School Building Authority of West Virginia
BUILDING INFORMATION MODELING (BIM) GUIDELINES AND STANDARDS FOR ARCHITECTS, ENGINEERS, AND CONTRACTORS
SBA FORM 190

This BIM Guideline and Standard applies to School Building Authority projects funded beginning December 2015 based on the following criteria:

- Required on all new construction with a total project funding of $10 million or greater, and on any project that has already been delivered with a BIM requirement.
- The School Building Authority goal is to implement BIM for design and construction of future SBA Funded projects as follows:
    - New School Construction Projects beginning in December 2015.
    - All New School Construction and Major Addition and Renovation Projects beginning in December 2016.
    - Implementation of BIM on all projects beginning December 2017.
    - BIM modeling information data provided to the owners for use in their preventative maintenance data bases state wide by 2019.

For more information and updates on SBA BIM guidelines and standards, please visit our website: http://www.sba.wv.gov/

1. General Requirements
    1.1. Objectives and Application – Architecture and Engineering Design Professionals
    Note: The Design Professionals are responsible for the development of all design models to Level300 as outlined in the most current "BIMFORUM Level of Document Specification."

2. Model Quality
    2.1. The Design Team shall establish and use in-house modeling quality control guidelines and exchange protocols. Good BIM practices may include, but are not limited to:
        - Use of element and component objects that embed the best practices of the firm.
        - Maintenance of parametric linkages within the model at all times.
        - The building envelope needs to be "air-tight" and correct to help support energy modeling activities and simulations.
        - Use industry standard defined nomenclature for objects and spaces. (IFC, COBie)
        - Use appropriate and interoperable viewing, checking, and output file formats
    2.2. The SBA reserves the right to request and obtain a written copy of these policies.
    2.3. Interference test(s) must be performed on the following:

	Interference Test(s):	Software with this function:	Authoring Software for final check:
M&P Model	**Duct vs Duct** **Pipe vs Pipe** **Duct vs Pipe** **Duct vs Struct** **Duct vs Elec** **Duct vs Ceilings** **Mech Equip vs (all)**	**Revit** **BIM Glue** **Navisworks Manage**	**Navisworks Manage**

Elec Model	**Elec vs Duct** **Elec vs Pipe** **Elec vs Struct** **Elec vs Fire Protection** **Lights vs Duct** **Lights vs Pipe** **Elec Equip vs (all)**	**Revit** **BIM Glue** **Navisworks Manage**	**Navisworks Manage**
Structural	**Struct vs Duct** **Struct vs Pipe** **Struct vs Elec**	**Revit** **BIM Glue** **Navisworks Manage**	**Navisworks Manage**
Architectural	**Ceiling vs Duct**	**Revit** **BIM Glue** **Navisworks Manage**	**Navisworks Manage**
***Federated Model** **In Navisworks**	**M&P vs Struct** **Elec vs Struct** **M&P vs Elec** **Duct vs Ceilings**	**Navisworks Manage**	**Navisworks Manage**

**Federated model is all of the project 3D models (A, M, E, P, S) merged together in proper orientation.*

3. Design Team Deliverable Schedule and Milestones
   The submittal schedule along with the milestones for any given project is listed below:

Model Name:	Model Content:	Project Phase:	Reviewing Company:	Authoring Tool:
Design-Intent Coordination Models	Architectural, Civil, Structural, and MEP components of main building and other associated structures (as necessary for proper construction coordination and assembly of building systems/components). (as specified under AIA E203 LOD 100 (Landscape), LOD 200 (Civil) and LOD 300 (Arch/Struct/MEP)	Design Development and Construction Documents	Architect, Civil Engineer, Structural Engineer, MEP Engineer, Other Consultants as needed	Autodesk® Revit® software, other programs to be submitted for approval to A/E and CM. (Current Versions)
Architectural Model	Architectural components of main building and other associated structures (as necessary for proper construction coordination and assembly of building systems/components). (as specified under AIA E203 LOD 300)	Design Development and Construction Documents	Architect	Autodesk® Revit® software, other programs to be submitted for approval to A/E and CM. (Current Versions)

