BuildDAO

Construction Vertical Specification

Decentralized Contractor Coordination for the Built Environment

Version 1.0

January 2026

Horizon Protocol

1. Executive Summary

BuildDAO is a decentralized construction coordination vertical built on Horizon Protocol. It enables contractors, sub-contractors, architects, engineers, and property developers to coordinate complex building projects through mission-based work phases, on-chain reputation, and DAO-owned intellectual property.

The construction industry suffers from fragmented coordination, payment disputes, reputation opacity, and IP ownership conflicts. BuildDAO addresses these through:

- Mission-based work phases with USDC escrow and DDR protection
- ContractorDAOs as autonomous business entities with portable reputation
- ProjectDAOs for multi-contractor coordination on building projects
- MetaGuilds for trade associations and regional standards
- DesignDAOs for blockchain-attested intellectual property ownership
- Inspection attestations integrated into mission completion workflows

1.1 Confirmed Design Decisions

Decision	Choice	Rationale
Mission Dependencies	Off-chain orchestration	Horizon Service manages phase sequencing; contracts remain simple
Guild Hierarchy	ContractorDAO → ProjectDAO → MetaGuild	Maps to real-world contractor → project → trade association
IP Ownership	DesignDAO with licensing NFTs	Collective ownership, individual licensing
Inspection Integration	Third-party attestation badges	Inspector signs off via Horizon; attestation linked to mission
Credential Verification	Badge-gated mission eligibility	License NFTs required for regulated work
Payment Structure	Milestone-based escrow release	Partial releases at inspection checkpoints
Dispute Reserves	Standard DDR/LPP model	Higher DDR factor (8-12%) for construction complexity

2. Mission Typologies

Construction work is organized into mission types that reflect the phased nature of building projects. Each mission type has specific eligibility requirements, verification methods, and payment structures.

2.1 Trade Missions

Single-trade work packages executed by specialized contractors.

Mission Type	Requirements	Verification	DDR Factor
Foundation	Licensed + Insured badge	Engineering inspection	12%
Framing	Carpentry license	Structural inspection	10%
Electrical	Electrician license NFT	Electrical inspection + permit	10%
Plumbing	Plumber license NFT	Plumbing inspection + permit	10%
HVAC	HVAC certification badge	Mechanical inspection	10%
Roofing	Roofing license badge	Photo + warranty attestation	8%
Finishing	Min 500 XP in trade	Client walkthrough approval	6%

2.2 Composite Missions

Multi-phase work packages that contain nested sub-missions for different trades.

- Rough-In Package: Combines electrical rough, plumbing rough, and HVAC rough into a coordinated phase
- Shell Complete: Foundation + Framing + Roofing + Weather barrier as a turnkey package
- Interior Finish: Drywall + Paint + Flooring + Trim coordinated completion
- Full Build: Complete house construction from permits to certificate of occupancy

2.3 Design & Planning Missions

Pre-construction coordination work for architects, engineers, and planners.

- Architectural Design: Floor plans, elevations, specifications → deliverable hash on IPFS
- Structural Engineering: Load calculations, foundation specs, beam sizing
- Permit Acquisition: Navigate permitting process → permit number as proof
- Site Survey: Boundary survey, topography, utility locations

2.4 Inspection Missions

Third-party verification missions that gate subsequent construction phases.

- Pre-Pour Inspection: Foundation formwork and rebar verification
- Rough Inspection: MEP systems before drywall closure
- Final Inspection: Certificate of occupancy preparation

- Quality Audit: Third-party quality verification for warranty claims

3. Guild Hierarchy

BuildDAO implements a three-tier guild hierarchy that maps to real-world construction industry organization: ContractorDAOs for individual businesses, ProjectDAOs for building coordination, and MetaGuilds for trade associations and regional standards.

