OBJECTIVE SHEET

SIDEWALKS AND PATIOS

6

INTRODUCTION

For the cement mason, sidewalks and patios can be one of the most gratifying areas of the trade. Usually the cement mason is responsible for the entire product, from the elevations, set up, subgrade, and ordering materials, as well as the placing and finishing of the concrete.

At times the cement mason is also given the responsibility of the engineering and design of the project. With virtually an unlimited number of combinations of form work design and finishes, this can be very challenging and rewarding.

FOCUS ASSIGNMENTS

FOCUS ASSIGNMENTS

1. Make sketches of sidewalks and patios that you would like to see or build.

2. Participate in a class discussion about how these structures would be laid out, formed, poured, and finished.

UNIT OBJECTIVE

After completing this unit, you will show the following competencies by mastering the activities on the Job Sheets and by scoring at least 85% on the Written Test.

SPECIFIC OBJECTIVES

1. Select from a list steps to take before placing concrete for a sidewalk or patio.

2. Arrange in order the steps to take when placing and finishing concrete for a sidewalk or patio.

3. Name types of finishes used on sidewalks and patios.

4. Name types of joints used on sidewalks and patios.

5. List reasons joints in sidewalks and patios are important.

6. Match types of joints to their locations on sidewalks and patios.
7. Name types of nonskid materials used on sidewalks and patios.
8. Place and finish a sidewalk with a float finish. (Job Sheet 1)
9. Finish a sidewalk with a fine swirl finish. (Job Sheet 2)
10. Finish a sidewalk with a fine broom finish. (Job Sheet 3)

SIDEWALKS AND PATIOS

OBJECTIVE 1

Optional Activities/ Resources in Instructor's Guide

Select from a list steps to take before placing concrete for a sidewalk or patio.

WORDS YOU SHOULD KNOW	
subgrade	soil prepared and compacted to support a structure or a pavement system

- Set forms to grade
- Make sure there is proper slope for drainage
- Check that subgrade is on grade, properly compacted, and relatively smooth
- Wet down subgrade if necessary

OBJECTIVE 2

Optional Activities/ Resources in Instructor's Guide

Arrange in order the steps to take when placing and finishing concrete for a sidewalk or patio.

1. Place concrete
2. Rod or straight edge
3. Darby or bullfloat
4. Edge
5. Cut joints
6. Hand float
7. Re-edge
8. Recut joints
9. Trowel
10. Finish

OBJECTIVE 3

Optional Activities/ Resources in Instructor's Guide

Name types of finishes used on sidewalks and patios.

- Float
- Trowel
- Fine swirl (sweat trowel)

  ✔ **NOTE:** Nonskid material is often used with a fine swirl finish.

- Broom (fine or rough)

  ✔ **NOTE:** When brooming concrete the texture can be defined by the firmness of the bristle and the finishing phase of the concrete. Finishing phases can be defined as floating or troweling procedures, fresnoing, or second troweling.

OBJECTIVE 4

Optional Activities/ Resources in Instructor's Guide

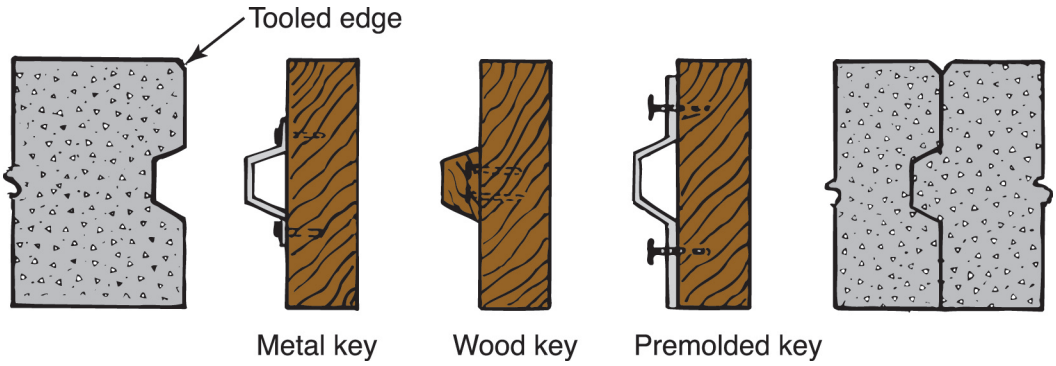
Name types of joints used on sidewalks and patios.

