GSA BIM, CDX & COBIE STANDARD

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This document is the “General Services Administration (GSA) Building Information Modeling (BIM), Common Data Exchange (CDX) & Construction to Operations Building information exchange (COBie) Standard”.

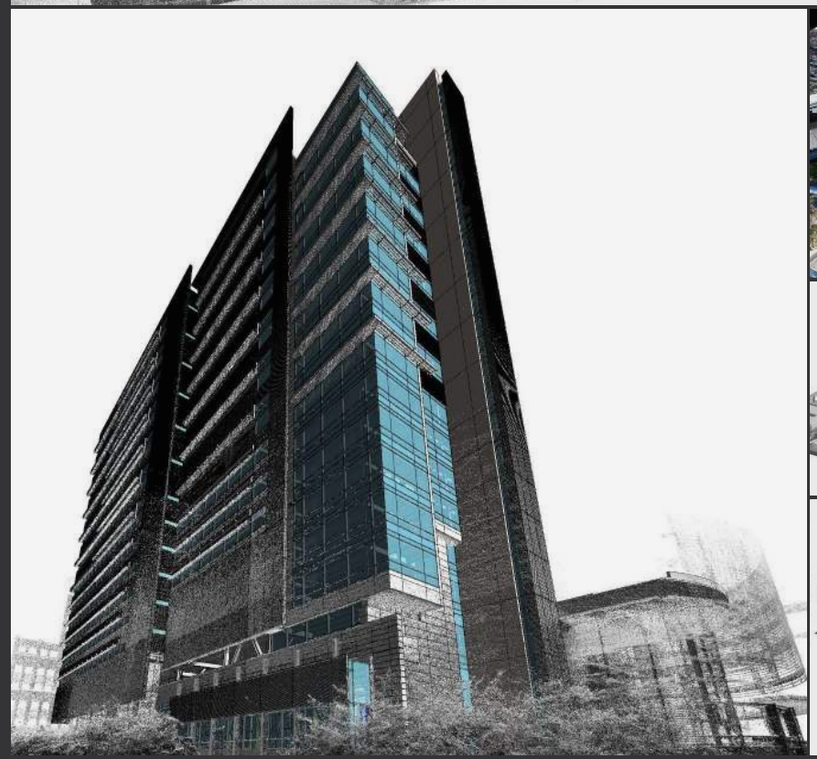
It has been developed by the Office of Architecture and Engineering (OAE) in collaboration with input from various individuals and groups across GSA to aggregate, clarify, and simplify BIM requirements to align with GSA programs to leverage BIM for the life-cycle of a facility. It is maintained and updated by the OAE BIM Services team.

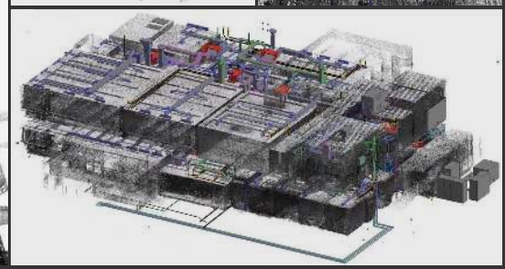
This standard is a requirement for all Capital Improvement projects, for all projects in buildings that have an existing Building Information Model (BIM), and for other Design & Construction projects where deemed appropriate after consultation with the GSA Regional Building Information Manager.

The most recent version of this document is available on GSA Insight.

If you have any comments or feedback on this document, please use this link.

Please see pg. 7. Overview of the model lifecycle for examples of BIM workflows.





OVERVIEW

Introduction

GSA has developed this standard to detail how BIM will be deployed and delivered, which includes compliance with other GSA contracts, specifications, P100 and other documentation.

The GSA BIM program aims to generate and maintain a robust BIM catalog of all of it's building infrastructure. This includes: developing a Common Data Environment (CDE), linking BIMs to facility data, information and documentation, and maintaining an evolving set of As-built BIMs for future operational needs.

This document is not intended to dictate the means and methods of designers or contractors in the development of BIMs. It does define the activities, responsibilities and requirements of complete BIM submissions during design and construction phases of projects. BIM Submissions are required by the P100 and delivery matrix, and those submissions must comply with this standard.

The requirements of this document may not be altered without approval of the OAE National BIM Program Manager.

This document also contains some guidance to designers and contractors as to best practices and toolsets for delivering in accordance with the requirements contained herein.

CONTRACTS & PRECEDENCE

The GSA BIM, CDX & COBie Standard applies to all contract types. This section provides some clarity on application of the standard for different contracts, and further clarification on official GSA published requirements related to BIM, and how to apply this standard to comply with other GSA BIM requirements in separate contractual documents.

BIM DELIVERY RESOURCES

A list of templates, standards, and tools that GSA provides or aligns with for project delivery of BIM. These resources are referenced throughout this standard.

MODEL LIFE-CYCLE

Content in this section is of critical importance for the application of BIM on a project. It provides critical definitions for different model types, how the Native Model evolves from start to finish of a project, and which contracted entities are responsible for producing and maintaining different model types.

CHANGE LOG

Maintains a record of changes to this standard so that new requirements added by GSA can be quickly understood by all project stakeholders.

Model Ownership

All Building Information Models developed under a GSA contract are the property of GSA, and will be delivered in full accordance with this standard. All model elements, notations, families, and similar content generated within the software used to develop models which is necessary for the production and delivery of 2D contract documentation shall remain in the model for all submissions - unless specifically stated otherwise in this document. Any related materials, documents, laser scans, and other work product that are developed to inform or produce the final As-Built Model are also the property of GSA.

For more information on all government rights see: FAR Subpart 27.4 - Rights in Data and Copyrights.

This ownership applies to all Model Types used for design, construction, coordination, fabrication and other BIM Workflows required by this document and any additional contract requirements related to BIM Submissions that may be unique to a specific project.

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Project Delivery Contract Types:

BIM is required for all project contracting types and delivery methods. Each contracting method will create small differences in how BIM is applied - which is the purview of the design/construction teams to determine in the BIM Execution Plan (BEP) & Information Delivery Plan (IDP). This BIM Standard applies the same to all contracting methods - as this standard describes the end-state of the Record Model and As-Built Model that will be delivered at the end of the project. The final As-Built Model requirements do not change between these contracting types. The following are the key considerations for applying this BIM Standard to the project based on delivery type:

Design Bid Build / Construction Manager as Constructor:
These projects separate design from construction, and therefore the design team will own the “live” Native Model until construction is substantially complete and then turn over the Record Model to the contractor for alignment with the contractor’s Federated Model. The key considerations are to ensure that there is appropriate sharing and exchange of the most recent Construction Administration Models with the contractor at all times during construction, as well as ensuring that the attribute data and CDX & COBie data that can be provided by the design team is input into the model before hand-off.

Design Build:
The key opportunity on a design build project for BIM is that the subcontractors are able to provide more input into the design process, and thus inform the models appropriately - which can reduce the amount of work required to conform the model to the installed conditions. It is up to the Designer/Contractor team to determine if and how their BIM approach will take advantage of this opportunity and define it in the BEP.

Bridging:
This delivery method involves a hand-off from one designer to another prior to development of Construction Documents per the P100. Bridging Design Models must implement all applicable BIM workflows, the “Modeling Requirements” section must be followed, and the model must align with the provided Revit template. The model may not be a perfect representation of the 2D bridging documents, and it the responsibility of the receiving design firm to validate any use of the bridging model. The provided 2D bridging documents are still the contractual design, and the Native Model provided to the Designer is for informational purposes only. The Designer is encouraged to continue to refine and progress this model if possible.

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Contracts & Precedence: Section Continues Next Page

BIM Requirement Order of Precedence

BIM is authorized and required for GSA design, construction and leasing projects by the P100.

GSA recognizes that BIM is referenced in many documents and has gone through due diligence to align these references between each other. However, BIM policy at GSA is an ever-evolving requirement, and there may be conflicting requirements between documents. The following order of precedence will govern BIM requirements.

1. **Contract Documents:** A specific project RFP may contain additional BIM requirements beyond other GSA BIM standards. This includes Division 01 Construction Specifications.

   In the event the facility is operated by another agency, and that agency has provided their own BIM standards, those requirements will be reconciled by the project team with this standard.

2. **BIM Standard Requirements (this document):** The BIM, CDX & COBie Standard details general BIM requirements for a project.

3. **GSA Common Data Exchange (CDX) and COBie Data Standard:** This document details the information (attributes) required to be contained in Native BIMs.

4. **GSA P100:** The P100 provides general requirements and identifies required submissions/deliverables for BIM on GSA projects.

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Note: The applicable legacy requirements of GSA BIM Guides have been consolidated and included in this standard. Legacy GSA BIM Guides no longer apply to GSA contracts.

Any conflicts between these documents that cannot be intuitively resolved by this precedence shall be submitted to GSA for review. The submitter shall identify the conflicting statements, and propose a resolution. GSA will review and approve/reject the proposed resolution.

Submitters shall identify these conflicts prior to submitting a proposal and identify any costs related to the proposed resolution prior to award. Conflicts identified post-award will require a “no-cost” resolution for GSA.

BIM Delivery Resources

The following resources will aid Designers and Contractors to develop compliant models according to the BIM Implementation Process and meet the requirements of this standard. This section is a summary of those resources, how they apply, and where to find them. They are referenced in various sections of this document as well, for further context.

BIM Execution Plan (BEP) & Information Delivery Plan (IDP) Template:

- **Summary:** BEP & IDP requirements of GSA consist primarily of documenting the key information about the project, the main points of contact, project file naming conventions, model exchange methodology, and similar information. For Each BIM Workflow, the plan will provide project specific information about how they will be executed at a summary level and detailing the methodology the project team will use for submittals. This is also the document where Designers and Contractors can request changes to the standard based upon project specific details.
- **Application:** The BEP & IDP will be developed at the beginning of the contract, and maintained and updated at quarterly intervals and made available to GSA on request. The most current BEP will be submitted to GSA at major milestone submissions defined in the Submission Matrix section or the P100.
- **Location:** Provided by GSA on request prior to award and after NTP.

GSA BIM Submission Quality Control Checklist:

- **Summary:** Defines the contents of the BIM package being submitted for review, as well as informing GSA on the progress of models and workflows, and provides context for GSA to conduct their BIM reviews.
- **Application:** Each BIM Submission must include the BIM Submission Quality Control Checklist
- **Location:** Provided by GSA on request prior to award and after NTP.

Revit Template:

- **Summary:** GSA has developed a GSA Revit Template that will be transmitted to the designer/contractor at the beginning of the contract. The intention of this template is to aid and assist in meeting the requirements outlined in this standard. It is recommended that this template be used as the starting point for any Revit model, and that each firm takes the time at the beginning of the project to reconcile their internal templates with the GSA template.
- **Application:** This template should be used as a starting point for setting up the Design Model, and validated at each major BIM submission.
- **Location:** Provided by GSA on request prior to award and after NTP.

BIM Interoperability Tools (BIT):

- **Summary:** Autodesk has developed the BIT, which provides additional functionality beyond native Revit functions. It supports the COBie workflow through the COBie Extension, and application of custom object attributes and data for spaces and equipment, as well as model checking.
- **Application:** Applying custom attributes to model objects, QC checking, and COBie spreadsheet development, GSA Common Data Exchange (CDX) attribute validation.
- **Location:** Can be downloaded from the BIT website, and is also an optional installation of Revit 2022 forward. Tutorials and guidance for using the tool can also be found on the website.

BIM Delivery Resources: Section Continues Next Page

BIM Delivery Resources (continued)

Division 1 Specifications for BIM:

- **Summary:** Section 017825 - Building Information Modeling. A specification for BIM for the project, defining BIM requirements for the construction phase that conform with this standard.
- **Application:** Design team completes the template, and includes the specification with the rest of the Division 01 project specifications when issuing construction documents.
- **Location:** A Template for this specification will be provided to the design team by GSA.

GSA Common Data Exchange (CDX) and COBie Data Standard

- **Summary:** The GSA Common Data Exchange (CDX) & COBie Data Standard is a separate GSA excel formatted document. This document is the specific Level of Information (LOI) attributes required to be populated in BIMs during design and construction. These attributes must be correctly applied to all Native Models which are then leveraged to export a COBie spreadsheet for the project. The standard also contains specific attributes that only apply to the final COBie spreadsheet delivered by the Contractor. Both the Designer and Contractor have independent responsibilities for development of these attributes as the project progresses.
- **Application:** The attributes required by the CDX and COBie Data Standard are used to populate the Trigriga database for Spatial Data Management (SDM), as well as import more detailed operations and maintenance data into MAXIMO. More detailed information on the requirements of this standard is in the Operations & Maintenance Facility Data section of this document, which replaces the GSA COBie Playbook.
- **Location:** Provided by GSA on request prior to award and after NTP.

BIM for Spatial Data Management Guide:

- **Summary:** This document provides guidance on how to configure and use Revit to generate the required “PBS National Business Space Assignment Policy” (NBSAP) spatial data requirements.
- **Application:** Used by Design teams to properly configure a Revit file for SDM submissions and for GSA to populate their database with the related information.
- **Location:** Provided by GSA on request prior to award and after NTP.

GSA P100 and P100 Submittal Matrix:

- **Summary:** Design standard of GSA. This document includes some high-level direction to design teams regarding BIM, and specific BIM submittal requirements for each stage in design.
- **Application:** All GSA design contracts.
- **Location:** GSA website.

AIA/BIMForum Level of Development (LOD) Specification:

- **Summary:** An industry standard document which is updated annually by the AIA/BIMForum. The document defines the model Level of Development in general terms (100, 200, 300, 350, etc), as well as provides a detailed description of LOD for different building elements by Uniformat code.
- **Application:** This GSA BIM Standard requires the Designer/Contractor to follow this standard as applicable when developing native Revit models. The current version of this standard as of the date of the ratified Design Contract will be used for the project.
- **Location:** AIA/BIMForum website.

