

Document Maturity Index — Framework

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A Methodology for Measuring Construction Document Readiness for Decision-Making

Rhogan Research Institute

Construction Intelligence Research & Standards

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Abstract

Construction documents are frequently described by issuance status: Preliminary, Design Development, Issued for Bid, Permit, Issued for Construction, or similar terminology. Those labels identify the administrative state of a document package. They do not necessarily establish whether the information contained within that package is complete, coordinated, interpretable, current, or sufficient for a particular construction decision.

The **Document Maturity Index (DMI)** is a developing measurement methodology intended to evaluate construction information according to its readiness for decision-making.

The methodology does not ask only whether documents exist.

It asks whether the available information can reliably support the decision being made.

The framework evaluates observable conditions within construction information, including document completeness, authority, coordination, scope clarity, specification alignment, revision stability, detail sufficiency, unresolved conditions, risk visibility, and evidence traceability.

The methodology is designed around a fundamental distinction:

Document maturity measures information readiness. Risk measures exposure. Decision readiness determines whether the available information is sufficient for a defined decision.

These three concepts should not be treated as interchangeable.

1. Purpose

The purpose of the Document Maturity Index is to establish a repeatable method for answering a question that construction teams routinely confront but rarely measure:

Is the information currently available sufficiently mature to support this decision?

The methodology is intended to replace subjective descriptions such as:

- “The drawings look pretty complete.”
- “It should be enough to bid.”
- “The project is technically IFC.”
- “We can probably figure it out.”
- “The missing information should not matter.”

with documented and inspectable measures.

DMI is not intended to certify the design, guarantee document accuracy, replace professional judgment, or determine whether a project will succeed.

It measures the **quality and sufficiency of the available information for a defined construction decision.**

2. The Decision-Specific Principle

Document maturity is not absolute.

The same information can be sufficiently mature for one decision and insufficiently mature for another.

A schematic drawing package may be adequate for conceptual budgeting while being wholly inadequate for material procurement.

Accordingly, every DMI evaluation must identify the **Decision Context** before maturity is evaluated.

Decision Context Classes

Class	Decision Context	Fundamental Question
DC-1	Concept / Feasibility	Is sufficient information available to establish an approximate project condition or budget?
DC-2	Design / Pre-Construction	Is sufficient information available to develop and compare scope, systems, risks, and alternatives?

Class	Decision Context	Fundamental Question
DC-3	Bid / GMP	Is sufficient information available to establish a defensible commercial bid position?
DC-4	Contract / Award	Is sufficient information available to establish contractual scope and responsibility?
DC-5	Procurement / Release	Is sufficient information available to release materials, systems, or fabrication without unacceptable uncertainty?
DC-6	Construction / Execution	Is sufficient information available to install or execute the work as intended?
DC-7	Handoff / Closeout	Is sufficient information available to preserve obligations, conditions, decisions, and project knowledge through turnover?

A document package is therefore not simply “mature” or “immature.”

It is mature **relative to a defined decision**.

3. Measurement Architecture

The Rhogan methodology separates construction intelligence measurement into three families.

Family A — Document Maturity

Measures the quality, completeness, coordination, and interpretability of the available construction information.

Output: Document Maturity Index, 0–100.

Family B — Project Risk

Measures the magnitude of documented commercial, technical, scope, schedule, substrate, procurement, contractual, and coordination exposure.

Within environments supported by SQUARES AI™, this function may be represented through the separate **SQUARES RA risk model**.

Output: Risk assessment independent of DMI.

A mature document package may describe a highly risky project.

A poorly developed document package may describe a relatively simple project.

The two variables must therefore remain independent.

Family C — Decision Readiness

Determines whether the available information is sufficient for the identified Decision Context.

Output:

READY

READY WITH QUALIFICATIONS

NOT READY

Decision readiness is a gate, not an average.

Critical missing information cannot be mathematically hidden by strong scores elsewhere in the project.

4. Evidence Model

Every scored condition should originate from identifiable evidence.

