

BIM LOD 100 to 500

Level of Development Explained

Your complete roadmap to understand LOD stages, improve coordination and deliver better projects with BIM.



Better
Coordination



Fewer
Reworks



Accurate
Construction



Digital Twin
Ready



Faster Project
Delivery



20+

Years Experience



2500+

Projects Delivered



200+

Clients in USA



100+

Strong Team



ISO

19650 Certified



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What's Inside

A progressive walkthrough of every LOD stage — from early concepts to facility-ready digital twins — plus the costly mistakes teams make and how to avoid them.

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AT A GLANCE

LOD Stages Overview

<p>100 Conceptual</p>	<p>200 Approximate Geometry</p>	<p>300 Precise Geometry</p>
<p>350 Coordination Ready</p>	<p>400 Fabrication Ready</p>	<p>500 As-Built / Digital Twin</p>

FOUNDATION

What Is LOD?

LOD (Level of Development) is the BIM standard that defines how complete, accurate, and reliable each model element is at any project stage. It tells every team member exactly what the model can — and cannot — be used for.

LOD vs. Level of Detail — A Critical Distinction

Most teams confuse these two terms. They are **not** the same.

Level of Development (LOD)

How much you can **rely on** the model data, confirmed by engineering analysis. Defines the model's contractual and coordination readiness.

Level of Detail (LoD)

How much visual/geometric information a model element **appears** to contain. Purely about graphical complexity.

The Key Insight

A model element can look highly detailed yet still be LOD 200 if its dimensions have not been confirmed by engineering. **Visual quality and Level of Development are entirely independent.**

High Detail + Low LOD

Photorealistic render with approximate dimensions = still
LOD 200

Low Detail + High LOD

Simple geometry with verified engineering data = can be
LOD 400

LOD Is a Communication Standard

When every stakeholder understands the LOD of each element, the entire project team knows what the model can be used for at every phase — eliminating assumptions, reducing rework, and creating clear accountability.

BUSINESS IMPACT

Why LOD Matters

Ignoring LOD doesn't just cause technical problems — it drives massive financial loss across the construction industry.

The Cost of Ignoring LOD

\$177B

Annual US construction rework cost driven by coordination failures
FMI Research

31%

Average cost overrun on projects without structured BIM protocols
McKinsey Global Institute

60%

Reduction in MEP-related RFIs on Excelize projects using LOD 350
Excelize Project Data

4 Core Benefits of Defining LOD

01

Standardized Communication

Shared language across all disciplines and trades — every team member knows what the model represents.

02

Fewer Change Orders

Fewer RFIs and change orders caused by model assumptions — problems found in the model, not the field.

03

Clear Ownership

Clear contractual responsibility for who owns what element, at what LOD, and by which milestone.

04

Lifecycle Value

Full lifecycle value through LOD 500 FM-ready handover and digital twin development.

Bottom line: Defining LOD on every project protects margin, reduces risk, and creates a model that serves the building for its entire operational life.

100

LOD 100 – Conceptual

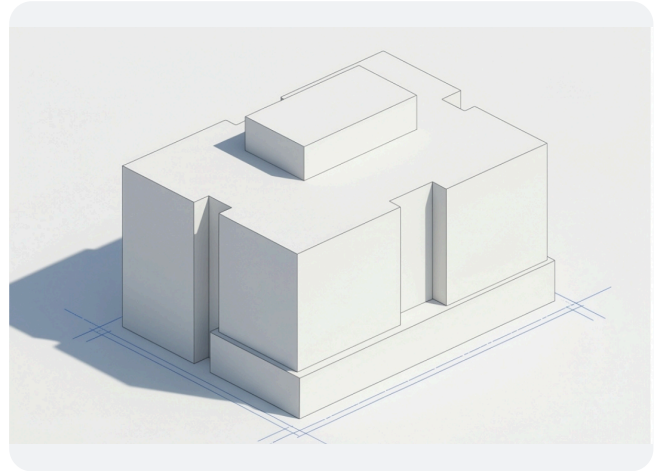
Symbol, generic form, or massing block. Shows existence and approximate location only.

