



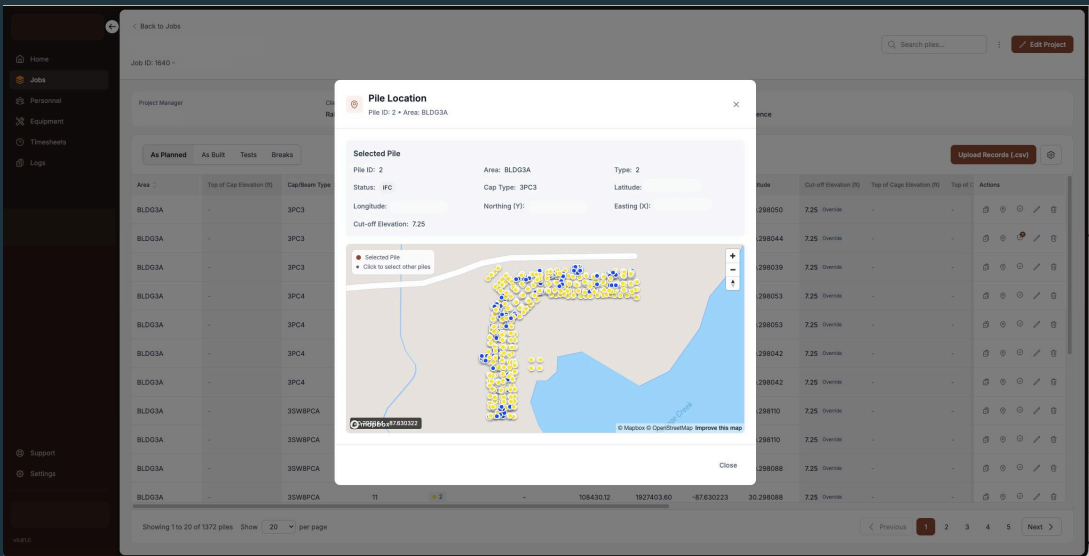
CASE STUDY · DEEP FOUNDATION OPERATIONS

1,372 Piles. One System of Record.

Metacto designed, built, and operates the platform deep-foundation contractors run their jobs on, and the AI that reviews every record inside it.

CLIENT	FUNCTION	FOCUS AREA	PRIMARY USERS
Confidential	Deep-foundation construction operations	Product build and in-product AI review	Project managers, rig crews, inspectors, in-office admins

The platform is the operations system deep-foundation contractors use to run pile schedules, rig data, load tests, and field paperwork in one place. Metacto designed and built it, ships the AI review layer inside it, and operates it end to end, schema to field deployment. This is what we built and what it changed on real jobs.



1,372
piles tracked on a
single job

1,400+
daily-log entries
synced to one
project

6
field data streams in
one view

100%
of rig records
kept with
originals intact

The Challenge & The Opportunity

The Operational Challenge

The platform's flagship customer, a leading deep-foundation contractor, installs auger-cast and drilled piles on marine terminals, industrial plants, and commercial projects across the Southeast. Those jobs routinely run to a thousand-plus piles, and every pile generated its own trail of artifacts. None of it lived together.



Every pile lived in five places.
A spreadsheet row, a drill record on the rig, a concrete ticket on paper, a drawing revision in a shared folder.



Rig data landed in drop folders.
Field crews wrote readings on paper and re-keyed them at night.



The same pile list, rebuilt three times.
Once for the estimate, once for the schedule, once for the closeout package.



Job history was tribal.
Finding the 16-inch piles tested on a job two years ago meant asking whoever might remember.

The Opportunity

One Live Job Record

Set the job up once and every pile carries its design identity through drilling, inspection, testing, and closeout. As-planned, as-built, tests, and concrete breaks become tabs on the same pile list rather than four different files.

A First Pass That Runs Overnight

Every incoming rig record checked against the project's tolerances, the pile's theoretical volume, the rig's own history on the job, and nearby test data, with the reasoning attached to anything unusual.

