

Pavement ‘Checks and Key Points’ Guidance

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Pavement 'Checks & Key Points' Guidance

- A suite of 'Checks & Key Points' guides have been developed and published by TII
- Key aspects for the installation of Bituminous mixtures during the construction of pavement schemes (HRA, SMA, SD, AC)
- Aimed at Employer's Representatives and other interested parties
- Enhance understanding and help in the interpretation of written specification requirements
- Photographs and notes used to emphasise the points being made (good practice and poor practice)
- Specification references provided in order for the user to easily locate the actual specification requirement

'Checks & Key Points' Guides (2019-2020)



TII Publications Number	TII Publication Title	Set	Published
CC-PAV-04011	Hot Rolled Asphalt and Coated Chippings – Checks and Key Points	Technical	January 2019
CC-PAV-04013	Surface Dressing – Checks and Key Points	Technical	March 2020
CC-PAV-04014	Stone Mastic Asphalt – Checks and Key Points	Technical	March 2020
CC-PAV-04015	Asphalt Concrete – Checks and Key Points	Technical	December 2020

Checklists of Items Required

Prior to Commencing Design (Surface Dressing Only)

- ✓ Site Assessment
- ✓ Road Hardness
- ✓ Macrotexture
- ✓ Traffic Volume
- ✓ Traffic Speed
- ✓ Chippings
- ✓ Season

Prior to Commencing Works

- ✓ Type Testing
- ✓ Declaration of Performance
- ✓ CE Marking
- ✓ Constituents
- ✓ Product Composition
- ✓ Chippings (SD)

- ✓ Works Proposals

During and After Works

- ✓ Works Requirements
- ✓ Monitoring of Construction
- ✓ Sampling, Storage & Retention
- ✓ Site Documentation & Traceability

Example:

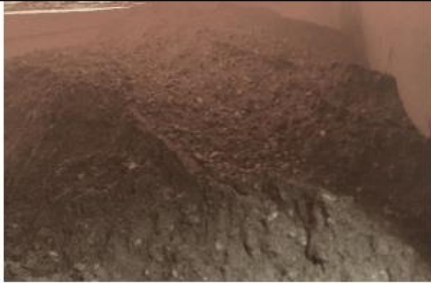



Item	Specification Reference	Task	Done ✓
CE Marking	CC-SPW-00900 Clause 5	Review documentation for compliance with specified SMA mixture:	
	CC-SPW-00900 Table 7	Constituents - Type testing, Declaration of Performance, CE Marking - CC-GSW-00900 Table NG1.2a	
	CC-SPW-00900 Table 8	Product Composition - Type testing, Declaration of Performance, CE Marking - CC-GSW-00900 Table NG1.2a	
Works Proposals	CC-SPW-00900 Clause 10.1.2	Contractor to submit works proposals to include:	
		Laying and compaction plant – CC-SPW-00900 Clause 10.1.7 & 10.1.9 & 10.1.9.3	
		Working in different climatic conditions - CC-SPW-00900 Clause 10.1.5, 10.1.5.1 & CC-GSW-00900 NG 10.1.5	
		Formation of joints - CC-SPW-00900 Clause 10.1.8 & CC-GSW-00900 NG 10.1.8	
		Further reading CC-GSW-00900 Clause NGA 10	

Hot Rolled Asphalt & Coated Chippings (CC-PAV-04011)

Key Points:

- HRA Mixture
- Chip Condition & Size
- Macrotexture
- Rate of Spread
- Embedment
- Joints
- Weather
- Chip loss
- Ride quality

Example:


Key point	Level	Example Photographs		Specification References and notes
HRA Mixture	Good			<p>The composition of the HRA mixture should be sufficiently robust to support the coated chippings and sufficiently malleable to hold the coated chippings in place.</p> <p>The manufacturing process can also play a significant role in the ability of the HRA mixture to support the coated chippings.</p> <p>The temperature of the HRA mixture should be within the limits contained in Tables 5 and 6 of CC-SPW-00900.</p> <p>Insulated transport is essential to minimise heat loss prior to use. CC-SPW-00900 Clause 10.1.3 stipulates the requirements for transport.</p> <p>Particularly wet or cold ambient conditions can affect the ability of the HRA mixture to support the coated chippings.</p> <p>Paver tamper settings can be altered to assist the process of supporting the coated chippings.</p> <p>Truck inspections on site should only take place if hopper material or screed indicates poor bearing capacity.</p>
	Poor			

Surface Dressing (CC-PAV-04013)

