



Now and Tomorrow
Excellence in Everything We Do

Essential Skills and Apprenticeship

Using Essential Skills: On the Job with a Carpenter

Are you starting an apprenticeship in carpentry or are you thinking about a career in this trade? Pursuing a career as a carpenter requires strong essential skills such as reading, document use, numeracy and critical thinking.

Use this booklet to:

- learn how carpenters use essential skills;
- follow the daily routine of a carpenter; and
- find out how your essential skills compare to those of a journeyman in carpentry.

How carpenters use essential skills

Carpenters use essential skills to perform a variety of job-related tasks, for example:

- **document use** to interpret blueprints, verify measurements and identify discrepancies;
- **numeracy** to take measurements and calculate the amount of concrete required for footings (foundations); and
- **problem solving** to adapt plans to the space available.



Carpenter



Essential Skills

Reading
Document Use
Numeracy
Writing
Oral Communication

Working with Others
Thinking
Computer Use
Continuous Learning

Carpenters construct, erect, install, maintain and repair structures and components made of wood, wood substitutes and other materials. They work for construction companies, carpentry contractors and the maintenance departments of factories, plants and other establishments. They may also be self-employed.

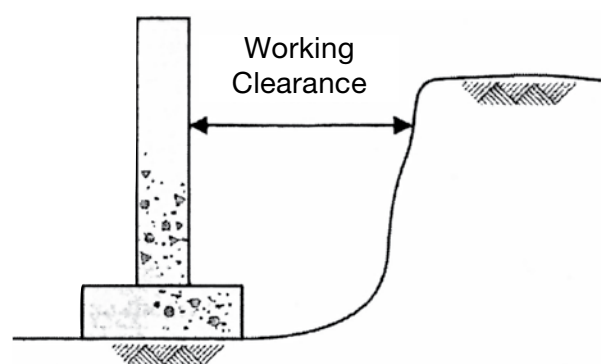
A day in the life of a carpenter: Brenda's story

Preparing the site

Brenda is a residential carpenter. Today she is the only carpenter on the building site of a single-family home. A heavy equipment operator is running an excavator to remove the soil where the foundation will be built. While the operator works, Brenda checks that the excavation is level, reaches the correct depth, and allows for three feet (one metre) of clearance around the outside walls of the house so that she will have enough space to work (*numeracy*).

The building code specifies that the excavation for the foundation must be below the frost line (depth of frost penetration), which in this case is 18 inches, and must reach a depth where there is no organic material (*reading*). Luckily, there is no organic material at an 18-inch depth on this job site. Excavating as little as possible will save the company and the homeowner money.

Brenda checks the excavation measurements carefully because once the excavator leaves the site, she will need to correct any discrepancies (*thinking skills – critical thinking*).



foundation excavation

Section 9.12. Excavation

9.12.1. General

9.12.1.1. Removal of Topsoil and Organic Matter

- 1) The topsoil and vegetable matter in all unexcavated areas under a building shall be removed.
- 2) In localities where termite infestation is known to be a problem, all stumps, roots and other wood debris shall be removed from the soil to a depth of not less than 300 mm in unexcavated areas under a building.
- 3) The bottom of every excavation shall be free of all organic material.

9.12.1.2. Standing Water

- 1) Excavations shall be kept free of standing water.

9.12.1.3. Protection from Freezing

- 1) The bottom of excavations shall be kept from freezing throughout the entire construction period.

9.12.2. Depth

9.12.2.1. Excavation to Undisturbed Soil

- 1) Excavations for foundations shall extend to undisturbed soil.

9.12.2.2. Minimum Depth of Foundations

- 1) Except as provided in Sentences (4) and (5), the minimum depth of foundations below finished ground level shall conform to Table 9.12.2.2.

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4. Depth of foundations

Carpenters interpret building code to suit the building site conditions. Look at the table below to answer the following questions:

- a) How does heating change the minimum depth of the foundation?
- b) What types of soil require deeper foundations?

9.12.2.2. Minimum Depth of Foundations

1) Except as provided in Sentences (4) and (5), the minimum depth of foundations below finished ground level shall conform to Table 9.12.2.2.

Table 9.12.2.2.
Minimum Depths of Foundations

Type of Soil	Minimum Depth of Foundation Containing Heated Basement or Crawl Space ¹		Minimum Depth of Foundation Containing No Heated Space ²	
	Good Soil Drainage ³	Poor Soil Drainage	Good Soil Drainage ³	Poor Soil Drainage
Rock	No limit	No limit	No limit	No limit
Course grained soils	No limit	No limit	No limit	Below the depth of frost penetration
Silt	No limit	No limit	Below the depth of frost penetration	Below the depth of frost penetration
Clay or soils not clearly defined	1.2 m	1.2 m	1.2 m but not less than the depth of frost penetration	1.2 m but not less than the depth of frost penetration

Note to Table 9.12.2.2.:

¹ Foundation not insulated to reduce heat loss through the footings.

² Including foundations insulated to reduce heat loss through the footings.

³ Good soil drainage to not less that depth of frost penetration.

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- b. Clay soils and soils that are not clearly defined require deeper foundations.
a. Foundations with no heated space need to be deeper.

4. Depth of foundations (thinking skills – problem solving)

Total stakes: 90
Two stakes in each of 6 corners: $78 + (2 \times 6) = 90$
Twice as many stakes as cleats: $39 \times 2 = 78$
Total cleats: 39
Cleats at both ends of 6 lengths: $33 + 6 = 39$ cleats
Cleats at 3-ft. intervals: $99 \div 3 = 33$ cleats
Perimeter: $27 + 22.5 + 18 + 9 + 9 + 13.5 = 99$ ft.

3. Estimation (numeracy)

produce a side piece of the correct length.
The carpenter needs to piece together one 16-ft. length and one 12-ft. length of 2×6 to make a piece of lumber 28-ft. long. The carpenter will then need to saw off 1-ft. to

2. Ordering materials (numeracy, document use)

The setback needed is 1.7 metres.

$$x = 1.65$$

$$4x = 6.6$$

$$4x = 3 \times 2.2$$

$$x/2.2 = 3/4$$

1. Calculating setback (numeracy)

Answers

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