WORDS YOU SHOULD KNOW

construction joint	planned joint between two successive placements where one is temporarily suspended
control joint	joint cut or formed in concrete to induce cracking at point of joint rather than at random
isolation joint	separation required at designated points of potential stress to isolate sections of concrete from one another or from other rigid objects
decorative joint	tooled joint in concrete to control random cracking and for decorative purposes
longitudinal joint	joint placed lengthwise in concrete slab placements where one is temporarily suspended

- Construction (Figure 1)

FIGURE 1



- Control (contraction) (Figures 2-5)

FIGURE 2

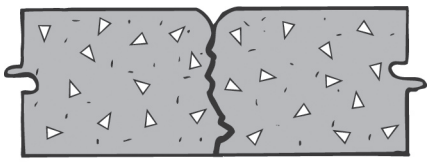


FIGURE 3

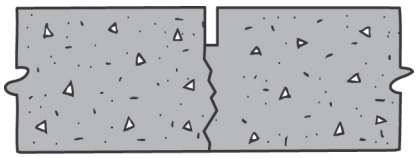


FIGURE 4

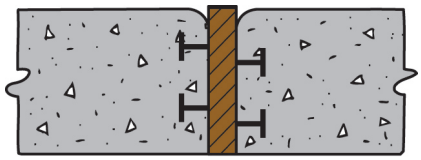
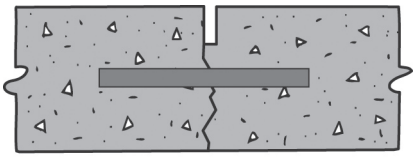
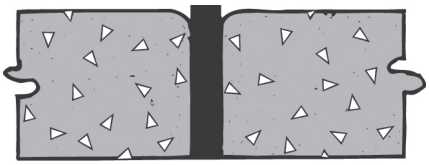


FIGURE 5



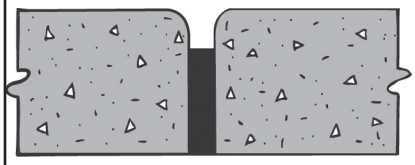
- Isolation (expansion) (Figures 6 and 7)

FIGURE 6



Tooled expansion

FIGURE 7

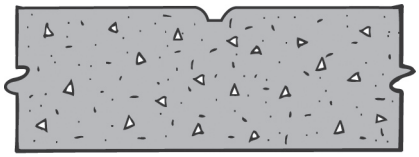


Tooled expansion
held down for sealant

✔ **NOTE:** An expansion cap should be used to create a proper spacing for joint sealant.

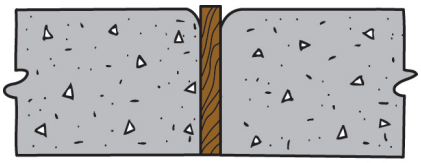
- Decorative (Figures 8-10)

FIGURE 8



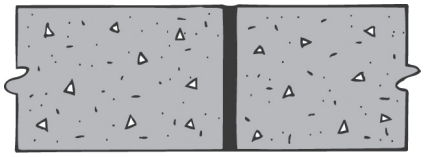
Tooled

FIGURE 9



Tooled with exposed
wood divider

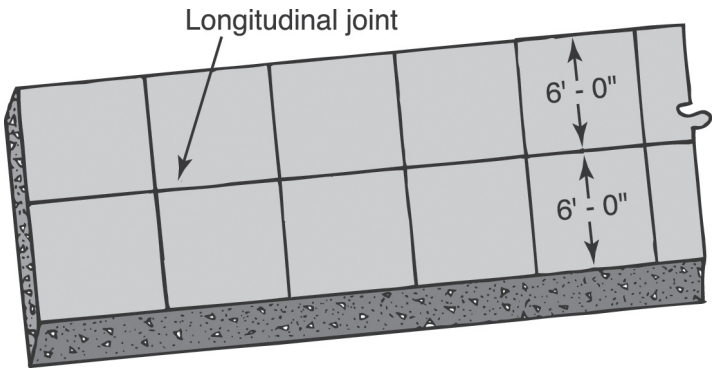
FIGURE 10



Metal or plastic spacer

- Longitudinal (Figure 11)