Structural Model	Structural components of the proposed building, including foundations, basic connections (steel detailing by Prime Contractor), framing details, and associated elements that are designed by the Structural Engineer. (as specified under AIA E203 LOD 300)	Design Development and Construction Documents	Structural Engineer	Autodesk® Revit Structure® software, Tekla Structures, Bentley Structural Modeler, other programs to be submitted for approval to A/E and CM. (Current Versions)
M/E/P/R/FP Model(s)	M/E/P/R/FP system components of the existing building design, including objects, elements that are designed by the M/E/P/R/FP Engineer(s). (as specified under AIA E203 LOD 300)	Design Development and Construction Documents	MEP Engineer, Other Consultants as needed	Autodesk® Revit MEP® software, other programs to be submitted for approval to A/E and CM. (Current Versions)

Milestone	**Deliverable**
Conceptualization Phase	Architectural Massing Model
Schematic Design Phase	Architectural Model
	Initial Collision Report
	Square Foot Cost Analysis (Upon Request)
Design Development	Architectural Model
	MEP Model or Models
	Structural Model
	Discipline Collision Report
	Program Validation
Construction Documents	Architectural Model
	MEP Model or Models
	Structural Model
	Pre-Bid Collision Report

4. Design Phase Application – Architecture and Engineering Design Professionals
   4.1. Schematic Design Phase (Criteria Design)

4.1.1. General

The Design Team may use any method to begin the design process but shall be using a BIM authored model(s) by completion of this phase. All information needed to describe the schematic design shall be graphically or alphanumerically included in and derived from these models. The SBA expects the Design Team to use analysis tools, static images and interactive 3D to describe the design concepts. Deliverables are required as stated in Section 3.

4.1.2. Program and Space Validation

The Design Team shall use the BIM Authoring software or other analysis tools to compare and validate stated program requirements (normally provided by the SBA and the County Board of Education) with the actual design solution. The following shall be developed automatically from the building information model:

- Assignable Areas (ASF) and Non-assignable Areas (NaSF) measured to inside face of wall objects and designated boundaries of areas.
- Gross Area (GSF) measured to the outside face of wall objects.

4.2. Design Development Phase (Detailed Design)

4.2.1. General

The Design Team shall continue development of their Building Information Model. Parametric links shall be maintained within the models to enable automatic generation of plans, sections, elevations, custom details and schedules as well as 3D views. All information needed to describe the "detailed design" shall be graphically or alphanumerically included in and derived from these models only, except for the Specifications. All documentation of the models happening outside of the BIM Authoring software, must be linked to all other documentation created creating one cohesive model from all sources of information. The quality of the models shall be as stated in Section 2.3.

4.2.2. Architectural Systems

The model should include the following architectural elements to a level that defines the design intent and accurately represents the design solution:

- New interior and exterior walls including but not limited to:
    - Doors, windows, openings
    - Interior and exterior soffits, overhangs, sun control elements
    - Parapets, screening elements
    - Architectural precast

    All finishes need to be included within the wall type regardless of the thickness of the finish
- Floor, ceiling and roof systems including but not limited to:
    - Appropriate structural items listed below if not provided by the structural engineer and integrated into the architectural model for coordination and document generation.
    - Insulation, ceiling systems, and floor are to be included.
    - Roof, floor and ceiling slopes, if needed, shall be modeled.
    - Soffits, openings, and accessories will also be modeled.
- Elevators, stairs, and ramps (including railing systems)
- Fixtures, and equipment (if not provided by others and integrated into the architectural model for coordination and document generation.)

    - Specialty equipment (food service, medical, etc)
    - Model mechanical, electrical and plumbing items that require architectural space (toilets/sinks/etc), require color/finish selection (louvers, diffusers, etc.) or affect 3D visualization (lighting fixtures) unless provided by engineers.
- Clearance zones for access, door swings, service space requirements, gauge reading, and other operational clearance must be modeled as part of all equipment and checked for conflicts with other elements. These clearance zones should be modeled as invisible solids within the object.

4.2.3. Structural Engineering

The model should include the following structural elements:

- Foundations such as:
    - Spread Foundations
    - Caisson Foundations
    - Pile Foundations
    - Mat Foundations
    - Load-bearing Wall Foundations
- Framing such as:
    - Steel Columns (with correct shape and size)
    - Steel Floor C-Joists
    - Open Web Joists
    - Joist Girders
    - Steel Beams (with correct shape and size)
    - Precast Concrete Elements (Hollow Core Plank may be modeled as a slab unless the hollow core is being used for mechanical systems and coordination with those systems needs to occur)
    - Cast-In-Place Concrete Elements
    - Floors including overall extents and openings
    - Model overall thickness of wood floor systems
    - Wood Posts/Column
    - All other Joists
    - Wood Trusses
    - Solid Wood or Laminated Beams
- Wall Types including openings
    - Load Bearing Walls – for calculations only (Masonry, Concrete, Cold-Formed Steel, and Wood)
    - Model overall thickness of Cold-Formed Steel and Wood Stud walls (individual members may be modeled at the Design Team's option)
    - Structural Foundation Walls including brick ledges
- These items may be modeled at the Design Team's option:
    - Steel reinforcing in concrete
    - Embeds in concrete
- Miscellaneous Steel
    - Angles for openings, deck bearing, etc.
    - Channels for mechanical units needed for coordination reviews between structural and mechanical
    - Lintels (unless considered a major member)