Key Points:

- Aggregates
- Design Checks
- Stockpile Management
- Binder Emulsion Storage
- Equipment
- Weather
- Substrate
- Installation
- Traffic Control & Aftercare
- Specific Issues

Example:


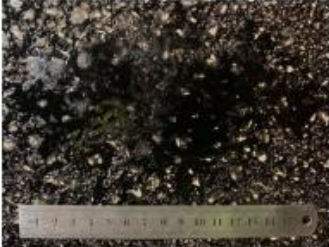




Key point	Level	Example Photographs		Specification References and notes
Aggregates	Good shape Good size Clean			<p>CC-SPW-00900 Table 17 & Table 18</p> <p>The shape and size of the chippings influences the performance of the surface dressing.</p> <p>The measurement of Average Least Dimension (ALD) provides a better measure of shape as it takes size and Flakiness Index (FI) into account.</p> <p>The ALD is used in the analytical design method along with traffic volumes, macrotexture, hardness and days to first frost to determine the rate of application of binder and rate of spread of chippings.</p> <p>A desktop application for calculating ALD and undertaking an analytical design is available at: https://web.tii.ie/adt/#/pavement</p> <p>Access to the desktop application requires initial registration with TII.</p>
	Poor shape Good size Clean			
Aggregates continued	Poor shape Poor size			
	Good shape Good size Dusty			

Stone Mastic Asphalt (CC-PAV-04014)

Key Points:

- SMA Mixture
- Surface Finish
- Transport
- Material Flow
- Preparation
- Bond to Substrate
- Macrotexture
- Joints
- Roundabouts
- Ironwork
- Weather
- Ride Quality
- Site Illumination

Example:




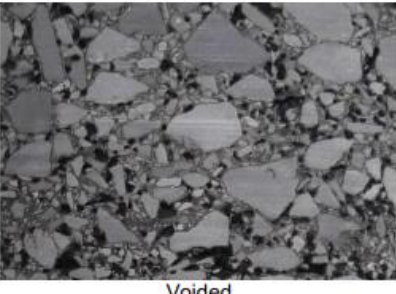


Key point	Level	Example Photographs		Specification References and notes
Surface finish	Variable			<p>The manufacturing process can also play a significant role in the ability of the SMA mixture to provide a consistent surface finish.</p> <p>The temperature of the SMA mixture should be within the limits contained in Tables 8 and 9 of CC-SPW-00900.</p> <p>Overheating can lead to binder drainage.</p>
	Binder Flushing			
	Good			<p>If the mixture temperature is too low, reduced cohesion occurs at the interface between the binder film and aggregate leading to excessive voids in the finished surface and subsequent loss of material.</p> <p>The surface finish is highly influenced by the mixture design.</p> <p>A well designed mixture produces a homogenous blend of components without segregation.</p>
Consistent				
Poor			<p>A poorly designed mixture can produce an imbalance of components leading to segregation during placement.</p>	
Variable				

Asphalt Concrete (CC-PAV-04015)

Key Points:

- AC32 Base Mixture
- AC20 Binder Mixture
- Transport
- Preparation
- Bond to Substrate
- Joints
- Freestanding Edge
- Adjacent Concrete Component
- Ironwork
- Temperature
- Regularity
- Specific Issues

Example:

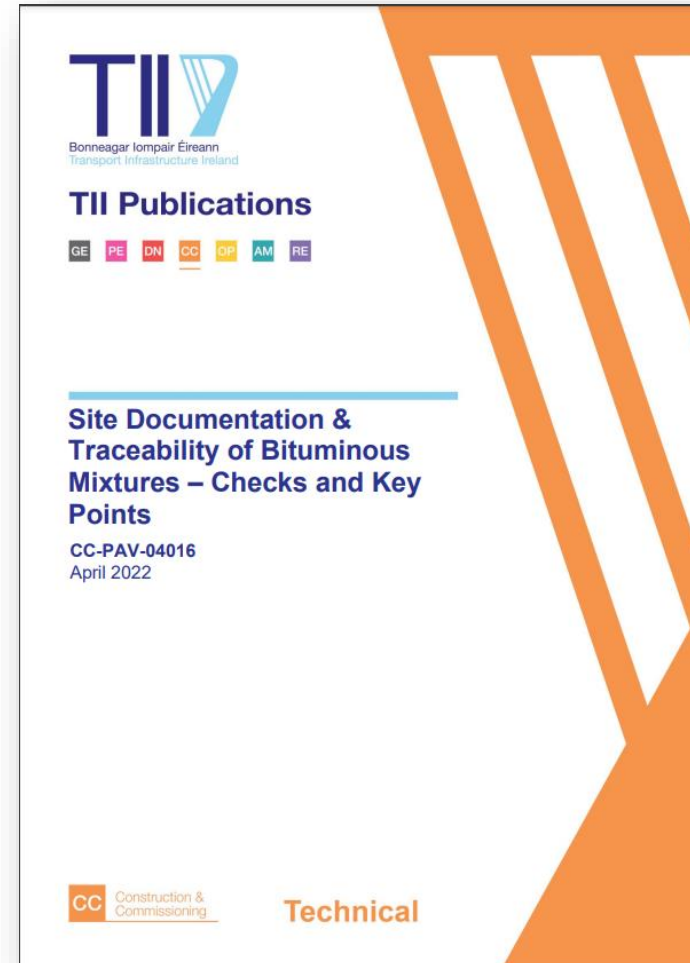
Key point	Level	Example Photographs		Specification References and notes
AC 20 Binder Mixture	Good			<p>The greater the proportion of RA used, the greater the influence on the mechanical properties and effective binder content of the mix.</p> <p>The constituents of mixtures should be traceable, this also applies to RA.</p> <p>AC mixtures should be dense enough to achieve aggregate interlock and rich enough to permit reorientation of the aggregate particles during compaction to reduce air voids.</p>
	Mixture is dense Low air voids Durable	Dense finish	Good aggregate interlock	
AC 20 Binder Mixture	Poor			<p>CC-SPW-00900 Clause 10.1.9.1</p> <p>A low level of air voids prevents water ingress, vital for long term durability.</p> <p>The temperature of the AC mixture should be within the limits contained in Tables 2 and 3 of CC-SPW-00900.</p>
	Mixture is partially dense Dull surface High air voids Not durable	Coarse finish	Voided	
Transport	Cleanliness & Insulation			<p>CC-SPW-00900 Clause 10.1.3</p> <p>To facilitate the discharge of asphalt, the floor of the vehicle shall be coated with water, a liquid soap solution or proprietary release agent.</p> <p>Insulated transport is essential to minimise heat loss prior to use. CC-SPW-00900 Clause 10.1.3 stipulates the requirements for transport.</p>
		Release agent application	Well insulated load	

New 'Checks & Key Points' Guides (April 2022)

Site Documentation & Traceability of Bituminous Mixtures (CC-PAV-04016)

Overview / Purpose

- To improve the retention and availability of relevant documentation:
 - Product approval,
 - Works proposals,
 - Laying/as-built records,
 - Traceability of materials
 - Content of close out reports
- To ensure that in the event of a subsequent investigation, sufficient records are available.



Site Documentation & Traceability: Checks

Checks Prior to Commencing Works:

- ✓ Contract specific Appendix requirements
- ✓ Type Test Reports, Declaration of Performance, CE Marking
- ✓ Works Proposals - How traceability of the material in the Works will be addressed

Checks During & After Completion of Works:

- ✓ Works Requirements - checks and review for compliance including:
- ✓ Traceability of material in the works – laying records
- ✓ OCL of the manufacturing plant – obtain reports
- ✓ Temperatures; Mixture properties; Macrotexture
- ✓ Monitoring by IA – data is compliant and test records available for review

Site Documentation & Traceability: Key Points

KEY POINTS

- Traceability of materials in the works
- Recording and reporting requirements
- Temperature requirements
- Recording of Weather Conditions
- Information Archiving: Retention of Records