An evidence unit may include:

drawing sheets; specifications; finish schedules; room finish schedules; details; elevations; addenda; bulletins; ASIs; RFIs; bid forms; alternates; narratives; contracts; product data; correspondence; approved project information; or other authorized construction records.

Each finding should maintain, when available:

Source → Location → Condition → Relationship → Finding → Status → Decision Impact

This creates an auditable evidence chain.

A maturity score without traceable evidence should not be considered equivalent to an evidence-supported maturity score.

5. Measurement Scale

Each applicable maturity category is evaluated using a five-level scale.

Score	Classification	Measurement Meaning
0	Absent / Unverifiable	Required information is absent, inaccessible, or cannot be established from the available evidence.
1	Fragmentary	Some information exists, but substantial ambiguity, incompleteness, conflict, or unsupported inference remains.
2	Limited	Information supports partial interpretation but requires material assumptions, qualifications, RFIs, or external verification.
3	Substantially Coordinated	Information is substantially usable for the intended decision with limited unresolved conditions.
4	Decision-Ready	Information is present, coordinated, traceable, current, and sufficiently resolved for the identified decision context.

“Not Applicable” is recorded separately and is not treated as zero.

6. Current SQUARES AI™ Measurable Categories

The following measurement domains formalize conditions currently evaluated through SQUARES AI™ Construction Intelligence workflows.

They represent observable information conditions rather than AI opinion.

6.1 Document Presence and Completeness

Determines whether the source information necessary to interpret the project is available.

Current measurable document-presence conditions include:

Specification Manual
 Finish Schedule
 Room Finish Schedule
 Finish Floor Plans
 Interior / Interior Design Documentation
 Vertical Circulation Documentation

Broader implementations may include additional trade-specific required sources.

Measurements may include:

required sources present / required sources expected; missing document families; partial document families; referenced-but-not-provided documents; and source accessibility.

6.2 Document Authority and Issue Status

Measures whether the governing information basis can be established.

Examples include:

issue date; revision date; drawing status; permit status; bid status; construction status; superseded information; conflicting title-block status; and unidentified governing issue.

A document can be complete in content while remaining unsuitable for procurement because its authority is unresolved.

6.3 Cross-Document Coordination

Measures whether related information agrees across project sources.

Typical comparisons include:

plan versus schedule; plan versus specification; schedule versus specification; keynote versus detail; plan versus elevation; addendum versus original issue; room designation versus finish assignment; and detail versus trade responsibility.

The objective is not simply to count conflicts.

The objective is to determine whether independent sources produce the same project interpretation.

6.4 Revision and Addenda Consistency

Measures whether project changes are identifiable and successfully propagated through the affected information set.

Measurements may include:

number of revision events; affected drawings identified; affected specification sections identified; changed finish assignments; changed room conditions; deleted scope; added scope; superseded information remaining active; and unresolved revision dependencies.

Each revision event should be independently traceable.

6.5 Scope Identification

Measures whether required work can be identified from the available information.

The category evaluates whether the project information identifies:

materials; locations; systems; accessories; interfaces; specialty conditions; and relevant installation requirements.

Scope identification asks:

Can the work be found?

6.6 Scope Assignment and Responsibility

Measures whether identified work can be assigned to the appropriate responsible party.

This includes:

contractor-furnished versus owner-furnished systems; installation responsibility; trade boundaries; testing responsibility; preparation responsibility; waterproofing responsibility; demolition responsibility; transition responsibility; and other interfaces.

Scope assignment asks:

Can responsibility for the work be established?

6.7 Finish Assignment Clarity

Measures whether finishes can be consistently mapped to locations.

Typical signals include:

finish identifiers; room assignments; floor plans; finish legends; room finish schedules; elevations; base assignments; wall finishes; orientation requirements; and specialty finish conditions.

A finish may be specified but still have low assignment maturity if its intended location cannot be established.

6.8 Product and Procurement Definition

Measures whether a specified finish or system contains enough information to support pricing, approval, ordering, or release.

Potential fields include:

manufacturer; product; style; color; size; backing; pattern; thickness; installation method; accessory requirements; approved substitutions; and procurement responsibility.

Product existence and procurement readiness are different measures.

