

CUSTOMER CAPABILITIES + TECHNOLOGY DETAIL

TRACE AI Platform + CAD / BIM

The comprehensive capability and development register

731 individual entries
58 capability sections

Includes every entry from the previous 455-item catalog, updated release states and detailed additions from the development record.

Expanded coverage: self-healing, recovery, source-backed reasoning, evidence decisions, signed offline capture, native clients, application generation, inventory, demonstrations and advanced engineering concepts.

Review cutoff: September 8, 2026 Pacific evening / September 9 UTC. Active development may continue after this edition.

EVIDENCE. INTELLIGENCE. PROJECT CONTROL.

AI / Construction operations / CAD & BIM / Bounded recovery

What changed in this edition

This edition preserves the complete earlier catalog and adds 276 individually described developments. Older candidate-only descriptions of the released contract package have been replaced by the later production release evidence.

Released assessment controls

Per-unit source review, material-condition retention, prerequisite checks, whole-answer completeness and qualified uncertainty.

Released evidence workspace

Signed journal, explicit acceptance gates, source correction/freshness, schedule/procedure controls and portable evidence archives.

Released offline capture

Enrolled signing devices, verified receipts, persistent originals, encrypted backup and independently reviewed recovery.

Native client advances

Released project-directory and replay fixes; protected queues, deterministic signing and isolated online-window development.

Self-healing detail

Named diagnosis, retries, deadlines, known-definition and index repair, durable upload/extraction admission, runtime recovery and backup mechanisms.

CAD and demonstration updates

Production DWG/IFC controls, accepted staging DXF primitive pipeline, shaded elevation preview and a substantially populated synthetic project.

How to read this catalog

Entries are organized by capability rather than a blanket undeployed section. Availability and scope are stated beside the applicable family or item. Released software, accepted isolated staging, tested source components and design concepts are distinct evidence levels.

The catalog is suitable for explaining TRACE to customers, but a requirement or concept is not a promise of current availability. Module licenses, project grants, usable sources, service configuration and the applicable client release still govern access.

Self-healing describes bounded repair of named failures. It does not mean error-free operation, arbitrary autonomous code changes, instantaneous offline revocation or guaranteed yearly intelligence growth.

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SECTION 01

TRACE AI: assistance and reasoning

Evidence-grounded assistance for construction administration, investigation and preparation.

001 Ask TRACE

Ask typed or voice questions, including informal wording and follow-ups. Choose quick lookup, an answer with sources or detailed investigation; edit scope-specific suggested questions before sending.

002 Product help and training

Find screen guidance, navigation help and explanations of supported workflows through a separate product-help knowledge base.

003 Project-context assistance

Use authorized project documents and supported structured records as evidence for project questions.

004 Structured interpretation

Separate recorded facts, inferred consequences, assumptions, competing evidence and missing information.

005 Risk and schedule reasoning

Explain supported implications, highlight missing logic, calendars or baselines, and propose a next verification step.

006 Cited answers and support checks

Attach source references to supported findings; identify insufficient evidence rather than invent a project determination.

007 Answer, draft, classify, compare and educate

Supported queued assistance tasks prepare material in an authorized record context, subject to evidence and access controls.

008 Professional decision boundaries

Keep formal engineering, safety, legal, approval and permission-to-build decisions with the authorized person.

009 Run history and accountability

Retain AI activity, run identifiers, source context and supported review/feedback information.

010 Request recovery

Recover eligible long-running requests with the same request key and avoid duplicate model calls for repeated submissions.

011 Voice interaction where available

Use supported voice entry/output subject to browser, device permissions and configured service availability.

Scope and availability: AI availability depends on the enabled module, configured provider and usage allowance. Fluent output is not evidence of correctness.

SECTION 02

TRACE AI: enforced evidence boundaries

Source selection is enforced before evidence reaches the reasoning model.

012 This project

Restrict retrieval to the current authorized tenant and project, with matching source and passage identity.

013 General knowledge

Search eligible shared reference material without carrying project context into that search.

014 Combined search

Use the authorized project plus separately identified general references; do not mix in another project.

015 Web research boundary

Project-only and combined project-bearing prompts do not use public web research. Permitted general research is a separate path.

016 Source authority

Distinguish project records, reviewed references, general guidance and assertions; a reference is not automatically a governing requirement.

017 Edition and adoption context

Retain available edition, jurisdiction and applicability metadata so the user can establish the controlling source.

018 Permission-aware retrieval

Apply current access rights to records and evidence, including API and queued worker paths.

019 Scope-switch reset

Clear prior questions, answers, citations and voice state when changing source scope.

020 Late-response protection

Reject stale results after account, tenant, project, source-mode or relevant revision changes.

021 Project-private improvement records

Keep failure curricula scoped and private; do not turn one customer's questions or project documents into another customer's knowledge.

Scope and availability: Shared general references and project-private evidence remain distinct. General references must be evaluated for actual project applicability.

SECTION 03

TRACE AI: documents, extraction and proof

Turn supported files into inspectable evidence while preserving their source identity.

022 Digital document ingestion

Extract supported born-digital documents into searchable passages with source and page context.

023 Scanned PDF and image OCR

Retain extraction method, page identity and available confidence/region metadata for scanned notes and images.

024 Page-preserving reference extraction

Retain native PDF page numbering and layout-oriented text; open the original PDF page to verify tables, symbols and context.

025 Immutable source identity

Use content fingerprints and revision links to identify the exact evidence used.

026 Source-linked passage retrieval

Search relevant passages and supported structured project facts rather than treating all text as equally authoritative.

027 Citation inspection

Open available source references and inspect the cited passage or original document.

028 Proof collection

Collect supported answer evidence into proof items for review and communication.

029 Proof preview and PDF export

Preview, print or download supported exhibits, reports and source manifests.

030 Safe upload admission

Apply supported file validation, scanning and ingestion gates before protected evidence becomes usable.

031 Reference-pack quality checks

Validate candidate hashes, page counts, page identity, empty/missing pages, safe paths and provenance metadata.

032 Controlled source expansion

Add eligible references through extraction and quality review; preserve approval states and edition metadata.

Scope and availability: Layout-oriented text does not preserve every visual relationship. OCR alone does not establish dimensions, scale, linework or design intent.

SECTION 04

TRACE AI: knowledge library

The deployed reference expansion includes eight complete retained federal publications, totaling 524 PDF pages, plus 24 original TRACE workflow guides.

033 Electrical engineering

UFC 3-501-01: electrical engineering reference material with page-linked source access.

034 Mechanical / HVAC

UFC 3-410-01: heating, ventilation and air-conditioning reference material.

035 Civil engineering

UFC 3-201-01: civil engineering reference material.

036 Plumbing

UFC 3-420-01: plumbing systems reference material.

037 Cost estimating

UFS 3-740-05: construction cost-estimating reference material.

038 Schedule specifications

UFGS 01 32 01.00 10: project schedule guide specification.

039 Quality control

UFGS 01 45 00: quality-control guide specification.

040 Safety requirements

UFGS 01 35 26: governmental safety requirements guide specification.

041 Existing reference records

Eligible existing Greenbook and selected OSHA reference records remain subject to their recorded rights, readiness and approval states.

042 Workflow knowledge

Original TRACE guidance explains common processes. Eligible exact guide matches can return cited guidance without a model call; the complete title index appears later in this document.

043 Source transparency

Retained editions, original PDF links and extraction provenance identify what is actually in the deployed pack.

Scope and availability: This is not an all-codes library. Referenced commercial standards are not included by reference. Full OSHA, FHWA and GAO libraries were not added by this expansion; full Greenbook fidelity was not newly certified.

SECTION 05

TRACE AI: drafting and action preparation

Prepare the next step while keeping issuance, approval and contractual decisions under human control.

044 RFI assistance

Investigate a question using authorized evidence and prepare supported wording or next-step guidance.

045 RFI follow-up draft

Generate an editable follow-up from the current RFI and workflow record; nothing is automatically sent or issued.

046 Change-review worksheet

Prepare a structured review draft tied to the current record, with missing evidence left visible.

047 Daily narrative assistance

Rewrite submitted daily notes into an editable narrative with fact-preservation checks.

048 Submittal preparation support

Use cited assistance to prepare questions and review material alongside the separate accountable submittal workflow.

049 Notice and correspondence preparation

Use supported drafting assistance with authorized context; review the controlling clauses and factual basis before use.

050 Living Project investigation drafts

Prepare source-linked drafts from selected evidence gaps for an authorized reviewer.

051 Reusable investigation workflows

Propose and evaluate bounded read-only investigation patterns from reviewed outcomes before owner activation.

052 Formal-action separation

An AI draft or recommendation does not itself approve a submittal, close an inspection, issue a notice or change the contract.

Scope and availability: A follow-up template is not an autonomous legal analysis. Autonomous bid-protest issuance and a comprehensive automated technical submittal compliance matrix are not delivered claims.

SECTION 06

TRACE AI: risk and forward workload

Interpret recorded project conditions and make missing inputs visible.

053 Project risk assessment

Review supported project risk evidence, record context and identified gaps.

054 Confidential forward look

Show cumulative 7-, 14- and 30-day RFI/submittal review due horizons in the authorized confidential assessment.

055 Overdue and aging work

Identify overdue, undated and aged actions without inventing missing deadlines.

056 Separate workflow histories

Keep RFI and submittal completion rates separate, respecting current route cycles and parallel approvals.

057 Conditional backlog scenarios

Estimate remaining review workload only when the required positive completion history exists for each active record type.

058 Data sufficiency gates

Require at least eight positive completions spanning three of four weeks for each active type; return unavailable when the evidence is insufficient.

059 Completion quality filters

Exclude returned, rejected and future completions from the positive completion basis.

060 Schedule readiness signals

Highlight missing or stale accepted schedule evidence.

061 Refresh-time operational feeds

Read current structured workflow and schedule records when the assessment refreshes.

062 Scope and privacy controls

Keep confidential forecasts out of shared/compact views and reject results for a previously selected project or period.

Scope and availability: These are descriptive workload scenarios, not trained delay probabilities, proof of physical progress, legal causation or a guarantee of future performance.

SECTION 07

TRACE AI: schedule and resource scenarios

Combine deterministic schedule analysis with bounded alternatives for authorized review.

063 Supported schedule imports

Read CSV, XLSX, MS Project XML and Primavera P6 XER exports through supported parsers.

064 Immutable schedule versions

Retain source identity, import assumptions and authorized version comparisons.

065 CPM and logic analysis

Inspect supported critical-path calculations, relationships, gaps and version deltas.

066 Rolling look-ahead

Prepare three-week look-ahead drafts with constraints, accountable transitions and export.

067 Living Project rehearsal

Compare up to four user-supplied network alternatives for duration, release and dependency changes.

068 Recovery scenario generation

Generate four fixed-priority heuristic proposals for eligible complete, unstarted networks of 1-200 activities and up to 1,000 supported relationships.

069 Work-calendar handling

Evaluate supported work periods, closures and dependencies in the recovery planner.

070 Resource feasibility

Respect declared labor/equipment capacities and material-release constraints in supported recovery cases.

071 Declared cost comparison

Show direct work costs based on the supplied rates and inputs, rather than inferred project margin.

072 Unsupported-input refusal

Inspect original source semantics; refuse unsupported logic, ambiguous defaults, actual-progress recovery and unrepresentable constraints.

073 Reviewable output

Show assumptions, finish effects and relevant calculation evidence without modifying the imported schedule.

Scope and availability: Legacy rehearsal uses abstract elapsed minutes; recovery is a separate constrained planner. Neither guarantees a global optimum, constructability, Monte Carlo probabilities or automatic write-back to P6/MS Project.

SECTION 08

TRACE AI: visual field-to-plan review

Use selected images and a specific plan page to prepare a traceable visual review.

074 Photo and plan inputs

Submit supported field images and select the relevant PDF plan page for comparison.

075 Exact revision and page binding

Bind the review to the source plan revision and selected page rather than an unspecified drawing set.

076 Multimodal interpretation

Use the configured vision provider to analyze the selected image evidence and plan page together.

077 Reviewable observations

Present supported observations, uncertainty and information requiring field confirmation.

078 Evidence-linked persistence

Retain the source references and review output with the authorized record context.

