

Coring of Asphalt Pavements

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INTRODUCTION

This Pavement Work Tip provides a guide to field procedures associated with coring of asphalt pavements for determining field density or other properties of insitu asphalt. It should be read in conjunction with existing specifications, standards or test methods and, where there is any conflict with such documents, the relevant specification/standard shall apply.

SITE SAFETY

The coring worksite shall be protected from traffic in accordance with the relevant code of practice. Where necessary, additional warning shall be provided for construction traffic and machinery within protected worksites.

Operators shall wear appropriate personal protective equipment including:

- High visibility safety vest
- Eye protection
- Hearing protection.

All equipment shall be handled and operated in accordance with relevant manuals and safe working procedures.

SITE SELECTION

Sites for coring shall be selected in accordance with the relevant specification or sampling plan.

Coring positions shall be marked on the pavement with crayon or suitable marking material. Where required by the specification, the direction of traffic shall also be marked within the core area.

EQUIPMENT

The coring machine shall be fitted with a motor driven head and a system for cooling and flushing the head.

Two types of cooling and flushing systems are employed:

- Water cooling and flushing is used for most applications.

- Cooling with dry ice or liquid nitrogen in conjunction with flushing by compressed air is used where dry samples must be obtained. Air cooling systems may require an extraction system

Key Summary

This issue of 'pavement work tips' provides a guide to equipment, site selection, safety and procedures for coring of asphalt pavements

to collect dust created by the coring operation.

Cooling of the surface with dry ice or liquid nitrogen may also be used in conjunction with water flushing to enable effective coring of freshly placed hot asphalt (>40°C).

Thin walled bits for obtaining core samples are fitted with diamond tips and vary in internal diameter from 50 mm up to 150 mm, although a finished core diameter of 100 mm is required for most tests undertaken on cored asphalt samples.

PROCEDURE

Position the coring machine perpendicular to the road surface. The angle of cut must not change during coring. A guide frame for the coring machine assists in positioning and maintaining the core in a vertical position throughout the coring operation (Figure 1).



Figure 1: Coring machine with guide frame

continued on reverse



For wet coring, ensure an adequate flow of water to cool and lubricate the coring bit. The water flow should be regulated to the minimum required for cooling and lubrication and to avoid flooding the surface. Slurry run-off should be controlled by an appropriate means such as an extraction system or absorbent sock placed on the surface.

For dry coring, place a block of dry ice on the surface (width approximately 40 mm greater than the core diameter) for sufficient time to chill the asphalt. Alternatively, freeze the area with liquid nitrogen. Ensure that air flow is maintained at a pressure sufficient to clear fines from around the wall of the hole and that the dust is collected in a suitable extraction system.

Apply an even and continuous pressure to the core bit. Generally, minimal pressure is required. Excessive pressure should be avoided and may cause labouring of the machine or movement of the coring machine. A screw feed control in conjunction with a support frame (Figure 1) assists in controlling pressure.

Core to the desired thickness (if known). If the desired layer cannot be dislodged with a light tap of a chisel or gentle leverage with a core lifter inserted between the core and wall of the core, continue coring to the full depth of the asphalt. A change in colour of coring water waste will generally indicate that a different base material such as concrete or unbound granular base has been reached.

Remove the core using a thin wire loop, plastic packing tape or purpose-built core lifter (Figure 2). Care must be taken not to damage the core. Screwdrivers, chisels or other



Figure 2: Core lifting device

sharpened tools that may cause damage or distortion of asphalt core samples should not be used for removing cores.

REINSTATING CORE HOLES

Core holes should be reinstated as follows:

- Wash or sweep waste from the site to avoid unsightly blemish on the surface
- Remove water from the hole by dabbing with a sponge or cloth.
- Tack coat the core hole with bitumen emulsion applied by spray or brush.
- Fill the hole in lifts of similar thickness to the existing pavement with either hot asphalt (if available) or high-performance proprietary cold mix. Each lift must be compacted by "Kanga hammer" or suitable tamper. Compaction using a hand operated sliding hammer is shown in Figure 3.



Figure 3: Reinstating core hole slide hammer

STORAGE AND TRANSPORT

Cores must be marked with a suitable identifier on the top or side of the core and identification details recorded.

Cores should be placed on a flat surface, top side down, or in half round pipe sections of suitable diameter and firmly secured to avoid damage in transit.

REFERENCES

AS 2891.1 Sampling of asphalt

AS 2891.14.5 Field density tests – Density ratio of compacted asphalt.

For more information on any of the construction practices discussed in "pavement work tips", please contact either your local Austroads

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