What the Model Contains

- Overall building volume, height, and footprint
- Approximate floor areas and total gross areas
- Basic orientation and site relationship
- Generic representation of major systems

Used For

- Feasibility Studies
- Site Planning
- Concept Design
- Order-of-Magnitude Cost Estimation



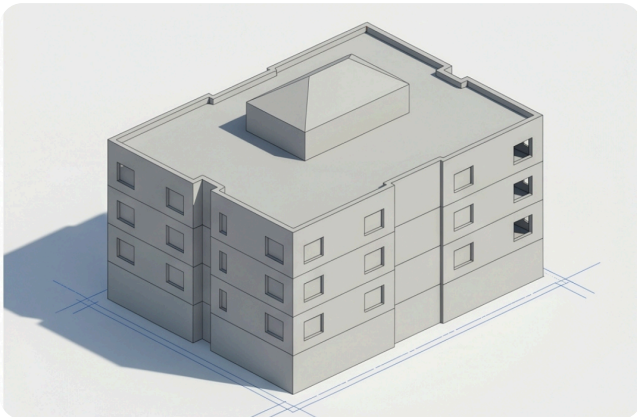
Do Not Use LOD 100 For

Coordination work, permit submissions, or construction planning. Elements are not sized to represent actual construction.

200

LOD 200 — Approximate Geometry

Generic systems with approximate size, shape, location, and orientation. A placeholder with a real-ish shape.



What Changes from LOD 100 to 200

- Elements have a recognizable shape (a beam looks like a beam, not a box)
- Floor plans, rough dimensions, and approximate quantities attached
- Basic structural, architectural, and MEP system placeholders defined
- Generic materials and system types indicated

Used For

Schematic Design

Budget Estimation

Owner Approval

Space Planning

Important Limitation

LOD 200 elements **cannot be used for coordination**. Because sizes and locations are approximate, routing conflicts at this stage may not reflect real field conditions.

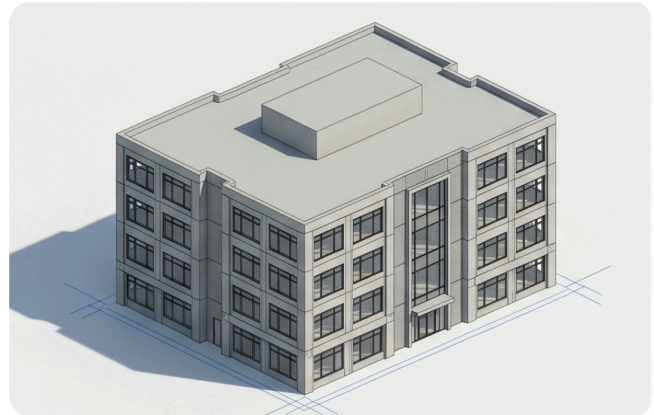
300

LOD 300 — Precise Geometry

Construction-document quality. Accurate quantity, size, shape, location, and orientation.

What LOD 300 Delivers

- Specific sizes, materials, grades, and specifications
- Exact location confirmed by engineering analysis
- Walls, floors, ceilings model actual assemblies
- MEP systems route accurately for space verification
- Quantity take-offs and line-item cost estimates



Used For

Permit Drawings

Design Development

Construction Documents

Quantity Takeoff & Cost Estimating

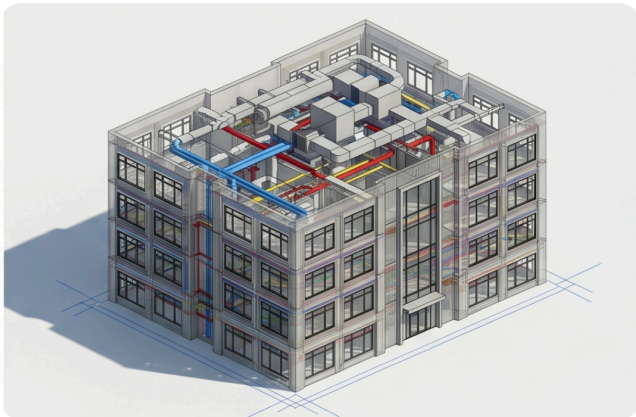
Important Note

LOD 300 lacks the interdisciplinary interface information needed for full construction coordination. That gap is filled by LOD 350 — the next critical stage.

350

LOD 350 — Coordination Ready

The most important — and most misunderstood — stage in the entire LOD framework.



Introduced by BIMForum in 2013, LOD 350 adds one critical capability LOD 300 lacks: **how an element interfaces with adjacent elements across disciplines.**

An LOD 350 structural beam doesn't just know its own size — it knows about the MEP hangers, the cladding panel on its flange, and the clearances for mechanical ductwork.