079 Human review notes

Add accountable review information rather than treating a visual suggestion as an accepted field determination.

080 Response validation

Validate the provider's structured response, required shapes and completion state before admitting a result.

081 Protected upload workflow

Use file and page extraction gates; preserve access boundaries across upload, analysis and replay.

082 Stale-view protection

Prevent a previous project's visual result from replacing the current view.

Scope and availability: Delivered scope is assisted review of selected inputs. Automatic drone-feed monitoring, survey registration, measured alignment deviation, soil-condition diagnosis, automated takeoff from photos and certified installed-work verification are not established.

SECTION 09

3D / BIM: model intelligence

Inspect real IFC-derived geometry and its relationship to the uploaded source.

083 IFC and IFCZIP admission

Upload supported models to an authorized project container with an immutable version and source fingerprint.

084 Queued extraction

Extract supported IFC identity, hierarchy, objects and properties through the conversion worker.

085 Searchable model manifest

Find extracted elements and inspect properties with authorized project/version context.

086 Human publication gate

Review, publish or reject model versions; viewing rights depend on authority and publication state.

087 Derived GLB geometry

Convert supported IFC geometry to a self-contained browser-viewable model.

088 Opening integrity

Exclude Boolean cutter solids from displayed meshes while retaining actual host opening subtraction.

089 Conversion coverage

Show represented, converted, excluded-feature and missing-geometry counts, with an explicit completeness result.

090 Coordinate metadata

Report available units and axis basis; display centering does not rewrite source coordinates.

091 Source-to-geometry verification

Check original source bytes, derived geometry bytes, lengths and fingerprints against the version binding.

092 Serving-time authorization

Recheck actor, project, version and status before serving verified geometry.

093 BCF coordination exchange

Import supported BCF 2.1 issues into the staging register and export authorized issues.

Scope and availability: Native Revit ingestion, cross-model federation and automatic BIM-to-asset linkage are not established. Bounded single-IFC coordination candidates were subsequently deployed and are listed below.

SECTION 10

3D / BIM: interactive viewing

A construction-related example is automatically available from every project BIM panel.

094 Smooth orbit, pan and zoom

Inspect the model using interactive camera controls and short animated view transitions.

095 Element tree and search

Find and select individual rendered objects; display authorized names when available.

096 Selection and fit

Highlight an object and frame the selected geometry.

097 Isolation and show-all

Focus on selected geometry, then restore the complete model.

098 Section cuts

Move a cut along X, Y or Z to look inside the model.

099 Orthographic views

Switch to top or front inspection views, or return to an isometric perspective.

100 Wireframe and reset

Inspect mesh structure and restore the default view.

101 Rendering quality

Use antialiasing, controlled pixel density, balanced lighting and ground shadows for a clear model display.

102 Resource cleanup

Abort obsolete loads and dispose viewer resources when the active scope changes.

103 Source details panel

Inspect conversion metadata and fingerprints; unavailable details remain explicitly unavailable.

104 Related synthetic example

Explore a three-storey public-works building with structure, glazing, doors, utility pipes and six opening voids; it creates no project records.

Scope and availability: Section cuts are uncapped visual slices. The synthetic example is IFC-derived, not a reconstruction from photographs or a survey-certified model.

SECTION 11

TRACE AI: bounded learning and monitoring

Improve selected workflows through measured, controlled changes rather than autonomous foundation-model training.

105 Scheduled failure capture

Collect bounded failure signals into private, scoped evaluation curricula.

106 Data-minimized curricula

Use run references rather than publishing raw customer questions into shared learning material.

107 Curated vocabulary candidates

Evaluate fixed retrieval aliases for the original public workflow guides.

108 Held-out evaluation

Compare a candidate on separate labeled cases before activating it.

109 Regression protection

Require preservation of previously passing cases for the eligible vocabulary candidate.

110 Experiment identity

Avoid repeatedly tuning identical experiments against the same holdout; reject stale fingerprint selections.

111 Reviewed outcomes

Record source-versioned human outcomes for selected administrative findings.

112 Calibration candidates

Evaluate selected priority/calibration changes against later, different records before owner activation.

113 Reusable skill candidates

Test bounded investigation patterns before activating supported read-only workflows.

114 Opt-in continuous watch

Process bounded scans, retain progress and recover eligible stalled work with retries, pause and health information.

115 Owner control

Require the applicable authorization for activation, monitoring and return to baseline.

Scope and availability: No autonomous model-weight training or unrestricted self-modifying code is deployed. Continued improvement needs maintained sources, new validated candidates and evaluation; it is not guaranteed every day or year.

SECTION 12

Assets, sensors and live-source checks

Connect structured observations to a protected project record.

116 Project asset registry

Register an asset with an immutable sensor channel, metric and unit.

117 Manual observation entry

Enter attributable readings with measurement time and declared units.

118 Authenticated observation API

Accept authorized client readings with project and tenant checks.

119 Data-quality validation

Validate decimal precision, time bounds, metric and unit identity; reject conflicting or mismatched observations.

120 Duplicate protection

Use UUID idempotency and sensor/timestamp deduplication to prevent replayed readings from multiplying records.

121 Channel credentials

Issue, rotate and revoke scoped sensor credentials with bounded expiry and one-time raw-token display.

122 Credential revalidation

Check issuer rights, license and project lifecycle at intake; credentials cannot silently switch channels.

123 MQTT 5 / TLS bridge

Delivered gateway software supports durable buffering, fixed-identity retries, QoS 1 acknowledgment and verified TLS.

124 Energy TRACE

Keep attributable manual energy, fuel and power-demand readings with units, time and source references.

125 City of Los Angeles permit lookup

Look up an exact issued-permit number in the supported official dataset and display source/status/check dates separately.

126 No automatic permit mutation

A lookup does not itself update a project's issued status or establish legal applicability.

Scope and availability: Gateway deployment and actual hardware onboarding are required. No production hardware calibration, anomaly control, general municipal feed, live CSLB/DIR connection or full operational digital twin is claimed.

SECTION 13

Platform: account, navigation and access

An organized workspace for owners, public agencies, construction managers, designers and contractors.

127 Account and profile

Manage profile, password, organization identity and branding.

128 Project portfolio

Create and open authorized projects; review active, closeout, archived and permitted trash views.

129 Account overview

Use portfolio summaries and project selection to reach the right job.

130 Project control center

Access project tools, current work, updates and available records from one starting point.

131 Task-oriented menu

Use grouped navigation for home, field work, plans, reviews, schedules, costs and closeout.

132 Find a project tool

Search navigation labels to locate a supported section quickly.

133 Quick access

Open common records through account/project shortcuts.

134 Visible authority context

See customer, project and current authority so actions are taken in the right workspace.

135 Organizations and users

Assign participating organizations, project team members, roles and effective permissions.

136 Notifications and activity

Review notifications, assigned actions and AI activity/audit information.

137 Page help and language controls

Use contextual guidance and available interface language options.

138 Field application controls

Configure licensed project, organization and person-level access; device enrollment and operating-system permissions remain separate.

Scope and availability: Module visibility depends on licensing and effective permissions. Device access follows the applicable client, browser and operating-system requirements.

SECTION 14

Platform: project setup and workflows

Keep responsibility, review authority and record history explicit.

139 Project identity and settings

Maintain the job identity, participating parties and supported administrative settings.

140 Contract basis

Record contract details, notice to proceed and the relevant review/payment clock inputs.

141 Project team and routing

Configure responsible organizations and supported review routes for each record type.

142 Distinct actions

Separate creating, submitting, responding, reviewing, verifying and approving according to effective authority.

143 Current ball-in-court

Identify the current responsible party and workflow state.

144 Multi-step / parallel review

Use supported route and approval semantics with accountable transitions.

145 Route revisions and history

Preserve earlier route steps and decisions when a current route is amended.

146 Content sealing

Bind supported certifications and finalized records to their content identity and attribution.

147 Linked corrections

Create eligible correction revisions while preserving original sealed RFI/submittal content.

148 Forms and signatures

Use configured templates and supported signing workflows with required fields and signing authority.

149 Audit events

Retain attributable record and status history across governed workflows.

Scope and availability: Routes differ by record type and project configuration. A content seal records identity and attribution, not the correctness of an engineering judgment.

SECTION 15

Platform: RFIs, submittals and communications

Manage the formal exchange of questions, responses and review packages.

150 RFI register

Track questions, subject, responsible parties, references and current review status.

151 RFI supporting context

Associate specification sections, plan references, related submittals and governed attachments.

152 RFI response workflow

Record the authorized response, route it through configured review and retain sealed history.

153 Submittal register

Organize packages by specification section, assigned parties and review clocks.

154 Submittal review

Capture dispositions, review stamps, certifications and accountable finalization.

155 Unsigned and sealed artifacts

Preserve supported original/unsigned material alongside the accountable review record.

156 Branded record documents

Produce supported RFI, submittal, change-order and payment-application covers from the record and account branding.

157 Issued transmittal register

Maintain append-only issued-document history and source associations.

158 Meeting management

Prepare agendas, record minutes and action items, and finalize supported meeting records.

159 Communication preparation

Preview or print supported records and prepare communication through the configured workflow.

Scope and availability: Draft generation and document export are separate from sending, issuing or approving a record.

SECTION 16

Platform: documents, plans and field evidence

Organize files, drawings and daily records around their project context.

160 Project document workspace

Upload, organize and retrieve authorized project files with source identity and extraction status.

161 Plan sets and sheets

Register plan sets and sheet records, including supported proposals from uploaded documents.

162 Human-attested registration

Review proposed sheets and bulk-register supported records with attribution.

163 Immutable plan revisions

Retain prior sheet versions and formal review context.

164 Internal document markup

Select a supported PDF/image page, annotate it and use the authorized sharing workflow while preserving original bytes.

165 Plan revision comparison

Compare extracted statements and metadata between authorized revisions of the same sheet.

166 Photo and media records

Store project images and attachments with content provenance.

167 Daily reports

Capture field work, labor/equipment context and supporting media in the daily record.

168 Signed daily records

Use supported signature/seal workflows and append corrections rather than overwriting finalized content.

169 Weather intelligence

Use project-coordinate forecasts, the current weather bar, ten-day outlook and source-linked weather notices.

170 Daily Project Success Brief

Produce a deterministic cited position statement from supported sealed records and contract clocks, including freshness and explicit unknowns.

Scope and availability: Text comparison does not compare all pixels or geometry. Forecasts are external observations, not proof that work was weather-delayed.

SECTION 17

Platform: quality, safety and permits

Record findings and route accountable follow-up through the project.

171 Inspections

Capture supported inspection records and evidence.

172 Observations and deficiencies

Describe issues, assign responsibility and track follow-up.

173 Punch items

Maintain completion items and evidence-backed closure under the applicable authority.

174 Job walks

Record field walks, observations, due dates, responsible parties and accountable finalization.

175 Formal closure rules

Require the supported human determination; a party claim or AI recommendation cannot close an item on its own.

176 Safety observations

Capture unsafe-condition reports and corrective actions.

177 Incidents and near misses

Maintain incident/near-miss records and human recordability determinations.

178 Toolbox talks and training

Record supported safety talks, training and participation evidence.

179 Permit screening

Use country/jurisdiction-aware candidate screening with editable federal, state/province and local entries.

180 Applicability determinations

Record a project-specific basis for permit applicability.

181 Issuance evidence

Require supported clean evidence for issued status and preserve determination history.

Scope and availability: These workflows support accountable administration; they do not independently certify site safety, statutory compliance or permit applicability.

SECTION 18

Platform: commercial and contract controls

Connect billing, cost and change records to their supporting evidence and authority.

182 Schedule of values

Structure progress billing and maintain supported line allocations.

183 Payment applications

Prepare progress applications with supporting records and review/payment clocks.

184 Certification controls

Use supported content-bound, two-person certification and structural validation.

185 Compliance withholdings

Track supported withholding amounts separately from the operation of the payment clock.

186 Change orders

Keep approval and contract incorporation as distinct actions.

187 Contract growth

Associate approved changes with SOV allocation while preserving the original contract value.

188 Cost codes and budgets

Maintain budget, commitments, actual cost, forecast and variance records with attributable revisions.

189 Timesheets

Record crew and equipment hours by cost code with supported approval.

190 Trade partners and subcontracts

Maintain project partners and subcontract records.