6.9 Detail and Interface Completeness

Measures whether interfaces between materials, systems, elevations, and adjacent trades are sufficiently defined.

Conditions include:

finished-floor-height relationships; termination details; edge conditions; wall interfaces; thresholds; penetrations; drains; expansion joints; transitions; substrate changes; and system build-up.

6.10 Substrate and Slab Readiness

Measures how clearly the project defines the condition and responsibility of the installation substrate.

Current SQUARES AI™ conditions include:

concrete slab conditions; floor preparation; gypcrete or gypsum underlayment; lightweight concrete; slab depressions; mud beds; patching; self-leveling; contaminants; existing adhesive; flatness; floor drains; and corrective-work requirements.

The measurement evaluates information sufficiency.

It does not infer concealed field conditions.

6.11 Moisture, Testing, and Mitigation Responsibility

Measures whether testing and mitigation obligations are defined.

Fields may include:

moisture testing; pH testing; test standards; testing party; acceptance limits; mitigation systems; remediation responsibility; manufacturer requirements; and warranty dependencies.

6.12 Transitions, Thresholds, and Accessibility Interfaces

Measures whether transitions between adjacent finish systems are identifiable and coordinated.

Conditions include:

transition location; transition type; finish-height difference; threshold condition; accessibility requirement; adjacent trade interface; product assignment; and responsibility.

6.13 Existing Conditions and Demolition

Measures the information available about retained, removed, restored, patched, or concealed conditions.

Potential measurements include:

demolition extent; finish removal; adhesive removal; substrate exposure; retained finishes; patch-back requirements; selective demolition; existing-to-new transitions; and field-verification dependencies.

6.14 Specialty Scope Clarity

Measures project-specific systems that require independent evaluation beyond standard finish assignments.

Current SQUARES AI™ implementations include conditions associated with:

stairs and vertical circulation; tub and shower areas; wet areas; raised-access flooring; tile assemblies; grout and trim; slab depressions; mud beds; floor drains; specialty transitions; and similar project-specific interfaces.

Applicable specialty categories vary by project and trade.

6.15 Alternates, Allowances, and Bid Controls

Measures whether commercial pricing structures are clearly distinguished from the base scope.

Potential conditions include:

base bid; alternates; allowances; unit prices; owner options; bid-form requirements; accepted substitutions; add/deduct conditions; and scope carried outside the base proposal.

6.16 Attic Stock and Closeout Obligations

Measures whether additional material and closeout requirements are identifiable.

Measurements may include:

required percentages; required quantities; material categories; packaging requirements; maintenance stock; overage requirements; and document silence.

6.17 Document-Identified Value Engineering

Measures explicit project-document references to Value Engineering, VE, or V.E.

This category should measure documented requirements or options rather than manufacture speculative savings.

Absence of documented VE is itself a reportable condition.

6.18 Contract and Commercial Risk Transfer

When contractual information is available and authorized for review, the methodology may evaluate information affecting:

site-condition responsibility; schedule obligations; warranty; testing; supervision; change management; indemnity; allowances; payment requirements; undocumented scope; and other commercial responsibility.

This category measures identifiable information and unresolved responsibility.

It does not constitute legal advice.

6.19 Schedule and Execution Dependency

Measures whether the documents reveal schedule conditions that materially affect interpretation or execution.

Potential indicators include:

occupied construction; phased work; shutdowns; cure periods; substrate release; sequencing; material lead time; milestone dates; owner turnover; and dependencies on adjacent trades.

6.20 Contradiction Burden

Measures the number and distribution of conflicting information conditions.

Contradiction count alone is insufficient.

Each contradiction should also be classified by significance.

A contradiction affecting punctuation is not equivalent to a contradiction affecting material selection, scope responsibility, quantity basis, procurement, warranty, or contract value.

Rhogan therefore treats contradiction **frequency** and contradiction **severity** as separate variables.

6.21 Unresolved Condition and Scope-Gap Burden

Measures conditions necessary for the decision that cannot be conclusively determined from available documentation.

