ALDOT-105-09
METHOD OF SAMPLING LAYERS OF EMBANKMENT, MODIFIED ROADBED, IMPROVED ROADBED, SUBBASE OR BASE COURSE, TOPSOIL, MATERIAL PITS AND SAMPLING FOR RESILIENT MODULUS TESTS

1. Scope

1.1. These methods outline the procedures to be followed when sampling for soils to be used in various roadway components. Test holes should be identified by assigning each a number written on a stake as well as the depth of the test hole.

1.2. Proper sampling techniques are necessary to obtain samples that are representative of the material in the holes or pits in order to determine the suitability of the material for use in the work. All borings and sampling shall be performed in general accordance with AASHTO T-306: Progressing Auger Borings for Geotechnical Explorations and ALDOT Procedure 390: Procedure for Conducting Soil Surveys and Preparing Materials Reports.

2. Sampling Tools

2.1. Manual or power auger, pick or mattock, and square or round point shovel.

3. Method of Sampling for Gradation and Atterberg Limit Tests from Roadbed

3.1. By using an auger, pick and a square point shovel, dig a hole at least six inches in diameter or a trench of a minimum twelve inches in length to provide visual inspection of the vertical face of the material exposed. The depth of the hole is governed by the thickness of the layer and should extend slightly below the layer to be sampled.

3.2. The sample should be taken by removing material from the exposed vertical face with approximately the same amount of material from the bottom to the top of the sample hole. Several passes from the bottom to the top of the hole may be necessary to obtain a sample of sufficient size.

3.3. Place 25 to 30 lbs (10 to 15 kg) of the material being sampled into a clean sample sack for transporting to the field, Division or Central Laboratory as required.

3.4. Include a sample card, Form BMT-1, with all pertinent information regarding the sample. The sample card should be written legibly in blue or black permanent ink. The card should be protected from moisture in the sample by some method such as placing it in a zip-lock bag. The sample card is then placed in the sack and the sack tied with heavy twine.

4. Thickness Measurements

4.1. Dig a test hole as outlined above through the compacted layer to be measured. Remove the material from the hole in a manner that will allow visual inspection to determine the limits of the layer being measured.

4.2. Place a straight edge over the surface of the layer and measure to the dividing line of the underlying layer. Record this measurement in a field notebook. Report the measurement on Form BMT-16.

5. Sampling Material Pits

5.1. Using an earth auger, either manual or power, the soil is removed from the test hole with each auger stem added. The soil should be placed in a circle around the test hole with each auger full in a separate pile.

5.2. The lengths of auger stems are usually 2 ft. (.6 m) for manual augers and 5 ft. (1.5 m) for power augers. At the end of each 2 or 5 ft. (.6 or 1.5 m) section of the circle of soil, a pile should be offset from the circle to indicate the depth from which the material was removed from the hole. This method readily indicates the depth of stripping required, the total depth of usable material, and information regarding stratification of the material.

5.3. Samples are taken from the completed test hole by taking a small amount of soil from each auger pile and placing it in a clean sample sack. If a soil analysis is required, each sample should weigh 25 to 30 lb (10 to 15 kg) and should be submitted to the Division Laboratory.

5.4. Include a Site Manager card, Form BMT-1, in each sample sack of soil with all pertinent information such as stratification, underground water, rocks or boulders encountered and any other information that will be useful in working the pit. The Site Manager card should be written legibly in blue or black permanent ink.

5.5. When completed, all test holes must be filled with dry friable (crumbly) material with special effort being made to fill the hole completely from bottom to top, allowing over--fill for future settlement.

5.6. Test holes should be arranged over the pit area by using a base line and a grid system so that the boundaries of the pit and test hole location may be reestablished. A sketch should be made showing distances to the test holes using trees, fences or other natural landmarks. The sketch should be filed in the project records for future use.

6. Method of Sampling for Resilient Modulus (M_R) Tests

6.1. M_R samples from a "cut" section of a roadway should be taken of the material at the grade line and 6 in. (300 mm) below. This is done by the use of earth augers, either manual or power. No material will be sampled above the grade line unless the material is to be used in a "fill section" or for subbase or base layers. If a M_R is required, it will be sampled by the same method as shown in Section 5.

6.2. When sampling at the grade line, the depth of the sample hole must be measured and extreme care must be taken to assure that the sample comes from the proper elevation as shown on the plan and profile sheets.

6.3. If the sample is taken from an open cut or slope, representative material should be taken along the entire surface of the slope from bottom to top and submitted as a composite sample.

6.4. The sample size for M_R tests is approximately 50 lbs (23 kg.)

6.5. Three (3) copies of the Site Manager card, BMT-1, must be included in each sample sack clearly marked that the material is for M_R tests. Also, the Site Manager cards must be completely filled out legibly in permanent blue or black ink and entered showing all pertinent information such as station, type material, depth at which sample was taken and any other information that may be of use.

6.6. When sampling is completed, the auger hole should be filled as previously described in Section 5.5

7. Method of Sampling for Topsoil Testing

7.1 By using an auger, pick, or a square point shovel, dig a hole or trench of sufficient length to provide visual inspection of the face of the material exposed. The depth of the hole is governed by the thickness of the layer and should extend slightly below the layer to be sampled.

7.2 The sample should be taken by removing material from the exposed vertical face with approximately the same amount of material from the bottom to the top of the sample layer. Several passes from the bottom to the top of the hole may be necessary to obtain a sample of sufficient size.

7.3 Place 15 to 20 lbs (7 to 9 kg) of the material being sampled into a clean sample sack for transporting to the Division or Central Laboratory as required.

7.4 Enter information into Site Manager and include a sample card, Form BMT-1, with all the pertinent information written legibly in permanent blue or black ink regarding the sample. The card should be folded so that the written information is protected from moisture in the sample by some method such as placing it in a zip-lock bag. The sample card is then placed in the sack and the sack tied with heavy twine.