191 Credential windows

Evaluate entered license, registration, bond and insurance effective/expiry dates against the recorded work date.

192 Releases and waivers

Manage configured release records and claimant exposure.

193 Stop payment notices

Track notice-related withholding separately from release exposure.

Scope and availability: Legal and financial determinations require the controlling project terms and authorized review. Recorded credential windows are not a live licensing-board verification.

SECTION 19

Platform: labor compliance

Support configured public-works and project-specific labor evidence workflows.

194 Compliance profile

Configure the applicable project requirements and supported California public-works / PLA / CWA settings.

195 Requirement register

Track required submissions and project-specific evidence.

196 Sealed submissions

Receive attributable subcontractor compliance submissions.

197 DIR receipt evidence

Record supported registration/receipt information for review.

198 Prevailing-wage review

Compare reported classifications against supplied, cited rate determinations; flag unknown or missing classifications.

199 Apprenticeship notices

Track DAS 140/142-related evidence and supported requests.

200 Apprenticeship ratios

Review configured ratio information against submitted records.

201 Training funds

Track supporting contribution evidence.

202 Assent and dispatch

Maintain agreement/dispatch-related records where required by the configured profile.

203 Local and targeted hiring

Track supported project workforce and hiring commitments.

204 Exception findings

Use deterministic checks to identify gaps and document human resolution.

Scope and availability: No universal live wage-rate feed, autonomous trade classification or blanket legal-compliance guarantee is included. Time cards and certified-payroll review remain distinct processes.

SECTION 20

Platform: preconstruction and estimating

Prepare procurement and contractor estimates while preserving controlled access.

205 Preconstruction readiness

Maintain supported readiness records and qualification information.

206 Procurement profiles

Configure public or private operating workflows for the project.

207 Solicitations

Prepare and manage supported solicitation records.

208 Addenda

Track procurement amendments and associated documents.

209 Bidder access

Use supported bidder invitation and controlled bid-room workflows.

210 Controlled bid receipt

Receive and retain bid submissions through the configured process.

211 Human award

Keep award decisions with authorized people.

212 Source-bound takeoff

Associate supported quantity work with the source evidence used.

213 Deterministic estimating

Build supported estimates with cost-code and cost-basis information.

214 Quotes and leveling

Maintain supported internal quote and comparison information under contractor access controls.

215 Estimate handoff

Move an authorized estimate through the supported controlled handoff process.

216 Contractor-private commercial data

Do not expose internal estimates, quotes, budgets or leveling merely because an owner also uses TRACE.

Scope and availability: Procurement profiles are configurable workflows, not determinations that a bid, classification, protest or award is legally compliant.

SECTION 21

Platform: Living Project and Energy TRACE

Bring supported project records into a current, permission-aware investigation workspace.

217 Current project-world view

Combine authorized RFIs, submittals, schedules, drawings, field observations and available energy records.

218 Evidence freshness and coverage

Show the age and coverage of available information rather than implying complete live awareness.

219 Selected gap detection

Identify supported missing answers, references, assignments and review information.

220 Investigation drafts

Prepare source-linked next-step drafts from selected findings.

221 Owner settings

Control eligible monitoring and learning through authorized opt-in settings.

222 Bounded scan execution

Retain scan progress and handle eligible retry, resume, pause and stalled work.

223 Outcome feedback

Record accountable adjudications with source-version context.

224 Priority and calibration review

Evaluate supported candidates against later records before adoption.

225 Reusable read-only investigations

Activate supported tested workflow patterns under owner control.

226 Schedule rehearsal

Explore bounded imported-network scenarios and retain assumptions and calculation evidence.

227 Manual energy readings

Record energy, fuel and demand separately with units, time and source attribution.

Scope and availability: The Living Project workspace and the asset/sensor intake are complementary foundations. They do not currently constitute a fully synchronized operational digital twin.

SECTION 22

Platform: App Factory and inventory

Create supported custom trackers and manage attributable stock movements.

228 Natural-language app definition

Describe a supported form or tracker and generate a reviewable constrained definition.

229 Typed fields

Configure supported field types, validation and references.

230 Workflow states

Define supported simple states and transitions.

231 Dashboard charts

Add supported charts over application records.

232 Draft and revision review

Inspect and edit the generated definition before publication.

233 Publication controls

Use app-specific builder and publisher authority to release a supported revision.

234 My Apps runtime

Open published applications and create or manage authorized records through the installed web runtime.

235 App-specific access

Separate viewer, editor, builder and publisher grants.

236 Bounded recovery

Restore an eligible prior valid published definition when required.

237 Inventory ledger

Record receipts, transfers, issues and reversals with fixed-precision quantities and attribution.

238 Movement history and reconciliation

Inspect stock movements and supported reconciliation records.

239 App-to-inventory references

Link supported custom records to inventory items without automatically posting a stock movement.

Scope and availability: App Factory generates constrained definitions, not arbitrary executable programs. It does not automatically purchase material, post ERP transactions or connect external systems.

SECTION 23

Platform: closeout, integrations and governance

Preserve the operating record and configure external exchange deliberately.

240 Closeout checklist

Assemble evidence-backed turnover requirements and track completion.

241 Human closure acknowledgment

Record accountable closure rather than inferring acceptance from an export.

242 Agency package builder

Create supported record snapshots with a sealed manifest and content fingerprints.

243 Project archive

Retain supported read-only archived records for authorized access.

244 Customer API

Use supported scoped API operations with current authorization and read/write restrictions.

245 Integration configuration

Maintain supported provider setup, mapping and connection-health information; unavailable adapters remain unavailable.

246 Source and record export

Export supported records, manifests, proof reports and exchange formats.

247 Tenant/project separation

Enforce server-side scope and effective permissions across governed endpoints.

248 Attributable history

Retain supported audit events, sealed content identity and linked corrections.

249 Platform administration

Manage supported account/module licensing, grants, AI usage and operational settings.

250 Support and onboarding

Use product help and supported support workflows; configure email, retention, backup and external connections for the deployment.

Scope and availability: Named integration catalog entries are not proof of active adapters. SSO/MFA/SCIM, enterprise certifications, failover and restore guarantees require separately verified delivery terms.

SECTION 24

Platform: source administration and media

Additional document, knowledge and field-record tools included in the platform inventory.

251 TRACE Atlas source administration

Upload eligible reference sources, track ingestion and manage source versions under the applicable authority.

252 Source review queues

Review extraction/readiness and verification status before eligible material is used as grounded evidence.

253 Source relationships

Maintain supported relationships between references and preserve provenance context.

254 Access classifications

Apply supported document/source classifications in addition to tenant and project permissions.

255 Quarantine handling

Keep unsafe or unready uploads out of the usable evidence path and expose supported status information.

256 Resumable media uploads

Use supported large-file upload handling for project media.

257 Media organization

Maintain descriptions, location metadata, collections, evidence links and previews.

258 Media archive and restore

Archive and restore eligible media under current authority.

259 Field-day archive

Retain supported daily field records and printable daily outputs.

260 TRACE Sign

Prepare, send or void supported signature envelopes; delivery and provider availability are configuration dependent.

Scope and availability: Source verification status does not establish universal technical correctness. Access to the source administration tools is role dependent.

SECTION 25

Platform: advanced app and inventory tools

Additional lifecycle functions behind the custom-application and stock-ledger workspaces.

261 App templates and catalogue

Start from supported catalogue definitions or reusable templates.

262 Saved app drafts

Retain editable drafts before publishing a valid application definition.

263 Blueprint import and export

Exchange supported application definitions through validated blueprint workflows.

264 Definition migration preview

Inspect supported schema/definition changes before applying an eligible migration.

265 Migration application

Apply supported changes through the controlled application lifecycle.

266 Record operations

Create, update and delete eligible custom-app records under app-specific permissions.

267 Search and pagination

Find records in supported custom trackers without loading the entire record set at once.

268 Linked tracker references

Relate supported records across authorized custom applications.

269 Summaries and dashboards

Use supported record summaries, charts and dashboard layouts.

270 Manifests and health controls

Inspect app definition/runtime state and use supported recovery-draft or repair operations.

271 Inventory setup

Maintain item/location registers and opening-stock preview/application.

272 Stock balances

Review balances and attributable movement history across authorized locations.

Scope and availability: These are validated application-data workflows. They do not establish arbitrary code execution, generalized ERP automation or fleet telemetry.

SECTION 26

Platform: extended project operations

Additional setup, commercial handoff and exchange functions included in the reviewed platform.

273 Project operating profile

Record supported sector, delivery method, contract duration and site coordinates.

274 Sourced contract clocks

Associate clock settings with the applicable source and delivery-evidence requirements.

275 Recoverable project deletion

Use eligible trash/recovery controls alongside archive and lifecycle permissions.

276 Preconstruction clearances

Track readiness, award/agreement clearances, authorities, organization policies and follow-ups.

277 Procurement and long-lead items

Maintain supported procurement-item tracking and mobilization/NTP handoff information.

278 Takeoff calibration and measurements

Record supported source calibration and measurements before relying on derived quantities.

279 Bid-basis capsules

Retain supported source-basis information with controlled estimate publishing and handoff.

280 Schedule acceptance and history

Record acceptance/rejection, supported mappings, activity data and analysis history for imported versions.

281 Billing findings and exports

Review payment-application findings and prepare supported accountant exports.

282 Accounting exchange setup

Maintain supported mappings, dry runs, approved exchange and reconciliation; an external provider must be configured and supported.

283 Portfolio reporting

Use supported cross-project summaries and export under effective account access.

284 Field-client governance

Apply licensed project, organization and person-level controls to eligible field-client operations.

Scope and availability: Configured agreements and signatures are not an unrestricted legal contract-authoring system.

Generalized Workflow Studio, fleet/GPS intelligence and comprehensive offline resilience are not established by these functions.

SECTION 27

TRACE AI: expanded interpretation, research and proof

Deployed additions verified in the interpretation, schedule-reasoning, research and RFI release records.

285 Informal question interpretation

Handle typos, shorthand, alternate meanings and standard-family hypotheses while retaining the original question.

286 Bounded multi-aspect investigation

Consider sequence, staging/access, crews, equipment, procurement, temporary works, testing holds, permits, handoffs, mitigation and counterevidence when supported.

287 General-reference explanation

Explain a standard as general guidance without requiring project adoption; keep binding project determinations separate.

288 No-match research fallback

Eligible general questions may continue to official public research when related local passages still cannot answer the question.

289 Advanced research fallback

The documented difficult-general-research fallback uses gpt-6-astra after the primary provider cannot release a cited answer; this is an application component, not a TRACE-trained foundation model.

290 Citation validation

Validate citation ranges and Unicode offsets; reject incomplete provider output and unsupported assertions rather than releasing partial text as verified.

291 Truthful research history

Distinguish research actually attempted from a setting merely being enabled; record provider usage and cost.

292 Schedule evidence context

Provide authorized baseline/latest revision, disposition history, methodology, bounded activities/relationships, import assumptions and exact-version comparisons.

293 Competing delay explanations

Examine overlapping delays, mitigation and completion impact; distinguish calendar days from working-time float and request missing CPM evidence.

294 Saved Office chart extraction

Read saved XLSX/PPTX chart series, categories, values, labels, number formats and formula references. Do not evaluate formulas or follow external links.

295 Exact RFI conversation binding

Load subject, question and references from the authorized RFI ID; preserve linked follow-ups only while that project and RFI remain active.

296 Public proof tools

Show proof, collect all eligible references, prevent duplicates and print answer proofs through an in-app preview.

297 Direct proof PDF download

Export supported complete text, tables, technical symbols, citations and eligible original source-page images without depending on the browser print dialog.

298 Mixed proof identity

Reauthorize indexed passages; distinguish archived source evidence from public URL references that have not been archived.

299 Request replay protection

Serialize/replay eligible requests by authenticated user and submission key; reject key reuse for a changed question and avoid duplicate model calls.

Scope and availability: Known limits include intermittent P6 answer-release failures, variable research latency, and saved chart caches that can be stale. These are not guarantees of universal answer accuracy.

SECTION 28

CAD and solid elevation review

Deployed customer-panel capabilities added after the earlier public inventory.

300 Automatic CAD availability

Clean authorized uploaded DWGs appear in the current project BIM CAD workspace.

