

Granular Equivalence (G.E.) Values for Various Materials

Material Description	Specification	Total G.E.
Superpave HMA ¹	2360	2.25
Plant Mix HMA ¹	2350 (HV & MV)	2.25
Plant Mix HMA ²	2350 (LV)	2.00
Plant Mix HMA ¹	2341 & 2361	2.25
Plant Mix HMA ²	2331	2.00
Cold In-place Recycling (CIR)	2390	1.50
Rubblized Concrete	2231	1.50
Stabilized Full Depth Reclamation (SFDR) ⁴	2215	1.50
Stabilized Full Depth Reclamation (SFDR) ⁵	2215	1.25
Full Depth Reclamation (FDR) ³	2215	1.00
Road Mix Bituminous	2321	1.50
Stabilized Aggregate Base ⁶	2204	1.50
Modified Aggregate Base ⁷	n/a	1.00
Open Graded Drainable Base (OGAB)	3136	1.00
Drainable Aggregate Base (DSB)	3136	1.00
Aggregate Base	3138 (Class 5, 5Q & 6)	1.00
Aggregate Subbase	3138 (Class 3 & 4)	0.75
Select Granular	3149.2B2	0.50
Multiaxial Geogrid ⁸	TM 15-SA-02	2.00

NOTES:

- ¹ GE values shown are for HMA mix when new. If HMA is left in-place, GE values should be reduced as follows for pavement condition:
Existing HMA Good GE = 2.00, Existing HMA Average GE = 1.75, Existing HMA Poor = 1.5
- ² GE values shown are for HMA mix when new. If HMA is left in-place, GE values should be reduced as follows for pavement condition:
Existing HMA Good GE = 1.75, Existing HMA Average GE = 1.5, Existing HMA Poor = 1.25
HMA Good = Moderate longitudinal and transverse cracking, HMA pavement is sound.
HMA Average = Severe longitudinal and transverse cracking, HMA pavement is sound.
HMA Poor = Severe longitudinal and transverse cracking or alligator cracking, HMA pavement is raveling and stripping.
- ³ Full Depth Reclamation (FDR) is a mixture of reclaimed asphalt pavement and aggregate base.
- ⁴ Stabilized FDR (SFDR) is FDR containing a minimum of 50% Recycled Asphalt Pavement (RAP) stabilized with a cementitious chemical, bituminous or other product and supported with a mix design.
- ⁵ Stabilized FDR (SFDR) is FDR stabilized with an alternative additive (i.e. Base One®).
- ⁶ Stabilized Aggregate Base is Aggregate Base stabilized with either a cementitious chemical or bituminous and supported by a mix design.
No GE credit is allowed for alternative additives.
- ⁷ Modified Aggregate Base is Aggregate Base modified with a product to improve its stability.
- ⁸ Maximum allowed GE from biaxial geogrid is 2.0. Minimum strength values shall be established in a project specific specification.

SOURCES:

- 1 Flexible Pavement Design Using Soil Factors, Figure B 5-892.201, State Aid Manual, December 28, 1992
- 2 Granular Equivalent Factor, MnDOT Technical Memorandum 98-02-MRR-01
- 3 Flexible Pavement Design Using Soil Factors, Figure B 5-892.210, State Aid Manual, August 16, 2000
- 4 Granular Equivalent Factors, Table 5-3.4, Section 3, Chapter 5, MnDOT Pavement Manual, July 2007
- 5 Ultimate 10 Ton Staged Flexible Pavement Design Using Soil Factors, Flexible Pavement Design, State Aid Pavement web page.
- 6 LRRB Research Report 2012-36, Structural Analysis of Asphalt Pavements with Full-depth Reclaimed Base.