# Atomic Task Decomposition — Combined Unified Workflow

This document enumerates all **atomic tasks** present in the COMBINED.nested.yaml workflow. Each task is a single-responsibility operation assigned to a specific role. Branching tasks—where the same operation is performed by different roles—are listed separately.

## Pipeline Layers (Seed Draft → Release & Observe)

atom\_001: Seed Draft: collect\_context | Role: planning\_ai  
atom\_002: Seed Draft: structure\_seed | Role: planning\_ai  
atom\_003: Requirements: derive\_requirements | Role: planning\_ai  
atom\_004: Requirements: classify\_requirements | Role: thinking\_ai  
atom\_005: Scope: compose\_scope | Role: planning\_ai  
atom\_006: Architecture: model\_architecture | Role: planning\_ai  
atom\_007: Contracts: produce\_openapi | Role: contract\_validator  
atom\_008: Contracts: produce\_db\_schema | Role: contract\_validator  
atom\_009: Contracts: produce\_event\_contracts | Role: contract\_validator  
atom\_010: Task Decomposition: decompose | Role: planning\_ai  
atom\_011: Task Decomposition: sequence | Role: thinking\_ai  
atom\_012: Initial Codegen: codegen | Role: codegen\_ai  
atom\_013: Test Hardening: build\_test\_matrix | Role: qa\_test\_agent  
atom\_014: Test Hardening: add\_tests | Role: qa\_test\_agent  
atom\_015: Test Hardening: establish\_coverage | Role: qa\_test\_agent  
atom\_016: Review & Compliance: review | Role: human\_reviewer  
atom\_017: Review & Compliance: review | Role: static\_analysis  
atom\_018: Release & Observe: release\_plan | Role: orchestrator  
atom\_019: Release & Observe: configure\_observability | Role: orchestrator  
atom\_020: Release & Observe: post\_deploy | Role: orchestrator  
atom\_021: Release & Observe: capture\_learnings | Role: orchestrator

## Bridge L11 — Artifact Translation & Repo Bootstrap

atom\_022: Artifact Translation & Repo Bootstrap: repo\_init\_or\_update | Role: git\_ops  
atom\_023: Artifact Translation & Repo Bootstrap: contracts\_transform | Role: contract\_validator  
atom\_024: Artifact Translation & Repo Bootstrap: build\_moddoc | Role: brainstorm\_bridge  
atom\_025: Artifact Translation & Repo Bootstrap: workplan\_to\_execution\_plan | Role: brainstorm\_bridge  
atom\_026: Artifact Translation & Repo Bootstrap: backlog\_to\_change\_requests | Role: brainstorm\_bridge  
atom\_027: Artifact Translation & Repo Bootstrap: handoff\_gate | Role: gate

## Workflow Phase: Plan & Route

atom\_028: Plan & Route > Change Analysis: parse\_change\_request | Role: planning\_ai  
atom\_029: Plan & Route > Change Analysis: analyze\_affected\_files | Role: planning\_ai  
atom\_030: Plan & Route > Change Analysis: assess\_change\_complexity | Role: thinking\_ai  
atom\_031: Plan & Route > Change Analysis: calculate\_resource\_requirements | Role: cost\_resource\_manager  
atom\_032: Plan & Route > Tool & Role Selection: select\_primary\_tools | Role: orchestrator  
atom\_033: Plan & Route > Tool & Role Selection: establish\_fallback\_chains | Role: orchestrator  
atom\_034: Plan & Route > Tool & Role Selection: validate\_tool\_availability | Role: orchestrator  
atom\_035: Plan & Route > Tool & Role Selection: enforce\_cost\_limits | Role: cost\_resource\_manager  
atom\_036: Plan & Route > Execution Planning: decompose\_requirements | Role: planning\_ai  
atom\_037: Plan & Route > Execution Planning: create\_workstreams | Role: orchestrator  
atom\_038: Plan & Route > Execution Planning: establish\_quality\_gates | Role: qa\_test\_agent  
atom\_039: Plan & Route > Execution Planning: configure\_rollback\_points | Role: resilience\_agent  
atom\_040: Plan & Route > Preflight Gates: schema\_check | Role: orchestrator  
atom\_041: Plan & Route > Preflight Gates: secrets\_license\_policy\_scan | Role: security\_compliance  
atom\_042: Plan & Route > Preflight Gates: record\_gate\_results | Role: orchestrator