FIGURE 11



OBJECTIVE 5

Optional Activities/ Resources in Instructor's Guide

List reasons joints in sidewalks and patios are important.

- To eliminate random cracking
- To allow expansion and contraction
- To separate adjoining parts at designated locations
- To separate two successive placements of concrete temporarily
- To enhance appearance
- To allow stress relief

✔ **NOTE:** Control (contraction) joints should extend into the slab one-fourth of the slab thickness to provide a weakened section that will induce cracking to occur at this point rather than somewhere else.

OBJECTIVE 6

Optional Activities/ Resources in Instructor's Guide

Match types of joints to their locations on sidewalks and patios.

- **construction joints** — planned joint between two successive placements where one is temporarily suspended
- **control joints (contraction joints)**

  — spaced at intervals approximately equal to width of sidewalk

  — on large walks or patios intervals should not exceed ten feet in either direction

— On walks or patios larger than ten feet, longitudinal joints should be cut down the center

- **isolation joints (expansion joints)**

  ✔ **NOTE:** Isolation or expansion joints are required at points of potential stress.

  — intersections of walks and drives

  — where slabs abut rigid objects such as curbs, buildings, other slabs, street signs, or fire hydrant

  — at regular intervals on long sidewalks

- **decorative joints** — to create decorative patterns to enhance the appearance of sidewalks and patios

- **longitudinal joints** — placed parallel to the long dimension of a slab; spacing in patios and large slabs should not exceed ten feet in either direction

  ✔ **NOTE:** Refer to Unit 8 "Joints in Concrete."

OBJECTIVE 7

Name types of nonskid materials used on sidewalks and patios.

Optional Activities/ Resources in Instructor's Guide

WORDS YOU SHOULD KNOW	
nonskid material	abrasive material used to create a nonskid finish on the surface of concrete

- Aluminum grits
- Silicon carbide grits
- Carborundum grits
- Emery grits

OBJECTIVE 8

Complete Job Sheet 1.

OBJECTIVE 9

Complete Job Sheet 2.

OBJECTIVE 10

Complete Job Sheet 3.

JOB SHEET 1

SIDEWALKS AND PATIOS

6

Name _____Score_____

OBJECTIVE 8

Place and finish a sidewalk with a float finish.

BASIC SKILLS

Employability

EQUIPMENT AND SUPPLIES

- Straightedge
- Bullfloat
- Hand floats
- Edger
- Tape or ruler
- Jointer
- Margin trowel
- Brush
- Sprayer
- Concrete
- Bucket of water
- Curing agent
- Production tools
- Personal protective equipment

✔ **NOTE:** Refer to C.F.R 1926.28 Sub Part C in regard to personal protective equipment.

PROCEDURE

Yes No

❑ ❑ 1. Place concrete at the starting point.

❑ ❑ 2. Use a straightedge to rod the concrete, making sure there is enough concrete behind the straightedge to fill holes.

✔ **NOTE:** The straightedge should be from one to two feet longer than the widest distance that is to be rodded.

❑ ❑ 3. Bullfloat the surface with a forward and backward movement.

Yes No

A. As you push the bullfloat across the slab, position the handle so that the far edge of the blade is slightly tilted up. This will prevent the float from digging into the wet concrete.

B. Pull the float back toward you keeping the near edge raised slightly.

✔ **NOTE:** Edges usually set faster; therefore, they should be floated and edged before the rest of the slab.

❑ ❑ 4. Hand float the edge after bullfloating.

