wet soil and lid (M2) in gm.
5. Keep the container containing wet soil specimen in an oven with the lid below the container.
6. Maintain the temp. Of the oven at 100 to105o C for 24 hrs.
7. After 24 hours, take out the container, close it with the lid and cool it preferably in desiccators.
8. Weigh in the container with lid and dried soil sample and record the final mass (M3) in gm.
9. Calculate the water content using prescribed formula.
10. Repeat step 1 to 10 for more soil specimens from the same soil sample.
11. Average of the three should be reported as a water content of a soil.

**OBSERVATIONS:**

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| **Sr.** | **Particulars** | | | | |  | **Symbol / Unit** | | **Determination No.** | |
| **No.** |  |  | |
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|  |  |  |  |  |  |  |  |  |  |  |
| 1 | Container No | | | | |  |  |  | **1** | **2** |
|  |  |  |  |  |  |  |  |  |  |  |
| 2 | Mass of container | | | | |  | M1 | gm |  |  |
|  |  |  |  |  |  | |  |  |  |  |
| 3 | Mass of container with wet soil specimen | | | | | | M2 | gm |  |  |
|  |  |  |  |  |  | |  |  |  |  |
| 4 | Mass of container with dry soil specimen | | | | | | M3 | gm |  |  |
|  |  |  |  |  |  |  |  | |  |  |
| 5 | Mass of dry soil | | | | |  | (M3 - M**1**) gm | |  |  |
|  |  |  |  |  |  |  |  | |  |  |
| 6 | Mass of water | | | | |  | (M2-M3) gm | |  |  |
|  |  |  |  |  |  |  |  |  |  |  |
|  | Water content = ( |  |  |  |  |  |  |  |  |  |
| 7 |  |  |  |  |  |  |  |  |
|  |  | | |  |  |  |  |
|  |  |  |  |  |  |  |  | |  |  |
| 8 | Average water content | | | | |  | w % | |  | |
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POST TEST:

1. When the soil is fully saturated the water content is ?
2. **100%**
3. 0%
4. can’t say
5. none
6. when soil is fully saturated the soil becomes?
7. 3 phase system
8. **2 phase system**
9. none
10. can’t say
11. water content can never be ?
12. 100%
13. 0%
14. **> 100%**
15. None of the above
16. water content of a soil depends upon the weather ?
17. true
18. **false**
19. maybe
20. none
21. which of the following has a high water content ?
22. **black cotton soil**
23. china clay
24. sand
25. none

REFERENCES:

GTE lab manual T.Y. BTech Department of Environmental engineering , and IS: 2720(part II)-1973