SYMBOL KEY

- Model exchange
- Native model progression
- X — Submit, Exchange or Transition of Model(s)

Model Life-Cycle Development Timeline

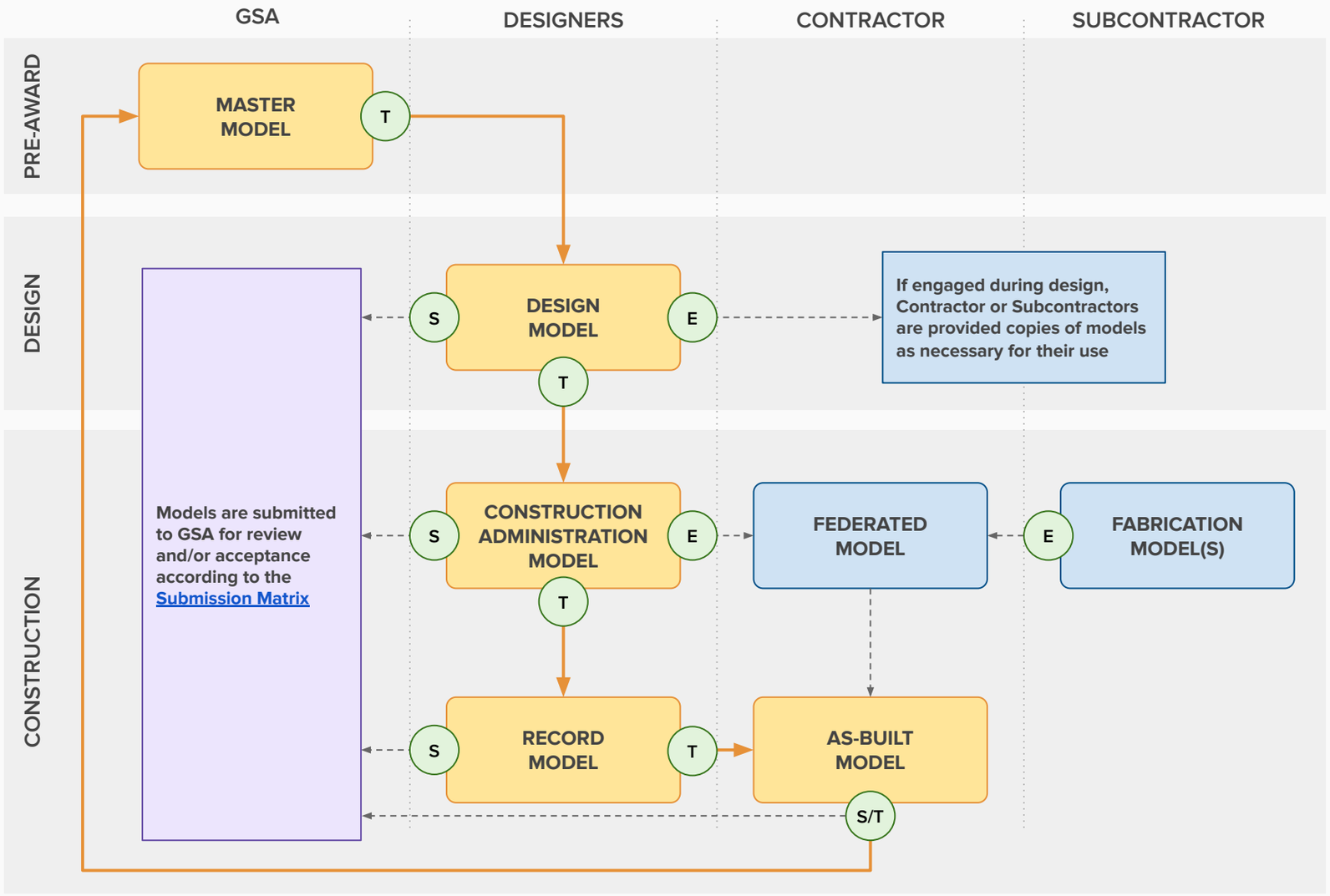
GSA intends to use building models for the entire project life-cycle, in coordination with stakeholders and for internal use throughout the life of the building. The life-cycle model development timeline graphic shows the progress of the model throughout the course of a project, from design through construction to final delivery. At each stage of the project, the model must comply with different elements of this standard.

Each model type will be archived by GSA at transition stages, there will be multiple model submissions required for each stage of this timeline. Formal and interim submissions are defined by the P100. The intention of this graphic is to provide clarity for model stakeholders and show the high-level overview of model progression through the project's life-cycle.

GSA has identified seven different model types which are defined in more detail in the graphic to the right.

- Yellow boxes represent the different Native Model types, at their respective stage of development, which are required submittals during the life-cycle.
- Blue boxes are model types that are generated from a BIM workflow and are not required to be in the native Revit format.

Note: The Model Life-Cycle Development Timeline applies regardless of the contracting method. Vertical columns indicate typical stakeholder responsibility for different models at each stage of the project (horizontal rows). This responsibility may vary depending on the type of contract and type of project.



Model Life-Cycle: Section Continues Next Page

SYMBOL KEY

Model exchange

Native model progression

X — Submit, Exchange or Transition of Model(s)

Master Model:

Ownership: GSA

Application: GSA Operations, document facility changes

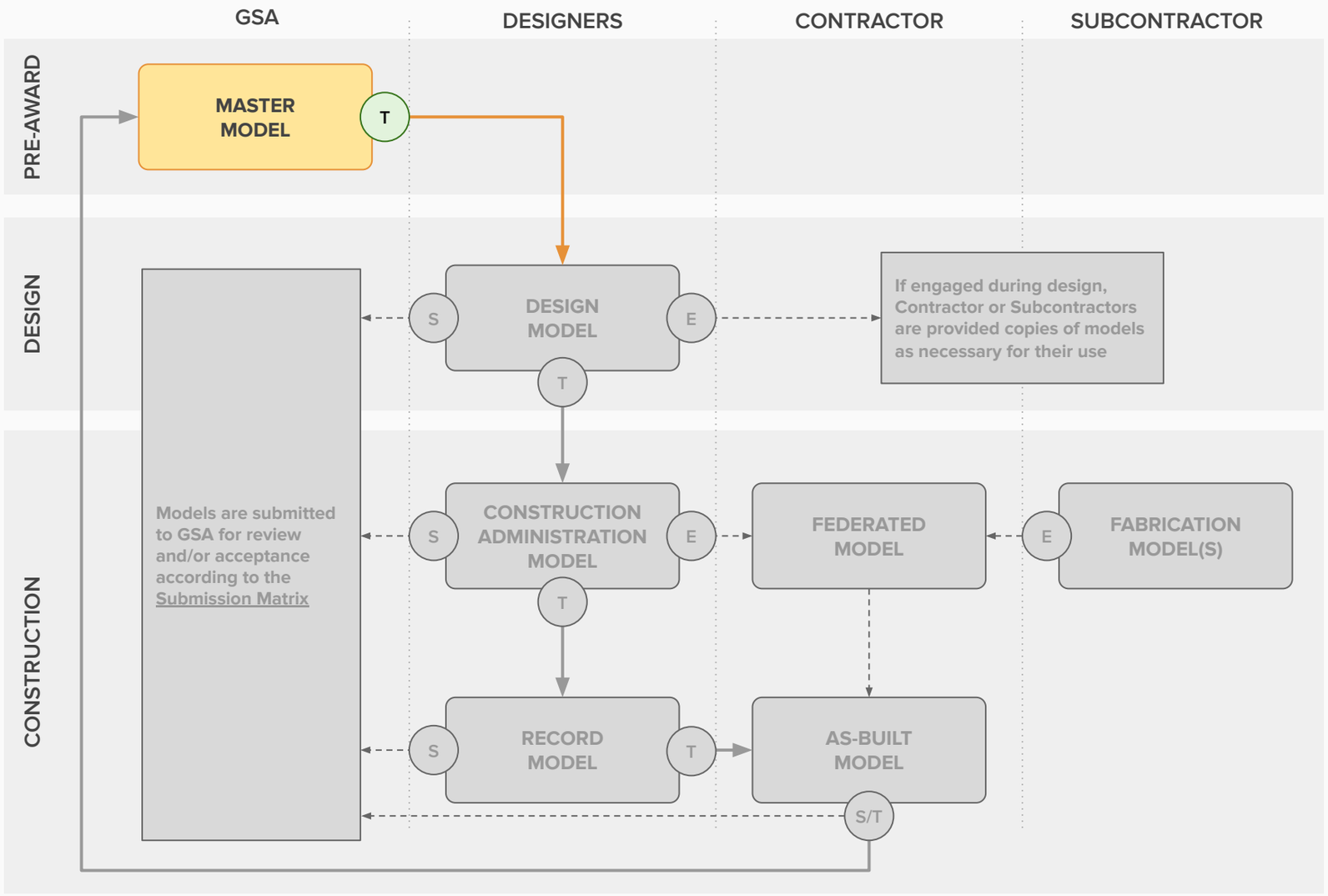
Definition: A model that has been maintained by the GSA, which is used for various purposes such as operations and maintenance. The Master Model may not be aligned to this standard yet. These models may not contain the same Level of Detail (LOD), or Level of Information (LOI) that are defined in this document.

The Master model should not be considered a perfect or complete replication of existing facility conditions. The Designer will apply a typical standard of care for owner supplied documentation, such as verifying existing conditions as necessary to execute their scope of work.

Submissions: N/A

Transition: If available, the Master Model may be provided to the Designer upon award as a reference for new design work. When there is no Master Model available, GSA will provide the GSA Revit Template to the designer instead.

Exchange: N/A



Model Life-Cycle: Go to First Page of Section

Model Life-Cycle: Section Continues Next Page

SYMBOL KEY
- Model exchange
- Native model progression
- X — Submit, Exchange or Transition of Model(s)

Design Model:

Ownership: Design Team

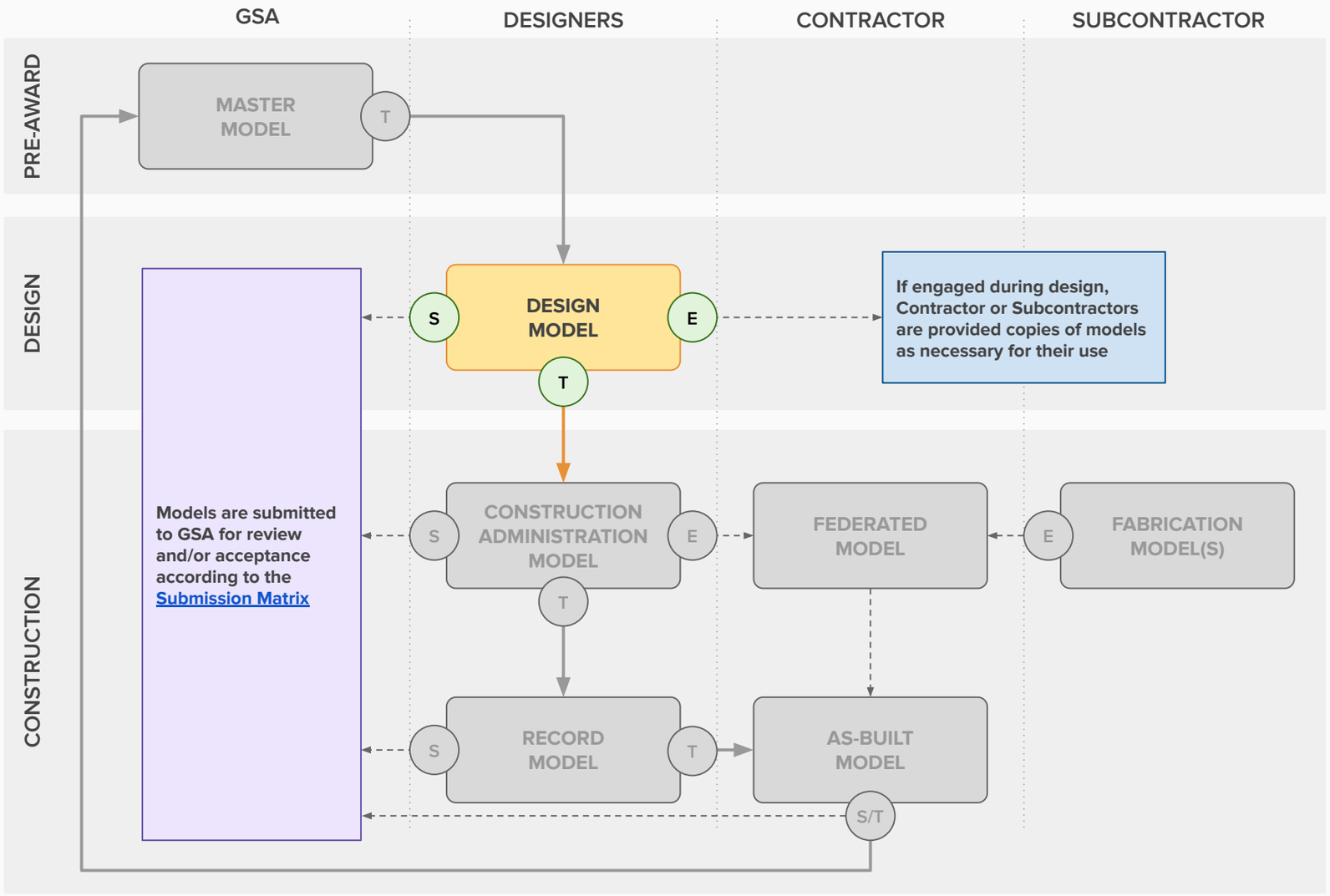
Application: Developing design documents

Definition: The model(s) that have been developed to produce the final approved 2D design drawings. These models align with typical design intent standard of care and contain graphical and design information required for construction with exception of supplementary documentation developed by the design team such as the project specifications. This model has been fully coordinated by trade/system, contains all required attributes for Spatial Data Management workflows, attributes required for Operations and Maintenance, as well as all 2D information required to produce the construction documents (such as sheet views and title blocks). At this stage, the design team has removed any extraneous content, references and sheet views not required or part of the final design submission. The design model retains elements such as title blocks that may be necessary for re-issuing sheets or modified details during construction.

