



**Facilities
Construction
Commission**



OHIOBIMS Delivery Team Implementation Guide

Practical guidance for design and construction teams

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Table of Contents

1. Introduction	3
2. Purpose of This Guide	4
2.1 This guide is for:	4
2.2 How This Guide Relates to State of Ohio BIM Standards	4
3. Quick Start: Essential Steps for Delivery Teams	5
3.1 Design Phase Kickoff	5
3.2 Construction Phase Kickoff	6
4. Understanding Your BIM Deliverables	8
4.1 Core Deliverables Required on All Projects	8
4.2 Model Definitions and Progression	8
4.3 Level of Development (LOD) Requirements	10
5. Preparing Your BEP	11
5.1 Use the State Template	11
5.2 Required BEP Content	11
5.3 BEP Approval Process	12
5.4 Model Element Table (MET) Guidance	12
6. Common Data Environment (CDE) Requirements	13
6.1 CDE Setup	13
6.2 File Naming Convention (CRITICAL)	13
7. Coordinate System Requirements (CRITICAL)	15
7.1 Ohio State Plane Zones	15
7.2 Why This Matters	15
8. Modeling Standards and Best Practices	16
8.1 Use State-Provided Revit Templates	16
8.2 Model Organization	16
8.3 Worksets Organization	17
8.4 Levels and Grids	17

8.5 Rooms and Spaces	17
9. Asset Data Requirements (AIR / FIM / SAID)	19
9.1 What is Asset Data?	19
9.2 SAID Worksheets and the FIM Schema	20
9.3 Minimum Viable BIM for Facility Management (MV-BIM-FM)	21
9.4 Unique Asset Identification	21
9.5 Data Collection Workflow	22
9.6 Essential and Extended AIR Tiers	22
9.7 SAID Delivery Mechanism and Acceptance	24
10. Quality Control and Common Errors to Avoid	26
10.1 Your QC Responsibilities	26
10.2 Top 10 Reasons BIM Deliverables Get Rejected	26
10.3 Pre-Submission Checklist	28
11. Collaboration and Coordination Requirements	29
11.1 Required BIM Meetings	29
11.2 Clash Detection Requirements	29
11.3 Model Sharing and Version Control	30
12. Closeout and Turnover	31
12.1 Closeout Deliverables Checklist	31
12.2 Record Model Requirements	31
12.3 Asset Data Completeness Validation	31
12.4 Owner Acceptance Process	32
13. Resources and Support	33
13.1 Available Templates and Tools	33
13.2 Getting Help	33
13.3 Agency-Specific Requirements	33
14. Summary: Keys to Successful BIM Delivery	34

1. Introduction

Note on the term “Owner” — In this document, “Owner” means the State of Ohio entity that commissions the project. On many projects, the Ohio Facilities Construction Commission (OFCC) and the operating state agency act jointly as Owner; “Owner” refers to either or both as applicable to the project.

This guide is designed to help architects, engineers, contractors, consultants, and others (collectively, the "Delivery Team") successfully deliver projects that comply with the Ohio BIM Standard (OHIOBIMS).

OHIOBIMS applies to projects whose procurement and executed contract documents incorporate it. The procurement package identifies the applicable editions, BIM Uses, model deliverables, AIR tier and project-specific requirements. Later releases do not automatically amend an existing contract. Agency applicability, delivery method and any statutory threshold are confirmed in procurement/legal review, not inferred from an A/E fee or undefined total-project-value test.

OHIOBIMS establishes consistent requirements for Building Information Modeling (BIM) across all State of Ohio capital facility projects. Whether you are designing a new K-12 school for the Ohio Facilities Construction Commission (Owner), renovating a veteran’s home, building a correctional facility, or delivering infrastructure for the Ohio Department of Transportation (ODOT), this guide will help you understand what is required and how to deliver it efficiently. The standard is based on the National BIM Standard – United States Version 4 (NBIMS-US v4) and incorporates proven best practices from Federal agencies such as the General Services Administration (GSA), Veteran’s Administration (VA), private sector implementations (including Ohio State University's decade-long BIM program), and input from Ohio design and construction professionals.

2. Purpose of This Guide

This guide provides practical, actionable guidance on:

- Understanding your BIM deliverable requirements
- Organizing your team and assigning BIM roles
- Setting up and using the CDE
- Meeting modeling and data requirements efficiently
- Preparing your BEP
- Quality control procedures to avoid common errors
- Asset data collection and handover for facility management

2.1 This guide is for:

- Design BIM Managers and Discipline BIM coordinators
- Construction BIM Managers and trade coordinators
- Project managers overseeing BIM delivery
- Architects, engineers, and other consultants developing design models
- General contractors and trade contractors developing construction and fabrication models
- Commissioning agents and closeout coordinators handling asset data handover

2.2 How This Guide Relates to State of Ohio BIM Standards

The complete OHIOBIMS is the authoritative technical standard. This guide extracts and organizes the requirements that directly affect the Delivery Team into a workflow-oriented format. When in doubt, refer to the complete OHIOBIMS document. All contract requirements take precedence over this guide.