301 Direct Open CAD

Open the selected drawing revision from Documents; keep original download and version history available.

302 Review-pending viewing

Provisional review status no longer alone blocks the CAD viewer; viewing does not approve the source, bypass quarantine or widen access.

303 Native bounded conversion

Convert supported DWG geometry through an isolated native worker; preserve original source bytes and report unsupported entities and missing references.

304 2D drawing controls

Pan, zoom, fit, show/hide layers, restore converted visibility and find/select supported entities.

305 CAD annotations

Create notes, polylines and approximate XY distance annotations bound to the exact version and source fingerprint.

306 Append-only markup history

Retain saved drawing annotation history without overwriting the original drawing.

307 XYZ elevation view

Inspect actual source line/point coordinates in 3D with orbit, pan and fit controls.

308 Elevation display filters

Choose a Z range, optional zero-Z exclusion and explicitly labeled 1x, 2x, 5x or 10x vertical display scale.

309 Solid terrain preview

Build a shaded height-colored triangulated surface from one selected native POINT layer.

310 Low/high color legend

Show source-elevation ranges with blue lows and gold highs; optional wireframe and source-point overlays.

311 Surface quality controls

Report zero-Z exclusions, merged duplicates, conflicting-coordinate exclusions and triangle counts; refuse unusable or collinear input.

312 Gap filtering

Optionally exclude triangles exceeding a selected edge length. Separate point layers are never automatically pooled.

313 Survey point distinction

Keep actual native POINT coordinates separate from block-insertion anchors; neither is automatically official survey control.

314 Point selection and filtering

Filter coordinate candidates by layer/block, select rows and retain exact XYZ rather than substituting attribute labels.

315 Selected-point CSV

Export selected coordinate rows with units, source/version and unverified status; escape spreadsheet-formula strings.

316 Reference marker

Mark a selected actual POINT with a visible reference label and XYZ; label remains unverified and does not establish an official benchmark.

317 Drawing and surface printing

Print current 2D, XYZ or solid-surface views and selected coordinate tables with source identity and applied display settings.

318 Context cleanup

Abort obsolete loads and dispose graphics resources on tenant/project/source changes; recheck access and source integrity.

Scope and availability: Solid terrain is interpolated point coverage, not certified final grade. The reviewed grading file has separate point patches and missing references; approved proposed-surface identity, boundaries, breaklines, CRS and datum remain unverified.

SECTION 29

IFC / VDC coordination additions

Deployed after the original 3D release.

319 Element evidence links

Associate an exact IFC element/revision with an authorized RFI, submittal or schedule activity and record the reason.

320 Revocable association history

Preserve link revocation history and recheck access to both model and target record.

321 Revision metadata comparison

Show added, removed and changed extracted identities/properties between two versions of the same model.

322 Potentially affected links

Show explicit associations potentially affected by metadata changes while leaving each link bound to its original revision.

323 Intersection candidates

Run bounded native geometric intersection checks between selected classes within one exact IFC revision.

324 Clearance candidates

Measure supported separation against the selected tolerance and return candidate pairs for human review.

325 Opening-aware geometry

Respect host opening subtraction and exclude Boolean cutter objects from the displayed products.

326 Coverage-qualified results

Report missing geometry and check coverage; incomplete zero-hit results cannot establish a no-conflict conclusion.

Scope and availability: No cross-model federation, RVT authoring, geometric revision comparison, 4D simulation or automatic issue/approval creation is claimed.

SECTION 30

Shared markup editor additions

Deployed document-page editing improvements.

327 Undo and redo

Restore up to 100 supported annotation changes, including grouped clear operations.

328 History branching

Invalidate redo after a new edit; retain native text-input undo behavior.

329 Page and source isolation

Reset markup history on project/source-version/page changes, cancellation and successful send.

SECTION 31

TRACE telephone voice development

Updated by the September 9 AI/operations release: interruption handling corrected and a user-reported real-call acceptance passed.

330 Telephone conversation gateway

Configured telephony gateway connects caller audio with a realtime AI conversation service.

331 Public product knowledge

Provide TRACE product/help knowledge through the configured voice service; this does not establish unrestricted project-document access over telephone.

332 Turn and response controls

Manage conversation-turn behavior and response-length settings to reduce interrupted or unfinished speech.

333 Privacy-safe timing diagnostics

Collect timing/completion telemetry for audio-gap diagnosis without recording audio or transcript text in that diagnostic.

334 Versioned gateway deployment

The current operations/help gateway passed 37 voice tests and TypeScript checks. Its audio/queue code matches the real-call-tested version.

Scope and availability: The earlier interruption issue is superseded by the documented fix and user-reported natural, responsive real-call result. Device, network and conversation conditions still affect call quality.

SECTION 32

TRACE Continuum: project-state and missing-proof foundation

Deployed on-demand foundation; its evidence compilation is distinct from a fully verified digital twin.

335 Cross-register state compilation

Compile accessible schedule, labor, change, billing, meetings, permits, safety, quality, daily and integration record state.

336 Typed evidence presentation

Distinguish facts about stored records from assertions in those records, unsupported proof and restricted registers.

337 Unsealed record citations

Provide scoped database references with explicit unsealed status and bounded per-register coverage.

338 Accepted-schedule gate

Distinguish submitted schedule versions from the recorded accepted schedule of record.

339 Missing-Proof Radar

Expose absent records and domain evidence that has not yet been verified.

340 Authority-aware proof requests

Prepare reversible proof-request text with the current brief attached only for an authorized preparer; no automatic sending or record insertion.

341 Review-bundle export

Download state, references, refusals, authority and draft/refusal as JSON with a payload SHA-256 fingerprint, not a digital signature.

342 Fresh-state controls

Refresh state, reject stale results and explain restricted access without inferring authority from an administrator title.

Scope and availability: Continuum continuous compilation and integrated sealed-evidence verification are separate unfinished work. The released contract workspace has its own signed journal and portable archive; that does not automatically complete their integration into Continuum.

SECTION 33

Living Project: detailed reviewed-learning controls

Implemented opt-in administrative improvement; activation and usable evidence are prerequisites.

343 In-project reviewed outcomes

Retain explicit source-versioned human adjudications and append-only corrections within the project.

344 Chronological source-disjoint evaluation

Evaluate on later unseen records rather than reusing the same source in training and testing.

345 Reviewer diversity gates

Apply minimum distinct-record and reviewer-diversity/concentration requirements before eligible candidate promotion.

346 Baseline and incumbent comparison

Compare eligible ranking candidates against baseline/current behavior, including per-kind regression and Brier-score checks.

347 Bounded learning history

Refuse candidate promotion from truncated history beyond the supported 2,000-review cap.

348 Correction invalidation

Invalidate dependent learning when source evidence is corrected or access is revoked.

349 Owner promotion and rollback

Keep candidate activation explicit and permit return to the baseline.

350 Declarative skill proposals

Propose read-only investigation patterns from repeated substantiated outcomes; test later reviewed records before owner activation.

351 Resumable monitoring

Use bounded source generations, durable cursors, fenced leases and atomic finding/checkpoint writes.

352 Fair scheduling and suspension

Process due projects with fresh authorization, retry/pause behavior and owner opt-out; do not treat platform support as unattended authority.

353 Uncertainty-reduction scenario

Compare supported paired readiness/duration scenarios and identify the next fact that reduces remaining uncertainty.

Scope and availability: Learning currently covers selected administrative RFI/submittal finding kinds. Metrics are observational and exposure-biased, not foundation-model retraining, physical verification or guaranteed improvement.

SECTION 34

Advanced capability architecture and extensions

Development history remains visible. Later production receipts supersede earlier candidate-only descriptions.

354 Universal approval evidence gates

Released for the supported bid-award, takeoff, accounting-exchange, lien-release and stop-notice paths. Explicit submitted acceptances are validated; mandatory gating of existing workflows remains disabled.

355 Expanded contract and procedure controls

Released customer device recovery/revocation, reviewed-procedure activation/drafting/retirement and jurisdiction-pack validation. Project policy and legal-rule content still require authorized configuration.

356 Approved jurisdiction packs

Validation machinery does not supply approved legal rule content; authoritative pack review remains outstanding.

357 Richer direct-face DXF path

Direct POINT/LINE/3DFACE extraction, restricted parsing, listener recovery, Documents opening and printing passed isolated staging acceptance. This successor is distinct from the production DWG viewer.

358 Broader regional recovery

Current isolated authentication, encrypted capture/restore, scoped regional-independence and backup recurrence evidence exists; full current-region production promotion/routing/write survival/failback remains unaccepted.

359 Native Revit and federation

Licensed native translation, multi-model federation and cross-source coordinate reconciliation remain advanced integration work.

360 4D and 5D intelligence

Model-linked schedule playback, cost exposure, trade/zone capacity and richer package/procurement readiness remain roadmap scope beyond bounded delivered tools.

361 Calibrated predictive models

Trained, prospectively validated delay/cost probabilities require suitable outcome data and validation; workload scenarios are not those probabilities.

362 Autonomous reality capture

Continuous drone feeds, photo-to-3D reconstruction, calibrated field-to-plan deviation measurements and certified visual takeoff remain unestablished.

363 Full operational digital twin

Automatic asset/BIM identity mapping, sensor-based physical-state simulation and municipal lifecycle synchronization remain incomplete.

364 General regulator synchronization

Live CSLB/DIR/wage and broad jurisdiction feeds remain separate from the limited delivered permit adapter.

365 Unrestricted self-learning and repair

Autonomous model-weight training, arbitrary executable self-modification and universal automatic infrastructure repair are not delivered capabilities.

Scope and availability: Some staging/candidate areas continue to change. Only a scoped acceptance/deployment receipt can promote their availability status.

SECTION 35

App Factory: additional AI and customer controls

Deployed web tooling with provider generation subject to current pricing, usage and service readiness.

366 Guided tracker creation

Describe, review, save draft and publish through a four-step process.

367 Searchable tracker library

Find trackers using library search and draft/published filters.

368 Stable field editing

Add, remove and reorder typed fields without silently replacing stable field keys.

369 Interactive practice mode

Preview a generated design and submit practice entries without creating business records.

370 Multiline records

Preserve paragraphs and Unicode through preview, creation, editing and reload.

371 Contextual entry deletion

Confirm deletion of the named selected entry with Keep entry as the safe default; this is not whole-tracker deletion.

372 Automatic training tracker

Supported new-account paths receive one account-local SAMPLE inspection tracker with 15 fields, four transitions, a chart and a fictional record; existing accounts are not universally backfilled.

373 Idempotent sample provisioning

Avoid duplicate samples and preserve user edits, deletions and revoked grants; eligible later members receive sample-specific access.

374 Known-definition recovery

Recover eligible valid published definitions and repair derived indexes without inventing replacement business records.

375 Generation availability disclosure

Earlier production generation passed, but later pricing/reconciled-usage gates blocked a tested request. Generation is implemented and conditional, not guaranteed available to every account.

Scope and availability: Client access follows the applicable browser and device requirements. Whole-tracker deletion and unrestricted executable generation remain separate from these supported tracker controls.

SECTION 36

Released contract evidence and reviewed procedures

The tested package was deployed September 8, 2026 Pacific time. Existing workflow behavior and grants were preserved.

376 Transactional evidence decisions

Connect supported formal record actions to explicit evidence acceptance, current source and authority checks, transaction locking and retry identity.

377 Contract provenance journal

Maintain append-only, project-bound events, source relationships, configured evidence policy, cryptographic signatures and independent review.

378 Signed offline capture

Enroll/revoke capture devices; sign local originals, pin receipt keys, retain offline queues, encrypt recovery backups, synchronize and quarantine recovered evidence for independent review.

379 Extended schedule semantics

Use working-day and relationship-lag calendars, progress methodology, remaining durations and source-linked scenario packets.

380 Reviewed procedure lifecycle

Record reviewed outcomes, evaluate candidate procedures, explicitly activate/retire versions and prepare unsent record-specific checklists.

381 Portable project evidence archive

Export registered project records and eligible original files with credential exclusions, byte checks, signed coverage manifest and an independent verifier.

Scope and availability: Workspace is enabled. Mandatory new evidence gating on existing workflows is off; explicit evidence acceptances remain enforced. This release does not supply automatically approved jurisdiction rules or activate merchant billing.

