

► INDUSTRY WHITEPAPER

AI in Construction Takeoff

What Demolition and Abatement Contractors Need to Know

A strategic guide for owners and VPs of Operations on what AI estimating can and can't do, and how to decide whether to trust it.

SEPTEMBER 2026

BID DAY · THURSDAY, 4:10 P.M.

The AI said 14,200 square feet. The survey said 11,800. The bid is due at five.

The job is a three-floor interior gut of a 1968 office building: asbestos floor tile and mastic on floors two through four, pipe insulation in the mechanical room, then selective demolition once the space is clear. Your senior estimator has been on it since Monday.

This time she tried something new. She ran the drawings through an AI takeoff tool, and it came back in about twenty minutes with **14,200 square feet** of resilient flooring across the three floors. The hazardous materials survey in the bid package says roughly **11,800**.

You lean over her shoulder and ask the only question that matters at 4:10 on bid day: *where did that number come from?*

She can't tell you, at least not quickly. The tool produced a total. It didn't show which rooms it counted, whether it included the corridor on three that the survey lists as carpet, or whether it knew that page 14 of the survey says the ceiling plenum was never accessed. She has fifty minutes to decide which number to trust and what to do about the gap.

Every owner we talk to about AI estimating ends up at some version of that question. This paper is about how to answer it: what AI takeoff actually does, where it breaks down on demolition and abatement work in particular, and what to require from any tool before you let it near a number with your company's name on it.

The bid-day scene is a composite drawn from common estimating situations, not a specific company or project.

For most specialty contractors, AI arrived as a question from someone else: a vendor, a peer at a trade show, a GC asking how fast you can turn a bid. The honest reason to take it seriously is closer to home. It's the estimating bench.

The U.S. Bureau of Labor Statistics projects about 17,600 openings for cost estimators each year through 2035. Every one of those openings is expected to come from replacing people who retire or leave the field, not from growth [4]. Specialty trade contractors employ a third of all cost estimators [4], and in demolition and abatement, the best of them carry a career of production rates, containment instincts, and "I've seen this building before" in their heads and in personal spreadsheets.

80%

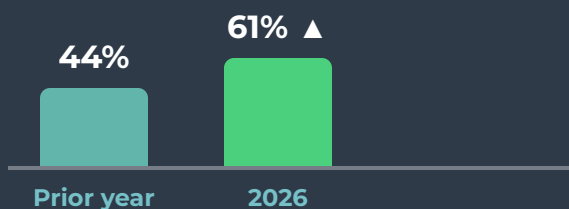
of construction firms report a hard time filling salaried positions, which is where estimators sit.

Source: AGC and Sage, 2026 Construction Hiring and Business Outlook [1]

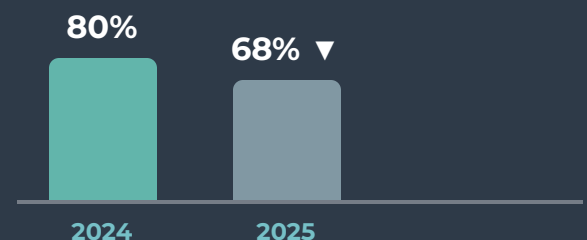
Meanwhile, adoption is moving whether or not your firm moves with it. In AGC and Sage's 2026 outlook, 61 percent of contractors said their firms use AI or plan to increase investment in it, up from 44 percent a year earlier, and 23 percent already use it for estimating [1]. Dodge Construction Network found that 87 percent of contractors believe AI will have a meaningful impact on the industry [2].

Belief is also cooling as people try it. Autodesk's annual survey found the share of construction respondents who think AI will enhance the industry fell from 80 percent to 68 percent in a single year [3]. That drop is useful information. It suggests many firms have now seen a demo, or a pilot, that didn't match the pitch.

USING AI OR INCREASING INVESTMENT



BELIEVE AI WILL ENHANCE THE INDUSTRY



Sources: AGC and Sage, 2026 [1]; Autodesk, 2025 State of Design & Make [3]. Adoption is rising while confidence is cooling.

For most owners, the open decision is how to adopt AI in estimating without betting a bid, or a client relationship, on a number nobody can explain.

➤ 2. What "AI Takeoff" Actually Means

Vendors use "AI takeoff" and "AI estimating" to describe at least three different kinds of technology. They have very different strengths, and most confusion in the market comes from treating them as one thing.