❑ ❑ 5. The existing slab or form should be cleaned prior to edging. A margin trowel or edger may be used.

A. To edge, tilt the front of the edger up slightly, move forward in an arm's length pattern, and, while still in motion, lift the edger at the end of the pass.

✔ **NOTE:** To avoid pulling up the surface, do not lift the edger from the concrete unless the edger is in motion.

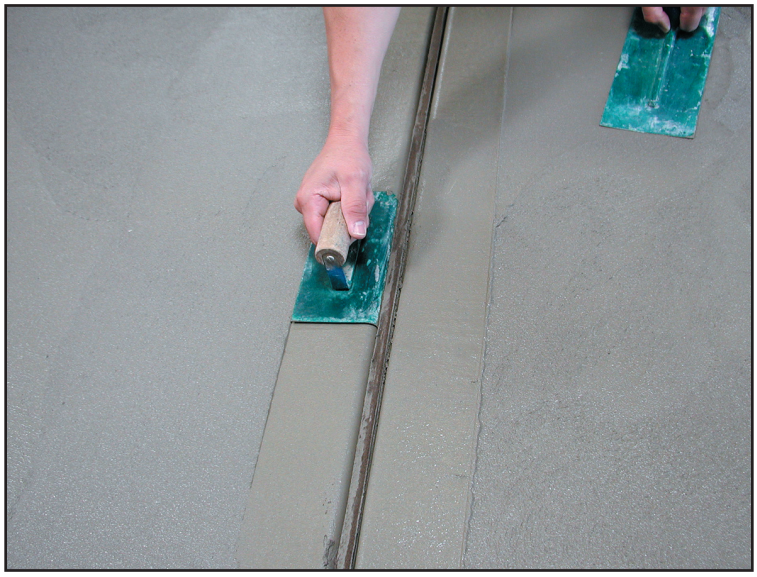
B. Continue this procedure until all edges are rounded and smooth.

✔ **NOTE:** To avoid low places, do not place too much pressure on the edger. This will "roll" the edge. The slab should be flat to the edge.

Yes No

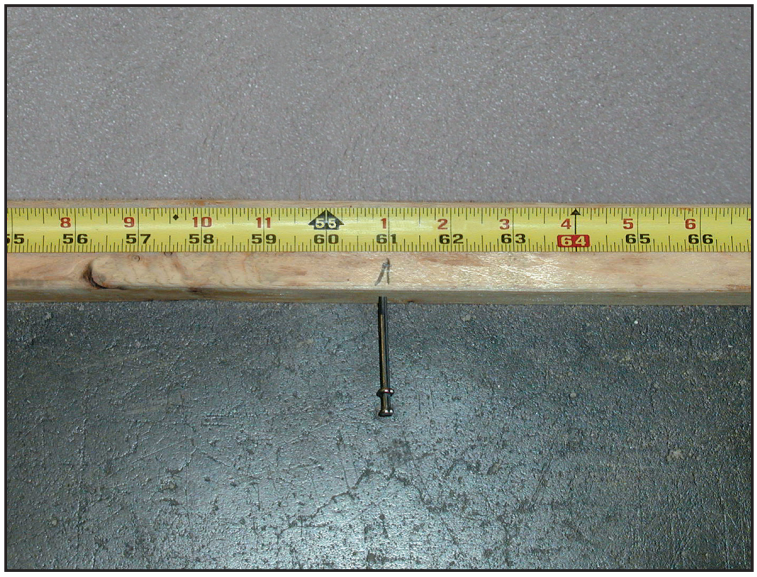
❑ ❑ 6. Edge both sides of the expansion material following the same procedures and taking all precautions. (Figure 1)

FIGURE 1



❑ ❑ 7. Use a ruler or tape to measure and mark all joints as specified. (Figure 2)

FIGURE 2



Yes No

❑ ❑ 8. Place the straightedge across the walk. Hold the edge of the jointer against the straightedge to determine the exact location of the joint. (Figure 3)

FIGURE 3

❑ ❑ 9. Use the straightedge as a guide and run the jointer across the walk along side of straightedge applying slight pressure to the back of the tool. (Figure 4)

FIGURE 4

Yes No

❑ ❑ 10. Reverse the tool and pull back over the joint to give the joint a smooth finish.