Submissions: See P100 Submittal Matrix Requirements. Models are reviewed by GSA at specified stages of the design process for feedback to the designer. The final Design Model is reviewed and accepted by GSA before transitioning to become the Construction Administration Model.

Transition: After acceptance by GSA, the final Design Model archived by GSA and the Design team. It is then copied as the Construction Administration Model.

Exchange: Distributed to all project stakeholders with real-time, daily or weekly scheduled exchanges.



Model Life-Cycle: Go to First Page of Section

Model Life-Cycle: Section Continues Next Page

SYMBOL KEY

- Model exchange
- Native model progression
- X — Submit, Exchange or Transition of Model(s)

Construction Administration (CA) Model:

Ownership: Design Team

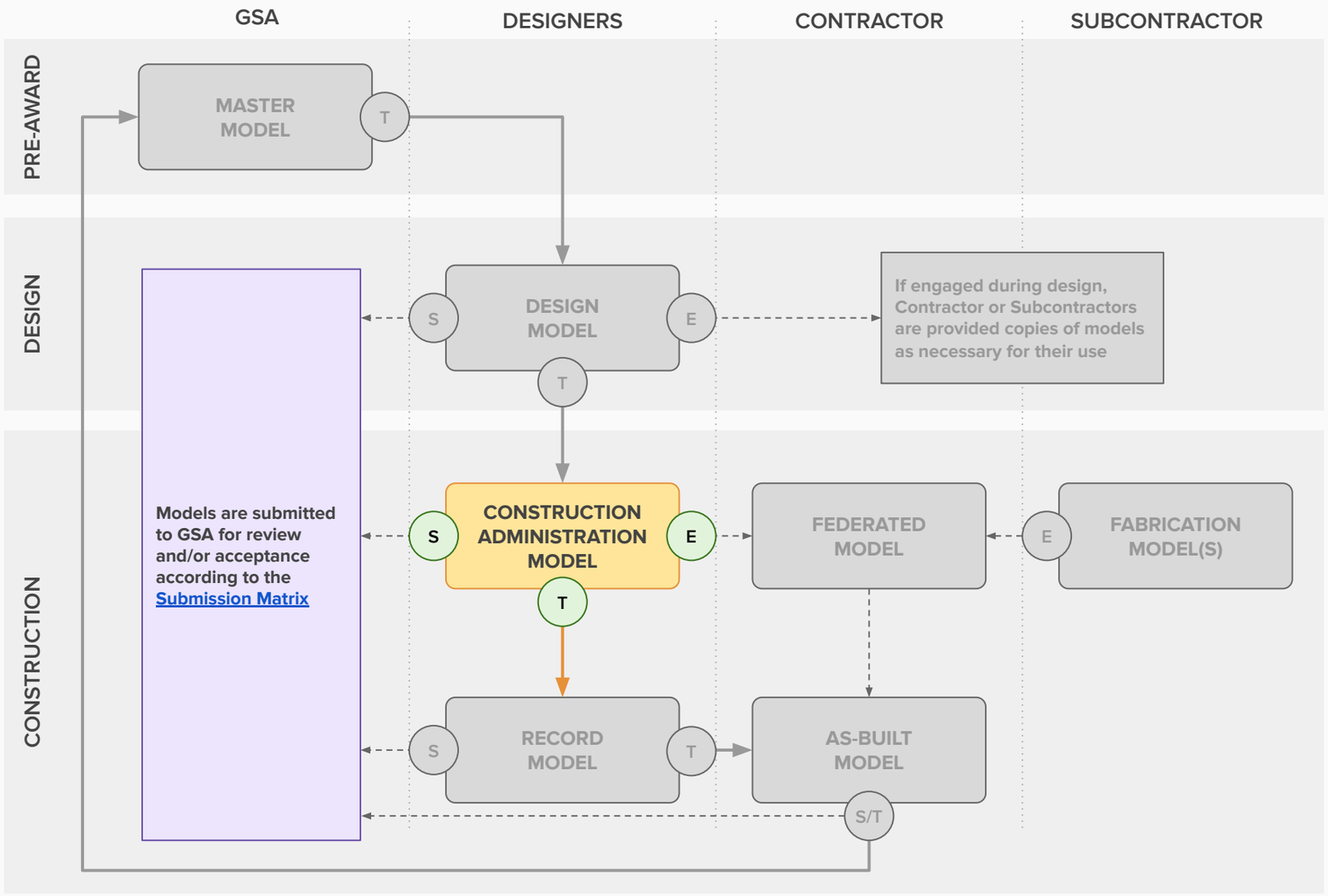
Application: Documenting design changes during construction

Definition: This model is the "live" model that is maintained by the design team during construction with changes to the construction documents. As the design team changes the design documents (such as RFI's from the contractor, or issuing ASI instructions), they simultaneously update the CA Model with those changes through model element manipulation, new notations, and updating sheet views that are then issued to the contractor. The CA Model is to contain all 2D information, notations, title blocks and other content required to produce the Construction Documents.

Submissions: This model is submitted to the GSA by the Designer per the submission matrix. During construction, GSA may provide review and comments on each submission. At Substantial Completion, the designer submits this model to GSA for review and acceptance.

Transition: The accepted final CA Model which includes all designer issued changes to construction documents, is archived is archived and copied as the Record Model.

Exchange: This model is exchanged with the contractor and GSA on a monthly basis at minimum. The purpose of this exchange is to ensure project stakeholders are using the most current model for construction activities and to keep the Federated Model updated with the most current information. This exchange is also an important part of the CDX and COBie attribute coordination between the designer and contractor.



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Model Life-Cycle: Section Continues Next Page

SYMBOL KEY

Model exchange

Native model progression

X — Submit, Exchange or Transition of Model(s)

Federated Construction Model:

Ownership: Construction Contractor

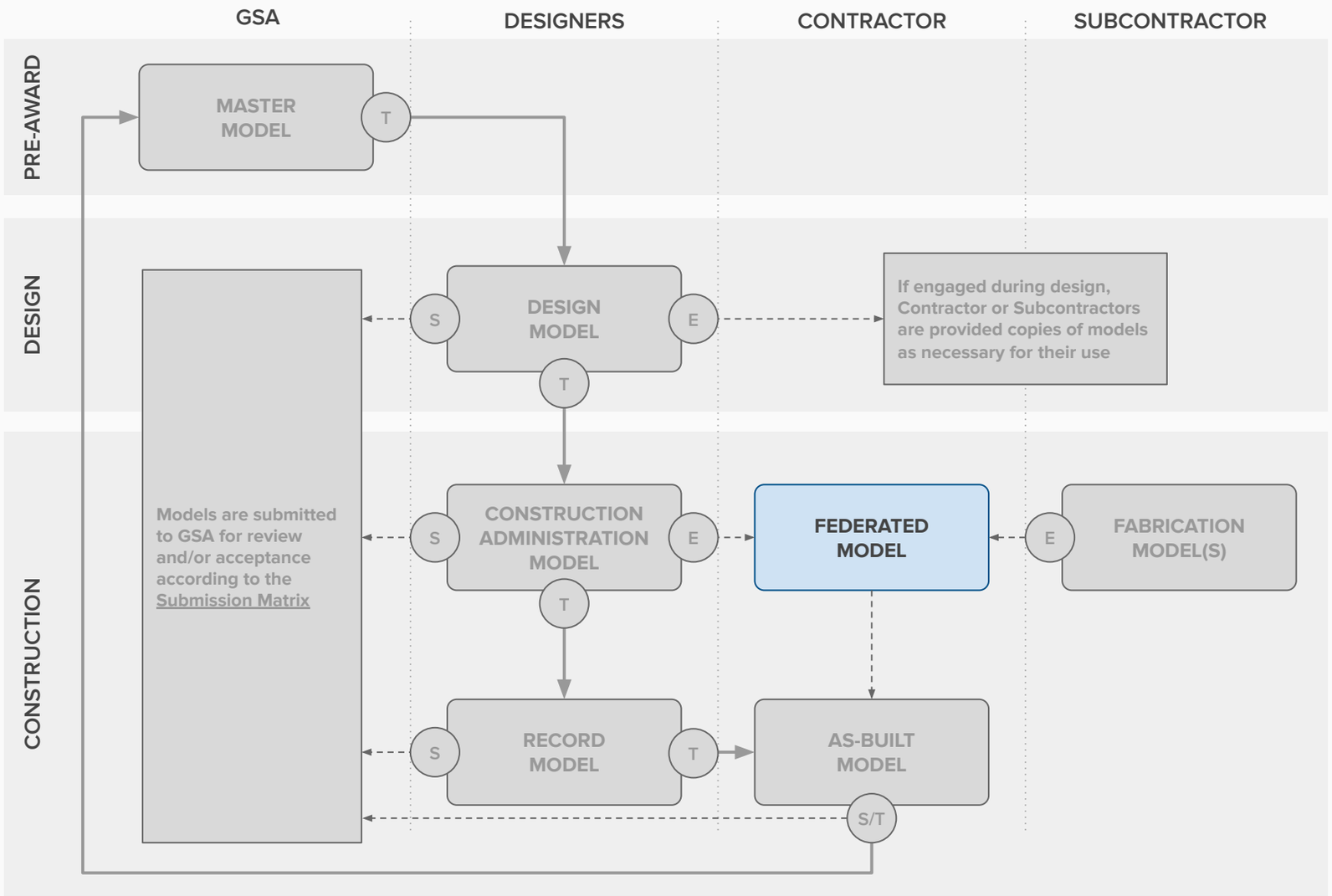
Application: Coordination of construction activities

Definition: This model is developed and maintained by the contractor using a software such as Autodesk Navisworks to overlay and view both the most current CA model as well as the Fabrication Models. During construction, this model represents the most current 3D state of all models, and is used throughout construction for various purposes such as 4D Scheduling, site logistics planning, resolving constructability issues, managing site logistics, etc.

Submissions: This model is submitted to the GSA by the contractor per the Submission Matrix. During construction, GSA may provide review and comments on each submission.

Transition: N/A

Exchange: This model will be exchanged on a monthly or more frequent schedule, and maintained and updated regularly throughout construction as the fabrication models and CA Models are updated such that all project stakeholders have access to view and inspect the model.



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Model Life-Cycle: Section Continues Next Page

SYMBOL KEY

Model exchange

Native model progression

X — Submit, Exchange or Transition of Model(s)

Fabrication Model(s):

Ownership: Trade Subcontractors

Application: 3D Coordination, fabrication and developing shop drawings

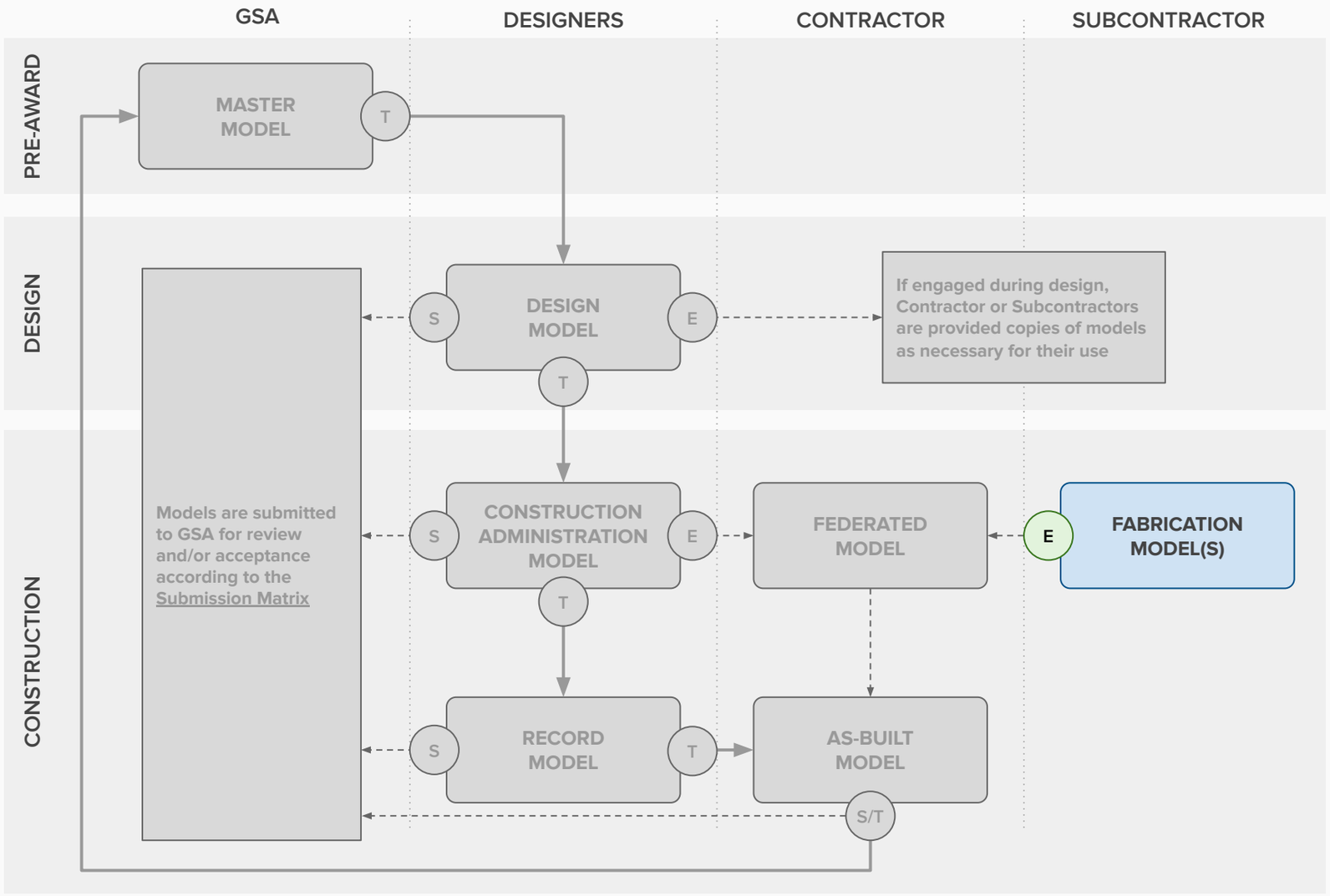
Definition: These models are generated by the respective subcontractors required for 3D Construction Coordination and their own fabrication needs as defined in the BIM Workflow Requirements section. The fabrication models will be used to produce 2D submittal documentation of the related systems. It is highly encouraged for subcontractors to produce these models using the same native modeling software as the design team, but not required. Regardless of the software used, these models will be used by the contractor to develop the Federated Model.