What LOD 350 Adds Over LOD 300

- All LOD 300 attributes, **plus inter-discipline interface information**
- Supports, hangers, brackets, and connections are modeled
- MEP routing coordinated with structure, architecture, and other MEP systems
- Full clash-free model suitable for subcontractor buyout and construction planning

Used For

Clash Coordination

General Contractor Use

Subcontractor Planning

4D Scheduling

Why This Matters

Projects that achieve LOD 350 before breaking ground see dramatically fewer field RFIs. Excelize projects using LOD 350 models experienced up to 60% reduction in MEP-related RFIs compared to projects using only LOD 300 for coordination.

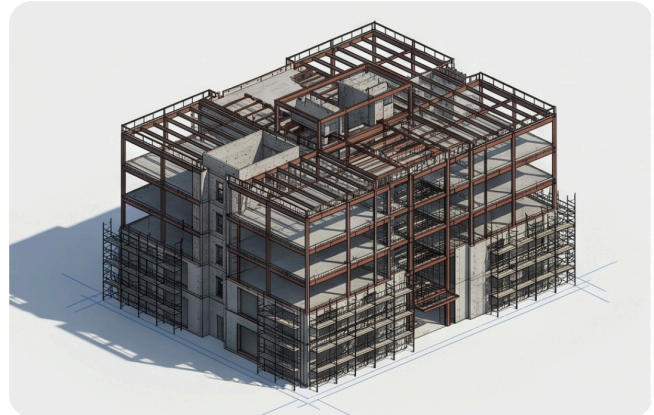
400

LOD 400 — Fabrication Ready

The model moves to the shop floor. Complete information for fabrication, assembly, and installation.

What LOD 400 Includes

- Steel connections, bolts, welds, and cut lengths
- Rebar placement, couplers, and lap splice details
- MEP spool sheets for prefabricated sections
- Installation sequencing & temporary works info
- Directly drives CNC machines or robotic assembly



Used For

Shop Drawings

Prefabrication & Manufacturing

CNC & Robotic Automation

Installation Sequencing

Note on Responsibility

LOD 400 content is almost always created by **trade contractors and specialty fabricators**, not the design team. This must be clearly defined in the BIM Execution Plan to avoid ownership disputes and delivery gaps.



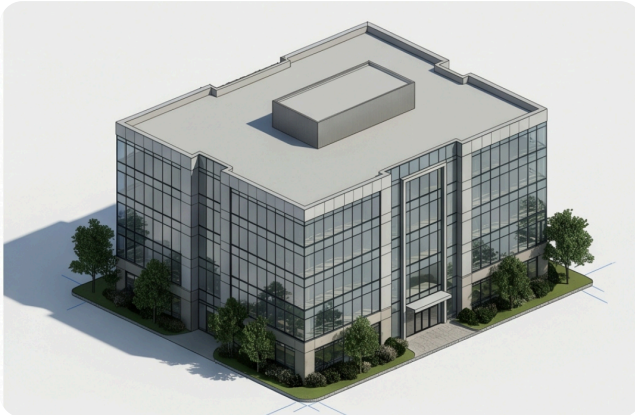
Think of It As...

The model now contains everything a fabricator needs to build the real thing — bolt sizes, weld specifications, cut lists. It's the digital blueprint that drives physical manufacturing.

500

LOD 500 — As-Built / Digital Twin

Field-verified, as-built model. The building's complete digital record for its entire operational life.



Key word: verified. Confirmed against actual conditions through field surveys, laser scanning, or photogrammetry — not just updated with red-line markups.

What LOD 500 Includes

- Actual installed location, size, and specification
- Serial numbers, warranty info, maintenance schedules
- Equipment parameters, zone assignments, lifecycle dates
- Linked to FM / CMMS platforms
- Base model for digital twin development

