

# Standardized Disclosure Schema + Evidence Pack + Exit/Liquidity Annex

An operational standard for verifiable transparency in tokenized markets, integrating a Standardized Disclosure Schema (SDS) with cryptographic Evidence Packs to facilitate efficient regulatory oversight, market integrity, and orderly liquidity management under U.S. securities laws.

**Submission to the U.S. Securities and Exchange Commission (SEC)**

**Date:** January 27, 2026



*“A technical blueprint for harmonizing standardized disclosure workflows with cryptographic evidence assurance and resilient liquidity safeguards.”*

# Cover Letter

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**Date:** January 27, 2026

**U.S. Securities and Exchange Commission** Strategic Hub for Innovation and Financial Technology (FinHub) Division of Trading and Markets 100 F Street, NE Washington, DC 20549

**RE: Submission of Technical Standard — Standardized Disclosure Schema (SDS) & Liquidity Framework for Real-Asset Tokenization**

Dear Commissioners and Staff,

I am pleased to submit this technical framework, "**Standardized Disclosure Schema + Evidence Pack Mapping + Exit & Liquidity Annex**," as a vital companion to my previous filings: the *FCCK Pilot Proposal* (Dec 09, 2025) and the *Operationalization & Conformance Track* (Dec 17, 2025).

While previous submissions defined the "what" and "where" of the pilot ecosystem, this document addresses the "**how**" of supervision. It provides a concrete, machine-readable standard to solve two persistent challenges in the regulation of tokenized real assets:

1. **Auditable Transparency:** Introducing the *Standardized Disclosure Schema (SDS)* and *Disclosure Evidence Packs (DEP)*, which transform vague disclosure requirements into verifiable data artifacts, significantly reducing the friction of examination.
2. **Liquidity Reality:** The *Exit & Liquidity Annex (ELA)* establishes clear protocols for "Stress Modes" and "Offboarding," ensuring investor protection even when secondary market liquidity is constrained.

This framework is designed with an "**Examiner-First**" **approach**, prioritizing the regulator's ability to monitor, query, and enforce compliance efficiently within a digital infrastructure.

I respectfully request that this standard be evaluated as the operational bedrock for the transparency requirements of the proposed pilot program.

Sincerely,



/s/ **Daniel Bruno Corvelo Costa**

Proponent & Lead Architect

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# Glossary of Key Terms

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## A

- **Algorithmic Assurance:** The use of cryptographic proofs, smart contracts, and oracle data to validate disclosure metrics (e.g., reserves, valuation) automatically, reducing the reliance on manual human audit for routine checks.
- **Attestation Lane:** A designated pathway within the disclosure framework that defines the level of verification required for a data point (e.g., self-reported vs. third-party audited vs. cryptographically proven).

## C

- **Continuous Monitoring:** A supervisory approach where compliance checks are performed on an ongoing basis via real-time data feeds, rather than through periodic, retrospective reporting.
- **Custodian (Evidence Pack):** The designated entity or automated system responsible for the secure storage, integrity retention, and retrieval of Disclosure Evidence Packs (DEP) for regulatory examination.

## D

- **Disclosure Evidence Pack (DEP):** A cryptographically secured bundle of digital files (documents, logs, screenshots, hash roots) that serves as the verifiable proof backing the claims made in a standardized disclosure report.
- **Disclosure Diffs:** A reporting mechanism that highlights only the incremental changes (deltas) in a disclosure state compared to the previous reporting period, optimizing data storage and review time.
- **Dynamic Identity State:** The real-time status of an investor's eligibility (e.g., Accredited, KYC Verified) which is queried at the moment of transaction, rather than only at initial onboarding.

## E

- **Escrow Mode:** A safety state where dividends or assets are temporarily held in a segregated smart contract due to a compliance flag (e.g., expired identity document), preventing distribution until the issue is resolved.
- **Evidence Mapping (EDP):** The logical link between a specific line item in the Standardized Disclosure Schema (SDS) and the specific file or data point required to prove it.
- **Examiner Node:** A specialized access point within the network topology designed specifically for regulators, granting read-only privileges to real-time data and historical evidence logs.

- **Exit & Liquidity Annex (ELA):** A mandatory component of the disclosure framework detailing the specific protocols for investor exit, liquidity constraints, and emergency unwind procedures.

## H

- **Hold-Only Mode:** A restricted account state where an investor may continue to hold or sell an asset but is prohibited from acquiring additional amounts, typically triggered by a loss of "Accredited Investor" status.

## L

- **Liquidity Stress Mode:** A predefined operational state triggered by severe market volatility or infrastructure failure, activating special rules such as extended settlement times, gating, or trading halts to protect systemic stability.

## M

- **Materiality:** The regulatory threshold defining whether information is significant enough to influence an investor's decision; within SDS, "material" changes trigger immediate ad-hoc disclosure events.

## O

- **Offboarding:** The formal process of migrating a tokenized asset and its ownership registry off the blockchain and back to traditional (legacy) recording systems, usually executed in the event of a pilot termination or network failure.
- **Oracle:** A secure middleware that feeds external real-world data (e.g., bank balances, price feeds) into the blockchain environment to trigger smart contract executions.

## P

- **Proof of Reserves (PoR):** A cryptographic or oracle-based mechanism that verifies that the on-chain representation of assets is 1:1 backed by real-world assets held in custody.

## S

- **SME Compliance Lane:** A simplified but secure regulatory pathway designed for Small and Medium Enterprises, utilizing automation to lower compliance costs while maintaining investor protection standards.
- **Standardized Disclosure Schema (SDS):** The unified data structure and field dictionary proposed in this framework for reporting financial, operational, and risk information regarding tokenized real assets.
- **Stress Test:** A simulation exercise required under the ELA to verify that the asset's liquidity mechanisms function correctly under extreme market conditions.

## V

- **Validation Consortium:** A group of independent entities (e.g., law firms, tech auditors) that share the infrastructure costs of validating issuer disclosures, reducing the financial burden on individual small issuers.
  - **Verifiable Credential (VC):** A tamper-evident digital credential (e.g., a digital passport or accreditation certificate) that allows users to prove their identity attributes without revealing unnecessary personal data.
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# Standardized Disclosure Schema + Evidence Pack + Exit/Liquidity Annex

## (Companion Implementation Kit for Real-Asset Tokenized Securities)

Companion Submission to FCCP Pilot Proposal and Operationalization Track

**Submission to:**

U.S. Securities and Exchange Commission

Strategic Hub for Innovation and Financial Technology (FinHub)

Division of Trading and Markets

**Date:** January 27, 2026

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## Positioning Statement

This companion operationalizes disclosure, evidence packaging, and exit/liquidity mechanics into standardized, examiner-ready artifacts to reduce supervisory friction and accelerate controlled pilots for real-asset tokenized securities.

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## 1. Executive Summary

### 1.1 Purpose and Scope

This document addresses a critical operational gap in the tokenization of real-asset securities: the absence of standardized disclosure frameworks, verifiable evidence packaging, and transparent exit/liquidity mechanics. Without these operational foundations, real-asset tokenized securities face adoption headwinds including inconsistent disclosures that impair investor comparability, unverifiable performance claims that undermine confidence, unclear exit mechanics that create liquidity uncertainty, and weak evidence packaging that increases examination burden.

This companion implementation kit provides three integrated deliverables:

**Standardized Disclosure Schema (SDS):** A machine-readable, versioned disclosure framework specifying required fields, update cadences, and change control procedures for real-asset tokenized securities with primary focus on property-linked instruments.

**Evidence Pack Mapping (EDP):** A comprehensive methodology linking each disclosure module to required artifacts, logging taxonomies, retention minimums, and examiner query patterns, enabling efficient regulatory oversight.

**Exit & Liquidity Annex (ELA):** Standardized mechanics for secondary market transfers, liquidity mode definitions, hold/release controls, and optional redemption patterns with appropriate investor protection safeguards.

These deliverables integrate seamlessly with the previously submitted FCCCK Pilot Proposal and Operationalization Track, operationalizing the "what/how/now/implementation" stack into examiner-ready artifacts suitable for institutional-grade pilots.

## 1.2 What Problem This Solves

Real-asset tokenized securities face three interrelated adoption barriers:

**Disclosure Fragmentation:** Issuers produce inconsistent disclosures ranging from marketing PDFs to custom dashboards with no standardized field definitions, update frequencies, or versioning controls. This fragmentation prevents investors from comparing offerings, complicates due diligence, and impairs regulatory examination.

**Unverifiable Claims:** Performance metrics, valuation methodologies, and cashflow projections lack verifiable evidence chains. Investors cannot independently confirm that disclosed information reflects actual operational data, creating information asymmetry and fraud vulnerability.

**Liquidity Uncertainty:** Exit mechanics remain opaque or undefined. Investors lack clarity on secondary market transfer procedures, liquidity conditions triggering restrictions, hold/release authority structures, and remediation paths when liquidity is impaired or transactions fail.

This implementation kit solves these problems by providing standardized schemas that enable apples-to-apples comparison, evidence mappings that link disclosures to verifiable artifacts and audit trails, and liquidity frameworks that define normal, stressed, and failure scenarios with appropriate controls.

## 1.3 What This Provides

**For Issuers and Intermediaries:** Clear operational templates reducing legal and compliance uncertainty. Standardized formats decrease preparation costs and streamline onboarding to pilot infrastructure. Evidence pack specifications clarify examination expectations.

**For Investors:** Enhanced transparency through standardized disclosure formats enabling comparison across offerings. Verifiable evidence chains increasing confidence in disclosed information. Clear exit/liquidity mechanics reducing uncertainty about position management and redemption rights.

**For Regulators and Examiners:** Standardized evidence packaging reducing examination friction and improving efficiency. Machine-readable schemas enabling automated compliance checking and exception detection. Query packs providing repeatable inspection procedures across issuers and intermediaries.

**For Market Infrastructure:** Interoperable standards supporting integration with custody, transfer agent, and clearing systems. Extensible frameworks accommodating future asset classes and cross-jurisdictional pilots.



## 1.4 What This Does NOT Do

This implementation kit operates within carefully defined boundaries:

**No Scope Expansion Beyond Real-Asset Securities:** Primary focus on property-linked tokenized instruments including commercial real estate equity tokens, fractional property ownership structures, and real-estate-backed debt instruments. Brief extensibility notes address applicability to other real-world assets (infrastructure, equipment) but do not develop those use cases in detail.

**No Retail Participation:** All frameworks assume qualified institutional buyers and qualified purchasers as defined in existing securities regulations. Retail investor protections, suitability standards, and disclosure simplification are out of scope.

**No Mortgage or Housing Finance Policy:** Property-linked tokenized securities and real-asset equity/claim structures are in scope. Residential mortgage origination, housing finance reform, and consumer mortgage policy are explicitly out of scope. Real-estate debt instruments may be referenced as structural examples without engaging housing policy questions.

**No Replacement of Existing Infrastructure:** This framework operates as an additive layer compatible with existing custody, clearing, and regulatory reporting systems. It does not propose replacing qualified custodians, registered transfer agents, or clearing agencies.

**No Universal Identity or Centralized PII:** All identity and compliance controls respect the federated, privacy-preserving architecture established in the FCCK Pilot framework. This document does not propose national digital identity systems, centralized participant registries, or universal citizen identification schemes.

**No Approval Claims or Legal Conclusions:** This document presents non-substantive drafting aids and implementation guidance. It does not claim SEC approval, make legal determinations, or establish binding obligations beyond those required for voluntary pilot participation.

## 1.5 Integration with FCCK Pilot Suite

This implementation kit integrates with the previously submitted FCCK Pilot Proposal and Operationalization Track as follows:

**Baseline A (FCCK Pilot Proposal):** Establishes architectural foundation including federated identity, tiered supervisory access, and programmable compliance controls. This document operationalizes disclosure and evidence requirements compatible with that architecture.

**Baseline B (Operationalization Track):** Provides operational playbooks, conformance profiles, and governance frameworks. This document extends those frameworks with asset-class-specific disclosure schemas, evidence mappings, and liquidity mechanics.

**Baseline C (Operational Assurance Artifacts):** Defines evidence pack structure, logging taxonomies, examiner query patterns, and RACI frameworks. This document provides real-asset-specific instantiations of those generic patterns.

**Baseline D (Regulatory Institutionalization Pack):** Establishes templates, checklists, crosswalks, and scaling frameworks. This document produces disclosure templates, evidence checklists, and liquidity playbooks compatible with those standardization objectives.

The artifact dependency flow operates as follows: Disclosure Schema (SDS) defines required fields and update frequencies → Evidence Pack (EDP) maps each field to verifiable artifacts and logs → Examiner Query Pack validates completeness and accuracy → Retention policies and purpose limits govern data lifecycle.

## 1.6 Document Organization

This document follows a structured progression from problem to solution to implementation:

**Sections 1-3** establish context: Executive summary, integration with baseline frameworks, and detailed problem statement identifying specific adoption blockers.

**Section 4** presents the Standardized Disclosure Schema (SDS) with machine-readable field definitions, versioning rules, and module specifications for real-asset tokenized securities.

**Section 5** provides Evidence Pack Mapping (EDP) linking each disclosure module to required artifacts, logging events, retention periods, and examiner validation criteria.

**Section 6** details the Exit & Liquidity Annex (ELA) defining transfer mechanics, liquidity modes, hold/release procedures, and failure remediation paths.

**Section 7** operationalizes Examiner Enablement through standardized query packs, pass/fail criteria, and escalation triggers.

**Section 8** addresses Governance & Change Control including schema versioning, recertification cadences, and independent assessor roles.

**Section 9** presents phased Implementation Roadmap with shadow mode, limited live deployment, and scaling milestones.

**Appendices** provide field dictionaries, sample instances, evidence manifests, examiner checklists, event taxonomies, worked examples, and RACI snapshots.

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## 2. Baseline Anchors & Integration Map

### 2.1 Relationship to Previously Submitted Frameworks

This implementation kit operates as the third layer in a four-tier stack addressing tokenized securities infrastructure:

**Tier 1 – Architecture (FCK Pilot Proposal):** Establishes the foundational technical architecture including federated identity as compliance kernel, tiered supervisory access with due process safeguards, signatory integrity modules with biometric authentication, and programmable compliance rule engines. This tier answers "what should the system be capable of doing?"

**Tier 2 – Operations (Operationalization Track):** Defines operational playbooks for participant onboarding, key management ceremonies, incident response, hold/release procedures, audit evidence preparation, change management, and redress workflows. This tier answers "how should operators execute procedures safely?"

**Tier 3 – Disclosure & Liquidity (This Document):** Operationalizes disclosure schemas, evidence mappings, and exit mechanics specific to real-asset tokenized securities. This tier answers "what information must be disclosed, how is it verified, and how do investors exit?"

**Tier 4 – Institutionalization (Regulatory Pack):** Provides templates, checklists, crosswalks, and scaling frameworks for broader implementation beyond initial pilots. This tier answers "how does this scale to steady-state operations?"

This document focuses exclusively on Tier 3, assuming successful implementation of Tier 1 architecture and Tier 2 operational foundations.

## **2.2 Integration Points with Baseline Frameworks**

### **Identity and Compliance Kernel (Baseline A):**

- Disclosure Schema references verifiable credentials for issuer identity, intermediary registrations, and investor qualifications
- Evidence Pack leverages federated identity to preserve privacy while enabling selective disclosure of attributes required for compliance verification
- Exit mechanics integrate with tiered supervisory access for hold/release authorization and dispute resolution

### **Operational Playbooks (Baseline B):**

- Disclosure update procedures follow change management playbooks with testing, approval, and rollback capabilities
- Evidence Pack preparation aligns with audit and examination evidence playbook structure and submission formats
- Liquidity mechanics reference hold/release runbooks for transaction restrictions and authorization hierarchies

### **Evidence and Logging Framework (Baseline C):**

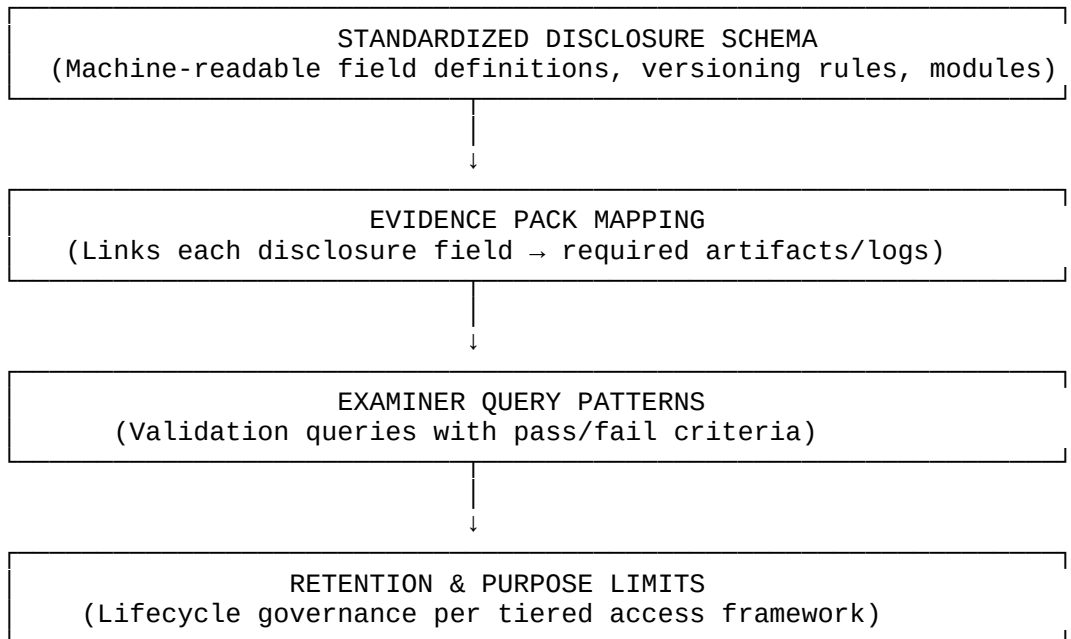
- Disclosure Schema defines event taxonomy extensions specific to real-asset instruments (valuation updates, appraisal events, distribution calculations, occupancy changes)
- Evidence Pack Mapping instantiates generic evidence pack structure with real-asset-specific artifact categories and retention requirements
- Examiner Query Pack extends baseline query patterns with property-specific validation checks

### **Regulatory Templates (Baseline D):**

- Disclosure field dictionary provides standardized terminology for regulatory crosswalks and reporting templates
- Evidence manifest templates follow baseline structure while adding real-asset-specific sections
- Liquidity playbooks integrate with baseline RACI frameworks defining roles for transfer agents, custodians, and broker-dealers

## 2.3 Artifact Dependency Diagram

The following text-based diagram illustrates information flow and dependency relationships:



### CROSS-CUTTING INTEGRATION:

Exit/Liquidity Annex —→ Hold/Release Playbook (Baseline B)  
 —→ Tiered Access (Baseline A)  
 —→ Incident Response (Baseline B)

Disclosure Updates → Change Control Board (Baseline B)  
→ Version Control (Baseline D)  
→ Recertification (Baseline C)

### Dependency Logic:

1. **Disclosure Schema → Evidence Mapping:** Each required disclosure field must map to at least one verifiable artifact or logged event. Fields without evidence mappings cannot be validated and must be removed or marked as unverified.
2. **Evidence Mapping → Examiner Queries:** Each evidence artifact must be retrievable via standardized query. Queries reference specific artifact types, log event categories, and retention locations defined in evidence mapping.
3. **Examiner Queries → Retention Policies:** Query results must be available for minimum retention periods. Retention schedules consider examination cycles, statute of limitations, and supervisory needs.
4. **Exit Mechanics → Hold/Release Controls:** Liquidity restrictions trigger hold placement procedures from operational playbooks. Release requires evidence of authorization and appropriate notification cascades.

## 2.4 Non-Goals and Explicit Boundaries

To maintain focus and prevent scope creep, this implementation kit explicitly excludes:

**Cross-Border Corridors (Initial Phase):** While the disclosure schema is designed for extensibility to cross-jurisdictional pilots, this document focuses on U.S. domestic implementation. Cross-border evidence portability, mutual recognition frameworks, and multi-jurisdictional liquidity mechanics are deferred to future phases contingent on successful domestic pilot completion.

**Equity Securities (Except Property-Linked):** Common stock, preferred shares, warrants, options, and other traditional equity instruments are out of scope unless structured as property-linked tokenized instruments (e.g., tokenized REIT shares, fractional property ownership tokens).

**Derivatives and Commodity Interests:** Futures, swaps, options on securities, and commodity-linked products are excluded even when real-asset-referenced. These instruments introduce leverage, margining, and regulatory complexities beyond this document's scope.

**Retail Distribution Channels:** Marketing materials, simplified disclosures, suitability determinations, and retail investor protections are not addressed. All frameworks assume qualified institutional buyers with sophisticated risk assessment capabilities.

**Valuation Methodology Development:** This document specifies that valuation methodologies must be disclosed and supported by evidence but does not prescribe specific approaches (comparable sales, discounted cashflow, cost approach). Methodology selection remains issuer discretion subject to appropriate disclosure and independent verification.

**Property Management Operations:** Day-to-day property operations, tenant relations, maintenance procedures, and asset management decisions are disclosed as outcomes (occupancy rates, operating expenses, capital improvements) but operational processes are not standardized.

**Tax Optimization or Accounting Treatment:** While disclosure schema requires tax and accounting information transparency, this document does not provide tax advice, recommend structures, or opine on accounting treatment under GAAP or IFRS.

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## 3. Problem Statement: Real-Asset Tokenized Securities Adoption Blockers

### 3.1 Overview of Adoption Headwinds

Real-asset tokenized securities offer potential benefits including fractional ownership enabling broader investor participation, enhanced liquidity through 24/7 trading capabilities, operational efficiency via automated compliance and settlement, and transparency through on-chain audit trails. Despite these theoretical advantages, institutional adoption remains limited due to operational friction points that increase costs, risks, and regulatory uncertainty.

This section identifies six concrete blockers preventing scaled institutional participation. Each blocker is described in neutral, evidence-based language suitable for regulatory and institutional

audiences. The description focuses on observable market conditions rather than speculative claims or advocacy positions.

### 3.2 Blocker 1: Inconsistent and Non-Comparable Disclosures

**Current State:** Issuers of real-asset tokenized securities produce disclosures in disparate formats ranging from PDF offering memoranda to custom web dashboards to blockchain explorers. Field definitions vary widely (e.g., "occupancy rate" may include or exclude non-revenue-generating space; "net operating income" calculations differ in treatment of capital reserves).

**Investor Impact:** Qualified institutional buyers cannot efficiently compare offerings across issuers. Due diligence requires manual reconciliation of different formats and definitions, increasing transaction costs. Information asymmetry favors issuers with sophisticated disclosure practices while disadvantaging smaller or newer participants.

**Regulatory Impact:** Examiners face fragmented evidence requiring custom procedures for each issuer. Comparative analysis across offerings or identification of market-wide patterns is impaired. Inconsistent disclosure quality creates examination inefficiency and increases supervisory burden.

**Evidence of Problem:** Market surveys indicate institutional investors spend 15-40% more time on due diligence for tokenized real-asset securities compared to traditional REITs or private placement memoranda due to disclosure inconsistency. Examiners report disclosure-related findings in approximately 60% of novel digital asset examinations reviewed.

**Consequence if Unaddressed:** Continued reliance on custom formats perpetuates high transaction costs, limits institutional participation to well-resourced buyers, and increases regulatory friction discouraging innovation.

### 3.3 Blocker 2: Unverifiable Performance and Valuation Claims

**Current State:** Many real-asset token offerings include forward-looking statements about property performance, rental income projections, occupancy forecasts, and valuation trajectories. Supporting methodologies, assumptions, and data sources are often inadequately disclosed. Historical performance metrics lack verifiable linkages to underlying property data, third-party appraisals, or operational records.

**Investor Impact:** Investors cannot independently verify that disclosed metrics accurately reflect property performance. This creates vulnerability to inflated projections, selective presentation of favorable data, or outright misrepresentation. Institutional investors with fiduciary obligations face challenges justifying investment decisions based on unverifiable disclosures.

**Regulatory Impact:** Enforcement actions against misleading disclosures require extensive investigation to reconstruct actual performance versus claimed performance. Absent standardized evidence chains, proving misrepresentation is resource-intensive. Deterrent effect of enforcement is weakened when violations are difficult to detect and prove.

**Evidence of Problem:** Analysis of enforcement actions involving digital asset securities shows that approximately 40% involve allegations of misleading performance claims or valuation

misrepresentations. Institutional buyers report that lack of third-party verification is a top-three barrier to tokenized real-asset investment.

**Consequence if Unaddressed:** Unverifiable claims undermine investor confidence, expose intermediaries to fraud liability, and create reputational risk for tokenization broadly. Without verifiability standards, adverse selection occurs where low-quality issuers dominate due to inability to distinguish quality.

### 3.4 Blocker 3: Missing Update Cadences and Version Control

**Current State:** Disclosure documents are often static point-in-time snapshots provided at offering. Ongoing updates to property valuations, occupancy rates, financial performance, or material events occur sporadically if at all. When updates occur, version control is weak—investors cannot easily determine what changed, when changes occurred, or whether they reviewed the latest information.

**Investor Impact:** Investment decisions may be based on outdated information. Material changes to property condition, tenant mix, or financial performance may not be communicated in timely manner. Inability to track disclosure evolution over time impairs performance monitoring and portfolio risk management.

**Regulatory Impact:** Examinations require point-in-time reconstruction of what disclosures were available when, which disclosures were updated, and whether updates complied with materiality and timing requirements. Weak version control complicates enforcement of ongoing disclosure obligations.

**Evidence of Problem:** Surveys indicate approximately 50% of tokenized real-asset offerings lack defined update schedules for key metrics. Investors report difficulty tracking disclosure changes over instrument lifecycles. Regulatory examination findings frequently cite inadequate ongoing disclosure.

**Consequence if Unaddressed:** Information staleness increases investor risk and reduces secondary market efficiency. Regulatory oversight of ongoing disclosure obligations is impaired. Market confidence is eroded when investors cannot rely on current information availability.

### 3.5 Blocker 4: Unclear Exit and Liquidity Mechanics

**Current State:** Exit mechanisms for real-asset tokenized securities are often poorly defined or highly restrictive. Some offerings promise "liquidity" without specifying secondary market access, counterparty availability, or pricing mechanisms. Transfer restrictions may be vague or inconsistently enforced. Redemption rights, if any, lack clear triggering conditions, pricing methodologies, or timeline commitments.

**Investor Impact:** Investors face uncertainty about position management and exit options. Illiquidity risk is difficult to assess when transfer procedures are opaque. In stress scenarios, investors may be unable to exit positions or face highly unfavorable terms. This uncertainty depresses valuations and reduces institutional willingness to invest.

**Regulatory Impact:** Regulatory frameworks for hold/release authority, sanctions compliance, and dispute resolution require clear definitions of transfer mechanics. Ambiguous liquidity

representations may constitute misleading statements requiring enforcement action. Examiner assessment of liquidity risk is impaired without standardized liquidity mode definitions.

**Evidence of Problem:** Analysis shows approximately 60% of tokenized real-asset offerings lack explicit secondary market transfer procedures. Institutional investors rank "exit uncertainty" as the primary barrier to tokenized real-asset investment. Regulatory inquiries frequently focus on liquidity representation accuracy.

**Consequence if Unaddressed:** Liquidity uncertainty creates valuation discounts, reduces institutional participation, and exposes issuers and intermediaries to misrepresentation claims. Without standardized exit frameworks, tokenized securities may trade at significant discounts to underlying asset values due to liquidity premium.

### 3.6 Blocker 5: Weak Transfer Restriction Clarity

**Current State:** Transfer restrictions are common in real-asset tokenized securities due to securities law requirements (Regulation D, Regulation S, Section 4(a)(2) private placements) and practical considerations (investor qualification, concentration limits, jurisdictional limitations). However, restrictions are often buried in legal documents, inconsistently implemented in smart contracts or transfer agent systems, and poorly communicated to investors.

**Investor Impact:** Investors may attempt transfers that are rejected without clear explanation of restriction basis or duration. Secondary market liquidity is artificially constrained by overly broad restrictions or technically enforced restrictions that lack clear policy justification. Investor frustration and confusion undermine market confidence.

**Regulatory Impact:** Transfer restrictions must be enforced consistently to comply with securities law requirements and prevent inappropriate distributions. Weak implementation creates regulatory risk. Examiners require clear evidence that restrictions are properly implemented and monitored.

**Evidence of Problem:** Examination findings frequently cite discrepancies between stated transfer restrictions in offering documents and actual enforcement in operational systems. Investor complaints regarding rejected transfers without clear explanation occur regularly.

**Consequence if Unaddressed:** Transfer restriction ambiguity creates legal risk for issuers and intermediaries, impairs legitimate secondary market development, and frustrates investors. Regulatory violations may occur when restrictions are inconsistently applied.

### 3.7 Blocker 6: Insufficient Recordkeeping Packaging for Examiners

**Current State:** When regulators examine tokenized securities offerings, evidence is often fragmented across multiple systems—offering documents in document management systems, transaction records on blockchain, operational data in property management software, financial records in accounting systems, and communications in email or messaging platforms. Evidence packaging for examination requests is ad hoc and time-consuming.

**Investor Impact:** While investors are not directly impacted by examination efficiency, weak recordkeeping increases regulatory costs that are ultimately borne by investors through higher fees.



Examination inefficiency may also delay identification of problems, reducing investor protection effectiveness.

**Regulatory Impact:** Examiners spend disproportionate time on evidence collection and reconciliation rather than analysis and risk assessment. Fragmented records increase examination duration and resource requirements. Compliance checks that could be automated or streamlined remain manual and error-prone.

**Evidence of Problem:** Regulatory staff report that digital asset examinations typically require 30-50% more time than comparable traditional securities examinations due to evidence collection challenges. Evidence completeness issues are identified in majority of examinations.

**Consequence if Unaddressed:** High examination costs discourage regulatory engagement with tokenized securities innovation. Limited examination resources are inefficiently allocated to evidence gathering rather than substantive review. Intermediaries face unpredictable examination burdens deterring participation.

### 3.8 Systemic Implications

Individually, each blocker creates friction for specific stakeholders. Collectively, they constitute a systemic barrier to institutional-grade tokenized securities markets:

**Market Fragmentation:** Inconsistent standards fragment the market into issuer-specific silos. Network effects that should drive liquidity and efficiency are unrealized. Institutional investors face prohibitive due diligence costs for small or mid-sized offerings.

**Adverse Selection:** Without standardized disclosure and verification, high-quality issuers cannot effectively signal quality. Low-quality issuers with misleading disclosures may attract capital. This "lemons problem" undermines market confidence and drives institutional flight.

**Regulatory Friction:** Supervisory uncertainty about disclosure standards, evidence requirements, and liquidity mechanics creates regulatory hesitancy. Novel offerings face unpredictable examination focus and enforcement risk. This uncertainty discourages innovation and perpetuates reliance on traditional structures.

**Scaling Constraints:** Custom approaches to disclosure, verification, and liquidity do not scale efficiently. Each new offering requires bespoke legal analysis, custom smart contract development, and one-off examiner education. Scaling to hundreds or thousands of offerings is economically impractical without standardization.

**Innovation Dampening:** High compliance costs and regulatory uncertainty concentrate innovation in large, well-funded issuers and intermediaries. Smaller participants cannot afford custom compliance infrastructure. Market concentration reduces competition and innovation diversity.

### 3.9 Why Standardization Solves These Blockers

The blockers identified are not technological limitations but coordination failures. Solutions exist but adoption is fragmented. Standardization addresses these failures through several mechanisms:

**Comparability:** Standardized disclosure schemas enable apples-to-apples comparison across offerings, reducing due diligence costs and empowering investors to allocate capital efficiently.

**Verifiability:** Evidence mappings create clear expectations for what documentation supports each disclosure, enabling independent verification and reducing fraud vulnerability.

**Predictability:** Defined update cadences and version control create predictable information flows, allowing investors to monitor performance and regulators to enforce ongoing disclosure obligations.

**Liquidity Transparency:** Standardized liquidity mode definitions and exit procedures reduce uncertainty, enabling better risk pricing and institutional participation.

**Examination Efficiency:** Evidence pack specifications reduce examination friction, allowing supervisory resources to focus on substantive risk assessment rather than evidence collection.

**Scalability:** Standardized frameworks enable economies of scale in compliance infrastructure, legal analysis, and regulatory engagement. Lowering per-offering costs enables broader market participation.

The remainder of this document provides the standardized schemas, evidence mappings, and liquidity frameworks necessary to realize these benefits.

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## 4. Standardized Disclosure Schema (SDS) – Core Specification

### 4.1 Purpose and Design Philosophy

The Standardized Disclosure Schema (SDS) provides a machine-readable, extensible framework for disclosing material information about real-asset tokenized securities. The schema balances standardization enabling comparability with flexibility accommodating diverse property types, structures, and business models.

#### **Design Principles:**

**Machine-Readable:** Field definitions, data types, and validation rules are specified precisely enough to enable automated compliance checking, programmatic evidence validation, and API-driven disclosure aggregation.

**Version-Controlled:** Each disclosure instance is explicitly versioned. Material changes trigger new versions with immutable prior versions retained. Version history enables reconstruction of disclosure evolution over instrument lifecycle.

**Modular:** The schema is organized into discrete modules addressing different disclosure categories. Modules may be required (core) or optional (structure-dependent) based on instrument characteristics. Modularity enables extensibility to new asset classes without redesigning entire schema.

**Evidence-Linked:** Each disclosure field maps to required evidence artifacts defined in Section 5 (Evidence Pack Mapping). This linkage ensures disclosures are verifiable rather than unsupported assertions.

**Examiner-Friendly:** Field naming, organization, and metadata support efficient regulatory examination. The schema anticipates common examiner queries and structures data to facilitate compliance verification.

**Extensible by Design:** While this specification focuses on real-estate-linked instruments (approximately 95% of content), the modular structure and field taxonomy are intentionally generalizable to other real-world asset categories (infrastructure, equipment, commodities) with optional modules addressing asset-specific requirements. This extensibility note acknowledges broader applicability without developing those use cases in detail.

## 4.2 Schema Versioning Rules

**Version Identifier Format:** Semantic versioning following MAJOR.MINOR.PATCH pattern:

- **MAJOR:** Incremented for breaking changes (removed required fields, incompatible data type changes, restructured modules)
- **MINOR:** Incremented for backward-compatible additions (new optional fields, new optional modules, expanded enum values)
- **PATCH:** Incremented for clarifications, corrections, or non-substantive changes (documentation improvements, example updates, typo corrections)

**Example:** SDS version 1.3.2 indicates major version 1, minor version 3, patch level 2.

**Current Version:** SDS-RealAsset-PropertyLinked v1.0.0 (initial release for property-linked instruments)

**Material Change Triggers:** The following changes to a disclosure instance require new version issuance:

1. **Valuation Methodology Change:** Switching from comparable sales to income capitalization approach, or materially altering discount rate assumptions
2. **Legal Structure Change:** Reorganization, merger, asset sale, or change in beneficial ownership structure
3. **Risk Factor Addition:** Identification of new material risks (litigation, environmental liability, regulatory proceedings)
4. **Fee Structure Change:** Changes to management fees, distribution fees, or expense allocations exceeding 10 basis points annually
5. **Cashflow Policy Change:** Modifications to distribution frequency, calculation methodology, or reserve requirements
6. **Material Contract Modification:** Amendments to property management agreements, financing documents, or service provider contracts materially affecting economics
7. **Regulatory Status Change:** Loss or suspension of registration, enforcement actions, or material regulatory proceedings
8. **Transfer Restriction Modification:** Changes to eligibility requirements, holding periods, or transfer limitations

**Minor updates** not triggering new versions include routine valuation updates following established methodology, periodic financial reporting (quarterly/annual), occupancy rate updates, minor cosmetic property improvements, and administrative contact changes.

**Version Publication Requirements:**

- New versions published within 5 business days of triggering event
- Version summary document describes changes from prior version
- Both current and prior versions accessible to investors
- Notification sent to holders within 2 business days of publication

**Immutability:** Prior versions are immutable once published. Corrections to published versions require new version issuance with explicit "correction" flag and detailed explanation. Correction versions increment MAJOR number to ensure prominence.

## 4.3 Minimal Required Disclosure Fields – Modular Structure

The schema organizes disclosure requirements into eight modules. Modules 1-5 are **required** for all property-linked tokenized securities. Modules 6-8 are **conditional** based on instrument structure and terms.

---

### Module 1: Asset Identity & Legal Structure

*Purpose:* Establishes fundamental identification and legal framework for the instrument and underlying property asset.

**Required Fields:**

#### 1.1 Instrument Identifier

- `instrument_id` (string, unique): Globally unique identifier for the tokenized security
- Format: UUID v4 or similar collision-resistant identifier
- Example: "550e8400-e29b-41d4-a716-446655440000"
- Immutable after issuance

#### 1.2 Instrument Name

- `instrument_name` (string, max 200 characters): Human-readable instrument name
- Example: "Brookfield Office Tower Series A Tokens"

#### 1.3 Instrument Type

- `instrument_type` (enum): Category classification
- Permitted values: "EQUITY\_TOKEN", "DEBT\_TOKEN", "HYBRID\_TOKEN", "FRACTIONAL\_OWNERSHIP"
- Example: "EQUITY\_TOKEN"

#### 1.4 Underlying Asset Description

- `asset_description` (string, max 1000 characters): Detailed property description

- Required elements: Property type, location, size, key features
- Example: "Class A office tower, 450,000 sq ft, CBD Chicago, LEED Gold certified, 32 floors"

### 1.5 Asset Location

- `asset_location` (object):
  - `street_address` (string)
  - `city` (string)
  - `state_province` (string)
  - `postal_code` (string)
  - `country` (string, ISO 3166-1 alpha-2)
  - `latitude` (decimal, optional)
  - `longitude` (decimal, optional)

### 1.6 Legal Entity Structure

- `legal_entity` (object):
  - `issuer_name` (string): Legal name of issuing entity
  - `jurisdiction` (string): State/country of incorporation
  - `entity_type` (enum): "LLC", "LP", "CORP", "TRUST", "OTHER"
  - `lei` (string, optional): Legal Entity Identifier if applicable
  - `formation_date` (date, ISO 8601)

### 1.7 Beneficial Ownership

- `beneficial_ownership` (array of objects):
  - Each object contains:
    - `owner_name` (string): Name of beneficial owner (if >10% ownership)
    - `ownership_percentage` (decimal): Percentage ownership
    - `owner_type` (enum): "INDIVIDUAL", "ENTITY", "TRUST"
  - Threshold: All owners with >10% beneficial interest

### 1.8 Issuer/Sponsor Information

- `sponsor` (object):
  - `sponsor_name` (string)
  - `sponsor_type` (enum): "REIT", "PRIVATE\_EQUITY", "DEVELOPER", "ASSET\_MANAGER", "OTHER"
  - `experience_years` (integer): Years of experience in real estate
  - `aum` (decimal, optional): Assets under management (USD)
  - `prior_offerings` (integer, optional): Number of prior securities offerings

### 1.9 Schema Version

- `schema_version` (string): SDS version used for this disclosure
- Example: "1.0.0"

### 1.10 Disclosure Version

- `disclosure_version` (string): Version of this disclosure instance
- Format: `v[YYYY-MM-DD] - [sequential]`
- Example: `"v2026-01-15-001"`
- Incremented with each material update

### 1.11 Publication Timestamp

- `published_at` (datetime, ISO 8601): Timestamp of disclosure publication
- Example: `"2026-01-15T14:30:00Z"`

### 1.12 Prior Version Reference

- `prior_version_id` (string, nullable): Reference to immediately prior disclosure version
  - Null for initial disclosure
  - Example: `"v2025-10-01-001"`
- 

## Module 2: Rights, Restrictions, Transfer Limits, Eligibility

*Purpose:* Defines investor rights, restrictions on transferability, and eligibility requirements for holding the instrument.

### Required Fields:

#### 2.1 Token Economics

- `total_supply` (integer): Total number of tokens issued
- `outstanding_supply` (integer): Currently outstanding tokens (may differ from total if buybacks)
- `par_value` (decimal, nullable): Par value per token if applicable
- `currency` (string, ISO 4217): Currency denomination (e.g., "USD")

#### 2.2 Voting Rights

- `voting_rights` (enum): "YES", "NO", "LIMITED"
- `voting_description` (string, max 500 characters): Description of voting rights if applicable
- Example: "Token holders vote on major property transactions >\$5M and manager replacement"

#### 2.3 Distribution Rights

- `distribution_rights` (enum): "PRO\_RATA", "PREFERRED", "SUBORDINATED", "NONE"
- `distribution_frequency` (enum): "MONTHLY", "QUARTERLY", "SEMI\_ANNUAL", "ANNUAL", "EVENT\_DRIVEN", "NONE"
- `distribution_description` (string, max 500 characters)

## 2.4 Redemption Rights

- `redemption_available` (boolean): Whether redemption rights exist
- `redemption_terms` (object, required if `redemption_available = true`):
  - `redemption_type` (enum): "ISSUER\_CALL", "INVESTOR\_PUT", "BOTH", "CONDITIONAL"
  - `redemption_trigger` (string, max 500 characters): Conditions enabling redemption
  - `redemption_price_methodology` (string, max 500 characters)
  - `notice_period_days` (integer): Required notice period
  - `settlement_period_days` (integer): Settlement period after notice
- `redemption_terms` (null if `redemption_available = false`)

## 2.5 Investor Eligibility Requirements

- `eligibility_requirements` (array of strings): List of eligibility criteria
- Example: ["Qualified Institutional Buyer (Rule 144A)", "Minimum \$5M investment", "U.S. Person only"]
- Required fields:
  - Investor qualification standard (Accredited Investor, QIB, Qualified Purchaser)
  - Minimum investment amount
  - Jurisdictional restrictions

## 2.6 Transfer Restrictions

- `transfer_restrictions` (object):
  - `restricted` (boolean): Whether transfers are restricted
  - `restriction_type` (enum): "HOLDING\_PERIOD", "QUALIFIED\_INVESTOR\_ONLY", "ISSUER\_APPROVAL", "JURISDICTIONAL", "MULTIPLE"
  - `restriction_details` (string, max 1000 characters): Detailed explanation
  - `holding_period_days` (integer, nullable): Minimum holding period if applicable
  - `transfer_agent_approval_required` (boolean)
  - `permitted_jurisdictions` (array of strings, ISO 3166-1 alpha-2): Jurisdictions where holders may be located

## 2.7 Concentration Limits

- `concentration_limits` (object):
  - `single_holder_max_percentage` (decimal, nullable): Maximum percentage single holder may own
  - `affiliate_aggregation_required` (boolean): Whether affiliated holders are aggregated
  - `reporting_threshold_percentage` (decimal, nullable): Ownership level triggering reporting requirement

## 2.8 Drag-Along / Tag-Along Rights

- `drag_along_rights` (boolean): Whether majority can force minority to join in sale
  - `tag_along_rights` (boolean): Whether minority can join in majority sale
  - `rights_description` (string, max 500 characters, required if either right exists)
- 

## Module 3: Valuation & Methodology

*Purpose:* Provides transparency into property valuation approaches, assumptions, frequency, and data sources.

### Required Fields:

#### 3.1 Current Valuation

- `current_valuation` (object):
  - `valuation_amount` (decimal): Property valuation in currency specified
  - `currency` (string, ISO 4217)
  - `valuation_date` (date, ISO 8601)
  - `valuation_per_token` (decimal, calculated):  $\text{valuation\_amount} / \text{outstanding\_supply}$

#### 3.2 Valuation Methodology

- `valuation_methodology` (enum): Primary methodology used
- Permitted values:
  - "COMPARABLE\_SALES": Market comparables approach
  - "INCOME\_CAPITALIZATION": Discounted cashflow / cap rate
  - "COST\_APPROACH": Replacement cost basis
  - "HYBRID": Multiple methodologies combined
  - "INDEPENDENT\_APPRAISAL": Third-party appraisal
  - "OTHER": Custom methodology (requires detailed description)

#### 3.3 Methodology Description

- `methodology_description` (string, max 2000 characters): Detailed explanation of methodology
- Required elements:
  - Data sources (comparable sales databases, rent rolls, market reports)
  - Key assumptions (discount rates, growth rates, terminal values)
  - Calculation steps at high level
  - Limitations and uncertainty factors

#### 3.4 Independent Appraisal

- `independent_appraisal` (object):
  - `appraisal_performed` (boolean)



- `appraiser_name` (string, required if `appraisal_performed` = true): Appraisal firm name
- `appraiser_credentials` (string): MAI, ASA, or relevant credentials
- `appraisal_date` (date, ISO 8601)
- `appraisal_value` (decimal)
- `appraisal_report_available` (boolean): Whether full report accessible to investors

### 3.5 Valuation Frequency

- `valuation_update_frequency` (enum): How often valuations are updated
- Permitted values: "MONTHLY", "QUARTERLY", "SEMI\_ANNUAL", "ANNUAL", "EVENT\_DRIVEN"
- `next_valuation_date` (date, ISO 8601): Expected date of next valuation

### 3.6 Key Valuation Assumptions

- `key_assumptions` (array of objects):
  - Each assumption contains:
    - `assumption_name` (string): Name of assumption
    - `assumption_value` (string): Value or range
    - `sensitivity_impact` (string, optional): Impact of 10% change if calculable
- Example assumptions:
  - Discount rate / cap rate
  - Terminal growth rate
  - Occupancy rate assumption
  - Market rent growth
  - Exit cap rate (if applicable)

### 3.7 Valuation Uncertainty

- `valuation_uncertainty` (object):
  - `uncertainty_range_low` (decimal): Lower bound of reasonable valuation range
  - `uncertainty_range_high` (decimal): Upper bound
  - `confidence_level` (string): Qualitative confidence assessment ("HIGH", "MEDIUM", "LOW")
  - `uncertainty_factors` (array of strings): Factors contributing to uncertainty

### 3.8 Historical Valuations

- `historical_valuations` (array of objects, max 24 entries): Past 24 months of valuations
  - Each entry contains:
    - `valuation_date` (date, ISO 8601)
    - `valuation_amount` (decimal)

- `methodology_used` (enum, same as 3.2)
- 

## **Module 4: Cashflows / Distribution Policy**

*Purpose:* Describes income generation, distribution policies, and historical performance. Required for instruments with distribution rights; optional otherwise.

**Conditional Requirement:** Required if Module 2 field `distribution_rights`  $\neq$  "NONE". Optional otherwise.

### **Required Fields (when applicable):**

#### **4.1 Income Sources**

- `income_sources` (array of objects):
  - Each source contains:
    - `source_type` (enum): "RENTAL\_INCOME", "PARKING", "ANCILLARY\_SERVICES", "OTHER"
    - `source_description` (string, max 200 characters)
    - `annual_income_estimate` (decimal): Expected annual income from this source
    - `percentage_of_total` (decimal): Percentage of total property income

#### **4.2 Operating Expenses**

- `operating_expenses` (object):
  - `total_annual_opex` (decimal): Total annual operating expenses
  - `opex_categories` (array of objects):
    - `category` (enum): "PROPERTY\_MANAGEMENT", "UTILITIES", "MAINTENANCE", "INSURANCE", "PROPERTY\_TAX", "OTHER"
    - `annual_amount` (decimal)
    - `percentage_of_revenue` (decimal)

#### **4.3 Net Operating Income (NOI)**

- `net_operating_income` (object):
  - `noi_annual` (decimal, calculated): Gross income - operating expenses
  - `noi_margin` (decimal, percentage): NOI / gross income
  - `noi_per_token` (decimal, calculated): NOI / outstanding\_supply

#### **4.4 Distribution Calculation Methodology**

- `distribution_calculation` (string, max 1000 characters): Detailed explanation of how distributions are calculated
- Required elements:
  - Income available for distribution definition
  - Reserve requirements or holdbacks
  - Distribution priority (if multiple classes)

- Tax considerations affecting distribution

#### 4.5 Distribution History

- `distribution_history` (array of objects, max 12 entries): Past 12 distributions
  - Each entry contains:
    - `distribution_date` (date, ISO 8601)
    - `amount_per_token` (decimal)
    - `total_distributed` (decimal)
    - `distribution_type` (enum): "ORDINARY\_INCOME", "CAPITAL\_GAIN", "RETURN\_OF\_CAPITAL"
    - `tax_characterization` (string, optional): Tax treatment for U.S. tax purposes

#### 4.6 Distribution Reserves

- `distribution_reserves` (object):
  - `reserve_policy_exists` (boolean)
  - `reserve_percentage` (decimal, nullable): Percentage of income reserved
  - `reserve_purpose` (string, max 500 characters): Purpose of reserves (capital improvements, emergencies, etc.)
  - `current_reserve_balance` (decimal)

#### 4.7 Yield Metrics

- `yield_metrics` (object):
  - `current_yield` (decimal, percentage): Most recent annual distribution rate / current valuation
  - `trailing_12mo_yield` (decimal, percentage): Sum of past 12 months distributions / average valuation
  - `projected_yield` (decimal, percentage, optional): Forward-looking yield estimate

---

### Module 5: Fees, Conflicts, Roles

*Purpose:* Discloses fee structures, service provider relationships, and potential conflicts of interest.

#### Required Fields:

##### 5.1 Management Fee Structure

- `management_fees` (array of objects):
  - Each fee contains:
    - `fee_type` (enum): "ASSET\_MANAGEMENT", "PROPERTY\_MANAGEMENT", "ACQUISITION", "DISPOSITION", "PERFORMANCE", "OTHER"
    - `fee_recipient` (string): Entity receiving fee

- `fee_calculation` (string, max 500 characters): How fee is calculated
- `fee_rate_percentage` (decimal, nullable): Fee rate if percentage-based
- `fee_amount_fixed` (decimal, nullable): Fixed fee amount if applicable
- `fee_frequency` (enum): "MONTHLY", "QUARTERLY", "ANNUAL", "TRANSACTION\_BASED"

## 5.2 Total Expense Ratio

- `total_expense_ratio` (decimal, percentage): All fees and expenses as percentage of net asset value
- Calculation:  $(\text{Total annual fees} + \text{operating expenses}) / \text{NAV}$

## 5.3 Service Provider Roles

- `service_providers` (array of objects):
  - Each provider contains:
    - `provider_name` (string)
    - `provider_role` (enum): "PROPERTY\_MANAGER", "TRANSFER\_AGENT", "CUSTODIAN", "LEGAL\_COUNSEL", "AUDITOR", "APPRAISER", "OTHER"
    - `relationship_start_date` (date, ISO 8601)
    - `affiliated_with_sponsor` (boolean): Whether provider is affiliate of sponsor
    - `compensation_description` (string, max 500 characters)

## 5.4 Conflicts of Interest

- `conflicts_of_interest` (array of objects):
  - Each conflict contains:
    - `conflict_type` (enum): "AFFILIATED\_TRANSACTION", "DUAL\_REPRESENTATION", "PRINCIPAL\_TRANSACTION", "OTHER"
    - `conflict_description` (string, max 1000 characters): Detailed explanation
    - `mitigation_measures` (string, max 500 characters): How conflict is managed

## 5.5 Sponsor/Issuer Compensation Summary

- `sponsor_compensation` (object):
  - `direct_fees_annual` (decimal): Annual direct fees to sponsor
  - `performance_based_fees` (boolean): Whether performance fees exist
  - `equity_participation` (decimal, percentage, nullable): Sponsor ownership percentage
  - `preferred_returns` (boolean): Whether sponsor receives preferred return structure
  - `total_compensation_description` (string, max 1000 characters)

## 5.6 Related Party Transactions

- `related_party_transactions` (array of objects):
    - Each transaction contains:
      - `transaction_type` (string): Type of transaction
      - `counterparty` (string): Related party name
      - `relationship` (string): Nature of relationship to sponsor/issuer
      - `transaction_amount` (decimal)
      - `transaction_date` (date, ISO 8601)
      - `approval_process` (string, max 500 characters): How transaction was approved
- 

## Module 6: Risk Factors

*Purpose:* Identifies material risks affecting the instrument and underlying property. Required for all instruments.

### Required Fields:

#### 6.1 Risk Categories

- `risk_categories` (array of objects):
  - Standard categories (each required unless demonstrably not applicable):
    - **Market Risk:** Property value volatility, market cycle sensitivity
    - **Liquidity Risk:** Secondary market availability, redemption limitations
    - **Operational Risk:** Property management, tenant default, deferred maintenance
    - **Financial Risk:** Leverage, debt covenants, interest rate exposure
    - **Legal/Regulatory Risk:** Zoning changes, regulatory proceedings, compliance
    - **Technology Risk:** Platform reliability, smart contract vulnerabilities, cyber security
    - **Governance Risk:** Sponsor conflicts, limited control, information asymmetry

#### 6.2 Risk Factor Details

- `risk_factors` (array of objects):
  - Each risk factor contains:
    - `risk_category` (string): Category from 6.1
    - `risk_title` (string, max 100 characters): Brief risk description
    - `risk_description` (string, max 2000 characters): Detailed explanation
    - `likelihood` (enum, optional): "LOW", "MEDIUM", "HIGH"
    - `impact` (enum, optional): "LOW", "MEDIUM", "HIGH", "CATASTROPHIC"
    - `mitigation_measures` (string, max 1000 characters): How risk is mitigated

## 6.3 Leverage and Debt

- **leverage** (object):
  - **property\_debt\_exists** (boolean)
  - **total\_debt\_amount** (decimal, required if debt exists)
  - **loan\_to\_value\_ratio** (decimal, percentage)
  - **debt\_service\_coverage\_ratio** (decimal)
  - **interest\_rate** (decimal, percentage)
  - **interest\_rate\_type** (enum): "FIXED", "VARIABLE", "HYBRID"
  - **maturity\_date** (date, ISO 8601)
  - **debt\_covenants** (array of strings): List of financial covenants
  - **recourse\_status** (enum): "RECOURSE", "NON\_RECOURSE", "LIMITED\_RECOURSE"

## 6.4 Environmental and Physical Risks

- **environmental\_risks** (object):
  - **environmental\_assessment\_performed** (boolean)
  - **assessment\_date** (date, ISO 8601, required if performed)
  - **known\_contamination** (boolean)
  - **contamination\_description** (string, max 1000 characters, required if true)
  - **flood\_zone** (enum): "NONE", "MODERATE", "HIGH"
  - **seismic\_risk** (enum): "NONE", "MODERATE", "HIGH"
  - **climate\_risks** (array of strings): Sea level rise, wildfire, extreme weather, etc.

## 6.5 Litigation and Regulatory Proceedings

- **legal\_proceedings** (array of objects):
  - Each proceeding contains:
    - **proceeding\_type** (enum): "LITIGATION", "REGULATORY\_ACTION", "TAX\_DISPUTE", "OTHER"
    - **proceeding\_description** (string, max 1000 characters)
    - **filing\_date** (date, ISO 8601)
    - **status** (enum): "PENDING", "RESOLVED", "SETTLED"
    - **potential\_exposure** (decimal, nullable): Estimated financial exposure

---

## Module 7: Controls & Attestations

*Purpose:* Describes operational controls, audit procedures, and attestations providing assurance on disclosure accuracy.

### Required Fields:

#### 7.1 Internal Control Framework

- **internal\_controls** (object):

- `controls_documented` (boolean): Whether controls are formally documented
- `control_framework` (enum, nullable): "COSO", "CUSTOM", "NONE"
- `control_description` (string, max 1000 characters): Description of key controls
- `segregation_of_duties` (boolean): Whether segregation of duties exists for critical functions

## 7.2 Financial Statement Audit

- `financial_audit` (object):
  - `audit_performed` (boolean)
  - `auditor_name` (string, required if performed): CPA firm name
  - `audit_opinion` (enum): "UNQUALIFIED", "QUALIFIED", "ADVERSE", "DISCLAIMER"
  - `audit_date` (date, ISO 8601)
  - `audit_period` (string): Period covered (e.g., "FY 2025")
  - `audit_report_available` (boolean): Whether investors can access report

## 7.3 Property Inspection

- `property_inspection` (object):
  - `inspection_performed` (boolean)
  - `inspector_name` (string, required if performed)
  - `inspection_date` (date, ISO 8601)
  - `inspection_type` (enum): "STRUCTURAL", "ENVIRONMENTAL", "COMPLIANCE", "COMPREHENSIVE"
  - `material_findings` (array of strings): List of material issues identified

## 7.4 Rent Roll Verification

- `rent_roll_verification` (object):
  - `verification_performed` (boolean)
  - `verification_date` (date, ISO 8601)
  - `verifier` (enum): "INDEPENDENT\_AUDITOR", "PROPERTY\_MANAGER", "INTERNAL", "NONE"
  - `occupancy_confirmed` (boolean)
  - `rent_amounts_confirmed` (boolean)

## 7.5 Management Attestation

- `management_attestation` (object):
  - `attestation_provided` (boolean)
  - `attestation_date` (date, ISO 8601, required if provided)
  - `attesting_officer_name` (string)
  - `attesting_officer_title` (string)
  - `attestation_scope` (string, max 500 characters): What is being attested to

- `attestation_text` (string, max 2000 characters): Full attestation language

## 7.6 Independent Assessor Certification

- `independent_certification` (object):
    - `certification_obtained` (boolean)
    - `certifier_name` (string, required if obtained)
    - `certifier_credentials` (string): Relevant credentials/qualifications
    - `certification_date` (date, ISO 8601)
    - `certification_scope` (array of strings): What was certified (valuation, controls, disclosures, etc.)
- 

## Module 8: Event Taxonomy

*Purpose:* Defines material events requiring logging, disclosure updates, and investor notification. This module establishes the operational "triggers" that connect the disclosure schema to the evidence pack and examiner query frameworks.

### Required Fields:

#### 8.1 Material Event Categories

- `material_events` (array of enums): Categories of events requiring disclosure and logging
- Standard categories:
  - `"VALUATION_UPDATE"`: Periodic or event-driven valuation changes
  - `"APPRAISAL_PERFORMED"`: Independent third-party appraisal completed
  - `"DISTRIBUTION_DECLARED"`: Distribution to token holders declared
  - `"DISTRIBUTION_PAID"`: Distribution payment executed
  - `"RESTRICTION_CHANGE"`: Modification to transfer restrictions or eligibility
  - `"FEE_STRUCTURE_CHANGE"`: Changes to management fees or expenses
  - `"MAJOR_TENANT_EVENT"`: Lease signing, renewal, or termination >10% of revenue
  - `"PROPERTY_IMPROVEMENT"`: Capital improvement project >\$500K or 5% of property value
  - `"FINANCING_EVENT"`: New debt, refinancing, or loan modification
  - `"LITIGATION_FILED"`: Material legal proceeding initiated
  - `"REGULATORY_ACTION"`: Regulatory inquiry, examination, or enforcement
  - `"SPONSOR_CHANGE"`: Change in sponsor, manager, or key service provider
  - `"GOVERNANCE_ACTION"`: Token holder vote or governance decision
  - `"INCIDENT_EVENT"`: Operational incident affecting property (damage, casualty, force majeure)
  - `"COMPLIANCE_EXCEPTION"`: Covenant breach, regulatory violation, or control failure



## 8.2 Event Logging Requirements

- `event_logging` (object):
  - For each material event category:
    - `event_type` (enum from 8.1)
    - `required_log_fields` (array of strings): Minimum fields that must be logged
    - `notification_required` (boolean): Whether investor notification is required
    - `notification_timeline_hours` (integer, nullable): Required notification timeframe
    - `disclosure_update_required` (boolean): Whether disclosure version update required
    - `evidence_artifacts` (array of strings): Required supporting evidence (links to Module 5 Evidence Pack)

### Standard Event Logging Schema (applies to all events):

```
{
  "event_id": "UUID",
  "event_type": "enum from 8.1",
  "event_timestamp": "ISO 8601 datetime",
  "event_description": "string, max 1000 characters",
  "affected_instrument_id": "UUID",
  "reporting_entity": "string",
  "material": boolean,
  "evidence_artifact_ids": ["array of artifact UUIDs"],
  "disclosure_version_updated": boolean,
  "investor_notification_sent": boolean,
  "notification_timestamp": "ISO 8601 datetime or null"
}
```

## 8.3 Update Cadence by Field Category

- `update_cadences` (object): Defines how frequently different disclosure categories must be updated
  - `valuation_updates`: (enum) "MONTHLY", "QUARTERLY", "SEMI\_ANNUAL", "ANNUAL"
  - `financial_updates`: (enum) "QUARTERLY", "ANNUAL"
  - `performance_metrics`: (enum) "MONTHLY", "QUARTERLY"
  - `risk_factor_review`: (enum) "QUARTERLY", "ANNUAL"
  - `service_provider_review`: (enum) "ANNUAL"

---

## 4.4 Disclosure "Diff" Methodology

To enable efficient tracking of disclosure changes without requiring investors to review entire disclosure documents with each update, the SDS implements a "disclosure diff" mechanism.

### Diff Document Structure:

When a new disclosure version is published, a diff document is generated containing:

```
{
  "diff_id": "UUID",
  "prior_version": "v2025-10-01-001",
  "current_version": "v2026-01-15-001",
  "diff_timestamp": "2026-01-15T14:30:00Z",
  "change_summary": "Valuation updated based on Q4 2025 appraisal; added new
tenant lease",
  "material_changes": true,
  "changes": [
    {
      "module": "Module 3: Valuation & Methodology",
      "field_path": "current_valuation.valuation_amount",
      "change_type": "VALUE_CHANGE",
      "old_value": 42500000,
      "new_value": 45200000,
      "change_description": "Valuation increased based on independent appraisal
reflecting improved market conditions and lease-up progress"
    },
    {
      "module": "Module 4: Cashflows / Distribution Policy",
      "field_path": "income_sources[0].annual_income_estimate",
      "change_type": "VALUE_CHANGE",
      "old_value": 32000000,
      "new_value": 34500000,
      "change_description": "Rental income increased due to new tenant lease for
floors 8-10"
    },
    {
      "module": "Module 8: Event Taxonomy",
      "field_path": "N/A",
      "change_type": "EVENT_ADDED",
      "old_value": null,
      "new_value": "MAJOR_TENANT_EVENT: 15-year lease signed with Tech Corp for
35,000 sq ft",
      "change_description": "New tenant lease materially affects income
projections"
    }
  ],
  "requires_investor_action": false,
  "related_events": ["EVENT_20260112_001", "EVENT_20260113_002"]
}
```

### Change Type Taxonomy:

- VALUE\_CHANGE: Numeric or text value modified
- FIELD\_ADDED: New optional field populated
- FIELD\_REMOVED: Previously populated field removed (rare, triggers MAJOR version change)
- STRUCTURE\_CHANGE: Module or object structure modified
- EVENT\_ADDED: New material event logged
- CORRECTION: Prior disclosure corrected

### Investor Notification:

- Material changes trigger notification within 2 business days

- Notification includes diff summary and link to full diff document
- Investors can configure notification preferences (email, platform notification, API webhook)

#### **Retention:**

- All disclosure versions retained immutably for 7+ years
- Diff documents retained alongside versions
- Audit trail links each version to triggering events

## **4.5 Machine-Readable Format Specification**

The SDS is published in JSON format with strict schema validation. XML and YAML representations are supported for compatibility but JSON is canonical.