Possible measurements include:

total unresolved conditions; decision-critical unresolved conditions; trade-assignment gaps; missing detail conditions; missing finish assignments; unknown system boundaries; and unresolved commercial responsibilities.

6.22 RFI-Generating Conditions and Resolution

Measures how many unresolved conditions require formal clarification and whether a valid resolution path exists.

Measurements may include:

RFI candidates identified; RFIs issued; questions resolved; unanswered conditions; affected locations; conflicting sources; decision impact; response authority; and bid position if unresolved.

An RFI is not evidence that the documents are poor.

It is evidence that an ambiguity has been formally recognized.

6.23 Proposal Qualification Strength

Measures whether identified uncertainty has been translated into a defensible commercial position.

Conditions may include whether:

assumptions are explicit; exclusions are explicit; unresolved scope is identified; bid positions are documented; RFIs are linked; governing document dates are stated; and qualifications remain traceable to underlying evidence.

A project may remain commercially bid-capable despite incomplete documentation when the unresolved conditions have been properly controlled.

6.24 Evidence Traceability

Measures whether intelligence outputs can be traced back to project evidence.

Potential measurements include:

findings with source references; findings with sheet or specification references; contradictions with both conflicting sources identified; RFIs tied to evidence; qualifications tied to unresolved conditions; and unsupported findings.

Traceability is a core maturity control because an untraceable conclusion cannot be independently inspected.

6.25 Human Validation

Measures whether AI-supported findings have been reviewed by a qualified construction professional before becoming decision intelligence.

Potential measurements include:

validated findings; rejected findings; modified findings; human overrides; unresolved AI findings; reviewer identity or role; and validation status.

AI-generated output should not receive the same evidentiary status as professionally reviewed construction intelligence.

6.26 Knowledge Continuity

Measures whether established project intelligence survives transitions between workflows and phases.

Potential transitions include:

estimating to pre-construction; pre-construction to contract; contract to project management; project management to field execution; and execution to closeout.

Measurements may include:

findings retained; qualifications retained; unresolved RFIs retained; revision history retained; source relationships retained; and decision rationale retained.

The purpose is to measure how much relevant project context survives the handoff rather than being recreated or lost.

7. Calculation of the Document Maturity Index

Each applicable maturity domain receives a score from 0 through 4.

The initial research model converts the average applicable domain score to a 100-point scale:

DMI = 25 × Mean Applicable Category Score

Example:

Mean maturity score = 2.8

DMI = 70

“Not Applicable” categories are excluded from the denominator.

Rhogan Research Institute should initially avoid arbitrary category weighting unless empirical research demonstrates that particular categories have greater predictive or decision value.

Equal weighting provides a transparent starting hypothesis.

Future studies may test alternative weights.

8. Provisional Interpretive Bands

For research and comparative purposes, the following bands may be used provisionally:

DMI	Classification	Interpretation
90–100	Mature	Information is highly coordinated and substantially decision-ready.
75–89	Substantial	Information is broadly usable but contains identifiable residual limitations.
60–74	Limited	Information can support controlled decisions only with material qualifications or clarification.
40–59	Immature	Significant information gaps or coordination conditions materially constrain reliance.
0–39	Insufficient	Available information does not provide a defensible basis for the intended decision.

These thresholds are **research thresholds**, not established industry standards.

They should be calibrated against real project outcomes before normative claims are made.

9. Decision Readiness Gate

The DMI score alone does not determine readiness.

A project must also pass a decision-specific critical-condition gate.

READY

Required decision-critical information is present and no unresolved condition materially prevents the intended decision.

READY WITH QUALIFICATIONS

The information supports the decision, but one or more material conditions remain unresolved and must remain controlled through written qualification, RFI, exclusion, assumption, allowance, or other documented mechanism.

NOT READY

The information cannot support the decision without unsupported inference, uncontrolled assumption, or reliance on unavailable or unresolved critical information.

A high average DMI cannot override a decision-critical failure.

This prevents a project with excellent performance in noncritical categories from mathematically concealing a fatal information gap.

10. Relationship to SQUARES RA

Document Maturity and SQUARES RA should be reported independently.

DMI asks:

How usable is the information?