## Workflow Phase: Execute & Validate

atom\_043: Execute & Validate > Code Generation: generate\_code\_modifications | Role: work\_cli\_tools  
atom\_044: Execute & Validate > Code Generation: apply\_changes\_atomically | Role: repo\_ai  
atom\_045: Execute & Validate > Code Generation: validate\_with\_vscode | Role: ide\_code\_editor  
atom\_046: Execute & Validate > Quality Validation: linting\_formatting\_typecheck | Role: qa\_test\_agent  
atom\_047: Execute & Validate > Quality Validation: security\_scanning | Role: security\_compliance  
atom\_048: Execute & Validate > Quality Validation: performance\_checks | Role: qa\_test\_agent  
atom\_049: Execute & Validate > Testing: run\_existing\_tests | Role: qa\_test\_agent  
atom\_050: Execute & Validate > Testing: generate\_new\_tests\_if\_needed | Role: planning\_ai  
atom\_051: Execute & Validate > Testing: measure\_coverage\_and\_regressions | Role: qa\_test\_agent  
atom\_052: Execute & Validate > Resilience & Recovery: rollback\_branch | Role: resilience\_agent  
atom\_053: Execute & Validate > Resilience & Recovery: retry\_with\_backoff\_or\_fallback | Role: resilience\_agent  
atom\_054: Execute & Validate > Resilience & Recovery: requeue\_modified\_plan | Role: orchestrator

## Workflow Phase: Ship & Monitor

atom\_055: Ship & Monitor > Merge Coordination: create\_integration\_branch | Role: merge\_coordinator  
atom\_056: Ship & Monitor > Merge Coordination: apply\_merge\_train\_strategy | Role: merge\_coordinator  
atom\_057: Ship & Monitor > Merge Coordination: resolve\_conflicts | Role: merge\_coordinator  
atom\_058: Ship & Monitor > Merge Coordination: escalate\_failures | Role: resilience\_agent  
atom\_059: Ship & Monitor > Merge Coordination: run\_integration\_gates | Role: qa\_test\_agent  
atom\_060: Ship & Monitor > Merge Coordination: run\_integration\_gates | Role: security\_compliance  
atom\_061: Ship & Monitor > Pull Request & Review: generate\_pr\_documentation | Role: docs\_summarizer  
atom\_062: Ship & Monitor > Pull Request & Review: open\_pr | Role: repo\_ai  
atom\_063: Ship & Monitor > Pull Request & Review: automated\_review\_analysis | Role: thinking\_ai  
atom\_064: Ship & Monitor > Pull Request & Review: automated\_review\_analysis | Role: qa\_test\_agent  
atom\_065: Ship & Monitor > Pull Request & Review: human\_review\_if\_needed | Role: human\_oversight  
atom\_066: Ship & Monitor > Final Merge & Deployment: squash\_merge | Role: repo\_ai  
atom\_067: Ship & Monitor > Final Merge & Deployment: tag\_release\_candidate | Role: repo\_ai  
atom\_068: Ship & Monitor > Final Merge & Deployment: validate\_post\_merge\_deployment | Role: qa\_test\_agent  
atom\_069: Ship & Monitor > Observability & Optimization: collect\_metrics | Role: orchestrator  
atom\_070: Ship & Monitor > Observability & Optimization: collect\_metrics | Role: cost\_resource\_manager  
atom\_071: Ship & Monitor > Observability & Optimization: analyze\_trends\_and\_bottlenecks | Role: thinking\_ai  
atom\_072: Ship & Monitor > Observability & Optimization: propose\_improvements | Role: docs\_summarizer  
atom\_073: Ship & Monitor > Observability & Optimization: propose\_improvements | Role: planning\_ai

## Extended Deterministic Pipeline Stages & Workstreams

The following atoms extend the pipeline with additional deterministic stages and parallel workstreams from the deep-merge/multi configuration.

