Level of Development Specification

James Vandezande AIA
HOK
@jvandezande
LOD Specification

- Why is the concept important?
- Benefits to model authors
- Benefits to model users
How can we define a BIM?

• What is the owner expecting when they ask for “BIM” on a project?
• How much information needs to be in a model?
• How much effort will it take (how do I price it?)
• How do I know I’m meeting my deliverables?
• Who’s going to rely on it for what?
The Disclaimer Response

“This model looks great so you can look at it but you can’t use it for anything or rely on it for anything which includes, but is not limited to, everything.”

“If you use it anyway then you have to pay my lawyers if I get sued for anything related to your use of the model.”

Have a nice day.
The Disclaimer Response

In other words...
Some of it’s not reliable,
so don’t rely on any of it.

Specified-Reliance Approach
Some of it’s not reliable so only rely on:
– what I say you can,
– for the purposes I say you can,
– to the degree of precision I say you can.
Legal Issues

• Use LODs with a model disclaimer?
• Authorized Uses? (in AIA E202)
  – Within Integrated Project Delivery
  – Traditional delivery methods
## LOD concepts

![AIA Document E202™ – 2008](bimforum.org/loa)

### § 4.3 Model Element Table

Identify (1) the LOD required for each Model Element at the end of each phase, and (2) the Model Element Author (MEA) responsible for developing the Model Element to the LOD identified.

Insert abbreviations for each MEA identified in the table below, such as "A - Architect," or "C - Contractor."

**NOTE:** LODs must be adapted for the unique characteristics of each Project.

<table>
<thead>
<tr>
<th>Model Elements Utilizing CSI Uniform™</th>
<th>LOD</th>
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Note Number (see 4.4)
LOD Concepts

“Development”

RELIABILITY/CONFIDENCE

“Detail”

INPUT

• Usually INPUT > RELIABILITY
• In UK, “Development” is “Detail”
The Levels of Development

LOD 100
MASSING OR
NON-TYPED
ASSEMBLIES

“ESTIMATE IT”

LOD 200
GENERIC, TYPED
ASSEMBLIES

“SPECIFY IT”

LOD 300
SPECIFIED
ASSEMBLIES

“BID IT”

LOD 400
DETAILED
COMPONENTS

“BUILD IT”

LOD 350
ACTUAL
ASSEMBLIES

“BUY IT”

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The Levels of Development

100 – Light fixture
200 – Pendant fixture
300 – Pendant fixture, LED lamps, 275 lumens
350 – Lightolier model PND17493
400 – Installation/fabrication details (3D)
LOD Modeling Examples

Schematic Design Model

LOD 100

LOD 200

LOD 300

LOD 350

Construction Document Model

bimforum.org/loid

Salvador Dalí Museum
St. Petersburg, FL
LOD Modeling Examples

LOD 200

LOD 300

LOD 400
LOD Modeling Examples

Roof = 200
Structure = 100

Roof = 300
Structure = 300

Roof = 200
Structure = 200

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What about the data?

BIM INFORMATION HIERARCHY & INFORMATION CLASSIFICATION

- OmniClass Table 11 (Construction Entity by Function) Building Type/Program
- OmniClass Table 12 (Construction Entity by Form) Building Type/Program
- OmniClass Table 21 Elements (Legacy Uniformat)
- OmniClass Table 23 Products
- OmniClass Table 41 Materials
- OmniClass Table 49 Properties/Defining
- OmniClass Table 10 (Spaces by Function) Space Type/Program
- OmniClass Table 14 (Spaces by Form) Space Type/Form

**Systems** are represented as the physical entities of the building. Systems use NA classifications such as OmniClass and Uniformat and are transported/exchanged via IFCs.

**Space** is physical in nature, but can be unbounded (there is no or cross physical boundaries) but it will always be tied to the physical structure of systems in some way.

**Overlays** are more abstract data - organizational, operational, functional, financial, non-fixed assets, resources, personnel, etc., that is data tied to the Systems and Space.
What about the data?

<table>
<thead>
<tr>
<th>Curtain Wall</th>
<th>BIM Object or Element</th>
<th>General Information</th>
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</thead>
<tbody>
<tr>
<td>Item Category - Curtain Wall</td>
<td><strong>Description:</strong> A 2D and 3D element. A vertical surface element often attributed to the building envelope. An curtain wall shall prevent the intrusion of the elements.</td>
<td><strong>Basic Tool Features</strong></td>
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</table>

<table>
<thead>
<tr>
<th>Level of Development</th>
<th>Information Category for Information Item (See Master Information Tab)</th>
<th>Information Item (information about the specific object or element)</th>
<th>Model Element Author</th>
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<td><strong>Building Program &amp; Project Meta Data</strong></td>
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<td>Phases Time Sequencing &amp; Schedule Requirements</td>
<td>Phasing</td>
<td>Phases Time Sequencing &amp; Schedule Requirements</td>
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</table>
Conclusion

• Think of LODSpecification as a dictionary
• Does not tell you how to use a BIM
• LOD’s are based on model assemblies
• 2D details not addressed in LOD Spec
• LOD’s ≠ project phases