



WSDOT SOP 734

Sampling Hot Mix Asphalt After Compaction (Obtaining Cores)

1. Scope

- This method describes the process for obtaining Hot Mix Asphalt test cores for Laboratory testing after compaction has been completed. Cores may range in size from 2 in to 12 in

2. Significance and Use

- Samples obtained in accordance with the procedure given in this practice may be used for measuring pavement thickness, density, and acceptance testing.
- When cores are used to determine nuclear gauge correlation, refer to WSDOT SOP 730.
- When cores are used to determine pavement density, the Bulk Specific Gravity (G_{mb}) is determined according to WSDOT FOP for AASHTO T 166.
- When cores are used for forensic testing of HMA, refer to SOP 737 “Procedure for the Forensic Testing of HMA Field Cores” to determine the required number and size of cores.

3. Apparatus

- Core Drill Machine –A Core Drill Machine of sufficient horsepower and depth to minimize distortion of the compacted cores of Hot Mix Asphalt.
- Core Bit – The cutting edge of the core drill bit shall be of hardened steel or other suitable material with diamond chips embedded in the metal cutting edge or as recommended by the core drill bit manufacturer. Typically the core drill bit should have an inside diameter of $4'' \pm 0.25''$ (100 mm \pm 6 mm) or $6'' \pm 0.25''$ (150 mm \pm 6 mm), these core bit dimensions are agency preferred alternatives. Suitable larger and smaller diameter core bit alternatives shall be employed as required by the agency.
- Tools – Core layers may be separated using a saw or other suitable device which provides a clean smooth surface and does not damage the core.
- Retrieval Device (Optional) –The retrieval device used for removing core samples from holes must preserve the integrity of the core. The device may be a steel rod of suitable length and with a diameter that will fit into the space between the core and the pavement material. There may be a 90 degree bend at the top to form a handle and a 90 degree bend at the bottom, approximately 2 in (50 mm) long, forming a hook to assist in the retrieval of the core or other suitable device.

4. Safety

This standard does not purport to address all of the safety concerns, associated with its use. It is the responsibility of the user of this standard operating procedure to establish a pre activity safety plan prior to use.

5. Test Site Location

- The quantity of cores to be obtained shall be determined by the test procedure to be performed or agency requirements. Refer to WSDOT SOP 730 when taking correlation cores.
- Determine the location of the core(s) as required by the agency.

6. Procedure

- For freshly placed Hot Mix Asphalt materials, the core shall be taken when the material has had sufficient amount of time to cool to prevent damage to the core.
- Pavement may be cooled to expedite the removal of the core by the following methods; water, ice water, ice, or dry ice or liquid nitrogen.
- Place the coring machine and core bit over the selected location.
- Keep the core bit perpendicular to the Hot Mix Asphalt surface during the coring process.
Note 1: If any portion of the coring machine shifts during the operation, the core may break or distort.
- Constant downward pressure should be applied on the core bit. Failure to apply constant pressure, or too much pressure, may cause the bit to bind or distort the core.
- Continue the coring operation until the desired depth is achieved.
- If necessary, use a retrieval device to remove the core.
- Clearly identify the cores location and offset without causing damage (i.e., lumber crayon or grease pencil).
Note 2: If the core is damaged to a point that it cannot be used for its intended purpose, a new core shall be obtained within 6 in of the original location.

7. Filling Core Holes

- When necessary, the hole made from the coring operation shall be filled with a material that will not separate from the surrounding material. If Hot Mix Asphalt is available and used, it shall be compacted into the hole. A **ready mix concrete or fast set grout** product may be used in lieu of a Hot Mix Asphalt. A black dye can be used to color the grout on **driving surface**.
- **Prior to backfilling a core hole on a bridge deck, ensure that the hole and sidewalls are dry enough to bond with the sealant before applying.**
- **Acceptable sealants include; asphalt binder or any waterproof sealant designed for asphalt applications as stated by the manufacturer.**
- **Apply sealant to bottom surface and side walls of core hole as needed.**
- **Backfill the core hole with Hot Mix Asphalt, cold mix asphalt, ready mix concrete or grout and compact as needed.**

8. Transporting Cores

- Transport cores in a suitable container(s) that prevents damage from jarring, rolling, hitting together, and/or impact with any object.
- Prevent cores from freezing or excessive heat above 130° F (54° C), during transport.

Note 1: In extreme ambient temperature conditions, cores should be placed in water during transport.

- If the core is damaged in transport to a point it can not be utilized for its intended purpose the core will not be used.

9. Separate The Layers

- When necessary, separate the lifts or layers of pavement courses by using a water cooled saw to cut the core on the designated lift line or separate by other suitable methods that will not damage the lifts or layers to be tested.

Note 4: Lift lines are often more visible by rolling the core on a flat surface and/or surface drying the core.

10. Length Determination

Measure the thickness of the designated lift to the nearest 0.01' or 1/8" according to WSDOT Test Method 720.

11. Report

Core information shall be reported on standard agency forms and should include the following information.

- The date the cores were obtained
- Paving date
- Contract number
- Project title
- Location of test
- The lift being evaluated
- Type of material being evaluated
- Mix Design Lab Number
- Average thickness of each core (to the nearest 0.01' or 1/8 ")
- Average Theoretical Maximum Density

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