LEARNER GUIDE

LLN READY

Hand spread asphalt

Training support material for:

RIICBS202E

Hand spread asphalt

Produced by:

EASY GUIDES
Australia Pty Ltd

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Hand spread asphalt

Introduction to hand spread asphalt

Hand spread asphalt refers to the manual application of asphalt mixtures by workers in civil construction. It involves physically spreading and shaping the asphalt to create road surfaces, parking lots, or other paved areas.

This method is used when precise control over the asphalt application is required, particularly in smaller or more intricate areas where large machinery may not be practical.

Workers typically use various hand tools, such as shovels, rakes, and lutes, to distribute the asphalt evenly and ensure it adheres properly to the underlying surface.

Hand spreading asphalt requires skilled labor and is commonly used for finishing touches, repairs, or small-scale paving projects where precision and attention to detail are essential.

What is compliant?

"Compliant" refers to the state of conforming to or meeting a set of rules, regulations, standards, or specifications.

In the context of hand spreading asphalt in civil construction, being compliant means that the work activities align with the,

- established guidelines,
- safety protocols,
- and project specifications,

ensuring that they meet the required standards and regulations.

QUESTION 1

What does the term "hand spread asphalt" refer to in civil construction?

It involves:

a. The automated application of asphalt mixtures using specialized machinery.
b. The manual application of asphalt mixtures by workers.
c. The use of asphalt in gardening and landscaping.
d. The production of asphalt mixtures in a factory setting.

Answer: b. The manual application of asphalt mixtures by workers.

QUESTION 2

What are the types of work that a person in hand spreading asphalt in civil construction do?

Possible types of work in hand spreading asphalt in civil construction could do?

a. Planting trees and shrubs in the work area.
b. Managing office paperwork and documentation.
c. Distributing asphalt evenly with hand tools and ensuring proper compaction.
d. Supervising the installation of electrical wiring on the construction site.

Answer: c. Distributing asphalt evenly with hand tools and ensuring proper compaction.

QUESTION 3

What are some of the tasks that a person might perform when hand spreading asphalt in civil construction?

When hand spreading asphalt in civil construction, the following tasks are typically performed by a worker? Choose all the correct tasks of a hand spread asphalt worker would do.

a. Material handling
b. Pouring and spreading
c. Leveling and smoothing
d. Edge work
e. Heat management
f. Working with the paver operator

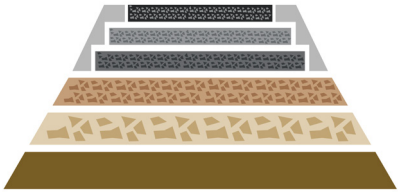
Answer: All of the above (a. Material handling, b. Pouring and spreading, c. Leveling and smoothing, d. Edge work, e. Heat management, f. Working with the paver operator).

QUESTION 4

Choose the correct sequence of the different layers in asphalt.

Arrange the layers in an asphalt pavement structure from bottom to top.

a. Subbase, Surface Course, Wearing Course, Base Course, Subgrade
b. Subgrade, Base Course, Subbase, Surface Course, Wearing Course
c. Base Course, Subbase, Subgrade, Surface Course, Wearing Course
d. Subgrade, Subbase, Base Course, Surface Course, Wearing Course

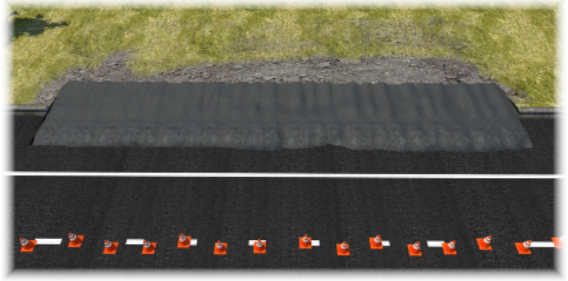


Answer: d. Subgrade, Subbase, Base Course, Surface Course, Wearing Course

Calculations

Working out how much material you need

The work plan has an area which is 4 metres × 20 metres that must be covered by a layer of road base of 150 mm depth.
How many square metres of road base are to be laid?
How many cubic metres of road base will you need?



Step 1:

To work out the square metres, multiply the Length (L) by the Width (W).
L × W = Square metres
4 m × 20 m = 80 square metres

This can also be written as:

80 m^2 or 80 square metres

Step 2:

Convert the layer thickness from millimeters to metres.
To do this divide the layer thickness by 1000
150 mm ÷ 1000 = 0.15 m

Step 3:

Multiply the square metres by the layer thickness to get the cubic metres.
80 square metres × 0.15 m
= 12 cubic metres

This can also be written as:

12 m^3 or 12 cubic metres

Answer:

There are 80 square metres of road base to be laid.
You will need 12 cubic metres to cover the area to 150 mm depth.

QUESTION 12

Calculate how much material is required to cover a spread at least 5m2 of asphalt and **over** 50mm thick, with a asphalt mixture density (or weight) of 2.5 tons per cubic meter.

Step 1: Calculate the volume (in cubic meters) using the formula:
Volume (in cubic meters) = Area (in square meters) x Thickness (in meters)
Given:

- Area to be covered = 5m²
- Thickness of the asphalt = 50mm (which is 0.05 meters))

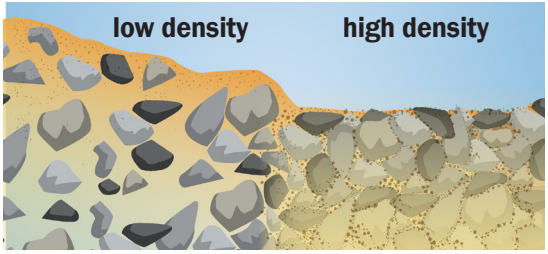
Volume = 5m² x 0.05m = 0.25 cubic meters
So, you need 0.25 cubic meters of asphalt material
Step 2: Convert the volume to tons based on the specific weight (or density) of the asphalt mixture.
The formula for this conversion is: **Tons = Volume (cubic meters) x Specific Weight (tons per cubic meter)**
Tons = 0.25 cubic meters x 2.5 tons per cubic meter = 0.625 tons
So, you would need approximately 0.6 tons of asphalt material to cover an area of at least 5m² with asphalt over 50mm thick, assuming a specific weight (density) of 2.4 tons per cubic meter for the material.

QUESTION 13

Calculate the density for a compacted base course layer in road construction from the following scenario information.

Scenario Description:
Mass of the compacted base course = 10,000 kg
Volume of the compacted base course = 8 m³

Density is calculated by dividing the mass by the volume:
Density = Mass / Volume
Density = 10,000 kg / 8 m³ = 1,250 kg/m³
So, in this example, the density of the compacted base course is 1,250 kg/m³.



Guide to using a hand shovel when hand spreading asphalt - (techniques)

When spreading asphalt with a hand shovel in civil construction, it's important to follow proper techniques to ensure safety, efficiency, and quality results. Here are the recommended steps and tips:

1. Position and Stance

1.1 Stand Firm: Ensure you have a stable and balanced stance with your feet shoulder-width apart. This helps with stability and control.

1.2 Face Forward: Stand facing the direction you want to spread the asphalt. Avoid turning your body while shoveling.

Stand Firm

2. Scooping and Lifting

2.1 Proper Angle: Hold the shovel with both hands and push the blade into the asphalt pile. Angle the blade slightly to help scoop the asphalt effectively.

2.2 Use Your Legs: When lifting the loaded shovel, bend your knees and use your leg muscles rather than your back to reduce strain and minimize the risk of injury.

Scooping and Lifting

2.3 Controlled Load: Avoid overloading the shovel with asphalt. It's better to take smaller, manageable loads to maintain control.

Controlled Load

Communication techniques and systems

The following are some ways you can communicate with the pave operator using hand signals, that you might find in a company's policy and procedures on how to communicate with a Paver Operator.

Policy And Procedures On How To Communicate With A Paver Operator.

Thumbs Up: *Used to signal that everything is okay and to continue with the current operation.*
Thumbs Down: *Indicates the need to stop or halt the operation immediately.*
Pointing: *Point in a specific direction to indicate which way the paver should move.*
For example, *pointing to the left or right can instruct the operator to steer the paver in that direction.*
Flat Hand Held Out: *Signifies that the paver should maintain its current position or speed.*
Hand Waving Downward: *A downward motion with your hand indicates that the paver should lower the screed or take it closer to the surface for paving.*
Hand Waving Upward: *An upward motion instructs the paver to raise the screed or lift it higher above the surface.*
Circular Motion: *Rotating your hand in a circle signifies that the paver should increase or decrease speed, with the direction of rotation indicating whether to speed up or slow down.*

Thumbs Up

Thumbs Down

Pointing Left / Right move

Flat hand out / stay in current position and or speed

Hand waving downward

Hand waving upward

Circular Motion / change speed

Hand Signals

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Working around a paver while hand spreading asphalt

Conduct hand asphalt spreading in close but safe proximity to the paver, maintaining clear communication and awareness of surrounding hazards.

Unsafe areas can include zones where heavy machinery operates and remains outside the operator's line of sight. The following red zones are areas that are un safe to operate.