3.1 ContractorDAO (Tier 1)

Each contractor company operates as a GuildDAO with:

- Treasury: Company operating funds, project bonds, insurance reserves
- Membership: Employees, licensed subcontractors, apprentices
- Roles: Owner (admin), Foreman (curator), Journeyman (performer), Apprentice (limited)
- Eligibility Schema: Trade licenses, insurance certificates, safety certifications
- Reputation: Aggregated from all member performance across missions
- Guild Board: Internal job assignments, crew scheduling, equipment allocation

3.2 ProjectDAO (Tier 2)

Created for each construction project to coordinate multiple ContractorDAOs:

- Treasury: Project escrow, contingency reserves, payment holdbacks
- Members: General contractor + all sub-contractors for the project
- Roles: Project Owner (poster), GC (coordinator), Sub (performer), Inspector (verifier)
- Phase Management: Mission dependencies enforced by Horizon Service
- Guild Board: Project-specific missions visible only to approved contractors
- Completion Attestation: Final project sign-off requires all phase missions complete

3.3 MetaGuild (Tier 3)

Trade associations and regional construction networks:

- Trade MetaGuilds: Electricians Association, Plumbers Union, Carpenters Guild
- Regional MetaGuilds: Nashville Metro Builders Network, Memphis Construction Alliance, East Tennessee Builders Guild (Knoxville), Chattanooga Valley Contractors
- Functions: Credential verification, apprenticeship programs, code compliance standards
- Cross-Guild Coordination: Shared insurance pools, equipment rentals, bulk purchasing
- Governance: Trade-specific rules, regional building code integration, dispute escalation

4. Project Workflow

A typical residential construction project flows through coordinated phases, each represented as missions with dependencies managed by Horizon Service.

4.1 Project Initialization

1. Property owner creates ProjectDAO via BuildDAO dashboard
2. Deposits project budget into ProjectDAO treasury (escrow)
3. Optionally attaches a DesignDAO license for pre-engineered house plans
4. Invites or opens bidding for General Contractor role

4.2 Phase Sequencing

Phase	Missions	Dependencies	Gate
0. Pre-Con	Design, Engineering, Permits	None	Permit approval
1. Site Prep	Survey, Clearing, Excavation	Phase 0 complete	Site ready inspection
2. Foundation	Formwork, Rebar, Pour, Cure	Phase 1 complete	Foundation inspection
3. Framing	Walls, Floor systems, Roof	Phase 2 complete	Framing inspection
4. Rough-In	Electrical, Plumbing, HVAC	Phase 3 complete	Rough inspection
5. Envelope	Roofing, Siding, Windows	Phase 3 complete	Weather-tight inspection
6. Interior	Drywall, Paint, Flooring, Trim	Phases 4+5 complete	Finish inspection
7. Final	Fixtures, Appliances, Cleanup	Phase 6 complete	Certificate of Occupancy

4.3 Mission Flow Within a Phase

- GC (General Contractor) posts phase mission to ProjectDAO board
- Eligible ContractorDAOs view mission based on trade badges + XP + reputation
- ContractorDAO accepts mission → escrow allocated from ProjectDAO treasury
- Work executed → progress photos + location verification uploaded
- Inspector mission triggered → third-party verification
- Inspection passes → mission marked complete → payment released
- Phase gate cleared → next phase missions unlocked

5. XP & Reputation System

BuildDAO uses a specialized XP model calibrated for construction work complexity, safety requirements, and quality standards.

5.1 XP Awards by Mission Type

Action	XP	Conditions
Trade Mission Complete	+50 base	Scales with mission value (1 XP per $100)
Inspection Pass	+25	First-time pass (no re-inspection)
Project Phase Complete	+100	All phase missions complete
Full Project Complete	+500	Certificate of Occupancy obtained
5-Star Rating	+15	From project owner or GC
Zero Dispute Streak	+10/mission	10+ consecutive missions without
Safety Incident	-100	Reported safety violation
Failed Inspection	-25	Requires re-inspection
Dispute Loss	-50	Resolver rules against contractor