➤ Measurement on drawings

This is computer vision applied to plan sheets. The software looks at a PDF drawing, finds walls, rooms, areas, and symbols, and returns lengths, square footages, and counts. It's good at repetitive geometry: a floor of identical offices, long runs of partition wall, a clean CAD-generated plan. It struggles with the drawings specialty contractors see most, like 1970s scans, hand-marked as-builts, curved or irregular geometry, and sheets so dense with notes that the lines are hard to separate.

➤ Reading documents

The second kind reads text: survey reports, specifications, scope letters. It can pull material descriptions, sample results, and stated quantities out of a forty-page hazardous materials survey and put them in a table. This is where current AI is strongest. In a January 2026 benchmark of AI models on architectural and engineering drawings, text extraction and document question-answering reached up to 95 percent accuracy, while reliably counting doors and windows on a floor plan often landed between 40 and 55 percent [6].

AI MODEL ACCURACY ON DRAWING TASKS

Reading text & answering document questions



up to
95%

Counting doors & windows on a floor plan



40–55%

Source: AECV-Bench, arXiv, January 2026 [6]. Counting bar shows the top of the reported range.

➤ General-purpose chatbots

The third is a general assistant like ChatGPT, Claude, or Copilot, pointed at a bid package. These tools can summarize a scope or draft a clarification letter. They are not estimating systems. RSMeans, which has published construction cost data for decades, answers the question of whether such tools produce accurate estimates bluntly: "These tools are not built for estimating" [5]. They don't know your production rates, and they can't show you which line on which sheet produced a quantity.

Type	Good at	Struggles with	First question to ask
Measurement on drawings	Repetitive walls, rooms, and areas on clean plans	Old scans, irregular geometry, busy sheets, symbol counts	Can I click any quantity and see exactly what was measured?
Document reading	Pulling materials, quantities, and limitations from surveys and specs	Tables split across pages, handwritten notes, ambiguous scope language	Does it flag survey limitations, or only extract quantities?
General chatbots	Summaries, drafts, quick questions	Pricing, production rates, traceable quantities	Where does my client's data go once I upload it?

One more finding puts the whole category in perspective. In a July 2026 study using real issued-for-construction drawings, the best AI model answered 71.7 percent of drawing-interpretation questions correctly. That beat the average person in the study (68.4 percent) and fell well short of experienced professionals, who scored 94.9 percent [7]. The gap was widest on questions that took several steps of reasoning.

ACCURACY INTERPRETING REAL CONSTRUCTION DRAWINGS

Experienced professionals		94.9%
Best AI model tested		71.7%
Average study participant		68.4%

Source: DrawingVQA, arXiv preprint, July 2026 [7]

Today's AI reads drawings about as well as a capable new hire. It doesn't yet read them like your best estimator.

That's a fair way to think about it. You wouldn't send a new hire's takeoff out the door without review, and you wouldn't refuse to hire because new hires make mistakes.

➤ 3. Takeoff Isn't the Estimate

Most AI takeoff products were designed around general construction, where the drawing is the scope and the job is to measure it. In demolition and abatement, the measurement is the first step of a longer chain of judgment. That's why a tool that performs well in a general-contractor demo can disappoint on your bids.

➤ In abatement, the survey leads and the drawing follows

Federal asbestos rules require a thorough inspection of the area before any demolition or renovation [8], and OSHA's construction standard requires building owners to determine the presence, location, and quantity of asbestos-containing material before work begins [10]. So the primary source document for an abatement estimate is usually the hazardous materials survey written by an industrial hygienist. The drawings are there to verify quantities and plan the work.

An experienced abatement estimator reads that survey cover to cover. They're looking for friability, for how spread out the material is, for condition, and, most of all, for the limitations section. A line like "areas above the ceiling were not accessed" or "mastic was not sampled separately from tile" tells them where the risk is. Measuring floor area can't produce that information.

Then come the decisions that actually drive cost. Is this one large containment per floor, or several smaller ones so the building can stay partly occupied? Where does the decon unit go? How does waste leave the building? Two estimators with identical square footages can arrive at very different prices because they made different containment calls. The quantity matters. The containment strategy often matters more.

➤ In demolition, the scope is defined by what stays

Interior selective demolition works the other way around. The spec says what to remove and what to protect, and the estimator walks every wall, ceiling, and floor making a keep-or-remove call. Every "protect" adds cost. Every missed "remove" becomes a change order. A single ambiguous phrase about mechanical, electrical, and plumbing work, like "cap and make safe" versus "remove to main," can move that portion of the estimate by a multiple.