atom\_074: Stage 0 — Prep Environment: install\_dependencies\_lock | Role: cost\_resource\_manager  
atom\_075: Stage 0 — Prep Environment: audit\_dependencies | Role: security\_compliance  
atom\_076: Stage 1 — Hygiene: format\_code | Role: qa\_test\_agent  
atom\_077: Stage 1 — Hygiene: lint\_code\_fix | Role: qa\_test\_agent  
atom\_078: Stage 2 — Correctness: typecheck\_code | Role: qa\_test\_agent  
atom\_079: Stage 2 — Correctness: run\_tests | Role: qa\_test\_agent  
atom\_080: Stage 2 — Correctness: enforce\_coverage | Role: qa\_test\_agent  
atom\_081: Stage 3 — Contracts & Migrations: api\_contract\_check | Role: contract\_validator  
atom\_082: Stage 3 — Contracts & Migrations: db\_contract\_check | Role: contract\_validator  
atom\_083: Stage 4 — Security & Advisory: security\_review | Role: security\_compliance  
atom\_084: Stage 4 — Security & Advisory: advisory\_review | Role: human\_reviewer  
atom\_085: Stage 4 — Security & Advisory: generate\_pr\_comments | Role: docs\_summarizer  
atom\_086: Stage 6 — Fan-in: collect\_change\_requests | Role: orchestrator  
atom\_087: Stage 6 — Fan-in: generate\_artifacts\_manifest | Role: orchestrator  
atom\_088: Stage 6 — Fan-in: dedupe\_change\_requests | Role: orchestrator  
atom\_089: Stage 6 — Fan-in: score\_and\_rank\_change\_requests | Role: planning\_ai  
atom\_090: Stage 7 — Dry-Run & Conflict Scan: simulate\_merge\_train | Role: merge\_coordinator  
atom\_091: Stage 7 — Dry-Run & Conflict Scan: conflict\_scan | Role: merge\_coordinator  
atom\_092: Stage 8 — Validate Aggregated: typecheck\_aggregated\_changes | Role: qa\_test\_agent  
atom\_093: Stage 8 — Validate Aggregated: run\_aggregated\_tests | Role: qa\_test\_agent  
atom\_094: Stage 8 — Validate Aggregated: enforce\_aggregated\_coverage | Role: qa\_test\_agent  
atom\_095: Stage 8 — Validate Aggregated: aggregated\_api\_contract\_check | Role: contract\_validator  
atom\_096: Stage 8 — Validate Aggregated: export\_public\_surface | Role: docs\_summarizer  
atom\_097: Stage 8 — Validate Aggregated: golden\_diff\_public\_surface | Role: qa\_test\_agent  
atom\_098: Stage 9 — Quality Gates: summarize\_gates | Role: qa\_test\_agent  
atom\_099: Stage 10 — Self-Healing Loop: route\_failures\_to\_streams | Role: resilience\_agent  
atom\_100: Stage 11 — Prepare Merge: compose\_release\_notes | Role: docs\_summarizer  
atom\_101: Stage 11 — Prepare Merge: prepare\_prs | Role: repo\_ai  
atom\_102: Stage 12 — Join & Ship: execute\_merge\_train | Role: merge\_coordinator  
atom\_103: WS1\_FORMAT: checkout\_branch\_ws\_format | Role: repo\_ai  
atom\_104: WS1\_FORMAT: run\_format | Role: qa\_test\_agent  
atom\_105: WS1\_FORMAT: run\_lint\_fix | Role: qa\_test\_agent  
atom\_106: WS2\_LINT: checkout\_branch\_ws\_lint | Role: repo\_ai  
atom\_107: WS2\_LINT: run\_lint | Role: qa\_test\_agent  
atom\_108: WS2\_LINT: run\_typecheck\_warn | Role: qa\_test\_agent  
atom\_109: WS3\_CONTRACTS: checkout\_branch\_ws\_contracts | Role: repo\_ai  
atom\_110: WS3\_CONTRACTS: run\_api\_contract\_check | Role: contract\_validator  
atom\_111: WS3\_CONTRACTS: run\_db\_contract\_check | Role: contract\_validator  
atom\_112: WS4\_TESTS: checkout\_branch\_ws\_tests | Role: repo\_ai  
atom\_113: WS4\_TESTS: run\_tests\_report | Role: qa\_test\_agent  
atom\_114: WS4\_TESTS: run\_coverage\_min | Role: qa\_test\_agent  
atom\_115: WS5\_SECURITY: checkout\_branch\_ws\_security | Role: repo\_ai  
atom\_116: WS5\_SECURITY: run\_security\_review | Role: security\_compliance  
atom\_117: WS6\_DEPS: checkout\_branch\_ws\_deps | Role: repo\_ai  
atom\_118: WS6\_DEPS: run\_deps\_install\_lock | Role: cost\_resource\_manager  
atom\_119: WS6\_DEPS: run\_deps\_audit | Role: security\_compliance  
atom\_120: WS7\_MIGRATIONS: checkout\_branch\_ws\_migrations | Role: repo\_ai  
atom\_121: WS7\_MIGRATIONS: run\_migrations\_check | Role: contract\_validator  
atom\_122: WS8\_SURFACE: checkout\_branch\_ws\_api\_surface | Role: repo\_ai  
atom\_123: WS8\_SURFACE: export\_public\_surface | Role: docs\_summarizer  
atom\_124: WS8\_SURFACE: golden\_diff\_public\_surface | Role: qa\_test\_agent  
atom\_125: WS9\_DOCTEST: checkout\_branch\_ws\_doctest | Role: repo\_ai  
atom\_126: WS9\_DOCTEST: run\_doctest | Role: qa\_test\_agent  
atom\_127: WS10\_MERGE\_TRAIN: checkout\_branch\_ws\_merge\_train | Role: repo\_ai  
atom\_128: WS10\_MERGE\_TRAIN: simulate\_merge\_train | Role: merge\_coordinator  
atom\_129: WS10\_MERGE\_TRAIN: conflict\_scan | Role: merge\_coordinator