❑ ❑ 11. Continue using the straightedge and jointer until all joints have been cut.

✔ **NOTE:** If concrete hardens to a point where the jointer will not make a depression, it may be necessary to use a hatchet or a hammer and wide chisel to make the first cut; then use a jointer to work and smooth the joint.

❑ ❑ 12. Start finishing at the hardest point of the concrete which is usually at the point of first floating.

❑ ❑ 13. Move in a semicircular fanlike motion with the float flat to the surface at arm's length.

❑ ❑ 14. Continue this procedure until the entire walk is finished.

❑ ❑ 15. Have the instructor check your work.

❑ ❑ 16. Clean the work area and return tools and equipment to proper storage.

SKILL TEST RECORD

PRODUCT EVALUATION

Evaluator note: Rate the student on the following criteria by circling the appropriate numbers. Each criterion must receive a rating of "3" or higher to demonstrate student mastery. (See Key below.) A student who is unable to demonstrate mastery should review the material and submit another product for evaluation.

Criteria:

Safety	4	3	2	1
Use of tools	4	3	2	1
General appearance	4	3	2	1
Overall performance	4	3	2	1

AVERAGE RATING

Evaluator note: To obtain an average rating for the Profile of Training Mastery, total the points in Product Evaluation and divide by the total number of criteria. Circle the rating on the Key.

KEY

4 **Skilled** — Can perform job with no additional training
3 **Moderately Skilled** — Has performed job during training program; limited additional training may be required
2 **Limited Skill** — Has performed job during training program; additional training is required to develop skill
1 **Unskilled** — Is familiar with process, but is unable to perform job

EVALUATOR'S COMMENTS

JOB SHEET 2

SIDEWALKS AND PATIOS

6

Name _____Score_____

OBJECTIVE 9

Finish a sidewalk with a fine swirl finish.

BASIC SKILLS

Employability

EQUIPMENT AND SUPPLIES

- Straightedge
- Bullfloat
- Hand floats
- Edger
- Tape or ruler
- Jointer
- Margin trowel
- Brush
- Sprayer
- Concrete
- Bucket of water
- Curing agent
- Production tools
- Personal protective equipment

✔ **NOTE:** Refer to C.F.R 1926.28 Sub Part C in regard to personal protective equipment.

PROCEDURE

✔ **NOTE:** The procedures in this job sheet begin with a sidewalk that has been poured, floated, and troweled.

Yes No

❑ ❑ 1. Edge all expansion joints, following the same procedures and taking all precautions.

❑ ❑ 2. Use a ruler or tape to measure and mark all joints as specified.

❑ ❑ 3. Use a straightedge as a guide and run the jointer across the walk along side of straightedge, applying slight pressure to the back of the tool.

Yes No

❑ ❑ 4. Reverse the tool and pull back across the joint to give the joint a smooth finish.

❑ ❑ 5. Continue using the straightedge and jointer until all joints have been cut.

✔ **NOTE:** If concrete hardens to a point where the jointer will not make a depression, it may be necessary to use a hatchet or a hammer and wide chisel to make the first cut; then use jointer to work and smooth joint.

❑ ❑ 6. Rerun the edger and jointer to smooth out joints and edges.

❑ ❑ 7. Start finish troweling at the hardest point of the concrete which is usually at the point of first troweling.

✔ **NOTE:** If a rough swirl finish is specified, use a float. For fine swirl, use a trowel.

❑ ❑ 8. Extend the trowel at arm's length and move the trowel in a wide semicircular fanlike motion keeping the trowel flat to the surface. (Figure 1)

FIGURE 1

✔ **NOTE:** This will leave a fine fuzzy, fanlike pattern. (Figure 2)

FIGURE 2

Yes No

❑ ❑ 9. Have the instructor check your work.