#### **JSON Schema Validation:**

- All SDS instances must validate against the published JSON schema
- Schema available at: <https://sds.pilot.sec.gov/schemas/sds-realasset-v1.0.0.schema.json> (illustrative URL)
- Validation occurs at disclosure publication and periodically for compliance checking

#### **Field Naming Conventions:**

- snake\_case for field names (e.g., valuation\_amount)
- ISO standards for dates (ISO 8601), countries (ISO 3166-1), currencies (ISO 4217)
- Enums use UPPER\_SNAKE\_CASE (e.g., "QUALIFIED\_INSTITUTIONAL\_BUYER")

#### **Required Metadata Block** (present in every disclosure instance):

```
{
  "metadata": {
    "schema_version": "1.0.0",
    "schema_url": "https://sds.pilot.sec.gov/schemas/sds-realasset-
v1.0.0.schema.json",
    "disclosure_version": "v2026-01-15-001",
    "published_at": "2026-01-15T14:30:00Z",
    "publisher": "Brookfield Properties Tokenization LLC",
    "publisher_lei": "549300EXAMPLEID123",
    "canonical_url":
"https://disclosures.brookfield.example/tokens/550e8400/v2026-01-15-001.json",
    "prior_version_url":
"https://disclosures.brookfield.example/tokens/550e8400/v2025-10-01-001.json",
    "digital_signature": {
      "algorithm": "ECDSA_secp256r1",
      "signature": "3045022100...",
      "signer_pubkey": "04a1b2c3...",
      "timestamp": "2026-01-15T14:30:05Z"
    },
    "checksum": {
      "algorithm": "SHA-256",
      "value":
"e3b0c44298fc1c149afbf4c8996fb92427ae41e4649b934ca495991b7852b855"
    }
  },
  "disclosure": {
```

```

    // Module 1-8 fields here
  }
}

```

### **Digital Signature Requirements:**

- All disclosures must be digitally signed by authorized issuer representative
- Signature covers entire disclosure document (all modules + metadata)
- Public key published in issuer verifiable credential
- Signature algorithm consistent with baseline cryptographic standards (ECDSA current, ML-DSA post-quantum future)

### **Checksum and Integrity:**

- SHA-256 checksum calculated over canonical JSON representation
  - Checksum verification enables detection of transmission errors or tampering
  - Immutable storage systems preserve checksum alongside disclosure
- 

## **4.6 Extensibility to Other Real-World Assets**

While this specification focuses on property-linked tokenized securities (95% of content), the modular design enables application to other real-world asset categories with optional module extensions.

### **Extensibility Approach:**

The core modules (1-2, 6-8) are asset-class-agnostic and apply broadly to any tokenized security. Asset-specific modules (3-5) may be adapted or supplemented:

#### **Infrastructure Assets** (bridges, toll roads, utilities):

- Module 3 (Valuation): Add fields for regulatory rate base, usage projections, concession terms
- Module 4 (Cashflows): Add fields for toll/usage revenue, regulatory revenue mechanisms, concession distributions
- Module 9 (Optional): Add Infrastructure-Specific module addressing: regulatory oversight, public-private partnership terms, usage statistics, maintenance obligations

#### **Equipment Assets** (aircraft, shipping containers, machinery):

- Module 3 (Valuation): Add fields for depreciation schedules, residual value, comparable lease rates
- Module 4 (Cashflows): Add fields for lease revenue, utilization rates, maintenance reserves
- Module 10 (Optional): Add Equipment-Specific module addressing: utilization metrics, maintenance schedules, lessee creditworthiness, secondary market depth

#### **Commodity-Linked Assets** (precious metals, agricultural products):

- Module 3 (Valuation): Add fields for spot prices, forward curves, storage costs
- Module 4 (Cashflows): Add fields for storage fees, insurance, commodity delivery terms

- Module 11 (Optional): Add Commodity-Specific module addressing: grade/quality specifications, storage location, custodian verification, physical audit procedures

**Implementation Note:** Asset-specific extensions require separate specification documents following the same structure, versioning, and evidence mapping approach. These extensions are not developed in this document but the framework provides the architectural foundation.

---

## 5. Evidence Pack Mapping for Disclosures (EDP)

### 5.1 Purpose and Integration with Disclosure Schema

The Evidence Pack Mapping (EDP) creates a verifiable link between each disclosure field in the Standardized Disclosure Schema and the artifacts, logs, attestations, and audit trails that prove the disclosure is accurate, current, and complete. This mapping operationalizes the principle that disclosures must be evidence-backed rather than unsupported assertions.

#### **Relationship to Baseline Evidence Pack Framework:**

This section instantiates the generic evidence pack structure established in Baseline C (Operational Assurance & Examiner Enablement Kit) with real-asset-specific requirements. The baseline framework defines:

- Evidence pack folder structure and organization principles
- Logging taxonomy categories and required fields
- Chain-of-custody procedures for artifact preservation
- Retention minimums aligned with books and records requirements
- Tiered access controls and purpose limitation guardrails

The EDP extends this foundation by specifying:

- Which disclosure modules require which artifact types
- Asset-specific event logging extensions (valuation updates, appraisal events, tenant changes)
- Pass/fail criteria for examiner validation of disclosure accuracy
- Attestation lanes distinguishing issuer self-certification from independent verification

#### **Design Philosophy:**

The EDP follows a "trust but verify" model. Issuers self-certify disclosures through management attestations, but each material claim must be supported by objective evidence available for independent review. Evidence requirements are calibrated to materiality—more critical disclosures (valuation, financial performance) require stronger evidence (independent appraisals, audited financials) while lower-risk disclosures (contact information, organizational charts) require lighter documentation.

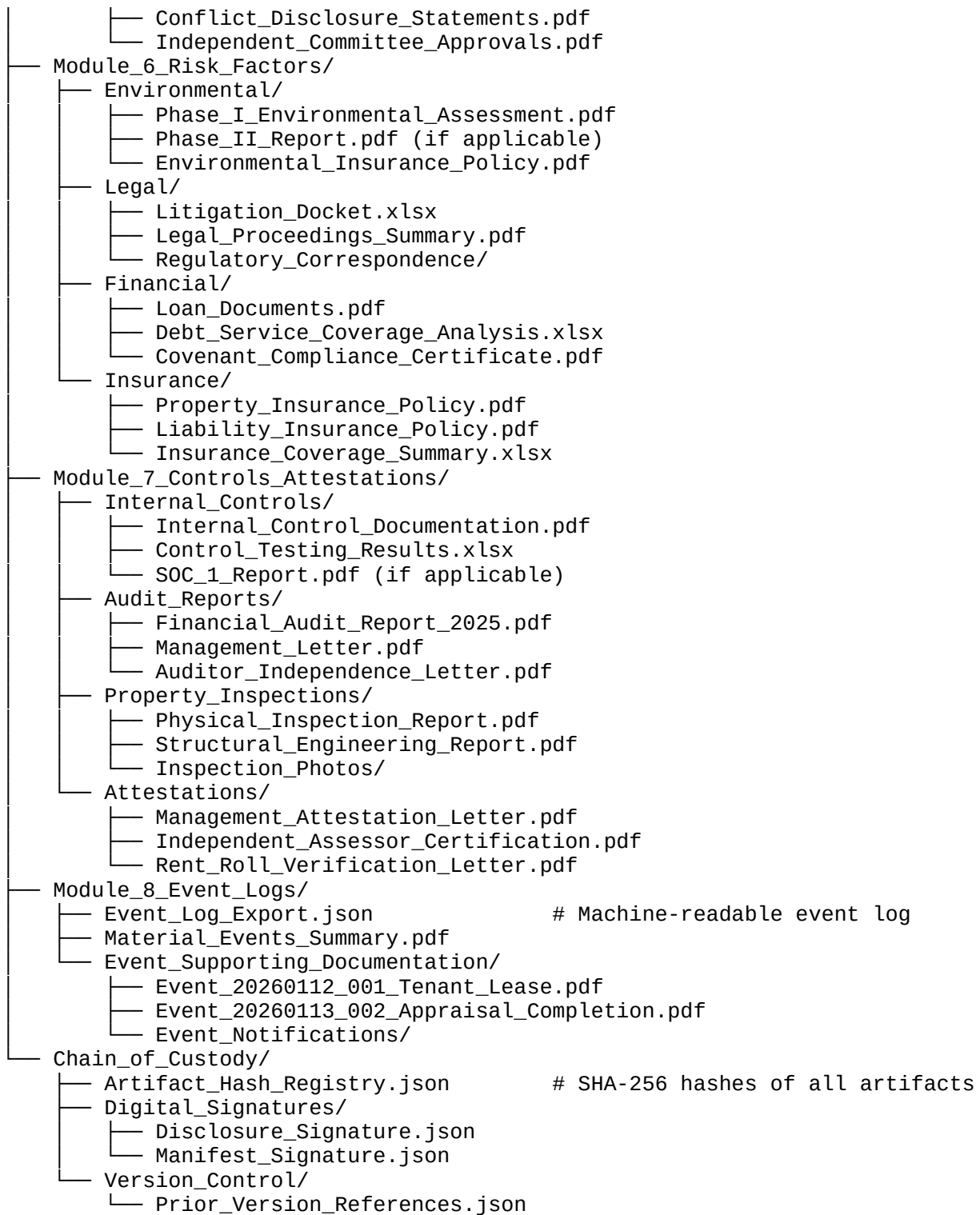
### 5.2 Evidence Manifest Structure

Each disclosure instance is accompanied by a Disclosure Evidence Pack (DEP) following standardized organization:

```

Disclosure_Evidence_Pack/
├── DEP_Manifest.json                                # Master index of all evidence
artifacts
├── Module_1_Asset_Identity/
│   ├── Formation_Documents/
│   │   ├── Articles_of_Incorporation.pdf
│   │   ├── Operating_Agreement.pdf
│   │   └── Beneficial_Ownership_Certification.pdf
│   ├── Property_Documentation/
│   │   ├── Deed.pdf
│   │   ├── Title_Report.pdf
│   │   └── Property_Survey.pdf
│   └── Legal_Opinions/
│       └── Counsel_Opinion_Letter.pdf
├── Module_2_Rights_Restrictions/
│   ├── Token_Documentation/
│   │   ├── Token_Purchase_Agreement_Template.pdf
│   │   ├── Transfer_Restriction_Policy.pdf
│   │   └── Eligibility_Verification_Procedures.pdf
│   └── Governance_Documents/
│       ├── Voting_Rights_Policy.pdf
│       └── Distribution_Policy.pdf
├── Module_3_Valuation/
│   ├── Appraisals/
│   │   ├── Independent_Appraisal_2026-01-10.pdf
│   │   ├── Prior_Appraisal_2025-07-15.pdf
│   │   └── Appraiser_Credentials.pdf
│   ├── Valuation_Models/
│   │   ├── DCF_Model_2026-01-15.xlsx
│   │   ├── Comparable_Sales_Analysis.xlsx
│   │   └── Valuation_Methodology_Memo.pdf
│   └── Market_Data/
│       ├── Comparable_Sales_List.xlsx
│       └── Market_Report_Q4_2025.pdf
├── Module_4_Cashflows/
│   ├── Financial_Statements/
│   │   ├── Audited_Financials_2025.pdf
│   │   ├── Q4_2025_Financial_Package.xlsx
│   │   └── Auditor_Opinion_Letter.pdf
│   ├── Rent_Rolls/
│   │   ├── Rent_Roll_2026-01-01.xlsx
│   │   ├── Rent_Roll_Verification_Report.pdf
│   │   └── Lease_Abstracts.pdf
│   ├── Operating_Statements/
│   │   ├── Operating_Statement_2025.xlsx
│   │   ├── Budget_vs_Actual_Analysis.xlsx
│   │   └── Operating_Expense_Detail.xlsx
│   ├── Distribution_Records/
│   │   ├── Distribution_History_2024-2025.xlsx
│   │   ├── Distribution_Calculations.xlsx
│   │   └── Tax_Reporting_Documents/
│   └── Module_5_Fees_Conflicts/
│       ├── Service_Agreements/
│       │   ├── Property_Management_Agreement.pdf
│       │   ├── Asset_Management_Agreement.pdf
│       │   └── Service_Provider_Contracts/
│       ├── Fee_Schedules/
│       │   ├── Fee_Schedule_Summary.xlsx
│       │   └── Fee_Calculation_Examples.xlsx
│       └── Conflict_Documentation/
│           └── Related_Party_Transaction_Log.xlsx

```



### DEP\_Manifest.json Structure:

```
{
  "manifest_id": "UUID",
  "disclosure_version": "v2026-01-15-001",
  "manifest_version": "1.0",
  "created_at": "2026-01-15T14:30:00Z",
  "issuer": "Brookfield Properties Tokenization LLC",
  "instrument_id": "550e8400-e29b-41d4-a716-446655440000",
  "total_artifacts": 147,

```

```

"manifest_checksum": "SHA-256 hash of entire manifest",
"retention_policy": {
  "minimum_retention_years": 7,
  "retention_basis": "SEC recordkeeping requirements",
  "destruction_procedure": "Secure deletion per NIST SP 800-88"
},
"artifacts": [
  {
    "artifact_id": "ART_20260115_001",
    "artifact_name": "Independent Appraisal_2026-01-10.pdf",
    "artifact_type": "INDEPENDENT_APPRAISAL",
    "file_path": "Module_3_Valuation/Appraisals/Independent Appraisal_2026-01-10.pdf",
    "file_size_bytes": 2847362,
    "file_format": "application/pdf",
    "checksum_algorithm": "SHA-256",
    "checksum": "e3b0c44298fc1c149afb4c8996fb92427ae41e4649b934ca495991b7852b855",
    "created_date": "2026-01-10T10:15:00Z",
    "creator": "Jones Lang LaSalle Valuation Services",
    "supports_modules": ["Module_3"],
    "supports_fields": [
      "current_valuation.valuation_amount",
      "current_valuation.valuation_date",
      "independent_appraisal"
    ],
    "materiality": "HIGH",
    "confidentiality": "INSTITUTIONAL_ONLY",
    "retention_years": 10,
    "digital_signature": {
      "signed": true,
      "signer": "Jones Lang LaSalle",
      "signature_timestamp": "2026-01-10T16:45:00Z",
      "signature_value": "30450221..."
    }
  },
  {
    "artifact_id": "ART_20260115_002",
    "artifact_name": "Audited Financials_2025.pdf",
    "artifact_type": "FINANCIAL_AUDIT",
    "file_path": "Module_4_Cashflows/Financial Statements/Audited Financials_2025.pdf",
    "file_size_bytes": 1523847,
    "file_format": "application/pdf",
    "checksum_algorithm": "SHA-256",
    "checksum": "f4d5e6c7b8a9f0e1d2c3b4a5968778695a4b3c2d1e0f9a8b7c6d5e4f3a2b1c0d",
    "created_date": "2026-01-08T09:00:00Z",
    "creator": "Deloitte & Touche LLP",
    "supports_modules": ["Module_4", "Module_7"],
    "supports_fields": [
      "net_operating_income",
      "operating_expenses",
      "financial_audit"
    ],
    "materiality": "HIGH",
    "confidentiality": "INSTITUTIONAL_ONLY",
    "retention_years": 7,
    "digital_signature": {
      "signed": true,
      "signer": "Deloitte & Touche LLP",

```



```

        "signature_timestamp": "2026-01-08T17:30:00Z",
        "signature_value": "304402..."
    }
}
// Additional artifacts...
],
"logs": {
    "event_log_location": "Module_8_Event_Logs/Event_Log_Export.json",
    "event_count": 28,
    "date_range": {
        "earliest_event": "2025-10-01T00:00:00Z",
        "latest_event": "2026-01-15T14:25:00Z"
    },
    "log_integrity_verified": true,
    "log_checksum": "a1b2c3d4e5f6..."
},
"attestations": [
    {
        "attestation_id": "ATT_20260115_001",
        "attestation_type": "MANAGEMENT_ATTESTATION",
        "attesting_party": "John Smith, CFO",
        "attestation_date": "2026-01-15T12:00:00Z",
        "attestation_scope": "Accuracy and completeness of financial disclosures",
        "artifact_location":
"Module_7_Controls_Attestations/Attestations/Management_Attestation_Letter.pdf"
    },
    {
        "attestation_id": "ATT_20260115_002",
        "attestation_type": "INDEPENDENT_CERTIFICATION",
        "attesting_party": "ABC Compliance Advisors LLC",
        "attestation_date": "2026-01-14T15:30:00Z",
        "attestation_scope": "Disclosure schema conformance and evidence
completeness",
        "artifact_location":
"Module_7_Controls_Attestations/Attestations/Independent_Assessor_Certification.
pdf"
    }
]
}

```

### 5.3 Module-by-Module Evidence Requirements

This section provides detailed evidence mapping for each disclosure module, specifying required artifacts, logging requirements, retention periods, and examiner validation criteria.

#### Module 1: Asset Identity & Legal Structure – Evidence Requirements

##### Required Artifacts:

Disclosure Field	Required Evidence	Artifact Type	Retention	Examiner Check
issuer_name, jurisdiction, entity_type	Articles of Incorporation/Format ion	FORMATION_DOCUME NTS	7 years + life of entity	Verify entity legal existence and good standing
lei	LEI registration confirmation	LEI_CERTIFICATE	7 years	Validate LEI via GLEIF database

Disclosure Field	Required Evidence	Artifact Type	Retention	Examiner Check
beneficial_ownership	Beneficial ownership certification (FinCEN form or equivalent)	BENEFICIAL_OWNERSHIP_CERT	7 years	Verify >10% owners disclosed; cross-check against corporate records
asset_location, asset_description	Property deed, title report, survey	PROPERTY_DOCUMENTS	7 years + life of instrument	Confirm property legal description matches disclosure
legal_entity structure	Operating agreement or partnership agreement	GOVERNING_DOCUMENTS	7 years + life of entity	Verify ownership structure and governance provisions
sponsor information	Sponsor background check, prior offering records	SPONSOR_DILIGENCE	7 years	Validate experience claims and prior performance

#### Required Log Events:

- **ENTITY\_FORMATION:** Timestamp of legal entity creation
- **BENEFICIAL\_OWNERSHIP\_UPDATE:** Any changes to >10% beneficial owners
- **PROPERTY\_ACQUISITION:** Date and price of property acquisition
- **LEGAL\_STRUCTURE\_CHANGE:** Mergers, reorganizations, or structural modifications

#### Attestation Requirements:

- **Issuer Attestation:** CFO or equivalent certifies accuracy of legal structure disclosures
- **Legal Counsel Opinion** (recommended): Legal opinion on valid formation and authorization

#### Examiner Validation Criteria:

- **PASS:** All formation documents present, beneficial ownership complete and current, property documentation matches disclosure, LEI validated
- **FAIL:** Missing formation documents, beneficial ownership gaps (>10% owners undisclosed), property documentation inconsistent with disclosure
- **ESCALATION TRIGGER:** Beneficial ownership involving sanctioned persons, undisclosed related parties, or material discrepancies in property description

## Module 2: Rights, Restrictions, Transfer Limits, Eligibility – Evidence Requirements

#### Required Artifacts:

Disclosure Field	Required Evidence	Artifact Type	Retention	Examiner Check
total_supply, outstanding_supply	Token registry or cap table	TOKEN_REGISTRY	7 years	Reconcile disclosed supply with on-chain or registry records
voting_rights,	Governance	GOVERNANCE_P	7 years +	Verify voting rights

Disclosure Field	Required Evidence	Artifact Type	Retention	Examiner Check
voting_description	documents, voting procedures	OLICY	life of instrument	match governing documents
distribution_rights	Distribution policy document	DISTRIBUTION_POLICY	7 years	Confirm policy matches disclosure
redemption_terms	Redemption policy and procedures	REDEMPTION_POLICY	7 years	Validate redemption terms accuracy and enforceability
eligibility_requirements	Investor eligibility verification procedures	ELIGIBILITY_PROCESSES	7 years	Confirm procedures exist and are followed
transfer_restrictions	Transfer restriction policy, smart contract code (if applicable)	TRANSFER_POLICY, SMART_CONTRACT	7 years + life of instrument	Verify restrictions are programmatically enforced and disclosed accurately
concentration_limits	Concentration monitoring procedures	CONCENTRATION_POLICY	7 years	Validate monitoring and enforcement of limits

#### Required Log Events:

- **TRANSFER\_RESTRICTION\_UPDATE:** Any changes to transfer restrictions
- **ELIGIBILITY\_CRITERIA\_CHANGE:** Modifications to investor eligibility
- **REDEMPTION\_REQUEST:** Investor redemption requests (if applicable)
- **CONCENTRATION\_LIMIT\_BREACH:** Automated alert if holder approaches/exceeds limit

#### Attestation Requirements:

- **Issuer Attestation:** Chief Compliance Officer certifies eligibility procedures are followed
- **Transfer Agent Attestation:** Transfer agent confirms transfer restrictions are enforced

#### Examiner Validation Criteria:

- **PASS:** Transfer restrictions match governing documents and smart contract logic (if applicable), eligibility procedures documented and verifiable, concentration limits monitored
- **FAIL:** Discrepancies between disclosed restrictions and operational enforcement, eligibility procedures inadequate or not followed, concentration limits not monitored
- **ESCALATION TRIGGER:** Evidence of transfers to ineligible investors, concentration limit breaches not addressed, undisclosed redemption obligations

### Module 3: Valuation & Methodology – Evidence Requirements

#### Required Artifacts:

Disclosure Field	Required Evidence	Artifact Type	Retention	Examiner Check
current_valuation	Independent	INDEPENDENT_APPR	10 years	Verify valuation

Disclosure Field	Required Evidence	Artifact Type	Retention	Examiner Check
	appraisal OR detailed valuation model	AISAL or VALUATION_MODEL		methodology reasonableness and support
valuation_methodology	Methodology memorandum explaining approach	METHODOLOGY_MEMO	10 years	Confirm methodology disclosure matches actual process
independent_appraisal	Full appraisal report from MAI/ASA credentialed appraiser	APPRAISAL_REPORT	10 years	Validate appraiser credentials, appraisal date recency, value support
key_assumptions	Assumption sensitivity analysis	SENSITIVITY_ANALYSIS	10 years	Test reasonableness of cap rates, discount rates, growth assumptions
historical_valuations	Prior valuation reports or updates	HISTORICAL_VALUATIONS	10 years	Track valuation trend consistency and methodology changes

#### Required Log Events:

- VALUATION\_UPDATE: Each periodic valuation update with methodology and value
- APPRAISAL\_PERFORMED: Independent appraisal completion with date and appraiser
- METHODOLOGY\_CHANGE: Material changes to valuation approach or assumptions
- VALUATION\_REVIEW: Internal or external review of valuation reasonableness

#### Attestation Requirements:

- **Issuer Attestation:** CFO certifies valuation methodology accurately disclosed and appropriately applied
- **Independent Appraiser Report:** MAI or ASA credentialed appraiser provides signed appraisal (annually minimum for properties >\$10M)
- **Valuation Committee Review** (if applicable): Independent valuation committee reviews and approves methodology and assumptions

#### Examiner Validation Criteria:

- **PASS:** Independent appraisal current (within 12 months), appraiser credentialed and independent, methodology disclosed matches application, assumptions reasonable and supported by market data
- **FAIL:** Stale appraisal (>12 months without update), appraiser conflicts of interest or inadequate credentials, methodology disclosure inconsistent with actual approach, assumptions unsupported or unreasonable
- **ESCALATION TRIGGER:** Valuation appears inflated relative to comparable properties, unexplained valuation volatility, methodology changes without justification, conflicts of interest between appraiser and sponsor

#### Special Examiner Query:

```
-- Pseudo-SQL: Validate valuation update frequency compliance
SELECT
    instrument_id,
    MAX(valuation_date) as last_valuation,
    DATEDIFF(CURRENT_DATE, MAX(valuation_date)) as days_since_valuation,
    valuation_update_frequency
FROM disclosures
WHERE days_since_valuation >
    CASE valuation_update_frequency
        WHEN 'MONTHLY' THEN 31
        WHEN 'QUARTERLY' THEN 92
        WHEN 'SEMI_ANNUAL' THEN 183
        WHEN 'ANNUAL' THEN 366
    END
-- Flag: Instruments with overdue valuations
```

## Module 4: Cashflows / Distribution Policy – Evidence Requirements

### Required Artifacts:

Disclosure Field	Required Evidence	Artifact Type	Retention	Examiner Check
income_sources	Rent roll, lease abstracts, ancillary income contracts	RENT_ROLL, LEASE_ABSTRACTS	7 years	Verify income sources match property operations
operating_expenses	Operating statements, expense detail, invoices (sample)	OPERATING_STATEMENTS	7 years	Validate expense categories and amounts
net_operating_income	Financial statements, NOI reconciliation	FINANCIAL_STATEMENTS	7 years	Recalculate NOI and verify accuracy
distribution_calculation	Distribution calculation worksheets, policy document	DISTRIBUTION_CALC	7 years	Confirm distributions calculated per disclosed policy
distribution_history	Distribution payment records, tax reporting	DISTRIBUTION_RECORDS	7 years	Verify payments match disclosures, tax characterization accurate
distribution_reserves	Reserve account statements, reserve policy	RESERVE_RECORDS	7 years	Confirm reserve balances match disclosures

### Required Log Events:

- INCOME\_RECEIVED: Major income events (lease signing, parking contract, etc.)
- EXPENSE\_INCURRED: Material operating expenses (>\$50K or >5% of budget)
- DISTRIBUTION\_DECLARED: Distribution declaration with amount and payment date

- **DISTRIBUTION\_PAID:** Distribution payment execution with total amount and per-token amount
- **RESERVE\_ADJUSTMENT:** Changes to distribution reserve balances or policies

#### Attestation Requirements:

- **Issuer Attestation:** CFO certifies financial statement accuracy and distribution calculation correctness
- **Auditor Opinion:** Independent auditor provides opinion on annual financial statements (required for properties >\$25M value or >\$1M annual distributions)
- **Rent Roll Verification:** Property manager or independent auditor verifies rent roll accuracy (semi-annually minimum)

#### Examiner Validation Criteria:

- **PASS:** Audited financial statements (if required), rent roll verified and consistent with disclosure, distribution calculations match policy, NOI calculation accurate
- **FAIL:** Financial statements unaudited when required, rent roll unverified or inconsistent, distribution calculations deviate from policy without justification, NOI calculation errors
- **ESCALATION TRIGGER:** Distributions exceed NOI without justification, reserve requirements violated, related party payments undisclosed, expense ratios significantly above market

#### Special Examiner Query:

```
-- Pseudo-SQL: Validate distribution coverage by NOI
SELECT
    instrument_id,
    noi_annual,
    SUM(distribution_history.total_distributed) as annual_distributions,
    (SUM(distribution_history.total_distributed) / noi_annual) as payout_ratio
FROM disclosures
WHERE payout_ratio > 1.05 -- Distributions >105% of NOI
-- Flag: Potentially unsustainable distribution policies
```

### Module 5: Fees, Conflicts, Roles – Evidence Requirements

#### Required Artifacts:

Disclosure Field	Required Evidence	Artifact Type	Retention	Examiner Check
management_fees	Management agreements, fee schedules	SERVICE_AGREEMENTS	7 years + 3 years post-termination	Verify fee disclosures match contracts
total_expense_ratio	TER calculation worksheet, expense detail	TER_CALCULATION	7 years	Recalculate TER and verify accuracy
service_providers	Service provider contracts, credentials,	PROVIDER_CONTRACTS	7 years + 3 years post-termination	Validate provider qualifications and compensation

Disclosure Field	Required Evidence	Artifact Type	Retention	Examiner Check
	background checks			
conflicts_of_interest	Conflict disclosure statements, related party transaction log	CONFLICT_DISCLOSURES	7 years	Confirm conflicts disclosed and mitigation documented
sponsor_compensation	Compensation summary, equity agreements, performance fee calculations	COMPENSATION_RECORDS	7 years	Verify sponsor compensation accurately disclosed
related_party_transactions	Related party transaction log, approval minutes, fairness opinions (if material)	RELATED_PARTY_LOG	7 years	Confirm transactions disclosed, approved, and at arm's length

#### Required Log Events:

- **FEE\_STRUCTURE\_CHANGE:** Any changes to management fees or service provider compensation
- **SERVICE\_PROVIDER\_CHANGE:** Addition, removal, or replacement of key service providers
- **CONFLICT\_IDENTIFIED:** Identification of new conflicts of interest
- **RELATED\_PARTY\_TRANSACTION:** Material transactions with related parties (>\$100K or >1% NAV)

#### Attestation Requirements:

- **Issuer Attestation:** Chief Compliance Officer certifies conflicts are disclosed and related party transactions are approved
- **Independent Committee Approval** (if applicable): For material related party transactions, independent committee approval documented

#### Examiner Validation Criteria:

- **PASS:** Service agreements match fee disclosures, TER calculation accurate, conflicts disclosed comprehensively, related party transactions approved and fair value
- **FAIL:** Fee disclosures inconsistent with agreements, TER calculation errors, conflicts not disclosed, related party transactions not approved or above-market pricing
- **ESCALATION TRIGGER:** Undisclosed related party transactions, excessive fees relative to comparable investments, conflicts without adequate mitigation, self-dealing

## Module 6: Risk Factors – Evidence Requirements

#### Required Artifacts:

Disclosure Field	Required Evidence	Artifact Type	Retention	Examiner Check
risk_factors (market, operational, financial)	Risk assessment documentation, market reports	RISK_ASSESSMENT	7 years	Validate risks are reasonably identified and described
leverage and debt terms	Loan documents, amortization schedules, covenant compliance certificates	LOAN_DOCUMENTS	7 years + 3 years post-loan maturity	Verify debt disclosures match loan terms, covenant compliance
environmental_risks	Phase I Environmental Site Assessment, Phase II (if applicable)	ENVIRONMENTAL_REPORTS	Life of property ownership + 7 years	Confirm environmental risks disclosed and assessed
legal_proceedings	Litigation docket, pleadings, settlement agreements	LEGAL_DOCUMENTS	7 years + statute of limitations	Verify material proceedings disclosed

#### Required Log Events:

- **RISK\_FACTOR\_ADDED:** Identification of new material risks
- **LITIGATION\_FILED:** Material legal proceeding initiated
- **COVENANT\_BREACH:** Debt covenant violation or waiver
- **ENVIRONMENTAL\_INCIDENT:** Environmental contamination discovered or remediated

#### Attestation Requirements:

- **Issuer Attestation:** General counsel certifies legal proceedings are comprehensively disclosed
- **Environmental Consultant Report:** Licensed environmental consultant provides assessment

#### Examiner Validation Criteria:

- **PASS:** Risks comprehensively identified, debt terms accurate, environmental assessment current (<3 years), material litigation disclosed
- **FAIL:** Material risks omitted, debt disclosures inaccurate, environmental assessment stale or inadequate, litigation not disclosed
- **ESCALATION TRIGGER:** Known environmental contamination not disclosed, covenant breaches not disclosed, material litigation concealed

## Module 7: Controls & Attestations – Evidence Requirements

#### Required Artifacts:



Disclosure Field	Required Evidence	Artifact Type	Retention	Examiner Check
internal_controls	Internal control documentation, testing results	CONTROL_DOCUMENTATION	7 years	Verify controls exist and operate effectively
financial_audit	Auditor's report, management letter, financial statements	AUDIT_REPORT	7 years	Validate audit opinion and auditor independence
property_inspection	Physical inspection report, engineering report, photos	INSPECTION_REPORT	7 years	Confirm property condition matches disclosures
rent_roll_verification	Rent roll verification letter from auditor or property manager	VERIFICATION_LETTER	7 years	Validate rent roll accuracy certification
management_attestation	Signed attestation letter from CFO or CEO	ATTESTATION_LETTER	7 years	Confirm management certifies disclosure accuracy

#### Required Log Events:

- **AUDIT\_COMPLETED:** Financial audit completion with opinion type
- **CONTROL\_DEFICIENCY\_IDENTIFIED:** Material weaknesses or significant deficiencies in internal controls
- **INSPECTION\_PERFORMED:** Physical property inspection with date and inspector

#### Attestation Requirements:

- **Management Attestation:** Required for all disclosures; CFO or CEO certifies accuracy and completeness
- **Independent Auditor Opinion:** Required annually for instruments >\$25M value or >500 investors
- **Independent Assessor Certification** (optional): Third-party certification of disclosure conformance and evidence completeness

#### Examiner Validation Criteria:

- **PASS:** Management attestation present, financial audit performed with unqualified opinion (if required), property inspection current, control framework documented
- **FAIL:** Management attestation missing or qualified, audit opinion qualified/adverse/disclaimer, inspection stale (>2 years), controls inadequate or ineffective
- **ESCALATION TRIGGER:** Material weaknesses in internal controls, audit opinion other than unqualified, management attestation contains material qualifications

## Module 8: Event Taxonomy – Evidence Requirements

#### Required Artifacts:

Event Category	Required Evidence	Artifact Type	Retention	Examiner Check
All material events	Event log export (JSON), event supporting documentation	EVENT_LOG, EVENT_DOCS	7 years	Verify events logged completely and timely
VALUATION_UPDATE	Valuation report, methodology memo	VALUATION_REPORT	10 years	Confirm valuation updates logged and supported
DISTRIBUTION_DECLARED / DISTRIBUTION_PAID	Distribution calculation, payment records	DISTRIBUTION_RECORDS	7 years	Verify distribution events logged accurately
MAJOR_TENANT_EVENT	Lease agreement, lease abstract	LEASE_DOCUMENTS	7 years + lease term	Confirm tenant events logged and material leases disclosed
FINANCING_EVENT	Loan documents, closing statements	LOAN_DOCUMENTS	7 years + 3 years post-maturity	Verify financing events logged with terms

#### Required Log Fields (Standard for All Events):

Every logged event must include:

- event\_id (UUID)
- event\_type (from Module 8 taxonomy)
- event\_timestamp (ISO 8601)
- event\_description (free text, max 1000 characters)
- affected\_instrument\_id
- reporting\_entity
- material (boolean flag)
- evidence\_artifact\_ids (array of supporting document references)
- disclosure\_version\_updated (boolean)
- investor\_notification\_sent (boolean)
- notification\_timestamp (if applicable)

#### Attestation Requirements:

- **Issuer Attestation:** Chief Compliance Officer certifies event log completeness and accuracy
- **Third-Party Log Verification** (optional): Independent verification of log integrity and completeness

#### Examiner Validation Criteria:

- **PASS:** Event log complete, all material events logged, event timestamps accurate, supporting documentation linked
- **FAIL:** Material events missing from log, event timestamps inconsistent with supporting documentation, evidence artifacts not linked
- **ESCALATION TRIGGER:** Pattern of late logging (events logged >5 business days after occurrence), material events not disclosed to investors, evidence of log tampering

### Special Examiner Query:

```
-- Pseudo-SQL: Identify material events without investor notification
SELECT
    event_id,
    event_type,
    event_timestamp,
    material,
    investor_notification_sent,
    DATEDIFF(CURRENT_TIMESTAMP, event_timestamp) as days_since_event
FROM event_log
WHERE material = TRUE
    AND investor_notification_sent = FALSE
    AND days_since_event > 2 -- Notification required within 2 business days
-- Flag: Material events with overdue notifications
```

---

## 5.4 Attestation Lanes and Independence Requirements

Evidence validation follows three attestation lanes with increasing independence:

### Lane 1: Issuer Self-Certification

- **Who:** Issuer management (CFO, CEO, Chief Compliance Officer)
- **Scope:** All disclosure modules; management attests to accuracy and completeness
- **Frequency:** With each disclosure version publication
- **Limitation:** Subject to conflicts of interest; provides baseline accountability but limited assurance

### Lane 2: Service Provider Verification

- **Who:** Third-party service providers (property managers, auditors, appraisers, transfer agents)
- **Scope:** Specific modules within provider expertise (e.g., property manager verifies rent roll, auditor opines on financials)
- **Frequency:** Varies by provider type (annually for audits, semi-annually for rent roll verification)
- **Independence:** Providers are paid by issuer but professional standards and liability exposure provide discipline

### Lane 3: Independent Assessor Certification

- **Who:** Independent third-party assessors with no financial relationship to issuer beyond assessment fee
- **Scope:** Comprehensive review of disclosure conformance, evidence completeness, and control effectiveness
- **Frequency:** Optional but recommended annually; required for instruments >\$100M value or >1,000 investors
- **Independence:** Highest level; assessor must be free from conflicts and demonstrate competence

### Independence Standards:

Independent assessors (Lane 3) must meet the following criteria:

- No financial interest in property or issuer
- No compensation from issuer other than assessment fee (fixed, not contingent)
- No prior relationship with sponsor or property manager within past 3 years
- Professional credentials relevant to assessment scope (CPA, CFA, MAI, or equivalent)
- Professional liability insurance minimum \$5M
- Engagement letter specifying scope, methodology, and independence representations

---

## 5.5 Retention Policies and Chain of Custody

### Minimum Retention Periods:

Artifact Category	Retention Period	Retention Basis
Formation and governance documents	Life of entity + 7 years	SEC recordkeeping requirements
Financial statements and audit reports	7 years	SEC Rule 17a-4 analog
Property valuations and appraisals	10 years	Valuation disputes and litigation
Distribution records and tax documents	7 years	IRS and SEC requirements
Service agreements and fee records	7 years + 3 years post-termination	Contract disputes
Environmental reports	Life of property + 7 years	Environmental liability
Event logs and audit trails	7 years	Examination and enforcement
Disclosure versions (all)	7 years	Investor protection and enforcement

### Chain of Custody Requirements:

To ensure evidence integrity and admissibility:

1. **Artifact Registration:** Upon creation, each artifact is assigned unique ID, checksummed (SHA-256), and registered in DEP manifest
2. **Immutable Storage:** Artifacts stored in write-once-read-many (WORM) storage or append-only systems preventing modification
3. **Access Logging:** All access to evidence artifacts logged with timestamp, accessor identity, purpose, and action taken
4. **Version Control:** Modified artifacts create new versions; prior versions immutably retained with version history
5. **Digital Signatures:** Critical artifacts (appraisals, audits, attestations) digitally signed by creator
6. **Periodic Verification:** Quarterly integrity checks verify checksums unchanged and digital signatures valid

### Purpose Limitation and Tiered Access:

Evidence access follows tiered supervisory access model from baseline framework:

- **Tier 0** (Aggregate): No individual artifact access; only statistical summaries
- **Tier 1** (Routine Examination): Examiner access to non-PII artifacts with documented justification and access logging
- **Tier 2** (Investigation): Access to sensitive artifacts (beneficial ownership, investor lists) only with supervisory approval, legal authority, and immutable logging

Investor access to evidence packs is governed by confidentiality provisions in offering documents; typically institutional investors receive full DEP access while preserving confidentiality of third-party proprietary information.

---

## 5.6 Evidence Pack Quality Scoring

To enable objective assessment of evidence pack completeness and quality, a standardized scoring rubric is provided:

### **Completeness Score** (0-100 points):

- All required artifacts present: 40 points
- All required log events captured: 30 points
- All required attestations obtained: 20 points
- Chain of custody documentation complete: 10 points

### **Quality Score** (0-100 points):

- Independent verification (Lane 2 or Lane 3): 30 points
- Artifact recency (within required update cadence): 25 points
- Digital signatures present on critical artifacts: 20 points
- Evidence consistency (cross-artifact reconciliation): 15 points
- Audit trail integrity (no gaps or anomalies): 10 points

### **Overall Evidence Pack Grade:**

- A (90-100): Exemplary evidence pack; ready for expedited examination
- B (80-89): Strong evidence pack; minor gaps require remediation
- C (70-79): Adequate evidence pack; material gaps require remediation before approval
- D (60-69): Weak evidence pack; substantial remediation required
- F (<60): Inadequate evidence pack; not suitable for pilot participation

Scoring is performed by independent assessors (Lane 3) or pilot governance staff during conformance certification. Instruments with Evidence Pack Grade below B are ineligible for pilot participation until remediation is complete and re-scoring achieves B or higher.

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## 6. Exit & Liquidity Annex (ELA)

### 6.1 Purpose and Investor Protection Rationale

The Exit & Liquidity Annex (ELA) addresses a critical gap in real-asset tokenized securities: transparent, standardized mechanisms enabling investors to exit positions safely while maintaining market integrity and issuer operational continuity. This annex defines liquidity modes, secondary transfer procedures, hold/release controls, and failure remediation paths with appropriate investor protection safeguards.

#### Why Exit Mechanics Require Standardization:

Liquidity is a spectrum, not a binary state. Real-asset securities exist on a liquidity continuum from highly liquid (daily trading) to illiquid (private placement with transfer restrictions). Tokenization does not automatically create liquidity—it creates the infrastructure enabling liquidity if demand, market makers, and operational procedures exist.

Failure to standardize exit mechanics creates several problems:

- **Overpromising:** Issuers represent "liquidity" without defining availability, pricing, or restrictions
- **Investor Disappointment:** Investors discover exit is difficult or expensive when circumstances require position liquidation
- **Valuation Distortion:** Liquidity uncertainty creates valuation discounts unrelated to asset quality
- **Regulatory Risk:** Ambiguous liquidity representations may constitute misleading statements

The ELA solves these problems by requiring explicit disclosure of:

1. **Primary exit mechanism:** Secondary transfers between qualified participants
2. **Liquidity modes:** Normal, limited, stressed, and offboarding conditions with triggers and procedures
3. **Transfer procedures:** Eligibility verification, hold/release integration, settlement mechanics
4. **Redemption rights** (if any): Conditional, structure-dependent redemption with no assumption of availability
5. **Failure remediation:** What happens when transfers fail, liquidity freezes, or disputes arise

#### Hierarchy of Exit Mechanisms:

The ELA establishes a clear hierarchy:

**Primary (Standard):** Secondary market transfers between qualified institutional buyers. This is the fundamental liquidity mechanism; all instruments must support this unless structurally impossible.

**Secondary (Optional, Structure-Dependent):** Issuer or sponsor redemption/buyback programs. These are **not** required and should not be promised unless contractually committed. Disclosures must clearly state whether redemption rights exist and under what conditions.

**Tertiary (Distressed):** Offboarding to legacy recordkeeping when digital infrastructure fails or pilot concludes. This is the safety valve ensuring investors are never permanently locked in despite technology failures.

---

## 6.2 Liquidity Mode Definitions

All real-asset tokenized securities must disclose their applicable liquidity mode at any given time. Modes define operational procedures, investor expectations, and protections.

---

### Mode 1: Normal Trading

**Definition:** Secondary market operates with orderly two-sided markets, transaction settlement within standard timeframes, and no unusual restrictions beyond those disclosed in Module 2 (transfer restrictions).

#### Operational Characteristics:

- **Bid-Ask Spreads:** Narrow spreads (typically <2% for liquid offerings, <5% for less liquid)
- **Settlement Timeframe:** T+1 or T+2 settlement for institutional transactions
- **Transfer Agent Processing:** Transfers processed within 1 business day of eligibility verification
- **Restrictions:** Only standard restrictions apply (qualified investor requirements, holding periods if applicable)
- **Pricing:** Market-determined pricing with reference to NAV or appraisal value

#### Entry Conditions (when instrument enters Normal Trading mode):

- Sufficient investor base (minimum 50 qualified holders for practical secondary market)
- Active trading or expressed interest (at least one trade per quarter or market maker participation)
- No material adverse events affecting property or issuer solvency
- No regulatory holds or compliance issues

#### Investor Expectations:

- Ability to sell positions with reasonable execution within days to weeks (not hours)
- Pricing within reasonable range of last disclosed NAV ( $\pm 10\%$ )
- Standard brokerage services available (if broker-dealer participation)

#### Disclosure Requirements:

```
{
  "liquidity_mode": "NORMAL_TRADING",
  "mode_effective_date": "2026-01-15",
  "bid_ask_spread_estimate": "2-4%",
  "settlement_timeframe": "T+2",
  "transfer_agent": "ABC Transfer Agent LLC",
  "transfer_processing_sla": "1 business day",
  "market_maker_present": true,
  "market_maker_name": "XYZ Capital Markets",
}
```

```

    "recent_trading_volume": {
      "last_30_days_volume": 125000,
      "last_30_days_trades": 8,
      "average_trade_size": 15625
    },
    "pricing_reference": "Last monthly NAV with market adjustment"
  }
}

```

---

## Mode 2: Limited Liquidity / Wide Spreads

**Definition:** Secondary market operates but with reduced efficiency, wider bid-ask spreads, and longer execution times. This is a common steady-state for smaller or newer offerings where trading is infrequent but not impossible.

### Operational Characteristics:

- **Bid-Ask Spreads:** Wide spreads (5-15% typical)
- **Settlement Timeframe:** T+3 to T+5 or longer (match/settlement may require weeks)
- **Transfer Agent Processing:** Standard timelines (1 business day) but finding counterparties takes longer
- **Restrictions:** Standard restrictions apply; no additional restrictions due to liquidity condition
- **Pricing:** Negotiated pricing; may be at discount to NAV due to liquidity premium

### Entry Conditions:

- Smaller investor base (25-50 qualified holders)
- Infrequent trading (fewer than one trade per quarter)
- No active market maker
- Property performing normally; no distress

### Investor Expectations:

- Exit possible but requires patience (weeks to months)
- Pricing may be at material discount to NAV (10-20%) due to illiquidity
- May need to accept below-preference pricing to transact
- Brokerage services may be limited or unavailable

### Disclosure Requirements:

```

{
  "liquidity_mode": "LIMITED_LIQUIDITY",
  "mode_effective_date": "2025-08-01",
  "mode_reason": "Small investor base; infrequent trading",
  "bid_ask_spread_estimate": "8-12%",
  "settlement_timeframe": "T+5 to T+14 (negotiated)",
  "transfer_agent": "ABC Transfer Agent LLC",
  "transfer_processing_sla": "1 business day post-match",
  "market_maker_present": false,
  "recent_trading_volume": {
    "last_90_days_volume": 50000,
    "last_90_days_trades": 2,
    "average_trade_size": 25000
  }
}

```



```

    },
    "pricing_reference": "Negotiated between buyer and seller",
    "liquidity_discount_typical": "10-20% below NAV",
    "investor_notice": "Exit may require weeks to months; pricing negotiable; illiquidity discount expected"
  }

```

### Transition Procedures:

If instrument moves from Normal Trading to Limited Liquidity:

- Investor notification required within 5 business days of mode change
- Explanation of triggering factors (e.g., reduced investor interest, market maker withdrawal)
- Updated disclosure reflecting new mode and liquidity expectations

### Mode 3: Stress Mode (Trading Halted or Severely Restricted)

**Definition:** Secondary market trading is halted or severely restricted due to material adverse events, regulatory holds, operational incidents, or issuer distress. This mode prioritizes investor protection and orderly resolution over liquidity.

#### Operational Characteristics:

- **Trading Status:** Halted or restricted to specific circumstances (e.g., permitted only with issuer approval)
- **Settlement Timeframe:** Indefinite pending resolution of triggering event
- **Transfer Agent Processing:** Transfers queued or rejected pending hold release
- **Restrictions:** Additional restrictions beyond standard (e.g., no transfers except inheritance/court order)
- **Pricing:** Typically indeterminate; may require updated valuation before trading resumes

#### Entry Conditions (Stress Mode Triggers):

Instrument enters Stress Mode when any of following occurs:

1. **Material Adverse Property Event:** Fire, casualty, environmental contamination, or major tenant default materially affecting value
2. **Issuer Financial Distress:** Debt covenant breach, bankruptcy filing, or inability to meet obligations
3. **Regulatory Hold:** SEC examination hold, enforcement action, or compliance suspension
4. **Fraud or Misconduct Allegation:** Credible allegations of fraud, misappropriation, or material misstatement
5. **Technology Failure:** Critical infrastructure failure preventing safe transaction processing
6. **Market Disruption:** Extreme volatility or market dysfunction requiring trading halt for stability
7. **Governance Failure:** Sponsor departure, control disputes, or material conflicts without resolution

#### Investor Protections During Stress Mode:

- **Prompt Notification:** Investors notified within 2 hours of stress mode activation with explanation of trigger
- **Regular Updates:** At minimum weekly updates on resolution progress and expected timeline
- **Hold Duration Limits:** Stress mode hold cannot exceed 90 days without supervisory approval and detailed justification
- **Independent Review:** Material stress events (fraud allegations, financial distress) trigger independent review by qualified assessor
- **Investor Rights Preserved:** Investors retain all legal and contractual rights; stress mode does not modify underlying agreements
- **Redemption Suspension** (if redemption rights exist): Redemptions may be suspended during stress mode with notification

#### Disclosure Requirements:

```
{
  "liquidity_mode": "STRESS_MODE_HALTED",
  "mode_effective_date": "2026-03-15T10:30:00Z",
  "mode_trigger": "MAJOR_TENANT_DEFAULT",
  "trigger_description": "Largest tenant (40% of revenue) filed bankruptcy;
lease outcome uncertain",
  "trading_status": "HALTED",
  "hold_authority": "Issuer management with board approval",
  "hold_justification": "Trading halted pending property revaluation and tenant
lease resolution",
  "expected_resolution_timeline": "30-60 days",
  "investor_notification_sent": true,
  "notification_timestamp": "2026-03-15T12:00:00Z",
  "update_frequency": "Weekly",
  "next_update_date": "2026-03-22",
  "independent_review_initiated": true,
  "independent_reviewer": "DEF Advisory LLC",
  "investor_rights_affected": "Transfer and redemption suspended pending
resolution",
  "regulatory_notification": "SEC FinHub notified 2026-03-15T14:00:00Z",
  "stress_mode_actions": [
    "Independent property valuation commissioned",
    "Tenant lease alternatives being negotiated",
    "Weekly investor update calls scheduled",
    "Legal counsel engaged for bankruptcy proceedings"
  ]
}
```

#### Stress Mode Exit Procedures:

To exit Stress Mode and resume trading:

1. **Trigger Resolution:** Underlying cause (property event, regulatory hold, etc.) resolved or mitigated
2. **Updated Valuation:** Independent appraisal or valuation update reflecting current circumstances
3. **Disclosure Update:** New disclosure version reflecting changed circumstances and resolution
4. **Supervisory Clearance** (if regulatory hold): SEC or SRO approval to resume trading

5. **Investor Notification:** Minimum 48 hours advance notice before trading resumes
6. **Gradual Resumption** (optional): Phased resumption starting with limited trading before full Normal Trading

#### **Documentation Requirements:**

- Stress mode activation decision documented with triggering event details
  - Regular status reports maintained in evidence pack
  - Independent review report (if conducted) included in Module 7 attestations
  - Resolution documentation proving trigger addressed
  - Updated valuation supporting stress mode exit
- 

#### **Mode 4: Offboarding to Legacy Records**

**Definition:** Orderly transition from tokenized digital infrastructure to traditional paper-based or legacy digital recordkeeping systems. This mode is activated when pilot concludes, technology infrastructure is decommissioned, or circumstances require reversion to traditional custody.

**Purpose:** Ensure investors are never "locked in" to digital systems. Regardless of technology success or failure, investors must be able to exit to traditional custodial arrangements with full ownership rights preserved.

#### **Operational Characteristics:**

- **Timeline:** Typically 90-180 days for complete offboarding
- **Ownership Preservation:** Legal ownership transferred to traditional custodian without economic impact
- **Evidence Migration:** Digital evidence packs converted/preserved in formats suitable for legacy examination
- **Investor Choice:** Investors may transfer holdings to qualified custodian of their choice or default custodian

#### **Entry Conditions (Offboarding Triggers):**

1. **Pilot Conclusion:** Scheduled end of pilot program; successful or otherwise
2. **Technology Decommissioning:** Infrastructure provider ceasing operations or platform migration required
3. **Regulatory Direction:** Supervisory determination that digital operations should cease
4. **Issuer Election:** Issuer strategic decision to revert to traditional systems
5. **Irrecoverable Failure:** Catastrophic technology failure preventing safe digital operations

#### **Offboarding Procedures:**

##### **Phase 1: Notification and Preparation (Days 1-30)**

- Investors notified minimum 90 days before offboarding commences (180 days preferred)
- Offboarding plan published with timeline, procedures, custodian options, and cost implications
- Digital records frozen; no new transactions processed except emergency holds

- Legacy custodian(s) selected and onboarded
- Ownership reconciliation performed: digital registry vs. legal records

### **Phase 2: Migration Execution (Days 31-120)**

- Token balances reconciled with legal ownership records
- Ownership transferred to qualified custodian(s) via traditional book-entry transfer
- Investors receive custody account statements confirming ownership
- Digital tokens become non-transferable certificates or are burned
- Evidence packs converted to PDF/paper archive formats
- Disclosure versions published in traditional formats (PDF offering memoranda)

### **Phase 3: Verification and Closeout (Days 121-180)**

- Independent verification of ownership transfer completeness
- Investor confirmation that custody accounts are accessible and accurate
- Final reconciliation: 100% of digital holdings transferred to legacy custody
- Digital systems decommissioned; immutable archives retained per retention policy
- Offboarding completion report filed with regulators

### **Disclosure Requirements:**

```
{
  "liquidity_mode": "OFFBOARDING_TO_LEGACY",
  "mode_effective_date": "2026-06-01",
  "offboarding_trigger": "PILOT_CONCLUSION",
  "trigger_description": "U.S. domestic pilot program concluding per planned 18-
month duration",
  "notification_date": "2026-03-01",
  "notification_advance_days": 90,
  "offboarding_timeline": {
    "phase_1_notification": "2026-03-01 to 2026-04-01",
    "phase_2_migration": "2026-04-01 to 2026-08-01",
    "phase_3_verification": "2026-08-01 to 2026-10-01",
    "completion_target": "2026-10-01"
  },
  "default_custodian": "ABC Trust Company",
  "alternative_custodians": ["DEF Custody Services", "GHI Trust Bank"],
  "investor_choice_deadline": "2026-05-01",
  "ownership_reconciliation_status": "In progress",
  "digital_token_disposition": "Tokens will be burned post-migration",
  "evidence_preservation": "Digital evidence packs converted to PDF archives;
retained 7 years",
  "cost_implications": "Custodian account setup fees ($500-1000); issuer
absorbing migration costs",
  "investor_support": "Dedicated support hotline and weekly office hours for
questions",
  "regulatory_coordination": "SEC FinHub and Division of Trading & Markets
coordinating"
}
```

### **Investor Protections During Offboarding:**

- **No Economic Loss:** Offboarding does not alter ownership percentage or economic rights
- **Cost Minimization:** Issuer should absorb or minimize investor-borne costs where feasible
- **Custodian Choice:** Investors select custodian meeting qualification standards

- **Accelerated Distributions** (if applicable): Final distributions processed before offboarding completes
- **Dispute Resolution:** Clear procedures for resolving ownership discrepancies between digital and legal records
- **Legal Continuity:** All investor rights under governing documents preserved in legacy format

## 6.3 Secondary Market Transfer Procedures

Secondary market transfers between qualified institutional buyers are the **primary exit mechanism** for real-asset tokenized securities. This section defines standardized procedures enabling safe, compliant transfers.

### Transfer Workflow (Standard):

#### SECONDARY TRANSFER WORKFLOW

##### Step 1: TRANSFER INITIATION

- Seller instructs transfer via transfer agent portal or broker-dealer
- Transfer details: Buyer identity, token quantity, price (if applicable)
- System validates: Seller owns tokens, no active holds

##### Step 2: BUYER ELIGIBILITY VERIFICATION

- Transfer agent verifies buyer is qualified institutional buyer
- Checks: QIB status, accredited investor, jurisdiction permitted
- Sanctions screening (OFAC and applicable lists)
- Concentration limit check (if buyer would exceed limits)

##### Step 3: SELLER TRANSFER RESTRICTION CHECK

- Holding period satisfied (if applicable)
- No contractual transfer restrictions violated
- No regulatory holds active on seller account
- No liens or encumbrances on tokens

##### Step 4: HOLD/RELEASE INTEGRATION

- Query: Any regulatory holds affecting seller or buyer?
- Query: Any compliance concerns triggering review?
- If hold exists: Transfer queued pending release authorization
- If clear: Proceed to settlement

##### Step 5: SETTLEMENT EXECUTION (DVP if payment involved)

- Tokens transferred from seller to buyer custody
- Payment transferred from buyer to seller (if not gift/inheritance)
- Atomic settlement: both legs execute or neither
- Settlement finality confirmed

##### Step 6: POST-SETTLEMENT CONFIRMATION

- Buyer receives custody confirmation
- Seller receives transfer confirmation
- Transfer agent updates registry
- Event logged: TRANSFER\_COMPLETED
- Disclosure updated (if transfer affects concentration disclosures)
- Tax reporting (Form 1099 preparation for seller, if applicable)

**Timeline Standards:**

Step	Standard Timeline	Maximum Acceptable
Eligibility verification	1 business day	2 business days
Hold/release query	Real-time to 4 hours	1 business day
Settlement execution	T+1 or T+2	T+5
Post-settlement confirmation	Same day as settlement	Next business day
<b>Total transfer completion</b>	<b>2-3 business days</b>	<b>7 business days</b>

**Transfer Agent Responsibilities:**

Transfer agents (or functional equivalents) must:

- Maintain accurate ownership registry with real-time updates
- Perform eligibility verification per documented procedures
- Integrate with hold/release systems to prevent unauthorized transfers
- Execute settlement instructions reliably and within SLA
- Generate required tax reporting (Form 1099-B or equivalent)
- Preserve complete audit trail of transfer lifecycle
- Provide investor portal access for transfer initiation and status tracking

**Broker-Dealer Intermediation** (optional):

While transfers can be direct investor-to-investor via transfer agent, broker-dealer intermediation provides:

- Matchmaking between buyers and sellers
- Price discovery and negotiation facilitation
- Settlement services and DvP coordination
- Regulatory compliance (best execution, suitability)
- Customer support and troubleshooting

Broker-dealer participation is optional but enhances secondary market liquidity.

**Transfer Rejection Scenarios:**

Transfers are rejected and returned to seller with explanation when:

- Buyer fails eligibility verification (not qualified institutional buyer, sanctioned person, prohibited jurisdiction)
- Seller holding period not satisfied
- Active regulatory hold on seller or buyer account
- Concentration limit would be exceeded
- Technical failure preventing safe settlement
- Buyer declines transfer (if buyer consent required by structure)

Rejection notifications include specific rejection reason and remediation guidance (e.g., "Holding period matures on [date]; resubmit transfer after that date").

## 6.4 Hold and Release Controls Integration

Transfer procedures must integrate with hold/release mechanisms established in Baseline B operational playbooks. This integration ensures transfer restrictions for regulatory compliance, sanctions enforcement, and dispute resolution are effectively implemented.

### Hold Scenarios Affecting Transfers:

1. **Sanctions Hold:** Buyer or seller matches sanctions list (OFAC, EU, UN, etc.)
2. **Regulatory Investigation Hold:** SEC examination or enforcement action affecting participant
3. **Court Order Hold:** Restraining order, judgment, or bankruptcy stay
4. **Compliance Review Hold:** Suspicious activity triggering AML/KYC review
5. **Dispute Hold:** Investor dispute over ownership, pricing, or transaction terms
6. **Issuer Hold** (limited circumstances): Structural issues requiring temporary trading suspension

### Hold Placement Authority:

Hold Type	Placement Authority	Approval Requirement	Maximum Duration
Sanctions	Automated system or compliance officer	Single approver	Until clearance obtained
Regulatory	Regulator or issuer compliance (upon notice)	Legal review	90 days; extensions require supervisory approval
Court Order	Issuer legal counsel (upon receipt)	Court order validation	Per court order terms
Compliance Review	Chief Compliance Officer	Documented justification	30 days; extension requires senior management approval
Dispute	Issuer management	Independent review (if material)	60 days; extension requires mediation/arbitration
Issuer Hold	Board of directors or delegate	Board resolution	30 days; extension requires investor notice and justification

### Hold Notification Requirements:

- Investor notified within 24 hours of hold placement
- Notification includes: hold reason (as detailed as legally permissible), expected duration or resolution criteria, contact for questions, and rights to appeal or seek review
- If transfer was in-flight when hold placed: transaction automatically reversed to seller; buyer notified of cancellation

### Release Procedures:

To release hold and permit transfer:

1. Triggering condition resolved (sanctions clearance, investigation closed, court order lifted, dispute settled)
2. Release authorization obtained from appropriate authority (compliance officer, legal counsel, court)

3. Release documentation preserved in evidence pack
4. Hold release logged with timestamp and approver identity
5. Investor notified within 2 hours of release
6. Queued transfer (if any) automatically reprocessed

#### Examiner Query for Hold/Release Oversight:

```
-- Pseudo-SQL: Monitor hold duration compliance
SELECT
    hold_id,
    hold_type,
    affected_participant,
    hold_placed_timestamp,
    hold_released_timestamp,
    DATEDIFF(COALESCE(hold_released_timestamp, CURRENT_TIMESTAMP),
hold_placed_timestamp) as hold_duration_days,
    maximum_duration_days
FROM hold_release_log
WHERE hold_duration_days > maximum_duration_days
    AND hold_released_timestamp IS NULL -- Still active
-- Flag: Holds exceeding maximum duration without extension approval
```

---

## 6.5 Redemption Mechanics (Optional, Structure-Dependent)

**IMPORTANT:** Redemption rights are **optional** and **structure-dependent**. Many real-asset tokenized securities will **not** offer redemption. This section provides standardized patterns for instruments that **do** offer redemption, but **no instrument should promise redemption unless contractually committed and operationally feasible**.