SECTION 37

Commercial onboarding availability

Separate billing technology from the construction capability inventory.

382 Subscription onboarding controls

Corrected provisioning checks distinguish subscription activation from verified completed payment and enforce plan mismatch guards.

383 Atomic account provisioning

Implemented receipt/account/encrypted-mail enqueue and retry controls are documented.

384 Sandbox checkout development

Sandbox OAuth, catalog and checkout creation are recorded; end-to-end buyer approval, webhook activation, delivery and live launch acceptance remain incomplete.

Scope and availability: Paid self-service launch is not accepted merely because sandbox objects or subscription routes exist. Quote-based public pricing and actual provider readiness remain relevant.

SECTION 38

TRACE AI: deeper evidence and learning architecture

Detailed implementation distinctions retained from the AI audit.

385 Deterministic clarification

Offer bounded follow-up choices for broad construction questions without reading private evidence or spending model tokens.

386 Structured field-day evidence

Retrieve authorized daily, job-walk, quality, safety and time-record facts with operational citations.

387 Sourced contract clocks

Include clock settings only with explicit source, day count and working/calendar basis; do not substitute unsourced settings for contract terms.

388 Authority, applicability and operativity

Distinguish retrieval relevance from controlling authority, effective time, jurisdiction, project area/system/phase and amendment effects.

389 Qualifying evidence lanes

Retain exceptions, conditions, alternatives and supersession alongside direct matches; a classifier alone does not establish a legal conflict.

390 Optional exact-evidence review

A separately configured reviewer can assess a draft against its cited passages without browsing, retrieving new evidence, adding citations or executing actions.

391 Private shadow curriculum

Capture corrections, rejections, no-match and escalation signals into a scoped curriculum. This shadow layer does not itself change live answers.

392 Measured public-guide retrieval improvement

A fixed 31-alias candidate improved one small held-out top-topic evaluation from 14/18 to 15/18 while preserving eligible passing cases; this is not general answer accuracy.

393 Fingerprint-bound retrieval activation

Bind eligible activation to pack, dataset, algorithm and registry identities; corrupt or stale state falls back to baseline.

394 Route-aware workload counting

Count any-one review groups once at the earliest due action, all-required groups separately, and exclude inactive future steps.

395 Recovery semantics gate

The resource-recovery planner supports bounded unstarted fixed-duration DAGs with FS/nonnegative lag and ASAP/SNET releases plus explicit calendars. Unsupported SS/FF/SF, actual progress, splitting, overtime and inferred productivity are refused.

396 Narrative fact preservation

Rewrite supplied daily notes in English or Spanish while preserving facts, numbers, negations and uncertainty; do not add unsupported blame or causation.

397 Provider-team distinction

Gemini, Grok and Claude consultations helped development reviews; they are not established as a three-provider vote on every customer answer.

Scope and availability: Reference extraction is automated rather than named human fidelity review. Attempted but blocked GAO, OSHA 3886 and USACE CQM source downloads were not ingested. UFS is a nonmandatory reference and UFGS documents are templates requiring tailoring/adoption.

SECTION 39

Internal TRACE viewer and controller

Integrated customer-panel viewing and review controls; original source files remain preserved.

398 Internal document viewer

Open supported authorized PDF/image documents inside TRACE, navigate available pages and download the original.

399 Internal CAD workspace

Choose a current-project DWG and exact version, then open the converted drawing inside BIM without requiring an external CAD application for the supported review functions.

400 Internal 2D controller

Select entities, search source handles, pan, zoom, fit, switch layers, restore converted visibility, add notes, draw polylines and measure approximate XY distances.

401 Internal XYZ controller

Orbit, pan, zoom and fit source XYZ line/point geometry; apply explicit Z-range, zero-Z and vertical-display controls. The 2D layer switches do not automatically filter this XYZ view.

402 Internal solid-surface controller

Select one actual POINT layer, build the shaded surface, inspect low/high colors, toggle points/wireframe and apply maximum-edge and display-scale controls.

403 Internal IFC controller

Use object tree/search, picking, selected-object fit, isolation/show-all, top/front orthographic views, isometric perspective, X/Y/Z section cuts, wireframe and reset.

404 Source/geometry distinction

IFC-derived GLB is served as a checked derivative; this does not establish arbitrary public GLB/glTF upload support or automatic mapping of every mesh to an IFC element.

405 Coordinate/reference controller

Select actual points or separate block anchors, inspect original XYZ, export/print chosen rows and label a selected actual point as an unverified reference marker.

406 Version and integrity controller

Bind viewing, annotations, evidence links and geometry to source/version fingerprints; reject stale or mismatched outputs.

407 Review and publication controller

Apply current source cleanliness, status, license and actor permissions; IFC publication and provisional CAD review remain distinct workflows.

408 Conversion controller

Dispatch bounded native extraction, use private identity-bound caches, report supported/omitted geometry and recheck access after processing.

409 Print/export controller

Prepare supported drawing, elevation, surface, coordinate and document-page outputs with applicable source identity, units and display settings.

410 Format boundaries

DWG and IFC/IFCZIP have production review paths. PDF/images use document/markup paths. The richer direct DXF/3DFACE successor has accepted isolated staging integration; native RVT/DGN/SKP and arbitrary format conversion still require separate work.

411 Editing boundaries

TRACE review annotations do not rewrite the DWG/IFC design. IFC dimensioning, capped section solids, survey-certified benchmarks and approved final grading are not supplied merely by viewing.

Scope and availability: This is TRACE's internal review viewer/controller, not a full AutoCAD/Civil 3D/Revit authoring replacement. Section cuts are uncapped; camera ground/shadows are display aids, and geometry completeness remains source-dependent.

SECTION 40

Latest AI / operations release: September 9, 2026

Implemented release with 155 passing tests: 112 PHP tests (384 assertions), 37 voice tests and six browser fixture tests; TypeScript typecheck also passed.

412 Telephone interruption fix

The response queue now waits while the caller speaks, coalesces overlapping turns and supports caller interruption. The user reported the real-call test passed as natural and responsive.

413 Source-specific research

Explicit official-source requests bypass the original workflow-guide shortcut; literal exclusions of project records are respected while private identifier protections remain in place.

414 Live official-citation acceptance

The tested RFI question returned official public-web citations to USACE CQM guidance and Caltrans Source Inspection Guidelines, with no project records used.

415 Immediate support and troubleshooting

Get help now provides four current workflow guides, typed product guidance, clear source labels, retained inputs/errors and a human-ticket handoff path.

416 Current product guidance

Web and telephone guidance covers My Apps/App Factory, Undo/Redo, loading, support, training and billing boundaries.

417 Private improvement cycle

Completed a private cycle containing seven failure signals, two scoped curricula and two new versions. No model weights, live answer behavior or promotion changed; no autonomous training.

418 Billing readiness checks

A read-only, secret-free check identifies missing merchant credentials, webhook configuration and plan setup. Live paid launch remains blocked pending configuration and financial acceptance.

419 Support interaction isolation

Support guidance no longer triggers a legacy acceptance toast; topic selection does not approve or seal a project record.

Scope and availability: The real-call result is one user-reported acceptance, not two independently identified calls or a statistical audio benchmark. Live research is a tested example, not universal accuracy. Human handoff is a ticket path, not a continuous staffing promise. No live charge, refund or subscription was attempted.

SECTION 41

Windows, Mac, iOS and Android access

Browser access, released native-server contracts and continuing installed-client development are distinct delivery paths.

420 Desktop access

Windows and Mac can use supported browser workflows. A Windows application with a separate protected native draft workspace and isolated online portal window is undergoing installed acceptance.

421 Mobile access

iOS and Android have native-client development, shared interface and bridge work. Signed distribution and physical-device acceptance must be confirmed for the applicable release; supported browser access remains separate.

422 Device permissions

Microphone, camera, file selection, downloads and notifications follow the device/browser permission settings.

423 Graphics and connectivity

Interactive CAD/BIM requires compatible graphics support; provider-backed and connected workflows require the relevant network/service connection.

Scope and availability: Device project enumeration and signed draft synchronization APIs are released. This does not establish App Store/Play distribution, complete native parity or offline formal approvals.

SECTION 42

Complete original workflow-guide index

Retained 24-guide pack; these are original workflow explanations, not adopted contract requirements.

424 Getting started with TRACE

Original TRACE guidance available to eligible workflow retrieval.

425 Asking TRACE a useful question

Original TRACE guidance available to eligible workflow retrieval.

426 Writing and tracking a request for information (RFI)

Original TRACE guidance available to eligible workflow retrieval.

427 Preparing a submittal for review

Original TRACE guidance available to eligible workflow retrieval.

428 Finding the right drawing and revision

Original TRACE guidance available to eligible workflow retrieval.

429 Organizing project files and document records

Original TRACE guidance available to eligible workflow retrieval.

430 Writing a useful daily report

Original TRACE guidance available to eligible workflow retrieval.

431 Taking and labeling useful site photos

Original TRACE guidance available to eligible workflow retrieval.

432 Preparing and recording an inspection

Original TRACE guidance available to eligible workflow retrieval.

433 Recording and escalating a safety concern

Original TRACE guidance available to eligible workflow retrieval.

434 Reviewing time entries and field days

Original TRACE guidance available to eligible workflow retrieval.

435 Turning meetings into clear action items

Original TRACE guidance available to eligible workflow retrieval.

436 Building a practical lookahead plan

Original TRACE guidance available to eligible workflow retrieval.

437 Tracking materials and long-lead items

Original TRACE guidance available to eligible workflow retrieval.

438 Keeping change requests and approvals distinct

Original TRACE guidance available to eligible workflow retrieval.

439 Reading a project budget carefully

Original TRACE guidance available to eligible workflow retrieval.

440 Preparing a payment application record

Original TRACE guidance available to eligible workflow retrieval.

441 Organizing permit and authority correspondence

Original TRACE guidance available to eligible workflow retrieval.

442 Planning closeout and turnover information

Original TRACE guidance available to eligible workflow retrieval.

443 Managing punch lists and remaining work

Original TRACE guidance available to eligible workflow retrieval.

444 Using a transmittal to explain what was sent

Original TRACE guidance available to eligible workflow retrieval.

445 Coordinating models and markups

Original TRACE guidance available to eligible workflow retrieval.

446 Using forecasts alongside field observations

Original TRACE guidance available to eligible workflow retrieval.

447 Understanding citations, uncertainty, and corrections

Original TRACE guidance available to eligible workflow retrieval.

SECTION 43

Complete retained publication index

Eight retained publications totaling 524 PDF pages. Editions below describe the retained pack, not a claim of current editions.

448 UFC 3-501-01 Electrical Engineering

27 November 2024; 96 PDF pages; https://legacy.wbdg.org/FFC/DOD/UFC/ufc_3_501_01_2024.pdf

449 UFC 3-410-01 Heating, Ventilating, and Air Conditioning Systems

28 July 2025; Change 1, 23 January 2026; 63 PDF pages; https://legacy.wbdg.org/FFC/DOD/UFC/ufc_3_410_01_2025_c1.pdf

450 UFC 3-201-01 Civil Engineering

20 December 2022; Change 1, 1 June 2026; 68 PDF pages;
https://legacy.wbdg.org/FFC/DOD/UFC/ufc_3_201_01_2022_c1.pdf

451 UFC 3-420-01 Plumbing Systems

1 April 2021; 72 PDF pages; https://legacy.wbdg.org/FFC/DOD/UFC/ufc_3_420_01_2021.pdf

452 UFS 3-740-05 Construction Cost Estimating

2 February 2026; 112 PDF pages; https://legacy.wbdg.org/FFC/DOD/UFC/ufs_3_740_05_2026.pdf

453 UFGS 01 32 01.00 10 Project Schedule

August 2026; 24 PDF pages; <https://legacy.wbdg.org/FFC/DOD/UFGS/UFGS%2001%2032%2001.00%2010.pdf>

454 UFGS 01 45 00 Quality Control

August 2023, Change 4 August 2026; 51 PDF pages;
<https://legacy.wbdg.org/FFC/DOD/UFGS/UFGS%2001%2045%2000.pdf>

455 UFGS 01 35 26 Governmental Safety Requirements

May 2024, Change 2 August 2026; 38 PDF pages; <https://legacy.wbdg.org/FFC/DOD/UFGS/UFGS%2001%2035%2026.pdf>

SECTION 44 | RELEASED

New release: source-linked assessment review

Released advisory assessment controls added after the previous catalog.

