

Aggregate from Inert Waste: Resource Framework

Recycled Aggregate as constituents in Bituminous Mixtures

Guidance & Testing Requirements

Specification for Highway Works (SHW) 2025

Clause CC 202 Section 7

(formerly SHW Series 900)

Applications

- All raw materials used in asphalt production

Focus

- Durability, consistency and compliance





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Recycled Aggregate as constituents in Bituminous Mixtures

CC 202 Section 7 Explained

CC 202 is part of the 2025 Specification for Highway Works (SHW) that governs the properties and acceptance of aggregates in asphalt used in highways flexible pavements. It covers natural, manufactured and recycled aggregates.

CC 202 replaces older Series 900 requirements.

CC 202 aligns with much of the requirements of CC 201 in relation to flexible pavement construction.

What CC 202 Section 7 is responsible for

CC 202 Section 7 is responsible for controlling the quality and suitability of all materials used in bituminous (asphalt) mixtures. It ensures that everything going into the asphalt mix is fit for purpose before production starts.

Aspects of CC 202 Section 7 (Core content)

1. Aggregate quality

- Specified requirements for stone materials (grading, strength etc.)
- Ensures aggregates can carry traffic loads without failing

2. Recycled material control

Governs the use of:

- Reclaimed asphalt (RAP)
- Recycled aggregates, including limits and testing requirements

3. Bitumen (binder) requirements

- Defines correct binder type and grade
- Controls handling and storage



Recycled Aggregate as constituents in Bituminous Mixtures

4. Material compliance and checking

- Requires testing and certification of all materials
- Ensures traceability, consistency and quality

CC 202 Section 7 and Recycled Aggregates

CC 202 Section 7 allows use of recycled aggregates, but their use is strictly controlled to ensure they meet required quality standards, are used in appropriate proportions and do not have any adverse impact on the performance of the finished pavement.

- Product Standards (BS EN 12620)
- UK Concrete Standard (BS 8500)
- SHW 2025 Quality and Composition requirements
- Requirements of the Aggregates from Inert Waste Resource Framework

Types of Recycled Aggregate used under CC 202 Section 7

Under CC 202 Section 7, recycled aggregates are typically from:

- Reclaimed asphalt (RAP, planings)
- Recycled concrete aggregate (RCA)
- Other secondary or recycled aggregates

Key requirements for recycled aggregate

1. Suitability

- Must be fit for use in asphalt mixtures
- Must perform to same levels as natural aggregate

Use of recycled aggregates cannot reduce strength, stiffness or durability.



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2. Quality control

- Must be tested and classified
- Contamination levels (wood, plastics, sulphates etc.)
- Grading consistency
- Mechanical properties

Ensures consistency of the final asphalt mix.

3. Limits on use

- Maximum levels of recycled aggregates use are set
- Specific limits depend on layer type (base, binder, surface)

Higher recycled content means more controls are required.

4. Consistency

- Materials must come from controlled, consistent sources
- Variability must be minimised

Prevents batch-to-batch inconsistency in asphalt performance.

5. Documentation and traceability

- Records of sources of recycled materials
- Full geotechnical and chemical testing results
- Mix proportions

These are essential for QA, audit and proof of end of waste criteria.



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Where recycled aggregates are NOT used under CC202 Section 7

Under CC 202 Section 7, recycled aggregate concrete mixes are not permitted in surface course materials, especially high-performance or thin surfacing systems.

1. Surface course/wearing course (Main restriction)

Not permitted in:

- Thin surface course systems (TSCS)
- High-speed / high-stress wearing courses
- Polished, skid resistant surfaces

Surface courses must deliver:

- Skid resistance
- Durability
- Consistent texture

Recycled aggregates use in surface layers can:

- Reduce skid resistance consistency
- Introduce variability
- Affect long-term surface performance

2. High performance asphalt mixtures

Recycled aggregates are typically not allowed or are highly restricted in:

- Polymer-modified asphalt mixes
- High-specification surface materials
- Premium durability mixes

These mixes require strict control of binder and aggregate properties and recycled materials can negatively affect binder performance and mix consistency



Recycled Aggregate as constituents in Bituminous Mixtures

3. Situations with strict durability or safety requirements

Use is restricted in:

- High traffic loadings (motorways and trunk roads)
- High safety requirements (braking zones, junctions, roundabouts)

Any variability in material quality can lead to early cracking, polishing of surface layer and surface failure.