Demolition also carries a hazmat dependency. On older buildings, the demolition number isn't final until the survey defines what needs abatement first, and sometimes the survey results arrive after the bid is due.

➤ Hidden conditions don't show up on any drawing

The EPA is explicit that if additional friable asbestos is discovered during a renovation or demolition, that material becomes subject to the regulations from the moment it's found [9]. Anyone who has opened a wall in a 1960s building knows what that means for schedule and cost. No AI model can see inside a wall cavity. What it can do, if it's built for this work, is make sure the estimator notices the survey's own warnings and carries them into the proposal as allowances, exclusions, or clarifications.

An AI tool can hand your estimator an accurate square footage. It can't tell them the survey skipped the ceiling plenum unless someone built it to look for that.

➤ 4. The Concerns Are Legitimate. Name Them.

When Dodge asked contractors what worried them about AI, 57 percent named the reliability or accuracy of AI output and 54 percent named data security. Only 26 percent rated their own company's data quality as high [2]. Those numbers match what owners tell us in conversation. The concerns tend to come in four forms.

WHAT CONTRACTORS SAY ABOUT AI AND THEIR DATA



Source: Dodge Construction Network and CMiC, AI for Contractors, 2025 [2]

"Is the number right?"

Sometimes it won't be, and a vendor who says otherwise is telling you something about the vendor. The better question is whether you can find out quickly when it isn't. A quantity you can trace back to the exact area of the exact sheet can be checked in seconds. A quantity that arrives as a bare total has to be re-measured to be verified, which cancels most of the time savings.

"Who's accountable when it's wrong?"

You are, the same as today. Your name is on the proposal and your crew lives with the price. That's why the estimator needs to stay the decision-maker, with the ability to accept, correct, or override every AI suggestion. Tools that make overriding awkward quietly shift judgment away from the person who's accountable.

"Where does our data go?"

Bid packages contain client drawings, building details, and your pricing. Before any upload, you should know in writing whether your files are used to train a model shared with other companies, who can access them, and what happens to them if you leave. "We take security seriously" is not an answer.

"Will this replace my estimators?"

Nothing in the current evidence suggests AI can do what a senior demolition or abatement estimator does. The more realistic risk runs the other way. If AI handles the measuring and nobody captures how your best estimators think, the knowledge still walks out the door when they retire. A good tool should make their judgment easier to see, reuse, and teach.

➤ The quieter risk: automation bias

There's a fifth concern owners rarely raise, and it may matter most. The National Institute of Standards and Technology describes automation bias as "excessive deference to automated systems" and warns that people may perceive AI output as higher quality than it is [12]. In KPMG and the University of Melbourne's 2025 global study, 66 percent of people said they rely on AI output without evaluating its accuracy [11].

66%

of people say they rely on AI output without checking whether it's accurate.

Source: KPMG and the University of Melbourne, *Trust, Attitudes and Use of AI: A Global Study 2025* [11]

On a Tuesday morning with a clear calendar, your estimator will check the AI's work. At 4:10 on a Thursday with three bids due, she may not. The practical defense is a tool that makes checking fast, plus a written rule about what always gets a second look.

➤ 5. Five Standards for Trustworthy AI Takeoff

These are the requirements we'd hold any AI estimating tool to, including our own. None of them depend on how impressive the demo is.

1

Every quantity has a source

Any number the system produces should link back to the drawing region, survey line, or spec section it came from. If your estimator can't click a quantity and see what was measured, you can't review it quickly, and you can't defend it to a GC three months later.

2

The estimator has the final say

Every AI-suggested item or quantity should have a manual fallback. Your estimator should be able to draw, correct, or delete a measurement by hand without fighting the software. The AI adds speed to a process the estimator still controls.

3

Limits are stated plainly

Ask the vendor where their AI performs worst. A credible answer names specific cases, such as low-quality scans, curved walls, or very busy sheets, and explains what the tool does when it's unsure. A vendor who claims no weak spots hasn't tested on your kind of drawings.

4

Your data stays yours

Get it in writing: your files and pricing stay private to your account and are not used to train a model shared across companies. Confirm how data is stored, who can see it, and how you get it back.