456 Answer-unit review

Split complete answer paragraphs and printable findings into server-created, hashed review units.

457 Complete finding review

Include finding titles and applicability text in review rather than examining only selected snippets.

458 Independent structured review

Return one review result per unit with source references, claim kind, assertion polarity and prerequisite states.

459 Review coverage validation

Reject omitted, duplicate or unknown units and evidence references outside the supplied source set.

460 Three-state prerequisites

Represent each condition as supported, contradicted or unknown; unknown does not become satisfied.

461 Conjunctive condition checking

Require all stated prerequisites to be supported before releasing a positive assertion that they are met.

462 Qualified uncertainty

Allow an honest statement that acceptance or applicability is unproven without treating it as a positive claim.

463 Material qualification retention

Require each material summary or finding to retain its relevant conditions; another paragraph cannot silently repair an omission.

464 Whole-answer completeness

Block truncated answers and materially unanswered requests through explicit completeness review.

465 Authority-promotion prevention

Avoid converting a reported execution or relevant document into verified incorporation, approval or controlling authority.

466 Missing-adoption distinction

Do not infer that terms are legally nonbinding merely because their adoption evidence is absent.

467 Source-conditioned notice language

A narrow guard checks identified suspension statements for supported notice and undisputed-invoice qualifications.

468 Complete reviewer evidence

Supply passage text, source hashes, passage hashes and page locators to the reviewer.

469 Review audit records

Retain unit hashes, prerequisite outcomes, evidence references, expected counts and reviewer details.

470 Adversarial regression capture

Turn observed truncation, omitted conditions, false authority promotion and incorrect refusal into regression cases.

471 Independent reference-answer consultation

Claude, Gemini and Grok reviewed anonymized supplied sources and corrected reference wording; their acceptance applies to that wording, not certification of TRACE software.

472 Advisory assessment acceptance

The recorded final suite passed 19 adversarial reviewer cases and a complete live assessment; software checks covered 91 tests and 305 assertions.

473 Human verification step

Name the missing or governing records and the authorized person's next verification action before consequential decisions.

Scope and availability: Semantic interpretation remains model judgment. This is evidence-backed advisory assistance, not guaranteed legal correctness or an autonomous construction manager.

SECTION 45 | RELEASED

New release: contract decisions and evidence custody

Detailed components of the released contract workspace.

474 Evidence source adapters

Import authorized facts from RFIs, submittals, changes, payments, schedules, quantities, quality, meetings, labor, safety, procurement and reviewed passages.

475 Accountable organization selection

Bind imported evidence to a configured project organization rather than accepting an invented party.

476 Evidence relationship graph

Record supports, requires, contradicts, measures, implements, responds-to and derived-from relationships.

477 Audited source correction

Retain the previous revision and correction reason rather than overwriting evidence history.

478 Evidence withdrawal controls

Record withdrawal or control events while preserving historical references.

479 Live source freshness

Recheck current source identity before proposals, relationships and accepted decisions.

480 Current actor refresh

Refresh user and grant state without discarding the device-bound token context.

481 Decision intent binding

Bind a proposed acceptance to its target, command content and source state.

482 Concurrent decision protection

Serialize relevant decisions and source corrections with scoped locks and transaction checks.

483 Same-request receipt replay

Return the prior result for an identical accepted request and reject reuse with changed content.

484 Stale browser action protection

Detect changed account, project, form content or decision options during asynchronous lookups.

485 Existing approval continuity

Keep ordinary approval behavior intact while mandatory evidence enforcement is disabled.

486 Explicit acceptance enforcement

Validate an expressly supplied contract acceptance even in continuity mode.

487 Five extended terminal paths

Support evidence acceptance at bid award, takeoff acceptance, accounting exchange approval, lien confirmation and stop-notice resolution.

488 Signed journal chain

Bind ordered project events to previous hashes and a server signing identity.

489 Project calendar policy

Configure timezone, working weekdays, exceptions and dated nonworking days.

490 Jurisdiction pack preview

Preview versioned rule changes against source-linked project evidence before publication.

491 Jurisdiction version pinning

Retain the exact reviewed pack, effective dates and publication history; do not silently inherit a changed rule set.

492 Evidence-aware permission display

Show available controls from current capabilities while keeping restricted source facts out of the projection.

493 Immutable migration behavior

Add journal/review structures while preserving existing records; destructive history rollback is refused.

Scope and availability: The deployed workspace does not automatically approve a source, issue a notice, send payment, adopt a legal rule or grant new access.

SECTION 46 | RELEASED, BOUNDED

New release: offline evidence capture and recovery

Browser evidence capture has a separate identity and review chain from native draft synchronization.

494 Browser device-key enrollment

Enroll a project-scoped capture key through authenticated controls before offline use.

495 Pinned server receipt key

Verify returned receipts against the previously pinned signing identity.

496 Original-byte manifest

Bind original files and observation metadata to a signed capture manifest.

497 Offline queue persistence

Keep signed originals on the enrolled browser while disconnected, including tested browser restart scenarios.

498 Capture sequence tracking

Maintain device-chain counters and avoid treating an older capture as new.

499 Reconnect receipt verification

Clear eligible pending items only after validating the server receipt.

500 Dropped-response recovery

Retry an uncertain capture with the same identity after a committed response is lost; avoid duplicate evidence.

501 Encrypted queue export

Export a protected recovery backup using a user-held passphrase.

502 Revoked-device refusal

Recheck device authority when reconnecting and retain refused originals for controlled recovery.

503 Recovery operator attribution

Distinguish the original signer from the person recovering the backup.

504 Recovered-evidence quarantine

Keep recovered originals unreviewed until the authorized inspection and review path completes.

505 Scanner prerequisite

Require the configured scan/inspection result before recovered evidence can be accepted.

506 Independent reviewer separation

Prevent original submitters and recovery operators from self-accepting the recovered evidence.

507 Original inspection and download

Allow an authorized reviewer to inspect exact recovered bytes before recording a review.

508 Revocation preservation

Recovery does not silently reactivate the revoked device.

509 Offline shell delivery

Serve the cacheable capture shell and JavaScript modules with the required routing and MIME behavior.

Scope and availability: Physical iOS/Android acceptance and comprehensive offline drawings, RFIs, schedules and approvals are separate. A disconnected device learns revocation only after contact; local expiry remains important.

SECTION 47 | RELEASED

New release: archive, schedule and procedure detail

Exportable review material and controlled improvement.

510 Registered archive coverage

Include an explicit registry of supported project record families and flag coverage gaps.

511 Newer schema preservation

Retain newer change-order fields and associated asset, sensor, visual-review, BIM-link and CAD-markup records.

512 Polymorphic target checks

Verify that supported polymorphic evidence targets are represented rather than silently omitted.

513 Credential exclusion

Exclude stored credential hashes and secrets from portable evidence packages.

514 Original file reconciliation

Check selected file identities, bytes and hashes against the archive manifest.

515 Signed coverage manifest

Release a complete marker only after record registry, file and coverage checks pass.

516 Independent archive verification

Provide verifier resources for checking signatures and package consistency separately from the interactive portal.

517 External reference distinction

Identify an external URL as a reference rather than implying its remote content is included in the archive.

518 Relationship-lag calendars

Use the appropriate relationship and working-time basis in supported schedule rehearsal.

519 Progress methodology declaration

Retain the selected progress/remaining-duration assumptions in the scenario packet.

520 Reviewable scenario signature

Bind the signed rehearsal to its exact source, assumptions and result.

521 Full schedule packet printing

Preserve complete row content across multiple printed pages in the tested packet path.

522 Reviewed outcome examples

Build procedure candidates from expressly reviewed outcomes and their required evidence types.

523 Procedure evaluation

Evaluate a proposed procedure against held-out examples and current source requirements.

524 Explicit procedure promotion

Require authorized activation of a candidate rather than automatically changing live behavior.

525 Procedure retirement

Retain history while stopping future use of a retired version.

526 Record-specific checklists

Prepare unsent review steps for a selected authorized source record.

Scope and availability: A portable evidence archive is not a complete infrastructure backup. Procedure learning does not train foundation-model weights.

SECTION 48 | MIXED: RELEASED API / CLIENT DEVELOPMENT

Native client development and released server contracts

Detailed platform-specific work remains visible without confusing source code, tests and public distribution.

527 Restricted native login contract

Issue enrollment/sync credentials through dedicated client routes rather than a generic unrestricted API bridge.

528 Device-bound token authority

Tie synchronization authority to the selected enrolled device and current owner.

529 Native project directory

Return only projects individually authorized for the current tenant, user, device, organization, membership and client surface.

530 Minimal project identity envelope

Return schema version, tenant/user/device identity and minimal project ID, name, number and lifecycle fields.

531 Bounded directory pagination

Scan a bounded page and continue by cursor, including empty visible pages with more candidates remaining.

532 Private directory responses

Use no-store responses and a request-rate limit for the installed-client project selector.

533 Full-envelope native replay check

Compare canonical payload, signature, proof version, record identity, operation type, version, logical clock, counter and normalized wall-clock before replaying a receipt.

534 Altered retry rejection

Return conflict for an operation UUID reused with changed content instead of presenting an earlier accepted receipt.

535 Monotonic batch high-water mark

A refused lower counter cannot lower the threshold for subsequent items in the same batch.

536 Stable refused receipts

An exact retry of a refused operation retains its prior disposition; it does not become accepted.

537 Protected native draft storage

Windows durable counters and OS-protected draft queues are in active implementation and acceptance.

538 Isolated online portal window

Windows development embeds the existing online portal in a sandboxed window with normal web login and CSRF, separate from privileged native storage.

539 Online workflow reuse

RFI, submittal, timecard and approval workflows use their existing portal authority instead of bypassing it through device tokens.

540 Controlled child views

Desktop development covers document popups, same-origin blob previews, printing and user-visible downloads without exposing a privileged bridge.

541 Identity-change cleanup

Desktop acceptance checks account cancellation, logout and separate browser-session cleanup.

542 Cached snapshot limitation

A snapshot checksum is not a detached server-signed grant. Cached permissions support bounded offline UX, not fresh server authority.

543 Reconnect authorization

Server checks current device, membership, project, organization, field policy and signatures before accepting drafts.

544 Consequential command refusal

Formal offline commands remain refused; a draft receipt does not approve, issue or pay a record.

545 Cross-platform material workflow

Windows/iOS/Android candidate work includes draft, submit, return, approve, order and receive stages with named approvers.

546 Authorized approver picker

Candidate material workflow resolves eligible people by project authority instead of relying on a typed internal identifier.

547 Voice-to-material draft protection

Candidate validation prevents voice-created line items from injecting approval fields.

548 Shared mobile bridge and UI

Android and iOS source integration and shared generated interface assets are being reconciled and tested.

549 Android build verification

The development task records a successful native compile; broader tests and signed distribution remain separate.

550 Installed reviewer acceptance

Synthetic desktop login/read/CSRF/logout checks passed; installed reviewer, offline queue and full release acceptance remain open at this checkpoint.

551 Protected original-operation queue

New native source work preserves the original signed operation in a protected queue rather than regenerating it on every retry.

552 Deterministic enrolled Ed25519 signing

Native source work signs the enrolled-device envelope deterministically; focused tests verify the signing contract.

553 Immutable signed-envelope readback

Native queue components read back the retained envelope and detect changed stored content.

554 Validated immutable native receipts

Native source components validate and retain immutable receipt results for the submitted operation.

555 Exact native upload transport

New orchestration targets the dedicated operations contract with account/device identity checks; current orchestration tests use mocked transport.

556 Native integration boundary

The new queue/orchestration is not yet integrated into the main/renderer release or accepted against the live server; no newer signed executable acceptance is recorded.

Scope and availability: Server project-directory and replay fixes are released. The Windows and mobile application components listed as development require their own signed-build, installed and physical-device acceptance.

SECTION 49 | IMPLEMENTATION + SCOPED STAGING ACCEPTANCE

Self-healing: bounded diagnosis and recovery

Named recovery mechanisms exist; later staging registrations do not imply blanket production activation.