Pile Design

Download CSV

Import CSV

+ Add Pile Type

Title	Product Code	Color	Minimum Mix Design	Comp (kips)	Tension (kips)	Lateral (kips)	Diameter (in)	Reinf. Cage	Cage Projection (ft)	Center-Bar
9	DWP	 Blue	-	155	0	13.5	14	18'-(5)#7	0	#11 GR.60
9T	DWP	 Yellow	-	155	45	13.5	14	18'-(5)#7	0	#11 GR.60
10	DWP	 Green	-	235	0	18.5	18	18'-(5)#7	0	#11 GR.60
10T	DWP	 Red	-	235	55	18.5	18	18'-(5)#7	0	#11 GR.60
11	DWP	 Orange	-	380	65	29.5	18	22'-(6)#8	0	#11 GR.60
11T	DWP	 Magenta	-	380	65	29.5	24	22'-(6)#8	0	#11 GR.60
1	DWP	 Blue	-	155	0	13.5	14	18'-(5)#7	0	#11 GR.60
2	DWP	 Green	-	235	0	18.5	18	18'-(5)#7	0	#11 GR.60

Pile types defined once with product code, capacities, diameter, and reinforcement, then referenced everywhere the pile appears.

Measured today:

42

records reviewed in one overnight pass

18s

to review a full shift of drill data

6

checks run on every record

2 clicks

to verify drill data, in place of a spreadsheet reconciliation

One Job Setup. Everything Hangs Off It.

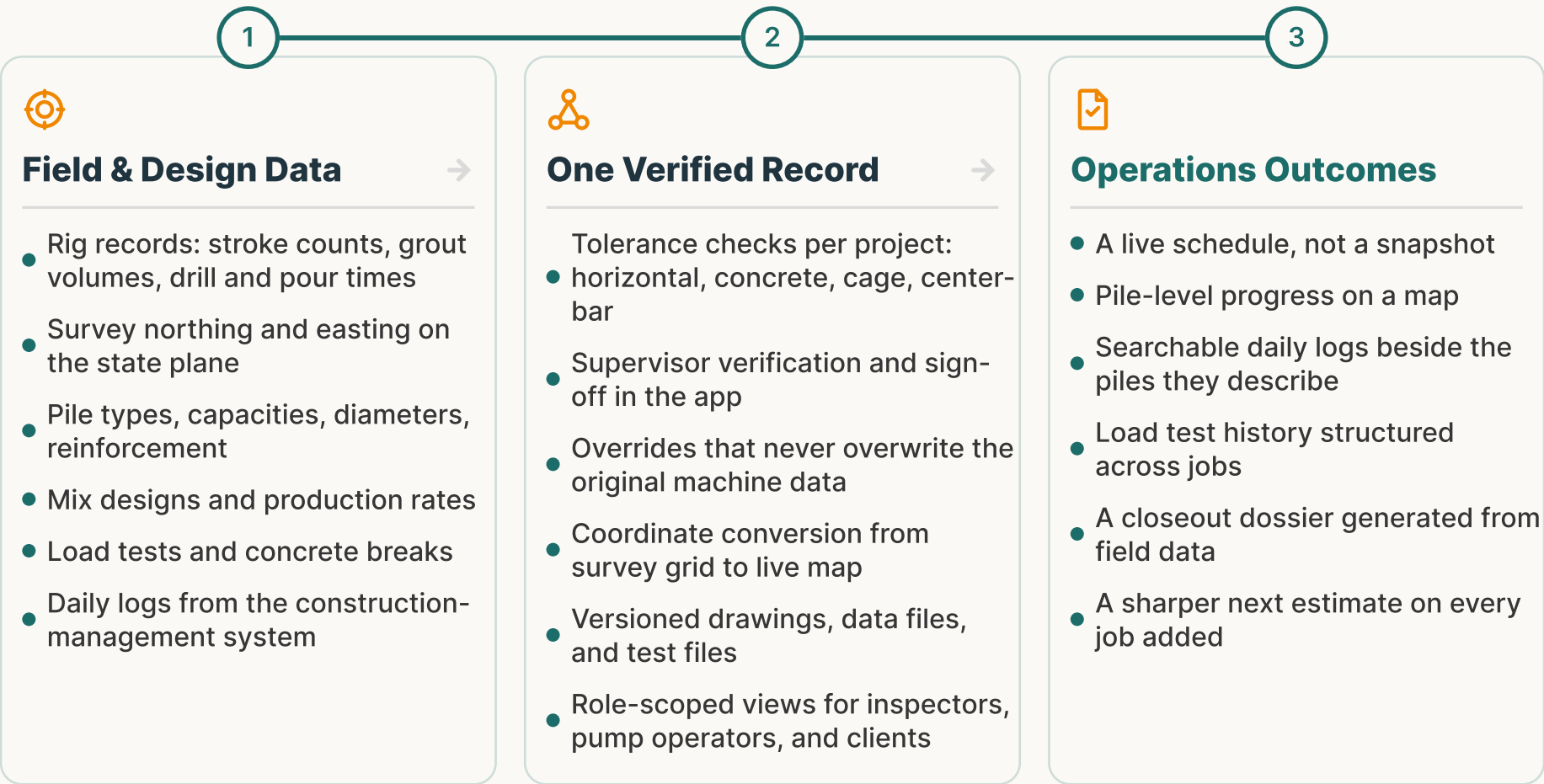
The platform starts where the work starts: a guided job setup that captures pile types with their capacities and reinforcement details, estimates and production rates, mix designs, load tests, cap configuration, and project documentation. From there, every pile on the schedule carries its design identity with it.