The contractor is responsible for ensuring that building elements installed by subcontractors are reflected in the related Fabrication Models, such that the Federated Model represents the installed conditions (locations) of building elements.

Submissions: This model is submitted to the GSA by the contractor per the Submission Matrix.

Transition: N/A

Exchange: The Contractor is responsible to ensure that the subcontractors are regularly exchanging updated Fabrication models with their BIM Coordinator.



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Model Life-Cycle: Section Continues Next Page

SYMBOL KEY
- Model exchange
- Native model progression
- X — Submit, Exchange or Transition of Model(s)

Record Model:

Ownership: Design Team

Application: BIM Standard Compliance

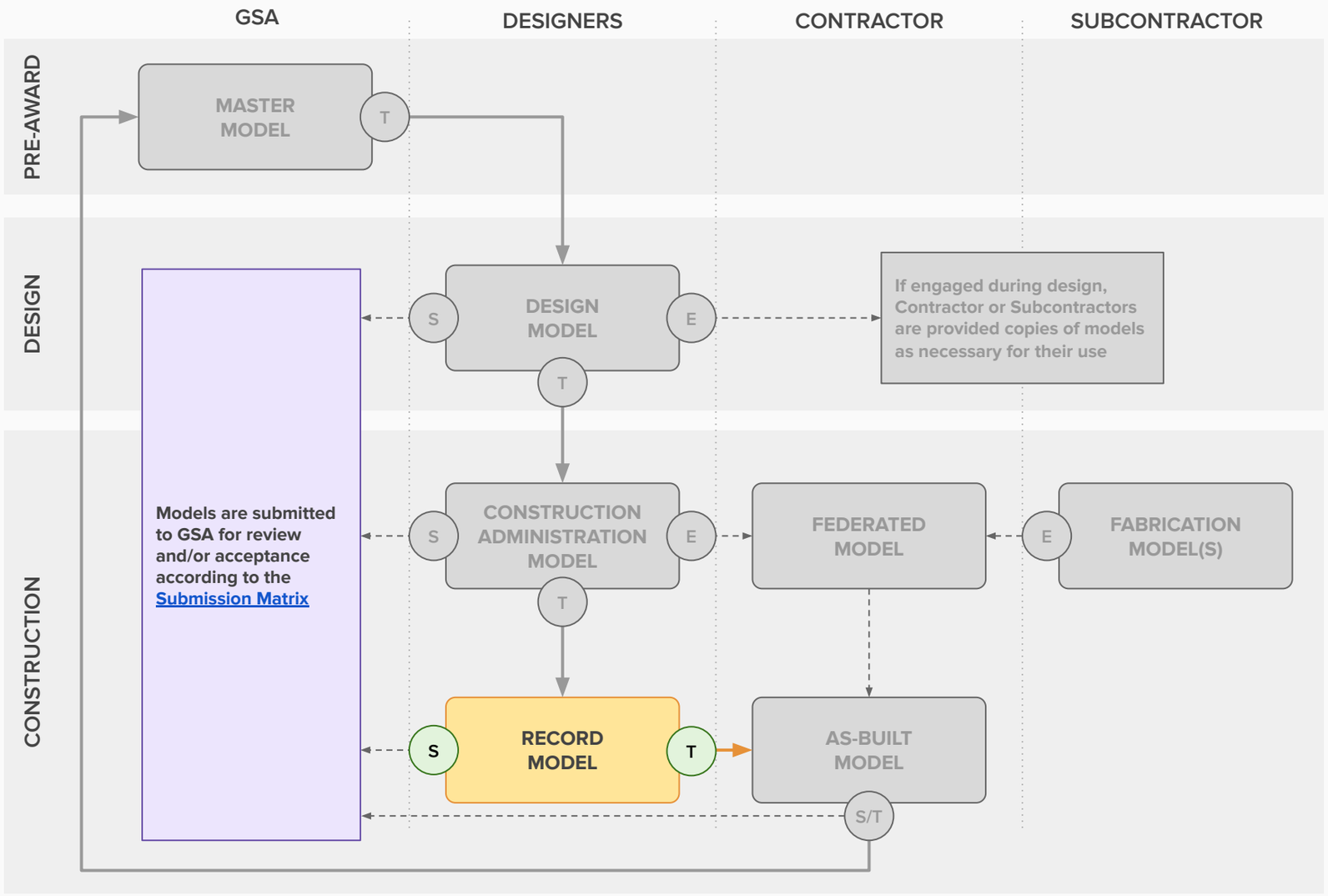
Definition: After the Construction Administration Model is archived, the designer proceeds to conform the model to be in full compliance with the Modeling Requirements section of this document. This process involves removing much of the content required for 2D documentation, as well as removing elements not required by the GSA template. The Record model will consist primarily of 3D modeled content, as well as a minimal number of GSA 2D reference views. Model attributes required by this document (see: LOD and LOI sections) are checked and verified.

This model must also be complete and accurate for all of the design team's responsibilities for the CDX and COBie requirements, and will not be approved unless a complete and accurate COBie spreadsheet can be exported from the model. The design team shall validate that final data values that are generated during design by designers are accurately input into the model. Data that is generated by the contractor, such as specific equipment model numbers and manufacturer names will be added later by the contractor in the As-Built Model.

Submissions: This model is submitted to the GSA by the Designer per the Submission Matrix and must be uploaded to PMIS (Kahua) located: File Manager > 5.0 Execution > 5.3 BIM > 5.3.3 Record Model

Transition: The accepted Record Model is archived and copied as the As-Built Model and ownership of the Native Model is transferred to the Contractor.

Exchange: N/A



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Model Life-Cycle: Section Continues Next Page

SYMBOL KEY
- Model exchange
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- X — Submit, Exchange or Transition of Model(s)

As-Built Model:

Ownership: Contractor

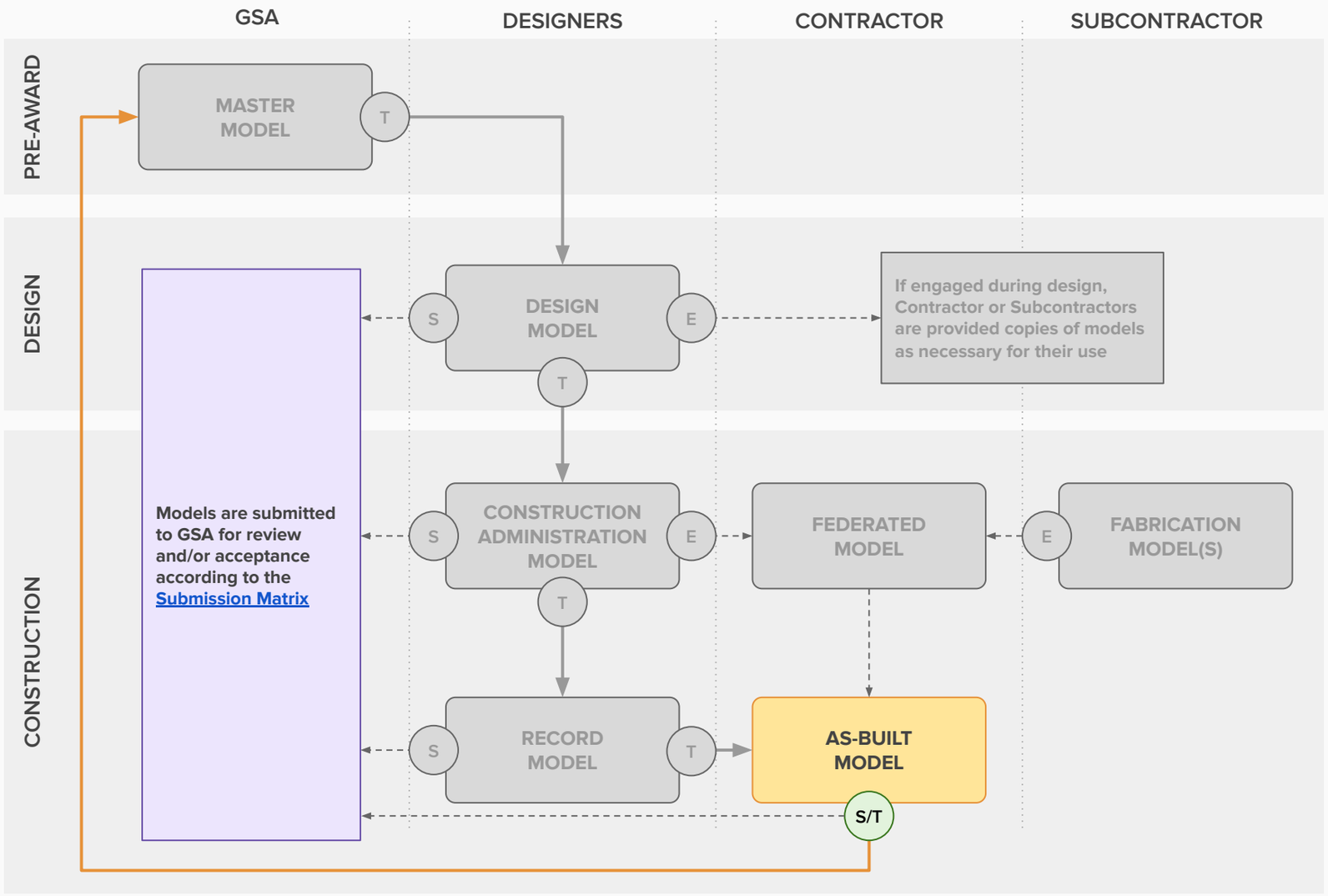
Application: Capturing installed conditions with spatial and facility information.

Definition: After the Record Model has been transferred to the Contractor, the contractor is responsible for aligning the Federated Model with the Record model such that the Native Model represents the installed conditions within the native Revit format. Objects that are present in both models are validated and adjusted in the native model. Objects that are provided in the Federated Construction Model, but not the Record Model are added to the Native Model per LOD 300 requirements. Model object attributes (per the LOI requirements of this standard) required by this document are verified and added if necessary. The contractor then inputs submittal data required by the CDX and COBie Data Standard into the appropriate attribute fields and then exports and completes the COBie spreadsheet.

Submissions: This model is submitted to the GSA by the Designer per the Submission Matrix. The completed As-Built model is reviewed/accepted by the GSA and must be uploaded to PMIS (Kahua) located: File Manager > 5.0 Execution > 5.3 BIM > 5.3.1 As-Built Model

Transition: Upon acceptance by GSA, it is saved as the new building Master Model for the facility.

Exchange: N/A



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Model Life-Cycle: Section Continues Next Page

SYMBOL KEY

- Model exchange
- Native model progression
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Native Model / Source Model:

Ownership: N/A

Application: N/A

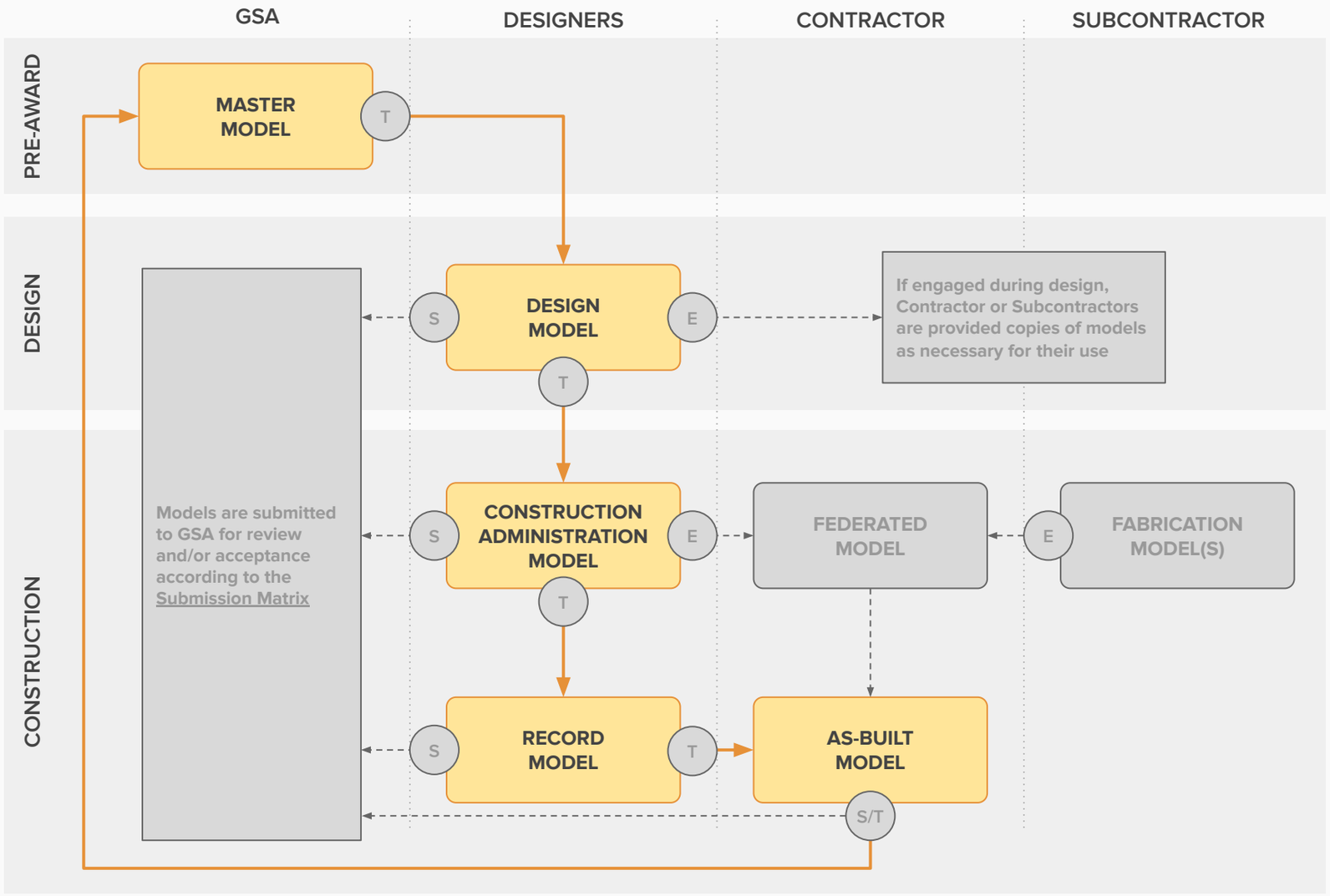
Definition: While not referenced in the graphic, the term "native model" and "source model" is also used in various GSA standards. These terms refer to the default file format used to generate the Design Documents which can create arrange or change objects, input data, and is used to save or open files.

