Adapting Contracts to Facilitate Building Information Modeling Process

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RISK is what we didn’t have time to Solve.
We’re not Building anymore, We’re Manufacturing.
Waste & Rework = Profitability

Changes & Schedule Compression = Cost escalations
Proactive vs Reactive

- Prequalification of Sub trades
- Tendering
- Contract Award
- Equipment Procurement and Delivery
- Detailing, Layouts, sleeving, spool drawings
- Submissions and Approval
- Fabrication
- Installation
- Commissioning
- Turnover
Proactive vs Reactive

RFIs & Change Management

- Prequalification of Sub trades
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Proactive vs Reactive

BIM strategy developed with Trades
- Prequalification of Sub trades
- Tendering with BIM requirements

Contract Award
- Equipment Procurement and Delivery
- BIM model production
- BIM Submissions and Approval

Detailing, Layouts, sleeving, spool drawings
- Submissions and Approval

RIM driven Pre Fabrication
- Installation

Commissioning
- Turnover
Proactive vs Reactive

BIM strategy developed with Trades
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  Equipment Procurement and Delivery
  BIM model production
  BIM Submissions and Approval
  Detailing, Layouts, sleeving, spool drawings
  Submissions and Approval
  BIM driven Pre Fabrication

Virtual Construction process

Reduced time and money

Installation
Commissioning
Turnover
Trade Models
Industry Perspective

- Owners & Contractors are beginning to Include “BIM” Requirements
- Mixed level of adaption amongst Consultants, GCs & Trades
- “BIM execution Plan” emerging as a standard
- Long term Use of Models being explored.
Contracting Strategies

- Process must be adapted for Existing Contracts
- Collaborative contracts are easiest to adapt to.
- Requirements should be defined by Scope (currently no industry standard)
- Non critical aspects can be defined by reference documents. (currently no industry standard)
- Requirements can not overrule healthy competition
BIM Execution Plan

- Who models what
- LOD
- Naming
- Exchange Rules
- Model organisation Framework

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## BIM Execution Plan

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<th>PROJECT FORM</th>
<th>PARTNER FORM</th>
<th>INTEROPERABILITY FORM</th>
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Scope

- What is to be modelled
- 3D Submissions & review
- Clash reviews
- Level of Detail
- Formats & Exchange
- Required meetings
- End Deliverables
Schedule

- Earlier tendering
- Earlier submission process
- Design submission milestones
- Timing of BIM submissions
- Weekly meetings
- Delivery of End deliverables
How will this effect Trades?

• Trades submit BIM execution plan for review.

• Trades use can use design models to start from.

• Trades required submit Models for review.

• Routing is fixed in Model before build, rather then determined on site.

• Composite Model is maintained on Job site.
Lump Sum / Stipulated Price

Owner

May choose to “Pre-detail” and go to tender with fully coordinated BIM

RFP’s and service contract to include BIM requirements

Design Team

Builder

Project Specifications to define project BIM deliverables and / or process

Scope and Specifications to define project BIM deliverables and / or process

Trades

Trades

Trades
Design / Build

Owner

Design Team

RFP’s and service agreement to include BIM requirements

Builder

RFP’s and service contract to include BIM requirements

Scope and Specifications to define project BIM deliverables and / or process

Trades

Trades

Trades
Alternative Financial Procurement

- **Project Co**: RFP’s and service contract to include BIM requirements

  - **Builder**: RFP’s and service agreement to include BIM requirements
    - **Trades**: Scope and Specifications to define project BIM deliverables and/or process
      - **MEP Consultants**: MEP consultants contracted to trades to ensure design and BIM are optimized for fabrication to reduce rework
      - **Design Team**:
Integration Team Approach / Integrated Project Delivery

- Owner:
  - RFP’s and service contract to include BIM requirements

- Key consultants:
  - RFP’s and service agreement to include BIM requirements

- Builder:
  - Shared gain / shared gain, Team works together to optimize BIM process

- Key Trades:
  - Scope and Specifications to define project BIM deliverables and/or process

- Consultants

- Trades

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Preconstruction / GMP / CM @ Risk

Owner:
- RFP’s and service contract to include BIM requirements
- Builder brought on early to develop Preconstruction BIM and Prefabrication Strategy

Builder:
- Pre-detailed BIM may be used for Tendering
- Scope and Specifications to define project BIM deliverables and/or process

Design Team:
- Trades

Trades:
- Trades
- Trades
Construction Management

- Owner / Builder
  - RFP’s and service contract to include BIM requirements

- Design Team
  - CM bought on early to develop Preconstruction BIM and develop Prefabrication strategy, CM manages Trade coordination

- Construction Manager

- Trades
  - Scope and Specifications to define project BIM deliverables and/or process

- Trades
  - Trades

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Traditional Construction Procurement

Prequalification of Sub trades
Tendering
Contract Award
Structure
Building envelope
MEP systems
Finishes
Commissioning
Turnover

Coordination
Suppliers
Trades
Site delivery

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BIM enabled Prefab Procurement

Prequalification of Sub trades
- Tendering
- Contract Award
- Structure
- Building envelope
- MEP systems
- Finishes
- Commissioning
- Turnover

BIM Coordination Process
- Offsite Prefabrication
- Site delivery
- Site Installation
- Site Commissioning & Testing
- Turnover

Suppliers

Trades

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Specifying Geometry

- Wireframes can be included as part of CDs
- Defines centre or face of members
- Divided by Contract delineating scope.
- NOT BIM files, but Simple, accurate, and transferable 3D models
- BIM can be provided for reference.
- Provides first principals for all systems
In conclusion.....

**Owner** – identify your goals and requirements, ie FM BIM, choose the most appropriate procurement method, prequalify the players.

**Architect & consultants** – specify the deliverables and participate in the BIM process.

**GC** – Tender the project with BIM requirements, develop the coordination strategy & Facilitate the process.

**Trades** – Develop Prefabrication strategy from day one. Adapt the tools
www.CanBIM.ca

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