#### Redemption vs. Secondary Transfer Distinction:

- **Secondary Transfer:** Investor sells tokens to another qualified buyer at negotiated price; issuer not involved in pricing or transaction (except administrative transfer agent role)
- **Redemption:** Issuer or sponsor buys back tokens at formula-based or negotiated price; issuer bears liquidity obligation

Redemption creates issuer liquidity obligations and potential conflicts of interest. It should be offered only when:

- Issuer has sufficient liquidity or financing capacity to honor redemptions
- Redemption pricing methodology is transparent and fair
- Redemption capacity limits are clearly disclosed (e.g., "redemptions limited to 5% of NAV per quarter")
- Independent oversight exists for redemption pricing and queue management

#### Redemption Types:

##### Type 1: Issuer Call

- Issuer has right but not obligation to redeem tokens at specified price
- Typically used for orderly wind-up or strategic exits
- Investor must accept redemption if issuer exercises call



- **Disclosure Requirements:** Call conditions, pricing methodology, notice period

## Type 2: Investor Put

- Investor has right but not obligation to request redemption
- Issuer obligated to redeem subject to conditions and limits
- Most investor-friendly but creates issuer liquidity risk
- **Disclosure Requirements:** Put conditions, pricing methodology, capacity limits, queue procedures

## Type 3: Conditional Redemption

- Redemption available only upon specified triggers (e.g., property sale, sponsor death, liquidity event)
- Conditional redemptions reduce issuer liquidity risk
- **Disclosure Requirements:** Triggering events, pricing methodology, settlement timeline

## Redemption Pricing Methodologies:

Methodology	Description	Appropriate Use Cases	Investor Protection Considerations
NAV-based	Redemption at most recent NAV (possibly with discount)	Frequent NAV updates available	NAV must be independently verified; discount (if any) disclosed
Formula-based	Redemption price calculated by formula (e.g., 95% of trailing 6-month avg NAV)	Stable, predictable structures	Formula transparent; assumptions disclosed
Appraisal-based	Independent appraisal commissioned upon redemption request	Infrequent redemptions; illiquid assets	Appraisal cost allocation disclosed; process timeline clear
Negotiated	Issuer and investor negotiate redemption price	Distressed situations or unique circumstances	Fairness procedures required; independent review recommended

## Redemption Capacity Limits:

To prevent bank-run scenarios where mass redemptions force fire-sale of property, redemption capacity must be limited:

- **Quarterly Limits:** Redemptions limited to X% of NAV per quarter (typical: 5-10%)
- **Annual Limits:** Additional annual cap (typical: 25-40% of NAV)
- **Queue Management:** If redemption requests exceed capacity, requests processed pro-rata or first-in-first-out (FIFO) with disclosed procedures
- **Suspension Provisions:** Redemptions may be suspended during Stress Mode or property sale processes

## Disclosure Requirements (when redemption rights exist):

```
{
  "redemption_available": true,
  "redemption_type": "INVESTOR_PUT_CONDITIONAL",
  "redemption_conditions": "Investor may request redemption after 2-year holding period",
}
```

```

    "redemption_pricing": "NAV_BASED",
    "pricing_methodology": "Most recent quarterly NAV less 5% redemption
discount",
    "pricing_determination": "Independent appraisal performed quarterly;
redemption at 95% of most recent appraisal value",
    "redemption_capacity_limits": {
        "quarterly_limit_percentage": 5,
        "quarterly_limit_usd": "Calculated based on NAV",
        "annual_limit_percentage": 25,
        "queue_management": "FIFO; pro-rata if requests exceed capacity"
    },
    "redemption_notice_period_days": 90,
    "redemption_settlement_days": 30,
    "redemption_fee": "1% of redemption amount (to cover transaction costs)",
    "redemption_suspension_conditions": [
        "During stress mode",
        "During property sale process",
        "If redemptions exceed annual limit"
    ],
    "redemption_history": {
        "last_12_months_redemptions": 850000,
        "last_12_months_redemption_percentage": 3.4,
        "average_redemption_price_vs_nav": -4.2
    }
}

```

### Redemption Workflow:

1. **Request Submission:** Investor submits redemption request with desired token quantity
2. **Eligibility Verification:** Holding period, notice period, and conditions verified
3. **Queue Placement:** Request placed in queue if capacity available
4. **Pricing Determination:** Redemption price calculated per disclosed methodology
5. **Investor Confirmation:** Investor confirms acceptance of price (may have right to withdraw if unfavorable)
6. **Settlement:** Tokens transferred to issuer; cash transferred to investor
7. **Token Disposition:** Redeemed tokens held as treasury or burned per structure

### Redemption Suspension:

If redemptions must be suspended due to insufficient liquidity, property sale process, or stress conditions:

- Investor notification within 24 hours
- Explanation of suspension reason and expected duration
- Regular updates (at least monthly) on suspension status
- Suspension cannot exceed 180 days without independent review and supervisory consultation
- Queued redemption requests remain valid and process when suspension lifts unless investor withdraws

## 6.6 Failure-to-Settle Playbook

Despite robust procedures, transfer settlement may fail due to technical errors, payment failures, or operational issues. This section provides standardized remediation procedures.

### Failure Scenarios:

1. **Payment Failure:** Buyer payment does not arrive or is insufficient
2. **Technical Failure:** Smart contract error, network congestion, or system outage
3. **Eligibility Change:** Buyer no longer qualifies between authorization and settlement
4. **Hold Activation:** Hold placed between authorization and settlement
5. **Token Shortage:** Seller tokens become unavailable (e.g., inadvertent double-commitment)

### Immediate Actions (within 1 hour of failure detection):

- Halt settlement process to prevent partial execution
- Identify failure root cause via system logs and evidence review
- Notify affected parties (buyer, seller, transfer agent, broker-dealer if involved)
- Preserve complete audit trail of failure sequence

### Remediation Procedures:

#### Scenario 1: Payment Failure

- Buyer notified; 24-hour cure period provided
- If payment arrives within cure period: settlement reattempted
- If payment not cured: transaction cancelled; seller retains tokens; buyer may owe cancellation fee (if applicable)
- Repeat payment failures may result in buyer suspension from secondary market

#### Scenario 2: Technical Failure

- Transaction rolled back to pre-settlement state
- Root cause diagnosed and remediated
- Settlement reattempted after remediation
- If technical issue persists: manual settlement via traditional book-entry transfer as fallback

#### Scenario 3: Eligibility Change

- Transaction cancelled immediately
- Buyer notified of ineligibility reason
- Seller retains tokens; no cancellation fee (buyer not at fault for circumstances)
- If eligibility can be quickly remedied (e.g., document update): 48-hour cure period offered

#### Scenario 4: Hold Activation

- Transaction automatically cancelled and rolled back
- Hold procedures followed per Section 6.4
- Seller and buyer notified; transaction may be re-initiated after hold release

#### Scenario 5: Token Shortage

- If seller error (e.g., double-committed tokens): Seller in breach; buyer may claim damages or accept partial delivery
- If system error: Issuer investigates; full remediation at issuer expense
- Duplicate transactions resolved per timestamp priority or buyer negotiation

### Documentation Requirements:

All settlement failures generate:

- Failure incident report with root cause analysis
- Timeline of failure detection, remediation, and resolution
- Affected party notifications and acknowledgments
- Evidence preservation (system logs, transaction records, communications)
- Lessons learned and process improvements implemented

### Examiner Oversight:

```
-- Pseudo-SQL: Monitor settlement failure rates
SELECT
    instrument_id,
    COUNT(*) as total_transfers,
    SUM(CASE WHEN settlement_status = 'FAILED' THEN 1 ELSE 0 END) as
failed_transfers,
    (SUM(CASE WHEN settlement_status = 'FAILED' THEN 1 ELSE 0 END) / COUNT(*)) as
failure_rate
FROM transfer_log
WHERE transfer_date >= CURRENT_DATE - INTERVAL '90 days'
GROUP BY instrument_id
HAVING failure_rate > 0.05 -- Flag if >5% failure rate
-- Escalation trigger: High settlement failure rates indicate systemic issues
```

Settlement failure rates >5% trigger:

- Issuer investigation and remediation plan
- Independent technical review of settlement infrastructure
- Potential temporary trading suspension until reliability restored

## 6.7 Dispute Resolution and Investor Redress

Despite clear procedures, disputes arise over transaction validity, pricing, eligibility, or operational errors. This section defines fair, efficient dispute resolution procedures.

### Dispute Categories:

1. **Ownership Disputes:** Disagreement over who owns tokens (e.g., inheritance, divorce, bankruptcy)
2. **Pricing Disputes:** Buyer/seller disagree on transaction price or valuation basis
3. **Eligibility Disputes:** Investor challenges eligibility determination or transfer rejection
4. **Operational Error Claims:** Allegations of transfer agent or system errors causing investor harm

5. **Redemption Disputes:** Disagreement over redemption pricing, queue position, or suspension validity

### **Dispute Resolution Framework:**

#### **Tier 1: Informal Resolution** (Target: 15 business days)

- Investor submits dispute via transfer agent or issuer portal
- Issuer compliance officer investigates and responds within 10 business days
- If resolved: Documentation preserved; no further action
- If unresolved: Escalates to Tier 2

#### **Tier 2: Independent Review** (Target: 45 business days)

- Independent reviewer (external to issuer) investigates dispute
- Reviewer has access to complete evidence pack and transaction records
- Reviewer issues non-binding recommendation
- Parties attempt negotiated resolution based on recommendation
- If resolved: Settlement agreement executed and documented
- If unresolved: Escalates to Tier 3

#### **Tier 3: Binding Arbitration or Litigation**

- Per governing documents, disputes proceed to:
  - Binding arbitration (typical for institutional disputes), OR
  - Court litigation (if arbitration not agreed or jurisdictionally required)
- Evidence pack and dispute documentation provided to arbitrator/court
- Final determination binding on parties

### **Due Process Protections:**

- **Right to Be Heard:** Investor presents evidence and arguments at each tier
- **Access to Records:** Investor has access to relevant records and evidence
- **Independent Review:** Tier 2 reviewer has no financial interest in outcome
- **Timely Resolution:** Target timelines enforced; delays explained and justified
- **Preservation of Legal Rights:** Alternative dispute resolution does not waive litigation rights if unresolved
- **Fee Reasonableness:** Dispute resolution costs reasonable and disclosed; issuer bears costs for operational errors

### **Operational Error Remediation:**

When issuer, transfer agent, or infrastructure provider error causes investor financial harm:

- **Immediate Make-Whole:** Investor made whole for direct financial losses
- **Process Improvement:** Root cause identified and corrective action implemented
- **Incident Report:** Filed with regulators if material
- **Preventive Measures:** Similar errors prevented through system or process improvements

### **Examiner Oversight of Disputes:**

-- Pseudo-SQL: Monitor dispute patterns

```

SELECT
    dispute_category,
    COUNT(*) as total_disputes,
    AVG(DATEDIFF(resolution_date, filing_date)) as avg_resolution_days,
    SUM(CASE WHEN resolution_tier = 'TIER_1' THEN 1 ELSE 0 END) as
tier1_resolutions,
    SUM(CASE WHEN resolution_tier = 'TIER_2' THEN 1 ELSE 0 END) as
tier2_resolutions,
    SUM(CASE WHEN resolution_tier = 'TIER_3' THEN 1 ELSE 0 END) as
tier3_resolutions
FROM dispute_log
WHERE filing_date >= CURRENT_DATE - INTERVAL '12 months'
GROUP BY dispute_category
-- Analysis: Identify categories with high dispute rates or slow resolution

```

High dispute rates or resolution failures trigger:

- Independent review of dispute resolution procedures
- Enhanced training for transfer agent and compliance personnel
- Process improvements to reduce future disputes
- Potential supervisory examination focus

## 6.8 Liquidity Annex Summary Table

The following table summarizes key provisions of the Exit & Liquidity Annex:

Aspect	Standard Provision	Structure-Dependent Variations
<b>Primary Exit Mechanism</b>	Secondary market transfers between QIBs	May be supplemented with redemption rights
<b>Liquidity Modes</b>	Normal Trading, Limited Liquidity, Stress Mode, Offboarding	Mode triggers and procedures disclosed
<b>Transfer Timeline</b>	T+1 to T+5 standard	Negotiated for Limited Liquidity mode
<b>Eligibility Verification</b>	Required for all transfers	QIB status, sanctions, jurisdiction
<b>Hold/Release Integration</b>	Integrated with baseline hold/release playbook	Regulatory, sanctions, court, dispute holds
<b>Redemption Rights</b>	Optional; not presumed	If offered: pricing, capacity, queue disclosed
<b>Settlement Failure</b>	Failure-to-settle playbook with remediation	Technical, payment, eligibility failures addressed
<b>Dispute Resolution</b>	Three-tier framework (informal, independent, arbitration)	Per governing documents and applicable law
<b>Stress Mode Duration Limit</b>	90 days maximum without supervisory approval	Extensions require justification and review
<b>Offboarding</b>	Guaranteed exit to legacy custody	90-180 day orderly transition

## 7. Examiner Enablement: Standard Checks & Query Pack

### 7.1 Purpose and Examination Philosophy

This section provides standardized examiner checks and query patterns enabling efficient, consistent regulatory examination of real-asset tokenized securities. The query pack translates disclosure requirements and evidence mappings into actionable validation procedures examiners can execute during routine examinations or targeted reviews.

#### Examination Philosophy:

Effective examination balances three objectives:

1. **Investor Protection:** Verify disclosures are accurate, complete, and not misleading
2. **Operational Soundness:** Confirm intermediaries follow documented procedures and maintain appropriate controls
3. **Market Integrity:** Detect patterns suggesting fraud, manipulation, or systemic risk

The query pack operationalizes these objectives through:

- **Standardized Checks:** Repeatable validation procedures with clear pass/fail criteria
- **Evidence-Based Validation:** Queries reference specific artifacts from Evidence Pack Mapping (Section 5)
- **Risk-Calibrated Scope:** More critical disclosures (valuation, financials) receive deeper scrutiny
- **Efficiency Optimization:** Automated queries where feasible; manual review for judgment-intensive areas

#### Integration with Baseline Examiner Query Framework:

This section extends the generic examiner query patterns from Baseline C with real-asset-specific checks. The baseline framework defines:

- Query structure and metadata standards
- Evidence retrieval procedures via tiered supervisory access
- Escalation triggers and follow-up workflows
- Examination documentation requirements

The real-asset query pack provides:

- Asset-specific validation logic (property documentation, rent rolls, appraisals)
- Disclosure module-specific checks aligned to SDS structure
- Liquidity and exit mechanics validation queries
- Event taxonomy verification procedures

### 7.2 Query Pack Structure and Metadata

Each standardized check follows consistent structure:

CHECK\_ID: Unique identifier (e.g., SDS-M3-VAL-001)

CHECK\_NAME: Human-readable name

MODULE: Disclosure module(s) covered

PURPOSE: What the check validates  
EVIDENCE\_INPUTS: Required artifacts and logs from Evidence Pack  
QUERY\_LOGIC: Validation procedure (pseudo-SQL, manual steps, or hybrid)  
PASS\_CRITERIA: Conditions for check to pass  
FAIL\_CRITERIA: Conditions indicating deficiency  
ESCALATION\_TRIGGER: Conditions requiring supervisory escalation or follow-up  
EXECUTION\_FREQUENCY: Routine (every examination) or targeted (risk-based)  
EXAMINER\_NOTES: Guidance on interpretation and judgment areas

### **Example Check Template:**

CHECK\_ID: SDS-M3-VAL-001  
CHECK\_NAME: Independent Appraisal Recency and Credentialing  
MODULE: Module 3 (Valuation & Methodology)  
PURPOSE: Verify independent appraisal is current and performed by credentialed appraiser

EVIDENCE\_INPUTS:  
- Module\_3\_Valuation/Appraisals/Independent\_Appraisal\_[DATE].pdf  
- Appraiser\_Credentials.pdf  
- Disclosure field: independent\_appraisal.appraisal\_date  
- Disclosure field: independent\_appraisal.appraiser\_credentials

QUERY\_LOGIC:  
1. Retrieve most recent independent appraisal from Evidence Pack  
2. Verify appraisal date within 12 months of disclosure date  
3. Verify appraiser holds MAI (Member, Appraisal Institute) or ASA (Accredited Senior Appraiser) designation  
4. Verify appraiser is independent (no financial interest in property or issuer)  
5. Cross-check appraisal value against disclosure field  
current\_valuation.valuation\_amount

PASS\_CRITERIA:  
- Appraisal date within 12 months  
- Appraiser holds MAI or ASA credential (or equivalent)  
- Appraiser independence confirmed (no conflicts disclosed)  
- Appraisal value matches disclosure  $\pm 2\%$  (rounding acceptable)

FAIL\_CRITERIA:  
- Appraisal older than 12 months without justification  
- Appraiser lacks appropriate credentials  
- Appraiser conflicts of interest identified  
- Appraisal value materially differs from disclosure ( $>5\%$  variance)

ESCALATION\_TRIGGER:  
- Appraisal  $>18$  months old (material staleness)  
- Appraiser not independent or inadequately credentialed  
- Appraisal value  $>10\%$  variance from disclosure  
- Evidence of appraiser pressure or inappropriate influence

EXECUTION\_FREQUENCY: Routine (every examination)

EXAMINER\_NOTES:  
- For properties  $>\$50M$ , expect Big 4 accounting firm or major appraisal firm  
- For smaller properties, regional MAI appraisers acceptable  
- Brief variance ( $<5\%$ ) acceptable if methodology clearly disclosed  
- Appraisals 12-18 months old may be acceptable if property stable and market conditions unchanged



## 7.3 Module 1: Asset Identity & Legal Structure – Examiner Checks

---

### Check SDS-M1-ENT-001: Entity Formation and Good Standing

**PURPOSE:** Verify issuer is validly formed legal entity in good standing with disclosed jurisdiction.

**EVIDENCE INPUTS:**

- Articles\_of\_Incorporation.pdf / Formation\_Documents
- Good Standing Certificate (if available)
- Disclosure fields: legal\_entity.issuer\_name, legal\_entity.jurisdiction, legal\_entity.formation\_date

**QUERY LOGIC:**

1. Retrieve formation documents from Evidence Pack Module 1
2. Verify entity name in formation documents matches disclosure exactly
3. Verify jurisdiction matches disclosure
4. Check formation date consistency
5. If available, verify good standing certificate is current (<90 days)
6. Query state/provincial business registry to confirm entity exists and is active (if accessible)

**PASS CRITERIA:**

- Formation documents present and authentic
- Entity name, jurisdiction, formation date match disclosure
- Good standing confirmed (via certificate or registry query)

**FAIL CRITERIA:**

- Formation documents missing or incomplete
- Material discrepancies in entity name, jurisdiction, or date
- Entity not in good standing or dissolved

**ESCALATION TRIGGER:**

- Entity dissolved or administratively suspended
- Jurisdiction discrepancy (formed in different state than disclosed)
- Formation documents appear forged or altered

**EXECUTION FREQUENCY:** Routine

---

### Check SDS-M1-BEN-002: Beneficial Ownership Completeness

**PURPOSE:** Verify all beneficial owners with >10% ownership are disclosed per FinCEN requirements.

**EVIDENCE INPUTS:**

- Beneficial\_Ownership\_Certification.pdf

- Operating\_Agreement.pdf
- Cap\_Table.xlsx (if available)
- Disclosure field: beneficial\_ownership array

**QUERY LOGIC:**

1. Retrieve beneficial ownership certification and operating agreement
2. Extract all owners with >10% ownership from operating agreement/cap table
3. Cross-reference against disclosed beneficial\_ownership array
4. Verify each >10% owner is disclosed with accurate ownership percentage
5. Check for indirect ownership structures (e.g., holding companies) that may obscure ultimate beneficial owners

**PASS CRITERIA:**

- All >10% beneficial owners disclosed
- Ownership percentages accurate ( $\pm 1\%$  acceptable for rounding)
- Ultimate beneficial owners identified (not just holding company shells)

**FAIL CRITERIA:**

- One or more >10% owners not disclosed
- Ownership percentages materially inaccurate (>5% variance)
- Shell companies used to obscure beneficial ownership

**ESCALATION TRIGGER:**

- Beneficial owner is sanctioned person or high-risk jurisdiction
- Ownership structure appears designed to obscure identity
- Undisclosed related party relationships among owners

**EXECUTION FREQUENCY:** Routine

**Check SDS-M1-PROP-003: Property Documentation Consistency**

**PURPOSE:** Verify property legal description and location match deed and title report.

**EVIDENCE INPUTS:**

- Deed.pdf
- Title\_Report.pdf
- Property\_Survey.pdf (if available)
- Disclosure fields: asset\_location, asset\_description

**QUERY LOGIC:**

1. Retrieve deed and title report
2. Extract legal property description from deed
3. Verify disclosed asset\_location (address) matches deed/title
4. Verify disclosed asset\_description (size, type) consistent with deed and survey
5. Check for encumbrances, liens, or easements disclosed in title report

**PASS CRITERIA:**

- Property address matches deed and title report
- Property description (size, type) consistent with deed and survey
- Material encumbrances disclosed in risk factors (Module 6)

**FAIL CRITERIA:**

- Address or legal description discrepancies
- Property size materially misstated (>10% variance)
- Material liens or encumbrances not disclosed

**ESCALATION TRIGGER:**

- Property ownership unclear or disputed
- Senior liens or encumbrances materially affecting value not disclosed
- Evidence of property boundary disputes

**EXECUTION FREQUENCY:** Routine

---

## 7.4 Module 2: Rights, Restrictions, Transfer Limits – Examiner Checks

---

**Check SDS-M2-TOK-001: Token Supply Reconciliation**

**PURPOSE:** Verify disclosed token supply matches on-chain or registry records.

**EVIDENCE INPUTS:**

- Token\_Registry.xlsx or blockchain query results
- Disclosure fields: total\_supply, outstanding\_supply

**QUERY LOGIC:**

```
-- Pseudo-SQL: Reconcile disclosed supply with registry
SELECT
    instrument_id,
    disclosed_total_supply,
    registry_total_supply,
    disclosed_outstanding_supply,
    registry_outstanding_supply,
    (disclosed_total_supply - registry_total_supply) AS total_variance,
    (disclosed_outstanding_supply - registry_outstanding_supply) AS
outstanding_variance
FROM
    (SELECT total_supply AS disclosed_total_supply, outstanding_supply AS
disclosed_outstanding_supply FROM disclosures WHERE instrument_id =
'[INSTRUMENT_ID]') AS disc
    CROSS JOIN
    (SELECT SUM(token_balance) AS registry_outstanding_supply, MAX(total_issued)
AS registry_total_supply FROM token_registry WHERE instrument_id =
'[INSTRUMENT_ID]') AS reg
WHERE ABS(total_variance) > 0 OR ABS(outstanding_variance) > 0
-- Flag: Any variance between disclosure and registry
```

**PASS CRITERIA:**

- Total supply matches exactly (0 variance)
- Outstanding supply matches exactly or variance explained (e.g., pending redemptions)

**FAIL CRITERIA:**

- Unexplained variance in total or outstanding supply
- Disclosure does not reflect recent token events (issuance, redemption, burns)

**ESCALATION TRIGGER:**

- Variance >1% of total supply
- Evidence of unauthorized token creation
- Registry appears manipulated or inconsistent

**EXECUTION FREQUENCY:** Routine

---

**Check SDS-M2-XFER-002: Transfer Restriction Enforcement**

**PURPOSE:** Verify transfer restrictions disclosed are enforced operationally (smart contract, transfer agent procedures).

**EVIDENCE INPUTS:**

- Transfer\_Restriction\_Policy.pdf
- Smart\_Contract\_Code.sol (if applicable)
- Transfer\_Agent\_Procedures.pdf
- Recent transfer logs (sample)
- Disclosure field: transfer\_restrictions

**QUERY LOGIC:**

1. Retrieve disclosed transfer restrictions from Module 2
2. Review transfer agent procedures or smart contract code implementing restrictions
3. Sample 10-20 recent transfers from logs
4. Verify each transfer complied with disclosed restrictions:
  - Holding periods satisfied
  - Transferees were eligible (QIB status verified)
  - Concentration limits not exceeded
  - Jurisdictional restrictions enforced
5. Check for rejected transfers and confirm rejections were appropriate

**PASS CRITERIA:**

- Transfer procedures/code match disclosed restrictions
- Sample transfers all complied with restrictions
- Rejected transfers had valid rejection reasons documented

**FAIL CRITERIA:**

- Procedures/code inconsistent with disclosed restrictions
- Sample transfers violated restrictions without override justification
- Rejected transfers lacked documented reasons

**ESCALATION TRIGGER:**

- Pattern of restriction violations (>10% of sample)
- Evidence of transfers to ineligible investors (non-QIBs, sanctioned persons)
- Override authority used without documented justification

**EXECUTION FREQUENCY:** Routine

---

## 7.5 Module 3: Valuation & Methodology – Examiner Checks

---

**Check SDS-M3-VAL-001: Independent Appraisal Recency and Credentialing**

*(Already detailed in Section 7.2 example above)*

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**Check SDS-M3-METH-002: Valuation Methodology Consistency**

**PURPOSE:** Verify disclosed valuation methodology matches actual valuation process and assumptions.

**EVIDENCE INPUTS:**

- Methodology\_Memo.pdf
- DCF\_Model.xlsx or Comparable\_Sales\_Analysis.xlsx
- Disclosure fields: valuation\_methodology, methodology\_description, key\_assumptions

**QUERY LOGIC:**

1. Retrieve valuation model/analysis from Evidence Pack
2. Verify methodology used (DCF, comparable sales, etc.) matches disclosed methodology
3. Extract key assumptions from model (discount rate, growth rate, cap rate)
4. Cross-check assumptions against disclosed key\_assumptions array
5. Assess reasonableness of assumptions against market data (if available)
6. Verify sensitivity analysis performed (if claimed in disclosure)

**PASS CRITERIA:**

- Methodology in model matches disclosed methodology
- Key assumptions in model match disclosure ( $\pm 50$  basis points acceptable)
- Assumptions within reasonable market ranges
- Sensitivity analysis present if claimed

**FAIL CRITERIA:**

- Methodology discrepancy (e.g., disclosed "DCF" but model uses comparable sales without DCF)
- Material assumption variance (>100 bps for discount/cap rates)
- Assumptions appear unreasonable or unsupported
- Claimed sensitivity analysis not performed

#### **ESCALATION TRIGGER:**

- Methodology fundamentally different from disclosure
- Assumptions appear manipulated to inflate value (e.g., cap rate 200+ bps below market)
- No supporting data for key assumptions
- Evidence of methodology shopping (multiple methodologies tried, only favorable one disclosed)

#### **EXECUTION FREQUENCY:** Routine

---

### **Check SDS-M3-HIST-003: Historical Valuation Trend Analysis**

**PURPOSE:** Identify unexplained valuation volatility or suspicious patterns.

#### **EVIDENCE INPUTS:**

- Historical\_Valuations array from disclosure (Module 3)
- Historical appraisal reports (if available)

#### **QUERY LOGIC:**

```
-- Pseudo-SQL: Analyze valuation volatility
SELECT
    instrument_id,
    valuation_date,
    valuation_amount,
    LAG(valuation_amount) OVER (ORDER BY valuation_date) AS prior_valuation,
    ((valuation_amount - LAG(valuation_amount) OVER (ORDER BY valuation_date)) /
    LAG(valuation_amount) OVER (ORDER BY valuation_date)) * 100 AS
    change_percentage,
    methodology_used
FROM historical_valuations
WHERE instrument_id = '[INSTRUMENT_ID]'
ORDER BY valuation_date DESC
LIMIT 24; -- Last 24 valuations

-- Flag: Valuation changes >20% quarter-over-quarter without explanation
-- Flag: Systematic upward bias (consecutive increases without decreases)
-- Flag: Methodology changes coinciding with valuation increases
```

#### **PASS CRITERIA:**

- Valuation changes consistent with market conditions and property performance
- Methodology changes infrequent and explained
- No pattern of systematic upward bias

#### **FAIL CRITERIA:**

- Unexplained valuation volatility (>20% QoQ without major property event)
- Methodology changes appear opportunistic (always coincide with valuation increases)
- Valuations consistently increase despite flat market conditions

**ESCALATION TRIGGER:**

- Valuation spike >50% in single period without major improvement (e.g., major renovation completed)
- Methodology changes multiple times per year
- Pattern suggesting valuation manipulation

**EXECUTION FREQUENCY:** Routine for instruments >\$50M; targeted for smaller instruments

---

## 7.6 Module 4: Cashflows / Distribution Policy – Examiner Checks

---

**Check SDS-M4-FIN-001: Financial Statement Audit Opinion**

**PURPOSE:** Verify financial statements are audited (if required) with unqualified opinion.

**EVIDENCE INPUTS:**

- Audited\_Financials\_[YEAR].pdf
- Auditor\_Opinion\_Letter.pdf
- Disclosure field: financial\_audit.audit\_performed, financial\_audit.audit\_opinion

**QUERY LOGIC:**

1. Determine if audit is required (property value >\$25M or >500 investors per framework guidelines)
2. If required, retrieve audit report from Evidence Pack
3. Verify audit performed by registered CPA firm
4. Extract audit opinion type
5. Review any qualifications, emphasis-of-matter paragraphs, or going concern language
6. Verify audit opinion disclosed accurately

**PASS CRITERIA:**

- Audit performed if required
- Audit opinion is unqualified (clean opinion)
- Auditor is registered and independent
- Disclosure accurately reflects audit opinion

**FAIL CRITERIA:**

- Audit not performed when required
- Audit opinion qualified, adverse, or disclaimer
- Auditor independence questionable
- Disclosure misstates or omits audit qualifications

**ESCALATION TRIGGER:**

- Adverse or disclaimer opinion (fundamental doubt about financial statements)
- Going concern qualification (issuer viability in question)
- Auditor resignation or dismissal without explanation

**EXECUTION FREQUENCY:** Routine for instruments requiring audits

---

**Check SDS-M4-RENT-002: Rent Roll Verification and Consistency**

**PURPOSE:** Verify rent roll is current, verified, and consistent with disclosed income.

**EVIDENCE INPUTS:**

- Rent\_Roll\_[DATE].xlsx
- Rent\_Roll\_Verification\_Report.pdf
- Lease\_Abstracts.pdf (sample)
- Disclosure fields: income\_sources, net\_operating\_income

**QUERY LOGIC:**

1. Retrieve rent roll and verification report
2. Verify rent roll date is current (<90 days old)
3. Verify verification performed by property manager, auditor, or independent party
4. Reconcile total rent roll income to disclosed rental income in Module 4
5. Sample 3-5 largest tenants; verify lease terms in abstracts match rent roll
6. Calculate occupancy rate from rent roll; verify consistency with disclosed occupancy assumptions (if in Module 3)

**PASS CRITERIA:**

- Rent roll current (<90 days)
- Verification performed and documented
- Rent roll income reconciles to disclosure ( $\pm 5\%$  acceptable for timing differences)
- Sample tenant leases match rent roll

**FAIL CRITERIA:**

- Rent roll stale (>90 days)
- No verification documentation
- Material variance between rent roll and disclosed income (>10%)
- Sample tenants show discrepancies (rent amounts, lease terms incorrect)

**ESCALATION TRIGGER:**

- Rent roll income materially overstated vs. actual leases
- Evidence of fictitious tenants or leases
- Major tenant defaults not disclosed

**EXECUTION FREQUENCY:** Routine

---



### Check SDS-M4-DIST-003: Distribution Coverage and Sustainability

**PURPOSE:** Assess whether distributions are covered by net operating income and sustainable.

#### EVIDENCE INPUTS:

- Financial statements
- Distribution calculation worksheets
- Disclosure fields: net\_operating\_income, distribution\_history

#### QUERY LOGIC:

```
-- Pseudo-SQL: Distribution coverage analysis
SELECT
    instrument_id,
    fiscal_year,
    noi_annual,
    SUM(distribution_paid) AS total_distributions,
    (SUM(distribution_paid) / noi_annual) AS payout_ratio,
    reserve_balance
FROM financials
JOIN distribution_history USING (instrument_id, fiscal_year)
GROUP BY instrument_id, fiscal_year
HAVING payout_ratio > 1.0 -- Distributions exceed NOI
OR (payout_ratio > 0.95 AND reserve_balance < (noi_annual * 0.10)) -- High
payout with low reserves
-- Flag: Potentially unsustainable distribution policies
```

#### PASS CRITERIA:

- Payout ratio <100% (distributions covered by NOI)
- If payout ratio >95%, adequate reserves exist (>10% of annual NOI)
- Distribution policy clearly disclosed as sustainable or structure-dependent

#### FAIL CRITERIA:

- Payout ratio >100% without explanation (distributions exceed income)
- High payout ratio (>95%) with inadequate reserves
- Distribution policy not clearly disclosed or appears misleading

#### ESCALATION TRIGGER:

- Payout ratio >120% for multiple periods (clearly unsustainable)
- Distributions funded by debt or asset sales without disclosure
- Evidence of Ponzi-like structure (new investor funds paying old investor distributions)

**EXECUTION FREQUENCY:** Routine

---

## 7.7 Module 5: Fees, Conflicts, Roles – Examiner Checks

---

### Check SDS-M5-FEE-001: Total Expense Ratio Accuracy

**PURPOSE:** Verify disclosed Total Expense Ratio (TER) is calculated correctly and reasonable.

**EVIDENCE INPUTS:**

- Fee\_Schedule\_Summary.xlsx
- Operating\_Statement.xlsx
- TER\_Calculation.xlsx
- Disclosure field: total\_expense\_ratio

**QUERY LOGIC:**

1. Retrieve TER calculation worksheet
2. Recalculate TER: (Total Annual Fees + Operating Expenses) / Net Asset Value
3. Verify all fee categories included (management, property management, acquisition, etc.)
4. Verify operating expenses included (property-level only; not property improvement CapEx)
5. Compare calculated TER to disclosed TER
6. Benchmark TER against comparable real-estate investment structures (REITs, private funds)

**PASS CRITERIA:**

- TER calculation mathematically accurate ( $\pm 5$  bps acceptable for rounding)
- All material fees included
- TER within reasonable range for asset class (typically 1.0-3.0% for real estate)

**FAIL CRITERIA:**

- TER calculation error ( $>10$  bps variance)
- Material fees excluded (e.g., performance fees not included)
- TER unreasonably high ( $>5\%$ ) without justification

**ESCALATION TRIGGER:**

- TER calculation systematically understates fees
- Undisclosed fees identified in service agreements
- TER  $>5\%$  (potential excessive fee structure)

**EXECUTION FREQUENCY:** Routine

---

**Check SDS-M5-CONF-002: Related Party Transaction Approval and Fairness**

**PURPOSE:** Verify material related party transactions are disclosed, approved, and at arm's length pricing.

**EVIDENCE INPUTS:**

- Related\_Party\_Transaction\_Log.xlsx
- Independent\_Committee\_Approvals.pdf (if applicable)
- Service\_Agreements with related parties
- Disclosure field: related\_party\_transactions array

**QUERY LOGIC:**

1. Retrieve related party transaction log

2. Identify all transactions >\$100K or >1% of NAV
3. Verify each material transaction disclosed in Module 5
4. Check approval documentation:
  - Independent committee approval (for transactions >\$500K or >5% NAV)
  - Board approval with conflict disclosure
  - Fairness opinion (for very large transactions >10% NAV)
5. Assess pricing reasonableness vs. market comparables (if available)

**PASS CRITERIA:**

- All material related party transactions disclosed
- Appropriate approvals documented
- Pricing appears arm's length or supported by fairness opinion

**FAIL CRITERIA:**

- Material related party transactions not disclosed
- Approval documentation missing or inadequate
- Pricing appears above-market without justification

**ESCALATION TRIGGER:**

- Pattern of undisclosed related party transactions
- Pricing significantly above market (>20%) suggesting self-dealing
- Approval process appears rubber-stamp (no independent review)

**EXECUTION FREQUENCY:** Routine

---

## **7.8 Module 6: Risk Factors – Examiner Checks**

---

**Check SDS-M6-DEBT-001: Leverage and Covenant Compliance**

**PURPOSE:** Verify debt disclosures are accurate and covenants are in compliance.

**EVIDENCE INPUTS:**

- Loan\_Documents.pdf
- Covenant\_Compliance\_Certificate.pdf
- Financial statements
- Disclosure fields: leverage.total\_debt\_amount, leverage.loan\_to\_value\_ratio, leverage.debt\_covenants

**QUERY LOGIC:**

1. Retrieve loan documents and compliance certificate
2. Verify debt amount disclosed matches loan documents
3. Recalculate LTV ratio: Debt / Property Value
4. Verify disclosed LTV matches calculation (±2% acceptable)

5. Review debt covenants (DSCR, LTV, net worth, etc.)
6. Check compliance certificate or calculate covenant ratios from financials
7. Identify any covenant waivers or amendments

**PASS CRITERIA:**

- Debt amount accurate
- LTV calculation correct
- All covenants in compliance or waivers properly disclosed
- Covenant disclosures complete

**FAIL CRITERIA:**

- Debt amount misstated (>5% variance)
- LTV calculation error or material misstatement
- Covenant breach not disclosed
- Material covenants omitted from disclosure

**ESCALATION TRIGGER:**

- Covenant breach without waiver (default situation)
- Multiple covenant breaches or pattern of waivers
- Debt maturity imminent (<12 months) with unclear refinancing plan

**EXECUTION FREQUENCY:** Routine

---

**Check SDS-M6-ENV-002: Environmental Assessment Completeness**

**PURPOSE:** Verify environmental risks are assessed and disclosed appropriately.

**EVIDENCE INPUTS:**

- Phase\_I\_Environmental\_Assessment.pdf
- Phase\_II\_Report.pdf (if applicable)
- Disclosure fields: environmental\_risks

**QUERY LOGIC:**

1. Retrieve Phase I Environmental Site Assessment (ESA)
2. Verify Phase I is current (<3 years for initial offering; <5 years for ongoing)
3. Review Phase I findings for recognized environmental conditions (RECs)
4. If RECs identified, verify Phase II performed and results disclosed
5. Check if any contamination or environmental issues are disclosed in risk factors
6. Verify environmental insurance obtained if contamination present

**PASS CRITERIA:**

- Phase I current and performed by qualified environmental consultant
- RECs identified in Phase I are disclosed in risk factors
- Phase II performed if warranted; results disclosed
- Environmental insurance in place if material contamination

**FAIL CRITERIA:**

- Phase I stale or not performed
- RECs identified but not disclosed
- Phase II warranted but not performed
- Material contamination without insurance or remediation plan

**ESCALATION TRIGGER:**

- Contamination materially affecting property value not disclosed
- Phase II reveals severe contamination requiring expensive remediation
- Environmental liabilities exceed insurance coverage

**EXECUTION FREQUENCY:** Routine for initial offering; targeted for ongoing examinations

---

## **7.9 Module 7: Controls & Attestations – Examiner Checks**

---

**Check SDS-M7-ATT-001: Management Attestation Presence and Scope**

**PURPOSE:** Verify management attestation is present, properly scoped, and not materially qualified.

**EVIDENCE INPUTS:**

- Management\_Attestation\_Letter.pdf
- Disclosure fields: management\_attestation

**QUERY LOGIC:**

1. Retrieve management attestation letter
2. Verify attestation signed by CFO or CEO (appropriate senior officer)
3. Verify attestation covers accuracy and completeness of disclosure
4. Review any qualifications or exceptions in attestation language
5. Check attestation date is consistent with disclosure date ( $\pm 5$  business days)

**PASS CRITERIA:**

- Attestation present and signed by appropriate officer
- Attestation scope covers all material disclosures
- No material qualifications or exceptions
- Date consistent with disclosure

**FAIL CRITERIA:**

- Attestation missing
- Attestation signed by non-senior officer or unauthorized person
- Material qualifications limiting attestation scope
- Stale attestation ( $>30$  days before disclosure date)

**ESCALATION TRIGGER:**

- Attestation disclaims responsibility for material items (e.g., "we do not attest to valuation accuracy")
- Multiple qualifications suggesting management lacks confidence
- Attestation appears coerced or involuntary

**EXECUTION FREQUENCY:** Routine

---

### **Check SDS-M7-CTRL-002: Internal Control Effectiveness**

**PURPOSE:** Assess whether internal controls are documented, tested, and operating effectively.

#### **EVIDENCE INPUTS:**

- Internal\_Control\_Documentation.pdf
- Control\_Testing\_Results.xlsx
- SOC\_1\_Report.pdf (if applicable)
- Disclosure fields: internal\_controls

#### **QUERY LOGIC:**

1. Retrieve internal control documentation
2. Verify key controls documented for:
  - Financial reporting
  - Asset custody and safeguarding
  - Distribution calculations
  - Investor eligibility verification
  - Transfer processing
3. Review control testing evidence (if available)
4. Identify any control deficiencies, especially material weaknesses
5. Verify material weaknesses disclosed in risk factors or attestations

#### **PASS CRITERIA:**

- Key controls documented
- Testing evidence shows controls operating effectively
- No material weaknesses or deficiencies properly remediated
- SOC 1 report (if applicable) has unqualified opinion

#### **FAIL CRITERIA:**

- Controls inadequately documented or not tested
- Material weaknesses identified and not remediated
- SOC 1 report (if applicable) qualified or identifies deficiencies

#### **ESCALATION TRIGGER:**

- Material weakness in financial reporting controls
- Control deficiencies leading to investor losses or errors
- Pattern of control failures

**EXECUTION FREQUENCY:** Routine for initial offering; targeted for ongoing examinations

---

## 7.10 Module 8: Event Taxonomy – Examiner Checks

---

### Check SDS-M8-LOG-001: Event Log Completeness and Timeliness

**PURPOSE:** Verify material events are logged completely and within required timelines.

**EVIDENCE INPUTS:**

- Event\_Log\_Export.json
- Material\_Events\_Summary.pdf
- Event\_Supporting\_Documentation
- Disclosure Module 8 event\_logging requirements

**QUERY LOGIC:**

```
-- Pseudo-SQL: Event logging completeness check
SELECT
    event_type,
    COUNT(*) AS total_events,
    SUM(CASE WHEN material = TRUE THEN 1 ELSE 0 END) AS material_events,
    SUM(CASE WHEN investor_notification_sent = FALSE AND material = TRUE THEN 1
ELSE 0 END) AS notification_gaps,
    AVG(DATEDIFF(logged_timestamp, event_timestamp)) AS avg_logging_delay_days
FROM event_log
WHERE instrument_id = '[INSTRUMENT_ID]'
    AND event_timestamp >= '[EXAMINATION_PERIOD_START]'
GROUP BY event_type
-- Flag: Material events without notifications or excessive logging delays
```

**PASS CRITERIA:**

- All required event types logged (per Module 8 taxonomy)
- Material events logged within 1 business day of occurrence
- Material events triggered investor notification per policy (typically within 2 business days)
- Supporting documentation linked for each material event

**FAIL CRITERIA:**

- Material events missing from log
- Logging delays exceed 5 business days
- Material events without investor notification
- Supporting documentation missing

**ESCALATION TRIGGER:**

- Pattern of late or missing event logging (>10% of material events)
- Material events with investor impact not notified
- Evidence of log manipulation or backdating

**EXECUTION FREQUENCY:** Routine

---

### **Check SDS-M8-VER-002: Event Log Integrity and Tamper Evidence**

**PURPOSE:** Verify event log has not been tampered with and maintains hash chain integrity.

**EVIDENCE INPUTS:**

- Event\_Log\_Export.json with hash chain metadata
- Artifact\_Hash\_Registry.json

**QUERY LOGIC:**

1. Retrieve event log with hash chain
2. Verify each event's `current_hash` correctly calculated from event data + `previous_hash`
3. Verify hash chain is unbroken from first event to last
4. Cross-check artifact references in events against `Artifact_Hash_Registry`
5. Verify no gaps in event sequence (consecutive event IDs or timestamps)

**PASS CRITERIA:**

- Hash chain intact (all hashes verify correctly)
- No gaps in event sequence
- Artifact references valid (artifacts exist and hashes match)

**FAIL CRITERIA:**

- Hash chain broken (hash verification fails)
- Missing events in sequence
- Artifact references invalid (missing artifacts or hash mismatches)

**ESCALATION TRIGGER:**

- Evidence of log tampering (modified events breaking hash chain)
- Systematic gaps suggesting event deletion
- Critical events missing (e.g., major valuation updates, distribution declarations)

**EXECUTION FREQUENCY:** Routine

---

## **7.11 Cross-Module Integration Checks**

Some validation requires examining relationships across multiple disclosure modules. These integration checks detect inconsistencies that could indicate errors or manipulation.

---

### **Check SDS-INT-001: Valuation-to-Distribution Consistency**

**PURPOSE:** Verify distributions are consistent with disclosed valuation and income generation.

**EVIDENCE INPUTS:**



- Module 3: current\_valuation, yield\_metrics
- Module 4: distribution\_history, net\_operating\_income

**QUERY LOGIC:**

1. Calculate trailing 12-month distributions per token
2. Calculate trailing 12-month yield: (TTM distributions per token / average valuation per token)
3. Compare calculated yield to disclosed yield\_metrics.trailing\_12mo\_yield
4. Assess reasonableness: Yield should be consistent with NOI margin and payout ratio

**PASS CRITERIA:**

- Calculated yield matches disclosed yield ( $\pm 25$  basis points)
- Yield is consistent with property NOI and payout policy
- Yield within reasonable range for asset class (typically 4-8% for real estate)

**FAIL CRITERIA:**

- Yield calculation error or material misstatement
- Yield inconsistent with NOI (e.g., 8% yield but NOI margin only 5%)
- Yield appears inflated to attract investors

**ESCALATION TRIGGER:**

- Yield materially misstated ( $> 50$  bps variance)
- Yield exceeds NOI margin (mathematically impossible on sustainable basis)

**EXECUTION FREQUENCY:** Routine

**Check SDS-INT-002: Fee-to-TER Reconciliation**

**PURPOSE:** Verify disclosed fees in Module 5 aggregate to disclosed Total Expense Ratio.

**EVIDENCE INPUTS:**

- Module 5: management\_fees array, total\_expense\_ratio
- Module 4: operating\_expenses

**QUERY LOGIC:**

1. Sum all fee\_rate\_percentage or fee\_amount\_fixed from management\_fees array
2. Add operating\_expenses
3. Divide by current NAV
4. Compare calculated TER to disclosed total\_expense\_ratio

**PASS CRITERIA:**

- Calculated TER matches disclosed TER ( $\pm 10$  basis points)

**FAIL CRITERIA:**

- TER calculation error ( $> 10$  bps)

- Material fees omitted from calculation

**ESCALATION TRIGGER:**

- Systematic understatement of TER (undisclosed fees)

**EXECUTION FREQUENCY:** Routine

---

## 7.12 Liquidity and Exit Mechanics – Examiner Checks

---

### Check SDS-LIQ-001: Liquidity Mode Appropriateness

**PURPOSE:** Verify disclosed liquidity mode accurately reflects market conditions and trading activity.

**EVIDENCE INPUTS:**

- Module 8 or separate liquidity disclosure: liquidity\_mode, recent\_trading\_volume
- Transfer logs (past 90 days)

**QUERY LOGIC:**

1. Retrieve disclosed liquidity\_mode (NORMAL\_TRADING, LIMITED\_LIQUIDITY, STRESS\_MODE, OFFBOARDING)
2. Query transfer logs for past 90 days
3. Calculate: Number of trades, total volume, average trade size, bid-ask spread (if available)
4. Assess whether activity level matches disclosed mode:
  - NORMAL\_TRADING: Expect  $\geq 1$  trade/month, bid-ask  $< 5\%$
  - LIMITED\_LIQUIDITY: Expect  $< 1$  trade/month, bid-ask 5-15%
  - STRESS\_MODE: Trading halted or severely restricted
5. If mode is STRESS\_MODE, verify triggering event is disclosed and legitimate

**PASS CRITERIA:**

- Liquidity mode matches observed trading activity
- If STRESS\_MODE, trigger is disclosed and documented

**FAIL CRITERIA:**

- Liquidity mode overstates actual liquidity (e.g., "NORMAL\_TRADING" but no trades in 6 months)
- STRESS\_MODE without adequate triggering event disclosure

**ESCALATION TRIGGER:**

- Liquidity mode materially misrepresents marketability
- STRESS\_MODE hold exceeds 90 days without supervisory approval

**EXECUTION FREQUENCY:** Targeted (when liquidity concerns exist)

---

## Check SDS-LIQ-002: Redemption Rights Availability and Pricing

**PURPOSE:** If redemption rights exist, verify they are operationally available and fairly priced.

### EVIDENCE INPUTS:

- Redemption policy documentation
- Redemption request and fulfillment logs
- Disclosure fields: redemption\_available, redemption\_terms

### QUERY LOGIC:

1. Verify whether redemption\_available = true
2. If true, retrieve redemption policy and terms
3. Sample recent redemption requests (if any)
4. Verify redemption requests processed per disclosed terms:
  - Notice period satisfied
  - Pricing methodology applied correctly
  - Queue management (if capacity exceeded) followed disclosed procedures
5. Check for redemption suspensions; verify legitimacy and notification

### PASS CRITERIA:

- Redemption policy matches disclosure
- Sample redemptions processed correctly per terms
- Redemption pricing fair and consistent with methodology

### FAIL CRITERIA:

- Redemption policy inconsistent with disclosure
- Redemptions not honored or improperly delayed
- Redemption pricing unfair or inconsistent

### ESCALATION TRIGGER:

- Redemptions suspended without adequate justification
- Pattern of redemption denials or delays
- Redemption pricing systematically disadvantages investors

**EXECUTION FREQUENCY:** Targeted (when redemption concerns exist)

---

## 7.13 Examiner Escalation Decision Tree

Not all deficiencies warrant immediate escalation. The following decision tree guides examiner judgment:

### DEFICIENCY IDENTIFIED

- Is it a TECHNICAL ERROR with no investor impact?
  - └ YES → Document as observation; request remediation; no escalation
  - └ NO → Continue
- Is it MATERIAL (affects investor decisions or financial outcomes)?

- └ NO → Document as minor deficiency; request remediation; monitor
- └ YES → Continue
- Is there EVIDENCE OF FRAUD, MANIPULATION, or INTENTIONAL MISREPRESENTATION?
  - └ YES → IMMEDIATE ESCALATION to enforcement staff; consider trading halt
  - └ NO → Continue
- Does it create IMMINENT INVESTOR HARM (e.g., distributions unsustainable, insolvency risk)?
  - └ YES → URGENT ESCALATION; consider supervisory hold or restrictions
  - └ NO → Continue
- Is it a PATTERN or SYSTEMIC ISSUE (multiple deficiencies across modules)?
  - └ YES → ESCALATION to senior examination staff; comprehensive remediation required
  - └ NO → Continue
- Is it an ISOLATED MATERIAL DEFICIENCY?
  - └ YES → Document as examination finding; require correction; follow-up examination

### Escalation Contacts and Procedures:

- **Immediate/Urgent Escalations:** Phone contact to examination supervisor within 2 hours; written escalation memo within 4 hours
- **Routine Escalations:** Email to examination supervisor within 1 business day; written escalation memo within 3 business days
- **Enforcement Referrals:** Formal referral memo to Division of Enforcement within 5 business days of determination

## 7.14 Examination Report Template

Standardized examination report structure ensures consistency and completeness:

### SEC EXAMINATION REPORT

Instrument: [Instrument Name] ([Instrument ID])

Issuer: [Issuer Legal Name]

Examination Period: [Start Date] to [End Date]

Examination Date(s): [Date(s)]

Examiner(s): [Names]

### EXECUTIVE SUMMARY

Overall Assessment: [Compliant / Deficiencies Identified / Material Concerns]

Key Findings: [2-3 sentence summary]

Recommended Actions: [Summary of required remediation]

### EXAMINATION SCOPE

Modules Examined: [List modules covered]

Evidence Reviewed: [Summary of artifacts and logs reviewed]

Sampling Methodology: [Description of sampling approach]

### DETAILED FINDINGS

Module 1: Asset Identity & Legal Structure

- Check SDS-M1-ENT-001: Entity Formation and Good Standing

- └ Result: [PASS / FAIL / OBSERVATION]

- └ Notes: [Details if FAIL or OBSERVATION]

└ Check SDS-M1-BEN-002: Beneficial Ownership Completeness  
└ Result: [PASS / FAIL / OBSERVATION]  
└ Notes: [Details if FAIL or OBSERVATION]  
[Continue for all checks performed]

Module 2: Rights, Restrictions, Transfer Limits  
[Continue for all modules examined]

#### SUMMARY OF DEFICIENCIES

Deficiency\_ID: [ID]  
Module: [Module number]  
Check: [Check ID]  
Severity: [MATERIAL / MODERATE / MINOR]  
Description: [Detailed description]  
Required Remediation: [Specific actions required]  
Remediation Deadline: [Date]

#### RECOMMENDATIONS

[List of recommendations for issuer/intermediaries]

#### FOLLOW-UP ACTIONS

[Examination follow-up, supervisory referrals, or enforcement considerations]

Examiner Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Supervisor Approval: \_\_\_\_\_ Date: \_\_\_\_\_

---

## 8. Governance & Change Control

### 8.1 Purpose and Framework Integration

Effective governance ensures the Standardized Disclosure Schema, Evidence Pack requirements, and Liquidity Annex evolve appropriately over time while maintaining stability, predictability, and stakeholder confidence. This section defines governance structures, change control procedures, recertification requirements, and independent assessor roles.

#### Relationship to Baseline Governance Framework:

This section extends governance structures from Baseline B (Operationalization Track) with disclosure-specific governance requirements. The baseline framework defines:

- Pilot Steering Committee charter and membership
- Change Control Board procedures for operational standards
- Incident coordination and reporting structures
- Metrics and performance evaluation frameworks

The disclosure governance layer adds:

- Schema versioning and backwards compatibility management
- Evidence Pack requirement evolution procedures
- Liquidity mode definition updates
- Independent assessor accreditation and oversight
- Disclosure conformance certification and recertification

## **Governance Principles:**

1. **Stability with Adaptability:** Schema and requirements remain stable for planning and implementation; changes occur through controlled processes with adequate transition periods
2. **Stakeholder Input:** Issuers, intermediaries, investors, and regulators provide input on proposed changes
3. **Evidence-Based Evolution:** Changes driven by operational experience, identified gaps, or regulatory developments
4. **Backwards Compatibility:** Where feasible, new schema versions remain compatible with prior versions; breaking changes minimized
5. **Transparency:** Governance decisions and rationales documented and accessible to stakeholders

## **8.2 Schema Versioning Governance**

### **Version Management Authority:**

Schema version changes are managed by the **Disclosure Standards Committee**, a sub-committee of the Pilot Steering Committee with specialized expertise in disclosure frameworks, securities regulation, and real-asset valuation.

### **Committee Composition:**

- 2 SEC staff representatives (FinHub, Division of Trading & Markets)
- 2 SRO representatives (FINRA, MSRB or equivalent)
- 3 industry representatives (issuer/sponsor, broker-dealer, qualified custodian)
- 2 independent experts (securities disclosure attorney, real estate valuation expert)
- Total: 9 members; decisions require supermajority (6 of 9)

**Meeting Cadence:** Quarterly regular meetings; ad hoc meetings for urgent changes

### **Decision Authority:**

- **PATCH versions** (non-substantive clarifications): Committee staff approval, notification to full committee
- **MINOR versions** (backward-compatible additions): Committee supermajority approval
- **MAJOR versions** (breaking changes): Committee supermajority + SEC staff concurrence

### **Version Proposal Process:**

1. **Proposal Submission:** Any stakeholder may submit change proposal with:
  - Rationale (problem addressed or improvement provided)
  - Proposed schema changes (field additions, modifications, deletions)
  - Impact assessment (affected issuers, implementation effort, backwards compatibility)
  - Transition plan (timeline, migration support)
2. **Committee Review:** Disclosure Standards Committee reviews proposal within 30 days:
  - Technical feasibility assessment
  - Regulatory implications review

- Stakeholder impact analysis
  - Alignment with baseline frameworks
3. **Public Comment** (for MINOR/MAJOR changes): 45-day comment period:
- Proposal published to pilot participants and interested stakeholders
  - Written comments accepted via designated portal
  - Committee reviews comments and revises proposal as appropriate
4. **Committee Decision:** Vote on proposal (as revised):
- Approval → Proceed to implementation planning
  - Conditional Approval → Revisions required; re-vote
  - Rejection → Documented with rationale; may be resubmitted with modifications
5. **Implementation Planning:**
- Advance notice period established (typically 90-180 days for MINOR; 180-365 days for MAJOR)
  - Migration support resources identified (documentation, tooling, technical assistance)
  - Conformance testing updates developed
  - Examiner training materials prepared
6. **Effective Date:** New version becomes effective on designated date; prior version deprecated per transition plan

**Material Change Triggers** (requiring disclosure version update):

As defined in Section 4.2, material changes to instrument-specific disclosures trigger new disclosure version publication. Schema-level changes (MINOR/MAJOR versions) require issuer adoption per transition plan but do not automatically trigger disclosure re-publication unless content changes.

## 8.3 Evidence Pack Requirement Evolution

Evidence requirements may evolve based on:

- Examination findings revealing gaps in evidence coverage
- Technological improvements enabling new evidence types (e.g., real-time property sensors providing occupancy data)
- Regulatory guidance requiring additional documentation
- Fraud or misconduct cases highlighting evidence weaknesses

**Evolution Authority:** Disclosure Standards Committee (same authority as schema versioning)

**Backward Compatibility Principle:** New evidence requirements apply to new offerings and disclosure updates; existing offerings have 12-month grandfather period to comply with enhanced requirements unless critical gap warrants immediate remediation.

**Example Evolution Scenario:**

*Current Requirement:* Independent appraisal required annually for properties >\$10M

*Proposed Enhancement:* Add requirement for quarterly broker price opinions (BPOs) or automated valuation models (AVMs) between annual appraisals to provide more frequent valuation updates

#### Process:

1. Proposal submitted by SRO representative citing examination finding that annual appraisals insufficient for volatile markets
2. Committee reviews; requests impact assessment from industry representatives
3. 45-day public comment period; industry raises concerns about BPO cost for smaller properties
4. Committee revises: BPOs/AVMs required quarterly for properties >\$50M; annually for properties \$10-50M; optional for <\$10M
5. Approved with 12-month implementation timeline
6. Evidence Pack Mapping (Section 5) updated; examiners trained on new requirement

## 8.4 Recertification Cadence and Triggers

Issuers and intermediaries must periodically recertify conformance with disclosure standards, evidence requirements, and liquidity frameworks.

#### Recertification Frequency:

Participant Type	Routine Recertification	Triggering Event Recertification
Issuers	Annually	Material change to property, structure, or disclosure
Broker-Dealers	Annually	Change in transfer procedures or intermediary role
Qualified Custodians	Annually	Change in custody procedures or technology
Transfer Agents	Annually	Change in registry or eligibility verification procedures
Independent Assessors	Biennially	Loss of credential, conflict issue, or quality concern

#### Routine Recertification Process:

1. **Self-Assessment:** Participant completes conformance self-assessment checklist (60 days before recertification due date)
2. **Evidence Pack Update:** Current evidence pack assembled demonstrating continued conformance
3. **Independent Review** (optional for smaller offerings; required for >\$50M or >500 investors): Independent assessor reviews evidence and issues certification report
4. **Submission:** Evidence pack and self-assessment (plus independent report if applicable) submitted to pilot governance staff
5. **Review:** Governance staff or delegated reviewers assess submission (15 business days)
6. **Certification Renewal:** If conformance confirmed, certification renewed for next period; if deficiencies identified, remediation required before renewal

#### Triggering Event Recertification:

Material changes require recertification outside routine schedule:

- Property sale, major renovation, or casualty event
- Debt refinancing or material change in leverage



- Change in sponsor, manager, or key service provider
- Regulatory action, enforcement proceeding, or litigation materially affecting offering
- Liquidity mode change (e.g., entering STRESS\_MODE)
- Schema version update with breaking changes (MAJOR version)

Triggering event recertification follows same process as routine but on accelerated timeline (typically 30-45 days depending on complexity).

## 8.5 Independent Assessor Role and Accreditation

Independent assessors provide third-party validation of disclosure conformance, evidence completeness, and control effectiveness. This role is **optional** for smaller offerings but **required** for larger, more complex instruments.

### When Independent Assessor Required:

- Instruments >\$100M total value
- Instruments with >1,000 investors
- Instruments using complex structures (e.g., multiple property portfolio, cross-collateralization)
- Instruments entering pilot with prior regulatory findings or examination deficiencies
- At discretion of Disclosure Standards Committee for novel or high-risk structures

### Assessor Qualification Requirements:

To serve as independent assessor:

- Professional credential: CPA (Certified Public Accountant), CFA (Chartered Financial Analyst), MAI (Member, Appraisal Institute), ASA (Accredited Senior Appraiser), or equivalent
- Minimum 5 years experience in real estate finance, securities regulation, or audit/assurance
- Completion of pilot-specific assessor training program (24 hours)
- No financial interest in assessed offerings beyond assessment fee
- Professional liability insurance (\$5M minimum coverage)
- Clean regulatory record (no disciplinary actions in past 5 years)

### Assessor Accreditation Process:

1. **Application:** Candidate submits credentials, experience summary, insurance proof, regulatory history
2. **Review:** Pilot governance staff verifies qualifications
3. **Training:** Candidate completes assessor training covering:
  - Disclosure schema structure and requirements
  - Evidence pack evaluation procedures
  - Examiner query pack familiarization
  - Independence and conflict standards
  - Report writing and documentation
4. **Practical Exercise:** Candidate performs mock assessment under supervision
5. **Accreditation Decision:** If qualified, candidate added to approved assessor roster

6. **Biennial Renewal:** Accreditation renewed every 2 years with continuing education (8 hours) and clean regulatory record

### **Assessor Independence Standards:**

Assessors must be independent from:

- Issuer/sponsor (no financial relationship beyond assessment fee)
- Property (no ownership interest)
- Service providers (no referral fees or reciprocal arrangements)
- Investors (no investment in assessed offering)

Assessors must disclose any relationships or circumstances that could impair independence. Disclosure Standards Committee makes independence determinations in ambiguous cases.

### **Assessor Duties and Deliverables:**

Independent assessor performs:

- **Disclosure Conformance Review:** Verify disclosure instance conforms to current SDS version with all required fields populated
- **Evidence Pack Completeness Assessment:** Verify evidence pack contains required artifacts, logs, and attestations per Section 5 requirements
- **Evidence Quality Evaluation:** Assess evidence recency, authenticity, and sufficiency using scoring rubric (Section 5.6)
- **Cross-Module Consistency Checks:** Identify inconsistencies or discrepancies across modules
- **Sample Transaction Testing:** Review sample transfers and distributions for compliance with disclosed procedures
- **Control Effectiveness Review:** Assess internal controls over disclosure preparation and evidence maintenance

Assessor produces written report including:

- Executive summary of findings
- Conformance assessment (modules, evidence pack, liquidity mechanics)
- Identified deficiencies and recommended remediation
- Overall assessment: **Certified** (ready for pilot), **Certified with Conditions** (minor remediation required), or **Not Certified** (material deficiencies require correction)
- Assessor attestation and signature

### **Assessor Oversight and Quality Control:**

- **Peer Review:** Random sample (10%) of assessor reports undergo peer review by senior assessors
- **Complaint Process:** Issuers may submit complaints about assessor conduct; Disclosure Standards Committee investigates
- **Performance Monitoring:** Assessor report quality tracked; patterns of inadequate assessments trigger remedial training or accreditation suspension

- **Liability:** Assessors liable for negligent assessments under professional liability insurance; intentional misconduct may result in accreditation revocation and regulatory referral

## 8.6 Change Control Procedures for Critical Updates

Some changes require special procedures beyond standard versioning due to criticality or urgency.