5.2 Contractor Tiers

Tier	XP Threshold	Unlocks
Apprentice	0 - 499	Helper missions only, supervised work
Journeyman	500 - 1,999	Independent trade missions, standard DDR
Master	2,000 - 4,999	Composite missions, reduced DDR (6%), inspection waiver for minor work
General Contractor	5,000+	ProjectDAO coordinator role, full builds, apprentice training

5.3 Guild Reputation

ContractorDAO reputation is calculated from member performance:

- Weighted average of member ratings (recent weighted higher)
- Inspection pass rate (major factor for licensed trades)
- Dispute rate and resolution outcomes
- Project completion rate and timeline adherence
- Safety record (incidents heavily penalized)

6. NFT & Credential System

BuildDAO uses Soulbound NFTs for credentials and licenses, with tradable NFTs for achievements and collectibles.

6.1 License NFTs (Soulbound)

Required for eligibility on regulated trade missions:

- Master Electrician License: Verified by licensing authority, gates electrical missions
- Master Plumber License: Required for plumbing missions with permit requirements
- General Contractor License: Required for ProjectDAO coordinator role
- HVAC Certification: Required for mechanical system installations
- Structural Engineer PE: Required for engineering approval missions

6.2 Insurance NFTs (Soulbound)

Proof of valid insurance coverage, verified and updated periodically:

- General Liability: $1M minimum coverage attestation
- Workers Compensation: Required for crews > 1 person
- Professional Liability: Required for design and engineering
- Builder's Risk: Project-specific coverage for active builds

6.3 Achievement NFTs (Tradable)

Milestone achievements that demonstrate experience and reliability:

- First Home Built: Complete residential construction
- 100 Inspections Passed: Consistent code compliance
- Zero-Dispute Season: Full year without disputes
- Master Builder: 5,000+ XP milestone
- Guild Founder: Created a ContractorDAO with 10+ active members

6.4 Inspection Attestation NFTs

Issued by verified inspectors upon passing inspections:

- Foundation Approved: Links to inspector wallet + inspection report hash
- Rough Approved: MEP systems verified before close-up
- Final Approved: Certificate of Occupancy attestation

7. DesignDAO & Intellectual Property

DesignDAO enables blockchain-attested collective ownership of pre-engineered house designs, architectural plans, and construction specifications.

7.1 DesignDAO Structure

- Members: Architects, engineers, and contributing contractors who created the design
- Treasury: Collects licensing fees from builds using the design
- IP Registry: Design files stored on IPFS with on-chain hash attestation
- Governance: Members vote on licensing terms, derivative works, and treasury allocation

7.2 Design License NFTs

Licensing rights to build from DesignDAO plans:

- Single-Use License: One build authorized, burned after CO issued
- Builder License: Unlimited builds for verified ContractorDAO (annual renewal)
- Developer License: Subdivision rights for 10+ identical homes
- Modification Rights: Permission to create derivative designs

7.3 Build Attestation Flow

1. Builder purchases Design License NFT from DesignDAO
2. License NFT attached to ProjectDAO at creation
3. Project missions reference the design hash for compliance verification
4. Each phase completion attests adherence to design specifications
5. Final CO links the physical building to the DesignDAO IP
6. Build count increments on DesignDAO registry (portfolio proof)

7.4 Revenue Distribution

DesignDAO treasury receives licensing fees, distributed as:

Recipient	Share
Contributing Architects	40% (weighted by contribution)
Contributing Engineers	25% (weighted by contribution)
DesignDAO Treasury	20% (future development, marketing)
Protocol Fee	15% (split per standard PaymentRouter)

8. Safety & Compliance

BuildDAO integrates with existing regulatory frameworks while adding blockchain-based accountability.

