Typical Values of Young's Elastic Modulus and Poisson's Ratio for Pavement Materials

Material	Young's Elastic Modulus (E or M_r), psi	Poisson's Ratio (μ or ν)
Asphalt concrete 32 F (uncracked) 70 F 140 F	2,000,000 – 5,000,000 300,000 – 500,000 20,000 – 50,000	0.25 – 0.30 0.30 – 0.35 0.35 – 0.40
Portland cement concrete (uncracked)	3,000,000 – 5,000,000	0.15
Extensively cracked surfaces	Similar to granular base course materials	Similar to granular base course materials
Crushed stone base (clean, well-drained)	20,000 – 80,000	0.35
Crushed gravel base (clean, well-drained)	20,000 – 80,000	0.35
Uncrushed gravel base Clean, well-drained Clean, poorly-drained	 10,000 – 60,000 3,000 – 15,000	 0.35 0.40
Cement stabilized base Uncracked Badly cracked	 500,000 – 2,000,000 40,000 – 200,000	 0.20 0.30
Cement stabilized subgrade	50,000 – 500,000	0.20
Lime stabilized subgrade	20,000 – 150,000	0.20
Gravelly and/or sandy soil subgrade (drained)	10,000 – 60,000	0.40
Silty soil subgrade (drained)	5,000 – 20,000	0.42
Clayey soil subgrade (drained)	3,000 – 12,000	0.42
Dirty, wet, and/or poorly-drained materials	1,500 – 6,000	0.45 – 0.50
Intact Bedrock Note: Values greater than 500,000 have negligible influence on surface deflections.	250,000 – 1,000,000	0.20

Note: Exceptions to the typical values given above **often** occur. High fines contents and/or high moisture contents tend to reduce Young's modulus and increase Poisson's ratio. Unusually low fines contents and/or low moisture contents have the opposite effect. Poisson's ratio for a completely saturated material will be close to 0.50. Well-cured, asphalt emulsion stabilized gravel, and reclaimed asphalt pavements, will have moduli slightly less than asphalt concrete.

Typical Values of Young's Elastic Modulus and Poisson's Ratio for Pavement Materials

Material	Young's Elastic Modulus (E or M_r), MPa	Poisson's Ratio (μ or ν)
Asphalt concrete 0 C (uncracked) 20 C 60 C	13500 – 35000 2000 – 3500 150 – 350	0,25 – 0,30 0,30 – 0,35 0,35 – 0,40
Portland cement concrete (uncracked)	20000 – 35000	0,15
Extensively cracked surfaces	Similar to granular base course materials	Similar to granular base course materials
Crushed stone base (clean, well-drained)	150 – 600	0,35
Crushed gravel base (clean, well-drained)	150 – 600	0,35
Uncrushed gravel base Clean, well-drained Clean, poorly-drained	 70 – 400 20 – 100	 0,35 0,40
Cement stabilized base Uncracked Badly cracked	 3500 – 13500 300 – 1400	 0,20 0,30
Cement stabilized subgrade	350 – 3500	0,20
Lime stabilized subgrade	150 – 1000	0,20
Gravelly and/or sandy soil subgrade (drained)	70 – 400	0,40
Silty soil subgrade (drained)	35 – 150	0,42
Clayey soil subgrade (drained)	20 – 80	0,42
Dirty, wet, and/or poorly-drained materials	10 – 40	0,45 – 0,50
Intact Bedrock Note: Values greater than 3500 have negligible influence on surface deflections.	2000 – 7000	0,20

Note: Exceptions to the typical values given above **often** occur. High fines contents and/or high moisture contents tend to reduce Young's modulus and increase Poisson's ratio. Unusually low fines contents and/or low moisture contents have the opposite effect. Poisson's ratio for a completely saturated material will be close to 0.50. Well-cured, asphalt emulsion stabilized gravel, and reclaimed asphalt pavements, will have moduli slightly less than asphalt concrete.