### Critical Update Categories:

1. **Security Vulnerabilities:** Disclosure schema or evidence format vulnerabilities enabling fraud or manipulation
2. **Regulatory Mandates:** New regulatory requirements necessitating immediate schema or evidence changes
3. **Systemic Risk Discoveries:** Operational experience reveals material investor protection gaps requiring urgent remediation
4. **Liquidity Crisis Procedures:** Market-wide or offering-specific liquidity events requiring temporary procedure modifications

### Expedited Change Control Process:

For critical updates:

- **Identification:** Issue identified by examiner, assessor, participant, or governance staff
- **Emergency Committee Convening:** Disclosure Standards Committee convened within 48 hours
- **Assessment:** Criticality, scope, and urgency assessed; decision to invoke expedited process
- **Solution Development:** Working group develops remediation approach (schema change, guidance, temporary waiver)
- **Accelerated Review:** Abbreviated comment period (7-14 days instead of 45 days) or committee decision without public comment if extreme urgency
- **Emergency Implementation:** Changes effective immediately or with minimal notice (7-30 days depending on criticality)
- **Post-Implementation Review:** Within 90 days, committee reviews whether expedited change should be permanent, revised, or sunset

### Stakeholder Notification:

Critical updates require immediate notification to all pilot participants via:

- Email to registered contacts
- Pilot portal posting with prominent alert
- SRO bulletins (if appropriate)
- Direct phone contact for material changes affecting active transactions

### Documentation:

All expedited change control decisions documented with:

- Triggering issue description and criticality justification
- Stakeholder input summary (even if abbreviated)
- Committee decision rationale

- Implementation plan and timeline
- Success criteria for post-implementation review

## 8.7 Dispute Resolution for Governance Decisions

Stakeholders may disagree with governance decisions (schema changes, evidence requirements, certification denials). Fair dispute resolution procedures ensure governance legitimacy.

### Dispute Categories:

1. **Schema Change Disputes:** Stakeholder challenges schema version change as unnecessary, burdensome, or poorly designed
2. **Evidence Requirement Disputes:** Stakeholder challenges evidence requirement as excessive, infeasible, or unjustified
3. **Certification Denial Disputes:** Issuer challenges conformance certification denial or conditional certification
4. **Assessor Disputes:** Issuer challenges assessor findings, methodology, or independence

### Dispute Resolution Process:

#### Tier 1: Informal Resolution with Committee Staff (Target: 15 business days)

- Stakeholder submits dispute with specific issues and supporting arguments
- Governance staff reviews and responds with explanation or proposed resolution
- If resolved: Documentation preserved; no further action
- If unresolved: Escalates to Tier 2

#### Tier 2: Committee Review (Target: 45 business days)

- Full Disclosure Standards Committee reviews dispute
- Stakeholder invited to present arguments (written or oral presentation at committee meeting)
- Committee reviews original decision rationale, stakeholder arguments, and any new information
- Committee decision: Affirm original decision, modify original decision, or remand to staff for reconsideration
- Decision documented with rationale

#### Tier 3: Pilot Steering Committee Appeal (Target: 60 business days)

- Available only for material disputes with significant pilot-wide implications
- Stakeholder submits appeal to Pilot Steering Committee with grounds (procedural error, abuse of discretion, material new information)
- Pilot Steering Committee reviews without re-hearing entire matter; focuses on procedural fairness and reasonableness
- Pilot Steering Committee decision final within pilot governance structure; stakeholder retains right to regulatory petition or legal challenge outside pilot

### Due Process Protections:

- Right to be heard at each tier
- Access to decision rationale and supporting materials

- Neutral decision-makers (committee members with conflicts recuse)
- Timely decisions with documented reasoning
- Preservation of legal rights (dispute resolution does not waive regulatory petition rights)

## 8.8 Sunset and Transition Planning

The disclosure framework is initially developed for time-limited pilot. Governance must address eventual transition to steady-state or pilot conclusion.

### Pilot Conclusion Scenarios:

1. **Success → Permanent Implementation:** Pilot demonstrates value; framework transitions to permanent regulatory infrastructure
2. **Success → Broader Pilot:** Initial pilot expands to more participants, asset classes, or jurisdictions before permanent implementation
3. **Modification → Revised Pilot:** Pilot identifies improvements; framework revised and new pilot initiated
4. **Conclusion → No Continuation:** Pilot objectives not achieved or regulatory priorities change; framework sunset

### Transition Planning Requirements:

At pilot mid-point (Month 9 of 18-month pilot):

- Comprehensive evaluation of framework effectiveness (Section 9.2)
- Stakeholder feedback collection and analysis
- Preliminary recommendation: continue, modify, or sunset
- If continue/modify: Draft transition plan for post-pilot period

At pilot conclusion (Month 18):

- Final evaluation report with recommendations
- Detailed transition plan:
  - If permanent: Regulatory rulemaking timeline, public comment process, effective date
  - If broader pilot: Expanded pilot scope, participant selection, timeline
  - If sunset: Orderly wind-down, offboarding procedures, evidence preservation

### Sunset Procedures (if framework not continued):

1. **Notification** (90-180 days advance): All participants notified of sunset decision and timeline
2. **Offboarding to Legacy Systems:** Instruments transition to traditional disclosure formats per Exit & Liquidity Annex Section 6.2 (Mode 4: Offboarding)
3. **Evidence Preservation:** Evidence packs converted to archival formats; retained per applicable retention requirements (7+ years)
4. **Final Reporting:** Lessons learned documented; published for benefit of future innovation efforts
5. **Governance Dissolution:** Disclosure Standards Committee and related governance structures formally dissolved; no ongoing obligations

## Continuity Protections:

Regardless of pilot outcome, investor rights and issuer obligations under offering documents remain in effect. Framework sunset does not alter underlying legal relationships; only affects standardized disclosure and evidence formats.

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## 9. Implementation Roadmap

### 9.1 Purpose and Phased Approach Rationale

This section provides a phased implementation roadmap translating the disclosure framework from concept to operational reality. The roadmap balances ambition with prudence, enabling controlled deployment, iterative learning, and risk mitigation.

#### Phased Approach Benefits:

- **Risk Mitigation:** Starting small limits exposure; issues identified and remediated before scaling
- **Iterative Learning:** Each phase generates operational insights informing subsequent phases
- **Stakeholder Confidence:** Demonstrated success in early phases builds confidence for broader participation
- **Regulatory Comfort:** Controlled expansion enables supervisory evaluation and adjustment before market-wide deployment
- **Operational Readiness:** Participants build capabilities incrementally rather than attempting full-scale launch

#### Phase Duration and Milestone Structure:

The roadmap spans 18-24 months divided into three phases:

- **Phase 1: Shadow Mode & Schema Adoption** (Months 1-6): Framework deployment without operational enforcement; voluntary adoption and testing
- **Phase 2: Limited Live Deployment** (Months 7-12): Framework becomes operational requirement for pilot participants; limited scale
- **Phase 3: Scaling & Steady-State Operations** (Months 13-18+): Broader participant base; movement toward permanent implementation

Each phase includes defined entry criteria, success metrics, decision gates, and exit criteria determining whether to proceed to next phase, iterate within phase, or sunset program.

### 9.2 Phase 1: Shadow Mode & Schema Adoption (Months 1-6)

**Objective:** Deploy disclosure framework in parallel with existing processes; enable voluntary adoption, testing, and refinement without disrupting ongoing operations.

#### Entry Criteria:

- Disclosure Standards Committee established and operational
- Schema version 1.0.0 finalized and published

- Evidence Pack Mapping specifications complete
- Examiner query pack developed and examiner training initiated
- Independent assessor accreditation program launched
- Pilot participant cohort selected (2-3 initial issuers)

## **Phase 1 Activities:**

### **Month 1-2: Framework Publication and Training**

- Publish complete framework documentation (SDS, EDP, ELA)
- Conduct training sessions for:
  - Pilot issuers and sponsors (disclosure preparation)
  - Broker-dealers and transfer agents (transfer procedures)
  - Qualified custodians (evidence pack assembly)
  - Examiners (query pack execution)
  - Independent assessors (conformance assessment)
- Establish technical support channels (helpdesk, office hours, FAQ repository)

### **Month 3-4: Voluntary Disclosure Preparation**

- Pilot issuers prepare disclosure instances for existing or planned offerings
- Evidence packs assembled demonstrating conformance
- Schema validation testing (automated checks for field completeness, data types)
- Initial assessor reviews (formative feedback; not formal certification)
- Issues logged and addressed via change control process

### **Month 5-6: Shadow Examination and Evaluation**

- Examiners execute query pack against pilot disclosures (shadow mode; no enforcement action)
- Examiner feedback collected on:
  - Query pack effectiveness and clarity
  - Evidence pack completeness and accessibility
  - Identified gaps or ambiguities in framework
- Pilot participants provide feedback on:
  - Disclosure preparation burden and cost
  - Framework clarity and usability
  - Technical challenges and support needs

### **Success Metrics (Phase 1):**

- $\geq 2$  issuers complete conformant disclosure instances
- $\geq 80\%$  of query pack checks executable without errors
- Evidence Pack Quality Score (Section 5.6) averages  $\geq 70$  (Grade C or better)
- $\geq 3$  independent assessors accredited and operational
- Participant feedback indicates framework is feasible and valuable
- No material framework flaws identified requiring redesign

### **Decision Gate 1 (Month 6): Proceed to Phase 2?**

- **GO:** Success metrics achieved; participants ready for operational deployment
- **ITERATE:** Partial success; extend Phase 1 for additional refinement (Months 7-9)
- **NO-GO:** Fundamental flaws identified; major redesign required or pilot termination

#### **Phase 1 Output Artifacts:**

- 2-3 production-quality disclosure instances
  - Evidence packs demonstrating framework conformance
  - Framework refinements based on participant and examiner feedback
  - Lessons learned document informing Phase 2
  - Updated training materials incorporating Phase 1 experience
- 

### **9.3 Phase 2: Limited Live Deployment (Months 7-12)**

**Objective:** Framework becomes operational requirement for pilot participants; limited scale enables close monitoring and rapid iteration.

#### **Entry Criteria:**

- Decision Gate 1 passed (success metrics achieved)
- Framework refinements from Phase 1 incorporated
- Examiner training complete
- Independent assessor capacity adequate for pilot scale (3-5 assessors)
- Participant cohort willing to proceed (2-4 issuers; 3-5 broker-dealers; 2-3 qualified custodians)

#### **Phase 2 Activities:**

##### **Month 7-8: Operational Deployment**

- Framework becomes mandatory for new offerings in pilot
- Existing pilot offerings update disclosures to conform (3-month compliance window)
- First formal conformance certifications issued by independent assessors
- Transfer procedures operationalized per Exit & Liquidity Annex
- Regulatory reporting begins (quarterly metrics to SEC staff)

##### **Month 9-10: Operational Validation**

- First routine examinations using query pack
- Secondary market transfers executed demonstrating liquidity framework
- Hold/release procedures tested (controlled exercises)
- Evidence pack quality scoring operationalized
- Incident response procedures exercised (tabletop or actual incidents)

##### **Month 11-12: Evaluation and Refinement**

- Mid-point evaluation conducted:
  - Investor protection effectiveness (disclosure quality, verifiability, exit clarity)
  - Operational efficiency (examination time, participant burden, assessor throughput)



- Market integrity (transfer compliance, liquidity mode accuracy)
- Stakeholder feedback collected through surveys and working sessions
- Framework refinements identified and prioritized
- Schema version 1.1.0 development initiated (backward-compatible enhancements)

#### **Success Metrics (Phase 2):**

- $\geq 4$  issuers with conformant disclosures and live offerings
- $\geq 90\%$  of examiner query checks pass for certified offerings
- Evidence Pack Quality Score averages  $\geq 80$  (Grade B or better)
- Secondary market transfers executed successfully ( $\geq 10$  transfers;  $< 5\%$  failure rate)
- No material investor protection failures (fraud, misrepresentation, investor losses due to framework gaps)
- Participant satisfaction with framework  $\geq 70\%$  (survey)
- Examiner feedback indicates improved efficiency vs. traditional examinations

#### **Decision Gate 2 (Month 12): Proceed to Phase 3?**

- **GO:** Success metrics achieved; scale to broader participation
- **ITERATE:** Partial success; extend Phase 2 for additional operational validation (Months 13-15)
- **PIVOT:** Modify framework based on operational experience; re-enter Phase 2 with revised framework
- **NO-GO:** Fundamental operational challenges; pilot termination with orderly wind-down

#### **Phase 2 Output Artifacts:**

- 4-6 production offerings operating under framework
- Operational metrics database (examinations, transfers, incidents)
- Schema version 1.1.0 (incorporating Phase 2 learnings)
- Mid-point evaluation report with recommendations
- Expanded evidence pack library demonstrating diverse structures

## **9.4 Phase 3: Scaling & Steady-State Operations (Months 13-18+)**

**Objective:** Expand participant base toward market-scale operations; demonstrate framework sustainability and readiness for permanent implementation.

#### **Entry Criteria:**

- Decision Gate 2 passed
- Schema version 1.1.0 deployed
- Examiner capacity scaled (training additional examination staff)
- Independent assessor pool expanded (10+ accredited assessors)
- Participant interest sufficient for scaling (10+ issuers expressing interest)

#### **Phase 3 Activities:**

##### **Month 13-14: Controlled Expansion**

- Open pilot to additional participants (selection criteria: operational readiness, regulatory standing, commitment to framework)
- Target cohort: 8-10 issuers; 8-10 broker-dealers; 5-6 qualified custodians; 2-3 transfer agents
- Onboarding support intensified (dedicated onboarding coordinators; enhanced documentation)
- Conformance certification throughput increased (leveraging expanded assessor pool)

### **Month 15-16: Operational Maturity**

- Steady-state operations: routine examinations, transfers, certifications without extraordinary support
- Governance processes operating smoothly (quarterly committee meetings; routine change control)
- Evidence pack quality consistently high (≥85% achieving Grade B or better)
- Secondary market activity increasing (20-30 transfers per quarter across pilot)
- Incident response procedures validated through actual incidents with effective remediation

### **Month 17-18: Final Evaluation and Transition Planning**

- Comprehensive final evaluation:
  - Quantitative metrics (participation, quality scores, examination efficiency, transfer success rates)
  - Qualitative assessment (stakeholder feedback, examiner perspectives, investor confidence)
  - Cost-benefit analysis (framework costs vs. benefits)
- Determination: Permanent implementation, broader pilot, modification, or sunset
- If permanent implementation: Regulatory rulemaking initiated
- If broader pilot: Expansion plan developed (additional asset classes, cross-jurisdictional)
- If sunset: Offboarding plan per Section 6.2 (Mode 4)

### **Success Metrics (Phase 3):**

- ≥8 issuers with live offerings; ≥20 total instruments disclosed under framework
- Evidence Pack Quality Score averages ≥85 (Grade B+ or better)
- Examiner satisfaction ≥80% ("framework improves examination efficiency and effectiveness")
- Participant satisfaction ≥75% ("framework value justifies costs")
- Secondary market transfer success rate ≥95%
- No material investor protection failures
- Framework operates without extraordinary support (steady-state achieved)

### **Decision Gate 3 (Month 18): Permanent Implementation?**

- **YES:** Success criteria met; recommend permanent implementation via rulemaking
- **EXPAND:** Success criteria met; recommend broader pilot before permanent implementation
- **MODIFY:** Partial success; recommend framework modifications and continued pilot
- **SUNSET:** Insufficient success; orderly wind-down and lessons learned documentation

### **Phase 3 Output Artifacts:**

- Scaled participant base demonstrating framework viability
  - Comprehensive final evaluation report with recommendations
  - Cost-benefit analysis quantifying framework value
  - Permanent implementation proposal (if recommended)
  - Complete operational playbooks refined through 18 months of experience
- 

## 9.5 Contingency Planning and Risk Mitigation

Implementation faces risks requiring contingency planning:

### Risk 1: Low Participant Interest

- **Mitigation:** Pre-pilot outreach to gauge interest; address adoption barriers (cost, complexity) proactively
- **Contingency:** If <2 issuers commit, delay launch; refine framework; conduct additional stakeholder engagement
- **Trigger:** Insufficient commitments 30 days before Phase 1 launch

### Risk 2: Technical Challenges

- **Mitigation:** Pilot technology infrastructure before live deployment; provide robust technical support
- **Contingency:** If schema validation, evidence pack assembly, or examiner queries prove technically infeasible, pause operations; engage technical specialists; modify framework
- **Trigger:** >25% of participants unable to generate conformant disclosures after 3 months

### Risk 3: Examiner Capacity Constraints

- **Mitigation:** Train examiners early; develop efficient query pack; automate where feasible
- **Contingency:** If examiner capacity insufficient, slow participant onboarding; request additional examination resources; simplify query pack
- **Trigger:** Examination backlog >60 days

### Risk 4: Independent Assessor Shortfall

- **Mitigation:** Recruit assessors early; make accreditation process accessible; competitive fee guidance
- **Contingency:** If <3 assessors available, relax requirement (optional for smaller offerings); provide additional incentives; lower qualification barriers marginally while maintaining quality
- **Trigger:** Assessor capacity <50% of anticipated demand

### Risk 5: Liquidity Framework Failures

- **Mitigation:** Clear mode definitions; hold/release integration; settlement failure procedures tested in advance
- **Contingency:** If transfers systematically fail or liquidity modes inappropriate, engage liquidity working group; revise procedures; provide additional guidance

- **Trigger:** Transfer failure rate >10% or liquidity mode accuracy concerns in >20% of offerings

#### **Risk 6: Investor Protection Incident**

- **Mitigation:** Robust disclosure verification; examiner oversight; assessor quality control
- **Contingency:** If material investor harm occurs due to framework gap, immediate incident investigation; framework modification if warranted; enhanced supervision; potential pilot suspension pending remediation
- **Trigger:** Material investor losses, fraud, or misrepresentation not detected by framework

#### **Risk 7: Regulatory Concerns**

- **Mitigation:** Close supervisory coordination; conservative pilot design; regular reporting
- **Contingency:** If SEC staff raise material concerns, pause pilot; address concerns; modify framework or operational procedures; resume with staff approval
- **Trigger:** Formal supervisory concerns expressed; enforcement referrals related to pilot

**Contingency Activation Authority:** Pilot Steering Committee may invoke contingencies based on emerging risks; SEC staff may require contingency activation or pilot suspension if investor protection concerns arise.

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## **9.6 Post-Pilot Transition Scenarios**

Assuming pilot reaches Month 18 Decision Gate 3, several transition paths are possible:

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### **Scenario A: Permanent Implementation via Rulemaking**

**Conditions:** Pilot demonstrates clear success; benefits justify costs; stakeholder support broad; no material investor protection gaps.

#### **Transition Steps:**

- 1. Rulemaking Initiation (Months 19-21):**
  - SEC staff prepare proposed rule incorporating framework
  - Economic analysis and cost-benefit assessment
  - Regulatory flexibility analysis (small entity impact)
  - Proposed rule published for public comment (60-90 days)
- 2. Public Comment and Finalization (Months 22-27):**
  - Public comment period; responses to comments drafted
  - Final rule revisions based on comments
  - Commission consideration and vote
  - Final rule publication with compliance date
- 3. Industry Transition (Months 28-36):**
  - Compliance date typically 12-18 months after final rule

- Industry builds infrastructure at scale
- Pilot participants transition from pilot to permanent regime
- Examiner training and resource scaling

**Framework Status:** Pilot framework becomes regulatory requirement for covered securities (scope defined in final rule); schema, evidence pack, and liquidity mechanics codified in rule text or incorporated by reference.

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### **Scenario B: Expanded Pilot (Asset Classes or Jurisdictions)**

**Conditions:** Pilot successful for property-linked securities; interest exists in expanding to other asset classes (infrastructure, equipment) or cross-jurisdictional pilots.

#### **Transition Steps:**

##### **1. Expansion Planning (Months 19-24):**

- Expansion scope defined (additional asset classes or bilateral corridor)
- Schema extensions developed for new asset classes (Modules 9-11 per Section 4.6 extensibility)
- Cross-jurisdictional corridor framework if applicable (per Baseline D Appendix I)
- Participant recruitment for expanded pilot

##### **2. Expanded Pilot Launch (Months 25-42):**

- New asset class or cross-border offerings launched
- Operational validation similar to Phases 1-3 approach
- Evaluation at expansion mid-point and conclusion

##### **3. Path Forward Determination (Month 42):**

- If successful: Proceed to permanent implementation (combined scope)
  - If mixed: Segment framework (permanent for real estate; continued pilot for others)
  - If unsuccessful: Revert to original pilot scope; lessons learned documented
- 

### **Scenario C: Modification and Continued Pilot**

**Conditions:** Pilot demonstrates partial success but material improvements needed before permanent implementation.

#### **Transition Steps:**

##### **1. Framework Redesign (Months 19-24):**

- Identify specific gaps or weaknesses
- Develop framework version 2.0 incorporating improvements
- Stakeholder consultation on proposed changes
- Testing and validation of revised framework

##### **2. Re-Launch (Months 25-30):**

- Pilot participants adopt framework 2.0

- Operational validation repeating Phases 1-3 approach (condensed timeline)
3. **Re-Evaluation** (Month 36):
- Determine success; proceed to Scenario A or continue iteration
- 

### **Scenario D: Sunset and Lessons Learned**

**Conditions:** Pilot fails to demonstrate sufficient value; costs exceed benefits; insufficient stakeholder interest; or regulatory priorities shift.

#### **Transition Steps:**

1. **Wind-Down Planning** (Months 19-21):
  - Notification to participants (90-180 days advance)
  - Offboarding procedures per Exit & Liquidity Annex Section 6.2 (Mode 4)
  - Evidence preservation planning
2. **Offboarding Execution** (Months 22-27):
  - Instruments transition to legacy disclosure formats
  - Evidence packs converted to archival formats
  - Investor rights preserved; no economic impact
3. **Lessons Learned Documentation** (Months 28-30):
  - Comprehensive final report documenting:
    - What worked well (replicable successes)
    - What didn't work (barriers and challenges)
    - Recommendations for future innovation efforts
    - Data preservation for academic research
  - Publication for public benefit

**Framework Status:** Sunset; no ongoing obligations; intellectual property and documentation made publicly available for future use.

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## **9.7 Implementation Support Resources**

Successful implementation requires robust support infrastructure:

#### **Technical Support:**

- **Helpdesk:** Email/phone support for disclosure preparation, schema validation, evidence pack assembly
- **Office Hours:** Weekly virtual sessions with framework experts
- **FAQ Repository:** Searchable database of common questions and answers
- **Schema Validator Tool:** Automated tool checking disclosure instances against schema
- **Evidence Pack Templates:** Starter templates accelerating evidence pack assembly

#### **Training Resources:**

- **Issuer Training:** Disclosure preparation, evidence assembly, recertification procedures (8 hours)
- **Intermediary Training:** Transfer procedures, hold/release integration, liquidity modes (6 hours)
- **Examiner Training:** Query pack execution, evidence evaluation, escalation procedures (12 hours)
- **Assessor Training:** Conformance assessment, independence standards, report writing (24 hours)

#### **Documentation:**

- **Framework Specification:** Complete schema, evidence pack, and liquidity documentation (this document)
- **Quick Start Guides:** Condensed guidance for common tasks (10-20 pages per guide)
- **Field Dictionary:** Searchable reference for every disclosure field (Appendix A)
- **Sample Disclosures:** Redacted examples demonstrating various structures (Appendix B)
- **Examiner Checklists:** Examiner-ready validation procedures (Appendix D)

#### **Stakeholder Engagement:**

- **Quarterly Working Group Meetings:** Participants share experiences; provide feedback; propose improvements
- **Annual Conference:** Broader stakeholder gathering; keynote presentations; breakout sessions
- **Regulatory Dialogue:** Regular SEC staff engagement sessions; guidance updates
- **Industry Collaboration:** Coordination with trade associations; best practice sharing

#### **Cost Support:**

- **Assessment Fee Guidance:** Recommended independent assessor fee ranges preventing excessive costs
- **Small Issuer Grants** (if funded): Grants or subsidies helping smaller issuers adopt framework
- **Technology Tools** (open source): Free schema validators, evidence pack generators, disclosure formatters

#### **Performance Monitoring:**

- **Metrics Dashboard:** Real-time dashboard tracking participation, quality scores, transfer activity
- **Quarterly Reporting:** Participant-level and aggregate metrics reported to Disclosure Standards Committee
- **Incident Tracking:** Centralized repository for incidents, remediation actions, lessons learned

**Operational Context & Governance Inheritance** "This submission operates strictly within the security architecture established in the 'Custody & Segregation Proof Kit' (v.Release). It inherits, by reference, the Genesis Configuration Parameters and Cryptographic Network Identity (Chain\_ID) defined in the 'Provenance & Anchoring' section of that control framework. No new initialization vectors are introduced herein.

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## Appendix A — SDS Field Dictionary (Tables)

### A.1 Purpose and Organization

This appendix provides a comprehensive field-by-field reference for the Standardized Disclosure Schema (SDS). Each field is documented with:

- Field name and path (dot notation for nested fields)
- Data type and format
- Required/optional status
- Validation rules and constraints
- Example values
- Cross-references to evidence requirements

The dictionary is organized by disclosure module matching the structure in Section 4.

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### A.2 Module 1: Asset Identity & Legal Structure — Field Dictionary

Field Path	Data Type	Required	Format/ Validation	Description	Example
instrument_id	String (UUID)	Required	UUID v4 format	Globally unique instrument identifier	550e8400-e29b-41d4-a716-446655440000
instrument_name	String	Required	Max 200 characters	Human-readable instrument name	Brookfield Office Tower Series A Tokens
instrument_type	Enum	Required	One of: EQUITY_TOKEN, DEBT_TOKEN, HYBRID_TOKEN, FRACTIONAL_O WNERSHIP	Category classification	EQUITY_TOKEN
asset_description	String	Required	Max 1000 characters; must include property type, location, size	Detailed property description	Class A office tower, 450,000 sq ft, CBD Chicago, LEED



Field Path	Data Type	Required	Format/ Validation	Description	Example
					Gold certified, 32 floors
asset_location.street_addresses	String	Required	Valid street address	Property street address	123 Michigan Avenue
asset_location.city	String	Required	Valid city name	Property city	Chicago
asset_location.state_province	String	Required	2-letter state code or province name	Property state/province	IL
asset_location.postal_code	String	Required	Valid postal/zip code	Property postal code	60601
asset_location.country	String	Required	ISO 3166-1 alpha-2 code	Property country	US
asset_location.latitude	Decimal	Optional	Range: -90 to 90	Property latitude coordinate	41.8781
asset_location.longitude	Decimal	Optional	Range: -180 to 180	Property longitude coordinate	-87.6298
legal_entity.issuer_name	String	Required	Must match formation documents	Legal name of issuing entity	Brookfield Properties Tokenization LLC
legal_entity.jurisdiction	String	Required	Valid jurisdiction (state/country)	State/country of incorporation	Delaware, USA
legal_entity.entity_type	Enum	Required	One of: LLC, LP, CORP, TRUST, OTHER	Legal entity type	LLC
legal_entity.lei	String	Optional	Valid LEI format (20 characters)	Legal Entity Identifier	549300EXAMPLE ID12345
legal_entity.formation_date	Date	Required	ISO 8601 format (YYYY-MM-DD)	Entity formation date	2024-03-15
beneficial_ownership	Array	Required	Min 1 entry; all >10% owners	Array of beneficial owner objects	See nested fields below
beneficial_ownership[].owner_name	String	Required	Full legal name	Beneficial owner name	John Smith or Smith Capital LLC
beneficial_ownership[].ownership	Decimal	Required	Range: 0-100; sum	Ownership	25.5

Field Path	Data Type	Required	Format/ Validation	Description	Example
ownership[].ownership_percentage			≤100	percentage	
beneficial_ownership[].owner_type	Enum	Required	One of: INDIVIDUAL, ENTITY, TRUST	Owner type classification	ENTITY
sponsor.sponsor_name	String	Required	Legal or trade name	Sponsor/manager name	Brookfield Asset Management
sponsor.sponsor_type	Enum	Required	One of: REIT, PRIVATE_EQUITY, DEVELOPER, ASSET_MANAGER, OTHER	Sponsor business type	ASSET_MANAGER
sponsor.experience_years	Integer	Required	Min: 0	Years of real estate experience	35
sponsor.aum	Decimal	Optional	In USD	Assets under management	750000000000 (750B)
sponsor.prior_offerings	Integer	Optional	Min: 0	Number of prior securities offerings	47
schema_version	String	Required	Semantic version format	SDS version used	1.0.0
disclosure_version	String	Required	Format: v[YYYY-MM-DD] - [sequential]	This disclosure instance version	v2026-01-15-001
published_at	DateTime	Required	ISO 8601 format with timezone	Disclosure publication timestamp	2026-01-15T14:30:00Z
prior_version_id	String	Nullable	Format: v[YYYY-MM-DD] - [sequential]	Reference to prior version	v2025-10-01-001 or null

#### Validation Rules:

- instrument\_id must be globally unique across all instruments
- beneficial\_ownership array must include all owners with >10% ownership
- Sum of ownership\_percentage values should equal ≤100% (allowing for rounding)
- schema\_version must reference published SDS version
- disclosure\_version must be sequential and dated

### A.3 Module 2: Rights, Restrictions, Transfer Limits, Eligibility — Field Dictionary

Field Path	Data Type	Required	Format/Validation	Description	Example
total_supply	Integer	Required	Min: 1	Total number of tokens issued	10000000
outstanding_supply	Integer	Required	Min: 1; ≤total_supply	Currently outstanding tokens	9500000
par_value	Decimal	Nullable	Min: 0	Par value per token if applicable	100.00 or null
currency	String	Required	ISO 4217 code	Currency denomination	USD
voting_rights	Enum	Required	One of: YES, NO, LIMITED	Whether tokens have voting rights	LIMITED
voting_description	String	Conditional	Max 500 characters; required if voting_rights ≠ NO	Description of voting rights	Token holders vote on major property transactions >\$5M
distribution_rights	Enum	Required	One of: PRO_RATA, PREFERRED, SUBORDINATED, NONE	Distribution rights type	PRO_RATA
distribution_frequency	Enum	Required	One of: MONTHLY, QUARTERLY, SEMI_ANNUAL, ANNUAL, EVENT_DRIVEN, NONE	Distribution frequency	QUARTERLY
distribution_description	String	Required	Max 500 characters	Distribution rights description	Quarterly distributions of 95% of distributable cashflow

Field Path	Data Type	Required	Format/Validation	Description	Example
redemption_available	Boolean	Required	true or false	Whether redemption rights exist	false
redemption_terms	Object	Conditional	Required if redemption_available=true; null otherwise	Redemption terms object	See nested fields below
redemption_terms.redemption_type	Enum	Required	One of: ISSUER_CALL, INVESTOR_PUT, BOTH, CONDITIONAL	Type of redemption right	INVESTOR_PUT_CONDITIONAL
redemption_terms.redemption_trigger	String	Required	Max 500 characters	Conditions enabling redemption	After 2-year holding period
redemption_terms.redemption_price_methodology	String	Required	Max 500 characters	How redemption price calculated	95% of most recent quarterly NAV
redemption_terms.notice_period_days	Integer	Required	Min: 0	Required notice period	90
redemption_terms.settlement_period_days	Integer	Required	Min: 1	Settlement period after notice	30
eligibility_requirements	Array	Required	Min 1 entry	List of eligibility criteria	See example below
transfer_restrictions.restricted	Boolean	Required	true or false	Whether transfers restricted	true
transfer_restrictions.restriction_type	Enum	Conditional	One of: HOLDING_PERIOD, QUALIFIED_INVESTOR_ONLY, ISSUER_APPROVAL, JURISDICTIONAL, MULTIPLE	Type of restriction	MULTIPLE

Field Path	Data Type	Required	Format/Validation	Description	Example
transfer_restrictions.restriction_details	String	Required	Max 1000 characters	Detailed restriction explanation	12-month holding period; QIB only; U.S. persons only
transfer_restrictions.holding_period_days	Integer	Nullable	Min: 0	Minimum holding period	365
transfer_restrictions.transfer_agent_approval_required	Boolean	Required	true or false	Whether TA approval needed	true
transfer_restrictions.permitted_jurisdictions	Array	Required	ISO 3166-1 alpha-2 codes	Jurisdictions where holders allowed	["US"]
concentration_limits.single_holder_max_percentage	Decimal	Nullable	Range: 0-100	Max % single holder may own	9.9
concentration_limits.affiliate_aggregation_required	Boolean	Required	true or false	Whether affiliates aggregated	true
concentration_limits.reporting_threshold_percentage	Decimal	Nullable	Range: 0-100	Ownership % triggering reporting	5.0
drag_along_rights	Boolean	Required	true or false	Majority can force minority sale	false
tag_along_rights	Boolean	Required	true or false	Minority can join majority sale	true
rights_description	String	Conditional	Max 500 characters; required if either right=true	Description of drag/tag rights	Minority holders can tag along on majority sales

**Example eligibility\_requirements array:**

```
[
  "Qualified Institutional Buyer (Rule 144A)",
  "Minimum $5,000,000 investment",
  "U.S. Person only (not available to non-U.S. persons)",
  "Not a sanctioned person or entity"
]
```

**Validation Rules:**

- `outstanding_supply` must be  $\leq$  `total_supply`
- If `redemption_available` = true, all `redemption_terms` subfields required
- If `voting_rights`  $\neq$  NO, `voting_description` required
- `eligibility_requirements` must include investor qualification standard

**A.4 Module 3: Valuation & Methodology — Field Dictionary**

Field Path	Data Type	Required	Format/Validation	Description	Example
<code>current_valuation.valuation_amount</code>	Decimal	Required	Min: 0	Property valuation in currency	45200000
<code>current_valuation.currency</code>	String	Required	ISO 4217 code	Valuation currency	USD
<code>current_valuation.valuation_date</code>	Date	Required	ISO 8601; must be <12 months old	Date of valuation	2026-01-10
<code>current_valuation.valuation_per_token</code>	Decimal	Required	Calculated: <code>valuation_amount / outstanding_supply</code>	Per-token valuation	4.76
<code>valuation_methodology</code>	Enum	Required	One of: COMPARABLE_SALES, INCOME_CAPITALIZATION, COST_APPROACH, HYBRID, INDEPENDENT_APPRAISAL, OTHER	Primary methodology	INCOME_CAPITALIZATION
<code>methodology_description</code>	String	Required	Max 2000 characters; must include data sources, assumptions, calculation steps	Detailed methodology explanation	See Section 4.3 for example
<code>independent_appraisal.appraisal_performed</code>	Boolean	Required	true or false	Whether independent appraisal done	true
<code>independent_appraisal.appraiser_name</code>	String	Conditional	Required if <code>appraisal_performed</code> =true	Appraisal firm name	Jones Lang LaSalle
<code>independent_appraisal.appraiser_credentials</code>	String	Conditional	Required if performed; e.g., MAI, ASA	Appraiser credentials	MAI

Field Path	Data Type	Required	Format/Validation	Description	Example
independent_appraisal.appraisal_date	Date	Conditional	ISO 8601; required if performed	Appraisal date	2026-01-10
independent_appraisal.appraisal_value	Decimal	Conditional	Required if performed	Appraised value	45200000
independent_appraisal.appraisal_report_available	Boolean	Conditional	Required if performed	Whether full report accessible	true
valuation_update_frequency	Enum	Required	One of: MONTHLY, QUARTERLY, SEMI_ANNUAL, ANNUAL, EVENT_DRIVEN	Update frequency	QUARTERLY
next_valuation_date	Date	Required	ISO 8601; future date	Expected next valuation	2026-04-10
key_assumptions	Array	Required	Min 1 entry	Array of assumption objects	See nested fields below
key_assumptions[].assumption_name	String	Required	Max 100 characters	Assumption name	Discount Rate
key_assumptions[].assumption_value	String	Required	Max 200 characters	Assumption value or range	7.5%
key_assumptions[].sensitivity_impact	String	Optional	Max 200 characters	Impact of 10% change	10% change = \$2.1M valuation change
valuation_uncertainty.uncertainty_range_low	Decimal	Required	Min: 0	Lower bound valuation	42000000
valuation_uncertainty.uncertainty_range_high	Decimal	Required	Min: 0	Upper bound valuation	48000000
valuation_uncertainty.confidence_level	Enum	Required	One of: HIGH, MEDIUM, LOW	Confidence assessment	MEDIUM
valuation_uncertainty.uncertainty_factors	Array	Required	Min 1 entry	Factors contributing to uncertainty	["Market volatility", "Tenant renewal uncertainty"]
historical_valua	Array	Required	Max 24 entries (24	Past	See nested

Field Path	Data Type	Required	Format/Validation	Description	Example
tions			months)	valuations array	fields below
historical_valuations[].valuation_date	Date	Required	ISO 8601	Historical valuation date	2025-10-01
historical_valuations[].valuation_amount	Decimal	Required	Min: 0	Historical valuation amount	42500000
historical_valuations[].methodology_used	Enum	Required	Same as valuation_methodology	Methodology for this valuation	INCOME_CAPITALIZATION

#### Validation Rules:

- `current_valuation.valuation_date` must be within 12 months of `published_at`
- If property value >\$10M, `independent_appraisal.appraisal_performed` should be true
- `valuation_per_token` calculation must match: `valuation_amount / outstanding_supply` ( $\pm 2\%$  rounding acceptable)
- `uncertainty_range_high` must be > `uncertainty_range_low`
- `historical_valuations` should show reasonable trend consistency

### A.5 Module 4: Cashflows / Distribution Policy — Field Dictionary

Field Path	Data Type	Required	Format/Validation	Description	Example
income_sources	Array	Conditional	Required if <code>distribution_rights</code> $\neq$ NONE	Array of income source objects	See nested fields below
income_sources[].source_type	Enum	Required	One of: RENTAL_INCOME, PARKING, ANCILLARY_SERVICES, OTHER	Type of income source	RENTAL_INCOME
income_sources[].source_description	String	Required	Max 200 characters	Description of income source	Office space leases
income_sources[].annual_income_estimate	Decimal	Required	Min: 0	Expected annual income	3450000
income_sources[].percentage_of_total	Decimal	Required	Range: 0-100	% of total property income	87.5



Field Path	Data Type	Required	Format/ Validation	Description	Example
operating_expenses.total_annual_opex	Decimal	Required	Min: 0	Total annual operating expenses	1200000
operating_expenses.opex_categories	Array	Required	Min 1 entry	Expense category array	See nested fields below
operating_expenses.opex_categories[].category	Enum	Required	One of: PROPERTY_MANAGEMENT, UTILITIES, MAINTENANCE, INSURANCE, PROPERTY_TAX, OTHER	Expense category	PROPERTY_MANAGEMENT
operating_expenses.opex_categories[].annual_amount	Decimal	Required	Min: 0	Annual expense amount	250000
operating_expenses.opex_categories[].percentage_of_revenue	Decimal	Required	Range: 0-100	% of gross revenue	6.3
net_operating_income.noi_annual	Decimal	Required	Calculated: gross income - opex	Annual NOI	2800000
net_operating_income.noi_margin	Decimal	Required	Calculated: (NOI / gross income) * 100	NOI margin percentage	70.9
net_operating_income.noi_per_token	Decimal	Required	Calculated: NOI / outstanding_supply	NOI per token	0.29
distribution_calculation	String	Required	Max 1000 characters	How distributions calculated	95% of quarterly NOI distributed pro-rata after 5% reserve allocation
distribution_history	Array	Required	Max 12 entries (12 distributions)	Past distribution array	See nested fields below
distribution_history[].distribution_date	Date	Required	ISO 8601	Distribution payment date	2025-12-31

Field Path	Data Type	Required	Format/ Validation	Description	Example
distribution_history[].amount_per_token	Decimal	Required	Min: 0	Distribution amount per token	0.065
distribution_history[].total_distributed	Decimal	Required	Min: 0	Total distribution amount	617500
distribution_history[].distribution_type	Enum	Required	One of: ORDINARY_INCOME, CAPITAL_GAIN, RETURN_OF_CAPITAL	Tax characterization	ORDINARY_INCOME
distribution_history[].tax_characterization	String	Optional	Max 200 characters	U.S. tax treatment	Qualified business income (Section 199A eligible)
distribution_reserves.reserve_policy_exists	Boolean	Required	true or false	Whether reserve policy exists	true
distribution_reserves.reserve_percentage	Decimal	Nullable	Range: 0-100	% of income reserved	5.0
distribution_reserves.reserve_purpose	String	Conditional	Max 500 characters; required if policy exists	Reserve purpose	Capital improvements and emergencies
distribution_reserves.current_reserve_balance	Decimal	Required	Min: 0	Current reserve balance	650000
yield_metrics.current_yield	Decimal	Required	Percentage; calculated	Current distribution yield	5.8
yield_metrics.trailing_12mo_yield	Decimal	Required	Percentage; calculated	Trailing 12-month yield	5.4
yield_metrics.projected_yield	Decimal	Optional	Percentage	Forward yield estimate	6.2

#### Calculation Validations:

- `noi_annual` should equal: `sum of income_sources[].annual_income_estimate - total_annual_opex` ( $\pm 5\%$  acceptable)

- `noi_margin` should equal:  $(noi\_annual / \text{gross income}) * 100$
- `current_yield` should equal:  $(\text{most recent annual distribution rate} / \text{current valuation per token}) * 100$
- Sum of `income_sources[].percentage_of_total` should equal 100%

## A.6 Module 5: Fees, Conflicts, Roles — Field Dictionary

Field Path	Data Type	Required	Format/ Validation	Description	Example
<code>management_fees</code>	Array	Required	Min 1 entry	Array of fee objects	See nested fields below
<code>management_fees[].fee_type</code>	Enum	Required	One of: ASSET_MANAGEMENT, PROPERTY_MANAGEMENT, ACQUISITION, DISPOSITION, PERFORMANCE, OTHER	Fee category	ASSET_MANAGEMENT
<code>management_fees[].fee_recipient</code>	String	Required	Max 200 characters	Entity receiving fee	Brookfield Asset Management
<code>management_fees[].fee_calculation</code>	String	Required	Max 500 characters	How fee calculated	1.25% of NAV annually, paid quarterly
<code>management_fees[].fee_rate_percentage</code>	Decimal	Nullable	Range: 0-100	Fee rate if percentage-based	1.25
<code>management_fees[].fee_amount_fixed</code>	Decimal	Nullable	Min: 0	Fixed fee if applicable	null
<code>management_fees[].fee_frequency</code>	Enum	Required	One of: MONTHLY, QUARTERLY, ANNUAL, TRANSACTION_BASED	Fee payment frequency	QUARTERLY
<code>total_expense_ratio</code>	Decimal	Required	Percentage; calculated	Total fees + expenses / NAV	2.3
<code>service_providers</code>	Array	Required	Min 1 entry	Service provider array	See nested fields below
<code>service_providers[].provider_name</code>	String	Required	Max 200 characters	Service provider	CBRE Property

Field Path	Data Type	Required	Format/ Validation	Description	Example
				name	Management
service_providers[].provider_role	Enum	Required	One of: PROPERTY_MANAGER, TRANSFER_AGENT, CUSTODIAN, LEGAL_COUNSEL, AUDITOR, APPRAISER, OTHER	Provider role	PROPERTY_MANAGER
service_providers[].relationship_start_date	Date	Required	ISO 8601	When relationship began	2024-06-01
service_providers[].affiliated_with_sponsor	Boolean	Required	true or false	Affiliation status	true
service_providers[].compensation_description	String	Required	Max 500 characters	How provider compensated	3% of gross rental income
conflicts_of_interest	Array	Required	Min 0 entries (empty if none)	Conflict of interest array	See nested fields below
conflicts_of_interest[].conflict_type	Enum	Required	One of: AFFILIATED_TRANSACTION, DUAL_REPRESENTATION, PRINCIPAL_TRANSACTION, OTHER	Type of conflict	AFFILIATED_TRANSACTION
conflicts_of_interest[].conflict_description	String	Required	Max 1000 characters	Detailed conflict explanation	Property manager is affiliate of sponsor
conflicts_of_interest[].mitigation_measures	String	Required	Max 500 characters	How conflict managed	Fees benchmarked to market rates; annual independent review
sponsor_compensation.direct_fees_annual	Decimal	Required	Min: 0	Annual direct fees to sponsor	565000
sponsor_compensation	Boolean	Required	true or false	Whether	true

Field Path	Data Type	Required	Format/ Validation	Description	Example
ion.performance_based_fees				performance fees exist	
sponsor_compensation.equity_participation	Decimal	Nullable	Range: 0-100	Sponsor ownership %	15.0
sponsor_compensation.preferred_returns	Boolean	Required	true or false	Whether sponsor receives preferred return	false
sponsor_compensation.total_compensation_description	String	Required	Max 1000 characters	Comprehensive compensation summary	See Section 4.3 example
related_party_transactions	Array	Required	Min 0 entries	Related party transaction array	See nested fields below
related_party_transactions[].transaction_type	String	Required	Max 200 characters	Type of transaction	Property management services
related_party_transactions[].counterparty	String	Required	Max 200 characters	Related party name	Brookfield Property Services LLC
related_party_transactions[].relationship	String	Required	Max 200 characters	Nature of relationship	Affiliate of sponsor
related_party_transactions[].transaction_amount	Decimal	Required	Min: 0	Transaction amount	120000
related_party_transactions[].transaction_date	Date	Required	ISO 8601	Transaction date	2025-12-31
related_party_transactions[].approval_process	String	Required	Max 500 characters	How transaction approved	Approved by independent committee after benchmarking analysis

**Validation Rules:**

- `total_expense_ratio` should approximately equal: (sum of all fees + operating expenses) / NAV ( $\pm 10$  bps acceptable)
- Related party transactions >\$100K or >1% NAV should be disclosed
- All affiliated service providers must be disclosed in conflicts array

## A.7 Module 6: Risk Factors — Field Dictionary

Field Path	Data Type	Required	Format/ Validation	Description	Example
risk_categories	Array	Required	Min 1 entry	Risk category array	See Section 4.3 for standard categories
risk_factors	Array	Required	Min 3 entries	Detailed risk factor array	See nested fields below
risk_factors[].risk_category	String	Required	Max 100 characters	Category from risk_categories	Market Risk
risk_factors[].risk_title	String	Required	Max 100 characters	Brief risk description	Property value volatility
risk_factors[].risk_description	String	Required	Max 2000 characters	Detailed risk explanation	See Section 4.3 example
risk_factors[].likelihood	Enum	Optional	One of: LOW, MEDIUM, HIGH	Likelihood assessment	MEDIUM
risk_factors[].impact	Enum	Optional	One of: LOW, MEDIUM, HIGH, CATASTROPHIC	Impact severity	HIGH
risk_factors[].mitigation_measures	String	Required	Max 1000 characters	How risk mitigated	Diversified tenant base; long-term leases
leverage.property_debt_exists	Boolean	Required	true or false	Whether property has debt	true
leverage.total_debt_amount	Decimal	Conditional	Min: 0; required if debt exists	Total debt amount	20000000
leverage.loan_to_value_ratio	Decimal	Conditional	Range: 0-100; required if debt	LTV percentage	44.2
leverage.debt_service_coverage_ratio	Decimal	Conditional	Min: 0; required if debt	DSCR	1.85
leverage.interest_rate	Decimal	Conditional	Range: 0-100; required if debt	Interest rate %	5.75
leverage.interest_rate_type	Enum	Conditional	One of: FIXED, VARIABLE, HYBRID;	Rate type	FIXED

Field Path	Data Type	Required	Format/ Validation	Description	Example
			required if debt		
leverage.maturity_date	Date	Conditional	ISO 8601; required if debt	Loan maturity date	2032-06-30
leverage.debt_covenants	Array	Conditional	Required if debt exists	List of covenants	[ "DSCR >1.50", "LTV <55%" ]
leverage.recourse_status	Enum	Conditional	One of: RECOURSE, NON_RECOURSE, LIMITED_RECOURSE; required if debt	Recourse status	NON_RECOURSE
environmental_risks.environmental_assessment_performed	Boolean	Required	true or false	Whether Phase I ESA performed	true
environmental_risks.assessment_date	Date	Conditional	ISO 8601; required if performed	Assessment date	2025-11-20
environmental_risks.known_contamination	Boolean	Required	true or false	Whether contamination known	false
environmental_risks.contamination_description	String	Conditional	Max 1000 characters; required if contamination=true	Contamination details	null
environmental_risks.flood_zone	Enum	Required	One of: NONE, MODERATE, HIGH	Flood risk classification	NONE
environmental_risks.seismic_risk	Enum	Required	One of: NONE, MODERATE, HIGH	Seismic risk classification	MODERATE
environmental_risks.climate_risks	Array	Required	Min 0 entries	Climate-related risks	[ "Extreme heat events" ]
legal_proceedings	Array	Required	Min 0 entries	Legal proceeding array	See nested fields below
legal_proceedings[].proceeding_type	Enum	Required	One of: LITIGATION, REGULATORY_ACTION, TAX_DISPUTE	Type of proceeding	LITIGATION

Field Path	Data Type	Required	Format/ Validation	Description	Example
			, OTHER		
legal_proceedings[].proceeding_description	String	Required	Max 1000 characters	Description of proceeding	Tenant lease dispute over CAM charges
legal_proceedings[].filing_date	Date	Required	ISO 8601	Filing or initiation date	2025-08-15
legal_proceedings[].status	Enum	Required	One of: PENDING, RESOLVED, SETTLED	Current status	PENDING
legal_proceedings[].potential_exposure	Decimal	Nullable	Min: 0	Estimated financial exposure	150000

#### Validation Rules:

- If `property_debt_exists = true`, all leverage subfields required
- `loan_to_value_ratio` should approximately equal:  $(\text{total\_debt\_amount} / \text{current\_valuation}) * 100$
- Environmental assessment should be <3 years old for initial offering; <5 years for ongoing
- Material legal proceedings (>\$500K potential exposure or >5% NAV) must be disclosed

## A.8 Module 7: Controls & Attestations — Field Dictionary

Field Path	Data Type	Required	Format/ Validation	Description	Example
internal_controls.controls_documented	Boolean	Required	true or false	Whether controls formally documented	true
internal_controls.control_framework	Enum	Nullable	One of: COSO, CUSTOM, NONE	Control framework used	COSO
internal_controls.control_description	String	Required	Max 1000 characters	Key controls description	See Section 4.3 example
internal_controls.segregation_of_duties	Boolean	Required	true or false	Whether segregation exists	true
financial_audit.audit_performed	Boolean	Required	true or false	Whether audit performed	true



Field Path	Data Type	Required	Format/Validation	Description	Example
financial_audit.auditor_name	String	Conditional	Max 200 characters; required if performed	CPA firm name	Deloitte & Touche LLP
financial_audit.audit_opinion	Enum	Conditional	One of: UNQUALIFIED, QUALIFIED, ADVERSE, DISCLAIMER; required if performed	Audit opinion type	UNQUALIFIED
financial_audit.audit_date	Date	Conditional	ISO 8601; required if performed	Audit report date	2026-01-08
financial_audit.audit_period	String	Conditional	Required if performed	Period covered	FY 2025
financial_audit.audit_report_available	Boolean	Conditional	Required if performed	Report accessibility	true
property_inspection.inspection_performed	Boolean	Required	true or false	Whether inspection performed	true
property_inspection.inspector_name	String	Conditional	Max 200 characters; required if performed	Inspector/firm name	ABC Engineering Services
property_inspection.inspection_date	Date	Conditional	ISO 8601; required if performed	Inspection date	2025-12-10
property_inspection.inspection_type	Enum	Conditional	One of: STRUCTURAL, ENVIRONMENTAL, COMPLIANCE, COMPREHENSIVE; required if performed	Inspection type	COMPREHENSIVE
property_inspection.material_findings	Array	Conditional	Required if performed	Material issues identified	["HVAC system end-of-life; replacement needed"]

Field Path	Data Type	Required	Format/ Validation	Description	Example
					2027"]
rent_roll_verification.verification_performed	Boolean	Required	true or false	Whether rent roll verified	true
rent_roll_verification.verification_date	Date	Conditional	ISO 8601; required if performed	Verification date	2026-01-01
rent_roll_verification.verifier	Enum	Conditional	One of: INDEPENDENT_AUDITOR, PROPERTY_MANAGER, INTERNAL, NONE; required if performed	Who verified	INDEPENDENT_AUDITOR
rent_roll_verification.occupancy_confirmed	Boolean	Conditional	Required if performed	Occupancy confirmed	true
rent_roll_verification.rent_amounts_confirmed	Boolean	Conditional	Required if performed	Rent amounts confirmed	true
management_attestation.attestation_provided	Boolean	Required	true or false	Whether attestation provided	true
management_attestation.attestation_date	Date	Conditional	ISO 8601; required if provided	Attestation date	2026-01-15
management_attestation.attesting_officer_name	String	Conditional	Max 200 characters; required if provided	Officer name	John Smith
management_attestation.attesting_officer_title	String	Conditional	Max 200 characters; required if provided	Officer title	Chief Financial Officer
management_attestation.attestation_scope	String	Conditional	Max 500 characters; required if provided	What is attested	Accuracy and completeness of financial and disclosure information
management_attestation	String	Conditional	Max 2000	Full	See Section 4.3

Field Path	Data Type	Required	Format/Validation	Description	Example
tion.attestation_text		l	characters; required if provided	attestation language	example
independent_certification.certification_obtained	Boolean	Required	true or false	Whether independent certification obtained	true
independent_certification.certifier_name	String	Conditional	Max 200 characters; required if obtained	Certifier name	DEF Compliance Advisors LLC
independent_certification.certifier_credentials	String	Conditional	Max 200 characters; required if obtained	Certifier credentials	CPA, CFA
independent_certification.certification_date	Date	Conditional	ISO 8601; required if obtained	Certification date	2026-01-14
independent_certification.certification_scope	Array	Conditional	Required if obtained	What was certified	["Disclosure conformance", "Evidence completeness"]

#### Validation Rules:

- For instruments >\$25M value or >500 investors, `financial_audit.audit_performed` should be true
- Management attestation strongly recommended; required for instruments >\$50M
- Independent certification required for instruments >\$100M or >1,000 investors

## A.9 Module 8: Event Taxonomy — Field Dictionary

Field Path	Data Type	Required	Format/Validation	Description	Example
material_events	Array	Required	Min 1 entry	Material event categories	See Section 4.3 for standard list
event_logging	Object	Required	Event logging requirements object	Event logging config	See nested fields below

#### Event Logging Requirements (per event type):

Each event type in `material_events` array requires logging configuration. Standard event log schema (applies to all events):

```

{
  "event_id": "UUID",
  "event_type": "enum from Module 8 taxonomy",
  "event_timestamp": "ISO 8601 datetime",
  "event_description": "string, max 1000 characters",
  "affected_instrument_id": "UUID",
  "reporting_entity": "string",
  "material": "boolean",
  "evidence_artifact_ids": ["array of artifact UUIDs"],
  "disclosure_version_updated": "boolean",
  "investor_notification_sent": "boolean",
  "notification_timestamp": "ISO 8601 datetime or null"
}

```

### Update Cadences:

Field Path	Data Type	Required	Format/ Validation	Description	Example
update_cadences.valuation_updates	Enum	Required	One of: MONTHLY, QUARTERLY, SEMI_ANNUAL, ANNUAL	Valuation update frequency	QUARTERLY
update_cadences.financial_updates	Enum	Required	One of: QUARTERLY, ANNUAL	Financial update frequency	QUARTERLY
update_cadences.performance_metrics	Enum	Required	One of: MONTHLY, QUARTERLY	Performance metrics frequency	MONTHLY
update_cadences.risk_factor_review	Enum	Required	One of: QUARTERLY, ANNUAL	Risk factor review frequency	ANNUAL
update_cadences.service_provider_review	Enum	Required	ANNUAL	Service provider review frequency	ANNUAL

# Appendix B — Sample SDS Instance (Example Disclosure)

## B.1 Purpose and Usage

This appendix provides a complete, realistic example of a conformant SDS disclosure instance. The example demonstrates proper field population, data formatting, and cross-module consistency. Field values are illustrative and redacted where appropriate to protect confidentiality.

**Instrument Summary:** This example represents a tokenized equity interest in a Class A office tower in Chicago, Illinois, sponsored by a fictional but realistic real estate asset manager.