React 19 · TypeScript · Strapi v5 · PostgreSQL · AWS ECS · Firebase Auth · Procore API · Mapbox

Built on the contractor's live rigs, surveys, and job records:

- RIG DRILL RECORDS
- SURVEY GRID COORDINATES
- PILE DESIGN & TOLERANCES
- LOAD TESTS & CONCRETE BREAKS
- DAILY LOGS

From Inputs to Business Outcomes



12 Modules That Run the Job

12 Modules That Run the Job

IN PRODUCTION ON LIVE JOBS

Guided Job Setup

Twelve configuration steps,
from milestones and personnel
to cap and constants.

Pile Design Library

Product codes, capacities,
diameters, reinforcement,
color coding.

Closeout Dossier

A branded PDF generated from the same data the field entered.

Drill Record Ingest

Stroke counts, grout volumes,
drill and pour times, CSV
upload.

Tolerance Engine

Horizontal, concrete, cage,
and center-bar tolerances, set
per project.

Load Tests & Concrete Breaks

Structured and searchable
across every job.

Pile Location Map

State-plane coordinates
converted and mapped live.

Override & Audit Trail

Corrections recorded without touching the machine values.

Role-Scoped Access

Admin, read-only, pump operator, inspector, client.

Document & Drawing Versioning

Versioned, archived, and linked to the piles they describe.

Daily Logs Integration

Manpower, reports,
equipment, deliveries with
scanned tickets, delays, field
book.

Live Pile Schedule

As planned, as built, tests, and breaks on one pile list.

We integrated the platform with the customer's construction-management system so it pulls the daily record of the job into context: manpower, construction reports, equipment hours, material deliveries with scanned tickets, delay logs, and field book quantities. On one terminal project that is more than 1,400 entries, searchable by date, rig, and phase, next to the piles they describe.

Daily Logs						
1678 - 	08/27/2025 - 08/27/2026 	Single day	Times shown in US/Pacific			
Manpower 330	Daily Construction Report 134	Equipment 200	Deliveries 122			
Delays 504	Field Book 142					
2026-06-25 · 7:20 AM · Approved <table> <tr> <td> PO NUMBER 1678-16445 PHASE. 200  </td><td> TOTAL YARDS 19 MATERIAL CODE 23005-Furnish PDP Piling Concrete-M </td><td> DESCRIPTION OF DELIVERY Platinum Ready Mix Mix id# 50augercast #89 straight DRILL RIGS DR-125 </td></tr> </table>				PO NUMBER 1678-16445 PHASE. 200 	TOTAL YARDS 19 MATERIAL CODE 23005-Furnish PDP Piling Concrete-M	DESCRIPTION OF DELIVERY Platinum Ready Mix Mix id# 50augercast #89 straight DRILL RIGS DR-125
PO NUMBER 1678-16445 PHASE. 200 	TOTAL YARDS 19 MATERIAL CODE 23005-Furnish PDP Piling Concrete-M	DESCRIPTION OF DELIVERY Platinum Ready Mix Mix id# 50augercast #89 straight DRILL RIGS DR-125				
2026-06-25 · 9:55 AM · Approved <table> <tr> <td> PO NUMBER 1678-16445 PHASE. 200  </td><td> TOTAL YARDS 63 MATERIAL CODE 23005-Furnish PDP Piling Concrete-M </td><td> DESCRIPTION OF DELIVERY Platinum Ready Mix Mix id# 50AUGERMSB DRILL RIGS DR-125 </td></tr> </table>				PO NUMBER 1678-16445 PHASE. 200 	TOTAL YARDS 63 MATERIAL CODE 23005-Furnish PDP Piling Concrete-M	DESCRIPTION OF DELIVERY Platinum Ready Mix Mix id# 50AUGERMSB DRILL RIGS DR-125
PO NUMBER 1678-16445 PHASE. 200 	TOTAL YARDS 63 MATERIAL CODE 23005-Furnish PDP Piling Concrete-M	DESCRIPTION OF DELIVERY Platinum Ready Mix Mix id# 50AUGERMSB DRILL RIGS DR-125				

