PROCURING FOR THE BIM YOU WANT

GETTING THE BIM YOU PROCURED

W. John Powell, Regeneron
Cindy Baldwin, VDCO Tech
W. John Powell
Sr. Manager of Building Information Technologies, Regeneron Pharmaceuticals

- NYS Licensed Architect
- 29 years A/E/C/O Experience
- 10 years implementing BIM
Cindy Baldwin, GCG, LEED®AP, CM-BIM, CM-Lean
Chief Operating Officer / President, VDCO Tech

• Licensed General Contractor
• AGC CM-BIM, LEAN Certified / Instructor
• 26 years A/E/C/O Experience
• Nationally recognized BIM Process Expert
Who is Regeneron?

A leading biotechnology company that invents life-transforming medicines for people with serious diseases.
Who is Regeneron?

**Lead With Science**
Science drives our business and passion drives our science. Whether you’re doing science, supporting science or delivering science. It’s what we do.

**Take On Big Ideas**
We take the long view and tackle the big ideas, the unsolvable problems, and the bottlenecks that get in the way. We pursue ideas with passion and courage, to make a real difference.

**Make It Happen**
It may not always be easy, but we figure it out and get it done. We have little appetite for unnecessary bureaucracy that can get in the way of innovation or quality.

**Be Great Together**
While others talk about teamwork, we actually do it. When you work with smart, fun people, you bring out the best in each other and can do the extraordinary.

**Do What’s Right**
We do well by doing good. We act with integrity and pride ourselves on doing the right thing – by each other, our communities, our patients and the world around us.

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Who is Regeneron?
OWNERS ARE REQUIRING BIM

_BUT_

THEY DON’T KNOW WHAT THEY WANT

“Just give me a complete COBIE deliverable”
OWNERS ARE REQUIRING BIM

BUT
THEY DON’T KNOW WHAT THEY WANT

“I want a BIM for operations, but I haven’t figured out how I am going to use it yet”
OWNERS ROLE IN BIM

An **informed** and **engaged** owner has the opportunity to set the scene for a **successful** BIM Project
TRADITIONAL PROJECT DRIVERS

Cost

Handover and Operations?

Quality

Schedule

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KEYS TO SUCCESS

Process

Communication

Accountability

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“I tried to organize a stampede, but everybody has their own agenda.”
Project Experience compared to BIM Experience

Years of Experience

- ARCH PM: 2
- ENG PM: 12
- CTR PM: 15
- OWNER PM: 20

Level of BIM Implementation @ Presentation

- ARCH BIM MGR: 2
- ENG BIM MGR: 3
- CTR BIM MGR: 5
- OWNER BIM MGR: 6

Level of BIM Implementation @ Handover

- ARCH BIM MGR: 2
- ENG BIM MGR: 3
- CTR BIM MGR: 5
- OWNER BIM MGR: 6
Project Experience compared to BIM Experience

Years of Experience

- ARCH PM: 2
- ENG PM: 3
- CTR PM: 5
- OWNER PM: 20
- ARCH BIM MGR: 2
- ENG BIM MGR: 3
- CTR BIM MGR: 8
- OWNER BIM MGR: 10

Levels of BIM Implementation:
- @Handover
- @Presentation

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Project Experience compared to BIM Experience

Years of Experience

ARCH PM: 2
ENG PM: 3
CTR PM: 5
OWNER PM: 15
ARCH BIM MGR: 2
ENG BIM MGR: 2
CTR BIM MGR: 3
OWNER BIM MGR: 20

Level of BIM Implementation increases based on experience of Owner BIM Manager or Compliance Agent

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Creation of a VDCO Toolkit

- Defines VDCO expectations during Procurement
- Creates guidelines and tools for execution and handover
- Promotes BIM as a collaborative tool
- Flexible from project to project (no “One Size Fits All”)
  - Menu of options
  - Start with “low hanging fruit”
  - Moving to higher levels of VDCO sophistication
VDCO Toolkit for Procurement

- Digital Deliverable Requirements
- BIM Use/Agent Responsible Matrix
- BIM Project Execution Plan Template
- Model Progression Specification
- Facilities Data Specification

Master Service Agreement
  → Request For Proposal
  → Proposal
  → Contract
  → Project Execution

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## BIM Uses

### BIM Project Execution Planning Guide
- Computer Integration
- Construction Research Program

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<tr>
<th>PLAN</th>
<th>DESIGN</th>
<th>CONSTRUCT</th>
<th>OPERATE</th>
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[@WJohnPowell](https://twitter.com/WJohnPowell), [@CindyWBaldwin](https://twitter.com/CindyWBaldwin) #BIMForum19
## BIM Use / Agent Responsible Matrix

### REGENERON

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<tr>
<th>Project</th>
<th>PLAN</th>
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<th>CONSTRUCT</th>
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### Notes

1. Partial Use: Sections of T47, T48, and T14 Road (BIM use is available from Regeneron. A BIM ready model of the campus is also available from Regeneron).
2. Architectural, MEP, and structural disciplines are required to design and document their scope of work in BIM.
3. P&ID's can be created in BIM as components of their associated process. The specialty subcontracts may need to be followed by the BIM model is preferred that they do. The BIM model is the primary tool for BIM use and will be used for the visual review.
4. Items to be done in a collaborative manner. This model is the primary tool for BIM use and will be used for the visual review.
5. The BIM model is the primary tool for BIM use and will be used for the visual review.
6. The BIM model is the primary tool for BIM use and will be used for the visual review.
7. The BIM model is the primary tool for BIM use and will be used for the visual review.