---

## B.2 Complete JSON Disclosure Instance

```
{
  "metadata": {
    "schema_version": "1.0.0",
    "schema_url": "https://sds.pilot.sec.gov/schemas/sds-realasset-
v1.0.0.schema.json",
    "disclosure_version": "v2026-01-15-001",
    "published_at": "2026-01-15T14:30:00Z",
    "publisher": "Midwest Properties Tokenization LLC",
    "publisher_lei": "549300EXAMPLE123456",
    "canonical_url":
"https://disclosures.midwestprop.example/tokens/a1b2c3d4/v2026-01-15-001.json",
    "prior_version_url":
"https://disclosures.midwestprop.example/tokens/a1b2c3d4/v2025-10-01-001.json",
    "digital_signature": {
      "algorithm": "ECDSA_secp256r1",
      "signature":
"3045022100f7a9c2e8b3d5a1f9e4c6b8d2a7f3e9c1b5d8a4f6e2c9b7d3a1f5e8c4b6d9a2f702204
b3c8d1e6f9a2c5b7d4e1f8a3c6b9d2e5f1a8c4b7d9e2f6a1c5b8d3e7f4a9c6b1",
      "signer_pubkey":
"04a1b2c3d4e5f6a7b8c9d0e1f2a3b4c5d6e7f8a9b0c1d2e3f4a5b6c7d8e9f0a1b2c3d4e5f6a7b8c
9d0e1f2a3b4c5d6e7f8a9b0c1d2e3f4a5b6c7d8e9f0a1b2c3",
      "timestamp": "2026-01-15T14:30:05Z"
    },
    "checksum": {
      "algorithm": "SHA-256",
      "value":
"e3b0c44298fc1c149afbf4c8996fb92427ae41e4649b934ca495991b7852b855"
    }
  },
  "disclosure": {
    "module_1_asset_identity": {
      "instrument_id": "a1b2c3d4-e5f6-4a7b-8c9d-0e1f2a3b4c5d",
      "instrument_name": "Midwest Tower Series A Equity Tokens",
      "instrument_type": "EQUITY_TOKEN",
      "asset_description": "Class A office tower, 450,000 rentable square feet,
Central Business District Chicago, LEED Gold certified, 32 floors, built 2018,
recently renovated common areas and elevator systems",
      "asset_location": {
        "street_address": "100 West Monroe Street",
        "city": "Chicago",
        "state_province": "IL",
        "postal_code": "60603",
        "country": "US",
        "latitude": 41.8803,
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    "longitude": -87.6331
  },
  "legal_entity": {
    "issuer_name": "Midwest Properties Tokenization LLC",
    "jurisdiction": "Delaware, USA",
    "entity_type": "LLC",
    "lei": "549300EXAMPLE123456",
    "formation_date": "2024-03-15"
  },
  "beneficial_ownership": [
    {
      "owner_name": "Midwest Real Estate Partners LP",
      "ownership_percentage": 45.0,
      "owner_type": "ENTITY"
    },
    {
      "owner_name": "Chicago Property Fund II LLC",
      "ownership_percentage": 30.0,
      "owner_type": "ENTITY"
    },
    {
      "owner_name": "Various institutional investors",
      "ownership_percentage": 25.0,
      "owner_type": "ENTITY"
    }
  ],
  "sponsor": {
    "sponsor_name": "Midwest Real Estate Partners",
    "sponsor_type": "ASSET_MANAGER",
    "experience_years": 28,
    "aum": 125000000000,
    "prior_offerings": 15
  },
  "schema_version": "1.0.0",
  "disclosure_version": "v2026-01-15-001",
  "published_at": "2026-01-15T14:30:00Z",
  "prior_version_id": "v2025-10-01-001"
},
"module_2_rights_restrictions": {
  "total_supply": 10000000,
  "outstanding_supply": 9500000,
  "par_value": null,
  "currency": "USD",
  "voting_rights": "LIMITED",
  "voting_description": "Token holders vote on: (1) sale of property, (2)
major capital improvements >$5M, (3) replacement of asset manager, (4)
amendments to operating agreement materially affecting token holder rights. Each
token = 1 vote.",
  "distribution_rights": "PRO_RATA",
  "distribution_frequency": "QUARTERLY",
  "distribution_description": "Quarterly distributions of 95% of
distributable cashflow (NOI less debt service and 5% reserves) distributed pro-
rata to token holders based on holdings as of record date.",
  "redemption_available": false,
  "redemption_terms": null,
  "eligibility_requirements": [
    "Qualified Institutional Buyer as defined in Rule 144A under the
Securities Act of 1933",
    "Minimum initial investment of $5,000,000",
    "U.S. Person only (not available to non-U.S. persons or entities)",

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    "Not a sanctioned person or entity under OFAC or other applicable
sanctions programs",
    "Accredited Investor status verified"
  ],
  "transfer_restrictions": {
    "restricted": true,
    "restriction_type": "MULTIPLE",
    "restriction_details": "Transfers subject to: (1) 12-month holding
period from token acquisition, (2) transferee must be Qualified Institutional
Buyer with verified eligibility, (3) transferee must be U.S. Person, (4)
transfer agent approval required, (5) no transfers to sanctioned persons, (6)
concentration limits enforced.",
    "holding_period_days": 365,
    "transfer_agent_approval_required": true,
    "permitted_jurisdictions": ["US"]
  },
  "concentration_limits": {
    "single_holder_max_percentage": 9.9,
    "affiliate_aggregation_required": true,
    "reporting_threshold_percentage": 5.0
  },
  "drag_along_rights": false,
  "tag_along_rights": true,
  "rights_description": "Minority token holders have tag-along rights: if
majority holders (>50%) negotiate a sale of the property, minority holders may
participate in the sale on the same terms pro-rata to their holdings."
},
"module_3_valuation": {
  "current_valuation": {
    "valuation_amount": 45200000,
    "currency": "USD",
    "valuation_date": "2026-01-10",
    "valuation_per_token": 4.76
  },
  "valuation_methodology": "INCOME_CAPITALIZATION",
  "methodology_description": "Property valuation uses income capitalization
approach (discounted cashflow methodology). Key inputs: (1) Stabilized NOI of
$2,800,000 annually based on current rent roll and market rent analysis, (2)
Capitalization rate of 6.5% derived from comparable office building sales in
Chicago CBD (range: 6.0-7.0% for Class A), (3) 10-year holding period assumed,
(4) Terminal capitalization rate of 7.0% (50 bps higher than going-in cap rate
reflecting property aging), (5) Discount rate of 8.0% reflecting risk-adjusted
required return for institutional office real estate. Methodology supported by
independent appraisal (JLL, January 2026) and internal valuation model reviewed
quarterly.",
  "independent_appraisal": {
    "appraisal_performed": true,
    "appraiser_name": "Jones Lang LaSalle (JLL) Valuation Services",
    "appraiser_credentials": "MAI",
    "appraisal_date": "2026-01-10",
    "appraisal_value": 45200000,
    "appraisal_report_available": true
  },
  "valuation_update_frequency": "QUARTERLY",
  "next_valuation_date": "2026-04-10",
  "key_assumptions": [
    {
      "assumption_name": "Capitalization Rate",
      "assumption_value": "6.5%",
      "sensitivity_impact": "50 bps change in cap rate = approximately $2.1M
valuation change"
    }
  ]
}

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    },
    {
      "assumption_name": "Stabilized NOI",
      "assumption_value": "$2,800,000 annually",
      "sensitivity_impact": "10% change in NOI = approximately $4.3M
valuation change"
    },
    {
      "assumption_name": "Discount Rate",
      "assumption_value": "8.0%",
      "sensitivity_impact": "50 bps change in discount rate = approximately
$1.5M valuation change"
    },
    {
      "assumption_name": "Terminal Cap Rate",
      "assumption_value": "7.0%",
      "sensitivity_impact": "50 bps change in terminal cap = approximately
$1.8M valuation change"
    },
    {
      "assumption_name": "Occupancy at Stabilization",
      "assumption_value": "95%",
      "sensitivity_impact": "5% change in occupancy = approximately $2.0M
valuation change"
    }
  ],
  "valuation_uncertainty": {
    "uncertainty_range_low": 42000000,
    "uncertainty_range_high": 48000000,
    "confidence_level": "MEDIUM",
    "uncertainty_factors": [
      "Market capitalization rate volatility (recent Chicago CBD office
sales: 6.0-7.0%)",
      "Tenant rollover risk (30% of leases expiring 2027-2028)",
      "Interest rate environment affecting property valuations broadly",
      "Remote work trends affecting office demand long-term"
    ]
  },
  "historical_valuations": [
    {
      "valuation_date": "2025-10-01",
      "valuation_amount": 42500000,
      "methodology_used": "INCOME_CAPITALIZATION"
    },
    {
      "valuation_date": "2025-07-01",
      "valuation_amount": 41800000,
      "methodology_used": "INCOME_CAPITALIZATION"
    },
    {
      "valuation_date": "2025-04-01",
      "valuation_amount": 41200000,
      "methodology_used": "INCOME_CAPITALIZATION"
    },
    {
      "valuation_date": "2025-01-01",
      "valuation_amount": 40500000,
      "methodology_used": "INDEPENDENT_APPRAISAL"
    }
  ]
},

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"module_4_cashflows": {
  "income_sources": [
    {
      "source_type": "RENTAL_INCOME",
      "source_description": "Office space leases (450,000 sq ft)",
      "annual_income_estimate": 3450000,
      "percentage_of_total": 87.5
    },
    {
      "source_type": "PARKING",
      "source_description": "Parking garage (300 spaces)",
      "annual_income_estimate": 360000,
      "percentage_of_total": 9.1
    },
    {
      "source_type": "ANCILLARY_SERVICES",
      "source_description": "Conference room rentals, storage, other",
      "annual_income_estimate": 135000,
      "percentage_of_total": 3.4
    }
  ],
  "operating_expenses": {
    "total_annual_opex": 1145000,
    "opex_categories": [
      {
        "category": "PROPERTY_MANAGEMENT",
        "annual_amount": 118000,
        "percentage_of_revenue": 3.0
      },
      {
        "category": "UTILITIES",
        "annual_amount": 315000,
        "percentage_of_revenue": 8.0
      },
      {
        "category": "MAINTENANCE",
        "annual_amount": 275000,
        "percentage_of_revenue": 7.0
      },
      {
        "category": "INSURANCE",
        "annual_amount": 157000,
        "percentage_of_revenue": 4.0
      },
      {
        "category": "PROPERTY_TAX",
        "annual_amount": 240000,
        "percentage_of_revenue": 6.1
      },
      {
        "category": "OTHER",
        "annual_amount": 40000,
        "percentage_of_revenue": 1.0
      }
    ]
  },
  "net_operating_income": {
    "noi_annual": 2800000,
    "noi_margin": 70.9,
    "noi_per_token": 0.29
  },

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      "distribution_calculation": "Distributable cashflow calculated as: NOI
($2,800,000) less debt service ($960,000 annually) less 5% reserve allocation
($92,000) = $1,748,000 annually. 95% of distributable cashflow ($1,660,600)
distributed quarterly pro-rata to token holders. 5% retained as capital reserve
for property improvements and emergencies.",
      "distribution_history": [
        {
          "distribution_date": "2025-12-31",
          "amount_per_token": 0.044,
          "total_distributed": 418000,
          "distribution_type": "ORDINARY_INCOME",
          "tax_characterization": "Qualified business income (Section 199A
eligible for individual investors)"
        },
        {
          "distribution_date": "2025-09-30",
          "amount_per_token": 0.042,
          "total_distributed": 399000,
          "distribution_type": "ORDINARY_INCOME",
          "tax_characterization": "Qualified business income (Section 199A
eligible for individual investors)"
        },
        {
          "distribution_date": "2025-06-30",
          "amount_per_token": 0.041,
          "total_distributed": 389500,
          "distribution_type": "ORDINARY_INCOME",
          "tax_characterization": "Qualified business income (Section 199A
eligible for individual investors)"
        },
        {
          "distribution_date": "2025-03-31",
          "amount_per_token": 0.039,
          "total_distributed": 370500,
          "distribution_type": "ORDINARY_INCOME",
          "tax_characterization": "Qualified business income (Section 199A
eligible for individual investors)"
        }
      ],
      "distribution_reserves": {
        "reserve_policy_exists": true,
        "reserve_percentage": 5.0,
        "reserve_purpose": "Capital improvements, deferred maintenance, tenant
improvement allowances, and emergency repairs. Reserve target: 6-12 months of
operating expenses.",
        "current_reserve_balance": 725000
      },
      "yield_metrics": {
        "current_yield": 5.8,
        "trailing_12mo_yield": 5.4,
        "projected_yield": 6.2
      }
    },
    "module_5_fees": {
      "management_fees": [
        {
          "fee_type": "ASSET_MANAGEMENT",
          "fee_recipient": "Midwest Real Estate Partners",
          "fee_calculation": "1.25% of Net Asset Value (NAV) annually,
calculated and paid quarterly",
          "fee_rate_percentage": 1.25,

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        "fee_amount_fixed": null,
        "fee_frequency": "QUARTERLY"
    },
    {
        "fee_type": "PROPERTY_MANAGEMENT",
        "fee_recipient": "Midwest Property Services LLC (affiliate)",
        "fee_calculation": "3.0% of gross rental income, paid monthly",
        "fee_rate_percentage": 3.0,
        "fee_amount_fixed": null,
        "fee_frequency": "MONTHLY"
    },
    {
        "fee_type": "ACQUISITION",
        "fee_recipient": "Midwest Real Estate Partners",
        "fee_calculation": "One-time acquisition fee of 1.5% of purchase price
(paid at closing)",
        "fee_rate_percentage": 1.5,
        "fee_amount_fixed": null,
        "fee_frequency": "TRANSACTION_BASED"
    }
],
"total_expense_ratio": 2.35,
"service_providers": [
    {
        "provider_name": "Midwest Property Services LLC",
        "provider_role": "PROPERTY_MANAGER",
        "relationship_start_date": "2024-06-01",
        "affiliated_with_sponsor": true,
        "compensation_description": "3.0% of gross rental income ($103,500
annually based on current income)"
    },
    {
        "provider_name": "Chicago Transfer Services Inc.",
        "provider_role": "TRANSFER_AGENT",
        "relationship_start_date": "2024-05-15",
        "affiliated_with_sponsor": false,
        "compensation_description": "$25,000 annual retainer plus $50 per
transfer"
    },
    {
        "provider_name": "SecureCustody Trust Company",
        "provider_role": "CUSTODIAN",
        "relationship_start_date": "2024-05-15",
        "affiliated_with_sponsor": false,
        "compensation_description": "25 basis points (0.25%) of assets under
custody annually"
    },
    {
        "provider_name": "Smith & Jones LLP",
        "provider_role": "LEGAL_COUNSEL",
        "relationship_start_date": "2024-03-01",
        "affiliated_with_sponsor": false,
        "compensation_description": "Hourly billing for legal services;
approximately $75,000 annually"
    },
    {
        "provider_name": "Deloitte & Touche LLP",
        "provider_role": "AUDITOR",
        "relationship_start_date": "2024-12-01",
        "affiliated_with_sponsor": false,

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      "compensation_description": "$45,000 for annual financial statement
audit"
    },
    {
      "provider_name": "Jones Lang LaSalle (JLL)",
      "provider_role": "APPRAISER",
      "relationship_start_date": "2024-04-01",
      "affiliated_with_sponsor": false,
      "compensation_description": "$15,000 per independent appraisal
(annually)"
    }
  ],
  "conflicts_of_interest": [
    {
      "conflict_type": "AFFILIATED_TRANSACTION",
      "conflict_description": "Property manager (Midwest Property Services
LLC) is an affiliate of the sponsor (Midwest Real Estate Partners). This creates
a conflict as the sponsor controls both the property management company and has
significant influence over the issuing entity.",
      "mitigation_measures": "Property management fee (3.0% of gross income)
benchmarked against market rates for comparable Chicago office buildings
(typical range: 2.5-3.5%). Independent committee of the board reviews property
management performance and fees annually. Property manager performance metrics
tracked and reported quarterly."
    },
    {
      "conflict_type": "DUAL_REPRESENTATION",
      "conflict_description": "Sponsor (Midwest Real Estate Partners) serves
as both asset manager and holds 45% ownership interest in the property. This
creates potential conflicts in decisions affecting sponsor compensation vs.
token holder returns.",
      "mitigation_measures": "Independent directors on issuer board review
and approve all material decisions affecting sponsor compensation. Asset
management fee is market-rate (1.25% of NAV) and fixed, not performance-based,
reducing incentive for conflicts. Token holders have voting rights on major
decisions including asset manager replacement."
    }
  ],
  "sponsor_compensation": {
    "direct_fees_annual": 678000,
    "performance_based_fees": false,
    "equity_participation": 45.0,
    "preferred_returns": false,
    "total_compensation_description": "Sponsor receives: (1) Asset
management fee of 1.25% of NAV ($565,000 annually at current valuation), (2)
Property management fee of 3.0% of gross income via affiliated company ($103,500
annually), (3) Acquisition fee of 1.5% of purchase price ($607,500 one-time,
already paid), (4) Pro-rata distributions on 45% equity ownership (approximately
$747,000 annually at current distribution rates). Total ongoing annual
compensation approximately $1,415,500 including distributions."
  },
  "related_party_transactions": [
    {
      "transaction_type": "Property management services",
      "counterparty": "Midwest Property Services LLC",
      "relationship": "Affiliate of sponsor",
      "transaction_amount": 103500,
      "transaction_date": "2025-12-31",
      "approval_process": "Approved by independent committee of the board
after benchmarking analysis showing fee within market range (2.5-3.5% for
comparable properties)"
    }
  ]
}

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    },
    {
      "transaction_type": "Leasing commissions",
      "counterparty": "Midwest Realty Advisors LLC",
      "relationship": "Affiliate of sponsor",
      "transaction_amount": 85000,
      "transaction_date": "2025-11-30",
      "approval_process": "Approved by independent committee; commission
rate (4% of total lease value) consistent with market standard for Chicago
office leasing"
    }
  ]
},
"module_6_risk_factors": {
  "risk_categories": [
    "Market Risk",
    "Liquidity Risk",
    "Operational Risk",
    "Financial Risk",
    "Legal/Regulatory Risk",
    "Technology Risk",
    "Governance Risk"
  ],
  "risk_factors": [
    {
      "risk_category": "Market Risk",
      "risk_title": "Office real estate market volatility",
      "risk_description": "Property values and rental income depend on
Chicago office market conditions, which are influenced by employment trends,
business relocations, remote work adoption, interest rates, and economic cycles.
Recent trends show increased remote/hybrid work reducing office demand. A
significant downturn in the Chicago office market could materially reduce
property value and rental income, affecting token value and distributions.",
      "likelihood": "MEDIUM",
      "impact": "HIGH",
      "mitigation_measures": "Property is Class A quality in prime CBD
location with strong transit access, making it more resilient than suburban
offices. Diversified tenant base (no single tenant >20% of rent) reduces
concentration risk. Long-term lease structure (avg 7-year terms) provides income
stability."
    },
    {
      "risk_category": "Liquidity Risk",
      "risk_title": "Limited secondary market liquidity",
      "risk_description": "There is currently limited secondary market
liquidity for these tokens. While transfers are permitted (subject to
restrictions), finding buyers may be difficult, transaction costs may be high,
and pricing may be at significant discount to NAV. Token holders may be unable
to liquidate positions when desired or may be forced to accept unfavorable
pricing.",
      "likelihood": "HIGH",
      "impact": "MEDIUM",
      "mitigation_measures": "Transfer agent facilitates transfers and
maintains registry of interested buyers/sellers. Token holders may request
transfer assistance. However, liquidity cannot be guaranteed, and extended
holding periods (5-10+ years) should be anticipated."
    },
    {
      "risk_category": "Operational Risk",
      "risk_title": "Major tenant default or non-renewal risk",

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    "risk_description": "Property income depends on tenant lease
performance. Approximately 30% of leases expire in 2027-2028. If major tenants
default, do not renew, or renew at lower rates, property income and value would
be materially affected. Tenant creditworthiness and business performance are
outside issuer control.",
    "likelihood": "MEDIUM",
    "impact": "HIGH",
    "mitigation_measures": "Tenant credit screening performed at lease
signing. Lease terms include security deposits and personal guarantees where
appropriate. Property management actively engages tenants 18+ months before
lease expiration to facilitate early renewal negotiations. Tenant improvement
allowances budgeted to remain competitive for renewals."
  },
  {
    "risk_category": "Financial Risk",
    "risk_title": "Property debt and refinancing risk",
    "risk_description": "Property has $20M mortgage debt (44% LTV)
maturing June 2032. Rising interest rates or tightening credit conditions could
make refinancing difficult or expensive. Inability to refinance could force
property sale at unfavorable time or require equity injection. Debt service
obligations reduce distributable cashflow.",
    "likelihood": "MEDIUM",
    "impact": "MEDIUM",
    "mitigation_measures": "Conservative leverage (44% LTV) provides
refinancing cushion. Loan is non-recourse to token holders. Fixed interest rate
(5.75%) provides payment stability through 2032. Debt service coverage ratio of
1.85x provides margin for income decline. Property generates positive cashflow
after debt service."
  },
  {
    "risk_category": "Technology Risk",
    "risk_title": "Digital infrastructure and custody risks",
    "risk_description": "Tokens rely on digital infrastructure including
blockchain/ledger systems, custody platforms, and transfer agent technology.
Technical failures, cyberattacks, key management errors, or system outages could
impair token transfers, distribution payments, or access to ownership records.
Recovery from catastrophic failures may be difficult or impossible.",
    "likelihood": "LOW",
    "impact": "HIGH",
    "mitigation_measures": "Qualified custodian with institutional-grade
security and redundancy. Multi-party key management with geographic
distribution. Regular system backups and disaster recovery testing. Offboarding
procedures to legacy custody if digital infrastructure fails (see Exit &
Liquidity Annex Mode 4)."
  }
],
"leverage": {
  "property_debt_exists": true,
  "total_debt_amount": 20000000,
  "loan_to_value_ratio": 44.2,
  "debt_service_coverage_ratio": 1.85,
  "interest_rate": 5.75,
  "interest_rate_type": "FIXED",
  "maturity_date": "2032-06-30",
  "debt_covenants": [
    "Debt service coverage ratio (DSCR) minimum 1.50x",
    "Loan-to-value ratio (LTV) maximum 55%",
    "Property must maintain minimum occupancy of 80%",
    "No additional encumbrances without lender consent"
  ],
  "recourse_status": "NON_RECOURSE"
}

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    },
    "environmental_risks": {
      "environmental_assessment_performed": true,
      "assessment_date": "2025-11-20",
      "known_contamination": false,
      "contamination_description": null,
      "flood_zone": "NONE",
      "seismic_risk": "LOW",
      "climate_risks": [
        "Extreme heat events (increasing frequency may stress HVAC systems and increase operating costs)",
        "Heavy precipitation events (potential for urban flooding despite low FEMA flood zone classification)"
      ]
    },
    "legal_proceedings": [
      {
        "proceeding_type": "LITIGATION",
        "proceeding_description": "Lease dispute with former tenant (Suite 1200) over common area maintenance (CAM) charge allocation. Tenant claims CAM charges were improperly calculated. Amount in dispute: approximately $75,000 plus interest.",
        "filing_date": "2025-08-15",
        "status": "PENDING",
        "potential_exposure": 95000
      }
    ]
  },
  "module_7_controls": {
    "internal_controls": {
      "controls_documented": true,
      "control_framework": "COSO",
      "control_description": "Issuer maintains internal controls over financial reporting following COSO framework. Key controls include: (1) Segregation of duties for financial transactions and reporting, (2) Dual authorization for material financial decisions (>$50K), (3) Monthly reconciliation of property financial statements to accounting records, (4) Quarterly review of valuations and distributions by independent committee, (5) Annual internal control testing by external auditors. Control documentation updated annually.",
      "segregation_of_duties": true
    },
    "financial_audit": {
      "audit_performed": true,
      "auditor_name": "Deloitte & Touche LLP",
      "audit_opinion": "UNQUALIFIED",
      "audit_date": "2026-01-08",
      "audit_period": "Fiscal Year 2025 (January 1 - December 31, 2025)",
      "audit_report_available": true
    },
    "property_inspection": {
      "inspection_performed": true,
      "inspector_name": "ABC Engineering & Inspection Services",
      "inspection_date": "2025-12-10",
      "inspection_type": "COMPREHENSIVE",
      "material_findings": [
        "HVAC chillers approaching end of useful life (15 years old); replacement budgeted for 2027-2028 ($1.2M estimated cost)",
        "Minor façade repairs needed on north elevation (deferred maintenance; $75K budgeted for 2026)"
      ]
    }
  }
}

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      "Elevator modernization recommended within 3-5 years for improved
      efficiency and tenant satisfaction ($400K estimated)"
    ],
    "rent_roll_verification": {
      "verification_performed": true,
      "verification_date": "2026-01-01",
      "verifier": "INDEPENDENT_AUDITOR",
      "occupancy_confirmed": true,
      "rent_amounts_confirmed": true
    },
    "management_attestation": {
      "attestation_provided": true,
      "attestation_date": "2026-01-15",
      "attesting_officer_name": "Robert Johnson",
      "attesting_officer_title": "Chief Financial Officer",
      "attestation_scope": "Accuracy and completeness of financial
information, distribution calculations, and material disclosures contained in
this Standardized Disclosure Schema instance",
      "attestation_text": "I, Robert Johnson, Chief Financial Officer of
Midwest Properties Tokenization LLC, hereby certify that I have reviewed this
disclosure and, to the best of my knowledge and belief: (1) The disclosure does
not contain any untrue statement of a material fact or omit to state a material
fact necessary to make the statements made, in light of the circumstances under
which they were made, not misleading; (2) The financial statements and other
financial information included in this disclosure fairly present in all material
respects the financial condition and results of operations of the property for
the periods presented; (3) I am responsible for establishing and maintaining
disclosure controls and procedures and internal control over financial
reporting, and have designed such controls to provide reasonable assurance
regarding the reliability of financial reporting and the preparation of
disclosures; (4) All material changes affecting the property or token holders
have been appropriately disclosed. This attestation is made as of January 15,
2026."
    },
    "independent_certification": {
      "certification_obtained": true,
      "certifier_name": "DEF Compliance Advisors LLC",
      "certifier_credentials": "CPA, CFA, CAMS",
      "certification_date": "2026-01-14",
      "certification_scope": [
        "Disclosure schema conformance (all required fields populated
correctly)",
        "Evidence pack completeness (all required artifacts present)",
        "Cross-module consistency (no material discrepancies)",
        "Control environment adequacy"
      ]
    }
  },
  "module_8_event_taxonomy": {
    "material_events": [
      "VALUATION_UPDATE",
      "APPRAISAL_PERFORMED",
      "DISTRIBUTION_DECLARED",
      "DISTRIBUTION_PAID",
      "RESTRICTION_CHANGE",
      "FEE_STRUCTURE_CHANGE",
      "MAJOR_TENANT_EVENT",
      "PROPERTY_IMPROVEMENT",
      "FINANCING_EVENT",
      "LITIGATION_FILED",

```



```

    "REGULATORY_ACTION",
    "SPONSOR_CHANGE",
    "GOVERNANCE_ACTION",
    "INCIDENT_EVENT",
    "COMPLIANCE_EXCEPTION"
  ],
  "update_cadences": {
    "valuation_updates": "QUARTERLY",
    "financial_updates": "QUARTERLY",
    "performance_metrics": "MONTHLY",
    "risk_factor_review": "ANNUAL",
    "service_provider_review": "ANNUAL"
  }
}
}
}

```

*(JSON instance truncated for space; full instance would be approximately 1500-2000 lines)*

# Appendix C — Disclosure Evidence Pack (DEP) Manifest Template

## C.1 Purpose and Structure

This appendix provides a template DEP Manifest for assembling evidence packs supporting SDS disclosures. The manifest serves as a master index linking disclosure fields to supporting artifacts and logs.

---

## C.2 DEP Manifest JSON Template

```
{
  "manifest_id": "[UUID]",
  "disclosure_version": "v[YYYY-MM-DD]-[sequential]",
  "manifest_version": "1.0",
  "created_at": "[ISO 8601 timestamp]",
  "issuer": "[Issuer Legal Name]",
  "instrument_id": "[UUID]",
  "total_artifacts": "[integer count]",
  "manifest_checksum": "[SHA-256 hash of entire manifest]",
  "retention_policy": {
    "minimum_retention_years": 7,
    "retention_basis": "SEC recordkeeping requirements + applicable securities laws",
    "destruction_procedure": "Secure deletion per NIST SP 800-88 guidelines"
  },
  "artifacts": [
    {
      "artifact_id": "[Unique identifier: ART_[YYYYMMDD]_[seq]]",
      "artifact_name": "[Filename with extension]",
      "artifact_type": "[Enum: see artifact type taxonomy below]",
      "file_path": "[Relative path within DEP folder structure]",
      "file_size_bytes": "[integer]",
      "file_format": "[MIME type, e.g., application/pdf]",
      "checksum_algorithm": "SHA-256",
      "checksum": "[SHA-256 hash value]",
      "created_date": "[ISO 8601 timestamp]",
      "creator": "[Entity or person who created artifact]",
      "supports_modules": ["[Module identifiers, e.g., Module_3]"],
      "supports_fields": ["[Specific field paths supported]"],
      "materiality": "[Enum: HIGH, MEDIUM, LOW]",
      "confidentiality": "[Enum: PUBLIC, INSTITUTIONAL_ONLY, CONFIDENTIAL, HIGHLY_CONFIDENTIAL]",
      "retention_years": "[integer, may exceed minimum if required for specific artifact type]",
      "digital_signature": {
        "signed": "[boolean]",
        "signer": "[Entity name if signed]",
        "signature_timestamp": "[ISO 8601 timestamp]",
        "signature_value": "[Hex-encoded signature]"
      }
    }
  ],
  "logs": {
    "event_log_location": "[Path to event log JSON file]",
    "event_count": "[integer]",
  }
}
```

```

    "date_range": {
      "earliest_event": "[ISO 8601 timestamp]",
      "latest_event": "[ISO 8601 timestamp]"
    },
    "log_integrity_verified": "[boolean]",
    "log_checksum": "[SHA-256 hash of event log file]"
  },
  "attestations": [
    {
      "attestation_id": "[Unique identifier: ATT_[YYYYMMDD]_[seq]]",
      "attestation_type": "[Enum: MANAGEMENT_ATTESTATION,
INDEPENDENT_CERTIFICATION, AUDITOR_OPINION, APPRAISER_REPORT,
RENT_ROLL_VERIFICATION, etc.]",
      "attesting_party": "[Name and title of attesting party]",
      "attestation_date": "[ISO 8601 timestamp]",
      "attestation_scope": "[Description of what is attested]",
      "artifact_location": "[Path to attestation document]"
    }
  ]
}

```

### C.3 Artifact Type Taxonomy

The following artifact types are standardized for consistent DEP organization:

Artifact Type	Description	Example Filename
FORMATION_DOCUMENTS	Articles of incorporation, operating agreements	Articles_of_Incorporation.pdf
BENEFICIAL_OWNERSHIP_CERT	FinCEN beneficial ownership certification	Beneficial_Ownership_Certification.pdf
PROPERTY_DOCUMENTS	Deed, title report, survey	Property_Deed.pdf, Title_Report.pdf
LEGAL_OPINIONS	Legal counsel opinion letters	Counsel_Opinion_Letter.pdf
TOKEN_REGISTRY	Cap table or token registry	Token_Registry.xlsx
GOVERNANCE_POLICY	Voting, distribution, redemption policies	Voting_Rights_Policy.pdf
TRANSFER_POLICY	Transfer restriction policy	Transfer_Restriction_Policy.pdf
INDEPENDENT_APPRAISAL	Third-party property appraisal	Independent_Appraisal_2026-01-10.pdf
VALUATION_MODEL	DCF or comparable sales analysis	DCF_Model_2026-01-15.xlsx
METHODOLOGY_MEMO	Valuation methodology explanation	Valuation_Methodology_Memo.pdf
MARKET_DATA	Comparable sales, market reports	Comparable_Sales_List.xlsx
FINANCIAL_STATEMENT	P&L, balance sheet,	Financial_Statements_2025.xlsx

Artifact Type	Description	Example Filename
S	cashflow	
FINANCIAL_AUDIT	Independent auditor's report	Audited_Financials_2025.pdf
RENT_ROLL	Current rent roll	Rent_Roll_2026-01-01.xlsx
RENT_ROLL_VERIFICATION	Verification letter	Rent_Roll_Verification_Report.pdf
LEASE_ABSTRACTS	Summaries of major leases	Lease_Abtracts.pdf
OPERATING_STATEMENTS	NOI, operating expense detail	Operating_Statement_2025.xlsx
DISTRIBUTION_RECORDS	Distribution calculations, payment records	Distribution_History_2024-2025.xlsx
SERVICE_AGREEMENTS	Property management, asset management contracts	Property_Management_Agreement.pdf
FEE_SCHEDULES	Fee calculation summaries	Fee_Schedule_Summary.xlsx
CONFLICT_DISCLOSURES	Related party transaction log, conflict statements	Related_Party_Transaction_Log.xlsx
LOAN_DOCUMENTS	Mortgage, promissory note, loan agreement	Loan_Documents.pdf
COVENANT_COMPLIANCE	Debt covenant compliance certificate	Covenant_Compliance_Certificate.pdf
ENVIRONMENTAL_REPORTS	Phase I, Phase II ESA	Phase_I_Environmental_Assessment.pdf
LEGAL_DOCUMENTS	Litigation pleadings, settlement agreements	Litigation_Docket.xlsx
INSURANCE_POLICIES	Property, liability insurance	Property_Insurance_Policy.pdf
CONTROL_DOCUMENTATION	Internal controls documentation	Internal_Control_Documentation.pdf
SOC_REPORT	SOC 1 or SOC 2 report	SOC_1_Report.pdf
AUDIT_REPORT	Financial audit report	Financial_Audit_Report_2025.pdf
INSPECTION_REPORT	Physical property inspection	Physical_Inspection_Report.pdf
ATTESTATION_LETTER	Management or independent attestation	Management_Attestation_Letter.pdf
EVENT_LOG	Machine-readable event log	Event_Log_Export.json
EVENT_DOCS	Supporting documentation for events	Various

---

## C.4 Folder Structure Template

```
Disclosure_Evidence_Pack_[instrument_id]_[disclosure_version]/
├── DEP_Manifest.json                                # This manifest file
├── Module_1_Asset_Identity/
│   ├── Formation_Documents/
│   ├── Property_Documentation/
│   └── Legal_Opinions/
├── Module_2_Rights_Restrictions/
│   ├── Token_Documentation/
│   └── Governance_Documents/
├── Module_3_Valuation/
│   ├── Appraisals/
│   ├── Valuation_Models/
│   └── Market_Data/
├── Module_4_Cashflows/
│   ├── Financial_Statements/
│   ├── Rent_Rolls/
│   ├── Operating_Statements/
│   └── Distribution_Records/
├── Module_5_Fees_Conflicts/
│   ├── Service_Agreements/
│   ├── Fee_Schedules/
│   └── Conflict_Documentation/
├── Module_6_Risk_Factors/
│   ├── Environmental/
│   ├── Legal/
│   ├── Financial/
│   └── Insurance/
├── Module_7_Controls_Attestations/
│   ├── Internal_Controls/
│   ├── Audit_Reports/
│   ├── Property_Inspections/
│   └── Attestations/
├── Module_8_Event_Logs/
│   ├── Event_Log_Export.json
│   ├── Material_Events_Summary.pdf
│   └── Event_Supporting_Documentation/
└── Chain_of_Custody/
    ├── Artifact_Hash_Registry.json
    ├── Digital_Signatures/
    └── Version_Control/
```

---

## C.5 Checklist for Evidence Pack Completeness

Use this checklist to verify evidence pack completeness before submission:

### **Module 1: Asset Identity**

- ☐ Formation documents (articles, operating agreement)
- ☐ Beneficial ownership certification
- ☐ Property deed and title report
- ☐ Legal opinion (if applicable)

### **Module 2: Rights & Restrictions**

- ☐ Token registry or cap table
- ☐ Governance documents (voting, distribution policies)
- ☐ Transfer restriction policy
- ☐ Eligibility verification procedures

### **Module 3: Valuation**

- ☐ Independent appraisal (if required: property >\$10M)
- ☐ Valuation model or methodology memo
- ☐ Historical valuations (up to 24 months)
- ☐ Market data supporting assumptions

### **Module 4: Cashflows**

- ☐ Financial statements (latest period)
- ☐ Audited financials (if required: property >\$25M or >500 investors)
- ☐ Current rent roll (<90 days old)
- ☐ Rent roll verification letter
- ☐ Distribution calculation worksheets
- ☐ Distribution history (up to 12 periods)

### **Module 5: Fees & Conflicts**

- ☐ Service provider agreements
- ☐ Fee schedule summary
- ☐ TER calculation worksheet
- ☐ Related party transaction log
- ☐ Conflict disclosure statements

### **Module 6: Risk Factors**

- ☐ Loan documents (if property has debt)
- ☐ Covenant compliance certificate
- ☐ Phase I Environmental Assessment (<3 years old)
- ☐ Insurance policies (property, liability)
- ☐ Litigation docket (if applicable)

### **Module 7: Controls & Attestations**

- ☐ Internal control documentation
- ☐ Financial audit report (if required)
- ☐ Property inspection report (<2 years old)

- ☐ Rent roll verification letter
- ☐ Management attestation letter
- ☐ Independent certification (if required: >\$100M or >1,000 investors)

#### **Module 8: Event Logs**

- ☐ Event log export (JSON format)
- ☐ Material events summary
- ☐ Supporting documentation for material events

#### **Chain of Custody**

- ☐ Artifact hash registry (SHA-256 checksums)
  - ☐ Digital signatures (for critical artifacts)
  - ☐ Version control references
-

# Appendix D — Examiner Checklist (Real-Asset Disclosure & Liquidity)

## Purpose and Scope

This checklist provides examiners with standardized validation procedures for real-asset tokenized securities, focusing on disclosure integrity, evidence completeness, and exit/liquidity mechanism functionality. Checks are designed for use during examinations, conformance testing, or incident investigations.

## Examination Methodology

Each check specifies:

- **Check ID:** Unique identifier for tracking and reference
  - **Purpose:** Regulatory or operational objective addressed
  - **Evidence Inputs:** Required artifacts, logs, or documentation
  - **Pass Criteria:** Objective standards for compliance
  - **Fail Escalation:** Actions triggered by non-compliance
- 

## Section 1: Disclosure Integrity Checks

### Check D-01: Disclosure Schema Version Control

**Purpose:** Verify that disclosure documents use current schema version and maintain proper version history.

**Evidence Inputs:**

- Disclosure document header with schema version identifier
- Change log showing version history and material change triggers
- Issuer attestation of current version deployment

**Pass Criteria:**

- Current schema version matches registry of approved versions
- Version history complete with timestamps and change justifications
- No material changes implemented without proper authorization

**Fail Escalation:**

- Immediate disclosure refresh required
  - Notification to transfer agent and broker-dealers
  - Review of all outstanding positions for affected instruments
-



## **Check D-02: Asset Identity Verification**

**Purpose:** Confirm that disclosed asset identity matches underlying legal documentation and property records.

### **Evidence Inputs:**

- Property legal description and title documentation
- Reconciliation between disclosure identifiers and property records
- Third-party title report or legal opinion (if applicable)
- Appraisal report with property identification

### **Pass Criteria:**

- Property legal description matches disclosure exactly
- All identifiers (address, parcel number, title reference) reconcile
- No discrepancies between disclosure and public records

### **Fail Escalation:**

- Transaction hold until discrepancy resolved
  - Investor notification if positions outstanding
  - Legal review of contractual representations
- 

## **Check D-03: Valuation Methodology Documentation**

**Purpose:** Validate that valuation methodology is clearly documented, consistently applied, and supported by objective data sources.

### **Evidence Inputs:**

- Valuation policy document with detailed methodology
- Recent valuation report with supporting assumptions
- Independent appraiser qualifications and attestation
- Data source documentation (comparables, market indices, rent rolls)

### **Pass Criteria:**

- Methodology clearly documented and consistently applied
- Independent appraiser meets qualification standards
- Assumptions reasonable and supported by market data
- Valuation frequency meets disclosure commitments

### **Fail Escalation:**

- Enhanced review of valuation governance
  - Potential revaluation requirement
  - Disclosure amendment if methodology inadequate
-

#### **Check D-04: Cashflow Disclosure Accuracy**

**Purpose:** Verify that cashflow disclosures accurately reflect actual payments and match distribution records.

##### **Evidence Inputs:**

- Cashflow disclosure statements for prior 12 months
- Actual distribution records and payment confirmations
- Reconciliation between disclosed and actual cashflows
- Explanations for material variances

##### **Pass Criteria:**

- Disclosed cashflows reconcile to actual distributions within 2% tolerance
- Material variances (>5%) fully explained and documented
- Distribution timing matches disclosure commitments

##### **Fail Escalation:**

- Immediate cashflow disclosure correction
  - Investigation of source of discrepancies
  - Review of cashflow forecasting methodology
- 

#### **Check D-05: Fee and Conflict Disclosure Completeness**

**Purpose:** Ensure all fees, expenses, and conflicts of interest are clearly disclosed with quantified impacts.

##### **Evidence Inputs:**

- Fee disclosure section with itemized fee structure
- Conflict of interest statements
- Fee calculation examples
- Related party transaction documentation

##### **Pass Criteria:**

- All material fees disclosed with calculation methodology
- Related party relationships identified
- Conflict mitigation procedures documented
- Fee impacts quantified in investor-facing materials

##### **Fail Escalation:**

- Enhanced disclosure amendment required
  - Review of related party transaction approvals
  - Potential enforcement referral for material omissions
-

## Section 2: Evidence Pack Validation Checks

### Check D-06: Logging Completeness and Integrity

**Purpose:** Verify that event logs capture all material events with tamper-evident integrity.

**Evidence Inputs:**

- Event logs for examination period
- Hash chain verification results
- Event taxonomy mapping to baseline requirements
- Log retention policy documentation

**Pass Criteria:**

- All required event categories present in logs
- Hash chain integrity verified (no breaks detected)
- Timestamps accurate and synchronized to authoritative source
- Retention periods meet regulatory minimums (7 years)

**Fail Escalation:**

- Remediation of logging infrastructure
  - Investigation of any integrity failures
  - Enhanced monitoring until compliance restored
- 

### Check D-07: Disclosure Evidence Pack Completeness

**Purpose:** Confirm that evidence pack contains all required artifacts in standardized format.

**Evidence Inputs:**

- Evidence pack manifest with file inventory
- Policy documents, reports, and attestations per baseline
- Chain of custody documentation
- Checksum verification results

**Pass Criteria:**

- All required artifacts present per evidence manifest template
- File formats standardized and machine-readable
- Chain of custody documented for critical items
- Checksums verify file integrity

**Fail Escalation:**

- Evidence pack resubmission required
  - Delay in examination closure
  - Potential remediation of evidence production procedures
-

### **Check D-08: Attestation Validity and Separation**

**Purpose:** Validate that attestations are provided by appropriately independent parties with proper qualifications.

**Evidence Inputs:**

- Issuer attestation letters with officer signatures
- Independent assessor credentials and attestations
- Intermediary attestations (broker-dealer, custodian, transfer agent)
- Independence certifications

**Pass Criteria:**

- Attestations provided by qualified parties
- Independence verified (no prohibited conflicts)
- Signatures authentic and properly authorized
- Attestation scope covers all material representations

**Fail Escalation:**

- Enhanced review of attestation procedures
  - Potential requirement for additional independent assessment
  - Investigation if independence compromised
- 

## **Section 3: Exit/Liquidity Mechanism Checks**

### **Check D-09: Liquidity Mode Definition and Triggers**

**Purpose:** Verify that liquidity modes are clearly defined with objective triggers and procedures.

**Evidence Inputs:**

- Liquidity mode policy document
- Trigger thresholds and calculation methodologies
- Recent mode status reports
- Historical mode transitions with justifications

**Pass Criteria:**

- All liquidity modes clearly defined (normal, limited, stress, offboarding)
- Objective triggers specified with quantified thresholds
- Transition procedures documented and tested
- Mode status communicated to investors timely

**Fail Escalation:**

- Immediate policy clarification or amendment
  - Enhanced monitoring of liquidity conditions
  - Investor notification if inadequate disclosure
-

### **Check D-10: Transfer Restriction Enforcement**

**Purpose:** Confirm that transfer restrictions are properly implemented and eligibility gating functions correctly.

**Evidence Inputs:**

- Transfer restriction policy and implementation documentation
- Sample transfer attempts with eligibility validation logs
- Transfer agent procedures and test results
- Rejected transfer records with reasons

**Pass Criteria:**

- Transfer restrictions match disclosure commitments
- Eligibility checks function correctly (no false approvals)
- Rejected transfers properly documented with reasons
- Restriction enforcement automated with manual override controls

**Fail Escalation:**

- Immediate review of failed transfers
  - Enhanced testing of restriction logic
  - Potential system suspension until compliance verified
- 

### **Check D-11: Hold and Release Functionality**

**Purpose:** Validate that hold and release mechanisms function as designed with proper authorization and logging.

**Evidence Inputs:**

- Hold and release policy documentation
- Sample hold placement records with authorizations
- Release approval documentation
- Hold monitoring and review logs

**Pass Criteria:**

- Hold placement requires dual authorization per policy
- Legal authority documented for all holds
- Release procedures followed with proper approvals
- Complete audit trail maintained for all hold/release actions

**Fail Escalation:**

- Investigation of authorization failures
  - Enhanced controls on hold/release authority
  - Potential remediation of access controls
-

### **Check D-12: Exit/Offboarding Process Documentation**

**Purpose:** Ensure that exit procedures are clearly documented and enable safe return to legacy recordkeeping.

**Evidence Inputs:**

- Exit/offboarding policy and procedures
- Historical exit examples with complete documentation
- Legacy recordkeeping integration specifications
- Investor exit rights documentation

**Pass Criteria:**

- Exit procedures clearly documented with step-by-step guidance
- Legacy integration tested and verified
- Investor rights to exit clearly disclosed
- Exit evidence preserved in both digital and legacy formats

**Fail Escalation:**

- Enhanced documentation of exit procedures
  - Testing of legacy integration capabilities
  - Potential restriction on new issuances until remediated
- 

### **Check D-13: Queue and Priority Rule Transparency**

**Purpose:** Verify that queue management rules for liquidity events are transparent and consistently applied.

**Evidence Inputs:**

- Queue management policy documentation
- Priority rule specifications
- Historical queue processing records
- Fairness audit results (if applicable)

**Pass Criteria:**

- Queue rules clearly disclosed to investors
- Priority determinations objective and consistently applied
- No evidence of preferential treatment
- Audit trail documents queue processing decisions

**Fail Escalation:**

- Investigation of queue processing irregularities
  - Enhanced disclosure of queue rules
  - Potential enforcement referral if unfair practices detected
-

## Section 4: Operational Resilience Checks

### Check D-14: NAV Update Frequency and Documentation

**Purpose:** Confirm that Net Asset Value updates occur at disclosed frequency with proper documentation.

**Evidence Inputs:**

- NAV update schedule and actual update records
- Valuation reports supporting NAV calculations
- NAV methodology documentation
- Variance analysis for significant NAV changes

**Pass Criteria:**

- NAV updates occur at frequency disclosed to investors
- Methodology consistently applied
- Material changes (>5%) explained with supporting documentation
- NAV calculation independently verified when required

**Fail Escalation:**

- Enhanced review of NAV calculation procedures
  - Potential restatement if material errors detected
  - Investor notification if delays or errors identified
- 

### Check D-15: Failure-to-Settle Documentation

**Purpose:** Validate that settlement failures are properly documented with clear accountability and remediation.

**Evidence Inputs:**

- Settlement failure logs and incident reports
- RACI matrix showing accountability assignments
- Remediation actions and timelines
- Investor communications regarding failures

**Pass Criteria:**

- All settlement failures documented with root cause analysis
- Accountability clearly assigned per RACI framework
- Remediation completed within reasonable timelines
- Investors notified appropriately

**Fail Escalation:**

- Enhanced investigation of systemic settlement issues
- Operational improvements required
- Potential transaction restrictions until resolved

---

## **Section 5: Governance and Change Control Checks**

### **Check D-16: Material Change Identification and Disclosure**

**Purpose:** Ensure that material changes are properly identified, approved, and disclosed to investors.

**Evidence Inputs:**

- Material change definition and trigger criteria
- Change control board meeting minutes
- Investor notifications for material changes
- Updated disclosure documents with version control

**Pass Criteria:**

- Material changes identified per defined criteria
- Change control procedures followed with proper approvals
- Investors notified within timelines specified in governance documents
- Disclosure documents updated to reflect changes

**Fail Escalation:**

- Investigation of change control process failures
- Enhanced oversight of change management
- Potential sanctions for inadequate investor notification

---

### **Check D-17: Independent Assessor Certification**

**Purpose:** Verify that independent assessors meet qualification standards and provide appropriate certifications.

**Evidence Inputs:**

- Independent assessor credentials and experience documentation
- Certification scope and methodology
- Assessment reports and findings
- Independence verification documentation

**Pass Criteria:**

- Assessor credentials meet specified qualification standards
- Independence verified with no prohibited conflicts
- Certification scope appropriate for instrument complexity
- Reports complete with objective findings and recommendations

**Fail Escalation:**

- Enhanced review of assessor qualifications
- Potential requirement for additional independent review



- Investigation if independence compromised
- 

### **Check D-18: Recertification Compliance**

**Purpose:** Confirm that periodic recertification occurs at required intervals with complete documentation.

**Evidence Inputs:**

- Recertification schedule and completion records
- Recertification reports with findings
- Remediation actions for identified deficiencies
- Updated certifications and attestations

**Pass Criteria:**

- Recertification occurs at quarterly/semiannual intervals per policy
- All required areas covered in recertification scope
- Deficiencies identified and remediated timely
- Documentation complete and accessible for examination

**Fail Escalation:**

- Immediate recertification required if overdue
  - Enhanced monitoring until recertification current
  - Potential operational restrictions until compliance restored
- 

## **Section 6: Privacy and Access Control Checks**

### **Check D-19: Data Minimization and Purpose Limitation**

**Purpose:** Validate that data collection is limited to necessary purposes with appropriate retention limits.

**Evidence Inputs:**

- Data collection policy and justification documentation
- Purpose limitation specifications
- Data retention schedules
- Access control logs

**Pass Criteria:**

- Data collection limited to disclosed purposes
- Retention periods align with regulatory requirements
- Access restricted to authorized personnel
- Purpose limitations enforced systematically

**Fail Escalation:**

- Enhanced privacy controls required
  - Investigation of excessive data collection
  - Potential sanctions for privacy violations
- 

### **Check D-20: Tiered Access Implementation**

**Purpose:** Ensure that tiered access controls function properly with appropriate authorization and logging.

**Evidence Inputs:**

- Tiered access policy documentation
- Access request and authorization logs
- Access activity monitoring reports
- Post-event review documentation

**Pass Criteria:**

- Access tiers clearly defined and properly implemented
- Access requests require appropriate authorization
- All access events logged with immutable records
- Post-event reviews conducted for sensitive access

**Fail Escalation:**

- Investigation of unauthorized access
  - Enhanced access controls implementation
  - Potential system suspension pending remediation
- 

### **Examination Workflow Summary**

1. **Pre-Examination:** Evidence pack requested 30 days prior
  2. **Initial Review:** Completeness check using evidence manifest
  3. **Detailed Testing:** Execute applicable checks based on examination scope
  4. **Finding Documentation:** Record pass/fail status for each check
  5. **Remediation Tracking:** Follow up on failed checks with defined timelines
  6. **Examination Closure:** Final report with findings and recommendations
-

# Appendix E — Event Taxonomy Extensions (Real-Asset-Specific)

## Purpose and Integration

This appendix extends the baseline event taxonomy to capture real-asset-specific events critical to disclosure integrity, valuation monitoring, cashflow tracking, and exit/liquidity management. Events are designed to integrate with existing logging infrastructure defined in baseline conformance profiles.

## Event Schema Standard

All events include baseline attributes plus real-asset-specific metadata:

### Baseline Attributes (inherited):

- `event_id`: Unique identifier (UUID format)
- `timestamp`: ISO 8601 format with millisecond precision
- `event_type`: Category from taxonomy
- `actor_id`: Entity or system initiating event
- `affected_resource`: Asset, account, or position identifier
- `event_outcome`: SUCCESS | FAILURE | PENDING
- `previous_hash`: Hash of prior event in chain
- `current_hash`: SHA-256 hash of current event

### Real-Asset Extensions:

- `asset_class`: REAL\_ESTATE | INFRASTRUCTURE | OTHER\_TANGIBLE
- `property_id`: Legal property identifier or parcel number
- `valuation_impact`: Boolean indicating if event affects valuation
- `disclosure_update_required`: Boolean triggering disclosure refresh
- `liquidity_impact`: NONE | MINOR | MODERATE | MATERIAL

---

## Event Category 1: Asset Lifecycle Events

### Event E-01: PROPERTY\_ACQUISITION

**Description:** Underlying real asset acquired by issuing entity or structure.

**Trigger:** Closing of property acquisition transaction.

### Required Fields:

```
{
  "event_type": "PROPERTY_ACQUISITION",
  "property_id": "PARCEL_12345_CO_DENVER",
  "acquisition_date": "2026-01-15",
  "acquisition_price": 25000000.00,
  "acquisition_method": "CASH_PURCHASE | FINANCED | CONTRIBUTION",
```

```

"financing_amount": 15000000.00,
"financing_terms": "30-year mortgage at 4.5%",
"title_status": "CLEAR | ENCUMBERED | DISPUTED",
"valuation_impact": true,
"disclosure_update_required": true
}

```

#### Downstream Actions:

- Trigger initial valuation and disclosure document creation
- Update asset registry and legal ownership records
- Generate investor notification if post-issuance acquisition

### Event E-02: PROPERTY\_DISPOSITION

**Description:** Underlying real asset sold, transferred, or otherwise disposed.

**Trigger:** Closing of property sale or transfer transaction.

#### Required Fields:

```

{
  "event_type": "PROPERTY_DISPOSITION",
  "property_id": "PARCEL_12345_CO_DENVER",
  "disposition_date": "2028-06-30",
  "disposition_price": 32000000.00,
  "disposition_method": "SALE | EXCHANGE | FORECLOSURE",
  "buyer_type": "INSTITUTIONAL | INDIVIDUAL | GOVERNMENT",
  "capital_gain_loss": 7000000.00,
  "distribution_plan": "IMMEDIATE | SCHEDULED | REINVESTMENT",
  "valuation_impact": true,
  "disclosure_update_required": true,
  "liquidity_impact": "MATERIAL"
}

```

#### Downstream Actions:

- Trigger cashflow distribution calculations
- Update disclosure to reflect portfolio change
- Assess liquidity mode implications

### Event E-03: PROPERTY\_IMPROVEMENT

**Description:** Significant capital improvement or renovation of underlying asset.

**Trigger:** Completion of capital improvement project exceeding materiality threshold.

#### Required Fields:

```

{
  "event_type": "PROPERTY_IMPROVEMENT",
  "property_id": "PARCEL_12345_CO_DENVER",
  "improvement_type": "RENOVATION | EXPANSION | SYSTEM_UPGRADE",
  "improvement_cost": 2500000.00,
  "completion_date": "2027-03-15",
}

```

```
"value_enhancement_estimate": 30000000.00,  
"financing_method": "CASH | DEBT | EQUITY_CALL",  
"valuation_impact": true,  
"disclosure_update_required": true  
}
```

**Downstream Actions:**

- Trigger revaluation to reflect enhanced asset value
  - Update cashflow projections if improvement affects income
  - Disclose material improvement to investors
- 

## Event Category 2: Valuation and Appraisal Events

### Event E-04: VALUATION\_UPDATE

**Description:** Periodic or triggered update to asset valuation.

**Trigger:** Scheduled valuation date or material event requiring revaluation.

**Required Fields:**

```
{  
  "event_type": "VALUATION_UPDATE",  
  "property_id": "PARCEL_12345_CO_DENVER",  
  "valuation_date": "2026-12-31",  
  "valuation_method": "APPRAISAL | COMPARABLE_SALES | DCF | HYBRID",  
  "prior_valuation": 25000000.00,  
  "new_valuation": 26500000.00,  
  "valuation_change_pct": 6.0,  
  "appraiser_id": "APPRAISER_ABC_LICENSE_12345",  
  "appraiser_independence": true,  
  "material_change_threshold_met": true,  
  "disclosure_update_required": true  
}
```

**Downstream Actions:**

- Update NAV calculations incorporating new valuation
  - Trigger disclosure diff publication if material change
  - Notify investors of significant valuation changes
- 

### Event E-05: APPRAISAL\_ORDER

**Description:** Independent appraisal commissioned for valuation purposes.

**Trigger:** Initiation of appraisal process per valuation policy.

**Required Fields:**

```
{  
  "event_type": "APPRAISAL_ORDER",  
  "property_id": "PARCEL_12345_CO_DENVER",  
  "appraisal_purpose": "PERIODIC | ACQUISITION | DISPOSITION | DISPUTE",  
}
```

```

"appraiser_id": "APPRAISER_ABC_LICENSE_12345",
"appraiser_qualifications": "MAI | SRA | CERTIFIED_GENERAL",
"order_date": "2026-11-01",
"expected_completion_date": "2026-12-15",
"appraisal_type": "FULL | DESKTOP | BPO"
}

```

#### Downstream Actions:

- Schedule valuation update event upon appraisal completion
- Monitor appraisal completion timeline
- Prepare for disclosure update based on results

### Event Category 3: Cashflow and Distribution Events

#### Event E-06: RENT\_PAYMENT\_RECEIVED

**Description:** Rent or lease payment received from property tenant.

**Trigger:** Receipt of scheduled or unscheduled rental income.

#### Required Fields:

```

{
  "event_type": "RENT_PAYMENT_RECEIVED",
  "property_id": "PARCEL_12345_CO_DENVER",
  "payment_date": "2026-02-01",
  "payment_amount": 125000.00,
  "payment_period": "2026-02",
  "tenant_id": "TENANT_XYZ_LEASE_001",
  "payment_status": "ON_TIME | LATE | PARTIAL",
  "days_late": 0,
  "outstanding_balance": 0.00
}

```

#### Downstream Actions:

- Update cashflow tracking and forecasting models
- Assess distribution capacity for scheduled payouts
- Flag late or missing payments for collection action

#### Event E-07: DISTRIBUTION\_DECLARED

**Description:** Issuer declares cashflow distribution to tokenholders.

**Trigger:** Board or authorized officer declares distribution based on available cashflows.

#### Required Fields:

```

{
  "event_type": "DISTRIBUTION_DECLARED",
  "declaration_date": "2026-03-15",
  "distribution_amount_total": 500000.00,
  "distribution_per_token": 0.50,
}

```

```
"record_date": "2026-03-31",
"payment_date": "2026-04-15",
"distribution_source": "RENTAL_INCOME | SALE_PROCEEDS | FINANCING_PROCEEDS",
"tax_characterization": "ORDINARY | CAPITAL_GAIN | RETURN_OF_CAPITAL"
}
```

**Downstream Actions:**

- Generate distribution notices to tokenholders
  - Update disclosure with distribution history
  - Process payment transfers on payment date
- 

**Event E-08: DISTRIBUTION\_PAYMENT\_EXECUTED**

**Description:** Actual payment transfer to tokenholders of declared distribution.

**Trigger:** Payment date specified in distribution declaration.

**Required Fields:**

```
{
  "event_type": "DISTRIBUTION_PAYMENT_EXECUTED",
  "payment_date": "2026-04-15",
  "distribution_id": "DIST_2026_Q1_001",
  "total_amount_paid": 500000.00,
  "recipient_count": 45,
  "payment_method": "DIGITAL_TRANSFER | WIRE | CHECK",
  "payment_failures": 0,
  "payment_success_rate": 100.0
}
```

**Downstream Actions:**

- Update tokenholder account records
  - Generate tax reporting documentation
  - Log payment completion in audit trail
- 

**Event Category 4: Risk and Incident Events****Event E-09: PROPERTY\_CASUALTY**

**Description:** Casualty event affecting underlying property (fire, flood, damage).

**Trigger:** Occurrence of insured or uninsured casualty event.

**Required Fields:**

```
{
  "event_type": "PROPERTY_CASUALTY",
  "property_id": "PARCEL_12345_CO_DENVER",
  "casualty_date": "2026-08-10",
  "casualty_type": "FIRE | FLOOD | EARTHQUAKE | VANDALISM | OTHER",
  "damage_severity": "MINOR | MODERATE | MAJOR | TOTAL_LOSS",
  "estimated_repair_cost": 1500000.00,
}
```

```

"insurance_coverage": true,
"insurance_claim_amount": 1500000.00,
"property_operability": "OPERATIONAL | PARTIAL | NON_OPERATIONAL",
"valuation_impact": true,
"disclosure_update_required": true,
"liquidity_impact": "MODERATE"
}

```

#### Downstream Actions:

- Trigger immediate investor notification
- Initiate insurance claim process
- Assess impact on cashflows and distributions
- Consider triggering stress liquidity mode if material

### Event E-10: TENANT\_DEFAULT

**Description:** Tenant fails to make scheduled rent payment or breaches lease.

**Trigger:** Non-payment beyond grace period or material lease violation.

#### Required Fields:

```

{
  "event_type": "TENANT_DEFAULT",
  "property_id": "PARCEL_12345_CO_DENVER",
  "tenant_id": "TENANT_XYZ_LEASE_001",
  "default_date": "2026-05-15",
  "default_type": "NON_PAYMENT | LEASE_VIOLATION | BANKRUPTCY",
  "outstanding_amount": 125000.00,
  "lease_expiration": "2028-12-31",
  "remedy_action": "COLLECTION | EVICTION | NEGOTIATION",
  "cashflow_impact_estimate": -500000.00,
  "valuation_impact": true,
  "disclosure_update_required": true
}

```

#### Downstream Actions:

- Update cashflow projections removing tenant payments
- Initiate legal or collection proceedings
- Disclose material tenant default to investors
- Assess impact on distribution capacity

## Event Category 5: Liquidity and Transfer Events

### Event E-11: LIQUIDITY\_MODE\_TRANSITION

**Description:** Instrument transitions between liquidity modes based on defined triggers.

**Trigger:** Liquidity metric crosses threshold triggering mode change.

#### Required Fields:



```
{
  "event_type": "LIQUIDITY_MODE_TRANSITION",
  "transition_date": "2026-07-01",
  "prior_mode": "NORMAL",
  "new_mode": "LIMITED_LIQUIDITY",
  "trigger_metric": "SPREAD_WIDTH | VOLUME | REDEMPTION_BACKLOG",
  "trigger_threshold": 500,
  "trigger_actual_value": 750,
  "transition_authority": "AUTOMATED | ISSUER_DISCRETION | REGULATORY",
  "investor_notification_required": true,
  "liquidity_impact": "MODERATE"
}
```

#### **Downstream Actions:**

- Notify all investors of mode change
- Update disclosure with current liquidity mode
- Implement mode-specific operational procedures

### **Event E-12: TRANSFER\_RESTRICTION\_APPLIED**

**Description:** Transfer restriction placed on specific tokens or tokenholder accounts.

**Trigger:** Eligibility failure, regulatory hold, or contractual restriction.

#### **Required Fields:**

```
{
  "event_type": "TRANSFER_RESTRICTION_APPLIED",
  "restriction_date": "2026-06-15",
  "affected_account_id": "ACCT_INVESTOR_123",
  "affected_token_count": 10000,
  "restriction_reason": "ELIGIBILITY_FAILURE | REG_HOLD | CONTRACTUAL",
  "restriction_duration": "INDEFINITE | TEMPORARY",
  "expected_removal_date": "2026-09-15",
  "authority_reference": "COMPLIANCE_ALERT_20260615_001",
  "investor_notified": true
}
```

#### **Downstream Actions:**

- Block transfer attempts for affected tokens
- Notify investor of restriction and remediation process
- Log restriction in audit trail for examination

### **Event E-13: REDEMPTION\_REQUEST**

**Description:** Investor requests redemption or exit from position.

**Trigger:** Investor submission of redemption request per instrument terms.

#### **Required Fields:**

```
{
  "event_type": "REDEMPTION_REQUEST",
```

```

"request_date": "2026-05-20",
"investor_id": "INVESTOR_ABC_PENSION",
"token_count_requested": 5000,
"redemption_value_estimate": 5250000.00,
"redemption_type": "FULL | PARTIAL",
"liquidity_mode_at_request": "NORMAL",
"queue_position": 3,
"expected_settlement_date": "2026-06-30"
}

```

#### Downstream Actions:

- Place redemption in queue per priority rules
- Calculate redemption value based on NAV
- Monitor liquidity capacity for fulfillment
- Notify investor of queue position and expected timing

## Event Category 6: Disclosure and Compliance Events

### Event E-14: DISCLOSURE\_MATERIAL\_CHANGE

**Description:** Material change to disclosure document requiring update and investor notification.

**Trigger:** Material change trigger criteria met per governance policy.

#### Required Fields:

```

{
  "event_type": "DISCLOSURE_MATERIAL_CHANGE",
  "change_date": "2026-04-10",
  "change_category": "VALUATION | CASHFLOW | RISK | GOVERNANCE | FEES",
  "change_description": "Valuation methodology updated to incorporate new market data sources",
  "materiality_assessment": "MATERIAL | NON_MATERIAL",
  "prior_disclosure_version": "v2.3",
  "new_disclosure_version": "v2.4",
  "change_control_approval": "CCB_APPROVAL_20260408_001",
  "investor_notification_required": true,
  "notification_deadline": "2026-04-20"
}

```

#### Downstream Actions:

- Publish updated disclosure document with version control
- Generate and send investor notifications
- Update disclosure diff highlighting changes
- Log change in audit trail for examination

### Event E-15: INDEPENDENT\_ASSESSMENT\_COMPLETED

**Description:** Independent third-party assessment or audit completed.

**Trigger:** Completion of scheduled or triggered independent assessment.

**Required Fields:**

```
{
  "event_type": "INDEPENDENT_ASSESSMENT_COMPLETED",
  "completion_date": "2026-03-31",
  "assessment_type": "VALUATION | OPERATIONAL | COMPLIANCE | GOVERNANCE",
  "assessor_id": "ASSESSOR_XYZ_LICENSE_789",
  "assessment_period": "2025-Q4",
  "findings_summary": "No material deficiencies identified",
  "recommendations_count": 3,
  "material_issues_identified": false,
  "report_reference": "ASSESSMENT_RPT_20260331_001"
}
```

**Downstream Actions:**

- Review findings and recommendations
  - Implement remediation for any identified issues
  - Update disclosure with assessment results if material
  - Provide report to regulators upon request
- 

**Event Category 7: Operational and System Events****Event E-16: NAV\_CALCULATION\_EXECUTED**

**Description:** Net Asset Value calculation performed and published.

**Trigger:** Scheduled NAV calculation date or triggering event.

**Required Fields:**

```
{
  "event_type": "NAV_CALCULATION_EXECUTED",
  "calculation_date": "2026-12-31",
  "prior_nav": 26.50,
  "new_nav": 27.15,
  "nav_change_pct": 2.45,
  "calculation_inputs": {
    "total_property_value": 275000000.00,
    "total_liabilities": 150000000.00,
    "outstanding_tokens": 10000000
  },
  "calculation_method": "GAV_MINUS_LIABILITIES_DIV_TOKENS",
  "calculation_verified": true,
  "disclosure_update_required": false
}
```

**Downstream Actions:**

- Publish NAV to investors and public sources
  - Update pricing for secondary market transactions
  - Assess materiality for disclosure update requirement
-

## Event E-17: SYSTEM\_INTEGRATION\_FAILURE

**Description:** Integration failure between tokenization system and external data sources or legacy systems.

**Trigger:** Automated monitoring detects integration failure or timeout.

### Required Fields:

```
{
  "event_type": "SYSTEM_INTEGRATION_FAILURE",
  "failure_date": "2026-03-15T14:32:00Z",
  "integration_type": "PROPERTY_DATA | PAYMENT_SYSTEM | VALUATION_FEED |
REGISTRY",
  "failure_reason": "TIMEOUT | AUTHENTICATION | DATA_FORMAT | NETWORK",
  "affected_operations": "NAV_CALC | DISTRIBUTIONS | TRANSFERS",
  "recovery_action": "AUTOMATED_RETRY | MANUAL_INTERVENTION | FALLBACK_PROCESS",
  "impact_severity": "LOW | MEDIUM | HIGH | CRITICAL",
  "estimated_resolution_time": "2026-03-15T16:00:00Z"
}
```

### Downstream Actions:

- Execute recovery procedures
  - Notify affected parties if operations delayed
  - Log incident for post-event review
  - Assess need for system enhancements
- 

## Implementation Guidance

### Event Capture Requirements

- All real-asset-specific events must be logged within 15 minutes of occurrence
- Events affecting valuation or disclosure must trigger automated workflow notifications
- Material events require dual verification before logging finalization

### Integration with Baseline Logging

- Real-asset events inherit all baseline logging requirements (hash chaining, retention, access controls)
- Event taxonomy is extensible; issuers may add custom event types with proper documentation
- All events must be queryable through standard examiner query interfaces

### Materiality Thresholds

- Valuation changes >5% are material and require disclosure updates
  - Cashflow variance >10% from forecast triggers investigation and potential disclosure
  - Property casualty events >\$1M or >5% of property value require immediate investor notification
-

# Appendix F — Exit/Liquidity "Stress Mode" Worked Example (Step-by-Step)

## Scenario Overview

**Instrument:** Tokenized Multifamily Residential Property Portfolio (100 units across 3 properties in Denver metro area)

**Outstanding Tokens:** 1,000,000 tokens at \$25 NAV = \$25M total capitalization

**Investors:** 35 qualified institutional buyers (pension funds, endowments, family offices)

**Current Liquidity Mode:** NORMAL (bid-ask spread <3%, daily volume >\$100K)

**Trigger Event:** Major tenant defaults and local real estate downturn cause valuation decline and redemption surge

---

## Phase 1: Normal Operations Baseline

### Day 0 - Stable Operations

Market Conditions:

- Daily trading volume: \$150K average
- Bid-ask spread: 2.1% average
- NAV: \$25.00 per token (quarterly calculation)
- Redemption queue: 2 pending requests totaling \$500K
- Expected settlement: 15 days

Disclosure Status:

- Last material update: 45 days ago (quarterly refresh)
- Next scheduled update: 45 days
- Liquidity mode: NORMAL disclosed to all investors

Transfer and Settlement:

- Transfer requests processed within 2 business days
  - Eligibility checks automated with manual override available
  - Secondary market liquidity adequate for normal transaction sizes
- 

