Contour Bunds Drawing: Earthwork Cross-Section Skills

Original tasks 1, 2, 3 / complete keys

Task 1

Draw a section with height 10 cm, berm 20 cm, slopes 2:1, scale 1 cm = 2 cm (hypothetical). Label and check.

Answer: Run per side = 20 cm; base = 20 + 40 = 60 cm; paper: height 5 cm, berm 10 cm, runs 10 cm each, base 30 cm.

Reason: Use base = berm + 2 × slope × height = 20 + 2 × 2 × 10 = 60 cm; divide by scale 2 to get paper lengths.

Check: Measure drawn base; should be 10 + 10 + 10 = 30 cm.

Task 2

Draw a section with height 12 cm, berm 18 cm, slopes 1.5:1, scale 1 cm = 3 cm (hypothetical). Label and check.

Answer: Run per side = 18 cm; base = 18 + 36 = 54 cm; paper: height 4 cm, berm 6 cm, runs 6 cm each, base 18 cm.

Reason: 1.5 × 12 = 18 cm run; base = 18 + 2 × 18 = 54 cm; divide by 3.

Check: Drawn base should equal 6 + 6 + 6 = 18 cm.

Task 3

Draw an asymmetric section: left slope 2:1, right slope 3:1, height 10 cm, berm 15 cm, scale 1 cm = 5 cm (hypothetical). Label and check.

Answer: Left run = 20 cm, right run = 30 cm; base = 15 + 20 + 30 = 65 cm; paper: height 2 cm, berm 3 cm, left run 4 cm, right run 6 cm, base 13 cm.

Reason: Compute each run separately; sum with berm; divide by scale.

Check: Drawn base should be 3 + 4 + 6 = 13 cm.

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Original tasks 4 / complete keys

Task 4

Draw a section with height 8 cm, berm 24 cm, slopes 2.5:1, scale 1 cm = 4 cm (hypothetical). Add a toe line 2 cm beyond each slope base and label. Check main section.

Answer: Run per side = 20 cm; base = 24 + 40 = 64 cm; paper: height 2 cm, berm 6 cm, runs 5 cm each, base 16 cm; toe line extends 0.5 cm each side on paper.

Reason: 2.5 × 8 = 20 cm run; base = 24 + 40 = 64 cm; divide by 4; toe extension 2 ÷ 4 = 0.5 cm.

Check: Main drawn base should be 6 + 5 + 5 = 16 cm; toe line adds 0.5 cm each side.

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Source rubric / reflection

- [ ] Cross-section convention followed: horizontal ground line, vertical height axis, no perspective.
- [ ] Berm drawn flat and labeled with width and units.
- [ ] Slope ratios labeled and consistent with drawn horizontal runs.
- [ ] Height dimension labeled with units.
- [ ] Scale stated and converted lengths checkable by arithmetic.
- [ ] Labels clear and non-crossing; valid orientation alternatives accepted.

Reflection: What did you check, what did you change, and what will you try next?