❑ ❑ 10. Clean the work area and return tools and equipment to proper storage.

SKILL TEST RECORD

PRODUCT EVALUATION

Evaluator note: Rate the student on the following criteria by circling the appropriate numbers. Each criterion must receive a rating of "3" or higher to demonstrate student mastery. (See Key below.) A student who is unable to demonstrate mastery should review the material and submit another product for evaluation.

Criteria:

Safety	4	3	2	1
Use of tools	4	3	2	1
General appearance	4	3	2	1
Overall performance	4	3	2	1

AVERAGE RATING

Evaluator note: To obtain an average rating for the Profile of Training Mastery, total the points in Product Evaluation and divide by the total number of criteria. Circle the rating on the Key.

KEY

4 **Skilled** — Can perform job with no additional training
3 **Moderately Skilled** — Has performed job during training program; limited additional training may be required
2 **Limited Skill** — Has performed job during training program; additional training is required to develop skill
1 **Unskilled** — Is familiar with process, but is unable to perform job

EVALUATOR'S COMMENTS

JOB SHEET 3

SIDEWALKS AND PATIOS

6

Name _____Score_____

OBJECTIVE 10

Finish a sidewalk with a fine broom finish.

BASIC SKILLS

Employability

EQUIPMENT AND SUPPLIES

- Straightedge
- Bullfloat
- Hand floats
- Edger
- Tape or ruler
- Jointer
- Margin trowel
- Brush
- Sprayer
- Concrete
- Bucket of water
- Curing agent
- Production tools
- Personal protective equipment

✔ **NOTE:** Refer to C.F.R 1926.28 Sub Part C in regard to personal protective equipment.

PROCEDURE

✔ **NOTE:** The procedures in this job sheet begin with a sidewalk that has been poured, floated, and troweled.

Yes No

❑ ❑ 1. Edge all expansion joints, following the same procedures and taking all precautions.

❑ ❑ 2. Use a ruler or tape to measure and mark all joints as specified.

❑ ❑ 3. Use a straightedge as a guide and run jointer across the walk along side of straightedge, applying slight pressure to the back of the tool.

❑ ❑ 4. Reverse the tool and pull back across the joint to give the joint a smooth finish.

Yes No

❑ ❑ 5. Continue using the straightedge and jointer until all joints have been cut.

✔ **NOTE:** If concrete hardens to a point where the jointer will not make a depression, it may be necessary to use a hatchet or a hammer and wide chisel to make the first cut; then use jointer to work and smooth joint.

❑ ❑ 6. Extend the trowel at arm's length and move the trowel in a wide semicircular motion with trowel slightly tilted; continue until concrete is smooth.

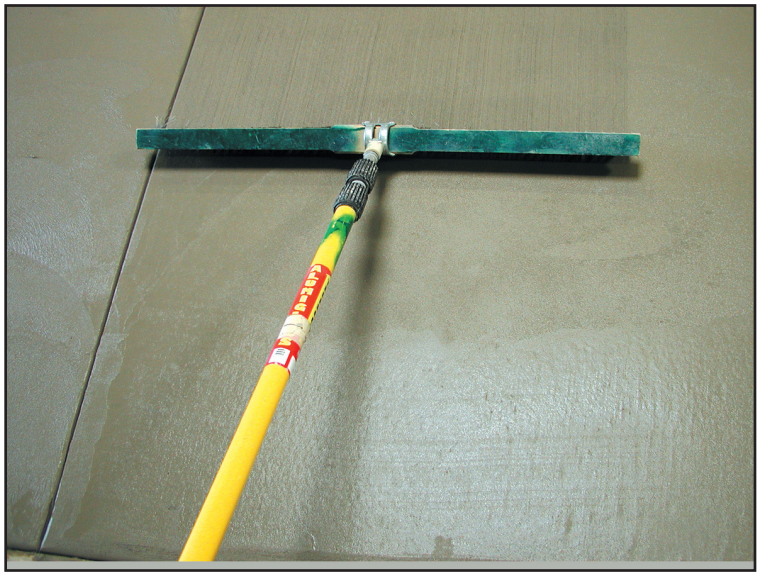
❑ ❑ 7. Continue this process until the entire walk has been troweled.