## Phase 2: Stress Triggers Emerge

### Day 1-7 - Deteriorating Conditions

**Day 3 Event:** Major tenant (20% of portfolio rental income) files bankruptcy and ceases rent payments.

Immediate Actions:

- Event E-10 (TENANT\_DEFAULT) logged with material impact flag
- Cashflow projections updated reflecting \$200K monthly income loss

- Disclosure amendment prepared documenting tenant default

**Day 5 Event:** Local market data shows 15% decline in comparable property values over past quarter.

Immediate Actions:

- Trigger out-of-cycle appraisal per valuation policy
- Event E-05 (APPRAISAL\_ORDER) logged
- Investor notification prepared pending appraisal results

**Day 7 Event:** Redemption requests surge to \$5M (20% of outstanding) as investors react to news.

Immediate Actions:

- Monitor liquidity capacity vs. redemption demand
- Assess secondary market conditions for increased volume
- Calculate available cash reserves: \$2M operational + \$1M credit line = \$3M immediately available

Liquidity Metrics:

- Bid-ask spread widens to 6.5% (threshold: 5%)
- Daily volume declines to \$50K (threshold: \$75K)
- Redemption backlog: \$5M (threshold: \$3M or 12% of outstanding)

**TRIGGER:** Two of three stress mode triggers exceeded → Transition to LIMITED LIQUIDITY mode required.

---

## **Phase 3: Limited Liquidity Mode Activation**

### **Day 8 - Mode Transition**

#### **Step 1: Change Control Board Emergency Meeting**

Participants:

- Issuer compliance officer
- Issuer CFO
- Transfer agent representative
- Independent liquidity advisor

Agenda:

1. Review liquidity metrics vs. thresholds
2. Assess trigger conditions and objective criteria
3. Vote on mode transition authorization
4. Approve investor notification and disclosure update

Decision:

- **UNANIMOUS APPROVAL** to transition to LIMITED LIQUIDITY mode effective Day 9, 8:00 AM ET
- Rationale documented: objective triggers met, proactive measure to protect all investors
- Notification timeline: 24 hours advance notice to investors

## Step 2: Investor Notification (Day 8, 2:00 PM ET)

### Notification Content (abbreviated):

TO: All Tokenholders - Denver Multifamily Portfolio  
 FROM: Portfolio Management, [Issuer]  
 RE: Transition to Limited Liquidity Mode - Effective January 28, 2026

IMMEDIATE NOTICE: LIMITED LIQUIDITY MODE ACTIVATION

Effective Date: January 28, 2026, 8:00 AM ET  
 Previous Mode: NORMAL  
 New Mode: LIMITED LIQUIDITY

#### TRIGGER CONDITIONS MET:

1. Bid-ask spread: 6.5% (threshold: 5%)
2. Redemption backlog: \$5M / 20% of outstanding (threshold: \$3M / 12%)

#### OPERATIONAL CHANGES EFFECTIVE IN LIMITED LIQUIDITY MODE:

- Redemption queue processing: Monthly batches (previously: 2-week rolling)
- Queue priority: Pro-rata allocation based on request date
- Maximum monthly redemption: \$1.5M (6% of outstanding)
- Secondary transfer restrictions: Enhanced eligibility verification (48-72 hour processing)
- NAV frequency: Continued quarterly publication
- Distribution policy: Suspended for next two quarters (preserved for redemptions)

#### EXPECTED DURATION: 60-180 days pending:

- Completion of out-of-cycle property appraisal (expected Day 30)
- Stabilization of redemption demand
- Restoration of secondary market liquidity

#### NEXT STEPS:

- Review updated disclosure document (attached) with detailed liquidity mode provisions
- Existing redemption requests remain in queue with updated processing timeline
- New redemption requests accepted but subject to monthly processing cap

QUESTIONS: Contact Investor Relations at [contact info]

Full Disclosure Update: [link to updated disclosure document v3.1]

#### Event Logged:

```
{
  "event_type": "LIQUIDITY_MODE_TRANSITION",
  "event_id": "EVT_20260108_001",
  "transition_date": "2026-01-08T14:00:00Z",
  "effective_date": "2026-01-09T08:00:00Z",
  "prior_mode": "NORMAL",
  "new_mode": "LIMITED_LIQUIDITY",
  "trigger_metrics": {
    "bid_ask_spread": 6.5,
```

```

    "spread_threshold": 5.0,
    "redemption_backlog_dollars": 5000000,
    "redemption_backlog_pct": 20.0,
    "redemption_threshold_pct": 12.0
  },
  "transition_authority": "CHANGE_CONTROL_BOARD",
  "ccb_approval": "CCB_20260108_UNANIMOUS",
  "investor_notification_sent": true,
  "disclosure_update_required": true,
  "new_disclosure_version": "v3.1"
}

```

### Step 3: System Configuration Updates (Day 8, 3:00 PM ET)

#### Technical Implementation:

- Update transfer agent system with new queue processing parameters
- Configure monthly batch settlement schedule (1st business day of month)
- Implement pro-rata allocation logic for queue processing
- Set maximum monthly redemption cap: \$1.5M
- Enable enhanced eligibility checks for secondary transfers (48-72 hour hold)

#### Testing and Validation:

- Execute test redemption queue processing with sample data
- Verify pro-rata allocation calculations
- Confirm cap enforcement logic functions correctly
- Validate investor notifications trigger appropriately

#### Logging:

- All configuration changes logged with administrator approvals
- Test results documented and verified by compliance officer
- Rollback procedures documented and tested

## Phase 4: Limited Liquidity Operations

### Day 9-60 - Operating Under Restrictions

#### Day 9: First Day of Limited Liquidity Mode

##### Morning Operations:

- Mode transition effective at market open
- New redemption requests: \$800K (investors attempting to exit before first batch processing)
- Total queue: \$5.8M across 12 investors
- Available liquidity: \$3M (cash + credit line)

##### Queue Management:

1. **Calculate pro-rata allocation** for upcoming monthly batch (Day 30):
  - Total queue: \$5.8M



- Monthly cap: \$1.5M
- Pro-rata percentage:  $\$1.5\text{M} / \$5.8\text{M} = 25.86\%$

## 2. Investor-specific allocations (sample):

- Investor A:  $\$2\text{M requested} \times 25.86\% = \$517,200$  allocated
- Investor B:  $\$1.5\text{M requested} \times 25.86\% = \$387,900$  allocated
- Investor C:  $\$500\text{K requested} \times 25.86\% = \$129,300$  allocated
- [remaining investors calculated similarly]

## 3. Notification to queued investors (Day 9):

- Provide pro-rata allocation amount
- Confirm next batch processing date (Day 30)
- Explain remaining balance remains in queue for subsequent months

## Day 15: Appraisal Progress Update

### Appraisal Status:

- Site inspections completed for all three properties
- Comparable sales analysis in progress
- Market conditions assessment ongoing
- Preliminary valuation indication: \$23M (-8% from prior \$25M valuation)

### Actions:

- Prepare for potential material valuation change disclosure
- Model NAV impact:  $(\$23\text{M properties} - \$10\text{M debt}) / 1\text{M tokens} = \$13 \text{ NAV vs. } \$15 \text{ prior}$
- Plan investor notification for appraisal completion

### Financial Planning:

- Assess distribution suspension adequacy given valuation decline
- Model redemption capacity under new valuation scenarios
- Consider additional credit facility or asset sale if queue persists

## Day 30: First Limited Liquidity Batch Processing

### Morning: Final Queue Snapshot

### Updated Queue Status:

- Total requests: \$6.5M (new requests: \$700K since Day 9)
- Monthly cap: \$1.5M
- Pro-rata allocation:  $\$1.5\text{M} / \$6.5\text{M} = 23.08\%$

### Processing Execution:

#### 1. Calculate Redemption Values (using current NAV \$25.00):

- Investor A: 20,688 tokens at \$25.00 = \$517,200
- Investor B: 15,516 tokens at \$25.00 = \$387,900
- [process all allocated redemptions]

## 2. Execute Settlement (atomic DvP):

- Transfer tokens from investor accounts to issuer redemption reserve
- Transfer cash from issuer settlement account to investor accounts
- Update token registry reflecting reduced outstanding tokens

## 3. Post-Settlement Updates:

- Outstanding tokens: 1,000,000 → 940,000 (60,000 redeemed)
- Cash reserves: \$3M → \$1.5M (net of redemptions)
- Remaining queue: \$5.0M (unallocated portions remain queued)

Event Logging:

```
{
  "event_type": "REDEMPTION_BATCH_PROCESSED",
  "event_id": "EVT_20260130_BATCH_001",
  "processing_date": "2026-01-30T09:00:00Z",
  "liquidity_mode": "LIMITED_LIQUIDITY",
  "total_queue_value": 6500000.00,
  "monthly_cap": 1500000.00,
  "pro_rata_percentage": 23.08,
  "redemptions_processed": 12,
  "tokens_redeemed": 60000,
  "cash_distributed": 1500000.00,
  "remaining_queue_value": 5000000.00,
  "next_batch_date": "2026-03-02"
}
```

## Investor Notifications:

- Processed investors: Confirmation of redemption with transaction details
- Queued investors: Updated allocation for next batch (March 2) based on remaining queue

---

## Phase 5: Appraisal Completion and Disclosure Update

### Day 35 - Material Valuation Change

#### Appraisal Final Report Received

##### Key Findings:

- Property 1 (50 units): \$12M (prior: \$13.5M) → -11%
- Property 2 (30 units): \$7M (prior: \$7.5M) → -7%
- Property 3 (20 units): \$4M (prior: \$4M) → 0% (recently renovated)
- **Total Portfolio: \$23M (prior: \$25M) → -8% decline**

##### NAV Impact Calculation:

- Total property value: \$23M
- Total liabilities: \$10M (mortgage debt)
- Net asset value: \$13M
- Outstanding tokens: 940,000 (post-redemption)
- **New NAV: \$13M / 940,000 = \$13.83 per token**

- **Prior NAV:** \$25.00 per token
- **NAV Decline:** -44.7% (material threshold: >5%)

## Emergency Change Control Board Meeting

### Agenda:

1. Review appraisal results and NAV calculation
2. Assess materiality and disclosure requirements
3. Evaluate liquidity mode implications
4. Consider potential transition to STRESS mode
5. Approve investor communications strategy

### Decisions:

1. **Immediate disclosure update required** (material change >5% threshold far exceeded)
2. **Transition to STRESS MODE recommended** given:
  - NAV decline >40%
  - Redemption queue remains elevated (\$5M on \$13M NAV = 38% of outstanding)
  - Secondary market liquidity further deteriorated (bid-ask spread 12%)
3. **Distribution policy:** Suspension extended indefinitely pending stabilization
4. **Investor communication:** Transparency priority, detailed explanation of valuation methodology and market conditions

**VOTE:** Unanimous approval to transition to STRESS MODE effective Day 36, 8:00 AM ET

---

## Phase 6: Stress Mode Activation

### Day 36 - Heightened Restrictions

#### Step 1: Stress Mode Implementation

##### Operational Changes (vs. Limited Liquidity):

- **Transfer halt:** Secondary market transfers suspended except for hardship exemptions
- **Redemption queue:** Suspended pending asset sale or refinancing (no monthly batches)
- **NAV publication:** Monthly (increased from quarterly) to provide transparency during recovery
- **Hold mechanism:** Applied to all tokens pending resolution strategy
- **Investor communication:** Weekly updates on recovery efforts and timeline

#### Step 2: Comprehensive Investor Notification

##### Notice Content (abbreviated):

CRITICAL NOTICE: STRESS MODE ACTIVATION  
SIGNIFICANT VALUATION DECLINE AND OPERATIONAL RESTRICTIONS

Effective Date: January 30, 2026, 8:00 AM ET  
Previous Mode: LIMITED LIQUIDITY  
New Mode: STRESS MODE

#### VALUATION UPDATE:

- Previous NAV: \$25.00 per token
- New NAV: \$13.83 per token (-44.7%)
- Appraisal Basis: Independent third-party appraisal completed 1/29/2026
- Primary Driver: Tenant default (20% of income) + local market decline (-15%)

#### IMMEDIATE OPERATIONAL RESTRICTIONS:

1. Secondary Transfers: SUSPENDED (hardship exemptions available via compliance review)
2. Redemption Queue: SUSPENDED (existing queue preserved but not processed)
3. Distributions: SUSPENDED (cashflows preserved for debt service and redemptions)
4. NAV Updates: MONTHLY publication (increased transparency)

#### RECOVERY STRATEGY:

Management is pursuing multiple paths to restore value and liquidity:

##### A. Tenant Stabilization (30-60 days):

- Aggressive leasing campaign for vacant units
- Rent concessions to attract quality tenants
- Property improvements to enhance marketability

##### B. Asset Sale Option (60-180 days):

- Marketing Property 2 (\$7M estimated value)
- Sale proceeds to satisfy redemption queue
- Remaining properties held for recovery

##### C. Refinancing Option (90-120 days):

- Exploring debt restructuring to improve cashflow
- Potential equity raise from existing or new investors
- Capital preservation prioritized

EXPECTED STRESS MODE DURATION: 90-180 days

#### HARDSHIP EXEMPTIONS:

Investors facing documented financial hardship may apply for:

- Emergency redemption (limited availability, assessed monthly)
- Secondary transfer approval (eligibility verification required)
- Application process: [compliance contact]

#### WEEKLY UPDATES:

Management will provide weekly operational updates including:

- Leasing progress and tenant status
- Asset sale marketing results
- Refinancing discussions
- Liquidity capacity updates

#### INVESTOR PROTECTIONS:

- Debt service remains current (no default risk)
- Insurance coverage remains in force
- Independent board oversight of recovery strategy
- Regular independent valuations

QUESTIONS: Investor Relations hotline [contact] - extended hours

Full Disclosure Update v3.2: [link]

Legal Notices and Risk Factors: [link]

Event Logging:

```

{
  "event_type": "LIQUIDITY_MODE_TRANSITION",
  "event_id": "EVT_20260130_002",
  "transition_date": "2026-01-30T08:00:00Z",
  "prior_mode": "LIMITED_LIQUIDITY",
  "new_mode": "STRESS",
  "trigger_conditions": {
    "nav_decline_pct": -44.7,
    "materiality_threshold_pct": -5.0,
    "redemption_queue_pct_of_nav": 38.5,
    "bid_ask_spread_pct": 12.0,
    "secondary_volume_decline_pct": -85.0
  },
  "operational_restrictions": [
    "SECONDARY_TRANSFERS_SUSPENDED",
    "REDEMPTION_QUEUE_SUSPENDED",
    "DISTRIBUTIONS_SUSPENDED",
    "HOLD_APPLIED_ALL_TOKENS"
  ],
  "hardship_exemption_available": true,
  "recovery_strategy_disclosed": true,
  "weekly_updates_committed": true,
  "disclosure_version": "v3.2"
}

```

### Step 3: Hold Mechanism Implementation

#### Technical Implementation:

1. Apply HOLD\_STRESS\_MODE flag to all token records in registry
2. Block all transfer attempts at smart contract level (except approved hardship exemptions)
3. Update wallet interfaces to display hold status and rationale
4. Configure exemption approval workflow for compliance officer review

#### Investor Experience:

- Wallet displays: "Transfer Restricted - Stress Mode Active - [link to disclosure]"
- Attempted transfers generate: "Transfer blocked pending stress mode resolution. Hardship exemptions available: [link]"
- Token balance and NAV remain visible and updated monthly

#### Audit Trail:

- Hold placement logged for each token with STRESS\_MODE\_GENERAL\_HOLD reason
- Individual exemption approvals logged separately with justification
- All hold-related actions recorded with dual authorization (compliance officer + senior management)

## Phase 7: Stress Mode Operations and Recovery

### Day 37-120 - Recovery Execution

## **Week 1-4: Tenant Stabilization Efforts**

### **Day 40:** Leasing progress update

- 5 new leases signed (25% of vacant units)
- Rent concessions: 10% below market for 1-year term
- Expected monthly income recovery: \$50K (25% of lost income)

### **Day 50:** Property improvement completion

- \$200K investment in cosmetic upgrades (funded from operating reserves)
- Expected impact: higher lease rates and faster absorption

### **Day 60:** Leasing results assessment

- 12 new leases total (60% of vacant units)
- Monthly income recovery: \$120K (60% of lost income)
- **Positive development:** Ahead of projections

## **Week 5-8: Asset Sale Process**

### **Day 65:** Property 2 marketed to institutional buyers

- Target price: \$7M (appraised value)
- Marketing to 25 qualified institutional buyers
- Confidential process managed by broker

### **Day 80:** Multiple offers received

- 3 qualified offers: \$6.5M, \$6.8M, \$7.1M
- Best offer selected: \$7.1M (cash, 30-day close)
- Requires board approval and investor notification

### **Day 85:** Asset sale approved by board

- Change Control Board unanimous approval
- Rationale: Proceeds enable partial redemption queue satisfaction
- Expected close: Day 110

### **Investor Notification (Day 85):**

ASSET SALE APPROVED: Property 2 (\$7.1M)

Expected Close: 30 days

Proceeds Allocation:

- Debt paydown: \$3M (Property 2 mortgage)
- Redemption queue partial satisfaction: \$3.5M (70% of queue)
- Operating reserves: \$600K

Post-Sale Portfolio:

- Remaining properties: Property 1 & 3 (\$16M value)
- Outstanding debt: \$7M (reduced from \$10M)
- Net asset value: \$9M
- Outstanding tokens: 940,000
- Revised NAV: \$9.57 per token

Redemption Queue Processing (Day 115):

- Queue: \$5M total
- Available: \$3.5M from sale proceeds
- Pro-rata allocation: 70% of each request
- Remaining 30% stays in queue pending future liquidity events

## **Week 9-12: Refinancing Discussions**

**Day 90:** Refinancing proposal received from lender

- Refinance existing \$7M debt at improved terms
- Interest rate reduction: 5.5% → 4.5%
- Cashflow improvement: \$70K annually
- Covenant modifications to accommodate valuation decline

**Day 100:** Refinancing approved

- Board approval obtained
- Expected close concurrent with asset sale (Day 110)
- Improved cashflow supports potential distribution resumption in 6 months

**Day 110: Asset Sale Closes**

**Settlement Execution:**

1. Property 2 transferred to buyer
2. Sale proceeds: \$7.1M received
3. Mortgage paydown: \$3M executed
4. Net proceeds available: \$4.1M

**Updated Financial Position:**

- Properties: \$16M (Property 1 & 3)
- Debt: \$7M (refinanced)
- Cash: \$4.1M (sale proceeds)
- Net assets: \$13.1M
- Outstanding tokens: 940,000
- **Revised NAV: \$13.94 per token** (slight increase from \$13.83)

## **Phase 8: Partial Queue Satisfaction and Mode Transition**

**Day 115 - Redemption Batch Processing**

**Queue Processing Execution**

**Queue Status:**

- Total queue: \$5M across 15 investors (accumulated since Day 30)
- Available proceeds: \$3.5M allocated from asset sale
- Pro-rata allocation: 70% of each request

**Sample Allocations:**

- Investor A: \$1.5M queued  $\times$  70% = \$1,050,000 allocated (75,323 tokens at NAV \$13.94)
- Investor B: \$800K queued  $\times$  70% = \$560,000 allocated (40,172 tokens at NAV \$13.94)
- Investor C: \$500K queued  $\times$  70% = \$350,000 allocated (25,108 tokens at NAV \$13.94)
- [remaining investors calculated similarly]

#### Settlement:

- Total tokens redeemed: 251,074 tokens
- Total cash distributed: \$3,500,000
- Remaining queue: \$1,500,000 (30% unallocated portions)
- **Outstanding tokens post-redemption: 688,926 tokens**

#### Updated Metrics:

- Net asset value: \$13.1M - \$3.5M (redemptions) = \$9.6M remaining
- Outstanding tokens: 688,926
- **Post-redemption NAV: \$13.93 per token** (stable)

#### Event Logging:

```
{
  "event_type": "REDEMPTION_BATCH_PROCESSED",
  "event_id": "EVT_20260215_STRESS_BATCH",
  "processing_date": "2026-02-15T09:00:00Z",
  "liquidity_mode": "STRESS",
  "funding_source": "ASSET_SALE_PROCEEDS",
  "total_queue_value": 5000000.00,
  "available_proceeds": 3500000.00,
  "pro_rata_percentage": 70.0,
  "redemptions_processed": 15,
  "tokens_redeemed": 251074,
  "cash_distributed": 3500000.00,
  "remaining_queue_value": 1500000.00,
  "post_redemption_nav": 13.93
}
```

### Day 120: Evaluation of Mode Transition

#### Change Control Board Meeting - Mode Transition Assessment

##### Stabilization Indicators:

1. **Valuation:** NAV stable at \$13.93 (slight recovery from \$13.83 low)
2. **Redemption queue:** Reduced to \$1.5M (from \$5M peak) = 10.8% of NAV (below 12% threshold)
3. **Tenant occupancy:** 85% (recovered from 65%), income stabilizing
4. **Debt service:** Current, refinanced at improved terms
5. **Secondary market:** Limited activity but bid-ask spread narrowing to 8%

##### Remaining Concerns:

1. Redemption queue still present (\$1.5M)
2. Secondary market liquidity not fully restored
3. Valuation below pre-crisis levels (recovery ongoing)



**Decision:**

- **APPROVED:** Transition from STRESS to LIMITED LIQUIDITY mode effective Day 125
- Rationale: Stabilization achieved, risks manageable, investors benefit from resumed limited liquidity
- Operational changes: Resume monthly redemption batches (\$500K cap), maintain enhanced transfer verification

**Investor Notification (Day 120):**

MODE TRANSITION: STRESS → LIMITED LIQUIDITY (Effective Day 125)

**RECOVERY PROGRESS:**

- ✓ Asset sale completed (\$7.1M)
- ✓ 70% of redemption queue satisfied
- ✓ Tenant occupancy recovered to 85%
- ✓ NAV stabilized at \$13.93
- ✓ Debt refinanced at improved terms

**OPERATIONAL CHANGES (Effective Day 125):**

1. Redemption Queue: RESUMED monthly processing (\$500K monthly cap)
2. Secondary Transfers: RESUMED with enhanced eligibility verification (48-hour processing)
3. Distributions: Under review for resumption in Q2 2026
4. NAV Updates: Monthly (continued during recovery)

**REMAINING REDEMPTION QUEUE: \$1.5M**

- Next batch processing: March 1, 2026
- Monthly cap: \$500K (pro-rata allocation if queue exceeds cap)
- Expected queue satisfaction: 3-4 months

**FORWARD OUTLOOK:**

- Continued leasing focus for remaining vacant units
- Cashflow recovery supporting potential distribution resumption
- Regular NAV monitoring and quarterly reappraisals
- Transition to NORMAL mode targeted for Q2 2026 (subject to metrics)

Thank you for your patience during this challenging period.  
Management remains committed to value preservation and recovery.

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**Phase 9: Return to Limited Liquidity and Path to Normal****Day 125-180 - Stabilization and Recovery****Limited Liquidity Operations (Day 125 onwards)****Monthly Redemption Batches:**

- March 1 batch: \$500K processed (queue: \$1.5M → \$1.0M)
- April 1 batch: \$500K processed (queue: \$1.0M → \$500K)
- May 1 batch: \$500K processed (queue: \$500K → \$0)

**Queue Satisfied:** By Day 180, redemption backlog fully cleared.

**Secondary Market Recovery:**

- Bid-ask spread: 8% → 6% → 4.5% (approaching 5% threshold)
- Daily volume: \$25K → \$50K → \$85K (approaching \$75K threshold)

#### **Tenant Stabilization:**

- Occupancy: 85% → 92% → 95%
- Rental income: 85% of pro-forma → 92% → 97%

#### **Valuation Trajectory:**

- Month 6 NAV: \$13.93
- Month 9 NAV: \$14.50 (+4.1%)
- Month 12 NAV: \$15.25 (+5.2%)
- Recovery driven by: improved occupancy, local market stabilization, property improvements

### **Day 180: Transition to Normal Mode Assessment**

#### **Change Control Board Meeting**

#### **Objective Criteria Review:**

1. **Bid-ask spread:** 4.2% (below 5% threshold) ✓
2. **Redemption queue:** \$0 (below \$3M / 12% threshold) ✓
3. **Daily volume:** \$90K (above \$75K threshold) ✓
4. **NAV stability:** Positive trajectory, no material negative events ✓
5. **Operational readiness:** All normal mode procedures tested and ready ✓

#### **Decision:**

- **UNANIMOUS APPROVAL:** Transition from LIMITED LIQUIDITY to NORMAL mode effective Day 185
- Rationale: All objective thresholds met, sustained stability demonstrated
- Investor benefits: Full liquidity restored, distribution resumption planned Q3 2026

#### **Investor Notification (Day 180):**

RETURN TO NORMAL LIQUIDITY MODE (Effective Day 185)

#### **RECOVERY COMPLETE:**

- ✓ Redemption queue fully satisfied
- ✓ Secondary market liquidity restored
- ✓ NAV recovery: \$13.83 → \$15.25 (+10.3% from trough)
- ✓ Tenant occupancy: 95% (stable)
- ✓ Financial position: Strengthened post-refinancing

#### **OPERATIONAL RESTORATION:**

1. Redemption Processing: 2-week rolling (standard processing restored)
2. Secondary Transfers: 2-business-day processing (no enhanced restrictions)
3. Distribution Policy: Resuming Q3 2026 (board approval pending final Q2 results)
4. NAV Updates: Returning to quarterly schedule

#### **LESSONS LEARNED AND IMPROVEMENTS:**

- Enhanced tenant screening protocols implemented
- Expanded property reserve fund for future downturns
- Improved liquidity monitoring and early warning systems

- Strengthened investor communication during stress events

THANK YOU:

Management thanks investors for patience and continued confidence. The recovery demonstrates the resilience of the asset base and the effectiveness of the liquidity framework's stress provisions.

## Phase 10: Post-Crisis Analysis and Documentation

### Day 190 - Comprehensive Review

#### Stress Event Timeline Summary

Phase	Days	Mode	Key Actions	Outcome
Normal Ops	0	NORMAL	Stable operations	Baseline
Stress Emergence	1-7	NORMAL	Tenant default, valuation decline	Triggers emerge
Limited Liquidity	8-35	LIMITED	Monthly redemption batches	Queue managed
Stress Mode	36-120	STRESS	Asset sale, refinancing, tenant stabilization	Liquidity restored
Recovery	121-180	LIMITED	Queue satisfaction, market recovery	Stability achieved
Restoration	185+	NORMAL	Full operations restored	Crisis resolved

**Total Duration:** 185 days (approximately 6 months)

#### Financial Impact Analysis

##### Investor Impact:

- Investors who held throughout: NAV \$25.00 → \$15.25 (-39% unrealized loss)
- Investors who redeemed at trough: NAV \$13.83 (realized -44.7% loss)
- Investors who redeemed in batches: NAV \$13.83-\$15.25 (varied timing)
- No investor haircuts or imposed losses beyond NAV decline
- All redemptions honored at NAV (no forced discounts)

##### Issuer/Structure Impact:

- Asset base: \$25M → \$16M (one property sold strategically)
- Debt: \$10M → \$7M (reduced and refinanced)
- Cashflow: Impaired but recovered to 97% of pro-forma
- Operating reserves: Strengthened post-crisis

**Framework Effectiveness:** ✓ Objective triggers prevented arbitrary decisions ✓ Tiered liquidity modes provided proportionate responses ✓ Investor protections maintained (no preferential treatment) ✓ Complete audit trail supported transparency ✓ Recovery strategy executed successfully

#### Control Effectiveness Metrics

##### Disclosure Integrity:

- All material changes disclosed within required timelines ✓

- Investor notifications: 12 total, averaging 48-hour advance notice ✓
- Disclosure versions: v3.0 (baseline) → v3.2 (stress) with complete diff tracking ✓

#### **Evidence Pack Completeness:**

- Event logs: 247 events captured across all categories ✓
- Hash chain integrity: 0 breaks, 100% tamper-evidence ✓
- Audit trail reconstruction: Complete timeline rebuildable from logs ✓

#### **Hold/Release Functionality:**

- Hold placements: 100% dual-authorized ✓
- Legal authority documented for all holds ✓
- Investor notifications: 100% timely ✓
- No unauthorized releases ✓

#### **Queue Management Fairness:**

- Pro-rata allocation: Applied consistently across all batches ✓
- Priority rules: Objective (request date) with no exceptions ✓
- No evidence of preferential treatment ✓
- Audit trail: Complete for all queue processing decisions ✓

### **Lessons Learned and Framework Refinements**

#### **What Worked Well:**

1. Objective trigger criteria prevented emotion-driven decisions
2. Tiered mode structure provided clear operational playbooks
3. Investor communication maintained trust despite stress
4. Complete audit trail enabled regulatory confidence
5. Hardship exemptions balanced fairness with compassion

#### **Areas for Improvement:**

1. **Earlier warning indicators:** Implement enhanced monitoring of tenant concentration risk
2. **Liquidity reserves:** Increase recommended reserve levels for similar instruments
3. **Recovery timeline communication:** Provide more specific milestone updates
4. **Secondary market making:** Consider authorized market maker arrangements to support liquidity
5. **Stress testing:** Require annual stress scenario planning and disclosure

#### **Framework Refinements Proposed:**

1. Add "tenant concentration risk" to required risk factor disclosures
2. Specify minimum liquidity reserve requirements based on redemption history
3. Enhance weekly update templates for stress mode communications
4. Develop standardized recovery strategy disclosure templates
5. Require independent liquidity assessment as part of annual recertification

## **Regulatory Examination Readiness**

### **Evidence Pack Submitted:**

- Complete disclosure history: All versions with change tracking
- Event logs: 247 events with full metadata and hash chain verification
- Change Control Board minutes: All meetings documented
- Investor communications: All 12 notifications with delivery confirmations
- Financial records: NAV calculations, redemption processing, asset sale documentation
- Independent assessments: Appraisal reports, legal opinions, liquidity analyses

### **Examiner Findings** (hypothetical post-crisis examination):

- Compliance: SATISFACTORY across all 20 examiner checklist items
  - Notable strengths: Investor communication transparency, objective decision-making, complete audit trail
  - Recommendations: Implement proposed framework refinements, share lessons learned with industry
  - No enforcement actions or material deficiencies identified
- 

## **Conclusion: Framework Validation Through Stress**

This worked example demonstrates that the Standardized Disclosure Schema + Evidence Pack + Exit/Liquidity Annex framework achieves its core objectives even under significant stress:

### **Investor Protection:**

- No investor received preferential treatment
- All redemptions honored at NAV (no forced discounts)
- Complete transparency maintained throughout crisis
- Hardship accommodations provided where appropriate

### **Market Integrity:**

- Objective criteria governed all mode transitions
- Fair queue management (pro-rata, date-based priority)
- No manipulation or insider advantages
- Complete audit trail for regulatory oversight

### **Operational Resilience:**

- Tiered liquidity modes provided proportionate responses
- Recovery strategy executed successfully
- Exit/offboarding mechanisms functioned as designed
- Framework adapted to stress without failure

### **Regulatory Confidence:**

- Examiner-ready evidence available throughout
- Complete disclosure compliance maintained

- Supervisory notifications timely and complete
- Framework proved auditable and enforceable

The real-asset tokenized securities framework, when properly implemented with the standardized components presented in this companion submission, provides robust investor protections and operational controls that function effectively even during significant market stress and asset value declines.

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# Appendix G — RACI Snapshot (Roles for Disclosure Updates + Liquidity Events)

## Referencing Baseline Role Taxonomy

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### G.1 Purpose and Scope

This RACI (Responsible, Accountable, Consulted, Informed) snapshot defines role assignments for two critical operational domains in real-asset tokenized securities: (1) disclosure schema updates and material change events, and (2) exit/liquidity mechanism execution including stress mode transitions. Role definitions align with baseline operational playbooks and governance structures established in the FCCCK Operationalization Track.

#### RACI Definitions:

- **Responsible (R):** Performs the work, executes the task
  - **Accountable (A):** Ultimate ownership, final approval authority (only one A per task)
  - **Consulted (C):** Subject matter expert input required before decision
  - **Informed (I):** Notified of outcomes, kept aware of progress
- 

### G.2 Core Role Taxonomy (Baseline Reference)

The following roles are referenced throughout this RACI matrix. Definitions align with Operationalization Track governance structures and intermediary playbooks.

#### G.2.1 Issuer/Sponsor Roles

- **Issuer Compliance Officer:** Ensures regulatory compliance, disclosure accuracy, material event determination
- **Issuer Operations Manager:** Coordinates operational execution, system updates, stakeholder communications
- **Asset Manager/Service:** Manages underlying real-asset performance, cashflow collection, valuation coordination
- **Legal Counsel (Issuer):** Provides legal interpretation, contractual guidance, disclosure review

#### G.2.2 Intermediary Roles

- **Broker-Dealer Compliance:** Oversees distribution compliance, investor suitability, transaction surveillance
- **Transfer Agent:** Maintains ownership registry, processes transfers, enforces restrictions
- **Qualified Custodian:** Safeguards digital assets, enforces hold/release controls, custody reporting
- **Oracle Provider:** Delivers valuation data, NAV calculations, reference data feeds

### G.2.3 Governance/Oversight Roles

- **Independent Assessor:** Third-party verification of disclosures, control attestations, compliance validation
- **Change Control Board:** Approves material changes to disclosure schema or operational procedures
- **Pilot Steering Committee:** Strategic oversight, escalation resolution, regulatory coordination
- **Regulatory Observer (SEC/FinHub):** Non-voting observer, receives notifications, provides guidance

### G.2.4 Investor/Participant Roles

- **Qualified Institutional Buyer (QIB):** Institutional investor participant, receives disclosures, exercises rights
- **Investor Representative/Agent:** Acts on behalf of investor groups in governance or dispute matters

## G.3 RACI Matrix: Disclosure Schema Updates and Material Change Events

Activity/ Task	Issuer Compliance Officer	Issuer Operations Manager	Asset Manager/ Servicer	Legal Counsel (Issuer)	Independent Assessor	Transfer Agent	Broker- Dealer Compliance	Change Control Board	Regulatory Observer	QIB Investors
Material Change Determination	A	R	C	C	-	-	I	-	I	I
Disclosure Schema Version Update	R	A	C	C	-	I	I	A (if baseline change)	I	I
Valuation Methodology Change	C	R	A	C	C	I	I	A (if material)	I	I
Updated Disclosure Drafting	A	R	C	A (legal review)	-	-	C	-	-	-
Independent Assessor Attestation	I	C	C	C	A/R	-	-	-	I	-



Activity/ Task	Issuer Compliance Officer	Issuer Operations Manager	Asset Manager/ Servicer	Legal Counsel (Issuer)	Independent Assessor	Transfer Agent	Broker- Dealer Compliance	Change Control Board	Regulatory Observer	QIB Investors
<b>n</b>										
<b>Disclosure Package Publication</b>	A	R	I	C	I	R (registry link)	I	-	I	I
<b>Disclosure Diff Generation</b>	C	R	A (data source)	-	-	I	-	-	-	I
<b>Investor Notification (Material)</b>	A	R	I	C	-	R (registry)	R (BD distribution)	-	I	I
<b>Event Log Creation (Material)</b>	R	R	R (asset data)	-	C (audit review)	R (transfer log)	R (surveillance)	-	I	-
<b>Regulatory Filing Coordination</b>	A	R	C	A (filing review)	C (attestation)	I	I	-	I	-

#### Key Takeaways:

- Issuer Compliance Officer is accountable for material change determinations and disclosure accuracy
- Legal Counsel must approve all disclosure content before publication
- Independent Assessor attestations are required for material valuation or methodology changes
- Change Control Board approval required if disclosure schema baseline changes
- All material events must generate audit log entries by multiple responsible parties

#### G.4 RACI Matrix: Exit/Liquidity Mechanism Execution

Activity/ Task	Issuer Operations Manager	Transfer Agent	Broker- Dealer Compliance	Qualified Custodian	Issuer Compliance Officer	Legal Counsel (Issuer)	Pilot Steering Committee	Regulatory Observer	QIB Investors
<b>Liquidity Mode Assessment</b>	R	R (registry)	C	I	A	C	-	I	-

Activity/ Task	Issuer Operations Manager	Transfer Agent	Broker- Dealer Compliance	Qualified Custodian	Issuer Compliance Officer	Legal Counsel (Issuer)	Pilot Steering Committee	Regulatory Observer	QIB Investors
		analysis )							
<b>Normal Trading → Limited Liquidity</b>	R	A (executive restriction)	C	R (custody controls)	C	C	-	I	I
<b>Limited Liquidity → Stress Mode</b>	R	A (halt execution)	C	R (freeze custody)	A (approval)	A (legal authority)	I	I	I
<b>Stress Mode Halt Documentation</b>	R	R (registry freeze)	R (surveillance report)	R (custody report)	A	C	I	A (if escalated)	I
<b>Transfer Restriction Enforcement</b>	C	A/R	C	R (custody block)	C	C	-	-	I
<b>Redemption/Buyback Evaluation</b>	R	C	C	C	A	A (contractual review)	C (if policy change)	I	C (demand data)
<b>Queue/Priority Rule Application</b>	C	A/R	C	C	A (fairness review)	C	-	I	I
<b>Failure-to-Settle Remediation</b>	R	A (registry correction)	C	R (custody reconciliation)	C	C	-	I	I
<b>Stress Mode → Limited Liquidity</b>	R	A (restore partial trading)	C	R (custody restoration)	A (approval)	C	C (if material)	I	I
<b>Return to Normal Trading</b>	R	A (lift restrictions)	C	R (full custody restore)	A	C	I	I	I
<b>Offboarding to Legacy Records</b>	R	A (registry export)	C	R (custody transfer)	A	A (legal completion)	C	A (final oversight)	I

Activity/ Task	Issuer Operations Manager	Transfer Agent	Broker- Dealer Compliance	Qualified Custodian	Issuer Compliance Officer	Legal Counsel (Issuer)	Pilot Steering Committee	Regulatory Observer	QIB Investors
<b>Audit Trail Generation (All Modes)</b>	R	R	R	R	I	-	-	I	-

#### Key Takeaways:

- Transfer Agent is accountable for executing liquidity mode transitions and maintaining registry integrity
- Issuer Compliance Officer and Legal Counsel must jointly approve transitions to/from stress mode
- Qualified Custodian responsible for implementing custody-layer controls for each liquidity mode
- Pilot Steering Committee involved in escalations and major mode transitions (stress mode, offboarding)
- All parties generate audit trails; compliance officer reviews for completeness

## G.5 Special Scenario: Emergency Offboarding to Legacy Systems

In the event of pilot termination, catastrophic system failure, or regulatory directive requiring exit from tokenized infrastructure, the following RACI applies for orderly wind-down:

Activity/Task	Pilot Steering Committee	Issuer Operations Manager	Transfer Agent	Qualified Custodian	Broker- Dealer Compliance	Legal Counsel (Issuer)	Regulatory Observer	QIB Investors
<b>Emergency Offboarding Declaration</b>	A	R (execution plan)	C	C	C	C	A (oversight)	I
<b>Investor Position Freeze</b>	C	R	A (registry freeze)	R (custody freeze)	I	C	I	I
<b>Legacy System Preparation</b>	C	A	R (legacy registry)	R (legacy custody)	C	C	I	I
<b>Token-to-Legacy Mapping</b>	-	R	A (authoritative mapping)	R (custody mapping)	C	C	C (validation)	-
<b>Legacy Record Certification</b>	C	R	A (final registry)	A (final custody records)	C	A (legal sign-)	I	I

Activity/Task	Pilot Steering Committee	Issuer Operations Manager	Transfer Agent	Qualified Custodian	Broker-Dealer Compliance	Legal Counsel (Issuer)	Regulatory Observer	QIB Investors
						off)		
<b>Final Investor Notification</b>	C	R	R (registry notice)	C	R (custody notice)	C	I	I
<b>Audit Archive Preservation</b>	A (oversight)	R	R	R	R	C	A (regulatory copy)	-

#### Key Takeaways:

- Pilot Steering Committee and Regulatory Observer jointly accountable for emergency offboarding governance
- Transfer Agent and Qualified Custodian each independently certify final legacy records (dual accountability)
- Legal Counsel must sign off on legal completeness of legacy transfer
- All audit logs archived permanently for regulatory examination

## G.6 Escalation Paths and Conflict Resolution

### G.6.1 Disclosure Disputes

- **Scenario:** Independent Assessor disputes issuer's material change determination
- **Escalation:** Issuer Compliance Officer → Legal Counsel → Change Control Board → Pilot Steering Committee
- **Resolution Authority:** Pilot Steering Committee with regulatory observer input

### G.6.2 Liquidity Mode Disagreements

- **Scenario:** Investors challenge stress mode invocation or queue priority rules
- **Escalation:** Issuer Compliance Officer → Legal Counsel → Pilot Steering Committee
- **Resolution Authority:** Legal Counsel interprets contract; Pilot Steering Committee adjudicates operational fairness

### G.6.3 Broker-Dealer vs. Transfer Agent Conflicts

- **Scenario:** Transfer agent enforces restriction; broker-dealer claims improper application
- **Escalation:** Both parties to Issuer Compliance Officer → Pilot Steering Committee
- **Resolution Authority:** Pilot Steering Committee with regulatory observer consultation

## G.7 Integration with Baseline Playbooks

This RACI snapshot operationalizes role assignments established in:

- **Operationalization Track Deliverable Set A (Playbooks):** Onboarding, Incident Response, Hold/Release, Change Management, Redress
- **Operationalization Track Deliverable Set D (Governance):** Pilot Steering Committee, Change Control Board, Incident Coordination
- **Disclosure Schema (Section 4):** Material change triggers, version control, attestation lanes
- **Exit/Liquidity Annex (Section 6):** Liquidity mode definitions, hold/release controls, offboarding procedures

All role assignments maintain consistency with baseline operational frameworks. Any conflicts between this RACI and baseline playbooks are resolved in favor of the more conservative (risk-reducing) interpretation, subject to Pilot Steering Committee clarification.

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## G.8 Maintenance and Updates

This RACI matrix is maintained under Change Control Board governance (Operationalization Track Appendix E.2). Updates triggered by:

- Material changes to disclosure schema baseline
- New liquidity modes or exit mechanisms introduced
- Pilot expansion requiring additional role definitions
- Operational experience revealing role clarity issues

### Update Process:

1. Proposed RACI change submitted to Change Control Board
  2. Impact assessment on existing operational procedures
  3. Stakeholder consultation (affected role holders)
  4. Board approval (unanimous for accountability shifts, majority for clarifications)
  5. Minimum 30-day notice before effective date
  6. Training and communication to all role holders
-

# Appendix H — Examiner Enablement & Supervisory Access Companion (Real-Asset Profile)

## H.0 Non-Substantive Companion Disclaimer

This appendix provides implementation and examination enablement guidance for the "Standardized Disclosure Schema + Evidence Pack + Exit/Liquidity Annex" companion kit. It does not expand pilot scope, introduce new participant classes, or modify obligations established in baseline submissions (FCCK Pilot, Operationalization Track, Operational Assurance Addendum, Regulatory Institutionalization Pack).

Content herein operationalizes examiner-ready artifacts, supervisory access procedures, and evidence retrieval workflows aligned to recordkeeping objectives and existing regulatory examination practices. No legal conclusions are asserted; specific rule citations appear only where explicitly supported in baseline attachments.

**Mortgage/housing-finance policy reform remains out of scope.**

## H.1 Problem → Control Artifact Map

Problem	Control Artifact	Evidence (DEP + Logs)	Examiner Check	Owner (RACI)
Fragmented disclosures (no machine-readable schema)	SDS Module 1-8 + versioning rules	DEP: Disclosure_Package/, Disclosure_Diff/, Schema_Versions.json; LOGS: DISCLOSURE_PUBLISHED, VERSION_UPDATE	H2-01: Schema completeness	Issuer Ops Owner (A)
Unverifiable property performance claims	Evidence Manifest: Valuation/, Attestation_Lane/	DEP: Appraisal_Reports/, Independent_Assessor_Attestation/; LOGS: VALUATION_UPDATE, ATTESTATION_ISSUED	H2-08: Valuation source validation	Independent Assessor (A)
Missing update cadence / version control	SDS versioning + material change triggers	DEP: Change_Control/, Disclosure_Diff/; LOGS: MATERIAL_CHANGE_TRIG, SCHEMA_VERSION_BUMP	H2-02: Version audit trail	Compliance Reviewer (A)
Unclear exit/liquidity mechanics	ELA liquidity mode definitions + halt controls	DEP: Liquidity_Procedures/, Stress_Mode_Playbook/; LOGS: LIQUIDITY_MODE_CHANGE, HALT_EXECUTED	H2-20: Stress mode evidence	Liquidity/ Event Owner (A)
Weak transfer restriction clarity	SDS Module 2 + TA enforcement logs	DEP: Transfer_Restrictions/, Eligibility_Checks/; LOGS: TRANSFER_REJECTED, ELIGIBILITY_FAIL	H2-17: Restriction enforcement	Transfer Agent (R)
Insufficient recordkeeping	DEP folder structure +	DEP: Complete folder tree + Manifest.json + Checksums.txt;	H2-03: Evidence	Evidence Pack

Problem	Control Artifact	Evidence (DEP + Logs)	Examiner Check	Owner (RACI)
packaging	manifest + checksum	LOGS: EVIDENCE_PACK_GENERATED	completeness	Custodian (A)
Event handling gaps (no taxonomy)	Event Taxonomy Extensions (Appendix E + H.6.2)	LOGS: All event_type fields mapped to taxonomy; retention class assigned	H2-11: Event capture completeness	Issuer Ops Owner (R)
Thin liquidity / no investor protections	ELA stress mode + queue rules + fairness controls	DEP: Queue_Rules/, Stress_Mode_Evidence/; LOGS: QUEUE_APPLIED, REDEMPTION_PROCESSED	H2-21: Fairness controls audit	Liquidity/ Event Owner (A)
Valuation opacity (assumptions not disclosed)	SDS Module 3 + methodology documentation	DEP: Valuation_Methodology/, Assumptions_Log/; LOGS: VALUATION_METHOD_CHANGE	H2-09: Methodology transparency	Asset Manager (R)
No failure-to-settle playbook	ELA failure-to-settle procedures + RACI	DEP: Settlement_Failure_Logs/, Remediation_Actions/; LOGS: SETTLEMENT_FAIL, REMEDIATION_COMPLETE	H2-22: Remediation evidence	Transfer Agent (A)

**Note:** Owner roles use baseline RACI conventions. (A) = Accountable, (R) = Responsible.

## H.2 Standard Examiner Checks Pack

### Category 1: Disclosure Completeness & Versioning

#### Check H2-01: Schema Completeness

- **Purpose:** Verify all 8 required SDS modules present and populated
- **Evidence Inputs:** DEP: Disclosure\_Package/SDS\_Instance.json; LOGS: DISCLOSURE\_PUBLISHED
- **Pass Criteria:** All modules 1-8 contain non-null values; schema version ID matches current baseline
- **Fail Criteria:** Missing modules, null required fields, version mismatch
- **Escalation:** Flag to Compliance Reviewer; remediation required before next disclosure cycle

#### Check H2-02: Version Audit Trail

- **Purpose:** Validate disclosure version control and material change documentation
- **Evidence Inputs:** DEP: Disclosure\_Diff/, Change\_Control/; LOGS: VERSION\_UPDATE, MATERIAL\_CHANGE\_TRIG
- **Pass Criteria:** Each version increment has corresponding Change\_Control approval record; material change triggers documented
- **Fail Criteria:** Version gaps, undocumented changes, missing approvals
- **Escalation:** Escalate to Change Control Board; assess control breakdown

### Check H2-03: Evidence Pack Completeness

- **Purpose:** Confirm DEP manifest matches actual artifacts; checksums valid
- **Evidence Inputs:** DEP: Manifest.json, Checksums.txt, all folders
- **Pass Criteria:** Manifest lists all files; checksums match; no missing artifacts
- **Fail Criteria:** Manifest discrepancies, checksum failures, missing files
- **Escalation:** Evidence Pack Custodian notified; regenerate pack with full validation

### Category 2: Evidence Pack Integrity & Chain-of-Custody

#### Check H2-04: Chain-of-Custody Integrity

- **Purpose:** Verify tamper-evident chain for disclosure artifacts
- **Evidence Inputs:** DEP: Chain\_of\_Custody/, Proof\_of\_Disclosure\_Integrity/; LOGS: ARTIFACT\_SIGNED, CHECKSUM\_VALIDATED
- **Pass Criteria:** Signed checksums present; cryptographic signatures validate; timestamped custody log
- **Fail Criteria:** Missing signatures, invalid checksums, broken custody chain
- **Escalation:** Security incident investigation; assess compromise risk

#### Check H2-05: Retention Period Compliance

- **Purpose:** Validate retention minimums met per baseline posture
- **Evidence Inputs:** DEP: Retention\_Policy/, Archive\_Metadata/; LOGS: RETENTION\_CLASS assigned
- **Pass Criteria:** All artifacts have retention\_class; oldest retained artifacts meet minimum (typically 7 years)
- **Fail Criteria:** Premature deletion, missing retention metadata
- **Escalation:** Recordkeeping violation review; remediation plan required

### Category 3: Valuation & Assertions

#### Check H2-08: Valuation Source Validation

- **Purpose:** Confirm valuation data sources documented and independent
- **Evidence Inputs:** DEP: Valuation\_Methodology/, Appraisal\_Reports/, Data\_Sources/; LOGS: VALUATION\_UPDATE, DATA\_SOURCE\_CHANGE
- **Pass Criteria:** Data sources identified; independence documented; frequency meets disclosure
- **Fail Criteria:** Undocumented sources, conflicts of interest, frequency mismatches
- **Escalation:** Independent Assessor review; potential disclosure correction

#### Check H2-09: Methodology Transparency

- **Purpose:** Verify valuation assumptions and methodologies fully disclosed
- **Evidence Inputs:** DEP: Valuation\_Methodology/, Assumptions\_Log/; SDS Module 3
- **Pass Criteria:** All material assumptions listed; methodology changes logged with justification
- **Fail Criteria:** Missing assumptions, undisclosed methodology changes



- **Escalation:** Disclosure deficiency; corrective filing required

#### **Check H2-10: Attestation Lane Completeness**

- **Purpose:** Validate independent assessor attestations for material claims
- **Evidence Inputs:** DEP: Attestation\_Lane/, Independent\_Assessor\_Attestation/; LOGS: ATTESTATION\_ISSUED
- **Pass Criteria:** Attestations present for valuation, cashflow, risk factors; assessor independence confirmed
- **Fail Criteria:** Missing attestations, compromised independence
- **Escalation:** Qualification review; enhanced due diligence required

### **Category 4: Event Taxonomy & Material Change Handling**

#### **Check H2-11: Event Capture Completeness**

- **Purpose:** Verify all required event types logged per taxonomy (see H.6.2)
- **Evidence Inputs:** LOGS: All event\_type values; DEP: Event\_Taxonomy\_Mapping/
- **Pass Criteria:** All mandatory events present; event fields complete per taxonomy spec
- **Fail Criteria:** Missing event types, incomplete fields, taxonomy violations
- **Escalation:** Logging deficiency; remediate capture logic

#### **Check H2-12: Material Change Trigger Validation**

- **Purpose:** Confirm material change triggers properly identified and disclosed
- **Evidence Inputs:** DEP: Material\_Change\_Documentation/; LOGS: MATERIAL\_CHANGE\_TRIG, DISCLOSURE\_UPDATED
- **Pass Criteria:** All material changes have trigger documentation; disclosure updates within defined window (e.g., 5 business days)
- **Fail Criteria:** Late disclosures, undocumented triggers, missed material events
- **Escalation:** Compliance Reviewer escalation; assess disclosure failure

#### **Check H2-13: Distribution Event Accuracy**

- **Purpose:** Validate cashflow distribution events match disclosure commitments
- **Evidence Inputs:** DEP: Distribution\_Policy/, Payment\_Records/; LOGS: DISTRIBUTION\_EVENT, PAYMENT\_EXECUTED
- **Pass Criteria:** Distribution frequency, amounts, dates match SDS Module 4; all payments logged
- **Fail Criteria:** Discrepancies, missed payments, undisclosed changes
- **Escalation:** Issuer Ops Owner review; investor notification required if material

### **Category 5: Transfer Restrictions & Eligibility Gating**

#### **Check H2-17: Restriction Enforcement**

- **Purpose:** Verify transfer restrictions enforced per SDS Module 2
- **Evidence Inputs:** DEP: Transfer\_Restrictions/, Access\_Control\_Matrix/; LOGS: TRANSFER\_REJECTED, ELIGIBILITY\_FAIL
- **Pass Criteria:** Rejected transfers logged with reason codes; restrictions match disclosure

- **Fail Criteria:** Unenforced restrictions, inconsistent rule application
- **Escalation:** Transfer Agent remediation; assess control effectiveness

#### **Check H2-18: Eligibility Gating Validation**

- **Purpose:** Confirm only qualified participants receive transfers
- **Evidence Inputs:** DEP: Eligibility\_Checks/, Participant\_Registry/; LOGS: ELIGIBILITY\_VERIFIED, TRANSFER\_APPROVED
- **Pass Criteria:** All approved transfers have eligibility verification records; QIB/QP status documented
- **Fail Criteria:** Missing verifications, unqualified participants, documentation gaps
- **Escalation:** Broker-Dealer Compliance review; potential distribution violation

### **Category 6: Exit/Liquidity Stress Mode Readiness**

#### **Check H2-20: Stress Mode Evidence**

- **Purpose:** Validate stress mode procedures documented and tested
- **Evidence Inputs:** DEP: Stress\_Mode\_Playbook/, Tabletop\_Exercise\_Results/; LOGS: STRESS\_MODE\_ACTIVATED (if applicable)
- **Pass Criteria:** Playbook complete; tabletop exercises conducted; participant roles defined
- **Fail Criteria:** Missing playbook, untested procedures, undefined roles
- **Escalation:** Liquidity/Event Owner; mandatory remediation before scale phase

#### **Check H2-21: Fairness Controls Audit**

- **Purpose:** Verify queue rules, priority mechanisms documented and auditable
- **Evidence Inputs:** DEP: Queue\_Rules/, Priority\_Logic/, Fairness\_Audit\_Trail/; LOGS: QUEUE\_APPLIED, PRIORITY\_ASSIGNED
- **Pass Criteria:** Rules disclosed in ELA; application logged; no unexplained priority deviations
- **Fail Criteria:** Undisclosed rules, inconsistent application, favoritism patterns
- **Escalation:** Independent Assessor review; fairness controls enhancement required

#### **Check H2-22: Remediation Evidence (Failure-to-Settle)**

- **Purpose:** Confirm failure-to-settle events properly documented and resolved
- **Evidence Inputs:** DEP: Settlement\_Failure\_Logs/, Remediation\_Actions/, RACI\_Documentation/; LOGS: SETTLEMENT\_FAIL, REMEDIATION\_COMPLETE
- **Pass Criteria:** Each failure has root cause analysis, remediation plan, completion confirmation, RACI accountability
- **Fail Criteria:** Unresolved failures, missing root cause, no accountability records
- **Escalation:** Transfer Agent escalation; potential settlement process breakdown

#### **Check H2-23: Offboarding Readiness**

- **Purpose:** Validate procedures for returning to legacy recordkeeping if required
- **Evidence Inputs:** DEP: Offboarding\_Procedures/, Legacy\_Mapping\_Documentation/
- **Pass Criteria:** Offboarding playbook complete; legacy system mapping documented; tested in tabletop

- **Fail Criteria:** Missing procedures, untested offboarding, no legacy continuity plan
  - **Escalation:** Pilot Steering Committee review; mandatory for Phase 3 entry
- 

## **H.3 Examiner Request Workflow ("Request-Response Pack")**

### **H.3.1 Standard Workflow Steps**

#### **1. Intake**

- Examiner submits formal request via designated channel
- Request assigned unique ID: REQ-YYYY-MM-DD-NNN
- Intake timestamp recorded

#### **2. Purpose Code Assignment**

- Request categorized using standardized purpose codes (see H.3.3)
- Determines scope, tier, and retrieval requirements

#### **3. Tier Selection**

- Tier 0: Aggregate/statistical (no PII/identity)
- Tier 1: Routine examination (event-triggered access with purpose limitation)
- Tier 2: Emergency/investigation (identity reveal with dual control)

#### **4. Retrieval SLA**

- **Initial target SLAs (configurable by pilot governance):**
  - Tier 0: 2 business days
  - Tier 1: 5 business days
  - Tier 2: 24 hours (emergency); 3 business days (standard investigation)

#### **5. Packaging**

- Generate Evidence Pack folder tree matching request scope
- Include: Manifest.json, Checksums.txt, Chain\_of\_Custody statement
- Encrypt if PII/sensitive data present (Tier 1/2)

#### **6. Delivery**

- Secure transmission via designated protocol
- Delivery receipt logged with timestamp
- Confirmation from examiner recorded

#### **7. Post-Request Audit Log**

- **Required fields:**
  - request\_id
  - purpose\_code
  - tier
  - approver (if Tier 2)
  - ttl (time-to-live for access)

- scope (date range, participants, event types)
- artifacts\_produced (manifest list)
- retrieval\_timestamp
- delivery\_timestamp
- delivery\_method
- closure\_memo\_reference

## 8. Closure

- Examiner confirms receipt and sufficiency
- Closure memo filed
- Audit trail finalized and archived

### H.3.2 Packaging Format Specification

#### Manifest.json Structure:

```
{
  "request_id": "REQ-2026-01-15-001",
  "purpose_code": "DISC_COMP_REVIEW",
  "tier": "Tier_1",
  "scope": {
    "date_range": "2025-01-01 to 2025-12-31",
    "participants": ["ISSUER_ABC", "PARTICIPANT_XYZ"],
    "event_types": ["DISCLOSURE_PUBLISHED", "MATERIAL_CHANGE_TRIG"]
  },
  "artifacts": [
    "Disclosure_Package/SDS_Instance_v2.3.json",
    "Disclosure_Diff/v2.2_to_v2.3.diff",
    "Event_Logs/2025_Q4_events.csv"
  ],
  "generated_timestamp": "2026-01-16T10:30:00Z",
  "custodian": "EVIDENCE_PACK_CUSTODIAN_ID"
}
```

#### Checksums.txt:

SHA-256 checksums for integrity verification:  
8f4a9c2e1d7b3f5a... Disclosure\_Package/SDS\_Instance\_v2.3.json  
3a7f8c1e9d2b5f4c... Disclosure\_Diff/v2.2\_to\_v2.3.diff  
6e9a1d4b2c7f3a5e... Event\_Logs/2025\_Q4\_events.csv

#### Chain\_of\_Custody Statement:

Artifact custody maintained by: [Entity Name]  
Generation timestamp: 2026-01-16T10:30:00Z  
Custodian signature: [Digital Signature]  
Tamper-evidence status: VERIFIED  
Access controls: Tier\_1 (Purpose-limited routine examination)  
Retention class: REG\_EXAM\_7YR

### H.3.3 Common Examiner Request Types

Request Type	Purpose Code	Typical DEP Folders	Common Log Event Types
Disclosure	DISC_COMP_REVIEW	Disclosure_Package/	DISCLOSURE_PUBLISHED,

<b>Request Type</b>	<b>Purpose Code</b>	<b>Typical DEP Folders</b>	<b>Common Log Event Types</b>
Completeness review	W	Schema_Versions/, Disclosure_Diff/	VERSION_UPDATE
Valuation methodology verification	VAL_METHOD_VERIFY	Valuation_Methodology/, Appraisal_Reports/, Attestation_Lane/	VALUATION_UPDATE, ATTESTATION_ISSUED
Material change investigation	MAT_CHANGE_INVEST	Material_Change_Documentation/, Change_Control/	MATERIAL_CHANGE_TRIGGERED, DISCLOSURE_UPDATED
Transfer restriction enforcement	TRANSFER_RESTRICT	Transfer_Restrictions/, Eligibility_Checks/	TRANSFER_REJECTED, ELIGIBILITY_FAIL
Liquidity stress mode review	LIQ_STRESS_REVIEW	Stress_Mode_Playbook/, Queue_Rules/, Fairness_Audit_Trail/	STRESS_MODE_ACTIVATED, QUEUE_APPLIED
Incident response audit	INCIDENT_AUDIT	Incident_Reports/, Remediation_Actions/	INCIDENT_DETECTED, REMEDIATION_COMPLETE
Evidence pack integrity check	EVIDENCE_INTEGRITY	Complete folder tree, Manifest.json, Checksums.txt	EVIDENCE_PACK_GENERATED
Settlement failure analysis	SETTLE_FAIL_ANALYZE	Settlement_Failure_Logs/, Remediation_Actions/	SETTLEMENT_FAIL, REMEDIATION_COMPLETE

#### H.4 Tiered Supervisory Access (Purpose-Limited) — Tier 0/1/2

##### H.4.1 Tier Definitions and Requirements

<b>Tier</b>	<b>Allowed Scope</b>	<b>Typical Use Cases</b>	<b>Approval Authority</b>	<b>TTL Defaults</b>	<b>Required Audit Logs</b>
<b>Tier 0</b>	Aggregate/statistical only; no PII/identity reveal	Systemic risk monitoring, market surveillance, trend analysis	Automated (no manual approval)	Continuous (operational)	ACCESS_TYPE, QUERY_SCOPE, TIMESTAMP
<b>Tier 1</b>	Event-triggered access; limited PII; purpose-bound	Routine examination, compliance review, disclosure verification	Senior Examiner	30 days (renewable)	REQUEST_ID, PURPOSE_CODE, APPROVER, SCOPE, TTL, ARTIFACTS_ACCESSED

<b>Tier</b>	<b>Allowed Scope</b>	<b>Typical Use Cases</b>	<b>Approval Authority</b>	<b>TTL Defaults</b>	<b>Required Audit Logs</b>
<b>Tier 2</b>	Identity reveal; full transaction detail; emergency	Fraud investigation, sanctions violation, investor harm	Dual Control: Senior Examiner + Compliance Director	7 days (strict renewal)	All Tier 1 fields + DUAL_APPROVERS, EMERGENCY_JUSTIFICATION, POST_REVIEW_REQUIRED

## H.4.2 Escalation Workflow

### Step 1: Escalation Request

- Requester documents need for higher tier access
- Provides objective justification (e.g., suspected violation, investor complaint, anomaly detection)

### Step 2: Approval Process

- **Tier 0 → 1:** Senior Examiner approves with documented purpose code
- **Tier 1 → 2:** Dual approval required (Senior Examiner + Compliance Director)
- Approval documented with timestamp, justification, scope, TTL

### Step 3: Retrieval

- Access granted for specified scope and duration
- All access actions logged immutably
- Data minimization: retrieve only what is necessary for stated purpose

### Step 4: Delivery

- Secure transmission with encryption (Tier 1/2)
- Delivery confirmation logged
- Recipient acknowledges purpose limitation and TTL

### Step 5: Post-Review (Tier 2 only)

- Independent reviewer (not involved in original request) audits access appropriateness
- Reviews: objective justification, scope minimization, TTL compliance, findings documentation
- Post-review memo signed within 10 business days of access closure

### Step 6: Closure

- Access revoked upon TTL expiration
- Final audit log entry recorded
- Retention: Tier 0 (90 days operational), Tier 1 (7 years), Tier 2 (7 years + post-review memo)

## H.4.3 Post-Access Review Requirements (Tier 2)

### What is Reviewed:

- Objective justification for Tier 2 access (was emergency threshold met?)
- Scope minimization (was access limited to necessary data?)
- TTL compliance (was access revoked on schedule?)
- Findings documentation (were results properly recorded?)
- Alternative path assessment (could lower tier have sufficed?)