Deliveries with scanned tickets, manpower, equipment, delays, and field book entries synced from the project-management system.

Every Drill Record, Reviewed Overnight

The AI does the reading. Your people do the deciding.

01 Nothing is auto-approved

Every approval, single or batch, is a human action, stamped and audited the same as today.

02 Original data is untouchable

AI suggestions use the platform's existing override system. The machine's values are preserved verbatim, forever.

03 Every flag shows its work

No black-box scores. Each finding names the values, the comparison set, and the reasoning behind it.

04 Where you already work

Results land on the pile schedule. There is no separate AI dashboard to learn.

The Overnight Pass

A working rig produces a record per pile, which on a busy job is dozens of records a day. Review is where digital jobs quietly go analog: someone scrolls a grid, eyeballs each row, and bulk-approves when they run out of afternoon. The one pile with a grout take 40% over theoretical looks exactly like its neighbors at that speed.

Metacto built the review agent directly into the platform. Clean records queue for one-click approval. Anything unusual gets flagged, with the reasoning attached.

38 clean · 3 flagged · 1 needs attention

Back to Jobs

Job ID: 1649

Search piles...

Edit Project

Project Manager

Client

Project Owner

General Contractor

Industry Sector

Commercial Residence

As Planned

As Built

Tests

Breaks

Upload Records (.csv)

Drill Data Review

Reviewed 42 new records from Rig CFA-102 overnight - checked against project tolerances, theoretical volumes & this job's drill history

38 clean

3 flagged

1 needs attention

Approve 38 clean

Review flagged

Area	Top of Cap Elevation (ft)	Cap/Beam Type	Pile ID	Pile Type	Client Pile ID	Northing (Y)	Actions
BUILDING 2	3.00	PC3	201	1	-	759477.95	
BUILDING 2	3.00	PC3	202	1	-	759474.97	
BUILDING 2	3.00	PC3	203	1	-	759474.89	Overbreak 1.68x
BUILDING 2	3.00	PC3	204	1	-	759474.84	
BUILDING 2	3.00	PC3	205	1	-	759477.83	Short of target -4.1 ft
BUILDING 2	3.00	PC3	206	1	-	759474.76	
BUILDING 2	3.00	PC4	207	1	-	759467.42	Drill time outlier
BUILDING 2	3.00	PC4	208	1	-	759467.50	

42 new records reviewed against tolerances, theoretical volumes, and rig history, with flagged piles marked in the schedule.

Job ID: 1649

Search piles...

Project Manager

Client

Project Owner

General Contractor

Industry Sector

Commercial Residence

As Planned

As Built

Tests

Breaks

Upload Records (.csv)

Drill Data Review

Reviewed 42 new records from Rig CFA-102 overnight - checked against project tolerances, theoretical volumes & this job's drill history

38 clean

3 flagged

1 needs attention

Approve 38 clean

Review flagged

201

Dec 17, 2025, 6:30 PM

Edit

View Processed Data

Reference Information

Drill Start: Dec 17, 2025, 8:38 AM

Location ID: 201

Elevation: 0.00

Overbreak: 1.23

Cycle Time: 00:06:18

Delay Time: 00:00:00

AI Review — record looks clean

PASSED 6 CHECKS

Overbreak 1.23x is within this job's normal range (1.05-1.35x) - pile length 32.57 ft matches target - cycle time 6:18 is typical for Rig CFA-102 - no delay recorded - tolerances met.