5

It's built around how your trade works

Abatement estimators work location by location, following the survey's homogeneous areas and measuring in square feet, linear feet, and each. Demolition estimators work scope by scope and system by system, often in cubic yards and tons. A tool built for general construction will make your estimators translate its output into their method. A tool built for your trade starts in their method, and ideally connects the estimate to what actually happened on the job so next year's numbers are better than this year's.

➤ 6. Questions to Ask Any AI Estimating Vendor

NIST's AI Risk Management Framework is voluntary and not specific to construction, but it gives owners a useful anchor: it calls for policies that address AI risks from third-party vendors and for contingency plans when a third-party AI system fails [13]. In practice, that comes down to asking the right questions before you sign.

Ask	Why it matters	A good answer sounds like
Can I trace every quantity back to its source?	Review speed and defensibility	"Click any number and you'll see the exact area on the sheet it came from."
What happens when the AI is unsure?	Silent errors are the expensive ones	"It flags low-confidence areas for review instead of guessing."
Where does your AI perform worst?	Tests the vendor's candor	Specific cases, like old scans and irregular geometry, with a plan for each
Is my data used to train a shared model?	Client confidentiality and your pricing	"No. Your data stays private to your account." In the contract.
How does it handle a hazardous materials survey?	In abatement, the survey is the scope	It reads the survey, including the limitations section, alongside the drawings
Can my estimator override anything, easily?	Accountability stays with your team	Manual fallback on every AI suggestion
What happens to the estimate after we win?	Scope and assumptions get lost at handoff	The scope, quantities, and assumptions carry into the job
Can we test it on our own past bids?	A demo on their drawings proves little	"Yes. Bring three jobs you've already finished."

➤ 7. A Low-Risk Way to Start: The Shadow-Bid Pilot

You don't need to trust an AI tool on a live bid to find out whether it's worth trusting. Test it on work you've already finished, where you know the answer.

- 1 Pick three to five completed jobs** with known actuals. Include at least one where a hidden condition hurt you, like an unsurveyed plenum or extra mastic layers.
- 2 Run them through the tool** using the original bid documents only. Have the same estimator who bid the job review the output.
- 3 Compare against both the original takeoff and the actuals.** Note where the AI was faster, where it was wrong, and whether it caught or missed the survey limitations that mattered.
- 4 Count corrections and time them.** If fixing the AI's output takes as long as doing the takeoff by hand, that's your answer for now.
- 5 Write your review rule before going live.** For example: any survey-limitation area, any quantity that differs from the survey by more than a set percentage, and any job over a set value always gets a second set of eyes.
- 6 Start live use on smaller, lower-risk bids,** then expand as the correction count drops.

FOUR NUMBERS TO TRACK

Hours per takeoff

Measured before and after.

Corrections per takeoff

And whether the count is falling.

Bids per estimator per month

The capacity number that matters most when the bench is thin.

Estimate-to-actual variance

On won jobs, so you know whether faster also means as accurate.

BACK TO BID DAY

Thursday, 4:10 p.m., again.

Picture the same job, the same fifty minutes, and a tool that meets the standards in this paper.

Your estimator clicks the 14,200 square feet and the measured areas light up on the sheets. In about a minute she sees it: the tool counted the third-floor corridor, which the survey identifies as carpet over concrete, not resilient tile. She removes it, and the takeoff drops to within a few hundred square feet of the survey. Then she looks at the survey's limitations note, the one about the ceiling plenum, which the tool had flagged beside the pipe insulation line. She adds a clarification excluding above-ceiling materials not identified in the survey and carries a unit price for any found during work.

The bid goes out at 4:48. You know where every number came from, and so does she.

For demolition and abatement contractors, that is the realistic promise of AI takeoff today: a first pass your estimator can check in minutes, with her attention pointed at the places where the risk actually sits.

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ABOUT FIELDFLŌ

Built around the standards in this paper.

FieldFlō is a field operations platform built for specialty subcontractors in demolition, abatement, and remediation. Its Takeoff & Estimating module was designed around the standards in this paper: AI-assisted detection with a manual fallback on every item, every quantity tied back to the drawing or survey it came from, estimators in control of final pricing, and customer data kept private to each account and never used to train a shared model.

When a bid is won, the scope, quantities, and assumptions carry straight into the job.

To see how it works on your own drawings, request a demo.

See Takeoff & Estimating on your drawings

fieldflo.com/takeoff-estimating-demo