3. Quick Start: Essential Steps for Delivery Teams

3.1 Design Phase Kickoff

Step 1: Schedule BIM Kickoff Meeting

- Schedule a BIM kickoff meeting to occur within 30 business days of contract award notification
- Attendees: Contracting Authority's Project Manager and BIM Manager, Design BIM Manager, Discipline BIM Coordinators, designated Owner representatives and BIM Closeout Coordinator as appropriate. The A/E or AOR designates the BIM Closeout Coordinator; the Owner's reviewer separately oversees compliance and acceptance.
- Agenda: Review project-specific BIM goals, confirm deliverable schedule, discuss CDE setup, clarify any agency-specific requirements

Step 2: Assign BIM Roles

- Designate a Design BIM Manager (subject to Owner approval)
- Assign Discipline BIM coordinators for each major discipline (architecture, structural, MEP, civil, etc.)
- Document all roles and contact information in your BEP

Step 3: Develop and Submit BEP

- Use the State of Ohio BEP template (required)
- Define BIM Uses for the project (at a minimum this will include design authoring, design coordination, record modeling, and asset management)
- Complete the MET showing who models what and to what Level of Development (LOD) at each project defined milestone in the BEP
- Prepare the BEP as soon as practical after the contract date and when new BIM Users are added, subject to the project's stated submission deadline. Modifications to the BEP and incorporated standards shall follow the applicable contractual change procedure. Under Exhibit §3.1.4.1, adjustment claims arising from received BEP protocols require notice to the Contracting Authority and Owner within 30 days of receipt; failure to give notice waives those claims.

Step 4: Set Up Common Data Environment (CDE)

- Projects will use Autodesk Construction Cloud (ACC) unless otherwise specified by the Owner
- Establish standard folder structure per OHIOBIMS requirements

- Configure role-based permissions (read/write access to model components will generally be restricted by discipline)
- Implement file naming conventions

Step 5: Use State-Provided Templates

- Download and use Ohio Revit templates for your discipline (e.g., ARCH, MEP, STRUC)
- Templates include pre-configured browser organization, view templates, shared parameters, and annotation standards
- Revit teams may use compliant firm authoring templates and content. A non-Revit pathway may be accepted when its IFC-compliant deliverables satisfy the project AIR and documented geometry, coordinate, identifier, property and exchange checks. Record the pathway and validation evidence in the BEP. Product-specific authoring arrangements are implementation guidance unless expressly required by the project contract.

3.2 Construction Phase Kickoff

Step 1: Construction BIM Kickoff Meeting

- Schedule Construction BIM Kickoff Meeting within 15 business days of construction contract award
- Attendees: Design BIM Manager, Construction BIM Manager, trade BIM coordinators, Owner Project Manager, and Owner BIM Coordinator
- Review design models, coordinate handoff, update BEP for construction phase

Step 2: Update BEP

- Construction BIM Manager updates BEP to include construction-phase BIM Uses (e.g., coordination, fabrication, as-built documentation)
- Add all subcontractors and trade coordinators to the BEP roles table; configure role-based permissions in CDE, and remove design-phase BIM Discipline Coordinators as appropriate
- Update the BEP through the applicable contract process when trades/new BIM Users join. Assign LOD 350 to identified coordination interfaces and LOD 400 to contracted fabrication scope.

Step 3: Establish Construction Coordination Process

- Set up clash detection environment (Navisworks or ACC Model Coordination)
- Define clash detection meeting schedule (typically weekly during major coordination periods)
- Establish clash resolution workflow and responsibility matrix

Step 4: Plan Asset Data Collection

- Review Asset Information Requirements (AIR) and Asset Attribute Tables for your project
- Identify which trade is responsible for collecting data for each asset type
- Document manufacturer, model, serial number, warranty information as equipment is installed

4. Understanding Your BIM Deliverables

4.1 Core Deliverables Required on All Projects

Every State of Ohio project with BIM requirements must deliver:

Deliverable	Due When	Responsible Party
BIM Execution Plan (BEP)	Within 30 days of contract execution	Design BIM Manager (design phase)
Design Model Phases (typically 30%, 60%, 90%, 100%)	Per project milestone schedule	Design Team Discipline Coordinators
Updated Model for Construction Coordination Meetings	Weekly or per BEP schedule during construction	Construction BIM Manager and trades
As-Built Model	At project substantial completion	Construction BIM Manager
Record Model	At final project closeout	Design team or designated closeout coordinator
Asset Data Worksheets	At final project closeout	Construction BIM Manager with trade input

Table 1: Core BIM Deliverables

4.2 Model Definitions and Progression

OHIOBIMS defines distinct model types that support different project purposes across the lifecycle. Model type and Level of Development (LOD) are related but are not the same thing: a model type describes the role of the model in the project workflow, while LOD describes the degree of development and reliability of individual model elements for authorized uses. Model progression shall follow the project lifecycle and the requirements defined in the BIM Execution Plan (BEP) and Model Element Table (MET). Unless otherwise required by contract, the following definitions and typical ranges apply.

A model-type label or LOD does not independently establish contractual status or authorized reliance. The approved non-editable federation has the status established by the Exhibit; working coordination and construction models do not automatically supersede it

Design Intent Model

- Primary models are prepared by the design team to develop the design and generate contract documents.
- Used for design authoring, owner review, analysis, interdisciplinary coordination, and documentation.

- Typically progresses from LOD 200 at 30 percent design, to LOD 300 at 60 percent design, to LOD 300 at 90 percent and 100 percent for the design intent baseline, unless the BEP/MET requires a different element-specific progression.
- Delivered at project-defined milestones established in the BEP, typically including 30 percent, 60 percent, 90 percent, and 100 percent submissions.

