

TEX-251-F

Obtaining and Trimming Cores of Bituminous Mixtures



Why

Roadway cores are used for acceptance and payment of hot mix asphalt mixtures. Cores must be taken and trimmed properly so they are not cracked or distorted in any way.

Roadway cores must be in good condition and trimmed to only represent the layer placed. Cores taken and properly trimmed will produce accurate results of the mix placed on the roadway.



When

Required for hot mix asphalt specifications that use air voids to determine acceptance and payment.

Roadway cores are taken after the completion of the subplot or day's production. The roadway must be cooled to a temperature where coring and trimming won't damage the cores.



How — Part I: Obtaining Cores

Equipment

- Motor driven core drill
- Core bit/barrel
- Water, ice, or dry ice to cool pavement
- Steel rod, thin wire loop, or mallet to remove cores
- TxDOT security bag w/serial number
- Patching mix to fill in core holes

Procedure

- Pavement surface must be cool to prevent damage to the core.
 - *Temperature should not be more than 160°F.*
 - *Surface can be cooled with water, ice, or dry ice.*
- Place the core bit or barrel directly above the sampling location.
- Use water to keep the core bit cool and to remove the cuttings.
 - *Water flows up inside and around the inner bit.*
- Keep the core bit perpendicular to the surface while applying constant pressure.
 - *Applying too much pressure may cause the bit to bind or distort the core.*
- Continue applying constant pressure until the desired depth is achieved.

Front
(TxDOT Logo Only)

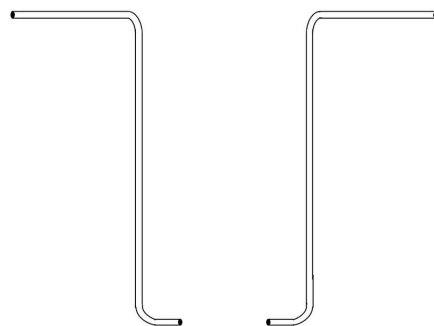
Back
(No Print)



Serial #

QUICK FACTS: LEVEL 1B

- Take the core out of the core bit or out from the core hole. Avoid distorting, bending, or cracking the core.
 - *When the core is in the bit after it's taken out of the pavement, you may have to use a mallet to strike the bit while keeping a hand at the bottom to catch and hold the core while it comes out.*
 - *When the core is in the pavement, you may have to use a steel rod or thin wire (pictured below) to help separate and lift the core from the core hole intact.*
 - It must be long enough to hold and maneuver with a diameter to fit into the space between the core and pavement to the needed thickness.
 - It may have a 90-degree bend at the top to form a handle approximately two to four inches long; and another 90-degree bend at the bottom approximately 1/4 to 1/2 inch long that forms a hook which can slip under the core.
 - *Using a screwdriver or wedge to snap off the core and pry it out may damage the core.*
- Place cores in TxDOT security bags and store in a cool place.
- Remove water from the hole.
- Fill the hole with patching mix or hot mix asphalt.
- Compact the material until the top of it is flush with the surface.
- Take caution during transport to prevent damage.



How — Part II: Trimming Cores

Equipment

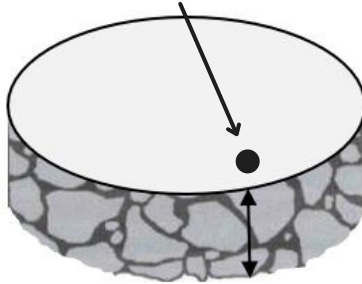
- Masonry Saw
 - Diamond or silicon-carbide blade, sharp to not cause cracks or dislodge aggregate.
- Paint pen or permanent marker
- Ruler, calipers, or measuring tape

Procedure

- Measure the untrimmed core height to the nearest 1/16 of an inch.
 - *Do not include any foreign matter, such as another paving layer of hot mix, seal coat, base, or subgrade material.*
- For cores with a level surface:
 - *Measure the height at one location and record this as the untrimmed core height.*
- For cores with an uneven surface:
 - *Mark the thinnest location.*
 - *Make three more marks around the perimeter of the core at 90, 180, and 270 degrees from the first mark.*
 - *Measure the height at these marked locations.*
 - *Take additional measurements if they vary by more than 1/4 of an inch. Mark the location(s).*
 - *Average the measurements and record this as the untrimmed core height.*