Approve record

Pile Details

Max Stroke

13

Pile Length (ft)

32.57

Pile Code

Production Pile

Pile Status

Complete

Delay Reason

No Delay

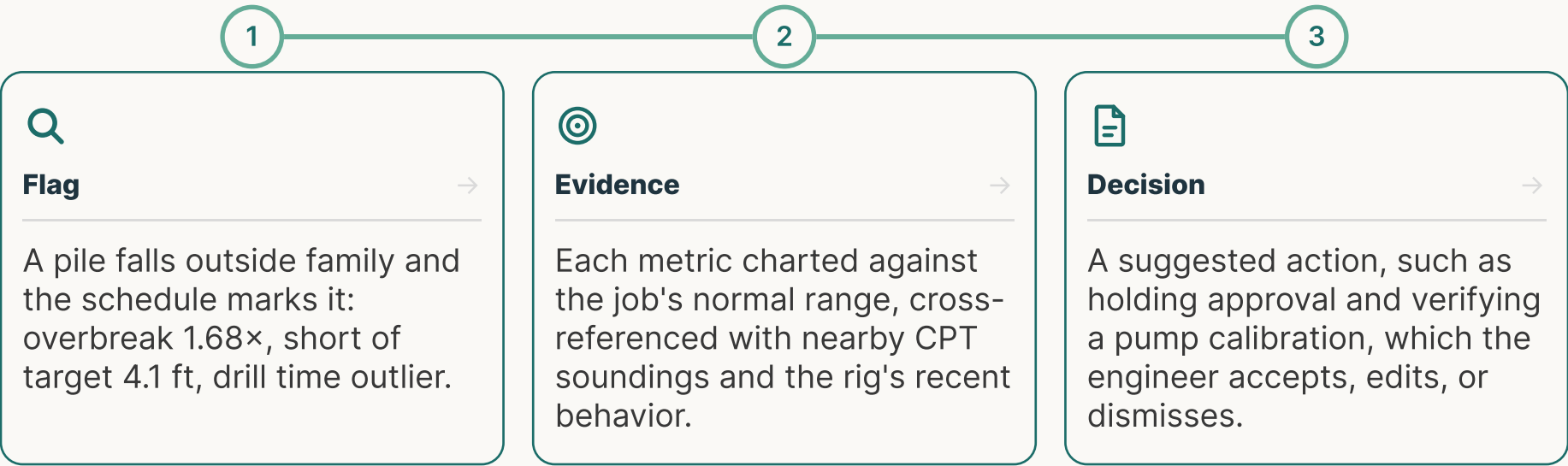
Comments

Close

Six checks passed, each one stated, one click to approve.

Not Just a Flag, a Case

Open a flagged pile and the AI presents its evidence, then proposes a next step the engineer accepts, edits, or dismisses.



The Pile Nobody Would Have Caught

Grout take on pile 203 came in at 1.68x theoretical, the highest on the job, against a 1.21x running average across 212 piles drilled by that rig. A nearby CPT logs a soft clay seam from 12 to 18 ft that likely explains the excess take, but the stroke count is also consistent with pump calibration drift on the last four piles. At scroll speed, that row looks like its neighbors.

PILE 203 · OVERBREAK DETECTION

1.68x

grout take, against a 1.21x job average

212

piles of rig history compared

4.9cy

actual grout, against 2.9 cy theoretical

18s

to surface it, across all 42 records

Home

Jobs

Personnel

Equipment

Timesheets

Logs

BY THE SEA

Job ID: 1649 -

Project Manager

Client

Project Owner

General Contractor

As Planned

As Built

Tests

Breaks

Drill Data Review

Reviewed 42 new records from Rig CFA-102 overnight - checked against project tolerances, theoretical volumes & this job's drill history

38 clean

3 flagged

Area	Top of Cap Elevation (ft)	Cap/Beam Type	Pile ID	Pile Type
BUILDING 2	3.00	PC3	201	1
BUILDING 2	3.00	PC3	202	1
BUILDING 2	3.00	PC3	203	1
BUILDING 2	3.00	PC3	204	1

Pile 203 — Drill Data Review

Rig CFA-102 · Drilled Dec 17, 8:38 AM ·

Record 1 of 1

Needs attention

ASSESSMENT

Grout take on this pile is 1.68x theoretical volume — the highest on this job, against a running average of 1.21x across 212 piles drilled by this rig. Nearby CPT CPT-B14 logs a soft clay seam from 12–18 ft that likely explains the excess take, but the stroke count (13) is also consistent with a possible pump calibration drift seen on the last 4 piles.