4.2.4. HVAC Systems

The model should include the following HVAC elements at a minimum:

- Equipment
    - Fans, VAV's, compressors, chillers, cooling towers, air handlers etc.
- Distribution
    - Supply, return, exhaust, relief and outside air ductwork modeled to outside face dimension or duct insulation (whichever is greater)
    - Diffusers, grilles, louvers, hoods, radiant panels, perimeter units, wall units
- Pipes 3/4" diameter and larger, include any insulation in model. *Unless otherwise noted and approved by the BIM Execution Plan.*
- Clearance zones for access, door swings, service space requirements, gauge reading, and other operational clearance must be modeled as part of the HVAC equipment and checked for conflicts with other elements. These clearance zones should be modeled as invisible solids within the object.

4.2.5. Electrical Systems

The model should include the following electrical elements at a minimum:

- Power and Telecommunications
    - Interior and exterior transformers, emergency generators, and other equipment
    - Main and distribution panels and switchgear including access clearances
    - Main IDF's
    - Feeders, cable trays, and conduit larger 3/4"diameter and larger. *Unless otherwise noted and approved by the BIM Execution Plan.*
- Lighting
    - Permanently mounted lighting fixtures (moveable, plug-in fixtures need not be modeled as part of the electrical package unless needed for plug load calculations or for estimating purposes within a loose furnishings package. Should be discussed and agreed upon within the BIM Execution Plan)
    - Ceiling Mounted Lighting Controls
    - Junction Boxes
- Fire Alarm and Security Systems
    - Input devices
    - Notification devices
    - Associated equipment and access clearances
    - Permanently mounted fixtures
- Building Controls
- Clearance zones for access, door swings, service space requirements, gauge reading, valve clearances, installation and other operational clearances must be modeled as part of the electrical equipment for collision checking. These clearance zones should be modeled as invisible solids within the object.

4.2.6. Plumbing and Fire Protection

The model should include the following plumbing and fire protection elements at a minimum:

- Waste and Vent Piping sized at 3/4" diameter and larger, includes any insulation in model. *Unless otherwise noted by the BIM Execution Plan*.
    - Roof and floor drains, leaders, sumps, grease interceptors, tanks, water treatments and other major items.

- Supply Piping 3/4” diameter and larger, includes any insulation in model. *Unless otherwise noted and approved by the BIM Execution Plan*.
    - Domestic Booster Pumps
- Fixtures: sinks, toilet fixtures, water tanks, floor sinks
- Fire protection
    - Sprinkler lines 3/4”diameter and larger
    - Sprinkler heads, Fire Protection Pumps
    - Stand pipes, wall hydrants, fire department connections, risers, including valve clearances
- Clearance zones for access, service space requirements, gauge reading, valve clearances, installation and other operational clearances must be modeled as part of the plumbing and fire protections system and checked for conflicts with other elements. These clearance zones should be modeled as invisible solids within the object.

4.3. Construction Documents Phase

4.3.1. General

The Design Team shall continue development of the models created in the Design Development Phase. Parametric links should be maintained within the respective models to enable automatic generation of all plans, sections, elevations, custom details, schedules and 3D views. All information needed to describe the “Execution documents” shall be graphically or alphanumerically included in and derived from these models only. Specifications are not required to be linked within the models. Model quality shall be as stated in Section 2.

4.3.2. Pre-Bid Collision Reports

See section 2.3.
Submit at 95% Construction Document Submittals

4.4. Bidding Phase

4.4.1. General

The Design Team shall update the models with all addendum, accepted alternates and/or value enhancement proposals. Upon completion of these updates, the design team shall reevaluate the collision report and resolve any and all conflicts prior to construction.