This is represented by the yellow boxes of this graphic.

Submissions: N/A

Transition: N/A

Exchange: N/A



Model Life-Cycle: Go to First Page of Section

Model Life-Cycle: End Section

REQUIREMENTS

Summary of Requirements

This section of the standard details specific requirements to be followed for BIM delivery on each project. It details responsibilities of all project stakeholders, which artifacts must be provided to GSA for submissions during design and construction, how BIM is to be used throughout the project, and details the specific modeling requirements for the final model delivery at the end of the project.

These requirements will not be altered or diverged from without written consent from GSA, including both the Contracting Officer and Regional BIM Manager. Any alteration to these requirements must be documented in the BIM Execution Plan (BEP) & Information Delivery Plan (IDP) if approved by GSA.

GENERAL REQUIREMENTS

This section defines overall BIM responsibilities of stakeholders throughout the project lifecycle, how this standard will be implemented by those stakeholders, software requirements, and the resources developed by GSA to assist with consistent implementation of the standard.

SUBMISSION REQUIREMENTS

This section defines each BIM deliverable required throughout the project lifecycle, and indicates when they are required to be submitted in the Design and Construction Process. It aligns with the P100, SDM program and GSA COBie playbook requirements. In the event that a submission definition or submission requirement conflicts (in the P100 or elsewhere) with this BIM standard, the definitions in this standard will take precedence. This section should be referenced when developing the BIM Execution Plan (BEP) and Information Delivery Plan (IDP), and developing a schedule of design and construction deliverables post-award.

MODELING REQUIREMENTS

This section defines the end-state of the Models as they will be delivered to the GSA with the Record Model and As-Built Model submissions. This section does not preclude the design firm from applying their own internal standards during design development, but the design firm should have a plan for complying with these requirements for the final deliverable. This section should be reviewed by design and construction teams at the beginning of the project.

BIM WORKFLOW REQUIREMENTS

This section defines the BIM workflows that are required on the project, as well as providing definition for other BIM workflows that may be requested by GSA during the RFP and subsequently added via a specific contract requirement. Specific types of deliverables for each workflow are also defined here, while the means, methods and tools for executing these workflows are to be defined in more detail by the design and construction teams in the BEP.

Software Requirements

All GSA projects are required to use 3D modeling software (Building Information Modeling) to develop all design and construction documentation. This GSA BIM Standard applies to all GSA Capital Improvement Projects, regardless of the software used to develop the BIMs.

GSA has determined that the vast majority of designers and contractors have aligned with Autodesk BIM products, and has aligned the related terminology of the standard with Autodesk Revit functionality to help provide clarity. The Region has also aligned its internal BIM practices with the Autodesk Revit authoring platform and has a strong preference for BIM file deliverables to be produced and submitted using these tools.

Additionally, GSA has provided Revit specific resources to assist designers and contractors to more efficiently deliver this standard in the form of project templates and the Autodesk BIM Interoperability Tools (BIT). In particular, the BIT allows the designer or contractor to partially automate the process for generating GSA required parameters in their Revit project file and validate if their model submissions are in compliance with this standard.

If Autodesk Revit has been selected to develop the Design Model files for the project, they must follow this standard and align with the Revit Template. The use of the AutoDesk BIM Interoperability Tools (BIT) is highly recommended to help the designer and contractor comply with the Level of Information requirements of this standard. Any projects not using Revit will need to detail in the BEP how the requirements of this standard will be met using an alternate BIM authoring solution.

Unless otherwise stated in the contract or by the contracting officer within 30 days of notice to proceed, the designer/contractor will use the most recent version and associated updates of the chosen BIM authoring tools. This version may not change without written approval from GSA. The most recent version will be determined by the date of the executed contract.

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General Requirements: Section Continues Next Page

Summary

This section defines the general responsibilities of the firms that hold a contract with GSA for the project. For clarity, it is organized into three categories plus the responsibilities of GSA in the process. A Designer contracted to GSA for only design is not responsible for the "Contractor" Section and vice versa for a Contractor with a GSA contract for construction. A Designer hired only for Bridging Documents, is responsible only for the Design Model and BIM workflows related to their scope of work from Designer & Construction Administrator Responsibilities section.

It is the responsibility of any party contracted to GSA to ensure the participation in BIM related activities of third parties. Delegation of any portion of this standard to a third party subcontractor does not relieve the party contracted to GSA of any of the requirements or responsibilities defined by this standard.

Responsibilities of all Parties Contracted to GSA

BIM Coordinator / BIM Quality Control:
Each party that has a direct contract with GSA must designate an individual that is responsible for managing BIM activities, performing quality control of models, ensuring compliance with this standard, and ensuring that the model is an integral part of project activities. The role can be split into two separate individuals, or one person responsible for both Coordination and Quality Control.

BIM File Exchange and Collaboration:
All Native Model files from authoring softwares (including Fabrication Models) will be shared with GSA and made available to all project stakeholders. At a minimum, these files will be provided on dates in accordance with the Submission Requirements section of this standard (through the current GSA project management software). Each contracted entity will use an approved cloud-based means to digitally transfer BIM files to GSA and all other project stakeholders.

BIM Submissions:
Detailed in the Submission Requirements Section, the holder of the contract for each submission type must provide the related documentation for each phase of the project. Submission types are defined by the P100, specifications and the GSA Contract - and augmented by this standard in the Submissions section.

BIM Execution Plan & Information Delivery Plan:
Each entity that holds a contract with GSA for a project must submit a BIM Execution Plan & Information Delivery Plan (BEP & IDP) following the requirements of this standard. If a deviation from this standard is requested, it must be submitted at this time - with each request following the requirements in the BEP section of this standard.

BIM Workflows:
Executes BIM Workflows related to their work (see BIM Workflows section). The Operations & Maintenance Facility Data BIM Workflow is a shared responsibility between the Designer and Contractor, and the efforts are to be coordinated.

General Requirements: Section Continues Next Page

Designer & Construction Administrator Responsibilities

Design Model:
Produces the Design Models and ensures that all sub-designers are contractually required to produce models in accordance with this standard and the relevant workflows for their respective work. See: Model-Life Cycle: Design Model section for more information.

Construction Administration Model:
Maintains the Construction Administration Model throughout construction, incorporating official changes or clarifications to the design documents which have been issued to GSA or the contractor. See: Model-Life Cycle: Construction Administration Model section for more information.

Record Model:
Formats the Construction Administration Model, removing extraneous content, formatting the native model files to align with these standards and the GSA Revit Template, and ensures the models contain all required attributes. See: Model-Life Cycle: Record Model section for more information.

Contractor Responsibilities

Federated Construction Model:
Builds and maintains a fully federated construction model of all design and fabrication models throughout construction, ensuring all project stakeholders have access to this model. Uses this model for related BIM Workflows. See: Model-Life Cycle: Federated Model section for more information.

Fabrication Models:
Requires that subcontractors use modeling software (of their choosing) to develop 2D submittal and fabrication plans listed in the 3D Construction Coordination section. See: Model-Life Cycle: Fabrication Model section for more information.

As-Built Model:
Aligns the Designer's approved Record Model with the Federated Construction model such that the Native Model is aligned spatially with the federated construction model and contains all the same systems/objects modeled in the fabrication models. Model object attributes required by this standard (and not already populated by the design team) are populated with data from the submittal documents. See: Model-Life Cycle: As-Built Model section for more information.

GSA Responsibilities

Templates and Master Models:
GSA will provide the Master Model to the design team after Notice to Proceed. If no Master Model is available, the current Revit Template will be provided instead.

BIM Execution Plan (BEP) Review/Acceptance:
GSA will make available a primary point of contact for BIM related questions and GSA BIM Reviews, and who will also represent GSA in the development, review/approval of the BEP. If the submitter of the BEP has requested any deviations from the BIM Standard, the main POC will take the lead on such review as appropriate.

Interim Submission Feedback:
For BIM submissions that are incomplete, but submitted along with P100 requirements (such as during 65% Construction Document submittal, etc.), GSA will review the submissions and provide feedback to the submitter as appropriate. This review is intended to be informal, and meant to identify deficiencies that should be addressed and might cause rejection of a BIM submittal at a major milestone submission (such as Design Model).

Major BIM Submission Review/Acceptance:
For major final BIM submissions (Design Model, CA Model, Record Model, As-Built Model), GSA may perform a quality assurance review of the submitted files and verify submissions are in accordance with this BIM Standard and accept or reject the submission accordingly.

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Stakeholder Responsibilities: Go to First Page of Sub-Section

General Requirements: Section Continues Next Page

BIM Implementation Process

The following section provides a sequential description of how BIM will be implemented on GSA projects using this standard. This implementation process is intended to be a high level summary of the major stages of BIM development - project teams are expected to work out the details as part of their means and methods for the project.

1. **Design Pre-Award:**
   GSA to insert this BIM Standard into the RFP/Contract. GSA provides other internal GSA standards and resource information such as the CDX, COBie Playbook, SDM Guide, and Revit Template.

2. **Design BIM Kick-off, BEP & IDP:**
   GSA transfers the Master Model or the Revit Template to the Design team. The Designer schedules the BIM Execution Plan & Information Delivery Plan Kick-off meeting to occur within 10 work days of NTP or as otherwise required by the contract. The Design team develops the BIM Execution Plan and submits for GSA Review. See the BIM Workflow BEP & IDP section for details.

3. **BIM Native Model file Set-up and Configuration:**
   The Design team will set-up the BIM files according to the BEP & IDP, review and apply the Revit Template or Master Model. The Design team will then transfer these files to GSA and assist the GSA BIM representative in configuring the set-up on their system such that updates to the models can be used for GSA purposes during design.

4. **Design Stage BIM Activities:**

   BIM Quarterly Check-in: The project BIM Leadership Team will meet quarterly (or as otherwise required by the contract) with the GSA BIM team or contact to review the progress of BIM compliance, address unforeseen challenges and update/modify the BEP & IDP if required. There are no formal submissions required at this stage other than meeting notes and a live review of the model with GSA. Note: This meeting will include the Contractor BIM Leadership Team after construction contract award, and include discussions related to the Construction Administration Model and ongoing model maintenance during construction.

   BIM Workflow Execution - Design: Required BIM Workflows for Design (Spatial Data Management, O&M Facility Data, 3D Design Coordination) will be executed at appropriate stages of design. Interim reports on the progress of these workflows will be submitted to GSA on as part of the BIM Quarterly Check-in, but are also required to be submitted per the Submittal Matrix when the workflow has been successfully completed.

   Design Submissions, Reviews and Acceptance: BIM submissions will be in accordance with the Submission Requirements section of this document. GSA will review BIM submissions for compliance and accuracy and provide feedback as necessary for each submission, but will only accept/reject submissions related to the 4 major Native Model submissions detailed in the Model Life-Cycle Development Section. It is expected that the models will be utilized during the design process by the design team to facilitate meetings and reviews as necessary.

   Stakeholder Hand-Offs: As detailed in the Model Life-Cycle Development section, models will be archived and transition purpose at each major BIM submission. The majority of these hand-offs will be informal, and ownership of the native Revit models will be maintained by the Design team until the Record Model is complete and accepted by GSA. At this stage, the Contractor will take ownership of the models and process to develop the As-built model.

5. **Construction Administration (CA) Model Set-up:**
   When the Design Model is complete and accepted by GSA, the Design team will archive that model and copy it as the Construction Administration (CA) Model. The CA Model will be continually updated and maintained by the design team throughout construction with all designer issued changes. This model will be shared with all project stakeholders and distributed on regular monthly intervals or at the request of any other project stakeholder.

General Requirements: Section Continues Next Page

BIM Implementation Process (continued)

6. **Pre-Construction Request for Proposal:**
GSA to insert this BIM Standard into the RFP/Contract. GSA provides other internal GSA standards such as the GSA CDX and COBie Data Standard, SDM Guide, and Revit Template if requested. The Design team includes the Division 1 BIM Specification in with the final Construction Documents.