Additional Information

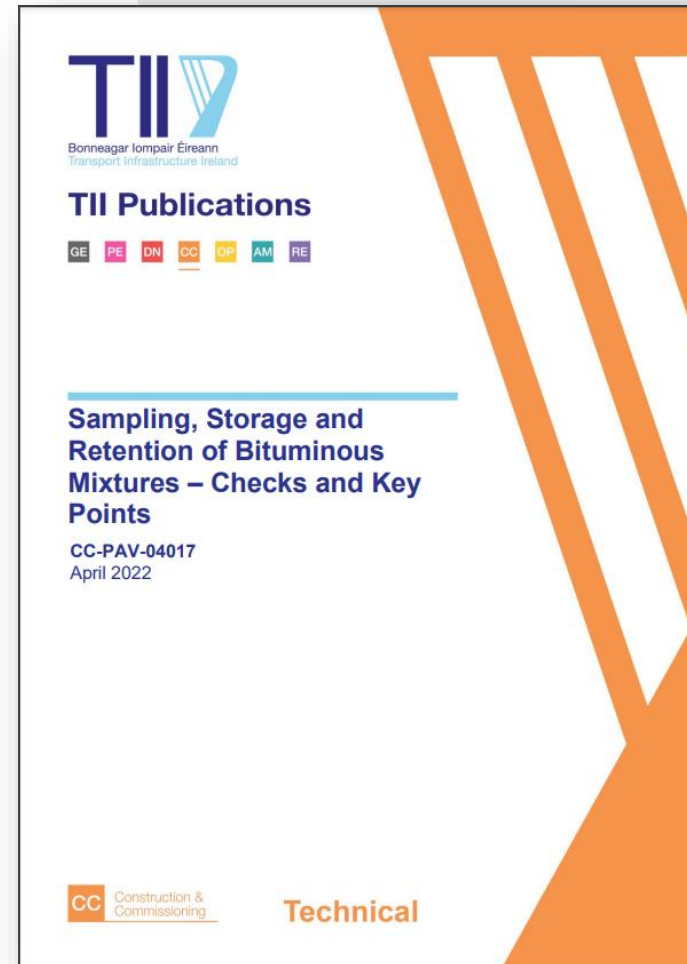
- Emerging technologies
- How data is captured, stored and retrieved



Sampling, Storage & Retention of Bituminous Mixtures (CC-PAV-04017)

Overview / Purpose

- Aims to improve the availability of reference samples for analysis and subsequent investigations.
- Outlines the required tasks for sampling, storage and retention of samples.
- Describes the Quality Control testing function
- How split samples may be used for compliance checks.
- Best practice for the storage of samples and retention methods
- Ensure ease of access of samples post-construction.



Sampling, Storage & Retention: Checks

Prior to Commencing Works:



- Contract Specific Appendix Requirements
 - ✓ Supply of Samples to the ER
 - ✓ Testing to be carried out by the Contractor

- Quality Assurance and Control
 - ✓ CE Marking Procedural Guidelines,
 - ✓ FPC Certificate
 - ✓ prTAIT documentation (where applicable)

During & After Completion of the Works:

- Quality Assurance and Control
 - ✓ Works Requirements
 - ✓ General testing requirements
 - ✓ Coring requirements
 - ✓ Routine testing required for FPC
 - ✓ Weekly OCL reports

- Monitoring of Construction
 - ✓ Monitoring and Supervision of the Works by IA

Sampling, Storage & Retention: Key Points

Fundamental Requirements

- Obtaining Samples; Testing; Traceability; Storage; Retention

Aggregates; Bituminous Mixtures; Surface Treatments; LEBM

- Sampling, Identification, Retention

Monitoring

- Competent National Authority; Market Surveillance

Indicative sample sizes for common tests

- Mixture; Aggregate; Binder tests

Indicative Sample Sizes for Common Tests

Note: Reference shall always be made to the specific test method to confirm sampling and sample size requirements

Type	Test	Mixture Nominal Size	Size for Test	Bulk sample retained for contract defects liability period	Sub sample retained for contract defects liability period	Indicative Sub sample Weight Required	Sub sample retained for minimum period of 6 years
Mixture	Binder Content & Grading	4mm - 16mm	Nominal mixture size	YES	YES	2 kg	SURFACE COURSE ONLY
		20mm - 31.5mm	Nominal mixture size	YES	YES	5 kg	NO
	Water Sensitivity		Nominal mixture size	YES	YES	15 kg	NO
	Coated Chippings		Nominal size	YES	YES	5 kg	YES
Aggregate	Grading / Flakiness Index / Fines Content / Average Least Dimension	6mm - 14mm	Nominal size	YES	YES	2 kg	SURFACE COURSE ONLY
		20mm	Nominal size	YES	YES	5 kg	SURFACE COURSE ONLY
	Particle Density & Water Absorption		Nominal size	YES	YES	5 kg	NO
	Magnesium Sulphate		10/14	YES	YES	2 kg	NO
	Los Angeles Value		10/14	YES	YES	5 kg	YES
	Aggregate Abrasion Value		10/14	YES	YES	2 kg	YES
	Polished Stone Value		6/10	YES	YES	2 kg	YES
	Friction After Polishing		6/10	YES	YES	5 kg	YES
	Geological & Petrographic assessment		Nominal size	YES	YES	2 kg	YES
Binder	Emulsion Binder			No	No	5 litres	NO