4.4.2. Contractor Bidding

Contractors who are bidding on this project are to review the BIM Execution Plan, and the SBA Building Information Modeling (BIM) Guidelines and Standards for Architects, Engineers, and Contractors before bidding. Contractor will follow the guidelines and requirements as set forth by the BIM Execution Plan.

4.4.3. Construction Documents Deliverable

Ten days after the project is awarded for construction, the Design Team shall submit to the Construction Manager’s/Contractor’s Office one set of the Construction Document Deliverables. This deliverable shall consist of CAD files representing every sheet in the Bid Documents. Each sheet is to have its own unique file. Native word processing files (Word

or WordPerfect) for all specifications shall also be included. Any addenda files in their native format shall also be included. Final payment for services rendered during the bidding phase is contingent upon approved acceptance of these documents.

5. Objectives and Application – Construction Team Members

Note: All Prime Contractors are responsible for the development of all construction models to Level 400 as outlined in the "BIMFORUM Level of Development Specification." When applicable, models shall be forwarded to the construction manager for coordination and incorporation in to As-Built Drawings.

5.1. Construction Phase

5.1.1. General

The Design Team is expected to continuously maintain and update the design intent model(s) with changes made from official Construction Change Directives. As-built mark-ups shall be maintained on site by the Contractor(s) during construction. At an interval that is decided within the BIM Execution plan or at minimum once a month during construction the updated design intent model will be published and posted to the "cloud" based project collaboration site for each project.

Model Name:	Model Content:	Project Phase:	Reviewing Company:	Authoring Tool:
Overall Construction Coordination Model(s)	Coordinated Design-Intent Model through Clash Detection sessions, includes Site Logistics and phasing (optional), 4-D scheduling (optional); model will be populated with O&M information as a deliverable to Owner. (as specified under AIA E203 LOD 400)	Construction Documents and ongoing through Construction Phase	**A/E** to deliver Design-Intent Models at outlined LODs to **CM**. **CM** becomes model owner during construction coordination process. **Prime Contractors** model their respective scopes of work in 3D and produce coordination models.	Autodesk Revit, Autodesk Navisworks, Microsoft Project, Primavera P6, other programs to be submitted for approval to A/E and CM. (Current Versions)
Prime/Subcontractor Coordination Model(s)	All specific components of the **Prime/Subcontractor's** scope of work to interface with the Construction Coordination Model, models are developed by **Primes/Subs** and coordinated by the **Lead Contractor (HVAC)** and	Construction Documents and Contractor Coordination Meetings	Models created and presented by each **Prime/Subcontractor**, models managed by **Lead Contractor (HVAC)** and CM; **A/E** participates as needed during coordination. **HVAC Contractor is**	Autodesk Civil 3D, Autodesk Revit Structure, Autodesk Revit MEP, Autodesk Navisworks, other

	CM. (as specified under AIA E203 LOD 400). **Primes/Subs** required to submit models are: **Structural Steel, HVAC, Electrical, Plumbing, Fire Protection, Geothermal (coordinate paths and locations in 3D), Technology (coordinate paths and locations in 3D).**		**Lead Prime for Navisworks Manage 3D coordination.**	programs to be submitted for approval to A/E and CM

Milestone	Deliverable
Construction Phase (Contractor)	Discipline Specific Coordination Models
	Shop Drawing Models (If Applicable)
	Fabrication Models
	As-Built Markups (3D dwf/pdf or 2D dwf/pdf format)
	Scheduling and Phasing Models
Construction Phase (Design Team)	Current As-Built Models for Each Discipline

Team Responsible:	Detailed Special Instructions:
Construction Manager, BIM 3D Construction Coordination through Navisworks Manage 2016 (NAV)	The BIM 3D Construction Coordination Process will be managed by the Construction Manager and assisted by the CM, HVAC Contractor, the Architect and their consultants (A/E). The CM will coordinate 3D information as submitted by the prime/subcontractors using Autodesk Navisworks Manage 2016. The HVAC Contractor will be the Lead Contractor responsible for the physical coordination of the Prime Trade Contractors' 3D models using Navisworks Manage 2016, with oversight from the CM. The CM is responsible for overseeing construction coordination and clash detection only; The CM will not provide design work or modeling work to assist prime/subcontractors. Prime/subcontractors are required to submit 3D model information that is generated from/based off of their 2D coordination drawings, which is a required submittal for this project. Prime/subcontractors are required to participate in BIM Coordination Meetings with the CM and A/E. Primes/subcontractors must supply their coordination drawings in a 3D format as listed in the above specifications. If the Prime/subcontractor utilizes a 3rd party consultant for their coordination drawings, said consultant is required to attend coordination meetings with the CM and A/E.
Construction Manager (CM)	The CM shall assess with receiving necessary photos, issues and descriptions to generate RFI's for the submission to the project architect.