❑ ❑ 8. Prepare the edge of the concrete for brooming by running one end of the broom along the concrete parallel to the form. (Figure 1)

FIGURE 1

❑ ❑ 9. Start the broom finish by extending the broom to the opposite side of the walk and pulling back across walk. (Figure 2)

FIGURE 2

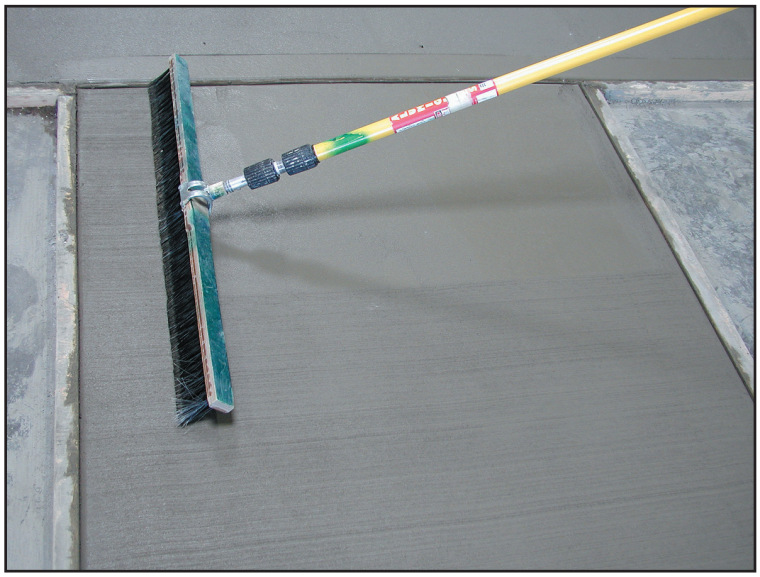


✔ **NOTE:** A broom finish is usually specified to be at a right angle to the direction of travel; occasionally specifications may call for alternate blocks to be broom finished at right angles to each other.

Yes No

❑ ❑ 10. Swing the broom back to the starting edge and repeat pulling across the slab, slightly over-lapping the preceding pass. (Figure 3)

FIGURE 3



Yes No

❑ ❑ 11. Continue this procedure until the entire walk has been broom finished. Periodically remove the buildup of fresh concrete from the broom.

✔ **NOTE:** Sometimes specifications will call for edger and jointer marks to be left exposed, especially on broom finishes.

❑ ❑ 12. Rerun the edger and jointer taking care not to press too deep or pull up the surface when lifting tools.

❑ ❑ 13. Apply a curing agent using a sprayer with the nozzle adjusted to a fine mist.

❑ ❑ 14. Use a margin trowel, brush, and water to clean tools and equipment.

❑ ❑ 15. Have the instructor check your work.

❑ ❑ 16. Clean the work area and return tools and equipment to proper storage.

SKILL TEST RECORD

PRODUCT EVALUATION

Evaluator note: Rate the student on the following criteria by circling the appropriate numbers. Each criterion must receive a rating of "3" or higher to demonstrate student mastery. (See Key below.) A student who is unable to demonstrate mastery should review the material and submit another product for evaluation.

Criteria:

Safety	4	3	2	1
Use of tools	4	3	2	1
General appearance	4	3	2	1
Overall performance	4	3	2	1

AVERAGE RATING

Evaluator note: To obtain an average rating for the Profile of Training Mastery, total the points in Product Evaluation and divide by the total number of criteria. Circle the rating on the Key.

KEY

4 **Skilled** — Can perform job with no additional training
3 **Moderately Skilled** — Has performed job during training program; limited additional training may be required
2 **Limited Skill** — Has performed job during training program; additional training is required to develop skill
1 **Unskilled** — Is familiar with process, but is unable to perform job

EVALUATOR'S COMMENTS