Used For

Facility Management

Asset Tracking

Digital Twin Development

CAFM & BMS Integration

Renovation Planning

Digital Twin Opportunity

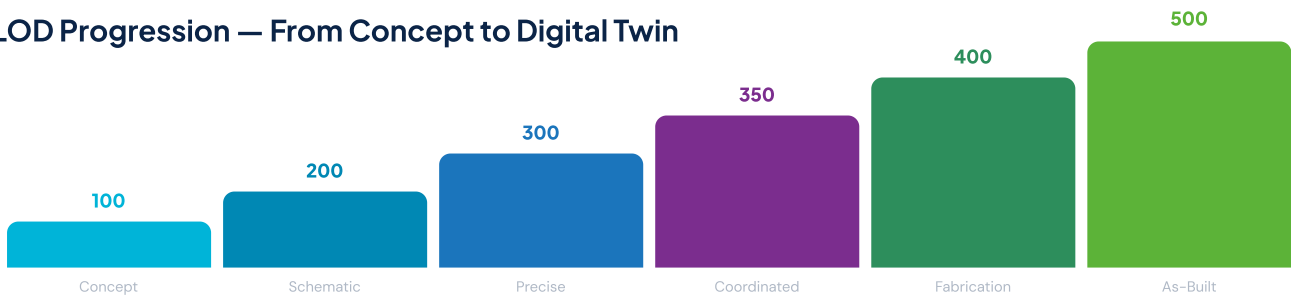
Buildings with operational digital twins reduce energy costs by 15–25% and maintenance costs by 25–30% over a 10-year operating period. — *Deloitte, 2024*

REFERENCE

LOD Comparison Overview

LOD	Description	What It Contains	Used For	Limitation
100	Conceptual — symbol or massing block	Building volume, footprint, approximate floor areas, basic orientation	Feasibility, Site Planning, Concept Design	Not for coordination or permits
200	Approximate Geometry — generic placeholders	Recognizable shapes, rough dimensions, generic materials, system placeholders	Schematic Design, Budget Estimation, Space Planning	Not for coordination — approximate only
300	Precise Geometry — CD quality	Specific sizes/materials, exact locations, construction assemblies, MEP routing	Permit Drawings, Construction Docs, QTO	No cross-discipline interface data
350	Coordination Ready — interdisciplinary	All LOD 300 data + supports, hangers, connections, full clash coordination	Clash Detection, GC Use, 4D Scheduling	—
400	Fabrication Ready — shop-floor detail	Bolts, welds, cut lengths, spool sheets, installation sequencing, CNC data	Shop Drawings, Prefab, CNC Automation	Created by trade contractors
500	As-Built / Digital Twin — field verified	Actual installed data, serial numbers, warranty, FM links, digital twin base	FM, Asset Tracking, CAFM, Renovation	Requires field verification

LOD Progression — From Concept to Digital Twin



LESSONS LEARNED

5 Costly LOD Mistakes to Avoid

After 2,500+ BIM projects, these are the patterns Excelize sees derail otherwise well-run project teams.

01 Treating the Entire Model as One LOD

Different elements in the same model legitimately carry different LOD levels at any given project stage. Requiring "an LOD 300 model" without specifying it element-by-element leads to dangerous assumptions and missed deliverables.

02 Coordinating at LOD 300 Instead of LOD 350

LOD 300 has no interdisciplinary interface data. Two elements can appear clash-free in the model and still physically conflict in the field. Always coordinate at LOD 350 minimum — without exception.

03 Confusing High Visual Detail with High LOD

A photorealistic render tells you nothing about LOD. An element can look extraordinarily detailed while still being LOD 200 if its dimensions haven't been engineering-confirmed. Visual quality and Level of Development are completely independent.

04 No LOD Responsibility Matrix in the BEP

If your BIM Execution Plan doesn't specify which team member is responsible for advancing each element to which LOD by which project milestone, ownership disputes will surface at the worst possible moments.

05 Treating LOD 500 as "Just Updating the Model"

True LOD 500 requires field verification — not just incorporating contractor red-line markups. Without verification via laser scanning or on-site survey, the as-built model may carry significant inaccuracies that create problems for the FM team for decades.

Excelize insight: The teams that avoid these five mistakes consistently deliver projects with fewer RFIs, tighter budgets, and models that serve the building long after construction ends.

21+

Years of BIM
Leadership

2500+

Projects
Delivered

250+

Clients
Globally

100+

Strong
Team

Ready to Standardize LOD Across Your Projects?

Excelize helps US-based minimize rework, streamline coordination, and deliver better projects with BIM from concept to digital twin.



BIM Clash Detection

Staff Augmentation

5D Cost Estimation

Quantity Takeoff

MEP BIM Services

4D Scheduling

BIM Execution Plan

Scan to BIM

Digital Twin Development

Get in Touch 

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