Construction Model

- Model developed by the contractor, construction manager, and trades from the design intent model to support coordination, detailing, and installation planning.
- May include trade-specific content, fabrication logic, means-and-methods support, and enhanced interface detail where required for construction execution.
- Typically advances to LOD 350 for detailed coordination and to LOD 400 where fabrication-level modeling, spool drawings, or prefabrication are required.
- Progression shall be based on trade scope and project need rather than assuming all construction content must reach a single uniform LOD.

As-Built Model

- Model that captures installed conditions at or near project completion using verified field information, approved changes, and incorporated RFI and change-order outcomes.
- May be derived from the construction model, the design intent model, or a coordinated combination of both, depending on project delivery and authoring responsibility.
- Should not automatically be defined as LOD 350-400 in all cases; where the contract requires field-verified installed conditions for model elements, those elements may be developed to LOD 500.
- Delivered in the format required by the contract documents and BEP, which may include a non-editable coordination reference such as Navisworks NWD.

Record Model

- Owner-facing model prepared for turnover and long-term operations use.
- Derived from verified project information and structured to support facility management, space management, maintenance workflows, and future renovation planning.
- Often maintained as a lighter, more usable operations model than the full construction model, with the required asset data and spatial references needed for owner systems.

- Commonly delivered in native editable format such as Revit RVT when required for future owner use.
- The record model may remain at LOD 300 or LOD 350 for many elements if that is sufficient for owner operations, while selected elements may require higher verified development only where contractually required.

4.3 Level of Development (LOD) Requirements

OHIOBIMS adopts the BIMForum Level of Development (LOD) Specification as the basis for defining model element progression. LOD describes the degree to which model elements and associated information may be relied upon for specific downstream uses, including design coordination, quantity takeoff, fabrication, installation, and operations planning. LOD requirements shall be assigned by element or system in the project Model Element Table (MET) and documented in the BIM Execution Plan (BEP). Unless the contract documents state otherwise, the following progression should be treated as the typical baseline alignment for State of Ohio projects.

- Pre-Design / Programming: LOD 100.
- 30 percent Design / Schematic Design: LOD 200.
- 60 percent Design / Design Development: LOD 300.
- 90 percent Design / Construction Documents: LOD 300-350.
- 100 percent Design / Issued for Construction: typically, LOD 350 unless higher development is required for specific systems.
- Construction / Fabrication: LOD 400 where fabrication-level modeling is required.
- As-Built / Record Conditions: LOD 500 only where field-verified installed conditions are required by contract.

This baseline shall not be interpreted to mean that every model element must progress uniformly at every milestone. Different systems may require different levels of development at different times based on project delivery method, procurement strategy, coordination demands, facility type, and owner information requirements. The Owner BIM Coordinator shall verify milestone compliance against the MET and BEP rather than against a blanket project-wide LOD assumption. If a project requires earlier advancement of selected systems, such as primary structural steel, major MEP systems, prefabricated assemblies, or owner-critical assets, those requirements shall be explicitly identified in the contract documents and BEP.

5. Preparing Your BEP

The BEP shall be based upon the State of Ohio BEP template. An alternate presentation shall preserve and cross-reference all required elements and receive the applicable approval. Submit as soon as practical within the project's contractual deadline.

5.1 Use the State Template

OHIOBIMS provides a BEP in a variety of formats for your convenience.

- XLSX
- PDF version
- Fillable HTML version

5.2 Required BEP Content

Your BEP must include ALL of the following sections:

- **1. Project Information and Contacts** - Project name, location, Owner, contract number, project team organization chart and roster with Owner-side and Delivery Team project managers
- **2. Project Milestones and Schedule** - Design milestones (30%, 60%, 90%), construction milestones, BIM deliverable dates
- **3. BIM Goals and Objectives** - Owner-specific goals, facility management integration requirements
- **4. Organizational Roles and BIM Responsibilities** - Names and contact information for individuals assigned to each BIM role
- **5. BIM Use Cases** - Identify which BIM Uses apply to this project (design authoring, coordination, energy analysis, asset management, etc.)
- **6. Model Element Table (MET)** - Identify who models what, at what LOD, at each milestone
- **7. Collaboration Procedures** - Meeting schedule, clash detection workflow, issue resolution process
- **8. Technology Infrastructure** - Software platforms, versions, file formats, CDE configuration
- **9. CDE Framework** - Folder structure, file naming, permissions, version control
- **10. Quality Control Procedures** - QA/QC checklists, validation steps, reporting

- **11. Information Exchange Requirements** - Formats for coordination (IFC), deliverables, data handover
- **12. Deliverables Schedule** - What is delivered when, and in what format
- **13. Turnover Requirements** - Asset data content and format, record model specifications, and CMMS integration approach

5.3 BEP Approval Process

Within 30 days after BEP acceptance, demonstrate the approved workflow to the Owner, unless the Contract specifies otherwise. Resubmit required demonstration-related changes within 10 business days. The Exhibit's separate adjustment-claim notice period runs from receipt of the BEP, not from submission, acceptance or demonstration

- Review BEP for clarification
- Verify CDE structure and access controls
- Demonstrate file naming and version control
- Confirm coordinate system alignment (Ohio State Plane)
- Review data export procedures for facility management If modifications are required, you have 10 business days to update and resubmit.

5.4 Model Element Table (MET) Guidance

Organize the MET using the project's approved, versioned element code list. Record author, milestone, geometry, information and authorized use. Use CD LOD 300 as the design baseline with identified LOD 350 interfaces, subject to the approved revision and project requirements.