SQUARES RA asks:

How much documented exposure is present?

These measurements may move independently.

Four conditions are therefore possible:

Document Maturity	Project Risk	Interpretation
High	Low	Coordinated information describing relatively controlled conditions.
High	High	Coordinated information clearly documenting substantial project exposure.
Low	Low	Incomplete information concerning an apparently uncomplicated scope; confidence remains limited.
Low	High	Incomplete information combined with significant exposure; strongest control condition.

This two-axis model provides substantially more intelligence than attempting to collapse maturity and risk into a single score.

11. SQUARES AI™ Workflow Performance Measures

Project maturity metrics should also remain distinct from metrics evaluating the Construction Intelligence process itself.

Current measurable workflow categories include:

review time; information-retrieval time; contradictions identified; unresolved conditions identified; revision changes detected; RFI-generating conditions surfaced; information retained across project handoffs; and Time to Turn where evaluated.

These metrics evaluate **process performance**, not document quality.

A faster review does not prove a better review.

A larger contradiction count does not prove a more intelligent system.

These measures become meaningful only when compared against a known project condition or validated reference baseline.

12. Intelligence Validation Metrics

Rhogan Research Institute should evaluate Construction Intelligence systems against known conditions rather than self-reported output volume.

Recommended validation measures include:

Detection Recall

Of all known relevant conditions in the validation set, what percentage did the process identify?

Precision

Of all conditions identified by the process, what percentage were valid?

False Positive Rate

How often did the system identify a condition that professional validation determined was not supported?

Missed-Condition Rate

How often did the system fail to identify a known material condition?

Evidence Traceability Rate

What percentage of accepted findings could be traced to supporting construction information?

Human Override Rate

How often did professional review materially change or reject an AI-supported finding?

Repeatability

When the same methodology evaluates the same evidence under controlled conditions, how consistently does it reproduce the same finding?

Inter-Rater Reliability

When multiple qualified professionals apply the methodology independently, how strongly do their maturity classifications agree?

Revision Sensitivity

When project information changes, does the methodology correctly identify the maturity categories affected by the change?

Decision Utility

Did the surfaced intelligence materially improve a documented construction decision?

These measurements evaluate the intelligence methodology itself rather than the construction documents.

13. Research Validation Protocol

Before the Document Maturity Index is presented as an industry benchmark, Rhogan Research Institute should subject the methodology to structured validation.

A validation dataset should contain projects with independently established document conditions.

Evaluators should score projects without knowing the benchmark outcome where practical.

Results should then be tested for:

construct validity; repeatability; inter-rater agreement; sensitivity to revision; false positives; missed conditions; category correlation; threshold stability; trade dependence; project-type dependence; decision-context dependence; and practical usefulness.

Unsuccessful results should remain part of the research record.

A credible methodology must be capable of producing evidence that its assumptions were wrong.

14. Limitations

The Document Maturity Index does not establish:

design correctness; code compliance; field conditions; contractor means and methods; actual installation quality; legal responsibility; product suitability; future project performance; or the absence of unidentified conditions.

A high DMI means that the available information is mature **for the defined decision context according to the methodology evaluated.**

It does not mean that the project is free of risk.

Similarly, a low DMI does not mean the underlying design is defective.

It means the available information does not yet provide sufficient clarity, coordination, or evidence for the specified decision.

15. Research Position

Construction has historically relied on document-status labels as proxies for information readiness.

The Document Maturity Index proposes a different approach.

Status describes what a document is called.

Maturity describes what the information can support.

The objective of the methodology is not to create another score for construction teams to display.

The objective is to create a transparent measurement structure through which information quality, uncertainty, coordination, and decision sufficiency can be inspected, tested, compared, and improved.

Construction Intelligence should not ask whether artificial intelligence produced an answer.

It should ask whether the evidence was sufficient, whether the relationships were correctly identified, whether the result survived professional review, and whether the information was mature enough to support the decision that followed.

That is the standard the Document Maturity Index is intended to measure.

Rhogan Research Institute

Research • Measurement • Validation • Standards

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This framework is a developing research methodology and is not presented as an adopted industry standard.