5.1.2. Construction Models

5.1.2.1. General

These models could include fabrication models, coordination models, or shop drawing models. These models will now be referred to as the Construction Models.

5.1.2.2. Modeling Requirements

The Construction Models should reflect the exact geometric properties of the materials and/or systems being submitted. These models should reflect the exact material properties and performance data.

5.1.2.3. Deliverables

All Prime Contractors shall submit all models to the Construction Manager/Contractor in both a Navisworks format and a 3D DWF format. These models should be updated after each project coordination meeting or as changes occur in the field during construction.

5.1.3. Coordination Meetings

5.1.3.1. General

The contractor shall submit a plan to the Owner for review, prior to the start of construction that outlines the process for concurrent as-built documentation. Concurrency is mandated. Methods for recording as-built information are left to the discretion of the contractor. Potential options include traditional methods, and/or periodic laser scanning of completed or partially completed primary systems coordinated with the sequence of construction. Primary systems fall into two categories:

Primary Architectural Systems include, but may not be limited to: Partition systems with structure, flooring systems, major HVAC, piping, sewerage and /or conduit systems, partition systems with bulkheads, partition systems with expansion control, vertical transportation systems with primary engineering systems, horizontal ceiling systems with window openings, bulkheads, partitions, lighting, fire protection and HVAC outlet locations, exterior skin systems with window openings, structure, roof edge conditions, parapets, roof penetrations, and equipment locations.

Primary Engineering Systems include, but may not be limited to: structural framing, primary HVAC duct runs, primary fire protection main runs, primary electrical conduits (larger than ¾" diameter), ceiling grid layouts, primary data, audio/visual, security and communication distribution systems (cable trays, etc.).

5.1.3.2. Projects With Active BIM Models at the Start of Construction

If BIM models are provided by the A/E at the start of construction, the contractor shall use those models in support of the objectives noted in 4.6.4.2.

5.1.3.3. Coordination With The Design Team, Construction Manager, and Owner

On no less than a biweekly basis the contractor shall include the project model manager, (architect's or other) in a coordination established for the purpose of assessing and / or executing FM/PM data transfers from the construction process into the model. The data transfer shall be coordinated with the Owner representative and

the architect's model manager (when feasible) and be based on the FM/PM objectives as defined in the BIM Execution Plan and project program.

5.1.3.4. Deliverables

Coordination files should be created at all critical coordination milestones. This record format will document a coordinated section of the model, either by area of the building or between specific critical trades. The Collision report showing all applicable collisions as either Approved or Resolved along with the coordination file shall be uploaded together to "cloud" based project collaboration environment. A text document shall also be uploaded which describes and references the approved coordination file with respect to what has and has not been coordinated. These deliverables shall be provided to the Construction Manager for verification.

5.1.4. Collision Reports

The Contractor is to utilize software designed to provided collision reporting. Collision reports from the software should be published weekly in a standard XML, HTML, or Text format. These reports shall include the following information at a minimum:

- Description of Collision Report
- Date of Collision Report Run
- List of all Collisions detected, their status, and their proposed solution.

5.1.5. Concurrent As-Builts

5.1.5.1. General

The contractor shall maintain concurrent as-built documentation monthly. Concurrency is maintained and is subject to progress payments. Primary systems include, but may not be limited to: structural framing, primary HVAC duct runs, primary fire protection main runs, primary electrical conduits (¾" diameter and larger), ceiling grids layouts.

5.2. Project Close-Out

Milestone	Deliverable
Project Close-Out (Design Team)	As-Built Models
	Record Document Project Drawings (.pdf format)
	Record Document Drawings (3 sets on paper)
Project Close-Out (Contractor)	Scanned Field Set Drawings – As Builts (.tif format)
	O&M Manuals (paper/.pdf/excel format)
	Coordination Models in their native file format

5.2.1. Design Team As-Builts

The Design Team shall update their respective models with contractor recorded changes (Record Documents). Republish record documents in paper, .dwg and .pdf formats.

5.2.2. Contractor Record Documents

The contractor shall submit one set of paper as-built drawings (Record Documents) at substantial completion.

