

Productivity in Multi-Trade Construction Workflows

Report 2 of 6 in Volume 1 of the *Multiskilling in the U.S. Construction Industry* research series

30%

faster completion time with fewer handoffs

43%

more installed work in the same production time

2

controlled field trials of the same work sequence

120,000

Monte Carlo simulation runs across 12 modeled scenarios

KEY FINDINGS

- 1 For closely sequenced work with frequent handoffs, reducing those handoffs cut completion time by about 30%.** Across all 12 scenarios and 120,000 simulation runs, reducing repeated handoffs shortened the time required for the defined work scope.
- 2 The reduced-handoff workflow could complete about 43% more installed work in the same amount of production time.** The workers were not assumed to perform individual tasks faster. The result came from reducing waiting, setup, reorientation, coordination, and restart between crews.
- 3 Multiskilling created the most value when frequent handoffs were concentrated within a closely sequenced work scope.** The size of the benefit ranged from almost none to very large, depending on how frequent and disruptive the handoffs were. Individual modeled scenarios ranged from 2% to 92% less elapsed time.
- 4 Two multiskilled workers completed a scope spanning seven trade functions without repeatedly handing the work to separate crews.** The one-trade workflow used 12 workers across the same sequence and transferred the work from one trade to another 10 times.

Two controlled field trials conducted for the same work sequence.

11

construction activities observed

10

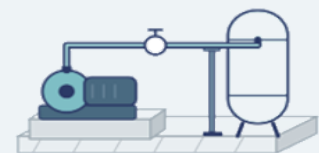
trade-to-trade handoffs

7

trade functions represented

221

minutes productive-work duration



Common pump assembly used in controlled trial

PRACTICAL APPLICATIONS

Plan for handoffs

Consider handoff exposure in production-planning

Flag high-handoff scopes

Identify tight, shared, handoff-heavy work packages early

Use where qualified

When multi-craft workers can safely do adjacent tasks

Check contractor capability

Owners can evaluate the ability to deploy multiskilled crews

Targeted strategy

Use selectively, not as a replacement for specialization.