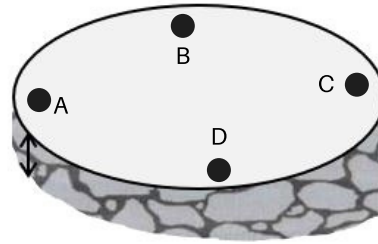
QUICK FACTS: LEVEL 1B

Level Top & Bottom Surfaces
Untrimmed Height = 2-1/8"



Level Core with No Foreign Matter
Do Not Trim
Untrimmed & Trimmed Height = 2-1/8"

Bottom Surface Not Level
A - Thinnest Location
Untrimmed Height = Average of A, B, C, & D
(Four locations)

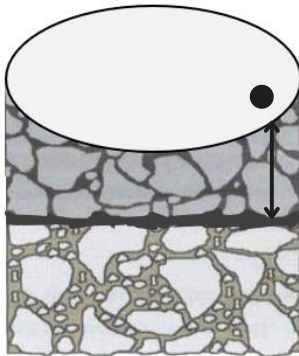


No Foreign Matter,
Do Not Trim
Untrimmed & Trimmed Height = Average of A, B, C, & D

Equipment

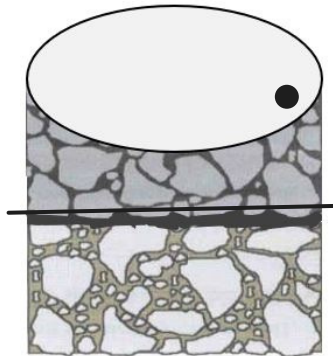
- Trim or saw off any foreign matter and tack material from the core to ensure a level and smooth surface for testing.
 - *Trim only when necessary.*
 - *Trim on-site, in close proximity to where the cores are taken.*
 - *Cores may be trimmed at a field laboratory only when allowed by the Engineer.*
- **Trim the minimum amount of core when necessary, no more than 1/2 of an inch.**
 - *Do not trim the core if the surface is level and there is no foreign matter or tack material bonded to the surface of the core.*
- Measure and record the trimmed core height to the nearest 1/16 of an inch.

Untrimmed Core - Level Surfaces
One Height Measurement



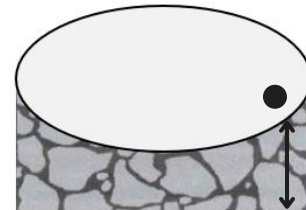
Untrimmed Height = 2-3/16"

Core includes Foreign Matter
Must be Trimmed



*Tack Coat & Hot Mix Base
Materials*

Trimmed Core



Trimmed Height = 2-1/16"
Trimmed Amount =
 $2\text{-}3/16" - 2\text{-}1/16" = 2/16"$ or 1/8"
Less than 1/2"

QUICK FACTS: LEVEL 1B

Action

When Do I Take Cores

- After each subplot is placed, at random sampling locations.
 - *Sublots or areas may not require coring when shown on plans for shoulders, ramps, intersections, turn lanes, and acceleration/deceleration lanes.*
- Sublot(s) is in "remove and replace" condition after referee testing.
 - *No trimming, must be given to the Engineer immediately after coring.*
- Under Exempt Production.
 - *When directed by the Engineer, and the location(s) is determined by the Engineer.*
- Miscellaneous areas such as temporary detours.
 - *When shown on plans.*
- Shear bond strength.
 - *Full depth cores are required for one random subplot from Lot 2 or higher.*
 - *Trimming may be necessary to remove foreign matter such as flexible base with tack coat.*
 - *No height measurements required.*
- Hamburg Wheel Test.
 - *Trimming may be necessary to remove foreign matter such as flexible base with tack coat.*
 - *No height measurements required.*
- Recovered asphalt binder properties.
 - *Trimming may be necessary to remove foreign matter such as flexible base with tack coat.*
 - *No height measurements required.*

Coring Requirements

- May be four or six inches in diameter depending on the mixture type.
 - *Cores with smaller size aggregate may be four inches in diameter.*
- Eligible for air voids/density testing when they meet the minimum untrimmed height requirements for each mixture type.
- Obtain within one working day of time from when placement subplot is completed.
- Obtain two cores side-by-side from within one foot of random location.
 - *Label cores with lot and subplot numbers and A or B.*
 - *Engineer must witness coring operation, trimming, and thickness measurements.*
- Verify the paving layer is bonded to underlying layer.
 - *If not, take corrective action, immediately communicate with roadway superintendent or supervisor.*
- May wrap cores to reduce risk of possible damage during transport.