7. **Construction BIM Kick-off, BEP & IDP:**
GSA exchanges a copy of the Construction Administration Model to the Contractor. This model is still the responsibility of the design team to maintain through substantial completion of the building. The Design Team BEP & IDP is shared with the contractor. The Contractor schedules the BIM Execution Plan & Information Delivery Plan kick-off meeting to occur within 10 work days of NTP or as otherwise required by the contract. The Contractor develops the Construction BIM Execution Plan and submits for GSA Review. See the BIM Workflow BEP & IDP section for details.

8. **Construction Stage BIM Activities:**

BIM Quarterly Check-in: See Design Stage BIM Activities for details.

Federated Construction Model Set-up: The Construction team will set-up the Federated Construction Model, adding fabrication models as they become available. The Construction team will then transfer these files to GSA and assist the GSA BIM representative in configuring the set-up on their system such that updates to the models can be used for GSA review purposes during construction.

BIM Workflow Execution - Construction: Required BIM Workflows for Construction (O&M Facility Data, 3D Construction Coordination) will be executed at appropriate stages of construction. Interim reports on the progress of these workflows will be submitted to GSA on as part of the BIM Quarterly Check-in, but are also required to be submitted per the Submittal Matrix when the workflow has been successfully completed.

8. **Construction Stage BIM Activities (continued):**

Attribute Data Collection: In preparation for populating the As-Built model with object/equipment data generated during the construction submittal process, the contractor will maintain a live database or spreadsheet of this data - populating it with each approved submittal and according to the LOI attribute requirements. This database will be reviewed with the GSA during quarterly BIM Reviews.

9. **Record Model Set-up:**
When construction is substantially complete, the Designer will submit the Construction Administration Model for review/acceptance by GSA. It will be archived - then saved as the Record Model. The Design team will process the CA Model to format the Record Model to be in full compliance with this Standard, removing extraneous content and performing QC checks on GSA required object attributes.

10. **As-Built Model Set-up:**
When the Record Model is complete, submitted and accepted by GSA, it will be transferred to the Contractor and become the As-Built Model. The contractor will proceed to align the spatial objects within the Federated Construction Model to the objects in the As-Built Model, adding objects as necessary such that the Native Model represents the installed conditions depicted in the Federated Model and any other records of installed conditions (such as laser scans or 360 progress photos). Then the attribute data collected during the submittal phase will be applied to the As-Built Model, compliance with this standard will be validated, and submitted to GSA for review/acceptance. Once this model is accepted by GSA, it becomes the new Master Model for the facility.

11. **Finalization of the COBie Spreadsheet:**
Once the all attribute data is entered into the As-Built Model, the contractor exports the COBie spreadsheet from the Revit model using the BIM Interoperability Tools (COBie Extension), and completes the required COBie tasks as defined by the Operations & Maintenance Facility Data Workflow in this document.

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Submission Matrix

BIM related submittals for each design stage is listed in the P100 Submittal Matrix.

For BIM deliverables required after "Final Construction Documents", refer to the tables below.

Designer						
	Format	Construction Start	Approved Construction MEP Coordination Submittals*	At 30% and 60% Fiscal Completion*	Substantial Completion*	Final Close-out
		Construction Administration Model			Record Model	As-Built Model
BEP & IDP: Design	PDF	✔			✔	
Revit Files	RVT	✔	✔	✔	✔	
IFC File	IFC				✔	
QC Checklist	PDF	✔	✔	✔	✔	
BIT Model Check Report	PDF	✔			✔	

* *if the project has multiple phases of construction, this applies to each phase.*
** *if required by contract.*

Required Submission File Naming Convention

All submissions contained in this section and the P100 Submittal matrix related to BIM submittals throughout the course of the project must have the following text in the file name: "BIM"

All model files are excluded from this requirement, and naming nomenclature noted in this standard would supercede this requirement.

Contractor						
	Format	Construction Start	Approved Construction MEP Coordination Submittals*	At 30% and 60% Fiscal Completion*	Substantial Completion*	Final Close-out
		Construction Administration Model			Record Model	As-Built Model
BEP: Construction	PDF	✔		✔	✔	✔
Information Delivery Plan	PDF	✔		✔	✔	✔
QC Checklist:	PDF	✔	✔	✔	✔	✔
Federated Construction Model:	NWD		✔	✔	✔	✔
Fabrication Model(s)	Native File		✔			✔
3D Coordination Report	PDF		✔			
Revit Files	RVT					✔
BIT Model Check Report	PDF					✔
COBie Spreadsheet	Excel			✔	✔	✔

* *if the project has multiple phases of construction, this applies to each phase.*
** *if required by contract.*

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Submission Requirements: Section Continues Next Page

Submission Definitions

In the event that a BIM submission definition or submission requirement conflicts (in the P100 or elsewhere) with this BIM standard, the definitions below and this standard will take precedence.

3D Coordination Report:
This is a report typically produced by 3D model coordination software, or from the native Revit files to show how well coordinated the building systems are.

Bidding Model:
A model is configured to be usable by a subsequent designer or contractor to assist with preparation of a bid. The model should be stripped of any details that would prevent this transfer of design risk and clearly labeled as a "Bidding Model" and "for information only".

BIM Execution Plan (BEP) & Information Delivery Plan (IDP):
The BEP & IDP is a document that is developed at the beginning of a contract and defined in the BEP & IDP section of this document. The document identifies specific details related to BIM for the project, and documents the plan for delivering BIM and COBie as well as the plan for curating and entering O&M data. If there are separate contracts for different stages of design and construction, each contracted entity shall have a BIM Execution Plan & Information Delivery Plan.

BIM Interoperability Tools (BIT) Model Check Report:
This report is generated from the BIM Interoperability Tools. The Designer/Contractor will run this report to capture the current state of model compliance with these BIM Standards.

COBie Spreadsheet:
This is an excel spreadsheet that has been developed in compliance with the COBie standard, with specific guidance provided in the GSA CDX and COBie Data Standard. The purpose of this document is to capture the data from the submittals that will later be input into the model during the As-Built Model stage of model development.

Division 1 Specifications for BIM (017825 - Building Information Modeling):
A specification for BIM during construction that conform with this standard.

Energy Model:
See "Energy Analysis" in the BIM Workflows section for definitions of these models.

Fabrication Model:
These are the subcontractors BIM files that are used to develop the construction submittal drawings. The file format will be defined by the BEP.

Federated Construction Model:
This is the contractor's model that aggregates the design and fabrication models and is used to coordinate construction and execute construction BIM workflows. These are typically non-editable file formats, such as Navisworks and will be defined by the BEP.

IFC File:
These are exported from the Design Revit files, and typically used for viewing models without the native software, and contain the data/attributes defined by the GSA CDX and COBie Data Standard.

QC Checklist:
This is a document provided with all BIM Submissions, with the majority of the elements being defined by GSA in the provided template. It is a high-level summary of the files being submitted at each required stage, detailing the state of each model, and the quality checks that have been performed on the models.

Reality Capture Documentation:
If reality capture is required for the project, associated files defined in the Reality Capture BIM workflow of this document are provided.

Revit Files / Source Models:
These are the native design authoring files and must be submitted with this requirement.

Spatial Validation / Spatial Data Management:
Native design BIM data and other elements used to produce the documentation required for GSA's National Business Space Assignment Policy (NBSAP), as defined by the P100 and the Spatial Data Management BIM workflow section of this standard.

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Submission Requirements: Section Continues Next Page

GSA REVIEWS

Information related to Design Stages and related BIM submittals is listed in the P100 Submittal Matrix.

Submission Stages and related GSA review activity after “Final Construction Documents”, is defined below.

Construction Start:
Contractor is issued a copy of the final Design Model and related COBie data spreadsheet that is exported to Microsoft Excel by the Design Team using the BIM Interoperability Tools.

The contractor will input COBie data related to construction (final equipment data which not provided by the A/E) in this sheet as it is produced/collected. For example: Type.Manufacturer, Type.Model, Component.SerialNumber, etc. fields are collected and entered into the sheet as they become available at approved submittals and equipment is delivered/installed.

Approved Construction MEP Coordination Submittals:
The contractor’s Federated Construction Models are checked by GSA to ensure that coordination between systems has been performed and modeled such that an as-built Revit model can be produced from the federated model during Final Close-out.

30% and 60% Fiscal Completion:
Designer's Construction Administration Model is checked by GSA to ensure it is being kept up to date with ASIs/RFIs reflecting everything up to date as of 2 weeks prior to this submission.

The Contractor's COBie/CDX data spreadsheet is checked by GSA to ensure it is showing progress on curation of the related data from contractor submittals.

The Federated Construction Model is checked to ensure geometry is updated to reflect any design or fabrication changes, and reflects installed conditions as of 2 weeks prior to this point.

Substantial Completion:
Designer's Construction Administration Model is checked by GSA to ensure it is fully up to date with all ASIs/RFIs reflecting full project complete conditions. The design team then proceeds to configure the Construction Administration Model to a Record Model that is in full alignment with the GSA BIM Standard. The record model is then verified and accepted by GSA and delivered to the Contractor for As-Built Model development.

The Contractor's COBie spreadsheet and Federated Model is reviewed by GSA. All model elements in the Federated Construction Model should reflect the installed conditions, and all COBie/CDX data should be fully collected and complete.

Contractor receives the Record Model from the design team, and proceeds to update model elements with the spatial configuration of systems represented in the Federated Construction Model. The COBie/CDX data spreadsheet is entered into the As-Built Model.

Final-Close Out:
GSA will review the Contractor’s submitted As-built Model. This model will be spatially aligned with the Federated Contractor model, and contain all COBie and CDX data per those standards. It will maintain all the data provided by the design team.

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Submission Requirements: Section Continues Next Page

Quality Control Checklist / Submission Cover Form

Each BIM submission must contain a cover form that provides the following information:

- SUBMITTER'S QUALITY CONTROL REPRESENTATIVE
- PROJECT INFORMATION
- SUBMITTAL STAGE / MODEL STAGE
- DELIVERABLES
- LIST OF INCLUDED FILES
- AUDIT OF SUBMISSION - COMPLIANCE WITH STANDARD
- SUBMITTER'S INTERNAL QUALITY CONTROL METHODOLOGY
- SUBMITTER'S ADDITIONAL NOTES (optional)
- ATTACHMENTS (optional)

A BIM QC template providing the detail and definition for these categories will be provided by GSA.
See the BIM Delivery Resources Section for more information.

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Introduction

The GSA requires that models developed using Autodesk Revit applications adhere to the following sections for Record Model and As-Built Model submissions. Projects will adhere to these requirements unless specifically documented and accepted by the GSA within the BIM Execution Plan (BEP).

The primary purpose of these requirements is to ensure that final Revit deliverables can be effectively utilized by GSA business lines – and that each building model will conform to a prescriptive and predictable set of naming conventions, model attributes and data fields, sheet structures and views, file structures, and multiple other settings within Revit. Much like a design firm will standardize model naming, libraries, families, etc. within its own firm - these requirements ensure that a final Revit deliverable will be standardized for GSA downstream applications of models.

However, GSA acknowledges that designers and contractors have established their own means and methods for developing and organizing models for production purposes, and it is not the intention of this section to force any firm to radically change its approach to modeling.

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Requirements

GSA modeling requirements define basic set-up of Revit files, and provides requirements for how to use certain aspects/settings of the software, naming conventions, organization, Level of Development (LOD) and Level of Information (LOI).

Record Models and As-Built Models must be fully compliant with the following model standards:

- Organization & Settings
- Imports / Exports
- Positioning
- Datum Elements
- Parameters
- Modeling
- Annotations
- Model Level of Development (LOD)
- Model Level of Information (LOI)

Note: Where the GSA has a client with its own modeling standards, the Designer/Contractor will identify the conflicts between this section of the GSA BIM Standard and the client document, and note how they will be reconciled in the BIM Execution Plan (BEP).

Additionally, models are reviewed periodically by GSA to monitor progress and alignment to these requirements throughout design and construction.

For Design Model and Construction Administration Model submissions, the designer should incorporate as much of these modeling requirements to the extent it is practical from the start of design through construction substantial completion. The GSA BIM Submission QC Checklist template provides a section for the design team to audit their compliance level with these requirements at each BIM Submission.

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Modeling Requirements: Section Continues Next Page

Organization & Settings

The Record Model Revit files will be organized in accordance with this section, with any extraneous content such that may have been developed to aid in the production of the model (such as: sheets, views, schedules and similar) -- will be removed from the file.

Assemblies:
All Assembly instances will be disassembled.

Browser Organization:
Contractors are free to use any browser organization they choose during design and construction. However, the "GSA Basic Default View" must be present in each Revit file and selected prior to BIM submissions to GSA. See "Views" requirement of this section.

Design Options:
All Design Options and Option Sets will be removed from the model.

Detachment:
All files submitted must be detached from all other files, such that opening that file does not generate broken links to outside references. The Master Revit File will be the only file that contains links, and only to other files that are submitted.

Detail Groups:
All Detail Group instances will be ungrouped and all Detail Group types will be removed from the project model.

Family Naming:
Create unique names for each Component Family or System Family. Family names shall convey clearly what building element that family pertains to. Family naming for similar elements (such as multiple different wall types) will be consistent with each other.

File Structure:
All files (Revit, images, DWG, libraries, families, blocks, parameters, etc) required to represent a full and complete representation of the building will be organized in a logical file folder structure, and directly linked to the master Revit file. Files will not be imported into the Master Revit file wherever possible. This structure for submission to GSA will be established in the BIM Execution Plan (BEP).

Fill Patterns, Line Styles and Line Weights:
Drawings printed from Revit sheets replicate results aligning with GSA CAD Standards.

Master File:
A master Revit file is required, such that opening this single file can be used to view all model objects and information.

Model Groups:
All Model Group instances will be ungrouped and all Model Group types will be removed from the project model.