8.1 Compliance Tiers

Tier	Missions	Requirements	Verification
T0: P2P	Handyman, minor repairs	None	Wallet only
T1: Basic	Non-structural, cosmetic	Insurance badge	Self-attested
T2: Licensed	MEP, structural	Trade license NFT + Insurance	Inspector attestation
T3: Full	New construction, major reno	GC license + Bonds + Full insurance	All inspections + CO

8.2 Safety Incident Protocol

- Incident reported via app → mission paused automatically
- Safety resolver assigned (from MetaGuild safety committee)
- Investigation with evidence collection (photos, witness statements)
- Resolution: XP penalty, temporary suspension, or guild removal
- Incident record linked to contractor/guild permanently

8.3 Insurance Integration

- Insurance badges require periodic reverification (quarterly)
- Lapsed insurance auto-revokes badge → missions blocked
- Claims history accessible (with contractor permission) for project owners
- MetaGuild insurance pools available for qualified members

9. Economic Model

9.1 Fee Structure

Fee Type	Rate	Recipient
Protocol Fee	3%	ProtocolDAO + LabsDAO
ProjectDAO Fee	2-5% (configurable)	ProjectDAO Treasury
MetaGuild Fee	0.5-1%	Trade association treasury
DDR (Dispute Reserve)	6-12% (by mission type)	Refunded if no dispute
Design License	1-3% of project value	DesignDAO Treasury

9.2 Payment Flow Example

For a $10,000 electrical rough-in mission:

- Mission posted: $10,000 + $1,000 DDR (10%) = $11,000 escrowed
- Mission completes successfully:
- → Electrician receives: $9,450 (after 5.5% fees)
- → Protocol: $300 (3%)
- → ProjectDAO: $200 (2%)
- → MetaGuild: $50 (0.5%)
- → DDR refunded: $1,000 back to project owner

9.3 Milestone Payments

Large missions can be structured with milestone releases:

- 30% released at material delivery verification
- 40% released at rough inspection pass
- 30% released at final inspection pass
- DDR held until all milestones complete

10. Technical Architecture

10.1 BuildDAO Dashboard

Dedicated web interface for construction coordination:

- Project timeline view with phase dependencies
- Contractor directory with reputation scores and trade badges
- Bid management for mission acceptance
- Document storage linked to IPFS (plans, permits, inspections)
- Real-time project budget tracking
- Inspection scheduling and verification

10.2 API Extensions

BuildDAO-specific endpoints added to Horizon Service:

- POST /projects/create — Initialize ProjectDAO with phases
- GET /projects/{id}/phases — Phase status and dependencies
- POST /inspections/schedule — Request inspection mission
- POST /inspections/{id}/attest — Inspector submits attestation
- GET /designs/{designDAO}/license — Check license availability
- POST /designs/{designDAO}/purchase — Acquire license NFT

10.3 Mission Dependency Engine

Horizon Service manages phase sequencing:

- ProjectDAO defines dependency graph at creation
- Missions remain hidden until prerequisites complete
- Gate missions (inspections) trigger phase transitions
- Parallel phases supported where dependencies allow
- Critical path visualization for project timeline

11. Implementation Roadmap

Phase	Components	Dependencies
Phase 1	ContractorDAO creation, trade mission types, basic credential NFTs	Core Horizon v2.1 (complete)
Phase 2	ProjectDAO structure, phase dependencies, inspection integration	Phase 1 + Map Layer
Phase 3	DesignDAO, IP licensing NFTs, build attestation	Phase 2 + NFT Engine extensions
Phase 4	MetaGuild formation, insurance pools, apprenticeship programs	Phase 3 + MetaGuild governance
Phase 5	BuildDAO Dashboard, project management UI, contractor	Phases 1-4 complete

12. Diagram Reference

The following diagrams should be created to accompany this specification:

- D30 — BuildDAO Guild Hierarchy (ContractorDAO → ProjectDAO → MetaGuild)
- D31 — Project Phase Dependency Graph
- D32 — BuildDAO Mission Flow (Trade Mission Lifecycle)
- D33 — DesignDAO IP & Licensing Flow
- D34 — Inspection Attestation Sequence
- D35 — BuildDAO Payment Routing (with Design License fees)

Version History

Version	Date	Changes
1.0	January 2026	Initial BuildDAO specification — mission types, guild hierarchy, XP/NFT system, DesignDAO IP model, safety compliance, economic model, implementation

— End of Specification —