Managing Digital Deliverables
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But first...

- Manage Expectations
- Manage the Process
- Manage the Deliverables
Managing Expectations

How the owner regulated it
How the project manager understood it
How the architect designed it
What the contractor bid
How the marketing team described it

How the contractor installed it
How the project was documented
How the owner was billed
When it was delivered
What the owner really wanted

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Managing Expectations

Begin with the end in mind... but it’s a process.
Managing Expectations

Are you lonely?
Tired of working on your own?
Do you hate making decisions?
HOLD A MEETING!

You can—
- See people
- Show charts
- Feel important
- Point with a stick
- Eat donuts
- Impress your colleagues

All on company time!

MEETINGS
THE PRACTICAL ALTERNATIVE TO WORK
Managing Expectations

What’s the end use?
Owner, Designers, Prime vs Subs
Constructors   GC vs Trades
# Managing Expectations

## ATTACHMENT 1 - BIM Matrix: (Model Progression Specification)

| A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R | S | T | U | V | W |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 |
| 1 | Project Name: | | | | | | | | | | | | | | | | | | | | | |
| 2 | Date: | | | | | | | | | | | | | | | | | | | | | |

### EXISTING CONDITIONS MODELS

<table>
<thead>
<tr>
<th>Level 1</th>
<th>Level 2</th>
<th>Level 3</th>
<th>Level 4</th>
<th>Existing</th>
<th>Field-Capture</th>
<th>LOA</th>
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</thead>
<tbody>
<tr>
<td>Major Group</td>
<td>Group Elements</td>
<td>Individual Elements</td>
<td>Model Elements</td>
<td>Documentation Model</td>
<td>Field-Capture Model</td>
<td>LOA</td>
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### DESIGN MODELS

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<tr>
<th>Programmatic</th>
<th>Design Analysis</th>
<th>Performance</th>
<th>Design</th>
<th>Documentation</th>
<th>Final Concept</th>
<th>LOA</th>
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### CONSTRUCTION MODELS

<table>
<thead>
<tr>
<th>Construction</th>
<th>Fabrication</th>
<th>Final Product</th>
<th>LOA</th>
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### BIMFORUM

Managing Expectations

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Design Models

403.2.11.5 Plumbing:

The following stipulations will be used for plumbing model elements.
- Piping 2" or greater or smaller piping if in ganged runs will be modeled.
- Plumbing piping and gas piping, including specialty gas, and equipment will be modeled. Pipes will be modeled to the outside diameter of the pipe or the pipe insulation, whichever is greater.
- Pipe slope will be incorporated in the model. Fittings and connections will not be modeled.
- All plumbing equipment will be modeled to its overall height, width and depth.
- All valves and clean outs will be modeled along with all access to valves/cleanouts.
- Any accessible zone requirements will be modeled as solids.

Contractor Models

403.2.16.4 Plumbing:
- Model all piping 1" and larger including insulated piping with insulation Ø.D. at 1" and greater.
- Model all valves, gauges, and control valves and service access.
- Model pipe hangers, supports and seismic bracing carrying 2 or more pipes.
- External insulation on piping must be modeled to scale.
- Model all drip legs, drain pipes, blow down valves, and cleanouts.
- Model all underground piping.
- Model all Plumbing Equipment: Domestic Water, Chilled Water, Steam, Storm/Roof Leaders, pumps, tanks, water heaters, in wall carriers, in wall plumbing equipment, etc.
- The Plumbing Contractor shall also include in the 3D model Concrete Equipment pads, inertia pads and Access Doors.
- The Plumbing Contractor shall identify under separate drawing layer Access doors and Accessibility requirements for above listed items for code and maintenance purposes.
Enforcement and accountability:
• Who’s in charge?
• How do you resolve conflicts?
• Frequency / schedule and specificity of content
• What are the consequences of noncompliance?
Managing the Process

- Be as specific as possible and plan for changes
- Understand there is no one global process
Documentation

• Reference documents (what is the source of truth) AIA E203, G201, G202, BPXP, DSM, Logs, Variance Request, Noncompliance reports, etc.

• Document Control (where is the source of truth)
Managing the Process

Design Team

Design phase
- Design Review?
- Spatial Coordination
- CDs vs Models – right of reliance.

Construction phase
- Participation in Construction Coordination
- RFI / Submittal incorporation
- Means/methods changes incorporation
  ‘Record Model’
Managing the Process

**Contractor**
Design Phase participation
Construction Phase
  - Schedule updates
  - Trade Coordination
  - Submittal Models
  - Fabrication Models
  - As-built Validation
  - Commissioning Data
Managing the Process

QA/QC
Budget for QA/AC
3rd party vs internal
Schedule, resubmits, consequences
Tools & reports
Sign-off process
Change Management
- BPXP/Standards Modification
- White Papers
- Variance requests
- Exceptions list
Managing the Deliverables
What, when, who, where, how... and why.
Who is responsible for the final deliverable(s)?

How is the deliverable packaged?
- Exceptions lists
- Narrative
- Relative links
- Road Map
When are they due?

- progress vs milestones vs final
- Critical path, consequences for delay?
- Final final deliverables
What specifically is being delivered and what is the value of each deliverable?
• IFC vs Native vs Federated Model vs Data vs Legacy Deliverables

Where are they delivered?
• Hosted, Cloud, License transfer
Managing Deliverables

Why are we even doing this???

Top BIM Benefits for Owners (2009 and 2012)

- Reduced Document Errors and Omissions: 61% - 43%
- Reduced Rework: 36% - 41%
- Reduced Construction Cost: 30% - 30%
- Reduced Project Duration: 22% - 25%
- Fewer Claims/Litigation: 17% - 25%

Are we done yet?
Final sign-off procedure
  Budget for final check
  # of resubmits permitted?
  Drop dead date.
Plan B for creating deliverables
Managing Deliverables

Thank You

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