What CC 202 Section 7 expects from recycled aggregates to be used in asphalt

Under CC 202 Section 7, recycled aggregates are not treated any differently in principle from primary aggregates, but they must perform exactly the same as natural materials. This is because they form the main structural element of asphalt mixes. They must be strong, durable, clean and consistent. There is no relaxation just because a material is recycled.

1. Strength and durability

Recycled aggregates must resist:

- Crushing under traffic loads
- Wear and polishing over time

These are typically proven by standard testing (PSV, AAV, LA) and ensures that the pavement does not rut, polish or deform prematurely.

2. Correct grading (size distribution)

- Aggregates must meet specified grading envelopes
- They must have the proper mix of sizes (coarse + fine)

These properties support overall structural performance by ensuring good compaction while controlling voids and density.



Recycled Aggregate as constituents in Bituminous Mixtures

3. Cleanliness

Aggregates must be free from:

- Clay
- Dust coatings
- Organic matter
- Deleterious materials

Presence of these contaminants in the aggregate will prevent poor bonding with the bitumen and lead to weak spots in the asphalt mix.

4. Compatibility with bitumen

Aggregates must bond effectively with the binder, and may require:

- Specific mineralogy
- Adhesion agents to be added

These prevent loss of adhesion between the aggregate and the binder.

Additional requirements specific to recycled aggregates

1. Source control and traceability

- Must originate from known, controlled sources
- Full traceability on origin, history and composition is required

2. Enhanced testing and characterisation

Additional testing is required compared to virgin materials:

- Grading consistency
- Binder content (for RAP)
- Contamination checks
- More frequent sampling



Recycled Aggregate as constituents in Bituminous Mixtures

3. Proportion limits

Use	Recycled Asphalt Limit
Surface/wearing layer	Not permitted
Binder course	10–30% but restricted and controlled
Base course	20–50%+ commonly used

The above proportions should be checked with your asphalt supplier, as limits are based on the use of recycled/reclaimed asphalt not recycled aggregate. The permitted percentages depend on the material, application and mixing plant. Reclaimed asphalt shall comply with the requirements of BS EN 13108–8.

4. Resource Framework Compliance

To be accepted under SHW CC 202 Section 7, recycled aggregates must comply fully with the Aggregates from Inert Waste Resource Framework, and have:

- Traceability
- Factory Production Control procedures in place
- Meet End of Waste criteria through product testing
- Independent third-party UKAS accreditation of the production process

This guarantees that the material is a tested and certified 'product' and not a waste which, if untested and unverified, could have critical implications for the performance of the designed asphalt mix and its application.

Common non-compliance issues include:

- No composition data (very common)
- Missing certification/testing/verification (Resource Framework)

Know what's in it, where it came from, how it performs and control its variability.

Summary:

CC 202 Section 7 allows recycled aggregate use in asphalt mixes, but only where they are fully characterised, controlled, tested and proven to deliver the same performance as primary materials. Material production and quality should be fully traceable, documented, certified and fully auditable.



Recycled Aggregate as constituents in Bituminous Mixtures

Mandatory Standard Aggregates Tests for Recycled Aggregates to be used in asphalt (CC 202 Section 7)

For SHW 2025 CC 202 Section 7, recycled aggregates must comply with a core set of mandatory laboratory and site tests to fully demonstrate material suitability and consistency.

Test	Standard
Particle Size Distribution (PSD)	BS EN 933-1
Los Angeles (LA) coefficient	BS EN 1097-2
Flakiness Index	BS EN 933-3
Water absorption and Density	BS EN 1097-6
Magnesium Sulphate Soundness	BS EN 1367-2
Cleanliness/fines content	BS EN 933-1
Dicalcium silicate disintegration of air-cooled blast furnace slag	BS EN 1744-1
Iron disintegration of air-cooled blast furnace slag	BS EN 1744-1
Volume stability of steel slag	BS EN 1744-1

Purpose:

These control the key design mix performance and durability. Recycled aggregates must perform to the same standards as natural aggregates.

Key differences in testing versus natural aggregate

Recycled aggregates require additional, more frequent, and more stringent testing than natural aggregates to control variability, contamination, and performance risk under CC 202 Section 7.

Test	Natural	Recycled
Grading	Routine	More frequent/stockpile
Strength (LA)	Periodic	Same or more frequent
Fines content	Routine	More frequent



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