5.2.3. O&M (Operations & Maintenance) Manuals

The Construction Manager/Contractor shall submit the following information to the County Board of Education – two paper copies in binders of the O&M Manuals: (1) the make, model and serial number of each piece of installed equipment, (2) the location of any equipment installed in the building, and (3) manufacturer's documents including cut sheets, installation instructions, and recommend maintenance tasks, testing or other reports. An electronic format of the O&M manuals shall also be submitted along with the paper copies, the format shall be color PDF and native Excel files (at substantial completion).

5.2.4. Project As-Built and Record Document Deliverable Matrix

The following matrix outlines the various As-Built and Record Documents deliverables that are required with the associated responsible parties.

Deliverable	Responsible Party	Quantity	Format	Due Date
Operations & Maintenance Manuals (O&M)	CM, C	2 sets	binders	At Substantial Completion
As-Built BIM Model(s) – By Contractor, Construction Manager	CM, C	1 set	.rvt	Prior to Final Payment

Responsible Parties
C = Contractor
CM = Construction Manager (On multiple-prime projects where a CM is used, the CM shall be responsible for the above listed items)

6. Ownership and Rights of Data

The Architect has ownership of all CAD files, BIM Models, and Facility Data developed for the Project through the completion of Construction. At the end of Construction, The SBA and/or the County Board of Education has ownership of all CAD files, BIM Models, and Facility Data developed for the Project. The SBA and/or County Board of Education may make use of this data following any deliverable.

7. Terminology

A

As-Built Documents
As-built documents are the collection of paper drawings or electronic drawings that typically reside in the contractor's onsite trailer that contain mark-ups, annotations, and comments about changes that have been made to the contract documents during the construction phase.

As-Built Model
Design Intent Models that have been updated throughout the construction process. These changes and updates have been communicated from the Contractor to the Design Team through the comments,

annotations, and mark-ups from the As-Built Documents. These typically, but not always, are discipline specific models.

B

BIM Execution Plan (BEP)
A plan that is created from the School Building Authority's BIM Execution Plan Template that is to be submitted thirty (30) days after contract award. The BEP helps to define roles and responsibilities within a project team.

D

Design Team
The Design Team is considered to be the Architect and all of the consultants that provide design services for a project. These design services can be rendered at any time during the project.

.DWF
.DWF is a file type that was developed by Autodesk to be locked file for drawing sheets and model data. It can be used as a file transfer for estimating data, markups, and other third party software. It can be a combination of 3D and 2D information within the same file.

.DWG
.DWG is a native AutoCAD file format. It is a widely used file format for exchanging drawing information and 3D information to different programs. While not a database file type, it still has lots of uses for exchanging information.

L

LEED
The Leadership in Energy and Environmental Design (LEED) Green Building Rating System is a suite of standards for environmentally sustainable construction. Based on a point system, a building can achieve different ratings based on the performance of the design, construction, and operation of the building.

N

Navisworks
Navisworks is software that allows for the viewing of multiple model formats. This ability to "view" these files also allows for Navisworks to simulate the interaction between model files. That includes collision reporting, time lining, and coordination.

.NWC
An .NWC file is a Navisworks Cache File that is used by Navisworks to quickly read many other file types. All linked files in Navisworks have an .NWC file created automatically. In addition, Revit will export directly to the very small file type of .NWC for quick access by Navisworks.

.NWD
A much larger file than the .NWC, the .NWD file shows a snapshot in time of a Navisworks file. No linked files exist but all geometry is included.

.NWF

The .NWF file is a native Navisworks file which has all linked files, clashes, markups, animations, schedules, etc.

O

Open Architecture
Open Architecture is a concept of creating a framework that helps to describe a common set of rules for how a project is created. This includes what types of software, the interoperability of the information, and how the participants interact with each other. This is different than open standards because it promotes progress without anchoring forward thinkers to a rigid standard.

P

Phases
The phases of a project can be describe in two different ways as the adoption of IPD terminology starts to penetrate the BIM Execution Plan and the IPD Methodology Plan. Below is a list of the traditional names followed by the IPD name:

Pre-Design/Conceptualization Phase
Schematic Design/Criteria Design Phase
Design Development/Detailed Design Phase
Construction Documents/Implementation Phase

R

Record Drawing
The production of Record Drawings is the capturing of the As-Built Document's annotation, comments, and mark-ups in a drawing format only. This does not typically include the updating of any models.

.RVT
An .RVT file is a native REVIT file type. It is also the deliverable file format for all projects. This includes all of the Design Team's models.