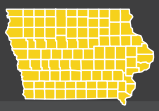
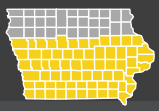
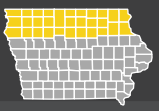
2023 ASPHALT BINDER AND MIXTURE REFERENCE GUIDE FOR IOWA DOT

In October of 2016, the Iowa DOT changed the nomenclature and the recommended asphalt binder grades for Iowa's roadways and published a reference guide card. Since that time, there have been updates to the guidance and specifications. This new reference guide will provide updated guidance for projects constructed under Iowa DOT requirements. See **Iowa DOT IM 510** ***Method of Design of Asphalt Mixture*** for additional information.

DESIGN TRAFFIC (1X10⁶ ESALS)		DESIGN SPEED (MPH)	*CLASS A PROJECTS 	**CLASS B PROJECTS 	**CLASS B PROJECTS 
≤ 1 M	AND/OR	> 45	58-28S	58-28S	58-34S
1-10 M	AND/OR	15-45	58-28H	58-28H	58-34H
> 10 M	OR	> 15	58-28V	58-28V	58-34V
> 10 M	AND	> 15	58-28E	58-28E	58-34E
			S=Standard	H= High	V = Very High	E = Extremely High

***CLASS A PROJECTS:** DOT Primary Highway and Interstate HMA Overlay ≤ 4"
PG 64-22 may be used south of I-80 if methods to retard reflective cracking are not used

****CLASS B PROJECTS:** **DOT Primary Highway and Interstate Projects Including:**
Full Depth Hot-Mix Asphalt | HMA + Cold-in-place Recycling | HMA + Rubblization
HMA + Crack and Seat | HMA Overlay > 4" | HMA + Full Depth Reclamation

MIXTURE SELECTION WITH ABBREVIATED DESIGN CRITERIA

DESIGN TRAFFIC (1X10⁶ ESALS)	MIXTURE DESIGNATION	LAYER	GYRATORY DENSITY		AGGREGATE[1]	
			N_{design}	Design (Target) % G_{mm}	Quality Type	Percent Crushed (min)
≤ 1.0 M	ST	Surface	50	96.0	A	60
		Intermediate			B	45
		Base		97.0		
1.0 – 10.0 M	HT	Surface	75	96.0	A	75
		Intermediate				60
		Base		96.5	B	
> 10 M	VT	Surface	95	96.0	A	85
		Intermediate				
		Base		96.5	B	75
	HMA Interlayer[2]	Base	50	98.0	A	45
	HMA High Performance Thin Lift[3]	Surface	50	≥ 98.0	A	50

1. Flat & Elongated 10% maximum at a 5:1 ratio.
2. See I.M. 510A, Table 3 for additional requirements.
3. See I.M. 510A, Table 4 for additional requirements.

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STEP-BY-STEP BID ITEM CONSTRUCTION

STEP 1: Select Nominal Maximum Aggregate Size

- ⅜" – Thin lifts, trails, athletic facilities
- ½" – General surface and intermediate mix
- ¾" – General base mix

STEP 2: Determine Traffic Level

- Standard Traffic (ST) ≤ 1M ESALs
- High Traffic (HT) 1M-10M ESALs
- Very High Traffic (VT) > 10M ESALs

STEP 3: Choose Lift Designation

- Base
- Intermediate
- Surface
- Shoulder

(Minimum lift thickness = 3 X NMA size)

STEP 4: Choose the Appropriate Binder

- Determine location and type of work.
- Use binder selection guide above to select recommended binder.

BID ITEM EXAMPLE

- HMA Standard Traffic (ST) surface, ½",
- Asphalt binder, PG 58-28S

EXAMPLE BINDER GRADE COMPARISON*

PREVIOUS PG	CURRENT PG	BINDER BUMP FOR RAP**
PG 58-28	PG 58-28S	PG 52-34S
PG 64-28	PG 58-28H	PG 52-34H
PG 70-28	PG 58-28V	PG 52-34V
PG 76-28	PG 58-28E	PG 52-34E

* Approximate equivalents

**Binder bump required when > 20% of binder is from RAP

ADDITIONAL INFORMATION

FULL DEPTH PAVEMENTS

- Use "S" binder at depths > 3" or 4" from the surface

TYPICALLY AVAILABLE BINDERS

- PG58-28S, PG 58-28H, AND PG 64-22S

NON-TYPICAL BINDERS

- Small quantities of specialized binders (<25 tons of binder) may not be available or have a high cost.

HMA INTERLAYER BID ITEMS

- **Mix** = HMA interlayer base course, ⅜"
- **Binder** = PG 58-34E

HIGH-PERFORMANCE THIN LIFT BID ITEM

- **Mix** = HMA thin lift surface course, ⅜"
- **Binder** = PG 64-34E+

WIDENING

- **Mix** = HMA ST, HT, or VT base, ½" or ¾"
- **Binder** = PG 58-28S, H, or V

SHOULDERS PAVED SEPARATELY

- **Mix** = HMA ST, HT, or VT base, ½" or ¾"
- **Binder** = PG 58-28S, 3% air voids

PATCHING

- **Mix** = Any ½" or ⅜" mix
- **Binder** = PG 58-28S or PG64-22S

DETOUR PAVING

- HT or ST mixture, PG58-28S binder

COLD-IN-PLACE RECYCLING

- **Foamed asphalt:** PG52-34S
- **Asphalt emulsion:** HFMS-2s, CSS-1

LEVELING AND GRADE CORRECTION

- ST or HT mixture, PG 58-28S binder

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