

ULTIMATE 10 TON STAGED FLEXIBLE PAVEMENT DESIGN USING SOIL FACTORS^{1,5}

Required Gravel Equivalency (G.E. in inches) for various Soil Factors (S.F.)

For new construction or reconstruction use projected ADT or HCADT; for reconditioning projects use present ADT or HCADT

Designs shown here are for an intital 9 Ton pavement structure. Agencies can add pavement structure to increase to 10 Tons in the future

9 TON Staged : < 150 HCADT			9 TON Staged: 151 to 300 HCADT			TYPE OF MATERIAL ³		SPECIFICATION	G.E. FACTOR
S.F.	Minimum Bit G.E.	Total G.E.	S.F.	Minimum Bit G.E.	Total G.E.				
50	7	10.3 ⁶	50	7	14	Bituminous Pavement	2360	2.25	
75	7	13.9	75	7	17.5	Cold-Inplace Recycling (CIR)	2331	1.5	
100	7	17.5	100	7	21	Rubblized Concrete	2231	1.5	
110	7	19	110	7	22.4	Full Depth Reclamation	2331	1.0	
120	7	20.5	120	7	23.8	Stabilized Full Depth Reclamation	2331	1.5	
130	7	22	130	7	25.2	Aggregate Base class 5 & 6	3138	1.0	
						Aggregate Sub-Base class 3 & 4	3138	0.75	
						Select Granular Mat'l	3149.2B2	0.5	

9 TON Staged: 301 to 600 HCADT			9 TON Staged: 601 to 1100 HCADT			AASHTO SOIL CLASS	SOIL FACTOR (S.F.)	ASSUMED R-VALUE	GENERAL ⁴ PLASTICITY
S.F.	Minimum Bit G.E.	Total G.E.	S.F.	Minimum Bit G.E.	Total G.E.				
50	7	16	50	8	18.5	A - 1	50 - 75	70 - 75	NP
75	7	20.5	75	8	23.7	A - 2	50 - 75	30 - 70	SP
100	7	25	100	8	29	A - 3	50	70	NP
110	7	26.8	110	8	31.1	A - 4	100 - 130	20	SP
120	7	28.6	120	8	33.2	A-5	130+	na	na
130	7	30.4	130	8	35.3	A - 6	100	12	P
						A - 7 - 5	120	12	P
						A - 7 - 6	130	8	P

9 TON Staged: 1101 to 1500 HCADT ²		
S.F.	Minimum Bit G. E.	Total G.E.
50	8	20.3
75	8	26.4
100	8	32.5
110	8	35
120	8	37.4
130	8	39.8

Values may not be exact due to rounding

¹For 10 Ton design see page 31 in MnDOT Pavement Manual, July 2007, Chapter 5, Section 3, Figure 5-3-7. Bituminous Pavement Design Chart (Aggregate Base). Increase calculated 18 kip design EASL's by 12% to determine required 10 ton design G.E. in the chart.

²For HCADT over 1500 more advanced design procedures should be used; please contact MnDOT's Pavement Design Unit

³See page 32 in MnDOT Pavement Manual, July 2007, Chapter 5, Section 3, Table 5-3.4 - Granular Equivalent (G.E.) factors

⁴General Plasticity: NP = nonplastic; SP= semi-plastic; P = plastic; na = not applicable (An A-5 soil rarely occurs in Minnesota)

⁵ Safety edge (30° to 35° wedge) are recommended to minimize edge dropoff. See www.dot.state.mn.us/stateaid/safety-edge.html

⁶ These GE values are for the finished pavement section. During construction additional GE may be warranted for a construction platform.