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### Agent Responsible

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# BIM Use / Agent Responsible Matrix

**REGENERON**

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<th>BIM Use / Agent Responsible Matrix</th>
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**Agent Responsible**

- AIA: Registration
- PM: Project Management
- ED: Executive Director
- Modeling Engineer
- MEP: Mechanical Engineering
- CRB: Construction Records
- Planning
- QA/QC: Quality Assurance
- COM: Commissioning
- IM: Information Manager
- GJ: Geotechnical
- M/E: Mechanical Engineer
- S: Sheet Metal
- P: Plumbing
- S: Sheet Metal
- A: Architectural
- T: Testing

**Reference:** The use of BIM in construction projects can significantly improve project outcomes. By utilizing BIM, the design team can create a comprehensive digital model of the project, which can be used throughout the design and construction phases. This model can help identify potential issues early on, allowing for more efficient design and construction processes.

**Note:** This is a high-level overview of the BIM use in construction projects. For a detailed guide on how to implement BIM in your projects, please refer to the comprehensive manual provided by the BIMForum 19 conference.
# BIM Use / Agent Responsible Matrix

## Existing Conditions Modeling
- Laser Scanning and Point Cloud Integration
- Structural Analysis
- Cost Analysis

## Electrical Analysis
- Design Reviews
- Design Authoring

## Visualization
- Asset Management
- Space Management
- Security / Key Management
- 3D Coordination & Conflict Analysis
- Cost Estimation
- Design for Maintenance
- Specification Production

## Facility Data Exchange with IWMS
- Quality Assurance/Quality Control
- Site Utilization Planning

## Digital Fabrication
- Digital Layout - BIM2Field
- Record Modeling
- As-Constructed Modeling
- Commissioning

## Matrix

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# BIM Use / Agent Responsible Matrix

## Existing Conditions Modeling
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- Site Utilization Planning
- Digital Fabrication
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- Record Modeling
- As-Constructed Modeling
- Commissioning

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# BIM Use / Agent Responsible Matrix

## Existing Conditions Modeling
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## 3D Coordination & Conflict Analysis
- Cost Estimation
- Design for Maintenance
- Specification Production

## Facility Data Exchange with IWMS
- Quality Assurance/Quality Control
- Site Utilization Planning

## Digital Fabrication
- Digital Layout - BIM2Field

## Record Modeling
- As-Constructed Modeling

## Commissioning

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*Note: The matrix above shows the responsible parties for various BIM tasks.*

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#BIMForum19
# BIM Use / Agent Responsible Matrix

## Final Use Case List

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## Lead and Support

**LEAD**

- Requirements management
- Communication
- Project coordination

**SUPPORT**

- Design coordination
- Technical support
BIM Use Lessons Learned

- Beware of over eager BIM Managers and overzealous marketing people during the proposal phase
  - The BIM Manager’s ambitions may not be shared by the Project Manager and the Project Team

- Mitigation:
  - Meet with project leadership at each phase to ensure alignment on BIM Goals; adjust as necessary
BIM Use Lessons Learned

▪ Getting the “B” BIM Team
  • A firm may have BIM capabilities but the team you get may not, even if expectations for BIM are clearly communicated

▪ Mitigation:
  • Require BIM experience in all team member profiles in proposals
  • Evaluate teams capabilities during project and make adjustments as required
Existing Conditions & Laser Scanning
### Existing Conditions & Laser Scanning

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Derived from the BIMForum 2019 Level of Development (LOD) Specification

@WJohnPowell, @CindyWBaldwin  #BIMForum19
# Existing Conditions & Laser Scanning

### Elevation Table

<table>
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<tr>
<th>Number</th>
<th>Minimum Elevation</th>
<th>Maximum Elevation</th>
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Existing Conditions And Laser Scanning

Lessons Learned

- Communications breakdown
  - BIM Planning was seen as a side activity for the “BIM experts”

- Mitigation:
  - Engage all discipline leads in BIM Planning meetings at regular intervals
Existing Conditions And Laser Scanning

*Lessons Learned*

- Communications breakdown
  - Changing of team members led to loss of institutional memory

- Mitigation:
  - Document an outline of plan for BIM and track progress
  - KEEP IT SIMPLE!
Existing Conditions And Laser Scanning

**Lessons Learned**

- **Lack of Expertise led to inaccurate modeling**
  - Architect did not require survey controls in scans
  - Point clouds were too dense to be useful
  - Team did not get training in Edgewise software

- **Mitigation:**
  - Owner's review of agreement with Laser Scan company
  - QA/QC of models against scans (using Verity software?)
As-builds & Record Modeling

TRADE MODELS vs. DESIGN MODELS

12” CLASH DIFFERENCE
10” CLASH DIFFERENCE
8” CLASH DIFFERENCE
6” CLASH DIFFERENCE
4” CLASH DIFFERENCE
2” CLASH DIFFERENCE
As-buils & Record Modeling

- Delays in getting Trade As-Builts
  - Focus is on getting the job built
  - Original modelers no longer available

- Mitigation Plan:
  - Add language to Specifications
  - Track As-buils on Submittal Schedule
  - Require submission within 30 days of completion of work
As-builts & Record Modeling

- **Difficulties getting Record Models from AE firms**
  - Design team has moved onto other projects
  - Modeling by Design Professionals is costly
  - Requirements misunderstood

- **Mitigation Plan:**
  - Consider outsourcing modeling to 3rd parties
Virtual Campus & Origin Point
Last Words

Achieving BIMtopia is a Challenge!
Last Words

The Industry has not caught up to BIM
Last Words

Monitor the Models throughout the project
Last Words

Educate your preferred vendors
THANK YOU!