557 Structured database diagnosis

Classify transaction conflicts, contention, timeouts, interruptions, access failures, constraints, schema/query errors and cancellation using driver codes.

558 Sanitized diagnostics

Avoid exposing SQL text, bindings, credentials or customer payloads in recovery guidance.

559 Allowlisted read recovery

Retry only explicitly supported factory and inventory reads, rather than arbitrary application calls.

560 Three-attempt retry budget

Bound eligible transient read recovery to at most three attempts.

561 SQLite contention handling

Recognize BUSY/LOCKED failures within the eligible retry policy.

562 PostgreSQL contention handling

Recognize selected lock-unavailable and transient read failures without retrying permanent errors.

563 Per-attempt authorization refresh

Recheck user, tenant, administrator and reference authority before retrying and returning data.

564 Pinned initiating identity

Prevent a retry from following a later account or tenant switch into another scope.

565 Circuit cooldown

After exhausted transient work, retain a bounded cooldown rather than retry indefinitely.

566 Private retry guidance

Return private 503 responses with a retry indication and a fixed reason code for eligible failures.

567 Uncertain-write reporting

Report an unconfirmed write outcome without claiming either success or loss.

568 No blind write replay

Reconcile uncertain mutations by their durable receipt/idempotency identity instead of automatically repeating them.

569 Statement deadlines

Apply transaction-local PostgreSQL statement deadlines to supported reads.

570 Lock deadlines

Apply transaction-local lock deadlines while preserving stricter deployment limits.

571 Caller transaction protection

Do not interfere with caller-owned transactions or leak timeout settings beyond commit/rollback.

572 Telemetry isolation

A telemetry failure must not transform a completed operation into a replayable failure.

573 Batch fault isolation

One failing application does not prevent another eligible application's inspection or recovery.

574 Truthful batch exit status

Report failed, degraded and deferred work rather than labeling a partly failed sweep successful.

575 Cancellation respect

Do not retry explicit cancellation or permanent permission/schema failures.

Scope and availability: Self-healing means bounded handling of named failures. It is not an error-free guarantee, arbitrary query rewriting, unrestricted code repair or zero-downtime certification.

SECTION 50 | MIXED DEPLOYMENT / STAGING

Self-healing: application generation and derived state

Controlled repair preserves business records and publication authority.

576 Scheduled application health sweep

Inspect a bounded set of app definitions and runtime state with overlap and lease guards.

577 Known-good definition restoration

Restore an eligible prior valid published definition while preserving recorded business data.

578 Row-locked definition repair

Own one scoped transaction during repair and retain tenant ownership.

579 Derived-index health checks

Detect eligible missing or inconsistent derived indexes separately from original records.

580 Bounded index repair

Repair supported derived indexes within configured scan/repair budgets.

581 Ordinary timer index acceptance

Saved staging evidence includes timer-driven repair; configuration alone is not counted as that scenario test.

582 Stale generation recovery

Inspect eligible abandoned generation work through a separately enabled recovery schedule.

583 Invalid-schema correction attempt

For eligible completed invalid provider output, make at most one guarded correction request.

584 Correction authorization guard

Refresh builder permissions, app version, references and catalog before a second provider attempt.

585 Separate correction accounting

Reserve quota and settle usage separately for each attempt, linking the correction to the original.

586 Shared provider deadline

Use only the remaining original deadline; do not start a correction when insufficient time remains.

587 No automatic publication from repair

A corrected schema remains subject to validation, review and explicit publication.

588 Unsupported integration refusal

Do not retry unsupported external integrations, unavailable references or unknown connection outcomes as automatic schema fixes.

589 Incremental app generation

Retain constrained definition/version semantics when generating an eligible application change.

590 Lease-aware progress

Check ownership before doing sweep work or advancing its cursor.

591 Admission-contention recovery

Later staging evidence records bounded admission contention retry; this does not prove recovery of every API or worker failure.

Scope and availability: Core factory tooling has an earlier production release. Newer repair switches and exact acceptance belong to their recorded staging revisions; generation correction is independently gated.

SECTION 51 | STAGING / BOUNDED DEVELOPMENT

Self-healing: uploads, documents and worker delivery

Durable admission and recovery workflows protect source identity.

592 Upload admission transitions

Track accepted upload intent separately from its final target receipt.

593 Private upload recovery snapshots

Retain bounded private source snapshots for eligible finalization recovery.

594 Quarantine recovery

Inspect eligible quarantined upload work without treating unsafe content as clean.

595 Real scanner integration tests

Recorded isolated recovery acceptance includes actual scanner execution and refusal paths.

596 Queued finalization recovery

Recover eligible interrupted upload finalization through a scoped handler and durable identity.

597 Atomic target receipt linkage

Link a finalized target to the corresponding upload operation rather than inventing a second result.

598 Permission-aware queued reprocessing

Revalidate source ownership and current processing authority before delayed work.

599 Knowledge extraction recovery

Maintain named recovery handling for eligible extraction intents and source/version identities.

600 Page-batch preservation

Acceptance criteria protect already committed page/passage hashes during recovery.

601 Ordinary extraction timer gap

Current registration is evidenced; the latest owned interrupted-admission timer scenario remains a separate unfinished acceptance.

602 BIM admission outbox

Record initial BIM-source admission with tenant/project/version/hash/storage identity and original uploader.

603 Fenced delivery claim

Use a time-bounded delivery claim before inserting the admitted extraction job.

604 Transactional queue insertion

For supported database queues, insert the job and sent receipt in the same transaction.

605 Transport-specific refusal

Unsupported queue transports remain pending; no nontransactional fallback is presented as equivalent.

606 Delivery attempt budget

Bound admission attempts, cooldown, lifetime and sweep size.

607 Duplicate-admission protection

Repeated admission cannot reset the original work budget.

608 Extraction/publication distinction

Delivery of an extraction job does not mean extraction, human review or model publication succeeded.

609 Private snapshot cleanup

Bound deletion and scanning of eligible expired recovery snapshots.

610 Scheduler overlap guards

Prevent overlapping eligible health, generation, index, quarantine, extraction, finalization and cleanup runs.

611 Separate manual retry

Keep explicit manual BIM retry separate from initial admission-delivery recovery.

612 Partial PDF recovery acceptance

A newer isolated real-Laravel test preserves committed page 1 and completes page 2 after a deliberately injected fault. The deployed ordinary-timer continuation remains a distinct acceptance.

Scope and availability: Later staging has enabled recovery registrations. Handler tests, timer observations and full workflow recovery are different evidence levels; not every promised failure has an accepted timer scenario.

SECTION 52 | MIXED: RELEASED SAFEGUARDS / STAGING RECOVERY

Self-healing: runtime, backup and regional recovery

Infrastructure developments are listed individually with their current acceptance limits.

613 Immutable release identity

Bind prepared runtime files and configuration to reviewed release manifests.

614 Baseline drift refusal

Stop a deployment when current production files differ from the approved baseline.

615 Shared deployment lock

Serialize cooperating releases instead of overwriting simultaneous work.

616 Pre-release backups

Preserve affected runtime files, configuration and database snapshots before accepted releases.

617 Private database backup verification

Validate retained backup archive structure with the matching database tool version.

618 Source-hash parity

Compare deployed bytes with reviewed/tested candidate hashes.

619 Controlled service reload

Reload application services and gracefully restart queue workers after the release switch.

620 Known-state rollback

Restore backed-up runtime/configuration while preserving newly recorded evidence and signing identity.

621 Immutable activation receipts

Record exact staging release, configuration and runtime-acceptance identities.

622 Interrupted publication recovery

Candidate supervisor work records durable intent and permits recovery only from recognized partial publication states.

623 Unknown-state refusal

Refuse another exchange or blind rollback when release ownership or pending-state identity is uncertain.

624 Service startup checks

Verify web, worker and scheduler service behavior before opening the accepted staging endpoint.

625 Boot-persistence checks

Inspect startup enablement and bounded retry requirements after reboot; full current regional acceptance remains separate.

626 Encrypted checkpoint capture

Create encrypted snapshots with independently verified ciphertext identity.

627 Cross-host retained copies

Verify matching retained encrypted bytes and receipts on two hosts for accepted staging captures.

628 Interrupted transfer reconciliation

Resume transfer of the exact existing ciphertext without silently recapturing a new snapshot under the old identity.

629 Scheduled backup recurrence

A later ordinary staging timer capture completed unattended with matching two-host evidence.

630 Plaintext cleanup verification

Check removal of owned temporary plaintext and work artifacts after retained capture.

631 Revision hold for backup changes

Pause eligible backup work during a staged revision until its own acceptance completes.

632 Restoration rehearsal

Recorded isolated restores reconcile selected database rows and file objects; coverage gaps remain explicit.

633 Region promotion preparation

Prepare/fence source and destination runtime identities before a proposed failover.

634 HTTPS and DNS acceptance

Require runtime, private HTTPS, routing and post-route checks rather than treating promotion alone as successful failover.

635 Post-route write survival

Regional acceptance requires scoped writes/files to survive the routed runtime and later reconciliation.

636 Failback verification

Returning to the original region requires its own acceptance and permission/state reconciliation.

637 Restored-document authorization

A remaining specific test must verify an existing restored document's actual authorized download, version/hash and denied-access behavior.

638 Provider security dependency tracking

Retain unresolved provider storage/security questions as dependencies rather than claiming external certification.

Scope and availability: Production release safeguards are in use. The broader regional program is isolated staging work; complete automatic regional failover, continuous backup guarantees and universal self-repair are not established.

SECTION 53 | ACCEPTED ISOLATED STAGING

CAD successor: direct primitive and parser recovery

A separate newer DXF path now has coherent isolated staging and browser acceptance.

639 Direct POINT extraction

Retain explicit source points with exact source identity and original decimal provenance.

640 Direct LINE extraction

Retain source line endpoints rather than inferring design lines from rendered pixels.

641 Direct 3DFACE extraction

Preserve explicit face vertex order and hidden-edge information where supported.

642 Unit provenance

Carry declared units without silently assigning survey datum or coordinate reference authority.

643 Unknown-reference retention

Expose missing or unsupported references instead of silently fabricating geometry.

644 Resource-limited parser

Constrain parsing by entity/vertex/output size, memory, CPU and wall-time limits.

645 Network-disabled parser isolation

Run the bounded parser with restricted filesystem/network permissions in the tested worker path.

646 Authenticated local socket bridge

Restrict the application-to-parser interface to its authorized local caller.

647 Lifetime ownership lock

Bind listener ownership and recovery to its recorded process/socket identity.

648 Recorded listener recovery

The accepted disposable integration tested listener termination, recovery and subsequent parsing.

649 Incomplete-ownership refusal

Do not recover an unproven socket/listener identity or crash before durable ownership metadata.

650 Application Documents integration

The later isolated staging release passed real Documents upload and CAD review.

651 Primitive viewer and printing

Staging browser acceptance covered one POINT, LINE and 3DFACE, source limits and TRACE-branded print output.

652 Parser release backup linkage

Bind the accepted staging CAD revision to its encrypted backup/transfer receipts.

Scope and availability: This successor does not replace the released DWG path in production. It does not establish arbitrary Civil 3D semantics, external-reference expansion, certified survey control or final-grade interpretation.

SECTION 54 | PREPARED DEMO / STAGING / CANDIDATE

Customer demonstration, onboarding and reuse

Recent public-demo and account-reuse development.

653 Shared synthetic project story

Prepare one coherent fictional park/restroom project with linked construction records.

654 RFI evidence examples

Populate ten fictional RFIs with supporting sample PDFs and source relationships.

655 Material submittal examples

Include CMU, concrete, doors, pavers and drinking-fountain submittal examples.

656 Prepared transmittal and pay examples

Provide labeled transmittal covers and a draft pay-application summary.

657 Complex change examples

Populate multiple detailed change orders linked to the synthetic project story.

658 Schedule and look-ahead examples

Populate baseline/update and look-ahead examples for read-only exploration.

659 Permits and job-walk examples

Populate candidate permits and a multi-item field walk with related evidence.

660 Procurement and budget examples

Link fictional procurement items to submittals/activities and populate budget lines.

661 Preconstruction checklist examples

Assign and date the prepared preconstruction checklist in the demonstration.

