|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Sieve Size** | **Weight retained****(gm)** | **Weight passed****(gm)** | **Percentage passing**= ($\frac{weight passed}{Total weight}$**)**  x 100 | **Percentage passing through the sieve =****(100 – percentage passing)** |
| **mm** | **in** |
| 75 | 3 in | - | - | - | - |
| 37.5 | 1 ½ in | - | - | - | - |
| 19 | ¾ in | - | - | - | - |
| 9.5 | 3/8 in | 0 | 500.0 | 100.0 | 0 |
| 4.75 | No.4 | 51.0 | 449.0 | 89.80 | 10.20 |
| 2.00 | No.10 | 40.9 | 408.1 | 81.62 | 18.38 |
| 0.840 | No.20 | 60.0 | 348.1 | 69.62 | 30.38 |
| 0.420 | No.40 | 75.4 | 272.7 | 54.54 | 45.46 |
| 0.250 | No.60 | 55.5 | 217.2 | 43.44 | 56.56 |
| 0.15 | No.100 | 49.9 | 167.3 | 33.46 | 66.54 |
| 0.075 | No.200 | 30.9 | 136.4 | 27.28 | 72.72 |
| **Pan** | 363.6 |  | 0 |  |

**From Grain Size distribution Curve:**

|  |  |
| --- | --- |
| % Gravel = 9.5 | D10 = 0.5 mm |
| % Sand = 46.4  | D30 = 0.0006 mm |
| % Fines = 44.1  | D60 = 0.0015 mm |

|  |  |
| --- | --- |
| Cu = $\frac{D60}{D10}$ = $\frac{0.0015}{0.5}$ = 0.003 , | Cc = $\frac{(D30)^{2}}{D60 X D10}$ = $\frac{(0.0006)^{2}}{0.0015 X 0.5}$ = 0.00048 |

Sieve No.40

Pan weight = 0.258 kg =258 gm

Soil weight = 200 gm

Pan + Soil = 200 + 258 = 458 gm

|  |  |
| --- | --- |
| **Test data** | **Test repetitions** |
| **1** | **2** | **3** |
| Row – 1 | Weight of can (gm) | 24 | 10 | 10 |
| Row – 2 | Weight of wet soil + can (gm) | 34 | 22 | 28 |
| Row – 3 | Weight of dry soil + can (gm) | 27.67 | 16.04 | 24.13 |
| Row – 4 | Weight of dry soil (gm) (Row.3 – Row.1) | 3.67 | 6.04 | 14.13 |
| Row – 5 | Weight of moisture (gm) (Row.2 – Row.3) | 6.33 | 5.96 | 10 |
| Row – 6 | Moisture content, m% = ($\frac{Row.5 }{Row.4})$ x 100 | 172.47 | 98.67 | 70.77 |
| Row – 7 | No. of blows N | 22 | 26 | 24 |

**Liquid Limit**

**Plastic limit**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **Column - 1** | **Column - 2** | **Column - 3** | **Column - 4** | **Column - 5** | **Column -6** |
| **Weight of can (gm)** | **Weight of wet soil thread + can (gm)** | **Weight of dry soil thread + can (gm)** | **Weight of dry soil****(col.3 – col.1)****(gm)** | **Weight of moisture (col.2 – col.3) (gm)** | **Moisture content, m% (col.5/col.4) X 100** |
| **Reading – 1** | 175 | 178 | 176.89 | 1.89 | 1.11 | 58.730 |
| **Reading – 2** | 175 | 178 | 176.88 | 1.88 | 1.12 | 59.574 |
| **Reading – 3** | 175 | 177 | 176.26 | 1.26 | 0.74 | 58.730 |

Plastic Limit (P.L.) = $\frac{58.730+59.574+58.730}{3}$ = 59.011

###### AASHTO SOIL CLASSIFICATION SYSTEM

The table below shows the AASHTO soil classification system (from AASHTO M 145).

|  |
| --- |
| **AASHTO Soil Classification System (from ASTM M 145)** |
|  |  |  |  |  |  |  |  |  |  |  |  |
| **General Classification** | **Granular Materials 35% or less passing the 0.075 mm (No 200) sieve** | **Silt-Clay Materials >35% passing the 0.075 mm sieve** |
| **Group Classification** | **A-1** | **A-3** | **A-2** | **A-4** | **A-5** | **A-6** | **A-7** |
| **A-1-a** | **A-1-b** | **A-2-4** | **A-2-5** | **A-2-6** | **A-2-7** | **A-7-5A-7-6** |
| **Sieve Analysis, % passing** |  |  |  |  |  |  |  |  |  |  |  |
| **2.00 mm (No. 10)** | 50 max | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **0.425 (No. 40)** | 30 max | 50 max | 51 max | --- | --- | --- | --- | --- | --- | --- | --- |
| **0.075 (No. 200)** | 15 max | 25 max | 10 max | 35 max | 35 max | 35 max | 35 max | 36 min | 36 min | 36 min | 36 min |
| **Characteristics of fraction passing 0.425 mm (No. 40)**  |  |  |  |  |  |  |  |  |  |  |
| **Liquid limit**  | --- | --- | 40 max | 41 min | 40 max | 41 min | 40 max | 41 min | 40 max | 41 min |
| **Plasticity index** | 6 max | N.P. | 10 max | 10 max | 11 min | 11 min | 10 max | 10 max | 11 min | 11 min**a** |
| **Usual types of significant constituent materials** | Stone fragments, gravel and sand | Fine sand | Silty or clayey gravel and sand | Silty soils | Clayey soils |
| **General rating as a sub grade** | Excellent to good | Fair to poor |
| **a**Plasticity index of A-7-5 subgroup is equal to or less than the LL - 30.  Plasticity index of A-7-6 subgroup is greater than LL - 30 |