Naming Conventions:
The model and its naming conventions, including files, geometry, components and views. Each Revit file will be named using the structure of the naming convention:

<GSA Building Code>_<Building Name>_< Model Type >_< Descriptor >_< Software Version >

GSA Building Code:	Provided/Designated by GSA (ref. GSA CDX) or documented in the BEP.
Building Name:	An abbreviated building name, documented in the BEP.
Model Type:	Models are often separated into discipline specific content such as: Architectural, Core and Shell, Structural, Mechanical, Electrical, etc. The breakdown of the different Revit models used by the design team will be documented in the BEP along with the abbreviations that will be used for file naming. Examples: Architectural = ARCH, Structural = STRC, Mechanical = MECH, Electrical = ELEC
Descriptor:	Use as necessary. Flexible part of naming convention to allow for more complex projects, or to break up the model by floor, section or similar.
Software Version:	BIM Authoring Software. Will name the specific version year of the BIM authoring software. Use RVT00 for Revit models. Other abbreviations to be defined in the BEP.
Example:	*1701 DC Headquarters, Architectural Revit file, Levels 1-3 =* **DC0031_1701DCHQ_ARCH_L1-3_RVT21.rvt**

Modeling Requirements: Section Continues Next Page

Organization & Settings (continued)

Project Units and Precision:
Units and accuracy settings will adhere to the requirements of the P100. All elements in the model will be modeled as "actual size" as opposed to "nominal". Linear Precision will be 1/32" and angular dimension will be to two decimal degrees.

Relative path:
External files shall use relative path links to the files in the established folder structure - such that the GSA does not need to re-link any necessary referenced files.

Views:
In addition to the project views, **minimum required views** for each floor must be created using each of the GSA views templates as shown the table.

Each view created with a GSA view template must have a unique name that is descriptive of the view itself (e.g. Level 1 - Basic MEP).

The appropriate spatial tags must be applied to any of the GSA views that show spatial elements such as rooms, spaces, or areas. Prior to each submission, the brower organization must be changed to the "GSA Basic Default Views" option, which can be found in the GSA Revit Template.

Worksets:
Worksharing will be disabled and all Worksets will be removed from the model.

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Revit View Category / Template Name	Architectural Models	Trade Models
Floor Plans		
GSA_Architectural Plan	✔	✔
GSA_Architectural (Rooms & Spaces)	✔	✔
GSA_Basic MEP		✔
Reflected Ceiling Plans		
GSA_Architectural RCP	✔	✔
Area Plans		
GSA_SDM Area Plan	✔	
3D Views		
GSA_Basic 3D	✔	✔

Imports / Exports

Only data which is of critical importance to the submitted BIM should be actively referenced to it. Any data that is not critical to the proper display or functioning of the BIM should be detached or unloaded (hidden) prior to the data being submitted.

This includes: point clouds, images, and similar items that do not represent objects that are part of the completed building.

CAD Export Settings:
All models developed will be capable of exporting to the AutoCAD format from Revit in accordance with GSA PBS CAD standard.

DWG Files:
All DWG file links will be removed from the model. Do not insert a DWG into the Revit model at any point in the model's life. All DWG files required for documentation must be linked into the Revit model and kept external to the Revit file in an appropriate folder structure to maintain the links.

DWG files are not permitted for any new documentation of elements within the scope of the contract. The only DWG files allowed will be for adjacent spaces or systems that are not in the scope of the contract, but need to be shown for a complete document.

Images:
All images will be removed from the model.

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Modeling Requirements: Section Continues Next Page

Datum Elements

Grids:
Grids will be used exclusively for column lines and not be created for any purpose other than structural column lines. All Designers and Contractors will use Revit's "Copy / Monitor" feature to copy the Grids from a single model (typically the structural model). If an existing Master Model is provided by GSA, all other models will copy the Grids from this model.

Levels:
All Designers and Contractors will use Revit's "Copy / Monitor" feature to copy Levels from a single model (typically the structural model). If an existing Master Model is provided by GSA, all other models will copy the Levels from this model.

When possible, levels should only be created when new construction requires new structural floors. Exceptions are acceptable for key architectural features such as "Top of Parapet". Deselect the "Building Story" and "COBie" checkboxes for all levels that are not reference levels for rooms or and spaces. This may include spaces exterior to the building if they are associated with equipment required for a complete COBie submission.

Reference Planes:
Reference Planes will be removed from the model unless specifically approved by GSA (such as when they are hosting other elements).

Scope Boxes:
Scope Boxes may be used to organize datum elements (Levels and Grids) in a logical and understandable fashion. They will be named appropriately, so anyone referencing it can understand the limits of the Scope Box.

- - - - - End Sub-Section - - - - -

Positioning & Elevation

A correct geolocation must be established using a real-world coordinate system in a single model before modeling begins. All subsequent linked models must acquire and use the same shared coordinates to ensure consistent "geographic location" for GSA models.

Project/Plan North:
All the views within the model shall be positioned to Plan North following the original working drawings.

True North:
The models shall be positioned to True North.

Project Base Point:
The project base point within each of the models shall be placed at the lowest left hand column intersection of the model at ground level. The position is based on the building column grid. It will be established in relation to the Survey Point.

Internal Origin:
The model's internal origin within each of the models shall be positioned 10 feet in the -x and -y directions from the project base point and maintain the same elevation.

Survey Point:
The survey point within each of the models shall be positioned based on a survey marker identified within the working plans for the project. This point shall be positioned from a known point in the physical world.

Geographic Location:
The geographic location of the building under project location settings will use the GSA provided building address.

- - - - - End Sub-Section - - - - -

Modeling Requirements: Section Continues Next Page

Parameters

A list of the specific parameters, required data, and the family categories to which the parameters need to be mapped is detailed in the GSA Common Data Exchange (CDX) and COBie Data Standard. See LOI section of “Modeling Requirements”.

For required parameters beyond native Revit parameters, a shared parameters file will be created and maintained exclusively by GSA. GSA will provide Designers and Contractors this database file to input the required project data into their project files.

Phases and Demolition:
Model elements that have not changed from the GSA master model will have a phase of “Existing”.

Model elements modified or added will be phased as “New Construction”. If the project has multiple phases of construction, model elements will be assigned to the correct new construction phase according to contract delivery.

Existing elements that are demolished will not be deleted, but switched to phase to “Demolished”.

Phases used during interim design development phases will be removed.

Sheet Issues/Revisions:
All Sheet Issues/Revisions will be removed from the model.

Spatial Object Use (Rooms, Areas & Spaces):
All of the Revit spatial objects are used in specific ways to contribute to compliance with GSA BIM and Data standards. For example, Revit areas are used to meet SDM standards while rooms and spaces are used to comply with CDX requirements. Any other uses of spatial objects is not permitted unless it is shown to have no impact on meeting GSA requirements.

MEP Color Mapping:
In an effort to achieve consistency across files, the color assignments for MEP systems listed in the table (see next page) are required. Systems not listed to be color mapped at designer or contractor discretion, but be consistent per system.

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Modeling Requirements: Section Continues Next Page

Parameters (continued)

MEP Color Mapping:

System	Revit	RGB
Electrical/Telecom - Lighting	255-255-170	255,255,170
Electrical/Telecom - Power Distribution	189-189-0	189,189,0
Electrical/Telecom - Security	255-255-0	255,255,0
Electrical/Telecom - Telecommunication	189-189-126	189,189,126
Fire Protection - CO2	255-0-191	255,0,191
Fire Protection - Halon	255-170-234	255,170,234
Fire Protection - Inert Gas	189-0-141	189,0,141
Fire Protection - Sprinkler	1	255,0,0
HVAC - Condensate - Gravity	127-255-000	127,255,0
HVAC - Condensate - Pumped	0-104-78	0,104,78
HVAC - Heating Hot Water Return	255-0-127	255,0,127
HVAC - Heating Hot Water Supply	255-0-63	255,0,63
HVAC - Exhaust Air	3	103,165,82
HVAC - Outside Air	0-191-255	191,255
HVAC - Return Air	0-255-127	255,127
HVAC - Supply Air	000-127-255	127,255
Piping/Plumbing - Chilled Water Return	191-0-255	191,0,255
Piping/Plumbing - Chilled Water Supply	234-170-255	234,170,255
Piping/Plumbing - Compressed Air	5	0,0,255
Piping/Plumbing - Cooling Tower Water Return	141-0-189	141,0,189
Piping/Plumbing - Cooling Tower Water Supply	173-126-189	173,126,189
Piping/Plumbing - Domestic Cold Water	0-63-255	0,63,255
Piping/Plumbing - Domestic Hot Water Return	255-170-170	255-170-170
Piping/Plumbing - Domestic Hot Water Supply	255-060-060	255,60,60
Piping/Plumbing - Natural Gas	2	255,255,0
Piping/Plumbing - Sanitary	255-127-0	255,127,0

System	Revit	RGB
Piping/Plumbing - Sanitary Vent	255-191-0	255,191,0
Piping/Plumbing - Steam - High Pressure	0-94-189	0,94,189
Piping/Plumbing - Steam - Low Pressure	170-212-255	170,212,255
Piping/Plumbing - Steam - Medium Pressure	126-157-189	126,157,189
Piping/Plumbing - Storm Drain	128-000-255	128,0,255
Piping/Plumbing - Storm Drain Overflow	219-183-255	219,183,255
Piping/Plumbing - Unknown Pipe	076-038-038	76,38,38
Specialty - Deionized Water	165-165-82	165,165,82
Specialty - Dual Temperature Return	000-063-255	0,63,255
Specialty - Dual Temperature Supply	191-000-255	191,0,255
Specialty - Energy Recovery	082-165-165	82,165,165
Specialty - Fuel Gas	255-127-127	255,127,127
Specialty - Fuel Oil	082-082-165	82,82,165
Specialty - Fuel Vent	165-165-82	165,165,82
Specialty - Laboratory Gas	165-124-82	165,124,82
Specialty - Medical Gas	165-082-165	165,82,165
Specialty - Nitrogen	5	0,0,255
Specialty - Non-Potable Water	165-000-000	165,0,0
Specialty - Potable Water	000-255-063	0,255,63
Specialty - Propane	5	0,0,255
Specialty - Refrigerant Liquid	4	255,255
Specialty - Refrigerant Suction	5	0,0,255
Specialty - Reverse Osmosis Water	165-000-000	165,0,0
Specialty - Vacuum	082-165-165	82,165,165

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Parameters: Go to First Page of Sub-Section

Modeling Requirements: Section Continues Next Page

Modeling

Duct and Piping Systems:
These family categories will be used to group together elements, based on their designated operational systems by using the “System Type” parameter on duct and pipe elements.

Element Purging:
The model shall be purged of all unused elements such as attributes, families or other content that is not required by the modeled objects before submission of the Record Model.

In-Place Families:
In-Place Families may be used under the very specific following conditions:

- There will only be a single instance of any In-Place Family type
- The proper category will be assigned to the In-Place Family
- In-Place Families will only be used when creation of the family is reliant upon existing complicated geometry within the model itself

Hosted Elements:
Elements should not utilize direct element hosting such as hosting to Walls, Ceilings, Floors, and Roofs. Any element that is best hosted (such as lighting fixtures, electrical panels, air terminals, etc.) should have the family definition built to be face hosted and the elements then placed that way.

Generic Models and Mass Families:
Do not assign any families to the Generic Models or Mass family. Assign families to most relevant family categories as defined in the LOD requirements.

Materials:
Materials will have the proper related Physical and Thermal assets applied to them, typically found in the Autodesk Asset Library. Material Graphics assets will align with GSA graphic standards found in the GSA Revit Template File.

Model Lines:
Model lines used directly in the model must be removed from the model prior to final submission. They may be used and remain within families to clarify design intent.

Walls:
Stacked Walls will not be used, and will be made exclusively from Basic or Curtain Walls.

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Annotations

Annotation Types:
Text and Dimension types will match the ones found in the GSA Revit Template File. All unnecessary Text and Dimension types will be removed from the model.

Tags:
Annotation and View Tags will match the tags found in the GSA Revit Template File. All unnecessary Annotation and View tags will be removed from the model.

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Modeling Requirements: Section Continues Next Page

Model Level of Development (LOD)

GSA has chosen a simplified way to define model level of detail requirements. Instead of requiring a cumbersome spreadsheet of all model element types to be provided for every project - LOD for the model will be defined by two classifications as defined in this section:

- Object Categories
- Building Objects

This only applies to GSA owned and operated buildings. In the event the facility is operated by another agency, and that agency has provided their own BIM standard that contains similar LOD requirements, those requirements will be used in lieu of the ones in this standard as directed by the Contract Documents or the Contracting Officer.

Object Categories:
The Object Categories represent the classification of different systems, and aligned with Revit object categories. The categories listed in the table represent the types of objects that are required to be modeled if they are present in the building.

If an object falls into one of these categories, refer to the “Building Objects” definition in this section to determine what level of detail should be provided.

Object Categories		
Areas	Electrical Equipment	Rooms
Air Terminals	Electrical Fixtures	Security Devices
Cable Tray Fittings	Fire Alarm Devices	Shaft Openings
Cable Trays	Flex Ducts	Spaces
Casework	Flex Pipes	Specialty Equipment
Ceilings	Floors	Sprinklers
Columns	Furniture	Stairs
Communication Devices	Furniture Systems	Structural Area Reinforcement
Conduit Fittings	HVAC Zones	Structural Beam Systems
Conduits	Lighting Devices	Structural Columns
Curtain Panels	Lighting Fixtures	Structural Connections
Curtain Systems	Mechanical Equipment	Structural Fabric Areas
Curtain Wall Mullions	Pipe Accessories	Structural Fabric Reinforcement
Data Devices	Pipe Fittings	Structural Foundations
Doors	Pipe Insulations	Structural Framing
Duct Accessories	Pipes	Structural Path Reinforcement
Duct Fittings	Piping Systems	Structural Rebar
Duct Insulations	Plumbing Fixtures	Structural Stiffeners
Duct Linings	Railings	Structural Trusses
Duct Systems	Ramps	Walls
Ducts	Roofs	Windows

Modeling Requirements: Section Continues Next Page

Model Level of Development (continued)

Building Objects:
The GSA Level of Development will be in accordance with the AIA/BIMForum Level of Development (LOD) Specification published at the time of Contract Award. This document defines the general LOD of model elements, as well as specific object types according to the Uniformat and Omniclass Standard.