- Which building elements will be modeled
- Which discipline is responsible for authoring each element
- What LOD is required at each milestone (30%, 60%, 90%, construction, as-built)

If the Owner has not provided a facility-specific MET template, you must create one and submit it as part of your BEP.

6. Common Data Environment (CDE) Requirements

All project information must be managed through a CDE. For State of Ohio projects, this will typically be Autodesk Forma unless otherwise specified.

6.1 CDE Setup

The Design BIM Manager is responsible for configuring the CDE at project start:

- Create project in ACC with Docs, Design Collaboration, and Model Coordination enabled
- Set up standard folder structure per OHIOBIMS (e.g., discipline folders, coordination folders, deliverables folders)
- Configure role-based permissions (company or role level only, NOT individual user level)
- Establish file naming conventions, which MUST follow State of Ohio standard

6.2 File Naming Convention (CRITICAL)

Use a stable working-model base name with the actual approved extension. For example, **[ProjectNumber]_[BuildingId]_[Discipline]_[Area]**. Manage working revisions through CDE version history. Use the approved issue/revision suffix for frozen deliverables; sheet PDFs retain their approved sheet identifiers. Publish controlled new versions without destroying prior versions or issue records

Example: OFCC260014_BLDG123_ARCH_01_R2.RVT

Discipline Codes:

- ARCH - Architecture
- STRUC - Structural
- MECH - Mechanical
- ELEC - Electrical
- PLUMB - Plumbing
- FP - Fire Protection
- CIVIL - Civil/Site
- LAND - Landscape

- EQUIP - Equipment

Rules:

- Files that do not comply with naming conventions SHALL NOT be published to the CDE
- Sheet PDFs must include sheet number (e.g., A-303.pdf)
- Use relative paths for linked models (not absolute local paths)

Folder Structure — Minimum required folders in the CDE:

- Administrative and contractual documents
- Discipline-specific model folders (ARCH, STRUC, MECH, ELEC, etc.)
- Shared/coordination model folders
- Drawings/PDFs and record documents
- Submittals and reference information
- Turnover/closeout data

Do NOT create ad hoc or non-standard folders. Additional folders may be created only with Owner approval and must be documented in the BEP.

7. Coordinate System Requirements (CRITICAL)

ALL final models, site plans, and construction drawings MUST be delivered in the correct Ohio State Plane Coordinate System (SPCS). This is not optional. Incorrect coordinate systems are a common cause of BIM deliverable rejection.

7.1 Ohio State Plane Zones

Select Ohio State Plane North (FIPS 3401) or South (FIPS 3402) by county under ORC 157.01, not by a latitude shortcut. Franklin and Licking are South; Allen, Auglaize, Mercer and Shelby are North. Record the full horizontal CRS, datum realization, units, applicable EPSG identifier, vertical datum/geoid, survey control and local-to-shared-coordinate transformation in the BEP. For example, NAD83(2011) / Ohio North (US survey feet) uses EPSG:6549 and the corresponding South system uses EPSG:6551; these are examples, not a blanket datum selection. Preserve georeferencing while keeping authoring geometry within the selected platform's supported local-coordinate range.

7.2 Why This Matters

Correct georeferencing is critical for:

- Integration with Owner GIS systems
- Coordination between multiple buildings on a campus
- Site/civil coordination with infrastructure databases (e.g., utility locations)
- Future facility expansions and renovations
- Emergency response and asset location for field staff In Revit, align your Project Base Point with the Internal Origin. Do NOT use absolute elevations relative to Internal Origin, as this can exceed Revit's accuracy radius.

8. Modeling Standards and Best Practices

8.1 Use State-Provided Revit Templates

State of Ohio provides discipline-specific Revit templates:

- Ohio Revit 2024 Template ARCH.RTE
- Ohio Revit 2024 Template MEP.RTE

Additional templates available for structural and other disciplines. These templates include:

- Pre-configured Project Browser organization
- Standard view templates and filters
- Shared parameters for asset data collection
- Annotation styles and title blocks
- Workset naming standards

Delivery Teams may use compliant firm Revit authoring templates and content. A non-Revit pathway may be accepted when its IFC-compliant deliverables satisfy the project AIR and documented geometry, coordinate, identifier, property and exchange checks. Record the pathway and validation evidence in the BEP. Product-specific authoring arrangements are implementation guidance unless expressly required by the project contract. Verify the template inventory and parameter-mapping counts against the actual released files. Publish edition, status, supported platform and limitations. The canonical parameter file and AIR-to-FIM mapping must agree on field types, units and bindings.

8.2 Model Organization

Follow these organization principles:

- Separate or combine discipline authoring files as documented in the BEP. Combined MEP models are permitted when discipline authorship, edit responsibility, filtering and required coordination exchanges remain clear.
- Do NOT separate models by floor unless project size requires it

- Use linked reference models for coordination – do not model other disciplines' scope in your file
- Model building elements in the appropriate discipline file (e.g., structural engineer models structure, MEP models systems)

8.3 Worksets Organization

Where Revit Cloud Worksharing is selected, coordinate workset use within the team. Other approved authoring workflows are permitted. Coordinate level names, elevations and grids across delivered models; internal view organization may follow firm standards if required outputs remain clear.