EVIDENCE

Overbreak ratio

1.68x · job avg 1.21x

Grout volume

4.9 cy · theoretical 2.9 cy

Pile length

32.6 ft · target 32.5 ft

Cycle time

6:18 · rig median 6:45

SUGGESTED ACTION

Hold approval and add a comment override: "High grout take 1.68x — soft seam per CPT-B14; verify pump calibration on CFA-102 before next shift."

Reviewed 42 records in 18 s · original machine data is never modified

From Drop Folders to a Data Hub

The goal was to give a thousand-pile job one record: design through certification on a single platform, with rig data verified as it arrives, paperwork attached to the piles it describes, and a closeout package that generates itself from what the field already entered.

Proof Points

IN PRODUCTION ON LIVE JOBS

1,372

piles on a single job,
one record each

1,400+

daily-log entries
sync'd to one project

18s

to review a full shift of
drill data

O

machine values ever
modified by AI

What Changed on the Job

18 seconds

to review a full shift of drill data, with every check stated

- Piling work runs on one platform, design through certification, in place of five artifacts per pile
- Drill data verified with a two-click approval instead of a spreadsheet reconciliation
- Load test records structured and searchable across jobs, in place of tribal knowledge
- The closeout dossier generated from the same data the field entered, not assembled by hand at the end
- Every job added makes the next estimate sharper and the next lookup faster

MEASURED IN PRODUCTION

38 of 42 new records passed every check — tolerances, theoretical volume, target length, and rig history

42

records reviewed

38

clean

1.19×

avg overbreak

6:47

avg cycle time

0

tolerance violations

Pile	Rig	Overbreak	Length / target	Cycle	AI Review
201	CFA-102	1.23×	32.57 / 32.5 ft	6:18	✓ Clean
202	CFA-102	1.18×	32.60 / 32.5 ft	6:41	✓ Clean
204	CFA-102	1.15×	32.49 / 32.5 ft	7:02	✓ Clean
206	CFA-102	1.27×	32.55 / 32.5 ft	6:12	✓ Clean
207	CFA-102	1.21×	32.58 / 32.5 ft	6:55	✓ Clean
209	CFA-102	1.09×	32.51 / 32.5 ft	7:14	✓ Clean
...and 32 more clean records					

Approval stamps your name and timestamp on each record — identical to approving them one by one.

Cancel

✓ Approve 38 records

38 records, zero tolerance violations, one approval. The flagged four wait for a human.

Deploy Your **Construction AI Workforce**

The AI Metacto built into the platform is production-ready. With Metacto's Managed AI Workforce, deploy AI built around your recurring construction work, in your own environment, operated in production by Metacto.

What We Build

**Field Data Platforms**
One live record from design through closeout.

**Machine and Sensor Pipelines**
Records off rigs and instruments, structured and verified on arrival.

**Systems Integration**
The construction-management system the job already runs on.

**Spatial and Mapping**
Survey coordinates converted and put on a live map.

**In-Product AI Review**
An overnight first pass with the reasoning attached.

**Governed AI Guardrails**
Nothing auto-approved, originals preserved, every flag showing its work.

How You Get There

**1 AI Workforce Review** →
We map your recurring work and model the business case.

**2 Launch & Prove** →
We build and prove the agents on your live systems.

**3 Managed Operations** →
We run them in production, governed and improving.

Why Metacto

**Production Operators**
Real systems on real jobs.

**Design and Engineering**
Schema to field deployment.

**Rig to Front Office**
Machine data through to the admin dashboard.

**AI That Ships Inside**
Guardrails that earn it a place in production.

Deploy a Managed AI Workforce

AI built around your recurring work, deployed in your own environment, and operated in production by Metacto. Delivered as AI Workforce Review, Launch & Prove, and Managed Operations.

Start with an AI Workforce Review