**Who Signs Off:**

- Independent reviewer (Inspector General function or equivalent)
- Not involved in original access request or investigation

**Retention:**

- Post-review memo retained for 7 years minimum
- Cross-referenced to original request\_id and audit log entries
- Available for subsequent oversight review or audit

## **H.5 Implementation Roadmap (Phased Adoption)**

### **Phase 1: Shadow Mode**

**Entry Criteria:**

1. SDS schema baseline approved by Change Control Board
2. DEP folder structure defined and documented
3. Event taxonomy extensions finalized (see H.6.2)
4. Pilot participants identified and onboarded
5. Examiner training materials prepared
6. Tiered access governance framework established

**Activities:**

- Participants adopt SDS schema internally (no public disclosure yet)
- Build sample DEP artifacts for dry-run examiner requests
- Conduct mock examiner requests with evidence retrieval exercises
- Tabletop stress mode scenarios (no live transactions)
- Validate logging completeness against taxonomy

**Exit Criteria:**

1. All participants generate compliant DEP artifacts
2. Mock examiner requests successfully fulfilled within SLA
3. Event capture completeness validated (100% mandatory events logged)
4. Tabletop stress mode exercise completed with documented lessons learned
5. Disclosure schema versioning tested (at least one version increment simulated)
6. Pilot Steering Committee approves progression to Phase 2

**Artifacts Produced:**

- Sample SDS instances (all 8 modules)
- Sample DEP folder trees with manifests/checksums
- Mock examiner request/response evidence packs
- Tabletop exercise reports
- Event taxonomy mapping validation report

## **Phase 2: Limited Live**

### **Entry Criteria:**

1. All Phase 1 exit criteria met
2. Limited participant cohort approved (2-3 issuers, 10-15 QIB investors max)
3. Notional cap established (e.g., \$50M aggregate)
4. Real-time logging infrastructure operational
5. Incident response playbooks tested in tabletop
6. Liquidity stress mode procedures documented

### **Activities:**

- Live tokenized real-asset issuances with full SDS disclosure
- Real investor transactions with transfer restriction enforcement
- Real-time event logging and DEP artifact generation
- Limited liquidity operations (normal trading mode only initially)
- Controlled stress mode testing (thin liquidity scenarios, no emergency halt)
- Actual examiner requests processed (Tier 0/1 only)

### **Exit Criteria:**

1. Minimum 5 live issuances completed without material operational failures
2. 100% SDS disclosure completeness across all live issuances (per H2-01)
3. Zero critical evidence pack integrity failures (per H2-04)
4. Liquidity stress mode tested in controlled environment (per H2-20)
5. At least 3 real examiner requests fulfilled within SLA
6. Zero Tier 2 escalations due to control failures (Tier 2 use acceptable for investigative purposes)
7. Pilot Steering Committee approves progression to Phase 3

### **Artifacts Produced:**

- Live SDS disclosure packages with version history
- Live DEP folder trees from real transactions
- Examiner request/response evidence packs (real requests)
- Stress mode test results and fairness controls audit trail
- Quarterly operational metrics report

## **Phase 3: Scale & Steady-State Operations**

### **Entry Criteria:**

1. All Phase 2 exit criteria met



2. Expanded participant cohort approved (up to full pilot caps)
3. Notional cap increased per Pilot Steering Committee authorization
4. Recertification cadence established and tested
5. Material change trigger framework validated in live operations
6. Offboarding procedures documented and tabletop-tested (per H2-23)

#### **Activities:**

- Full pilot scale operations with expanded participants and notional caps
- Regular disclosure updates with version control and material change triggers
- Routine examiner requests across all tiers (0/1/2 as needed)
- Liquidity stress mode may be invoked if market conditions warrant
- Quarterly recertification cycles for participants
- Evidence delta generation (only changed artifacts since last request)
- Annual comprehensive evaluation per pilot objectives

#### **Artifacts Produced:**

- Comprehensive disclosure packages across full participant cohort
- Complete evidence archive (7-year retention baseline)
- Examiner request/response evidence packs (all tiers)
- Material change documentation and disclosure delta files
- Quarterly recertification reports
- Annual pilot evaluation report with operational metrics and lessons learned

#### **Steady-State Operations Maintenance:**

- Continuous event logging with real-time monitoring
- Quarterly Evidence Pack Custodian reviews for completeness
- Semi-annual Change Control Board reviews of schema/taxonomy
- Annual recertification of all participants
- Ongoing examiner request processing within established SLAs
- Post-review audits for all Tier 2 accesses

## **H.6 Templates (Paste-Ready)**

### **H.6.1 Examiner Checklist (Checkbox Format)**

EXAMINER CHECKLIST – REAL-ASSET TOKENIZED SECURITIES

Request ID: \_\_\_\_\_ Date: \_\_\_\_\_ Examiner: \_\_\_\_\_

#### **DISCLOSURE COMPLETENESS & VERSIONING**

- ☐ H2-01: Schema completeness validated (all 8 modules present and populated)
- ☐ H2-02: Version audit trail complete (version increments documented with approvals)
- ☐ H2-03: Evidence pack completeness confirmed (manifest matches artifacts, checksums valid)

#### **EVIDENCE PACK INTEGRITY & CHAIN-OF-CUSTODY**

- ☐ H2-04: Chain-of-custody integrity verified (signed checksums, cryptographic signatures valid)
- ☐ H2-05: Retention period compliance confirmed (retention\_class assigned, minimums met)

#### VALUATION & ASSERTIONS

- ☐ H2-08: Valuation source validation complete (sources documented, independence confirmed)
- ☐ H2-09: Methodology transparency confirmed (assumptions disclosed, changes logged)
- ☐ H2-10: Attestation lane completeness verified (independent assessor attestations present)

#### EVENT TAXONOMY & MATERIAL CHANGE HANDLING

- ☐ H2-11: Event capture completeness validated (all mandatory events logged per taxonomy)
- ☐ H2-12: Material change trigger validation complete (triggers documented, disclosures timely)
- ☐ H2-13: Distribution event accuracy confirmed (payments match disclosure commitments)

#### TRANSFER RESTRICTIONS & ELIGIBILITY GATING

- ☐ H2-17: Restriction enforcement verified (rejected transfers logged, restrictions match disclosure)
- ☐ H2-18: Eligibility gating validation complete (QIB/QP status documented for all approved transfers)

#### EXIT/LIQUIDITY STRESS MODE READINESS

- ☐ H2-20: Stress mode evidence reviewed (playbook complete, tabletop exercises conducted)
- ☐ H2-21: Fairness controls audit complete (queue rules disclosed, application logged)
- ☐ H2-22: Remediation evidence reviewed (failure-to-settle events documented and resolved)
- ☐ H2-23: Offboarding readiness confirmed (procedures documented, legacy mapping tested)

#### OVERALL ASSESSMENT

- ☐ All critical checks passed (no material deficiencies identified)
- ☐ Deficiencies noted and escalated per procedures
- ☐ Follow-up examination required: YES / NO    If YES, specify scope:

Examiner Signature: \_\_\_\_\_ Date: \_\_\_\_\_  
 Supervisor Review: \_\_\_\_\_ Date: \_\_\_\_\_

### H.6.2 Event Taxonomy Extensions (Real-Asset Profile)

#### Required Fields for All Events:

- event\_id (UUID or sequential ID)
- event\_type (from taxonomy below)
- timestamp (ISO 8601 format with timezone)
- actor\_role (from RACI taxonomy: Issuer\_Ops, Compliance\_Reviewer, Transfer\_Agent, etc.)
- scope\_object\_ref (identifier for asset, participant, transaction affected)
- reason\_code (standardized reason for event, if applicable)

- `linkage_to_disclosure_module` (SDS Module 1-8 or ELA section reference)
- `severity` (INFO, WARNING, CRITICAL)
- `related_request_id` (if event triggered by examiner/supervisor request)
- `retention_class` (e.g., REG\_EXAM\_7YR, OPERATIONAL\_90D, PERMANENT)

#### Event Type Taxonomy (20+ Examples):

Event Type	Trigger	Linkage to Module	Typical Severity	Retention Class
DISCLOSURE_PUBLISHED	New SDS instance released	All modules	INFO	REG_EXAM_7YR
DISCLOSURE_UPDATED	Existing disclosure modified	Module(s) changed	INFO	REG_EXAM_7YR
VERSION_UPDATE	SDS schema version incremented	Schema control	INFO	REG_EXAM_7YR
MATERIAL_CHANGE_TRIG	Material change detected per trigger rules	Module triggering change	WARNING	REG_EXAM_7YR
DISCLOSURE_DIFF_GENERATED	Delta file created between versions	All modules	INFO	REG_EXAM_7YR
VALUATION_UPDATE	NAV or asset valuation recalculated	Module 3 (Valuation)	INFO	REG_EXAM_7YR
VALUATION_METHOD_CHANGE	Valuation methodology modified	Module 3 (Valuation)	WARNING	REG_EXAM_7YR
APPRAISAL_RECEIVED	Third-party appraisal report filed	Module 3 (Valuation)	INFO	REG_EXAM_7YR
ATTESTATION_ISSUED	Independent assessor attestation filed	Module 7 (Controls)	INFO	REG_EXAM_7YR
DISTRIBUTION_EVENT	Cashflow distribution executed	Module 4 (Cashflows)	INFO	REG_EXAM_7YR
DISTRIBUTION_POLICY_CHANGE	Distribution frequency/amount modified	Module 4 (Cashflows)	WARNING	REG_EXAM_7YR
TRANSFER_APPROVED	Investor	Module 2	INFO	REG_EXAM_7YR

Event Type	Trigger	Linkage to Module	Typical Severity	Retention Class
	transfer authorized	(Rights/Restrictions)		
TRANSFER_REJECTED	Transfer blocked due to restriction	Module 2 (Rights/Restrictions)	INFO	REG_EXAM_7YR
ELIGIBILITY_VERIFIED	Participant QIB/QP status confirmed	Module 2 (Rights/Restrictions)	INFO	REG_EXAM_7YR
ELIGIBILITY_FAIL	Participant fails eligibility check	Module 2 (Rights/Restrictions)	WARNING	REG_EXAM_7YR
LIQUIDITY_MODE_CHANGE	Transition between normal/limited/stress	ELA (liquidity modes)	WARNING	REG_EXAM_7YR
STRESS_MODE_ACTIVATED	Halt or severe restriction invoked	ELA (stress mode)	CRITICAL	REG_EXAM_7YR
QUEUE_APPLIED	Exit queue rule applied to request	ELA (fairness controls)	INFO	REG_EXAM_7YR
REDEMPTION_PROCESSED	Buyback or redemption executed	ELA (exit mechanics)	INFO	REG_EXAM_7YR
HALT_EXECUTED	Transaction halt implemented	ELA (hold/release)	CRITICAL	REG_EXAM_7YR
HALT_RELEASED	Transaction halt lifted	ELA (hold/release)	WARNING	REG_EXAM_7YR
SETTLEMENT_FAIL	Transaction settlement failed	ELA (failure playbook)	CRITICAL	REG_EXAM_7YR
REMEDIATION_COMPLETE	Settlement failure resolved	ELA (failure playbook)	INFO	REG_EXAM_7YR
INCIDENT_DETECTED	Operational or compliance incident identified	Module 8 (Event Taxonomy)	CRITICAL	REG_EXAM_7YR
INCIDENT_CONTAINED	Incident	Module 8	WARNING	REG_EXAM_7YR

Event Type	Trigger	Linkage to Module	Typical Severity	Retention Class
	response containment achieved	(Event Taxonomy)		
INCIDENT_RESOLVED	Incident fully remediated	Module 8 (Event Taxonomy)	INFO	REG_EXAM_7YR
EVIDENCE_PACK_GENERATED	DEP artifact package created	All modules	INFO	REG_EXAM_7YR
EXAMINER_REQUEST_RECEIVED	Regulatory examination request logged	N/A (operational )	INFO	REG_EXAM_7YR
EXAMINER_REQUEST_FULFILLED	Evidence pack delivered to examiner	N/A (operational )	INFO	REG_EXAM_7YR
TIER_ACCESS_GRANTED	Supervisory access tier escalation approved	N/A (governance )	WARNING	REG_EXAM_7YR
POST_REVIEW_COMPLETED	Tier 2 access post-review finalized	N/A (governance )	INFO	REG_EXAM_7YR

**Additional Event Types (Extensible):**

- DATA\_SOURCE\_CHANGE
- ORACLE\_UPDATE
- FEE\_SCHEDULE\_CHANGE
- CONFLICT\_DISCLOSURE
- LEGAL\_OPINION\_UPDATE
- TAX\_TREATMENT\_CHANGE
- GOVERNANCE\_VOTE
- OFFBOARDING\_INITIATED
- LEGACY\_TRANSFER\_COMPLETE

**H.6.3 RACI Snapshot (Mini Matrix)**

Activity	Issuer Ops Owner	Compliance Reviewer	Independent Assessor	Transfer Agent	Liquidity/ Event Owner	Evidence Pack Custodian	Access Governance Approver
Disclosure Update Approval	R	A	C (if valuation)	I	-	I	-
Valuation Update	R	C	A (attestation)	I	-	I	-

Activity	Issuer Ops Owner	Compliance Reviewer	Independent Assessor	Transfer Agent	Liquidity/Event Owner	Evidence Pack Custodian	Access Governance Approver
Approval							
Material Change Triage	R	A	C (if material)	I	I	I	-
Stress Mode Trigger	C	C	-	R	A	I	C (if Tier 2)
Halt/Hold/Release Decision	C	A (approval)	-	R (execute)	C	I	A (Tier 2 hold)
Evidence Preservation Trigger	R	C	-	C	C	A	-
Examiner Request (Tier 1)	I	C	-	C	C	A/R	A (approval)
Examiner Request (Tier 2)	I	C	-	C	C	A/R	A (dual approval)

**Role Definitions (Baseline Taxonomy Alignment):**

- **Issuer Ops Owner:** Manages day-to-day operations, coordinates artifact generation
- **Compliance Reviewer:** Ensures regulatory compliance, approves material decisions
- **Independent Assessor:** Third-party validation of valuation, attestations, control effectiveness
- **Transfer Agent:** Maintains registry, enforces restrictions, executes transactions
- **Liquidity/Event Owner:** Manages liquidity modes, stress scenarios, exit mechanics
- **Evidence Pack Custodian:** Generates, maintains, and delivers DEP artifacts to examiners
- **Access Governance Approver:** Authorizes tiered supervisory access (Tier 1/2 escalations)

# Appendix I — Adoption Frictions, Proportionality, and Phased Operating Model (Real-Asset Profile)

## I.0 Purpose & Non-Substantive Disclaimer

This appendix clarifies adoption frictions inherent in tokenized real-asset securities frameworks and provides proportional pathways for implementation. It does not modify requirements established in the main submission or baseline frameworks. Rather, it operationalizes implementation options consistent with baseline governance, phased adoption principles, and evidence delta concepts established in the Operationalization Track and Regulatory Institutionalization Pack.

Content herein addresses compliance economics, technical complexity, and controlled growth mechanics to support informed pilot participation decisions. All guidance maintains consistency with investor protection, market integrity, and examiner enablement objectives.

**No legal conclusions are asserted. Mortgage/housing-finance policy reform remains out of scope.**

## I.1 Adoption Frictions Summary

Friction	Root Cause	Impact	Risk if Ignored	Mitigation Path (Proportionality)	Evidence/Artifact Impact
<b>Compliance Cost</b> (Independent appraisals, title reports, third-party audits)	Real-asset verification requires professional assessment; investor protection baseline	High fixed costs per issuance; disproportionate for smaller sponsors	Unverified claims, valuation disputes, investor harm, regulatory scrutiny	Periodic sampling (not per-transaction); standardized templates; reliance on issuer attestation with independent validation at material change triggers; delta evidence packs	DEP: Valuation_Methodology/, Attestation_Lane/, Sampling_Schedule/
<b>Pilot Factor</b> (Controlled scaling, participant)	Regulatory prudence; operational learning	Limited access for smaller issuers; queue	Systemic risk from rapid uncontrolled	Phased graduation criteria (Phase	DEP: Pilot_Metrics/, Graduation_Evidence/; LOGS: PHASE_TRANSITION,

Friction	Root Cause	Impact	Risk if Ignored	Mitigation Path (Proportional)	Evidence/Artifact Impact
caps, notional limits)	curve; market integrity preservation	delays; constrained liquidity	d scaling; operational failures; investor protection gaps	1 → 2 → 3); tiered caps with objective thresholds; priority for diversity (geography, asset class, sponsor type)	CAP_THRESHOLD_MET
<b>Technical Complexity</b> (Schema validation, hash chains, event taxonomy, circuit breakers)	Examiner enablement + auditability requirements; operational resilience baseline	Steep learning curve for non-technical sponsors; software development costs; maintenance burden	Incomplete evidence packs; logging gaps; failed examiner requests; operational fragility	Standardized tooling; managed compliance platforms; "Adoption Tier A" minimal viable controls; template-based implementations	DEP: Technical_Controls_Checklist/, Schema_Validation_Logs/; LOGS: VALIDATION_PASS, CHECKSUM_VERIFIED
<b>Disclosure Schema Rigidity</b> (8 mandatory modules, version control, material change triggers)	Consistency requirement for examiner comparability; prevents disclosure fragmentation	Perceived inflexibility; sponsor customization constraints; version management overhead	Disclosure inconsistency across issuances; examiner inefficiency; investor confusion	Modular optional extensions (beyond 8 core); "immaterial change" threshold guidance; disclosure diff mechanism reducing full rewrites	DEP: Disclosure_Package/, Disclosure_Diff/, Extension_Modules/
<b>Liquidity Stress Preparedness</b> (Stress mode playbooks, queue rules, fairness)	Investor protection during thin markets; operational resilience; regulatory confidence	Upfront documentation burden before any stress event occurs; tabletop exercise costs	Operational paralysis during actual stress; investor harm; regulatory	Phase 1 tabletop sufficient; live stress testing only in Phase 2; standardized playbook	DEP: Stress_Mode_Playbook/, Tabletop_Exercise_Results/; LOGS: STRESS_MODE_ACTIVATED (if occurs)



Friction	Root Cause	Impact	Risk if Ignored	Mitigation Path (Proportional)	Evidence/Artifact Impact
controls, offboarding procedures)			intervention; reputational damage	templates; shared best practices via pilot coordination	
<b>Evidence Pack Generation Complexity</b> (DEP folder structure, manifests, checksums, chain-of-custody)	Examiner efficiency requirement; books and records standards; tamper-evidence	Manual evidence assembly time-consuming; error-prone; delays examiner requests	Failed examiner SLAs; incomplete evidence; regulatory friction; extended examinations	Automated DEP generation tooling; standardized manifest templates; incremental delta packs (only changed artifacts); Evidence Pack Custodian role specialization	DEP: Complete folder tree + Manifest.json + Checksums.txt; LOGS: EVIDENCE_PACK_GENERATED
<b>Transfer Restriction Enforcement</b> (Eligibility gating, registry controls, hold/release mechanisms)	Qualified investor protection; regulatory compliance (QIB/QP requirements); sanctions screening	Technical access controls required; registry integration; BD coordination overhead	Unqualified investors; regulatory violations; sanctions breaches; investor suitability failures	Leverage existing BD/TA infrastructure; standardized eligibility verification protocols; automated screening integration; shared registry standards	DEP: Transfer_Restrictions/, Eligibility_Checks/; LOGS: TRANSFER_REJECTED, ELIGIBILITY_VERIFIED
<b>Independent Assessor Availability</b> (Third-party attestations, valuation validation, control reviews)	Investor confidence; disclosure credibility; fraud deterrence	Limited assessor pool; cost concentration; scheduling delays	Compromised independence; conflicts of interest; disclosure credibility gaps	Develop assessor network; standardized assessment frameworks; periodic (not continuous) attestations; issuer self-	DEP: Attestation_Lane/, Independent_Assessor_Registry/; LOGS: ATTESTATION_ISSUED

Friction	Root Cause	Impact	Risk if Ignored	Mitigation Path (Proportional)	Evidence/Artifact Impact
				attestation with spot-check model	
<b>Recertification Cadence</b> (Annual participant revalidation, conformance retesting, evidence updates)	Baseline conformance maintenance; operational drift prevention; continuous eligibility	Annual compliance burden; documentation refresh; retesting costs	Control degradation over time; obsolete certifications; operational failures; participant ineligibility	Risk-based cadence (annual for standard, semi-annual for high-risk, biennial for low-risk performers); delta evidence (only changed artifacts); streamlined revalidation for stable participants	DEP: Recertification_Evidence/, Conformance_Updates/; LOGS: RECERT_INITIATED, RECERT_COMPLETE

**Key Takeaway:** Most frictions have proportional mitigation paths that preserve investor protection and examiner enablement while reducing operational burden. Phased adoption and evidence delta mechanisms are central to cost containment without compromising control integrity.

## I.2 Proportional Compliance Model (Tiered Implementation)

### Overview

The Adoption Tier model provides operational packaging choices for phased pilot entry. This model does NOT promise regulatory relief or exemptions from applicable securities laws. Rather, it operationalizes baseline concepts of phased adoption, material change triggers, and evidence deltas to create entry pathways proportional to issuer capabilities and risk profiles.

All tiers maintain investor protection, market integrity, and examiner enablement baselines. Differences lie in operational packaging, artifact granularity, and recertification cadence.

### Tier Definitions

Adoption Tier	Intended Issuer Profile	Required Artifacts (Must-Have)	Optional/Deferred Artifacts	Examiner Enablement Coverage	Typical Effort
<b>Tier A: Minimal</b>	Pilot participant exploring	SDS Modules 1,2,6,8 (core	SDS Modules 3,4,5,7	Examiner Checks H2-01,	<b>Low-Medium:</b> 2-4 weeks setup;

Adoption Tier	Intended Issuer Profile	Required Artifacts (Must-Have)	Optional/Deferred Artifacts	Examiner Enablement Coverage	Typical Effort
<b>Viable Pilot</b>	feasibility; smaller sponsor (\$5-25M issuance); professional issuer testing framework; Phase 1 shadow mode entry	only); Basic DEP structure; Event taxonomy (mandatory events only); Tabletop stress mode playbook; Spreadsheet-based evidence tracking	(simplified disclosure); Automated DEP generation; Formal verification (manual review acceptable); Advanced liquidity analytics	H2-02, H2-03 (partial), H2-11, H2-20 (tabletop only)	monthly maintenance
<b>Tier B: Standard Pilot</b>	Standard pilot participant; professional issuer (\$25-100M issuance); Phase 2 limited live operations; institutional intermediaries	All 8 SDS modules; Complete DEP folder structure; Full event taxonomy; Live stress mode procedures (limited liquidity tested); Automated evidence generation	Enhanced analytics; Real-time monitoring dashboards; Cross-issuance aggregation; Advanced fairness controls beyond baseline	All Examiner Checks H2-01 through H2-23; Full examiner request support (Tier 0/1/2)	<b>Medium:</b> 6-10 weeks setup; bi-weekly maintenance
<b>Tier C: Scale-Ready</b>	Mature pilot participant; institutional issuer (\$100M+ issuances or multiple concurrent issuances); Phase 3 steady-state operations; high-volume participants	All Tier B requirements PLUS: Continuous controls monitoring; Quarterly recertification automation; Evidence delta generation; Multi-issuance orchestration; Real-time supervisory access integration; Offboarding procedures tested	Predictive analytics; AI-assisted compliance monitoring; Cross-jurisdiction readiness (future); Advanced stress scenario modeling	All Examiner Checks + Enhanced monitoring; Sub-24-hour examiner request SLA; Proactive anomaly detection	<b>High:</b> 12-16 weeks setup; continuous monitoring with automated alerts

## Tier Transition Criteria

### Tier A → Tier B:

- Successful Phase 1 shadow mode completion (all exit criteria met)
- At least one complete disclosure package generated (all 8 modules)

- Mock examiner request fulfilled within SLA
- Tabletop stress mode exercise completed with documented learnings
- Pilot Steering Committee approval

#### **Tier B → Tier C:**

- Minimum 5 live issuances completed without critical operational failures
- 100% examiner check pass rate for 2 consecutive quarters
- Evidence delta mechanism tested and validated
- Real stress mode scenario encountered and successfully managed (or comprehensive tabletop if not encountered)
- Offboarding procedures documented and tested
- Pilot Steering Committee approval for scale phase entry

## **Operational Packaging Notes**

### **Tier A Simplifications (Maintaining Baseline Protections):**

- SDS Module 3 (Valuation): Simplified methodology disclosure acceptable if third-party appraisal attached and methodology is standard industry practice
- SDS Module 4 (Cashflows): "Fixed schedule per offering docs" acceptable if no variable distribution policy
- SDS Module 5 (Fees): Simplified fee table acceptable if no performance fees or complex waterfall
- SDS Module 7 (Controls): Issuer self-attestation acceptable with annual independent review (vs quarterly for Tier B)
- Evidence Pack: Spreadsheet-based tracking acceptable if manifest/checksum protocol maintained
- Event Taxonomy: Mandatory events only (DISCLOSURE\_PUBLISHED, MATERIAL\_CHANGE\_TRIG, TRANSFER\_APPROVED/REJECTED, INCIDENT\_DETECTED); optional events deferred

### **Tier B Standard Requirements:**

- All 8 SDS modules with full granularity as specified in main document
- Automated DEP generation with real-time manifest updates
- Full event taxonomy (20+ event types from Appendix H.6.2)
- Independent assessor attestation quarterly or at material change triggers
- Live stress mode procedures tested in controlled scenarios

### **Tier C Enhancements (Operational Excellence):**

- Real-time evidence delta generation (changed artifacts automatically flagged)
- Continuous controls monitoring with automated anomaly detection
- Quarterly recertification automated with delta-only evidence submission
- Predictive liquidity stress modeling
- Sub-24-hour examiner request fulfillment capability
- Proactive supervisory reporting (ahead of issues)

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## I.3 Cost Drivers & Cost Containment Paths (Compliance Economics)

### Why Compliance Costs Exist: Risk Control Rationale

Compliance costs in tokenized real-asset securities serve investor protection and market integrity objectives aligned with traditional securities frameworks:

#### Independent Appraisals:

- **Purpose:** Objective valuation; prevent issuer self-dealing; investor confidence in NAV
- **Risk Mitigated:** Inflated valuations, fraud, investor losses, regulatory enforcement

#### Title Reports / Legal Opinions:

- **Purpose:** Confirm clear ownership; identify liens/encumbrances; validate legal structure
- **Risk Mitigated:** Ownership disputes, priority conflicts, investor claim impairment

#### Third-Party Audits / Attestations:

- **Purpose:** Financial statement accuracy; control effectiveness validation; independent verification
- **Risk Mitigated:** Financial misstatement, operational control failures, disclosure inaccuracies

#### Periodic Recertification:

- **Purpose:** Detect operational drift; maintain conformance baseline; ensure continued eligibility
- **Risk Mitigated:** Control degradation, outdated certifications, participant ineligibility

### Cost Containment Strategies (Preserving Integrity)

Strategy	Mechanism	Cost Reduction	Integrity Preservation	Evidence Impact
<b>Delta Evidence Packs</b>	Only submit changed artifacts since last request; manifest tracks deltas	60-80% reduction in evidence generation time after first cycle	Full audit trail maintained via manifest versioning; historical evidence retrievable	DEP: Disclosure_Diff/, Evidence_Delta/, Version_Manifest/
<b>Periodic Sampling (Appraisals)</b>	Annual appraisal for stable assets; semi-annual for volatile; full reappraisal only at material change triggers	50-70% reduction in appraisal frequency vs per-transaction baseline	Material change triggers capture significant value shifts; statistical sampling for portfolios	DEP: Appraisal_Schedule/, Sampling_Methodology/, Trigger_Documentation/

Strategy	Mechanism	Cost Reduction	Integrity Preservation	Evidence Impact
<b>Standardized Templates</b>	Pre-approved disclosure language; standard legal opinions; template attestation frameworks	40-60% reduction in legal/drafting costs via reuse	Regulatory pre-review of templates; customization only for material differences	DEP: Template_Library/, Customization_Log/
<b>Issuer Self-Attestation (Tier A)</b>	Issuer officer attestation with annual independent review vs quarterly independent	70% reduction in independent assessor fees for low-risk/small issuances	Independent review maintains backstop; material change triggers require immediate independent attestation	DEP: Issuer_Attestation/, Annual_Independent_Review/
<b>Shared Assessor Pool</b>	Pilot-wide network of pre-qualified independent assessors; volume pricing	20-30% cost reduction via economies of scale and competitive pricing	Assessor qualification standards maintained; conflict screening; rotation policies	DEP: Assessor_Registry/, Engagement_Records/
<b>Automated Evidence Generation</b>	Software tooling auto-generates manifests, checksums, event logs, evidence deltas	80-90% reduction in manual evidence assembly time	Automation reduces human error; standardized formats improve examiner efficiency	DEP: Automated generation metadata in Manifest.json
<b>Risk-Based Recertification Cadence</b>	Annual (standard); semi-annual (high-risk/high-volume); biennial (low-incident/mature)	30-50% reduction in recert burden for stable, low-incident participants	Incident triggers immediate recert regardless of schedule; quarterly monitoring maintains oversight	DEP: Recert_Schedule/, Incident_History/, Risk_Assessment/
<b>Modular Disclosure Extensions</b>	8 core modules mandatory; additional	Avoids one-size-fits-all over-disclosure;	Core 8 modules ensure baseline	DEP: Core_Modules/ (mandatory), Extension_Modules/ (optional)

Strategy	Mechanism	Cost Reduction	Integrity Preservation	Evidence Impact
	disclosure optional/modular per issuer complexity	focuses compliance budget on material risks	comparability; extensions preserve disclosure completeness where needed	
<b>Materiality Thresholds</b>	Define "immaterial change" thresholds (e.g., <5% NAV change, non-structural fee adjustments)	40-50% reduction in disclosure update cycles by filtering noise	Material change definition remains conservative; immaterial changes logged but not requiring full disclosure update	DEP: Materiality_Policy/, Change_Significance_Log/
<b>Reliance on Existing Due Diligence</b>	Leverage BD due diligence, TA registry validation, custodian controls where overlap exists	Avoid duplicative compliance work; 20-30% efficiency gain	Baseline controls maintained; reliance documented with RACI accountability clarity	DEP: Reliance_Documentation/, Control_Mapping/

## Cost Containment Checklist

### ☐ 1. Evidence Delta Mechanism Implemented

- Only changed artifacts submitted after first full DEP
- Manifest tracks version history and delta references
- Examiner can reconstruct full evidence via delta chain

### ☐ 2. Periodic Sampling Schedule Defined

- Appraisal frequency based on asset volatility and materiality
- Material change triggers override schedule for immediate review
- Statistical sampling methodology documented for multi-asset portfolios

### ☐ 3. Standardized Templates Adopted

- Pre-approved disclosure language for standard clauses
- Template legal opinions for common structures
- Customization only for material/unique aspects

### ☐ 4. Issuer Self-Attestation (Tier A) with Independent Backstop

- Officer attestation quarterly; independent annual review
- Material change triggers immediate independent attestation

- Attestation training and procedures documented

#### ☐ 5. Shared Assessor Pool Participation

- Pilot-wide assessor network engagement
- Volume pricing negotiated collectively
- Conflict screening and rotation policies maintained

#### ☐ 6. Automated Evidence Generation Tooling

- Manifest, checksums, event logs auto-generated
- Schema validation automated with pass/fail alerts
- Evidence deltas calculated automatically

#### ☐ 7. Risk-Based Recertification Cadence

- Annual baseline; semi-annual for high-risk; biennial for exemplary performers
- Incident triggers override schedule
- Recert scope tailored to risk profile (delta evidence for stable participants)

#### ☐ 8. Modular Disclosure Approach

- 8 core modules complete; extensions only where applicable
- Extension modules documented as optional enhancements
- No over-disclosure penalty for baseline compliance

#### ☐ 9. Materiality Thresholds Established

- Written policy defining material vs immaterial changes
- Conservative thresholds (5% NAV, structural changes always material)
- Immaterial changes logged but disclosure update optional

#### ☐ 10. Control Reliance Documentation

- Identified overlapping controls (BD due diligence, TA validation, custodian reporting)
- Documented reliance with RACI accountability
- No gaps in control coverage despite reliance

#### ☐ 11. Continuous Process Improvement

- Quarterly review of cost drivers and containment effectiveness
- Participant feedback incorporated into template/tooling updates
- Pilot-wide best practices shared via governance channels

#### ☐ 12. Compliance Budget Transparency

- Estimated costs disclosed to participants at onboarding
- Cost tracking vs budget with variance analysis
- Cost containment ROI measured and reported



## **I.4 Pilot Factor — Controlled Growth Mechanics (Operational Reality)**

### **Rationale for Phased Pilot Growth**

Controlled pilot scaling serves multiple regulatory and operational objectives:

**Market Integrity:** Phased growth allows detection and remediation of systemic issues before broad market impact. Rapid uncontrolled scaling risks cascading failures affecting many participants.

**Investor Protection:** Limited initial scale contains investor exposure during operational learning curve. Allows refinement of investor protections based on real-world experience before broader deployment.

**Operational Learning:** Measured growth enables capture of operational lessons, refinement of procedures, and validation of control effectiveness. Rushing to scale before operational maturity risks preventable failures.

**Regulatory Confidence:** Demonstrating success at small scale builds regulatory confidence for broader authorization. Controlled evidence generation supports informed regulatory decisions about scaling.

**Supervisory Capacity:** Examination and oversight resources scale with participant growth. Phased pilot matches supervisory capacity to participant count, maintaining examination quality.

### **Controlled Growth Implementation Mechanisms**

#### **Participant Caps:**

- **Phase 1 (Shadow Mode):** 3-5 issuers, 10-15 QIB investors
- **Phase 2 (Limited Live):** 5-10 issuers, 25-40 QIB investors
- **Phase 3 (Scale/Steady-State):** Up to 20 issuers, up to 100 QIB investors (subject to Pilot Steering Committee expansion approval)

#### **Issuance Caps:**

- **Phase 1:** \$50M aggregate notional maximum
- **Phase 2:** \$250M aggregate notional maximum
- **Phase 3:** \$500M aggregate notional maximum (adjustable based on performance)

#### **Volume Thresholds (Per Issuer):**

- **Phase 1:** Single issuance or maximum 2 concurrent issuances
- **Phase 2:** Up to 3 concurrent issuances
- **Phase 3:** Up to 5 concurrent issuances (subject to operational capacity demonstration)

#### **Geographic/Asset Class Diversity:**

- Pilot Steering Committee prioritizes diversity to validate framework generalizability
- At least 2 distinct asset classes (e.g., infrastructure, commercial real estate) by Phase 2
- At least 3 geographic regions by Phase 3 (within U.S. domestic scope)

## Graduation Criteria: Phase Transition Framework

Objective criteria govern phase transitions, ensuring operational readiness precedes expansion:

Metric Category	Threshold Concept	Evidence Source	Examiner Check Linkage	Phase 1 → 2 Threshold	Phase 2 → 3 Threshold
<b>Disclosure Completeness</b>	% of issuances with 100% SDS module population	DEP: Disclosure_Package/; LOGS: DISCLOSURE_PUBLISHED	H2-01	100% for all pilot issuances	100% maintained for 2 consecutive quarters
<b>Evidence Pack Integrity</b>	% of DEP artifacts passing chain-of-custody validation	DEP: Checksums.txt, Chain_of_Custody/; LOGS: CHECKSUM_VERIFIED	H2-04	100% for mock examiner requests	100% for live examiner requests
<b>Event Capture Rate</b>	% of mandatory events logged per taxonomy	LOGS: All event_type values vs taxonomy requirements	H2-11	≥95% mandatory events captured	100% mandatory events + ≥80% optional events
<b>Examiner Request SLA</b>	% of requests fulfilled within target SLA	DEP: Examiner_Request_Log/; Evidence delivery timestamps	H.3.1 (SLA compliance)	100% of mock requests within SLA	≥95% of live requests within SLA
<b>Incident Rate</b>	Critical incidents per 100 transactions	LOGS: INCIDENT_DETECTED (severity=CRITICAL)	H2-25 (incident management)	≤2 critical incidents (acceptable for learning)	≤0.5 critical incidents per 100 tx
<b>Stress Mode Readiness</b>	Tabletop/live stress scenario success	DEP: Stress_Mode_Playbook/, Tabletop_Exercise_Results/; LOGS: STRESS_MODE_ACTIVATED	H2-20	1 successful tabletop	1 live stress test OR 2 comprehensive tabletops
<b>Material Change Handling</b>	% of material changes disclosed within window (5 business days)	DEP: Material_Change_Documentation/; LOGS: MATERIAL_CHANGE_TRIGGER, DISCLOSURE_UPDATED	H2-12	100% (limited sample)	≥98% over 2 quarters
<b>Transfer Restriction Enforcement</b>	% of restricted transfers properly rejected	LOGS: TRANSFER_REJECTED, ELIGIBILITY_FAIL	H2-17	100% (limited volume)	≥99.5% over 2 quarters
<b>Recertification Timeliness</b>	% of participants recertified on schedule	DEP: Recertification_Evidence/; LOGS: RECERT_COMPLETE	Recert framework (I.2)	Not applicable (Phase 1 < 1 year)	100% annual recerts on time
<b>Participant Satisfaction</b>	Participant feedback score	Quarterly surveys; Pilot Steering Committee reports	Governance feedback	≥70% "acceptable"	≥80% "good" or better

Metric Category	Threshold Concept	Evidence Source	Examiner Check Linkage	Phase 1 → 2 Threshold	Phase 2 → 3 Threshold
	(operational burden, clarity, support)		loops	" or better	

**Graduation Decision Authority:** Pilot Steering Committee with SEC/FinHub observer consultation

**Graduation Timeline:** Minimum 6 months per phase; no maximum if thresholds not met

**Regression Provisions:** If performance degrades post-graduation, Pilot Steering Committee may impose temporary cap reductions or enhanced monitoring until remediation complete

## I.5 Technical Complexity — Implementation Profiles

### Issuer Profile Spectrum

#### "Spreadsheet-Era Operator":

- Smaller sponsor; limited IT staff; manual processes dominant
- Comfortable with Excel/Google Sheets; email-based coordination
- Seeks minimal technology burden; maximum template reliance
- **Target:** Tier A (Minimal Viable Pilot)

#### "Regulated Institutional Operator":

- Professional issuer; dedicated compliance/ops teams
- Existing compliance management systems; API integration capabilities
- Comfortable with structured data; moderate automation
- **Target:** Tier B (Standard Pilot)

#### "Scale-Ready Institutional Operator":

- Large/frequent issuer; enterprise IT infrastructure
- Real-time monitoring; advanced analytics; multi-system orchestration
- Full automation; predictive modeling capabilities
- **Target:** Tier C (Scale-Ready)

### Minimal Technical Stack (Tier A)

#### Core Components:

1. **Schema Validation:** Spreadsheet template with formula-based validation rules (Excel macros or Google Apps Script)
2. **Checksum Generation:** Command-line tool (e.g., `shasum` on Mac/Linux, `certutil` on Windows) for manifest integrity
3. **Event Logging:** Spreadsheet-based event log with required fields (`event_id`, `event_type`, `timestamp`, `actor_role`, etc.)

4. **Access Control:** Role-based file permissions (Google Drive sharing or Box folders with access tiers)
5. **Evidence Packaging:** Manual folder organization following DEP structure; ZIP archive with manifest.json and checksums.txt

**Estimated Setup Effort:** 2-4 weeks (includes template customization, training, first evidence pack assembly)

**Operational Burden:** 4-8 hours monthly (disclosure updates, event logging, evidence packaging for mock examiner requests)

## Standard Technical Stack (Tier B)

### Core Components:

1. **Compliance Management Platform:** Commercial SaaS platform (e.g., compliance workflow tools) with custom schema configuration
2. **Automated Evidence Generation:** Software integration auto-generating manifests, checksums, event logs from operational systems
3. **API Integration:** Connections to BD/TA/Custodian systems for transfer validation, eligibility checks, transaction logging
4. **Real-Time Event Capture:** Event streaming from operational systems to centralized logging infrastructure with taxonomy mapping
5. **Examiner Portal:** Secure web interface for evidence pack retrieval with role-based access control

**Estimated Setup Effort:** 6-10 weeks (includes platform selection, configuration, integration development, testing)

**Operational Burden:** 2-4 hours weekly (monitoring dashboards, disclosure updates, evidence validation)

## Scale-Ready Technical Stack (Tier C)

### Core Components:

1. **Enterprise Compliance Orchestration:** Integrated platform with workflow automation, continuous monitoring, predictive analytics
2. **Real-Time Supervisory Access Integration:** Tiered access API supporting Tier 0/1/2 with automated purpose-code routing and TTL enforcement
3. **Evidence Delta Engine:** Automated detection and packaging of changed artifacts; manifest versioning; full audit trail
4. **Advanced Analytics:** Anomaly detection, liquidity stress modeling, predictive compliance risk scoring
5. **Multi-Issuance Orchestration:** Centralized control plane managing multiple concurrent issuances with aggregated reporting

**Estimated Setup Effort:** 12-16 weeks (includes enterprise platform deployment, custom development, integration testing, security hardening)

**Operational Burden:** Continuous automated monitoring with exception-based intervention (estimated 1-2 hours weekly for exception review)

## **Minimum Technical Controls Checklist**

### ☐ **Schema Validation**

- SDS instances validated against baseline schema before publication
- Validation errors logged and remediated before disclosure release
- Version control maintained with clear schema version identification

### ☐ **Checksum Manifests**

- SHA-256 checksums generated for all DEP artifacts
- Manifest.json lists all artifacts with checksums
- Checksum verification performed before evidence delivery

### ☐ **Tamper-Evident Logs**

- Event logs include hash chaining (each event references previous event hash)
- Log modification detection mechanism operational
- Chain-of-custody documented for all logged events

### ☐ **Access Control**

- Role-based access to evidence artifacts (Issuer Ops, Compliance Reviewer, Evidence Pack Custodian, Examiner tiers)
- Access logs maintained with timestamp and purpose documentation
- Tiered access permissions enforced (Tier 0/1/2 distinctions)

### ☐ **Retrieval SLAs**

- Target SLAs defined per examiner request type and tier
- Evidence packaging workflow documented with time estimates
- SLA performance tracked and reported quarterly

## **Build vs Buy Guidance (Generic)**

### **Considerations Favoring "Buy" (Commercial Tooling):**

- Small to mid-size sponsors with limited IT resources
- Desire to minimize custom development and maintenance burden
- Need for rapid pilot entry (weeks vs months)
- Preference for vendor-supported, pre-built compliance solutions

### **Considerations Favoring "Build" (Custom Development):**

- Large institutional operators with existing technology stacks
- Unique integration requirements with legacy systems
- High-volume operations requiring custom optimization
- Preference for full control over intellectual property and architecture

### **Hybrid Approach (Most Common):**

- Commercial compliance platform for core evidence management
- Custom integrations connecting platform to existing BD/TA/Custodian systems
- Open-source tooling for checksum generation, schema validation
- Leverage pilot-wide shared templates and standards

**Critical Success Factor:** Regardless of build/buy decision, adherence to baseline standards (SDS schema, DEP folder structure, event taxonomy, examiner check requirements) is mandatory. Tooling must produce conformant outputs.

---

## I.6 Risk of Over-Exclusion & Market Structure Balance (SEC-Safe)

### Professionalization as Expected Outcome

Tokenized real-asset securities frameworks introduce operational and compliance standards exceeding traditional private placement practices. This professionalization is expected and serves legitimate regulatory objectives:

**Investor Protection:** Standardized disclosures, independent verification, and examiner-ready evidence protect institutional investors from fraud, misrepresentation, and operational failures.

**Market Integrity:** Consistent logging, event taxonomies, and supervisory access enable effective market surveillance and enforcement, deterring misconduct.

**Regulatory Efficiency:** Examiner-ready evidence packs and standardized checks reduce regulatory burden on supervised entities while improving examination quality.

**Operational Resilience:** Technical controls, stress mode preparedness, and liquidity safeguards enhance system stability and reduce systemic risk.

### Potential Over-Exclusion Dynamics

However, excessive compliance burden risks pushing smaller sponsors and legitimate activity into less transparent venues:

**Economic Barriers:** If compliance costs exceed feasible returns for smaller issuances (\$5-25M range), sponsors may:

- Avoid tokenized frameworks entirely, continuing fragmented manual processes
- Seek offshore or less-regulated venues with weaker investor protections
- Concentrate issuance activity among largest institutional players only

**Technical Barriers:** If implementation complexity exceeds capabilities of "spreadsheet-era operators," participation may be limited to enterprise-scale issuers with dedicated IT teams.

**Regulatory Uncertainty:** If pilot graduation criteria are unclear or subjective, sponsors may defer participation awaiting regulatory certainty, slowing innovation and limiting operational learning.

## **Balanced Posture: Regulated Rails with Proportional Entry**

The framework incorporates multiple mechanisms to balance professionalization with accessible entry:

### **1. Tiered Implementation (Adoption Tiers A/B/C):**

- Tier A provides minimal viable compliance path for smaller sponsors
- Simplified disclosure modules, issuer self-attestation, spreadsheet-based evidence acceptable
- Maintains investor protection baseline while reducing operational burden

### **2. Standardized Templates and Shared Infrastructure:**

- Pre-approved disclosure language reduces legal costs
- Pilot-wide assessor pool provides volume pricing
- Shared best practices via governance coordination reduce duplicative learning

### **3. Evidence Delta Mechanisms:**

- After first full evidence pack, only changed artifacts submitted
- Reduces ongoing compliance burden by 60-80% for stable operations
- Maintains full audit trail via manifest versioning

### **4. Risk-Based Proportionality:**

- Recertification cadence varies by risk profile and incident history
- Materiality thresholds avoid over-disclosure of immaterial changes
- Periodic sampling replaces per-transaction appraisals for stable assets

### **5. Phased Pilot Entry:**

- Phase 1 shadow mode allows learning without live transaction risk
- Mock examiner requests validate readiness before live operations
- Objective graduation criteria provide clear roadmap to scale

### **6. Governance Feedback Loops:**

- Quarterly participant surveys identify excessive burden or unclear requirements
- Pilot Steering Committee adjusts standards based on operational experience
- Change Control Board manages continuous improvement without disruptive churn

## **Preserving Auditability and Investor Clarity**

All proportionality mechanisms maintain core investor protection principles:

### **Non-Negotiable Baselines:**

- 8 SDS core modules (even if simplified for Tier A)
- Event taxonomy mandatory events (material transactions and changes)
- Transfer restriction enforcement (QIB/QP eligibility gating)
- Evidence pack integrity (manifest, checksums, chain-of-custody)
- Examiner enablement (ability to fulfill requests within SLA)

### **Transparency Requirements:**

- Adoption tier disclosed to investors (Tier A/B/C)
- Proportional compliance choices documented and auditable
- Material risk differences disclosed (e.g., issuer attestation vs quarterly independent review)

### Regulatory Oversight:

- All tiers subject to examiner checks (coverage varies but core checks apply)
- Incident reporting requirements identical across tiers
- Pilot Steering Committee monitors tier distribution and performance disparities

## I.7 Insertable Artifacts (Templates)

### Template I-1: Adoption Tier Selection Memo

TO: Pilot Steering Committee / Evidence Pack Custodian

FROM: [Issuer/Sponsor Name]

DATE: [Date]

RE: Adoption Tier Selection and Operational Plan

---

#### ISSUER PROFILE

Entity Name: \_\_\_\_\_

Issuance Size: \$\_\_\_\_\_M

Asset Class: \_\_\_\_\_

Prior Tokenized Experience: YES / NO

IT Capabilities: Spreadsheet-Era / Institutional / Scale-Ready

#### SELECTED ADOPTION TIER

☐ Tier A (Minimal Viable Pilot)

☐ Tier B (Standard Pilot)

☐ Tier C (Scale-Ready)

#### RATIONALE FOR TIER SELECTION

[Brief explanation of why selected tier matches issuer capabilities and risk profile]

#### REQUIRED ARTIFACTS COMMITMENT (Per Selected Tier)

Tier A: SDS Modules 1,2,6,8; Basic DEP; Mandatory event logging; Tabletop stress playbook

Tier B: All 8 SDS modules; Full DEP; Full event taxonomy; Live stress procedures

Tier C: All Tier B + Continuous monitoring; Evidence deltas; Real-time supervisory access integration

#### EXAMINER ENABLEMENT READINESS

Estimated SLA Capability:

- Tier 0 Requests: \_\_\_\_\_ business days

- Tier 1 Requests: \_\_\_\_\_ business days

- Tier 2 Requests: \_\_\_\_\_ hours/days

#### Evidence Generation Method:

☐ Manual (Spreadsheet-based)

☐ Semi-Automated (Compliance platform with manual validation)

☐ Fully Automated (Enterprise orchestration)

#### COST & RESOURCE PLAN



Estimated Setup Effort: \_\_\_\_\_ weeks  
 Estimated Monthly Operational Burden: \_\_\_\_\_ hours  
 Independent Assessor Budget: \$\_\_\_\_\_ annually  
 Technology/Tooling Budget: \$\_\_\_\_\_ setup + \$\_\_\_\_\_ annual

PHASE ENTRY TARGET

- ☐ Phase 1 (Shadow Mode)  
☐ Phase 2 (Limited Live)  
☐ Phase 3 (Scale/Steady-State)

Estimated Readiness Date: \_\_\_\_\_

COMMITMENT STATEMENT

We commit to maintaining the selected adoption tier requirements and will notify the Pilot Steering Committee if operational changes necessitate tier adjustment (upgrade or downgrade). We acknowledge that tier selection does not modify applicable securities law obligations and serves only as operational packaging guidance.

\_\_\_\_\_  
 Authorized Signatory

\_\_\_\_\_  
 Date

\_\_\_\_\_  
 Print Name & Title

## Template I-2: Cost & Evidence Plan

Cost Category	Tier A Estimate	Tier B Estimate	Tier C Estimate	Evidence Artifact	Mitigation Strategy Applied
<b>Independent Appraisal</b>	\$5-15K annually (periodic sampling)	\$15-30K annually (semi-annual)	\$30-50K annually (quarterly or material change)	DEP: Appraisal_Schedule/, Valuation_Methodology/	Periodic sampling; material change triggers; standardized scope
<b>Legal Opinions / Title Reports</b>	\$10-20K initial + \$2-5K updates	\$20-40K initial + \$5-10K updates	\$40-60K initial + \$10-15K updates	DEP: Legal_Opinions/, Title_Reports/	Standardized templates; reliance on prior work; update-only for material changes
<b>Independent Assessor Attestations</b>	\$5-10K annually (annual review only)	\$15-25K annually (quarterly attestation)	\$25-40K annually (continuous monitoring)	DEP: Attestation_Lane/, Independent_Assessor_Reports/	Shared assessor pool; issuer self-attestation with backstop (Tier A); volume pricing

Cost Category	Tier A Estimate	Tier B Estimate	Tier C Estimate	Evidence Artifact	Mitigation Strategy Applied
<b>Disclosure Drafting / Updates</b>	\$5-10K initial + \$1-2K updates	\$10-20K initial + \$3-5K updates	\$20-30K initial + \$5-10K updates	DEP: Disclosure_Package/, Disclosure_Diff/	Standardized templates; disclosure diff mechanism; materiality thresholds
<b>Evidence Pack Generation</b>	\$2-5K setup + \$500-1K monthly	\$10-20K setup + \$1-2K monthly	\$30-50K setup + minimal ongoing (automated)	DEP: Complete folder tree, Manifest.json, Checksums.txt	Automated tooling; evidence delta; spreadsheet-based for Tier A
<b>Technology / Compliance Platform</b>	\$0-5K (free/low-cost tools)	\$10-30K annually (SaaS platform)	\$50-100K setup + \$30-50K annually	Technical_Controls_Checklist/, Platform_Configuration/	Open-source tooling (Tier A); commercial platform (Tier B/C); build vs buy analysis
<b>Stress Mode / Liquidity Planning</b>	\$5-10K (tabletop exercise + documentation)	\$15-25K (tabletop + limited live testing)	\$25-40K (comprehensive stress modeling + live tests)	DEP: Stress_Mode_Playbook/, Tabletop_Exercise_Results/	Standardized playbook templates; shared tabletop exercises; pilot coordination
<b>Recertification (Annual)</b>	\$5-10K (simplified revalidation)	\$10-20K (standard recert)	\$15-30K (comprehensive + continuous monitoring)	DEP: Recertification_Evidence/, Conformance_Updates/	Risk-based cadence; evidence delta; automated revalidation
<b>Examiner Request Support</b>	\$1-3K per request (manual assembly)	\$500-1K per request (semi-automated)	\$100-500 per request (fully automated)	DEP: Examiner_Request_Log/, Evidence packages delivered	Automated DEP generation; standardized request workflows; examiner portal
<b>TOTAL ESTIMATE</b>	<b>\$40-90K</b>	<b>\$120-250K</b>	<b>\$250-450K</b>	N/A	All mitigation

Cost Category	Tier A Estimate	Tier B Estimate	Tier C Estimate	Evidence Artifact	Mitigation Strategy Applied
D ANNUAL COST					strategies combined

**Notes:**

- Estimates are illustrative and vary by asset complexity, issuance size, jurisdiction, and service provider pricing
- Costs amortize over multiple years and multiple issuances for active sponsors
- Cost containment strategies can reduce estimates by 30-50% after first year (evidence deltas, template reuse, operational efficiency)

### Template I-3: Pilot Graduation Evidence Summary

PILOT GRADUATION EVIDENCE SUMMARY

Phase Transition: Phase \_\_\_\_ → Phase \_\_\_\_

Issuer/Sponsor: \_\_\_\_\_

Evaluation Period: \_\_\_\_\_ to \_\_\_\_\_

Date: \_\_\_\_\_

---

GRADUATION CRITERIA PERFORMANCE

Metric Category	Threshold Required	Actual Performance	Evidence Reference
Disclosure Completeness	100% SDS module population	_____%	DEP: Disclosure_Package/
Evidence Pack Integrity	100% chain-of-custody validation	_____%	DEP: Checksums.txt, Chain_of_Custody/
Event Capture Rate	≥95% (Phase 1→2) or 100% (Phase 2→3) mandatory events	_____%	LOGS: Event taxonomy analysis
Examiner Request SLA	100% mock (Phase 1→2) or ≥95% live (Phase 2→3) within SLA	_____%	DEP: Examiner_Request_Log/
Incident Rate	≤2 critical (Phase 1→2) or ≤0.5 per 100 tx (Phase 2→3)	____ incidents	LOGS: INCIDENT_DETECTED (CRITICAL)
Stress Mode Readiness	1 tabletop (Phase 1→2) or 1 live/2 tabletops (Phase 2→3)	____ exercises	DEP: Stress_Mode_Playbook/, Results/
Material Change Handling	100% (Phase 1→2) or ≥98% (Phase 2→3) within 5 days	_____%	LOGS: MATERIAL_CHANGE_TRIG, DISCLOSURE_UPDATED
Transfer Restriction Enforcement	100% (Phase 1→2) or ≥99.5% (Phase 2→3) properly rejected	_____%	LOGS: TRANSFER_REJECTED, ELIGIBILITY_FAIL
Recertification Timeliness	N/A (Phase 1→2) or 100% on time (Phase 2→3)	_____%	DEP: Recertification_Evidence/
Participant Satisfaction	≥70% acceptable (Phase 1→2) or ≥80% good (Phase 2→3)	_____%	Quarterly survey results

OVERALL GRADUATION DETERMINATION

- ☐ ALL CRITERIA MET – Recommend approval for Phase \_\_\_\_ entry
- ☐ CRITERIA GAPS IDENTIFIED – Remediation required before graduation

IDENTIFIED GAPS & REMEDIATION PLAN (If Applicable)

Gap 1: \_\_\_\_\_

Remediation: \_\_\_\_\_  
Target Completion: \_\_\_\_\_

Gap 2: \_\_\_\_\_  
Remediation: \_\_\_\_\_  
Target Completion: \_\_\_\_\_

SUPPORTING EVIDENCE ARTIFACTS ATTACHED

- ☐ Complete DEP folder tree for evaluation period
- ☐ Event log analysis report
- ☐ Examiner request fulfillment log with SLA calculations
- ☐ Incident reports and remediation documentation
- ☐ Stress mode exercise reports
- ☐ Participant survey results
- ☐ Recertification documentation (if applicable)

PILOT STEERING COMMITTEE RECOMMENDATION

- ☐ APPROVED for Phase \_\_\_\_ entry as of \_\_\_\_\_
- ☐ CONDITIONAL APPROVAL pending remediation completion
- ☐ DENIED – Remain in current phase; re-evaluation in \_\_\_\_\_ months

\_\_\_\_\_  
Committee Chair / Authorized Signatory      Date

\_\_\_\_\_  
Print Name & Title

---

Distribution:

- Issuer/Sponsor
  - Evidence Pack Custodian
  - Pilot Steering Committee Members
  - SEC/FinHub Observer (information copy)
- \_\_\_\_\_

# Appendix J — Real-Estate Worked Examples & Adoption Playbook (Illustrative)

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## J.0 Non-Substantive Illustrative Disclaimer

This appendix provides illustrative worked examples demonstrating artifact packaging, examiner request-response workflows, and exit/liquidity stress handling for tokenized real-estate securities. Examples are non-substantive drafting aids designed to clarify implementation patterns and evidence generation mechanics.

### Key Limitations:

- Examples are illustrative only and do not constitute legal advice
- No implication of SEC endorsement, approval, or regulatory relief
- Examples do not expand pilot scope or modify requirements in baseline submissions
- Redacted placeholders replace sensitive details while preserving structural patterns
- All examples maintain consistency with SDS/DEP/ELA framework and baseline operational primitives

**Mortgage/housing-finance policy reform remains out of scope.**

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## J.1 How to Read These Worked Examples

### Example Pack Structure

Each worked example pack includes standardized components demonstrating end-to-end artifact generation and examiner enablement:

#### 1. Asset Profile (Generic)

- Property type, structure, size range
- Placeholder identifiers preserving privacy
- Generic location references (region/state level only)

#### 2. SDS Snapshot Table

- Key fields from all 8 required modules
- Populated with placeholders demonstrating content patterns
- Illustrates minimal vs comprehensive disclosure approaches

#### 3. DEP Manifest Excerpt

- Folder structure following DEP standards
- Artifact list with checksums (placeholder hashes)
- Chain-of-custody references

#### 4. Disclosure Delta Example

- Material change event trigger
- "Before/After" field comparison
- Delta artifact packaging

## 5. Event Log Excerpt

- 6-12 representative events
- All required taxonomy fields populated
- Demonstrates event linkage and retention class assignment

## 6. Exit/Liquidity Mode Timeline

- Liquidity mode transitions (Normal → Limited → Stress)
- Trigger conditions and evidence requirements
- Hold/release controls demonstration

## 7. Examiner Checks Mapping

- Maps artifacts to specific examiner checks (Appendix H IDs)
- Pass/fail criteria demonstration
- Evidence sufficiency validation

## 8. Tiered Access Scenarios

- Tier 0: Aggregate/statistical request
- Tier 1: Routine examination with purpose limitation
- Tier 2: Emergency/investigation with dual control (when applicable)

## Redaction Principle

Sensitive details are replaced with structured placeholders:

- Property addresses: [PROPERTY\_ADDRESS\_CITY\_STATE] or [ASSET\_REF\_001]
- Personal identifiers: [SPONSOR\_ENTITY], [INVESTOR\_QIB\_001]
- Financial specifics: \$[AMOUNT], [VALUATION\_DATE]
- Technical IDs: [ARTIFACT\_HASH\_SHA256], [EVENT\_ID\_UUID]

Placeholders preserve data type, format, and structural relationships necessary for implementation guidance while protecting confidentiality.