- Follow State of Ohio workset naming standards (defined in templates)
- Create user-created worksets for major building systems or areas
- Assign elements to appropriate worksets for visibility control
- Do NOT delete or rename worksets without team coordination

8.4 Levels and Grids

Levels and grids provide the spatial framework for the model:

- Level names must correspond to building stories (e.g., Level 1, Level 2, Roof)
- One Floor Plan, Reflected Ceiling Plan, and Structural Plan per level
- Grid names must be consistent across all discipline models
- Coordinate level and grid changes across the entire project team

8.5 Rooms and Spaces

Rooms (architectural) and Spaces (MEP) define occupiable areas:

Architectural Models:

- Use Rooms for space programming and area calculations
- Place rooms after walls and floors are modeled
- Include Room Number, Room Name, Department, Area, Finishes

MEP Models:

- Use Spaces for system analysis and load calculations
- Spaces must align with architectural room boundaries (link architectural model)
- Engineering analytical Spaces may intentionally differ from architectural Rooms

where needed for system analysis, load sizing or zoning. Document the purpose and Room-to-analytical-Space mapping in the BEP; preserve the owner-facing Room/Space identifiers and boundaries used by the FIM.

- Unexplained or uncoordinated differences are QC issues; documented analytical differences are not automatic failures.

9. Asset Data Requirements (AIR / FIM / SAID)

Three terms govern asset information delivery on every State of Ohio project — AIR = requirement, FIM = schema, SAID = deliverable. The Owner's Asset Information Requirement (AIR), set in the Project BIM Requirements (PBR) and inherited by the BEP, defines what asset data must be delivered and at what tier. The Facility Information Matrix (FIM) — published as Appendix B of the OHIOBIMS standard — is the schema that defines the worksheet structure, field names, data types, and validation rules. The Structured Asset Information Deliverable (SAID) is the contractor's actual handover: the populated worksheets, CSV and PDF exports, and the AIR Compliance Card that together conform to the FIM and satisfy the AIR.

One of the primary goals of OHIOBIMS is to reduce asset information onboarding time from 1-2 years to 2-3 months. This requires complete, accurate asset data at project turnover. Asset data collection is NOT a last-minute closeout activity. Plan for it from project start.

9.1 What is Asset Data?

Asset data is structured information about maintainable building equipment and systems that the Owner needs to operate and maintain the facility. This includes:

- Unique asset identifier (tag number)
- Asset classification (OmniClass Table 23)
- Manufacturer name
- Model number
- Serial number (as installed)
- Installation date
- Warranty start date and duration
- Expected service life
- Maintenance frequency and procedures
- Technical specifications (capacity, voltage, flow rate, etc.)
- Location (building, floor, room number)
- Links to O&M manuals, cut sheets, warranties

9.2 SAID Worksheets and the FIM Schema

Your project's SAID is delivered as a structured set of worksheets that conform to the Facility Information Matrix (FIM) schema published in Appendix B of the OHIOBIMS standard. The AIR defines which assets must be documented and which attributes are required; the FIM defines the worksheet container those attributes live in. The SAID worksheets include the following tabs:

- Facility - Portfolio record and area baseline
- Floor - Vertical navigation and area reporting
- Space - Space management, occupancy tracking
- Zone - Systems mapping and cost allocation
- Component - Individual assets (equipment) requiring maintenance
- Type - Manufacturer/model information for asset types
- Document - Links to O&M manuals, warranties, submittals

Tier Selection (Essential vs Extended)

The FIM tabs above are common to both AIR tiers established in State of Ohio BIM Standards. The tier selected in the Project BIM Requirements (PBR) determines which fields within each tab are required and whether the Extended-tier registers (Systems, Zones, Spares, Documents, and Spaces) must also be delivered. Section 9.6 defines the field-level requirements for each tier; this section defines the SAID worksheet container (per FIM Appendix B) that those fields sit in.

Essential Tier (Default)

The Component tab is populated with the twelve required per-asset fields. The Space, Floor, and Facility tabs provide the spatial scaffolding referenced by the Component records. The Zone, Type, and Document tabs are optional under the Essential tier and may be left empty unless required by contract.

Extended Tier (Mission-Critical and Large Projects)

The Component tab is populated with the Essential twelve fields plus approximately fifteen to eighteen additional per-asset fields. Five additional registers are also delivered as separate FIM worksheets: Systems, Zones, Spares, Documents, and Spaces.

Cross-references between Component records and these registers (Asset System, Space ID, Document Reference, etc.) must resolve at submission for the Compliance Card to pass.

9.3 Minimum Viable BIM for Facility Management (MV-BIM-FM)

State of Ohio requires Minimum Viable BIM (MV-BIM) for facility management. This means:

Spatial Model Requirements:

- Building and floor hierarchy
- Space/room objects with correct areas and boundaries
- Zone objects grouping spaces by system or function
- AIR:
 - a. 100% of in-scope assets represented in Component worksheet
 - b. 100% of Components have valid Space reference (building/floor/room)
 - c. No Components reference non-existent Spaces

In-scope asset categories (typical - confirm against your AIR):

- HVAC equipment (air handlers, boilers, chillers, pumps, heat exchangers, VAV boxes)
- Plumbing equipment (water heaters, pumps, backflow preventers, water treatment)
- Electrical equipment (switchgear, panels, transformers, generators, battery backups)
- Vertical transportation (elevators, escalators, lifts)
- Life safety equipment (fire alarm panels, sprinkler risers, fire pumps, extinguishers)
- Building envelope elements (roof hatches, overhead doors)

9.4 Unique Asset Identification

Every maintainable asset MUST have a Unique Asset Identifier (UAI) that is:

- Identical across: BIM model object, FIM Component row, physical asset tag, CMMS system
- Permanent and unchanging throughout asset lifecycle
- Follows format defined in AIR (e.g., AHU-1, PUMP-DHW-1, PANEL-E-2A)

Example: An air handling unit tagged as "AHU-1" must be:

- Named "AHU-1" in the Revit model
- Listed as "AHU-1" in the Component worksheet
- Physically tagged "AHU-1" on the installed equipment
- Entered as "AHU-1" in the State's CMMS upon handover

9.5 Data Collection Workflow

Successful asset data collection requires planning throughout project development:

During Design:

- Include Revit shared parameters for asset attributes in design models
- Populate manufacturer and model number from specifications
- Establish unique asset ID naming convention
- Reference the Asset Attribute Map tab in the OHIOBIMS Asset —> Revit Parameter Mapping workbook to identify required asset attributes before populating data.

During Construction:

- Update models with actual installed equipment (substitutions, model changes)
- Collect serial numbers as equipment is installed
- Record installation dates
- Collect warranty documentation and link to components

At Closeout:

- Export complete SAID worksheets from models
- Validate 100% completeness of required fields
- Verify spatial references (every asset has correct building/floor/space)
- Submit for Owner review and acceptance

9.6 Essential and Extended AIR Tiers

State of Ohio BIM Standards establishes a two-tier framework for AIR delivery. The tier framework defines the minimum per-asset field set and validation expectations and operates alongside the FIM schema (Appendix B) described in Section 9.2. The Owner selects the tier in the Project BIM Requirements (PBR), and the BEP inherits that selection. The selected AIR tier and incorporated edition are recorded in the PBR/BEP before design. FIM is defined in Appendix B. Changes to tier/scope follow the applicable contractual change and notice process. Card validation supports, but does not independently constitute, acceptance.

Essential Tier (Default)

The Essential tier applies to most State of Ohio capital projects. It requires twelve per-asset fields and is validated by an owner-side Compliance Card combined with form-level required-field validation. The twelve Essential fields are:

- Instance Name — unique asset identifier (for example, AHU-01-A), following the project naming convention defined in the BEP
- Asset Code — code identifying the asset type
- Space — room or space identifier matching a Space ID in the Revit room or space schedule
- Manufacturer — sourced from submittal or nameplate
- Model — manufacturer's model number
- Serial Number — manufacturer's unique serial number, sourced from the nameplate as installed
- Tag or Barcode — Owner's asset tag applied at commissioning
- Install Date — YYYY-MM-DD, sourced from construction records
- Warranty Start Date — YYYY-MM-DD, sourced from submittal or contract
- Expected Life (years) — ASHRAE service-life tables or manufacturer data
- Replacement Cost (USD) — contractor estimate at handover
- Asset Status — one of: In Service, Spare, Removed, or Future (verified by the commissioning agent)

All twelve fields are required. The OHIOBIMS OmniClass Asset Data Form blocks CSV and PDF export until every required cell is populated.

Extended Tier (Mission-Critical and Large Projects)

The Extended tier applies to mission-critical facilities (hospitals, data centers, airports, central plants, research laboratories), to projects exceeding twenty-five million dollars in construction value, or where the operating state agency opts in. The Extended tier adds approximately fifteen to eighteen additional per-asset fields and five additional structured registers.

Additional Per-Asset Fields (Extended Tier)

- Asset System (references the Systems register), Asset Family (the Revit family used to model the asset)
- Warranty Duration (months), Warranty Type (Parts, Labor, Parts plus Labor, or Extended), Commissioning Status (Not Started, In Progress, Complete, or Deferred), Commissioning Date, and TAB Report Reference
- Capacity or Rating with Capacity Units, and Service Voltage and Phase for powered equipment
- PM Frequency (Monthly, Quarterly, Semi-Annual, or Annual), Spares Reference, O&M Manual Reference, and Manufacturer Contact

- Recommended: Sustainability Rating (ENERGY STAR, AHRI, or applicable certification), Refrigerant Type, and Disposal Notes

Additional Registers (Extended Tier)

The Extended tier delivers five additional registers beyond the per-asset record set:

- Systems register — each engineered system in the facility, with System ID, System Name, System Type (HVAC, Electrical, Plumbing, Fire, Security, or Technology), Description, Member Assets, Serving Spaces, and Drawing References
- Zones register — HVAC, fire, security, acoustic, or lighting zoning with Zone ID, Zone Name, Zone Category, Member Spaces, and Controlling Asset where applicable
- Spares register — inventory of spare parts delivered at handover with Spare ID, For Asset, Description, Manufacturer, Part Number, Quantity, Storage Location, and Delivery Date
- Documents register — manifest of all handover documents with Document ID, Title, Type (O&M Manual, Submittal, TAB Report, Cx Report, Warranty, Cut Sheet, or As-Built Drawing), Related Assets or Systems, File Path in the CDE, Date Issued, and Issued By
- Spaces register — structured space data with Space ID, Space Name, Floor or Level, OmniClass Table 13 code, Gross Area, Occupancy Type, and Occupant Load where applicable

Identifying Your Tier Early

Check the PBR or BEP for the tier designation at design kickoff. If the tier is not stated, request clarification from the Owner BIM Coordinator before populating shared parameters in your Revit template — the Extended tier requires additional parameter groups that should be set up once at the start rather than retrofitted later.

