

Densities for Use in Estimating Quantities

Design Manual
Chapter 1
General Information
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The following densities should be used for estimating quantities of Hot Mix Asphalt (HMA) material.

Table 1: HMA Densities

	English	Metric
<i>HMA</i>	145 pcf	2325 kg/m ³
Crushed HMA for use as Subbase	127 pcf	2035 kg/m ³
Base Course	145 pcf	2325 kg/m ³
Intermediate Course	145 pcf	2325 kg/m ³
Surface Course	145 pcf	2325 kg/m ³

The following densities should be used for estimating quantities of granular material.

Table 2: Granular Material Densities

	English	Metric
Granular Subbase	135 pcf	2160 kg/m ³
Granular Backfill	125 pcf	2000 kg/m ³
Granular Blanket	125 pcf	2000 kg/m ³
Granular Shoulders	140 pcf	2250 kg/m ³
Special Backfill (treatment)	140 pcf	2250 kg/m ³
Porous Backfill	120 pcf	1920 kg/m ³
Class "A" Crushed Stone	140 pcf	2250 kg/m ³
Class "D" Rip-Rap	110 pcf	1760 kg/m ³
Erosion Stone	120 pcf	1920 kg/m ³
Recycled Pavement	135 pcf	2160 kg/m ³
Macadam Stone	130 pcf	2080 kg/m ³
Crushed Concrete for use as Subbase	135 pcf	2160 kg/m ³
P.C.C. Pavement Broken for use as Class "E" Rip-Rap	120 pcf	1920 kg/m ³
Rolled Stone Base	140 pcf	2250 kg/m ³
Modified Subbase	140 pcf	2250 kg/m ³
Crushed Brick	115 pcf	1840 kg/m ³

The following properties should be used when estimating reinforcing bar quantities.

Table 1: Properties of Reinforcing Bars

ASTM A615 – English Reinforcing Bars						
Designation	Weight		Diameter		Area	
	lb/ft	kg/m	in	mm	in ²	mm ²
#3	0.375	0.560	0.375	9.50	0.11	71
#4	.0668	0.994	0.500	12.7	0.20	129
#5	1.043	1.552	0.625	15.9	0.31	200
#6	1.502	2.235	0.750	19.1	0.44	284
#7	2.044	3.042	0.875	22.2	0.60	387
#8	2.670	3.973	1.000	25.4	0.79	510
#9	3.400	5.060	1.128	28.7	1.00	645
#10	4.303	6.404	1.270	32.3	1.27	819
#11	5.313	7.907	1.410	35.8	1.56	1006
#14	7.650	11.38	1.693	43.0	2.25	1452
#18	13.60	20.24	2.257	57.3	4.00	2581

When determining the length of bent reinforcing bar do not calculate the curvature of the bend. The length of the bar is the sum of the two sides as shown below:

