Carpentry Level One

Building Materials, Fasteners, and Adhesives 27102-13

Objectives

- Identify various types of building materials and describe their uses.
  - n. Describe the composition of concrete and explain how hydration occurs.
  - o. List uses of concrete masonry units for a construction project.
  - p. Identify where metal framing members may be used in a structure.

Performance Task

1. Given a selection of building materials, identify a particular material and state its use.

Kickoff Activity

- Identify where concrete, concrete masonry units (CMUs), and steel framing members are used in commercial construction projects.

Section 1.14.0

- Concrete is a mixture of three basic materials:
  1. Portland cement
     - Lime, silica, alumina, iron, other trace components
  2. Aggregates
     - Natural sand, gravel, crushed stone, blast furnace slag, manufactured sand (from crushed stone, gravel, or slag)
  3. Water

Section 1.14.1

- *Plastic concrete*—concrete is in a semiliquid state; when first mixed
- *Green concrete*—concrete hardens but has not yet gained structural strength
- *Cured concrete*—concrete has hardened and gained its structural strength

Section 1.14.4

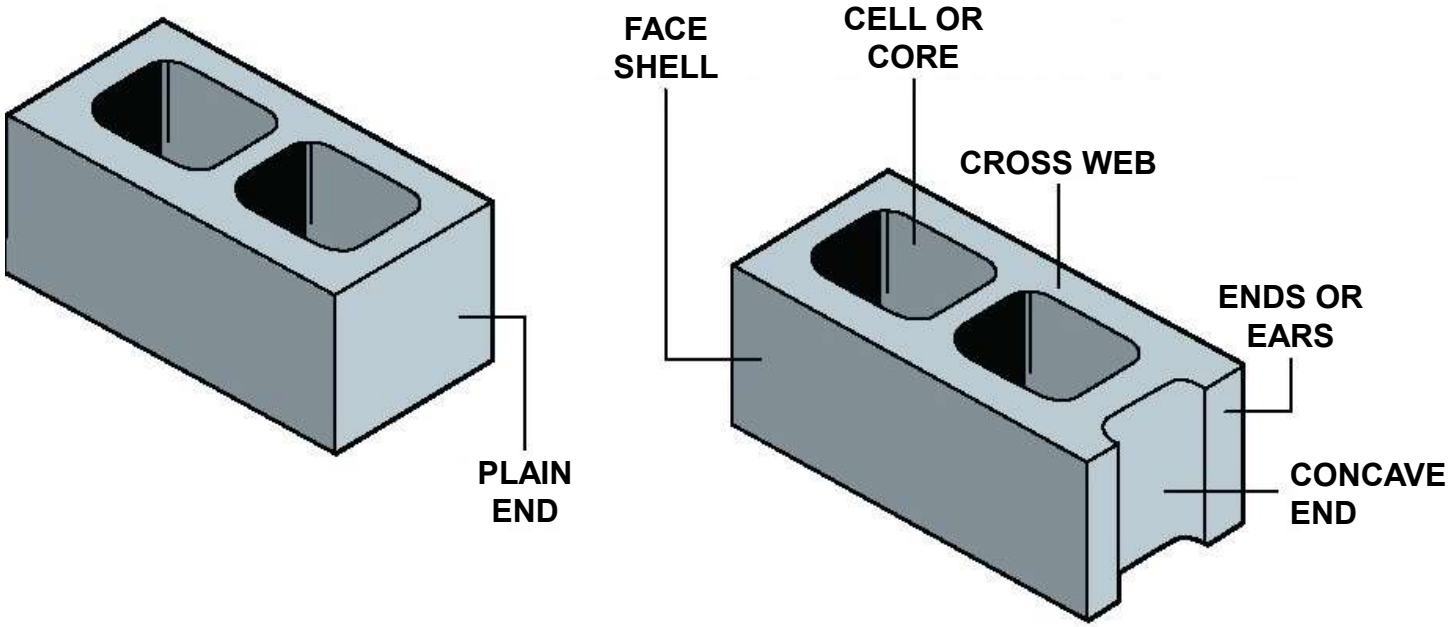
- Admixtures
  - Materials added to a concrete mixture before or during mixing to modify the characteristics of the concrete
  - May be used to improve workability during placement, increase strength, retard or accelerate strength development, increase frost resistance, and impart color
  - May increase or decrease the cost of concrete work

Section 1.15.0

- Concrete masonry units (CMUs), also referred to as concrete block are:
  - Commonly used to build foundations and basement walls.
  - Manufactured under a controlled environment using materials such as portland cement, sand, and gravel.
- After water is added to the portland cement, aggregates and admixtures are added.