9.7 SAID Delivery Mechanism and Acceptance

SAID data is delivered through the OHIOBIMS Asset Data Form, a browser-based fillable form requiring no software installation. The form enforces required-field validation in real time and provides an embedded asset picker covering all maintainable-asset divisions. The same form is used for the Extended tier with additional tabs for Systems, Zones, Spares, Documents, and Spaces.

Submission Workflow

Submit the populated form package to the project CDE at three milestones:

- Sixty Percent Construction Documents — baseline asset roster with design-stage fields populated (Instance Name, Asset Code, Space, Manufacturer where specified, Expected Life, and projected Install and Warranty Start Dates)
- Substantial Completion — all twelve Essential fields populated for every in-scope asset; for Extended tier, all additional per-asset fields and the Systems, Zones, Spares, Documents, and Spaces registers fully populated; commissioning records linked
- Final Handover — final SAID conforming to FIM Appendix B with final values for all fields, including verified Asset Status (no Future values permitted at this milestone), final Tag or Barcode, and confirmed Warranty Start Date

Each submission package contains: the populated Asset Data Form, the SAID file conforming to FIM Appendix B, the auto-generated CSV export, the auto-generated PDF for archival, and the one-page AIR Compliance Card. For the Extended tier, the package additionally contains the populated Systems, Zones, Spares, Documents, and Spaces forms and their consolidated CSV and PDF exports.

Tips for First-Submission Acceptance

- Establish the Instance Name (asset tag) format with the Owner BIM Coordinator before design begins, and apply it consistently across the model, the form, the physical tag, and the CMMS import
- Populate Asset Codes in the Revit shared parameter set during design — do not defer to closeout
- For Extended tier, build the Systems register progressively during design so that Asset System references resolve at the sixty percent CD submission, not only at Substantial Completion
- Treat the Asset Status value Future as a temporary state only; every Future asset must transition to In Service or Removed before Final Handover

10. Quality Control and Common Errors to Avoid

Owners will perform QA/QC checks at each milestone before accepting your BIM deliverables. Understanding common errors will save time and prevent rejections.

10.1 Your QC Responsibilities

Before submitting ANY BIM deliverable, your team must:

- Verify metadata (date, file type, naming, coordinate system)
- Validate file naming convention compliance
- Confirm all models share common coordinate basis
- Run model integrity checks (warnings, errors, orphaned elements)
- Perform clash detection and resolve high-priority conflicts
- Sample elements to verify LOD/LOI compliance
- Check asset data completeness (for turnover deliverables)

Maintain a Project Data Submission Log documenting:

- What was submitted
- When it was submitted
- Any non-compliance issues identified
- Any corrective actions taken

10.2 Top 10 Reasons BIM Deliverables Get Rejected

1. Incorrect Coordinate System

- Models not in Ohio State Plane (North or South zone as applicable)

2. File Naming Violations

- Files do not follow [Project]_[Building]_[Discipline]_[Floor]_[Revision] format
- Inconsistent naming across linked files

3. Incomplete BEP

- Missing required sections
- MET not completed
- BIM roles not assigned to named individuals

4. LOD Non-Compliance

- Elements modeled at lower LOD than required for milestone
- Generic placeholders instead of specific products (at 90% or later)

5. Room/Space Boundary Mismatches

- MEP Spaces do not align with architectural Rooms
- Missing or unplaced rooms/spaces

6. Unresolved High-Priority Clashes

- Major equipment conflicts not addressed
- Inadequate maintenance clearances
- Conflicts affecting accessibility or egress

7. Missing or Incomplete Asset Data

- Required asset attributes left blank
- Assets without unique identifiers
- Components reference non-existent Spaces

8. Model Linking Errors

- Broken links to reference models
- Absolute file paths instead of relative paths
- Models not published to CDE regularly

9. Unauthorized Template Modifications

- Project Browser organization changed from mandated State template
- Shared parameters deleted or renamed

10. Incomplete Record Model Data

- As-built changes not incorporated
- RFI resolutions not reflected in model
- Warranty and commissioning data missing

10.3 Pre-Submission Checklist

Use this checklist before every BIM submission. Check each item as it is confirmed prior to upload to the CDE.

- ☐ File names follow State of Ohio convention
- ☐ All files uploaded to correct CDE folder
- ☐ Coordinate system verified (Ohio State Plane North or South)
- ☐ All discipline models share common Project Base Point
- ☐ Model integrity check run (warnings resolved or documented)
- ☐ Clash detection performed, high-priority clashes resolved
- ☐ Rooms/Spaces placed and aligned
- ☐ Sample elements verified for correct LOD/LOI
- ☐ (For turnover) Data completeness validated — SAID conforms to FIM (Appendix B)
- ☐ (For turnover) Unique asset IDs match between model, SAID worksheets, physical tags, and CMMS
- ☐ Linked models not broken
- ☐ BEP updated if workflows or team composition changed

11. Collaboration and Coordination Requirements

11.1 Required BIM Meetings

OHIOBIMS requires specific BIM coordination meetings, as noted below.