662 Real synthetic IFC processing

Process the fictional BIM model through TRACE extraction; the recorded demo has geometry for 49 modeled objects.

663 Visitor read-only boundary

Candidate visitor controls deny uploads, mutations, processing, live AI execution and unauthorized account-directory access.

664 Registration and access expiry

Candidate visitor registration, verification, expiration and functional-demo request forms remain under integration acceptance.

665 Section completeness audit

Audit meaningful contents and detail views across 38 project sections; an HTTP success alone does not close the section.

666 Training coverage development

Track section guidance, examples and training-video gaps separately from the sample data.

667 Blueprint tenant reuse

Recorded staging acceptance exports/imports a blueprint into a new tenant with empty destination business records.

668 Destination publication and write

Validate independent destination publication, authorized writes, suspended writes and cross-tenant denials.

669 Signed customer setup journey

Accepted on current isolated staging: expired setup link denied, normal password setup and correct-tenant login passed, and reused setup POST was rejected.

670 First-login navigation correction

The corrected same-origin /app.html navigation passed normal-browser acceptance, including original-password login after attempted setup-link reuse and logout.

671 Native parsed demo schedule

The synthetic project has an accepted-for-training MS Project XML revision with 25 activities, 34 finish-to-start links and 66 working days; the actual risk builder consumes it.

672 Published synthetic BIM model

The real extraction produced 49 geometric products and 52 hierarchy/element records, published inside the synthetic project.

673 Indexed demonstration references

The newest demo additions include seven indexed PDFs totaling 18 pages, four plan sheets and four drawing images.

674 Web-service file readability

The demo owner corrected folder ownership and verified 46 of 46 files readable by the web-service user.

675 Prepared internal demo access

The synthetic project and records exist in a separate live tenant. Public visitor signup/access, full section acceptance and training remain separate work.

Scope and availability: The shared public visitor experience remains in preparation at this checkpoint. Synthetic examples are not customer work, physical inventory or completed approvals.

SECTION 55 | ROADMAP / PARTIALLY IMPLEMENTED FOUNDATIONS

Advanced BIM, predictive risk and invention concepts

All previously discussed advanced concepts remain visible; a concept is not a shipped feature.

676 Design-package readiness

Propose versioned deliverable/prerequisite views by discipline or zone, without treating incomplete evidence as permission to build.

677 Confirmed change impact map

Extend confirmed model/record links into review impact across requirements, activities and cost allocations.

678 Procurement exposure map

Relate declared lead times and required-on-site dates to selected package/installation assumptions.

679 Model federation

Combine models only after explicit units, coordinate and reference alignment acceptance.

680 4D schedule playback

Propose model state playback bound to explicitly mapped schedule versions and activity dates.

681 5D cost exposure

Propose allocated cost links with protection against counting the same cost line repeatedly.

682 Licensed Revit translation

Evaluate authorized RVT translation separately from native Revit authoring or automation.

683 Information Delivery Specification checks

Evaluate machine-readable model information requirements against a supported model/toolchain.

684 Model-to-BCF action drafts

Prepare traceable issue/RFI drafts from accepted coordination findings for human adoption.

685 Prospective risk outcomes

Capture what was known at forecast time and prevent later outcomes or revisions leaking into training features.

686 Calibrated risk probabilities

Require chronological holdout comparison, calibration and uncertainty before advertising delay/cost probabilities.

687 Trade and zone capacity

Model declared resource demand, access and temporary-work occupancy for supported scenarios.

688 Weather-sensitive work exposure

Use dated forecasts and explicitly approved thresholds for advisory activity exposure.

689 Design-build interface responsibility

Record named organizations, delegated design and scope boundaries with source-backed authority.

690 Commissioning and turnover map

Propose versioned associations among equipment, tests, O&M requirements and asset records.

691 Evidence Readiness Map

Prototype a 3D view of missing release evidence and prerequisites rather than inferred physical defects.

692 Decision Replay

Reconstruct the evidence available when a decision was recorded while keeping later information separate.

693 Minimum-Unblock Plan

Propose a bounded set of documented review/procurement steps that clears declared prerequisites, with conditional effects.

694 Continuous field-to-plan capture

Future calibrated image/drone pipelines need source registration, physical scale, temporal alignment and validation.

695 Municipal living asset twin

Future live simulation and municipal handover require real asset identity, sensor connections and maintenance data contracts.

696 Broad regulator synchronization

Future CSLB, wage and permit feeds need authorized providers, current jurisdictions and source validation beyond the limited existing adapter.

697 Autonomous code repair boundary

Arbitrary generated code, automatic hotfix deployment and foundation-model self-training are not implemented by bounded recovery.

Scope and availability: These are engineering directions and product concepts, not patent novelty, competitor superiority or an error-free guarantee.

SECTION 56 | CLAIM AND EVIDENCE RULES

Reliability: customer-facing claims and measured limits

How to describe the system accurately while retaining every reliability development.

698 Self-healing claim

TRACE contains bounded, permission-aware recovery mechanisms for named failures; each requires its recorded configuration and acceptance.

699 Error-free claim boundary

No finite test suite establishes an error-free system. Public wording should name verified safeguards and observed results.

700 No test-count inflation

Overlapping suites, inherited tests and different frozen releases are not added into a universal coverage percentage.

701 Source-scoped answer quality

An accepted cited answer or adversarial fixture is evidence for that case, not universal answer accuracy.

702 No inevitable intelligence growth

Scheduled failure capture and reviewed evaluation enable improvement work; next year is not automatically smarter without validated changes.

703 Fail-closed consequential actions

Missing authority, evidence, stale sources, unsupported inputs or uncertain outcomes result in refusal or review rather than invented success.

704 Production versus staging distinction

A registered timer, built binary, private prototype or successful isolated test is not a production release receipt.

705 Real versus synthetic distinction

Demonstration records, generated fixtures and prepared stock movements remain labeled as synthetic.

706 Configuration dependency disclosure

Provider accounts, merchant credentials, legal rule adoption and per-user grants control availability.

707 Independent decision authority

Human engineering, legal, safety, payment and project approvals remain attributable to authorized people.

Scope and availability: This inventory documents capabilities and developments; it is not an independent certification or a new full-system test.

SECTION 57 | RELEASED, SUBJECT TO EXISTING GRANTS

Document, RFI and tracker workflow refinements

Delivered RFI, document and tracker refinements from reviewed release records.

708 Record-specific Ask TRACE

Bind the exact authorized RFI identity, subject, question and references to the conversation and retain that context only while the matching project/RFI stays active.

709 Historical response separation

Display superseded responses as history while directing current action to the active correction.

710 Named seal attribution

Resolve recorded actors to names and timestamps instead of showing only internal identifiers.

711 Correct document parties

Use the recorded issuing/originating and receiving organizations in the corresponding preview.

712 Separate RFI and submittal printing

Use record-specific Preview / print RFI and Preview / print submittal controls and headings.

713 Shared issued-document register

Retain explicit issued status and distinguish issued documents from generated previews.

714 Authorized original attachment viewing

Retrieve the submitted original under current account/project permission, with page navigation and download where supported.

715 Unsigned original preservation

Preserve the unchanged unsigned original while the supported review workflow creates separate signed copies for individual reviewers.

716 Final required-approver seal

Keep intermediate signed review copies separate from the final seal after the last required approval.

717 Member template previews

Permit eligible project members to preview templates while requiring template-management authority for edits.

718 Revision-preserving template edits

Create a new template revision without invalidating earlier assignments or signatures.

719 Resumable submittal attachments

Use bounded upload chunks and finalized attachment identity to avoid duplicate or partial attachments; the recorded implementation uses 8 MB chunks.

720 Governing-document conflict controls

Record unrecorded, confirmed or conflicting precedence with citations, ordered categories and conflict notes; do not silently choose between conflicting provisions.

721 Printable download fallback

Provide a self-contained printable document when an embedded host blocks the standard print window.

722 Tracker validation guidance

Give actionable feedback for empty generation prompts, tracker names, missing fields, empty labels and empty choice lists.

723 Responsive tracker keyboard access

The deployed studio includes tested responsive layouts, keyboard access and reduced initial clutter on small screens.

724 Demo weather role coverage

The live demo location/weather correction provides current conditions and a 10-day forecast to the four configured demo roles.

Scope and availability: Viewing, previewing and printing do not issue, seal or approve records.

SECTION 58 | RELEASED CONVERTER / INTERNAL DEMO / SCOPED VIEWER TESTS

Latest native CAD and synthetic project acceptance

Newer verified additions received from the demonstration development owner after the main catalog refresh.

725 Native synthetic DWG admission

A native DWG is admitted in the separate synthetic project, with 651 terrain POINT coordinates matching the authored CSV, one explicitly unverified reference point and 656 rendered entities.

726 DWG layer visibility correction

An installed narrow LibreDWG exporter patch preserves layer visibility instead of negating all layer colors and hiding otherwise visible drawing layers.

727 Visible and hidden layer regression

Both visible-layer and deliberately hidden-layer fixtures passed, together with the real production sandboxed preview under the web-service user.

728 Native BIM control acceptance

Scoped local viewer acceptance verified 49 mesh loads, IFC tree selection, isolation, fit, top projection, wireframe, section cut, search and source checksum.

729 Linked preaward demonstration estimate

The synthetic project includes a draft preaward profile and a ten-item estimate, with all ten items linked to plan versions.

730 Unsigned TRACE Sign demonstration

A synthetic draft envelope contains two fictional recipients, unsigned fields and a two-page PDF; it is not an executed customer agreement.

731 Expanded file integrity acceptance

Ninety media/document-version file readability, hash and size checks passed for the synthetic demonstration content.

Scope and availability: The converter patch is installed. Synthetic geometry and records do not establish survey authority or real contract approval. Public visitor signup/access remains separate.

Evidence and review basis

This is a documentation reconciliation, not a fresh exhaustive functionality test. Recent TRACE task messages were compared with saved deployment receipts, test results, capability catalogs and the previous full inventory. Historical findings were superseded only where a later scoped result supports the change.

The active assessment, expansion, demonstration and native-client owners provided a fresh status readback for this edition. They confirmed the later assessment deployment and additional staging/native/demo work, while identifying remaining boundaries. Retrieved task histories can be partial; this document does not claim access to every historical message or external AI account.

Previous complete inventory

455 entries; AI, full platform, internal viewer/controller, CAD/IFC and reference indexes.

TRACE AI / operations acceptance

155 checks in the recorded release; telephone, official-source research, immediate help, private improvement cycle and billing-readiness controls.

Assessment readiness, 04:58 UTC

91 software tests / 305 assertions; 19 adversarial model cases and a complete live assessment. External AI acceptance covers reference text only.

Contract production release, 04:04 UTC

Final continuity regression 91 / 678; earlier integrated PostgreSQL 171 / 1,206; 80 deployed files verified. Existing-workflow mandatory gating remains off.

Native replay and directory releases

Replay PostgreSQL 5 / 78 plus independent Windows fixtures; directory SQLite and PostgreSQL each 9 / 139. These are server contracts, not installed-app certification.

CAD workspace and VDC acceptance

Authorized DWG review, coordinate export/print, conceptual terrain and bounded single-IFC coordination; source and model limitations remain explicit.

BIG EXPANSION current evidence map

Earlier production app/inventory release plus newer isolated staging generation, reuse, bounded recovery, primitive CAD, backup and navigation results.

Recovery scenario coverage map

Maps actual historical fault-test cases to eight enabled staged mechanisms. Overlapping tests are not summed; ordinary-timer gaps remain recorded.

Shared demonstration receipts

Prepared fictional construction records, parsed schedule, indexed references and published synthetic IFC model. Public visitor access is still separate.

Native completion checklist

Protected queue/signing/receipt components and isolated online portal development. Current source work does not establish signed installed release acceptance.

Prior platform audits and engineering roadmap

Retains full operational catalog and advanced risk/BIM/design-build concepts with exact delivered foundations and remaining dependencies.

Test results cover different snapshots and often overlap. They must not be added into a single coverage percentage or represented as independent certification. Source references and original public guides are included in their catalog sections. Retained reference editions are not necessarily the newest edition or governing requirements for a project.

For the applicable customer configuration and available release, visit tracems.com or the authorized TRACE workspace.