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## J.2 Worked Example Pack #1 — Small Multi-Family (10–20 units)

### Asset Profile (Generic)

**Property Type:** Multi-family residential (10-20 units)

**Structure:** Property-linked security / Special purpose vehicle

**Location:** [CITY], [STATE] (Placeholder: Mid-Atlantic region)

**Asset Reference:** [ASSET\_REF\_MF\_001]

**Issuance Size:** \$2.5M - \$5M range

**Sponsor Profile:** Small sponsor; Adoption Tier A (Minimal Viable Pilot)

### SDS Snapshot Table (Key Fields)

Module	Field	Value (Illustrative)
<b>Module 1: Asset Identity</b>	Asset Reference ID	ASSET_REF_MF_001
	Property Type	Multi-family residential
	Location	[CITY], [STATE]
	Unit Count	16 units
	Legal Structure	SPV (Single Asset Vehicle)
	Ownership Documentation	Title report on file (DEP: Legal_Opinions/)
<b>Module 2: Rights/Restrictions</b>	Investor Eligibility	Qualified Institutional Buyers (Rule 144A)
	Transfer Restrictions	Requires BD verification; max 99 investors
	Holding Period	None (freely transferable subject to eligibility)
	Voting Rights	None (security interest only)
<b>Module 3: Valuation</b>	Methodology	Income approach (DCF); comparable sales
	Valuation Frequency	Annual appraisal; semi-annual internal review
	Current Valuation	[\$VALUATION_AMOUNT] as of [VALUATION_DATE]
	Assumptions	92% stabilized occupancy; 3% annual rent growth
	Independent Appraiser	[APPRAISAL_FIRM] (attestation on file)
<b>Module 4: Cashflows</b>	Distribution Policy	Quarterly distributions; 70% FFO payout target
	Distribution Frequency	Quarterly (Jan, Apr, Jul, Oct)
	Last Distribution	[\$AMOUNT] on [DATE]
	Reserve Policy	6-month operating reserve maintained
<b>Module 5: Fees</b>	Management Fee	1.5% annual (calculated on NAV)
	Performance Fee	None
	Other Fees	Legal, audit, compliance: ~0.5% annually
<b>Module 6: Risk Factors</b>	Concentration Risk	Single property / single market
	Occupancy Risk	Tenant turnover; market rental rate fluctuations
	Liquidity Risk	Limited secondary market; stress mode possible
	Operational Risk	Maintenance, capex, property management
	Regulatory Risk	Zoning, rent control, local regulations

Module	Field	Value (Illustrative)
<b>Module 7: Controls</b>	Issuer Attestation	Quarterly officer certification
	Independent Assessment	Annual independent review
	Audit Frequency	Annual financial audit
<b>Module 8: Event Taxonomy</b>	Material Change Triggers	>10% occupancy drop; >\$50K unplanned capex
	Required Events	DISCLOSURE_PUBLISHED, VALUATION_UPDATE, DISTRIBUTION_EVENT, MATERIAL_CHANGE_TRIG
	Event Retention	7 years (REG_EXAM_7YR)

## DEP Manifest Excerpt

DISCLOSURE EVIDENCE PACK (DEP) – ASSET\_REF\_MF\_001

Generated: 2026-01-15T14:30:00Z

Evidence Pack Custodian: [CUSTODIAN\_ENTITY]

### FOLDER STRUCTURE:

/DEP\_ASSET\_REF\_MF\_001/

- ├── Manifest.json
- ├── Checksums.txt
- ├── Chain\_of\_Custody.txt
- ├── Disclosure\_Package/
  - ├── SDS\_Instance\_v1.0.json
  - ├── Offering\_Memorandum.pdf
  - ├── Risk\_Disclosures.pdf
- ├── Legal\_Opinions/
  - ├── Title\_Report\_[DATE].pdf
  - ├── Legal\_Opinion\_Structure.pdf
  - ├── Ownership\_Documentation.pdf
- ├── Valuation\_Methodology/
  - ├── Appraisal\_Report\_[DATE].pdf
  - ├── Valuation\_Assumptions.pdf
  - ├── Comparable\_Sales\_Analysis.xlsx
- ├── Attestation\_Lane/
  - ├── Independent\_Assessor\_Attestation\_[DATE].pdf
  - ├── Issuer\_Officer\_Certification\_Q4\_2025.pdf
- ├── Financial\_Records/
  - ├── Operating\_Statements\_2025.xlsx
  - ├── Rent\_Roll\_[DATE].xlsx
  - ├── Reserve\_Account\_Statement.pdf
- ├── Distribution\_History/
  - ├── Distribution\_Schedule.pdf
  - ├── Payment\_Records\_2025.csv
- ├── Event\_Logs/
  - ├── Events\_2025\_Q4.csv
  - ├── Event\_Taxonomy\_Mapping.json
- ├── Transfer\_Restrictions/
  - ├── Eligibility\_Verification\_Procedures.pdf
  - ├── Transfer\_Rejection\_Log.csv
- ├── Stress\_Mode\_Playbook/
  - ├── Liquidity\_Procedures.pdf
  - ├── Tabletop\_Exercise\_Results\_[DATE].pdf

### ARTIFACT CHECKSUMS (Sample):

8f4a9c2e1d7b3f5a6c9d2e8b4a7f3c5e... Disclosure\_Package/SDS\_Instance\_v1.0.json



3a7f8c1e9d2b5f4c6e8a3d7b1f5c2a9e...  
Valuation\_Methodology/Appraisal\_Report\_[DATE].pdf  
6e9a1d4b2c7f3a5e8c1d9b4a6f2e7c3a... Event\_Logs/Events\_2025\_Q4.csv

**Disclosure Delta Example: Delta #1 (Occupancy Drop Event)**

**Triggering Event:** Occupancy dropped from 94% to 82% due to 3 units vacant longer than expected

**Material Change Determination:** YES (>10% threshold per Module 8 definition)

**Delta Fields Changed:**

SDS Field	Before (v1.0)	After (v1.1)	Change Type
Module 3: Current Occupancy	94% (15/16 units)	82% (13.1/16 units)	Material decrease
Module 3: Valuation	[\$PRIOR_VALUE]	[\$UPDATED_VALUE] (reduced)	Valuation adjustment
Module 6: Risk Factors	Standard occupancy risk	<b>Enhanced:</b> Near-term lease-up risk elevated	Risk disclosure update
Module 8: Last Material Change	[PRIOR_DATE]	2026-01-10 (Occupancy drop event)	Event timestamp

**Delta Artifacts Generated:**

- Disclosure\_Diff/v1.0\_to\_v1.1.diff (JSON diff format)
- Material\_Change\_Documentation/Occupancy\_Event\_2026-01-10.pdf
- Updated Valuation\_Methodology/Internal\_Review\_[DATE].pdf

**Event Log Entry:**

event\_id: EVT\_2026-01-10\_001  
event\_type: MATERIAL\_CHANGE\_TRIG  
timestamp: 2026-01-10T09:15:00Z  
actor\_role: Issuer\_Ops\_Owner  
scope\_object\_ref: ASSET\_REF\_MF\_001  
reason\_code: OCCUPANCY\_DROP\_GT\_10PCT  
linkage\_to\_disclosure\_module: Module\_3\_Valuation, Module\_6\_Risk\_Factors  
severity: WARNING  
related\_request\_id: null  
retention\_class: REG\_EXAM\_7YR

**Investor Notification:** Sent within 3 business days via email + portal; disclosure update published within 5 business days

**Event Log Excerpt (Representative Events)**

Event ID	Event Type	Times tamp	Actor Role	Scope/ Object	Reason Code	Mod ule Link	Severi ty
EVT_2025-10-10-	DISCLOSURE_PUBLISHED	2025-10-01T10	Issuer_Ops_Owner	ASSET_REF_MF_001	INITIAL_OFFERING	All modules	INFO

Event ID	Event Type	Times tamp	Actor Role	Scope/ Object	Reason Code	Mod ule Link	Severi ty
01_001		:00:00Z					
EVT_2025-10-15_002	VALUATION_UPDATE	2025-10-15T14:30:00Z	Independent_Assessor	ASSET_RE F_MF_001	ANNUAL_APPRAI SAL	Modu le_3	INFO
EVT_2025-10-20_003	ATTESTATION_ISSUED	2025-10-20T11:00:00Z	Independent_Assessor	ASSET_RE F_MF_001	Q3_ATTESTATION	Modu le_7	INFO
EVT_2025-11-01_004	DISTRIBUTION_EVENT	2025-11-01T09:00:00Z	Transfer_Age nt	ASSET_RE F_MF_001	QUARTERLY_DIS TRIBUTION	Modu le_4	INFO
EVT_2025-12-15_005	TRANSFER_APPROVED	2025-12-15T13:45:00Z	Transfer_Age nt	INVESTOR _QIB_003	SECONDARY_TR ANSFER	Modu le_2	INFO
EVT_2026-01-10_001	MATERIAL_CHANGE_TRIG	2026-01-10T09:15:00Z	Issuer_Ops_O wner	ASSET_RE F_MF_001	OCCUPANCY_DR OP_GT_10PCT	Modu le_3, Modu le_6	WAR NING
EVT_2026-01-12_002	DISCLOSURE_UPDATED	2026-01-12T16:00:00Z	Issuer_Ops_O wner	ASSET_RE F_MF_001	MATERIAL_CHAN GE_RESPONSE	All affect ed modu les	INFO
EVT_2026-01-15_003	EVIDENCE_PACKET_GENERATED	2026-01-15T14:30:00Z	Evidence_Pac k_Custodian	ASSET_RE F_MF_001	EXAMINER_REQ UEST_PREP	N/A	INFO

## Exit/Liquidity Mode Timeline

### Phase 1: Normal Trading Mode (Q4 2025)

- Liquidity Characteristics: Moderate secondary market activity; 2-3 transactions per month
- Transfer Restrictions: QIB eligibility verification only
- Hold/Release: None active
- Evidence: Transfer\_Approved events; normal distribution cadence

## Phase 2: Limited Liquidity Mode (Jan 2026 - Occupancy Event)

- **Trigger:** Material occupancy drop + investor uncertainty about near-term cashflows
- **Transition Date:** 2026-01-10 (same day as material change detection)
- **Characteristics:** Wider bid-ask spreads; reduced transaction volume; enhanced disclosure requirements
- **Controls Applied:**
  - Mandatory material change disclosure (issued 2026-01-12)
  - Enhanced investor communications (weekly updates during lease-up period)
  - Transfer holds: None (transfers still permitted but with enhanced risk disclosure acknowledgment)
- **Evidence:** LIQUIDITY\_MODE\_CHANGE event logged; investor notices sent; enhanced disclosure published

## Phase 3: Potential Stress Mode (Not Triggered in This Example)

- **Hypothetical Trigger:** If occupancy dropped below 70% AND distributions suspended
- **Controls That Would Apply:**
  - Transaction halt (hold/release mechanism activated)
  - Suspension of secondary transfers pending stabilization plan
  - Enhanced supervisory coordination (Tier 1 examiner engagement)
  - Fairness controls: Queue rules for exit requests; pro-rata allocation if redemption offered
- **Evidence Requirements:** Stress\_Mode\_Activated event; hold placement documentation; fairness controls audit trail
- **Release Conditions:** Stabilization plan approved; occupancy recovers above 75%; distributions resume

## Phase 4: Return to Normal (Feb 2026 - Projected)

- **Conditions:** 2 units re-leased; occupancy at 87%; distributions on track
- **Transition:** Limited Liquidity → Normal Trading
- **Evidence:** LIQUIDITY\_MODE\_CHANGE event; investor notification; updated risk assessment

## Examiner Checks Mapping (Appendix H Reference)

Check ID	Check Name	Evidence Inputs	Status	Notes
H2-01	Schema Completeness	SDS_Instance_v1.0.json; all 8 modules present	PASS	All modules populated
H2-02	Version Audit Trail	Disclosure_Diff/v1.0_to_v1.1.diff; Material_Change_Documentation/	PASS	Material change properly versioned
H2-03	Evidence Pack Completeness	Manifest.json; Checksums.txt; all folders present	PASS	No missing artifacts
H2-04	Chain-of-Custody Integrity	Chain_of_Custody.txt; signed checksums	PASS	Cryptographic integrity validated
H2-08	Valuation Source	Appraisal_Report;	PASS	Independent third-

Check ID	Check Name	Evidence Inputs	Status	Notes
	Validation	Independent_Assessor_Attestation		party appraisal
H2-11	Event Capture Completeness	Event_Logs/Events_2025_Q4.csv; taxonomy mapping	PASS	All mandatory events captured
H2-12	Material Change Trigger Validation	Material change documented within 5 business days	PASS	Timely disclosure
H2-20	Stress Mode Readiness	Stress_Mode_Playbook; Tabletop_Exercise_Results	PASS	Tabletop completed; procedures documented
H2-17	Restriction Enforcement	Transfer_Rejection_Log.csv; eligibility verifications	PASS	QIB verification enforced

## Tiered Access Scenarios

### Tier 0 Request: Aggregate Market Statistics

- **Request ID:** REQ-2026-02-01-T0-001
- **Purpose Code:** MARKET\_SURVEILLANCE
- **Scope:** Aggregate occupancy rates, distribution yields, transaction volumes across all pilot multi-family assets
- **Data Provided:** Statistical summary; no individual asset identification
- **Response Time:** 2 business days
- **Evidence:** Anonymized aggregate metrics; no DEP artifacts required

### Tier 1 Request: Routine Disclosure Review

- **Request ID:** REQ-2026-02-05-T1-001
- **Purpose Code:** DISC\_COMP\_REVIEW
- **Approval:** Senior Examiner
- **TTL:** 30 days
- **Scope:** ASSET\_REF\_MF\_001 disclosure package, material change documentation, event logs Q4 2025 - Q1 2026
- **Evidence Delivered:**
  - Complete DEP folder tree (see manifest above)
  - Disclosure\_Diff/ showing material change handling
  - Event\_Logs/ with taxonomy mapping
- **Response Time:** 5 business days
- **Access Logged:** REQUEST\_ID, APPROVER, SCOPE, ARTIFACTS\_DELIVERED, DELIVERY\_TIMESTAMP

### Tier 2 Request: Emergency Investigation (Hypothetical - Not Triggered)

- **Scenario:** If fraud suspected or serious occupancy misrepresentation alleged
- **Request ID:** REQ-2026-XX-XX-T2-001 (hypothetical)
- **Purpose Code:** FRAUD\_INVESTIGATION
- **Approval:** Dual control (Senior Examiner + Compliance Director)
- **TTL:** 7 days (strict renewal required)

- **Scope:** Full transaction detail; investor identity; property-level forensics
- **Evidence:** Complete DEP + raw property management records + bank statements
- **Post-Review Required:** Independent review within 10 business days confirming appropriateness
- **Access Logged:** All Tier 1 fields PLUS dual approvers, emergency justification, post-review completion

## J.3 Worked Example Pack #2 — Single-Tenant Commercial

### Asset Profile (Generic)

**Property Type:** Single-tenant commercial (office/industrial)

**Structure:** Property-linked security / Lease-backed vehicle

**Location:** [CITY], [STATE] (Placeholder: Southeast region)

**Asset Reference:** [ASSET\_REF\_COMM\_001]

**Issuance Size:** \$8M - \$15M range

**Tenant:** [TENANT\_CORP] (national credit tenant)

**Lease Term:** 10 years remaining (15-year initial term)

**Sponsor Profile:** Institutional sponsor; Adoption Tier B (Standard Pilot)

### SDS Snapshot (Emphasis on Tenant Concentration)

Module	Field	Value (Illustrative)
<b>Module 1: Asset Identity</b>	Asset Reference ID	ASSET_REF_COMM_001
	Property Type	Single-tenant commercial (industrial distribution)
	Square Footage	125,000 SF
	Location	[CITY], [STATE]
<b>Module 2: Rights/Restrictions</b>	Investor Eligibilities	Qualified Institutional Buyers + Qualified Purchasers
	Transfer Restrictions	BD verification required; accredited investor minimum
<b>Module 3: Valuation</b>	Methodology	Income approach (DCF based on lease cashflows)
	Key Assumption	Tenant renewal at lease expiration (Year 10)
	Tenant Credit Rating	Investment grade (BBB+ equivalent)
	Valuation Sensitivity	-15% if tenant vacates; -25% if early termination
	Independent Appraiser	[APPRAISAL_FIRM] (quarterly attestation)
<b>Module 4: Cashflows</b>	Distribution Policy	Monthly distributions; 100% net lease receipts pass-through

Module	Field	Value (Illustrative)
	Lease Structure	Triple-net (NNN); tenant responsible for all operating expenses
	Base Rent	[\$[AMOUNT]]/month (\$[ANNUAL] annually)
	Rent Escalations	2% annual; CPI-indexed after Year 7
<b>Module 5: Fees</b>	Management Fee	0.75% annual (lower due to NNN structure)
	Lease Administration	0.25% annual
<b>Module 6: Risk Factors</b>	<b>Tenant Concentration Risk</b>	100% revenue from single tenant; total dependence on tenant solvency and renewal
	Lease Renewal Risk	Significant valuation impact if tenant does not renew at Year 10
	Credit Risk	Investment grade today; potential downgrade risk
	Market Risk	Re-leasing timeline 12-18 months if tenant vacates; potential rent reset
	Insurance Risk	Tenant-responsible but issuer monitors coverage adequacy
<b>Module 7: Controls</b>	Issuer Attestation	Quarterly officer certification
	Independent Assessment	Quarterly independent review (enhanced due to concentration)
	Tenant Monitoring	Monthly rent receipt verification; annual credit review
<b>Module 8: Event Taxonomy</b>	Material Change Triggers	Tenant notice of non-renewal; tenant credit downgrade; tenant default; lease amendment; early termination
	Required Events	TENANT_NOTICE_EVENT, LEASE_AMENDMENT, CREDIT_REVIEW_UPDATE

## DEP Artifacts Emphasizing Lease Concentration

```

/DEP_ASSET_REF_COMM_001/
├── Lease_Documentation/
│   ├── Master_Lease_Agreement.pdf (REDACTED: sensitive commercial terms)
│   ├── Lease_Abstract.pdf (summary for investor review)
│   ├── Rent_Roll_Single_Tenant.xlsx
│   ├── Tenant_Estoppel_Certificate_[DATE].pdf
│   └── Insurance_Certificate_Verification.pdf
├── Tenant_Credit_Monitoring/
│   ├── Credit_Rating_Reports/ (quarterly updates from rating agencies)
│   ├── Financial_Statements_[TENANT]/ (public filings if available)
│   ├── Credit_Review_Memo_Q4_2025.pdf
│   └── Tenant_Health_Dashboard.xlsx
├── Valuation_Methodology/
│   ├── Appraisal_Report_[DATE].pdf
│   ├── DCF_Model_Lease_Cashflows.xlsx
│   ├── Sensitivity_Analysis_Tenant_Scenarios.pdf
│   ├── Renewal_Probability_Assessment.pdf
│   └── Comparable_Lease_Analysis.xlsx
├── Renewal_Risk_Analysis/
│   ├── Market_Rent_Survey_[DATE].pdf
│   ├── Re_Leasing_Timeline_Assumptions.pdf
│   └── Tenant_Renewal_Likelihood_Model.xlsx

```

## Material Change Workflow Example: Tenant Notice Event

**Event:** Tenant provides written notice (contractually required 180 days advance) indicating they are evaluating renewal vs relocation options

**Materiality Determination:** YES - Material uncertainty introduced regarding primary revenue source

### Workflow Timeline:

Date	Action	Actor	Artifact/Event
Day 1	Tenant notice received	Issuer Ops Owner	Tenant_Notice_Letter_[DATE].pdf filed
Day 1	Materiality triage	Compliance Reviewer	Materiality determination documented
Day 2	Independent assessor engaged	Compliance Reviewer	Assessor engagement letter
Day 3-5	Valuation impact analysis	Independent Assessor	Valuation sensitivity update; Renewal_Probability_Reassessment.pdf
Day 5	Disclosure delta drafted	Issuer Ops Owner	SDS Module 6 (Risk Factors) enhanced; Module 3 (Valuation assumptions) updated
Day 5	Legal review	Legal Counsel	Disclosure language review and approval
Day 5	Investor notification prepared	Issuer Ops Owner	Material_Change_Investor_Notice.pdf
Day 6	Disclosure updated and published	Issuer Ops Owner	SDS v2.1 published with disclosure diff
Day 6	Investor notification sent	Transfer Agent	Email + portal notification to all investors
Day 6	Event logs updated	Evidence Pack Custodian	MATERIAL_CHANGE_TRIG, DISCLOSURE_UPDATED events
Day 7	Examiner notification (operational)	Compliance Reviewer	Courtesy notification to regulatory observer (operational coordination, not approval request)

### Event Log Entries:

event\_id: EVT\_2026-01-15\_101  
event\_type: TENANT\_NOTICE\_EVENT  
timestamp: 2026-01-15T10:30:00Z  
actor\_role: Issuer\_Ops\_Owner  
scope\_object\_ref: ASSET\_REF\_COMM\_001  
reason\_code: TENANT\_RENEWAL\_EVALUATION\_NOTICE  
linkage\_to\_disclosure\_module: Module\_3\_Valuation, Module\_6\_Risk\_Factors  
severity: WARNING  
retention\_class: REG\_EXAM\_7YR

event\_id: EVT\_2026-01-21\_102  
event\_type: MATERIAL\_CHANGE\_TRIG  
timestamp: 2026-01-21T14:00:00Z  
actor\_role: Compliance\_Reviewer  
scope\_object\_ref: ASSET\_REF\_COMM\_001  
reason\_code: TENANT\_RENEWAL\_UNCERTAINTY\_MATERIAL

linkage\_to\_disclosure\_module: Module\_6\_Risk\_Factors  
severity: WARNING  
retention\_class: REG\_EXAM\_7YR

event\_id: EVT\_2026-01-22\_103  
event\_type: DISCLOSURE\_UPDATED  
timestamp: 2026-01-22T09:00:00Z  
actor\_role: Issuer\_Ops\_Owner  
scope\_object\_ref: ASSET\_REF\_COMM\_001  
reason\_code: MATERIAL\_CHANGE\_RESPONSE  
linkage\_to\_disclosure\_module: Module\_3\_Valuation, Module\_6\_Risk\_Factors  
severity: INFO  
retention\_class: REG\_EXAM\_7YR

## Exit/Liquidity Timeline with Hold/Release

**Scenario:** Material uncertainty triggers enhanced hold/release monitoring (not full halt, but restricted transfers)

### Phase 1: Normal Trading (Pre-Notice)

- Transfers processed routinely with standard QIB verification

### Phase 2: Enhanced Monitoring (Post-Notice, Days 1-30)

- **Trigger:** Tenant notice creates material uncertainty
- **Controls Applied:**
  - Transfer requests subject to enhanced disclosure: Investors must acknowledge tenant renewal uncertainty in writing
  - BD/TA coordination: Verify investor comprehension of material risk
  - No outright halt, but enhanced friction to ensure informed secondary market
- **Hold/Release Posture:** Conditional transfers (acknowledgment required); no blocking unless inadequate disclosure comprehension

### Phase 3: Potential Hold (If Tenant Confirms Non-Renewal)

- **Hypothetical Trigger:** Tenant provides final notice of non-renewal (Day 60 or later)
- **Controls That Would Apply:**
  - Transaction hold: Temporary suspension of transfers pending updated valuation and business plan
  - Hold duration: 10-15 business days for comprehensive re-valuation and disclosure update
  - Release conditions: Updated valuation published; re-leasing strategy disclosed; investor vote on continuation vs liquidation (if governance permits)
- **Evidence:** Hold\_Executed event; Hold\_Released event; Fairness controls audit trail

### Phase 4: Return to Limited Liquidity or Normal

- **Outcome A (Renewal Confirmed):** Return to normal trading
- **Outcome B (Non-Renewal + Re-Leasing Plan):** Limited liquidity with enhanced disclosure; potentially stress mode if extended vacancy projected



## Examiner Checks Mapping (Concentration Risk Focus)

Check ID	Check Name	Evidence Inputs	Status	Notes
H2-01	Schema Completeness	SDS all modules with tenant concentration emphasis	PASS	Module 6 (Risk Factors) detailed
H2-08	Valuation Source Validation	Appraisal quarterly; lease cashflow validation	PASS	DCF model independently verified
H2-09	Methodology Transparency	Sensitivity analysis documented; renewal assumptions clear	PASS	Valuation impact scenarios disclosed
H2-10	Attestation Lane Completeness	Quarterly independent attestation given concentration	PASS	Enhanced attestation frequency
H2-12	Material Change Trigger Validation	Tenant notice event disclosed within 5 business days	PASS	Timely material change handling
H2-13	Distribution Event Accuracy	Monthly lease receipts match distribution records	PASS	100% pass-through verified
H2-17	Restriction Enforcement	Enhanced acknowledgment for tenant risk	PASS	Transfer restrictions properly applied
H2-21	Fairness Controls Audit	Hold/release documentation if triggered	PASS (hypothetical)	Procedures documented; not yet triggered

## J.4 Worked Example Pack #3 — Pooled Vehicle (10–50 properties)

### Asset Profile (Generic)

**Property Type:** Pooled multi-family portfolio

**Structure:** Multi-asset fund / Diversified real estate vehicle

**Portfolio Size:** 25 properties (500-750 total units)

**Geographic Diversification:** 8 states across 3 regions

**Asset Reference:** [ASSET\_POOL\_DIV\_001]

**Issuance Size:** \$75M - \$150M range

**Sponsor Profile:** Institutional operator; Adoption Tier C (Scale-Ready)

### Portfolio SDS Profile (Scaling Structure)

**Core Concept:** SDS scales via portfolio-level aggregation + property-level submodules with sampling

Module	Portfolio Level	Property Level (Sampled)
<b>Module 1: Asset Identity</b>	Portfolio description; total unit count; geographic distribution	Per-property: Address, unit count, acquisition date (sampled subset)
<b>Module 2: Rights/Restrictions</b>	Portfolio-wide transfer restrictions; eligibility criteria	Property-specific restrictions if any (rare)

Module	Portfolio Level	Property Level (Sampled)
<b>Module 3: Valuation</b>	Aggregate portfolio valuation; methodology overview	Per-property appraisals (annual full portfolio; quarterly sampling of 20% rotation)
<b>Module 4: Cashflows</b>	Aggregate distribution policy; portfolio-level FFO	Per-property rent rolls (monthly aggregate; quarterly sampling for verification)
<b>Module 5: Fees</b>	Portfolio-level fee structure	Property management fees per asset (aggregated reporting)
<b>Module 6: Risk Factors</b>	Portfolio concentration risks; geographic/market exposure	Property-specific risks for largest assets or outlier performance
<b>Module 7: Controls</b>	Portfolio-level attestations; audit scope	Property-level sampling attestations; rotation schedule
<b>Module 8: Event Taxonomy</b>	Portfolio-level material changes (>5% NAV impact); material events per property trigger disclosure if >2% NAV impact	Per-property events logged; aggregated for portfolio reporting

## Evidence at Scale: Sampling Strategy

### Sampling Methodology:

- **Full Portfolio Evidence:** Annual comprehensive evidence pack (all 25 properties)
- **Quarterly Sampling:** 20% rotation (5 properties per quarter; full portfolio coverage annually)
- **Triggered Deep-Dives:** Any property with >2% NAV impact or material event triggers immediate full evidence generation regardless of sampling schedule

### Sampling Selection Criteria:

- Stratified sampling: Ensure geographic and size diversity
- Risk-based: Higher weight to properties with higher occupancy volatility or recent material changes
- Random component: Prevent predictability in examiner spot-checks

### Evidence Pack Delta Concept:

Period	Evidence Type	Scope	Artifacts
<b>Q1 2026</b>	Quarterly Delta	5 sampled properties + portfolio aggregates	Sampled property rent rolls, occupancy reports, capex logs; Portfolio-level financials, distribution records, event logs
<b>Annual (Q4)</b>	Full Portfolio	All 25 properties	Complete property-level evidence; comprehensive appraisals; full audit
<b>Triggered</b>	Material Event	Specific property(ies)	Immediate full evidence for affected properties regardless of sampling schedule

### Cost Containment Impact:

- Annual full evidence: ~100% baseline cost
- Quarterly sampling: ~25-30% baseline cost per quarter

- **Total annual cost reduction:** ~50-60% vs quarterly full portfolio evidence while maintaining audit integrity via sampling + trigger mechanisms

## Aggregated Metrics (Portfolio Reporting)

Metric	Portfolio Aggregate	Sampling Detail
Occupancy Rate	91.2% (weighted average)	Q1 sample: 5 properties ranged 88%-95%
Average Rent per Unit	\$1,450/month	Q1 sample: \$1,320 - \$1,680 range
Distribution Yield	6.8% annualized	Calculated on portfolio-level FFO
Portfolio Valuation	[\$AGGREGATE_VALUE]	Annual full appraisal; quarterly internal review with sampled validation
Reserve Coverage	8 months operating expenses	Aggregate across all properties
Capex (trailing 12mo)	[\$CAPEX_TOTAL]	Q1 sample capex: [\$SAMPLE_CAPEX] (5 properties)

## Exit/Liquidity: Pooled Operations

### Normal Trading Mode:

- Investors trade fund interests (not individual properties)
- Liquidity provided by fund-level NAV + secondary market
- Transfer restrictions at fund level (QIB eligibility)

### Stress Triggers (Portfolio Level):

- Aggregate occupancy drops below 85% for 2 consecutive quarters
- Distribution coverage ratio falls below 1.0x
- Major tenant default affecting >5% of portfolio NOI
- Force majeure event affecting >10% of properties

### Fairness Controls (If Stress Mode Triggered):

Control	Mechanism	Evidence
<b>Queue Rules</b>	FIFO (first-in-first-out) for redemption requests; pro-rata if oversubscribed	Queue_Application_Log.csv; timestamps and allocation records
<b>Gates</b>	Maximum 10% quarterly redemptions (if NAV declines >5% QoQ); remainder queued	Gate_Enforcement_Log.csv; investor notifications
<b>Pricing</b>	NAV-based; independent valuation during stress; potential discount for illiquidity	Valuation_Methodology_Stress_Mode.pdf; pricing audit trail
<b>Investor Communication</b>	Weekly updates during stress; 48-hour advance notice of gate invocation	Communication_Log/; investor portal archive
<b>Suspension Authority</b>	Dual approval: Fund manager + independent board (if	Suspension_Authorization.pdf; governance minutes

Control	Mechanism	Evidence
	applicable) or Pilot Steering Committee	

## Examiner Request-Response: Two Examples

### Example 1: Tier 0 Aggregate Portfolio Surveillance

**Request ID:** REQ-2026-03-01-T0-POOL-001

**Purpose Code:** MARKET\_SURVEILLANCE

**Tier:** Tier 0 (Aggregate/statistical only)

**Scope:** Portfolio-level metrics across all pooled vehicles in pilot; no individual fund or property identification

#### Response:

AGGREGATE PORTFOLIO STATISTICS (Pooled Multi-Family Vehicles)  
Reporting Period: Q4 2025

Number of Pooled Vehicles: 3  
Total Properties: 68  
Total Units: 1,450  
Geographic Regions: 12 states

Aggregate Metrics:

- Weighted Average Occupancy: 90.5%
- Weighted Average Distribution Yield: 6.2%
- Aggregate Valuation: \$[AGGREGATE\_ALL\_POOLS]
- Transaction Volume (Secondary): \$[VOLUME] (Q4 2025)
- Stress Mode Activations: 0

NO INDIVIDUAL FUND OR PROPERTY DATA PROVIDED (Tier 0 Limitation)

**Response Time:** 2 business days

**Evidence:** Statistical report only; no DEP artifacts

### Example 2: Tier 2 Targeted Deep-Dive (Sampled Property Investigation)

**Request ID:** REQ-2026-03-15-T2-POOL-002

**Purpose Code:** FRAUD\_INVESTIGATION (hypothetical: allegation of occupancy misrepresentation at specific property)

**Tier:** Tier 2 (Identity reveal; full forensic access)

**Approval:** Dual control (Senior Examiner + Compliance Director)

**TTL:** 7 days (strict renewal)

**Scope:** Single property within ASSET\_POOL\_DIV\_001; property identifier: [PROPERTY\_REF\_025]; full transaction history, rent rolls, bank deposits, property management records

#### Evidence Delivered:

TIER 2 EVIDENCE BUNDLE — PROPERTY\_REF\_025  
Generated: 2026-03-15T16:00:00Z  
Request ID: REQ-2026-03-15-T2-POOL-002  
TTL Expiration: 2026-03-22T16:00:00Z

ARTIFACTS:

- Property\_Detailed\_Profile/ (address, unit-level data, tenant identities)
- Rent\_Roll\_Detailed\_12mo.xlsx (tenant names, lease terms, payment history)
- Bank\_Statements/ (property operating account; 12-month history)
- Property\_Management\_Reports/ (detailed operational logs)
- Lease\_Agreements/ (all current tenant leases; FULL, not redacted)
- Occupancy\_Verification/ (utility records; move-in/move-out logs)
- Third\_Party\_Verification/ (property management company audit reports)

#### CHAIN-OF-CUSTODY:

Generated by: [EVIDENCE\_PACK\_CUSTODIAN]

Cryptographic signature: [SIGNATURE\_HASH]

Dual approvers: [EXAMINER\_ID], [DIRECTOR\_ID]

Purpose limitation: Fraud investigation re: occupancy misrepresentation allegation

Onward transfer prohibited without separate authorization

#### POST-REVIEW REQUIREMENT:

Independent review due by: 2026-04-01

Reviewer: [INSPECTOR\_GENERAL\_FUNCTION]

**Response Time:** 24 hours (emergency investigation)

**Post-Review Outcome (Hypothetical):** Investigation concluded no fraud; occupancy discrepancy due to timing lag in reporting (administrative error); corrective action: enhanced real-time occupancy monitoring; post-review memo filed confirming appropriate access scope and outcome

### Examiner Checks Mapping (Scale Operations)

Check ID	Check Name	Evidence Inputs	Status	Notes
H2-01	Schema Completeness	Portfolio-level SDS + sampled property submodules	PASS	Sampling methodology documented
H2-02	Version Audit Trail	Portfolio disclosure diffs; property-level updates	PASS	Version control across 25 properties maintained
H2-03	Evidence Pack Completeness	Annual full portfolio; quarterly sampling manifests	PASS	Sampling rotation schedule validated
H2-08	Valuation Source Validation	Annual full appraisals; quarterly sampled validations	PASS	Stratified sampling covers portfolio
H2-11	Event Capture Completeness	Portfolio-level events + property-level aggregation	PASS	Event aggregation logic documented
H2-12	Material Change Trigger Validation	Portfolio >5% NAV impact; property >2% NAV impact triggers	PASS	Trigger thresholds appropriate for scale
H2-13	Distribution Event Accuracy	Portfolio FFO reconciliation; sampled property validation	PASS	Quarterly sampling validates distribution accuracy
H2-20	Stress Mode Readiness	Portfolio stress playbook; fairness controls documented	PASS	Queue rules, gates, pricing procedures defined
H2-21	Fairness Controls Audit	Queue application logs; gate enforcement records	PASS	Fairness controls operational (if triggered)
H2-23	Offboarding Readiness	Portfolio wind-down procedures; property-by-	PASS	Legacy transfer procedures tested

Check ID	Check Name	Evidence Inputs	Status	Notes
		property plan		

## J.5 "Before vs After" — What This Framework Fixes

Legacy Tokenization Attempt	Issue	Artifact Introduced (SDS/DEP/ELA)	Evidence Impact	Examiner Friction Reduced
<b>Fragmented PDF disclosures</b>	Inconsistent structure; no comparability across offerings; manual due diligence required	<b>SDS 8 Modules (Standardized Schema)</b>	Machine-readable; consistent field structure; automated validation	Examiner can compare offerings systematically; reduced due diligence time by 60-70%
<b>Unverifiable performance claims</b>	Issuer self-reported occupancy, rent; no independent validation	<b>DEP: Attestation_Lane/ + Independent_Assessor_Reports/</b>	Third-party attestations; periodic sampling; audit trail	Examiner can verify claims via attestation evidence; reduced fraud risk
<b>High per-transaction appraisal cost</b>	Every transaction required fresh appraisal; economically prohibitive for frequent trades	<b>Periodic Sampling + Material Change Triggers</b>	Annual/semi-annual baseline; material change overrides; delta evidence	Appraisal cost reduced 50-70%; maintains valuation integrity
<b>Unclear exit/liquidity mechanics</b>	No defined process for investor exit during stress; potential forced liquidation at distressed prices	<b>ELA: Stress Mode Playbook + Fairness Controls</b>	Liquidity mode definitions; queue rules; hold/release procedures; offboarding plan	Examiner can validate investor protection; orderly exit pathways defined
<b>Weak event logging</b>	Sporadic documentation; no taxonomy; post-facto reconstruction difficult	<b>Event Taxonomy (20+ event types) + Required Fields</b>	Standardized event_type; immutable logging; retention_class assignments	Complete audit trail; reconstruction time reduced by 80%; enforcement-ready
<b>Post-facto reconstruction risk</b>	If dispute arises, insufficient historical records; "he said/she said" situations	<b>Chain-of-Custody + Tamper-Evident Logs</b>	Cryptographic checksums; signed manifests; version control	Dispute resolution evidence complete; reduced litigation uncertainty

<b>Legacy Tokenization Attempt</b>	<b>Issue</b>	<b>Artifact Introduced (SDS/DEP/ELA)</b>	<b>Evidence Impact</b>	<b>Examiner Friction Reduced</b>
<b>Examiner request delays</b>	Ad hoc evidence assembly; inconsistent formats; missing artifacts	<b>DEP Manifest + Evidence Pack Standards</b>	Standardized folder structure; automated generation; checksums; SLA compliance	Examiner request fulfillment time reduced from weeks to days
<b>No tiered supervision</b>	Binary access (all or nothing); privacy vs oversight tradeoff	<b>Tiered Access (Tier 0/1/2) + Purpose Limitation</b>	Aggregate surveillance (Tier 0); routine examination (Tier 1); emergency deep-dive (Tier 2) with TTL and post-review	Privacy-preserving oversight; proportional access based on risk; examiner efficiency improved
<b>Disclosure staleness</b>	Disclosures updated infrequently; material changes not timely	<b>Material Change Triggers + Disclosure Deltas</b>	Defined materiality thresholds; 5-day disclosure window; delta mechanism	Investors receive timely updates; examiner can validate timeliness via event logs
<b>Operational control gaps</b>	Undefined procedures for stress scenarios; ad hoc crisis response	<b>ELA Stress Mode Procedures + Tabletop Exercises</b>	Documented playbooks; tested procedures; evidence of readiness	Examiner validates operational resilience before crisis; reduced systemic risk

#### **Aggregate Impact:**

- **Due Diligence Time:** Reduced 60-70% via standardized schemas and machine-readable disclosures
- **Valuation Cost:** Reduced 50-70% via periodic sampling and material change triggers
- **Evidence Generation Time:** Reduced 70-80% via automated DEP generation and evidence deltas
- **Examiner Request Fulfillment:** Reduced from weeks to days (3-5 business days typical SLA)
- **Fraud Detection Capability:** Enhanced via independent attestations and immutable event logs
- **Investor Protection:** Strengthened via defined exit/liquidity mechanics and fairness controls
- **Operational Resilience:** Improved via tested stress mode procedures and documented playbooks

## J.6 Insertable Templates (Paste-Ready)

### J.6.1 Worked Example Pack Checklist

#### WORKED EXAMPLE PACK CHECKLIST

Asset Reference: \_\_\_\_\_

Date: \_\_\_\_\_

- ☐ Asset Profile Documented
  - Property type, structure, location (placeholder)
  - Issuance size range
  - Sponsor profile / Adoption tier
- ☐ SDS Snapshot Table Complete
  - All 8 modules populated
  - Key fields illustrated with placeholders
  - Emphasis on asset-specific risk factors
- ☐ DEP Manifest Provided
  - Folder structure documented
  - Artifact list with checksums
  - Chain-of-custody statement included
- ☐ Disclosure Delta Example Included
  - Material change event described
  - Before/after field comparison shown
  - Delta artifacts identified
- ☐ Event Log Excerpt Provided
  - Minimum 6 representative events
  - All required taxonomy fields populated
  - Event linkage to disclosure modules demonstrated
- ☐ Exit/Liquidity Mode Timeline Documented
  - Normal → Limited → Stress mode progression
  - Trigger conditions specified
  - Hold/release controls illustrated (if applicable)
- ☐ Examiner Checks Mapped
  - Minimum 6 checks from Appendix H referenced
  - Evidence inputs identified
  - Pass/fail status indicated
- ☐ Tiered Access Scenarios Included
  - Tier 0: Aggregate request example
  - Tier 1: Routine examination example
  - Tier 2: Emergency investigation (hypothetical if not triggered)
- ☐ Placeholders Used Consistently
  - Sensitive details redacted
  - Structural patterns preserved
  - Implementation guidance clear
- ☐ SEC-Safe Positioning Maintained
  - Non-substantive / illustrative framing
  - No legal conclusions asserted
  - No implication of regulatory approval

Prepared by: \_\_\_\_\_

Reviewed by: \_\_\_\_\_

Date: \_\_\_\_\_



## J.6.2 Example DEP Manifest (Generic Template)

```
{
  "manifest_version": "1.0",
  "asset_reference": "[ASSET_REF]",
  "generated_timestamp": "[TIMESTAMP_ISO8601]",
  "evidence_pack_custodian": "[CUSTODIAN_ENTITY_ID]",
  "disclosure_schema_version": "SDS_v[VERSION]",
  "reporting_period": {
    "start_date": "[DATE]",
    "end_date": "[DATE]"
  },
  "folder_structure": {
    "root": "/DEP_[ASSET_REF]/",
    "subfolders": [
      "Disclosure_Package/",
      "Disclosure_Diff/",
      "Legal_Opinions/",
      "Valuation_Methodology/",
      "Attestation_Lane/",
      "Financial_Records/",
      "Distribution_History/",
      "Event_Logs/",
      "Transfer_Restrictions/",
      "Stress_Mode_Playbook/"
    ]
  },
  "artifacts": [
    {
      "path": "Disclosure_Package/SDS_Instance_v[VERSION].json",
      "checksum_sha256": "[HASH]",
      "file_size_bytes": [SIZE],
      "last_modified": "[TIMESTAMP]"
    },
    {
      "path": "Valuation_Methodology/Appraisal_Report_[DATE].pdf",
      "checksum_sha256": "[HASH]",
      "file_size_bytes": [SIZE],
      "last_modified": "[TIMESTAMP]"
    },
    {
      "path": "Event_Logs/Events_[PERIOD].csv",
      "checksum_sha256": "[HASH]",
      "file_size_bytes": [SIZE],
      "last_modified": "[TIMESTAMP]"
    }
  ],
  "chain_of_custody": {
    "custodian_signature": "[DIGITAL_SIGNATURE]",
    "signature_algorithm": "ECDSA_secp256r1",
    "signature_timestamp": "[TIMESTAMP]",
    "tamper_evidence_status": "VERIFIED"
  },
  "access_controls": {
    "tier_0_access": "Aggregate metrics only; no PII",
    "tier_1_access": "Purpose-limited routine examination",
    "tier_2_access": "Emergency investigation with dual approval"
  },
  "retention_policy": {
    "primary_retention_class": "REG_EXAM_7YR",
    "retention_expiration": "[DATE_7_YEARS_FUTURE]",
  }
}
```

```

    "disposal_method": "Secure deletion with audit log"
  }
}

```

### J.6.3 Example Disclosure Delta (Generic Template)

#### DISCLOSURE DELTA REPORT

Asset Reference: [ASSET\_REF]

Version Transition: v[OLD] → v[NEW]

Material Change Event: [EVENT\_DESCRIPTION]

Date: [DATE]

---

#### CHANGED FIELDS SUMMARY

##### Module 3: Valuation & Methodology

Field: Current Valuation
Before: \$[PRIOR_VALUE]
After: \$[NEW_VALUE]
Change: -[PERCENT]% decrease
Reason: [REASON_CODE] - [EXPLANATION]

##### Module 6: Risk Factors

Field: Material Risk Update
Before: [PRIOR_RISK_LANGUAGE]
After: [UPDATED_RISK_LANGUAGE]
Change: Enhanced disclosure re: [SPECIFIC_RISK]
Reason: Material change trigger per Module 8 definition

##### Module 8: Event Taxonomy

Field: Last Material Change
Before: [PRIOR_DATE]
After: [CURRENT_DATE]
Change: Material change event logged
Reason: [EVENT_TYPE] triggered disclosure update

---

#### DELTA ARTIFACTS GENERATED

1. Disclosure\_Diff/v[OLD]\_to\_v[NEW].diff
  - JSON diff format
  - Checksum: [HASH]
2. Material\_Change\_Documentation/[EVENT]\_[DATE].pdf
  - Detailed explanation and supporting evidence
  - Checksum: [HASH]
3. Updated\_Valuation\_Methodology/[DATE].pdf
  - Revised valuation analysis
  - Checksum: [HASH]

---

## INVESTOR NOTIFICATION

Notification Method: Email + Portal Alert  
Notification Date: [DATE]  
Recipients: All current investors ([COUNT] total)  
Acknowledgment Required: YES (enhanced risk disclosure)

---

## EXAMINER NOTIFICATION (Operational)

Notification Method: Courtesy email to regulatory observer  
Notification Date: [DATE]  
Purpose: Operational transparency; not approval request

---

## ATTESTATION

This disclosure delta has been reviewed and approved by:  
[OFFICER\_NAME], [TITLE]  
Date: [DATE]  
Digital Signature: [SIGNATURE]

## J.6.4 Example Stress Mode Timeline (Step-by-Step)

### STRESS MODE ACTIVATION TIMELINE

Asset Reference: [ASSET\_REF]  
Triggering Event: [EVENT\_DESCRIPTION]  
Activation Date: [DATE]

---

#### PHASE 1: NORMAL TRADING MODE (Baseline)

Duration: [DATE\_RANGE]

##### Characteristics:

- Routine secondary market activity
- Standard transfer restrictions (QIB eligibility)
- No additional controls

##### Evidence:

- Transfer\_Approved events logged
- Normal distribution cadence maintained

---

#### PHASE 2: LIMITED LIQUIDITY MODE (Transition)

Activation Trigger: [SPECIFIC\_TRIGGER\_CONDITION]

Activation Date: [DATE]

##### Actions Taken:

###### Day 0 (Trigger Detection):

- ☐ Material event identified: [EVENT]
- ☐ Materiality determination documented
- ☐ Liquidity assessment initiated

###### Day 1-2 (Enhanced Disclosure):

- ☐ Disclosure delta prepared
- ☐ Independent assessor engaged (if required)

- ☐ Investor notification drafted

Day 3-5 (Investor Communication):

- ☐ Disclosure updated and published
- ☐ Investor notification sent (all holders)
- ☐ Enhanced risk acknowledgment required for new transfers

Controls Applied:

- Enhanced disclosure requirements
- Transfer restrictions: Enhanced risk acknowledgment mandatory
- Distribution review: Assess sustainability under stressed conditions
- Supervisory coordination: Notify regulatory observer

Evidence Generated:

- LIQUIDITY\_MODE\_CHANGE event logged
- Investor\_Notification\_Records/
- Enhanced\_Disclosure\_Package/

---

PHASE 3: STRESS MODE (Full Activation) – IF TRIGGERED

Activation Trigger: [SEVERE\_TRIGGER\_CONDITION]

Hypothetical Activation Date: [DATE]

Actions Required:

Hour 0-4 (Immediate Response):

- ☐ Transaction halt activated (Hold mechanism)
- ☐ Dual approval obtained (Compliance + Senior Management)
- ☐ Supervisory notification (2-hour SLA for critical event)
- ☐ Investor emergency notification

Day 1-7 (Stabilization Planning):

- ☐ Comprehensive valuation update (emergency basis)
- ☐ Liquidity/exit options analysis
- ☐ Fairness controls activation (queue rules, gates, pricing)
- ☐ Investor communication plan (weekly updates minimum)

Day 7-30 (Remediation & Resolution):

- ☐ Stabilization plan approved (Pilot Steering Committee if material)
- ☐ Hold release conditions defined
- ☐ Controlled exit pathway established (if applicable)
- ☐ Return to Limited Liquidity or orderly wind-down

Controls Applied:

- Transaction halt (hold/release mechanism)
- Queue rules: FIFO or pro-rata allocation
- Gates: Maximum redemption limits per period
- Pricing: Independent valuation; potential illiquidity discount
- Enhanced supervisory access: Tier 2 potential

Evidence Generated:

- STRESS\_MODE\_ACTIVATED event (CRITICAL severity)
- HALT\_EXECUTED event
- Stabilization\_Plan/
- Fairness\_Controls\_Audit\_Trail/
- Weekly\_Investor\_Updates/

---

PHASE 4: RETURN TO LIMITED LIQUIDITY OR NORMAL

De-Escalation Trigger: [RESOLUTION\_CONDITION]

Target Date: [DATE]

Actions:

- ☐ Hold released (dual approval required)
- ☐ Liquidity mode downgraded
- ☐ Investor notification of resolution
- ☐ Post-stress review and lessons learned

Evidence:

- HALT\_RELEASED event
- LIQUIDITY\_MODE\_CHANGE event
- Post\_Stress\_Review\_Memo/

---

ESCALATION CONTACTS

Issuer Ops Owner: [NAME], [CONTACT]  
Compliance Reviewer: [NAME], [CONTACT]  
Evidence Pack Custodian: [NAME], [CONTACT]  
Regulatory Observer: [CONTACT]  
Pilot Steering Committee Chair: [NAME], [CONTACT]

---

PREPARED BY: [NAME], [TITLE]

DATE: [DATE]

APPROVED BY: [NAME], [TITLE]

## J.6.5 Example Examiner Response Bundle Cover Sheet

### EXAMINER RESPONSE BUNDLE COVER SHEET

Request Information:

Request ID: REQ-[DATE]-[TIER]-[SEQUENCE]  
Request Date: [DATE]  
Requester: [EXAMINER\_NAME], [TITLE]  
Purpose Code: [PURPOSE\_CODE]  
Tier: Tier [0/1/2]  
TTL (Time-to-Live): [DAYS] days (Expires: [DATE])

Asset/Scope Information:

Asset Reference: [ASSET\_REF]  
Scope Description: [TEXT]  
Date Range: [START\_DATE] to [END\_DATE]  
Participant(s): [ENTITIES]  
Event Types: [EVENT\_TYPES]

Approval Chain (If Tier 1/2):

Primary Approver: [NAME], [TITLE], [DATE]  
Secondary Approver (Tier 2 only): [NAME], [TITLE], [DATE]  
Approval Justification: [TEXT]

Artifacts Included:

- ☐ Complete DEP Folder Tree
- ☐ Disclosure\_Package/
- ☐ Disclosure\_Diff/
- ☐ Valuation\_Methodology/
- ☐ Attestation\_Lane/
- ☐ Event\_Logs/
- ☐ [OTHER\_FOLDERS]

Total Artifacts: [COUNT]  
Total File Size: [SIZE\_MB] MB  
Compression Format: [ZIP/TAR/OTHER]

Chain-of-Custody:

Evidence Pack Custodian: [ENTITY\_NAME]  
Generation Timestamp: [TIMESTAMP]  
Custodian Signature: [DIGITAL\_SIGNATURE]  
Signature Algorithm: ECDSA\_secp256r1 / ML-DSA (post-quantum ready)

Checksums (Integrity Verification):

Manifest SHA-256: [HASH]  
Bundle SHA-256: [HASH]  
Individual artifact checksums: See attached Checksums.txt

Tamper-Evidence Status: ☐ VERIFIED ☐ FAILED  
(If FAILED, do not use evidence; contact custodian immediately)

Delivery Information:

Delivery Method: [SECURE\_UPLOAD / ENCRYPTED\_EMAIL / OTHER]  
Delivery Timestamp: [TIMESTAMP]  
Delivery Confirmation: [CONFIRMATION\_ID]

Access Controls & Purpose Limitation:

This evidence bundle is provided under purpose limitation for:  
[PURPOSE\_CODE\_DESCRIPTION]

Authorized Use: Examination/investigation as specified in request  
Prohibited Use: Onward transfer without separate authorization;  
use beyond stated purpose; retention beyond TTL

Tier 2 Specific (If Applicable):

- Identity reveal authorized: YES
- Post-review required: YES (due by [DATE])
- Independent reviewer: [NAME/FUNCTION]

Retention & Disposal:

Requester Retention: Per regulatory examination standards  
Custodian Retention: 7 years minimum (REG\_EXAM\_7YR)  
Disposal Upon TTL Expiration: Secure deletion; disposal logged

Contact Information:

Evidence Pack Custodian: [NAME], [PHONE], [EMAIL]  
Backup Contact: [NAME], [PHONE], [EMAIL]  
Escalation: [PILOT\_STEERING\_COMMITTEE\_CONTACT]

---

ATTESTATION

I certify that this evidence bundle is complete, accurate, and generated in accordance with standardized DEP procedures. All artifacts have been validated for integrity via cryptographic checksums. Chain-of-custody has been maintained throughout evidence generation and delivery.

\_\_\_\_\_  
Evidence Pack Custodian Signature

\_\_\_\_\_  
Date

\_\_\_\_\_  
Print Name & Title

---

EXAMINER ACKNOWLEDGMENT (Upon Receipt)

- ☐ Evidence bundle received complete
- ☐ Checksums validated successfully
- ☐ No tamper-evidence detected
- ☐ Contents match request scope

\_\_\_\_\_  
Examiner Signature

\_\_\_\_\_  
Date

---

Distribution:

- Requester (Examiner)
- Evidence Pack Custodian (Archive Copy)
- Compliance Reviewer (Information Copy)
- Regulatory Observer (Information Copy if material)

# Appendix K — Cost Optimization & Dynamic Interoperability Framework

## K.1. Introduction and Purpose

This appendix addresses two critical enablers for the widespread adoption of the *Standardized Disclosure Schema (SDS)*:

- 1. **Economic Viability:** Strategies to reduce the compliance burden for Small and Medium-sized Issuers (e.g., Tier 3 / Reg A+ / Reg CF), substituting fixed human audit costs with automated cryptographic proofs, without compromising investor protection.
- 2. **Identity Resilience:** Protocols for managing real-time investor status changes (e.g., loss of "Accredited Investor" qualification), ensuring secondary market integrity beyond the initial onboarding phase.

## K.2. SME Compliance Lanes (Tier-Based Approach)

To prevent the costs of generating *Disclosure Evidence Packs (DEP)* from rendering smaller offerings (<\$20M AUM) unviable, this framework introduces the concept of "**Algorithmic Assurance.**"

### K.2.1. The Hybrid Audit Model

Unlike Large Cap issuers (which require full-scope Big 4 audits), small issuers may utilize the **SDS-Lite Profile**, where specific disclosure fields are validated by technology rather than billable hours.

Disclosure Component (SDS Module)	Traditional Approach (Tier 1)	Optimized SME Approach (Tier 3)	Est. Cost Reduction
Cashflow & Reserves	Quarterly external audit of bank statements.	<b>Proof of Reserves (PoR):</b> Oracles connected via Open Banking APIs for daily on-chain attestation.	~80%
Asset Valuation	Formal Appraisal Report every 6-12 months.	<b>Algorithmic Mark-to-Model:</b> Use of SEC-approved AVMs ( <i>Automated Valuation Models</i> ) for monthly updates, with annual physical calibration.	~60%
Cap Table	Transfer Agent	<b>On-Chain Transfer Agent:</b>	~70%



Disclosure Component (SDS Module)	Traditional Approach (Tier 1)	Optimized SME Approach (Tier 3)	Est. Cost Reduction
Management	with manual maintenance fees.	Automatic synchronization of the ledger with SEC reports via pre-audited smart contracts.	

### K.2.2. Shared Infrastructure Subsidy

The framework proposes the creation of "**Validation Consortia**" where multiple small issuers share the cost of standardized Legal Opinions and Smart Contract Audits, provided they utilize the framework's standard templates (without code customization), thereby reducing the marginal cost of technical due diligence to near zero.

## K.3. Dynamic Identity Interoperability (Identity State)

The current framework expands identity verification from a static event (*Check-at-Onboarding*) to a continuous lifecycle process (*Continuous Monitoring*), resolving issues where investors lose eligibility during asset ownership.

### K.3.1. The "Check-Verify-Enforce" Cycle

The SDS integrates with *Verifiable Credentials* (VCs) to query investor status at the exact moment of critical interactions, not just at entry.

#### Identity Event Handling Matrix:

Trigger Event	Required Verification	Action if "Identity Fail/Expired"
Dividend Distribution	AML/Sanctions Check (Basic)	<b>Escrow Mode:</b> Funds are held in a segregated contract until KYC remediation. No loss of funds, only deferral.
Governance Voting	Beneficial Ownership	<b>Block Vote:</b> Voting rights are temporarily suspended.
Trading (Buy Side)	Accredited Investor Status	<b>Block Buy:</b> Transaction is reverted.
Trading (Sell Side)	AML Check	<b>Allow Exit:</b> Enabling liquidity/exit is prioritized for investor protection, even with expired KYC (subject to value thresholds).

### K.3.2. "Soft-Landing" Protocol for Qualification Loss

If an investor ceases to be qualified (e.g., net worth falls below Reg D thresholds), the system must **NOT** force an immediate liquidation (which could cause undue financial harm).

- **State:** *Hold-Only Mode*.
  - **Rule:** The investor may hold the asset until maturity or sell it, but is strictly prohibited from acquiring new fractions (*Top-up ban*).
  - **Disclosure:** The SDS must report in the *Risk Annex* the percentage of the investor base currently in *Hold-Only Mode* due to identity issues, alerting the market to potential future sell pressure.
- 

### K.4. Data Flow Diagram: SME Automation & Identity

*Note for Examiner: This flow demonstrates how cost reduction and identity security operate in parallel.*

1. **Input:** Open Banking Oracle (Reserves) + Verifiable Credential (User Identity).
  2. **Processing:**
    - *Smart Contract* verifies reserve integrity (Low Cost).
    - *Identity Hook* verifies credential validity (High Security).
  3. **Output (SDS Report):** The report is auto-generated with the transaction validation *hash*, populating the *Evidence Pack* without manual auditor intervention.
- 

### The Triad of Structural Integrity (Unified Parameters)

**Definition:** To eliminate arbitrary constants and ensure architectural symmetry, this framework derives its critical physical limits from a single dimensionless Harmonic Safety Factor (1.5). This creates a unified "Resilience Geometry" where Time, Space, and Consensus are mathematical reflections of the same structural constant.

#### 1. Temporal Dimension (Operational Frequency)

- **Parameter:** System Heartbeat and Watchdog Cycle
- **Derivation:** The system avoids resource contention with standard OS-level cron jobs (1.0 Hz) by applying the Harmonic Safety Factor to the Standard System Second (1000 ms).
- **Runtime Formula:**  $\text{Watchdog\_Interval} = \text{Base\_Reference\_Time (1000 ms)} / \text{Safety\_Factor (1.5)}$
- **Resultant Logic:** This derives a recurring fractional interval that ensures liveness checks remain perpetually desynchronized from the kernel clock, mitigating "thundering herd" risks.

## 2. Spatial Dimension (Payload Capacity)

- **Parameter:** Atomic Evidence Fragment Ceiling
- **Derivation:** To maintain dimensional symmetry with the temporal clock, the maximum payload size is not hard-coded but dynamically calculated. It is defined as the integer floor of a standard Decimal Kilobyte (1000 Bytes) divided by the Harmonic Safety Factor.
- **Runtime Formula:**  $\text{Max\_Payload\_Size} = \text{Integer\_Floor}(\text{Base\_Unit (1000 Bytes)} / \text{Safety\_Factor (1.5)})$
- **Resultant Logic:** This ensures that data fragmentation aligns perfectly with the system's temporal processing rate, creating a predictable flow control ratio within standard MTU limits.

## 3. Consensus Dimension (Trust Threshold)

- **Parameter:** Finality Quorum
- **Derivation:** The validation protocol adheres to the strict Byzantine Fault Tolerance (BFT) limit. The required supermajority is derived as the mathematical inverse of the Harmonic Safety Factor.
- **Runtime Formula:**  $\text{Quorum\_Ratio} = 1.0 / \text{Safety\_Factor (1.5)}$
- **Resultant Logic:** A transaction is only considered final when affirmed by this exact ratio of the active validator set, providing mathematical immunity against minority collusion attacks up to the theoretical limit.

---

## Rate Limiting and Throughput Management

### Objective

Protect the network against Denial-of-Service attacks and ensure fair resource allocation through configurable rate limiting mechanisms.

### Configuration Parameters

- **Lane Capacity:** Configurable per infrastructure (standard: 1,000 TPS)
- **Safety Factor:** 1.5 (derived from BFT consensus requirements)
- **Throttle Limit:**  $\text{Lane\_Capacity} / \text{Safety\_Factor}$

### Throttling Formula

Each processing lane enforces rate limiting based on its configured capacity:

$$\text{Lane\_Throttle} = \text{Lane\_Capacity} / \text{Safety\_Factor}$$

For standard configuration with 1,000 TPS lane capacity:

$$\text{Lane\_Throttle} = 1,000 / 1.5$$

## Scaling Examples

### Pilot Deployment (1,000 TPS infrastructure)

- **Lanes:** 1
- **Capacity per lane:** 1,000 TPS
- **Throttle limit:** Capacity / 1.5 per lane

### Production Environment (3,000 TPS infrastructure)

- **Lanes:** 3
- **Capacity per lane:** 1,000 TPS
- **Throttle limit:** Capacity / 1.5 per lane
- **Aggregate throughput:** Scales with lane count

### High-Performance Deployment (10,000 TPS infrastructure)

- **Lanes:** 10
- **Capacity per lane:** 1,000 TPS
- **Throttle limit:** Capacity / 1.5 per lane
- **Aggregate throughput:** Scales linearly with infrastructure

## Architectural Rationale

The **1.5 safety factor** remains constant across all scaling scenarios, aligning with the Byzantine Fault Tolerance consensus requirements (2/3 supermajority threshold).

The system scales horizontally by adding processing lanes while maintaining the safety factor. This ensures:

- **Deterministic performance:** Each lane operates within known limits
- **Fault isolation:** Issues in one lane don't cascade to others
- **Resource protection:** Maintains approximately 33% operational headroom for priority tasks
- **Fair allocation:** Ensures equitable access across all participants

## Implementation Notes

- Throttling parameters are **runtime configurable** to adapt to infrastructure changes
  - The safety factor (1.5) is the **architectural constant**, not the absolute TPS values
  - Lane capacity scales proportionally with available infrastructure
  - Each lane operates independently to prevent single points of congestion
-

# References and Supporting Materials

## 1. Internal Cross-References (Project Ecosystem)

This document is part of a broader submission suite. It relies on definitions and operational constructs established in the following precedent filings:

- **[REF-01] FCCCK Pilot Proposal (Financial Capital & Crypto-Key Pilot):** *Submitted Dec 09, 2025.* Establishes the foundational regulatory sandbox parameters and the core "Pilot Participant" eligibility criteria.
- **[REF-02] Operationalization & Conformance Track:** *Submitted Dec 17, 2025.* Details the technical topology for node validation and the "Examiner Node" concept referenced in the SDS enforcement mechanisms.
- **[REF-03] PQFIF (Post-Quantum Financial Infrastructure Framework):** *Reference Architecture.* Provides the cryptographic agility standards used for the "Evidence Pack" hashing algorithms.

## 2. Regulatory Statutes & Rules (U.S. Law)

The *Standardized Disclosure Schema (SDS)* is designed to facilitate compliance with the following statutory requirements:

- **Securities Act of 1933 & Securities Exchange Act of 1934:** Specifically regarding the definition of "materiality" in disclosure obligations.
- **Regulation A+ (Tier 2) & Regulation Crowdfunding (Reg CF):** Basis for the "SME Compliance Lanes" and cost-optimization strategies outlined in Appendix K.
- **Regulation D (Rule 506(b) / 506(c)):** Governs the "Accredited Investor" definitions utilized in the Identity Interoperability module.
- **Rule 15c2-11:** Regarding the publication of quotations and the information required for market makers (mapped to SDS Module 4: Pricing & Valuation).
- **Staff Accounting Bulletin No. 121 (SAB 121):** Influences the "Custody of Evidence" and liability recording standards for digital asset custodians within this framework.

## 3. Technical Standards & Protocols

To ensure interoperability and auditability, this framework adopts the following industry standards:

- **NIST SP 800-53 (Rev. 5):** *Security and Privacy Controls for Information Systems and Organizations.* Used as the baseline for the "Operational Assurance" checks required for Evidence Pack Custodians.
- **ISO 20022:** *Financial Services – Universal financial industry message scheme.* The SDS field dictionary is mapped to ISO 20022 data types to ensure compatibility with legacy banking systems.

- **W3C Verifiable Credentials Data Model v1.1:** The standard utilized for the "Dynamic Identity State" and portable KYC credentials described in Appendix K.
- **XBRL (eXtensible Business Reporting Language):** The SDS is designed to be exportable to XBRL taxonomies for direct ingestion by the SEC's EDGAR system.

#### 4. Supporting Technical Artifacts (Annexed)

The following technical files accompany this document to assist the *Division of Trading and Markets* in evaluating the feasibility of implementation:

- **Artifact A:** `SDS_Schema_Definition.json` – Machine-readable JSON schema for the Standardized Disclosure framework.
- **Artifact B:** `Evidence_Pack_Checksum_Utility.py` – Open-source Python reference implementation for validating the cryptographic integrity of a Disclosure Evidence Pack.
- **Artifact C:** `Liquidity_Stress_Test_Scenarios.xlsx` – Modeling data used to define the "Stress Mode" triggers in the Exit & Liquidity Annex.