Design BIM Kickoff Meeting

- Within 30 business days of design contract award
- Attendees: Design BIM Manager, Discipline Coordinators, Owner PM, and State Agency BIM Coordinator
- Purpose: Review BIM goals, BEP requirements, CDE setup, coordinate workflows

Construction BIM Kickoff Meeting

- Within 15 business days of construction contract award
- Attendees: Design BIM Manager, Construction BIM Manager, trade coordinators, State Agency PM, and Owner BIM Manager
- Purpose: Model handoff, BEP update, coordination process, asset data planning

Regular Coordination Meetings

- Frequency per BEP (typically biweekly during design, weekly during construction)
- Agenda: Review models, discuss issues, resolve clashes, confirm upcoming tasks
- Document: Meeting minutes, issue/action logs, attendees list

11.2 Clash Detection Requirements

Clash detection is REQUIRED at design coordination and construction phases:

- Tools: Revit interference checks, Navisworks clash detection, Autodesk Forma, or other platforms approved in the BEP
- Frequency: Per BEP schedule (minimum: prior to each major milestone submission)
- Deliverables: Clash reports, issue logs, resolution documentation High-priority clashes that MUST be resolved before submission:
- Major equipment conflicts (ducts through beams, pipes through columns)
- Maintenance access violations (insufficient clearance for equipment service)
- Egress and accessibility conflicts

- Critical system interferences (sprinkler heads blocked, fire dampers inaccessible)

11.3 Model Sharing and Version Control

To maintain coordination across the team:

- Publish models to CDE shared area at least weekly
- Do NOT share models via email or file transfer outside CDE
- Use CDE version control - do not overwrite files manually
- Check any models you receive from others before using them
- Report issues to originating party and Project BIM Manager promptly

12. Closeout and Turnover

Final project acceptance depends on complete and correct BIM and asset data deliverables. Plan for closeout from the beginning, not as a last-minute scramble.

12.1 Closeout Deliverables Checklist

The following must be delivered at project closeout:

- As-Built Model (Navisworks NWD format), or alternate approved in BEP
- Record Model (native Revit RVT format), or alternate approved in BEP
- Structured Asset Information Deliverable (SAID) conforming to FIM Appendix B
- As-Built 2D drawings (PDFs extracted from models)
- O&M manuals linked to assets in model
- Warranty documentation
- Commissioning reports
- Final BEP (updated to reflect actual delivery)

12.2 Record Model Requirements

The Record Model is the final editable model for facility management. It must:

- Incorporate all field-verified as-built conditions
- Reflect all approved RFIs, change orders, and bulletins
- Include complete asset data in model elements (manufacturer, model, serial, warranty)
- Be cleaned of temporary elements (construction aids, coordination geometry)
- Use correct Ohio State Plane coordinates
- Be optimized for performance (purge unused families, reduce file size)

12.3 Asset Data Completeness Validation

Before final submission, validate that:

- 100% of in-scope asset categories are in Component worksheet
- 100% of Components have valid Space reference (building/floor/room)
- No Components reference non-existent Spaces

- All required attribute fields are populated (no blanks)
 - Unique asset IDs match between model, SAID worksheets, physical tags, and CMMS
- Failure to meet these thresholds will result in deliverable rejection

12.4 Owner Acceptance Process

Upon closeout deliverable submission, the Owner will:

- Review models for completeness and compliance with OHIOBIMS
- Validate SAID against the FIM schema (Appendix B) and AIR tier requirements
- Verify coordinate system accuracy
- Test CMMS integration (import asset data into facility management system) Possible outcomes:
 - Accepted: Meets all requirements, minor issues documented for future reference
 - Accepted with Conditions: Non-conformances identified, corrective action plan required
 - Rejected: Major gaps, deliverable returned for correction before final payment

13. Resources and Support

13.1 Available Templates and Tools

The following resources are available to support OHIOBIMS compliance:

- BEP Template (fillable HTML and PDF)
- Revit Templates (ARCH, MEP)
- MET Templates
- Asset Attribute Tables (SAID worksheets per FIM Appendix B)
- OHIOBIMS Asset Class —> Revit Parameter Mapping Workbook (new in v2.8) — read-only reference for Revit template setup and asset attribute requirements

13.2 Getting Help

For questions or clarifications on OHIOBIMS requirements:

- Contact the Owner BIM Coordinator for your project
- Contact State of Ohio BIM Technical Manager for statewide standard questions
- Review the complete OHIOBIMS documentation
- Request BEP review meeting to clarify requirements before submission

13.3 Agency-Specific Requirements

Some Owners have additional requirements beyond OHIOBIMS. Confirm with your State Agency PM if additional standards apply:

- ODOT: Nuvolo CMMS integration, AutoCAD standards for civil
- DAS: 360 Facility integration for major office buildings
- DVS: VA BIM standards compliance when federal funding involved
- ODNR: GIS integration priorities for site infrastructure

14. Summary: Keys to Successful BIM Delivery

Successfully delivering BIM on State of Ohio projects requires:

- **1. Early Planning** - Schedule BIM kickoff within 30 days, assign roles, develop BEP as soon as possible
- **2. Use State Templates** - Revit templates, BEP template, MET templates – get approval for alternate delivery in BEP
- **3. Follow Naming Conventions** - File naming is strictly enforced, non-compliance causes rejection
- **4. Correct Coordinate System** - Ohio State Plane (North or South zone), NAD83 datum, verify early
- **5. Continuous Coordination** - Publish to CDE weekly, run clash detection regularly, resolve high-priority issues
- **6. Plan Asset Data Collection** – This should not be a closeout activity – collect this information throughout construction, and construct and structure it as the SAID per FIM Appendix B
- **7. Quality Control Before Submission** - Run pre-submission checklist every time
- **8. Complete Record Models** - Field-verified, RFI-updated, with complete asset data