

Cold-Climate Bitumen Selection & Procurement Checklist

Use this form to select and release asphalt binder for low-temperature cracking resistance without sacrificing warm-season stability, workability or moisture durability.

1. Climate and project basis

- Project location, pavement layer, elevation and road function identified.
- Governing binder specification and edition identified.
- Minimum pavement design temperature documented using the approved climate method.
- Maximum pavement design temperature documented; full seasonal envelope retained.
- Reliability level required by the agency/project documented.
- Traffic volume, heavy/slow traffic and design life documented.
- Freeze-thaw exposure, drainage condition and moisture-damage risk reviewed.

2. Binder grade selection

Item	Requirement	Project value	Verified
Low-temperature PG	Climate-derived minimum grade under governing standard		■
High-temperature PG	Climate + traffic requirement; do not soften blindly		■
M 332 traffic class	S / H / V / E when the project uses MSCR grading		■
Legacy grade	Exact penetration/viscosity grade if specified; no unofficial PG conversion		■
Modified binder	Performance requirement and storage/change-control provisions		■

3. Binder laboratory release

Test / property	Method / basis	Requirement	COA / lab result	Pass
Grade identity / source	Project specification			■
BBR creep stiffness, S	T 313 / D6648 at specified condition			■
BBR m-value	T 313 / D6648 at specified condition			■
PAV conditioning	R 28 / D6521			■
Direct tension / critical T	If required by selected M 320/D6373 path			■
High-temperature DSR	Applicable PG specification			■
MSCR Jnr / traffic class	M 332 when applicable			■
Viscosity / workability	Applicable specification			■

4. Recycled materials and aging review

- RAP/RAS percentage and aged-binder contribution documented.
- Virgin binder grade not selected without considering recycled-binder stiffness.
- Any rejuvenator has approved dosage, supplier data and mixture validation.
- Long-term aging sensitivity considered for severe climate/high-value pavement.
- Modified-binder storage stability and homogeneity requirements defined.

5. Mixture cracking and durability validation

Check	Project method / condition	Requirement	Result	Pass
DC(T) fracture energy / low-temp fracture test				■
Intermediate-temp cracking / BMD test if specified				■
Rutting / high-temperature performance				■
Moisture susceptibility				■
Air voids / VMA / density				■
Binder content / effective binder				■
Freeze-thaw / drainage-related QA where applicable				■
Plant-produced / field trial validation				■

6. Procurement and supplier controls

- Purchase order states exact grade, grading system and standard edition.
- Batch-specific COA and lot traceability required.
- Approved refinery/source status confirmed where the project requires it.
- Independent sampling and verification rights included.
- Supplier must notify relevant source/process/modifier changes before shipment.
- For modified binder, storage temperature, circulation and maximum hold requirements documented.
- Typical TDS values are not accepted as a substitute for batch release data.

7. Receiving and release

Check	Acceptance evidence	Status
Identity / lot	Grade, source, batch and documents match purchase order	■
COA	All project-required high/low-temperature and aging tests reported	■
Sampling	Representative sample taken under approved procedure	■
Temperature / condition	Delivery and storage condition within approved range	■
Homogeneity	No contamination, water ingress or modified-binder separation	■
Mixture validation	Required cracking, rutting, moisture and density results accepted	■
Retention sample	Sealed representative sample retained for traceability	■

8. Red flags - stop and investigate

Red flag	Why it matters
Binder chosen from minimum air temperature only	Pavement temperature model and reliability are missing.
Only BBR stiffness is reported	m-value / stress-relaxation requirement may be controlling.
Softest available binder selected without summer check	Warm-season rutting and workability can become unacceptable.
Penetration grade treated as direct PG equivalent	The grading systems are not one-to-one.
High RAP/RAS mixture released from virgin-binder COA only	Aged recycled binder can control low-temperature mixture response.
Freeze-thaw distress blamed only on binder	Moisture, drainage, density and base condition may dominate.
Polymer percentage specified without performance data	Modifier content alone does not establish low-temperature grade or fracture resistance.

Approval record: Project _____ Binder grade _____ Supplier _____ Lot _____ Mixture ID _____ Reviewer _____
 Date _____