Section 1.15.0

- Identify the various parts of the CMUs pictured below.



Section 1.15.0

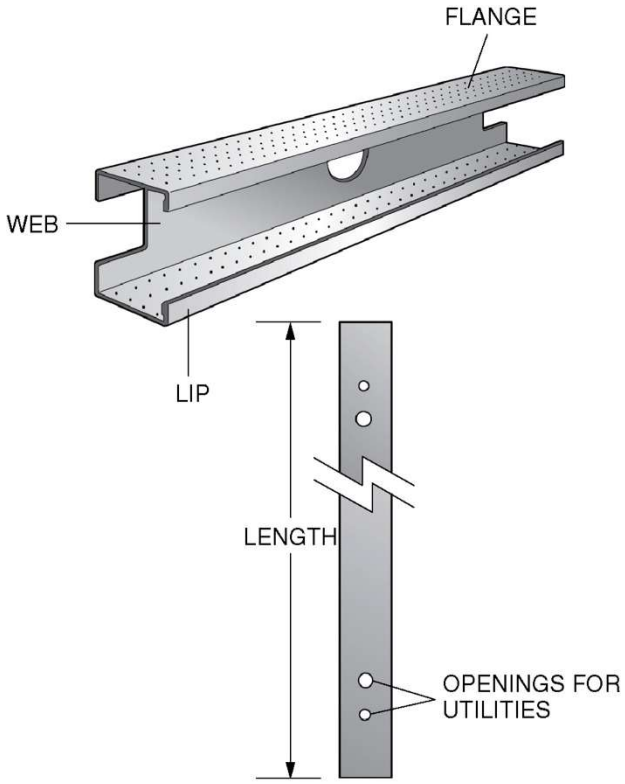
- Grout alone, or steel reinforcing bars combined with grout, is commonly used to fill the hollow cores of CMUs to increase loadbearing strength, rigidity, and wind resistance.

Section 1.16.0

- Steel framing materials include light- and heavy-gauge framing members, such as steel joists and steel trusses.

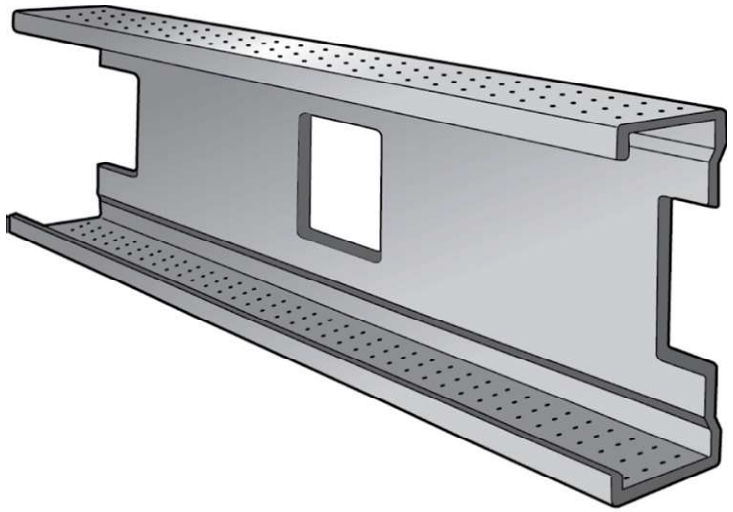
Section 1.16.0

- Light-gauge steel framing members
  - Include C-shapes, tracks, U-channels, and furring channels
  - C-shapes are used as studs; tracks are used as top and bottom plates.
  - Are available in a wide range of standard web widths



Section 1.16.0

- Heavy-gauge steel framing members
  - Are available in the same shapes as light-gauge framing members
  - Have knurled or dimpled sides for positive screw setting
  - Can be ordered to the lengths that are needed



Wrap Up

Keeping in mind the basic ingredients used in concrete, discuss how the proportions of the ingredients affect the characteristics of the hardened concrete.

Next Lesson: Handling and Storing Building Materials
Review Sections 2.0.0–3.4.0