GSA requires that all objects provided in the Design Model (Final Submission), Construction Administration Model, Record Model, and As-built Model to be compliant at Level 300 of the detailed descriptions provided by this document.

See examples of applying both "Object Categories" and "Building Objects" to the right.

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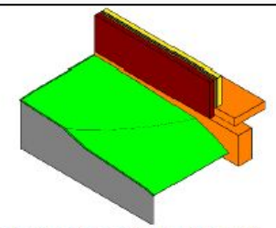
Example:

Object Category: Walls

Building Object: Exterior Wall Veneer - Level 300

300	Exterior wall veneer modeled as a separate element. Specific wall modeled to actual dimensions. Penetrations are modeled to nominal dimensions for major wall openings such as windows, doors, and large mechanical elements.	

64 B2010.10-LOD-300 Exterior Wall Veneer
From Ikerd.com

Example:

Object Category: Ducts

Building Object: Exhaust Air - Level 300

300	Modeled as design-specified size, shape, spacing, location, duct slope (if required), dampers, fittings, insulation for risers, mains, and branches; approximate specified allowances for spacing and clearances required for all hangers, supports, vibration and seismic control that are to be utilized in the layout of all risers, mains, and branches; access/code clearance requirements modeled.	

172 D3060.30-LOD-300 Exhaust Air, From Ikerd.com

Images credit: AIA/BIMForum Level of Development Specification.

Model Level of Information (LOI)

Model LOI is defined by two separate GSA documents:

- GSA COBie Requirements (see O&M Workflow)
- GSA Common Data Exchange (CDX) and COBie Data Standard

These two documents primarily require information for building objects that require maintenance. These documents will be provided by the GSA at the start of the project.

Other information will be present in the model, generated by the design team during design development, and used for detailing the construction documents according to the designer's means and methods for using Revit. This information is to remain in the final models, but GSA is not specifying specific attributes for other systems not addressed by CDX and COBie Data Standard at this time.

In addition to the CDX & COBie Data Standard, all objects modeled will be classified by the correct Uniformat and OmniClass codes.

This only applies to GSA owned and operated buildings. In the event the facility is operated by another agency, and that agency has provided their own BIM standard that contains similar LOD requirements, those requirements will be used in lieu of the ones in this standard as directed by the Contract Documents or the Contracting Officer.

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BIM Workflows / BIM Uses Overview

GSA Core BIM Values:
A BIM Workflow is a process to leverage BIM in a specific manner on a project to deliver improved value to the project. This value can be defined by any/all of the following:

1. Reduced cost
2. Improved quality
3. Enhanced deliverables
4. Expedited delivery
5. Risk mitigation

Required BIM Workflows:
Several BIM Workflows are required by this standard. These workflows have been determined by GSA to meet one or multiple of the values (listed above) to project delivery or GSA operational excellence for all GSA projects. Required BIM Workflows are defined in this section, and they include:

- BIM Execution Plan (BEP)
- Spatial Data Management
- Operations & Maintenance Facility Data
- 3D Design Coordination
- 3D Construction Coordination (a.k.a. Clash Detection)

Other BIM Uses:
The list below are the BIM Uses which have been deemed highly valuable to GSA, but not applicable on every project. Whether the designer or contractor includes them in their proposal, or if they are required via the RFP, these sections shall govern their delivery. They include:

- Reality Capture (includes Laser Scanning and other related technologies)
- Schedule Simulation (a.k.a. 4D Modeling)
- Energy Analysis

GSA recognizes that the industry has developed many new tools and processes to leverage BIM for both design and construction, and developed unique and valuable workflows that are not discussed in this standard. Many of these BIM uses primarily serve the means and methods of the designer or contractor, but also improve the quality of services GSA receives.

Other BIM Uses may provide substantial value to GSA, and welcomes more advanced applications of BIM on all their projects. An entity submitting a proposal is encouraged to differentiate their BIM capabilities by recommending specific additional BIM Uses that may benefit GSA in context of the 5 values identified in this section.

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Workflow Requirements: Section Continues Next Page

BIM Execution Plan (BEP) & Information Delivery Plan (IDP)

Applicability:	Required for all projects
Required Software:	GSA BEP & IDP Template (excel)
Deliverables:	PDF of template and attachments
Submitted with:	See Submission Matrix section for official submission definitions.
Validated with:	GSA BIM Standard / Contract Requirements

Summary:

Because GSA has provided BIM requirements through this standard, the BEP & IDP will not need to address any of the items contained within, unless an exception is requested post-award.

Instead, **the GSA BEP & IDP will be exclusively focused on capturing information about BIM execution that are truly unique to the project** and must be documented. Items such as project team and contact information, model breakdown structure, documented naming conventions, file organization structures, and similar will be the only required elements of the BEP.

Items such as technical procedures, deliverables, and how the designer/contract intends to implement BIM for their internal means and methods should not be defined in the BEP.

The designer or contractor will need to document in the BEP & IDP if the project may require an exception to the BIM Standard or special accommodation based on project circumstances to differ from what is required by this standard. A section for this request is provided in the excel BEP & IDP template.

Requirements

GSA has developed a template that must be used for all projects. See GSA BIM & IDP Template for detailed content requirements.

Each entity that holds a contract with GSA for a project must submit a BEP & IDP following the requirements of this standard. If a deviation from this standard is requested, it must be submitted at this time.

Each required BIM Workflow requires a 1-2 page overview of how the designer or contractor will deliver each workflow, which should include information about schedule/milestones, stakeholders, approach, quality control for deliverables, and any tools/software involved in the process.

The Design and Construction BEP & IDP kick-off will be conducted within 10 work days of NTP. During the BEP Kick-off, the team will review the GSA BIM Standard, review/discuss BIM Workflows and address the significant challenges posed for BIM delivery on the project and identify the core BIM Leadership Team for the project. During the Construction BEP & IDP kick-off, the Design BIM Leadership Team will also attend and review the Design BEP & IDP with the Contractor. Any potential requested deviations to this BIM Standard must be discussed during this meeting.

BEP & iDP must be submitted for review/approval within 20 work days of NTP or as otherwise required by the contract. The BEP will be reviewed by GSA and a review meeting will be scheduled upon review completion. Revisions to the BEP will be resubmitted within 10 working days of the BEP Review meeting. A Rejected BEP will be resubmitted within 5 work days of rejection by GSA.

The BEP will not:

- Document the process or means and methods of designer or contractor, although the design may submit these as an FYI for GSA as separate attachments to the BEP.
- Develop or capture internal standards of the designer or contractor that are passed onto sub-consultants or contractors.
- Define deliverable requirements (these are already defined in this document)

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Workflow Requirements: Section Continues Next Page

Spatial Data Management (BIM for SDM)

Applicability:	Required for all projects
Required Software:	Autodesk Revit and BIM Interoperability Tools (BIT)
Deliverables:	An architectural .rvt file that includes 1) Revit areas placed in compliance with SDM standards and 2) fully populated SDM data and SDM-compliant .dwg exports
Submitted with:	See Submission Matrix section for official submission definitions.
Validated with:	Design BIM, CA Model, Record Model, As-Built Model (final versions)

Summary:

Building space data is critical information for GSA that is used by business lines for post-construction space management purposes. It is critical that the BIM contains the necessary attributes such that the native as-built model can be leveraged by GSA to populate their SDM software.

Spatial Data and the required documentation are defined by GSA by the P100 and GSA's National Business Space Assignment Policy (NBSAP) , and these deliverables are unchanged by this BIM Standard. These deliverables are to be generated from the Design BIM - and must contain all of the SDM data detailed in the CDX and COBie Data Standard.

Guidance for using Autodesk Revit to incorporate SDM attributes is provided in the BIM for Spatial Data Management Guide.

Requirements:

The Design Model will be the native source of all plans, tables, data, CAD files and other artifacts submitted to GSA by the Designer as required by the P100.

The design team will use the Revit "Area" objects to comply with GSA SDM standards. These areas will be associated with their respective Revit "Room" by synchronizing the Number and Name fields of each to the greatest extent possible. The Autodesk BIM Interoperability Tools can help synchronize room and area data.

SDM data and areas generated by the design team must be maintained in all submissions of the model from design through construction such that the As-Built Model contains all the data and related areas. The Designer will ensure that the Record Model represents all construction red-lines as it pertains to building partitions and their associated rooms/areas, and that the final Record Model is in alignment with GSA NBSAP requirements.

Upon hand-off of the native model to the Contractor at the completion of the Record Model, the Design team will review the SDM aspects of the model with the Contractor to ensure that the SDM attributes and Areas are not altered during As-Built Model development.

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Workflow Requirements: Section Continues Next Page

Operations & Maintenance Facility Data

Applicability:	Required for all projects
Required Software:	Autodesk Revit and BIM Interoperability Tools (BIT)
Deliverables:	COBie Spreadsheet and BIT model checker report
Submitted with:	See Submission Matrix section for official submission definitions.
Validated with:	Design BIM, CA Model, Record Model, As-Built Model (final versions)

Summary:

The GSA will leverage the As-Built Model as part of their ongoing operations and maintenance processes. In order to align the As-Built Model with their MAXIMO NCMMS, GSA requires that all Native Models developed during design and construction be in compliance with the CDX & COBie Data Standard .

The GSA CDX & COBie Standard is a BIM Level of Information (LOI) standard that defines all of the attributes and data required to be generated during design and construction and contained in the final As-Built Model. This O&M Facility data Workflow defines the requirements for Designers/Contractors to develop data within the model and produce a functional COBie spreadsheet from the Native Model. See the Modeling Requirements LOI section for more information.

Both Designer and Contractor are responsible for the attributes and the associated data contained in the CDX & COBie Standard, as both designer and contractor are the generators of different data related to both COBie and the CDX. It is critical that both parties review this Workflow and the data standard in detail at the beginning of their contract and proactively collaborate to be in compliance with this BIM Standard.

About the GSA CDX and COBie Data Standard:

GSA has standardized on a model-centric deliverable for delivering design and construction data about building assets. The CDX specifies the asset attributes required to be present in the Record Model and As-Built Model for final delivery. These attributes include standard COBie fields, as well as custom data fields for Spatial Data Management (SDM) operations which are required for all GSA projects through the P100. Designers and contractors are both required to develop models that include all CDX attributes and Data throughout design and construction. This Workflow identifies attributes required for the standard conceptually, and the full list of required attributes is provided in a separate Excel Spreadsheet.

What is COBie?

Construction to Operations Building information exchange (COBie) is a standard to manage important building data such as equipment lists, product data sheets, warranties, spare parts lists, and preventive maintenance schedules. This information is then used to support operations, maintenance, and asset management once the building is in service. Most Building Information Modeling (BIM) and Computerized Maintenance Management Systems (CMMS) software applications come with the ability to read and write COBie data in MS Excel and other file formats as well.

The delivery of a COBie spreadsheet compliant with this standard is a requirement for all Capital Improvement Projects.

This spreadsheet must be exported from the Revit model and be complete and accurate without modification. The Autodesk BIM Interoperability Tools should be used to apply both standard COBie attributes, and additional CDX attributes within the model. Data associated with these attributes will be input into the model by both designer and contractor according to the responsibilities defined in the CDX and COBie Standard. These responsibilities are conceptually represented in the CDX & COBie Attribute Requirements section of this Workflow, and detailed fully in the CDX and COBie Data Standard Excel Spreadsheet.

Workflow Requirements: Section Continues Next Page

Responsibilities Overview:

The Design team will ensure that the Design Model contains all of the required attributes defined by the CDX and COBie Data Standard, but is only responsible for providing the data associated with those attributes as identified in the CDX and COBie Data Standard. Generally, this responsibility applies to attributes that would not be changed through a construction submittal. Example: room signage data is finalized by the design team, and they must provide that data within the Design Model and COBie spreadsheet.

The Designer is responsible for generating the initial COBie spreadsheet per this Workflow for review and approval at each design submission. Each submitted Design BIM must have all required attributes applied. This spreadsheet must originate from the Design Model using tools such as the Autodesk BIM Interoperability Tools.

The Contractor is responsible for providing attribute data in the As-Built model and produce the final COBie spreadsheet during construction. Example: The manufacturer attribute of the installed AHU is finalized by the contractor. They must provide that data within the As-Built Model and COBie spreadsheet.

At their first Quarterly Check-in, the Designer/Contractor will demonstrate a sample implementation of COBie and CDX attributes by the individuals that will perform this effort on the project.

COBie export data will be reviewed and accepted by GSA Office of Facilities Management at the specified project Design and Construction milestone phases.

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CDX and COBie Manager Responsibilities:

Both Designer and Contractor are required to provide a qualified individual assigned to oversight of the process to ensure that the Record Model and As-Built Model are developed correctly and in accordance with the GSA CDX and COBie Data Standard. They will coordinate the extraction, collection, collating, testing, and delivery of all COBie-specified deliverables, including:

- Preparation, approval and implementation of COBie Information Delivery Plan (part of the BEP)
- Preparation, review, and approval of all COBie-specific and formatted submittals
- Documentation and submission of current COBie deliverables
- Identification, designation, and documentation of all COBie data collection personnel
- Coordination of all COBie data collection personnel to ensure accurate data merging
- Provide COBie technical expertise and project specific knowledge to all COBie affected parties
- Carry out and lead monthly COBie progress meetings
- Identification, selection, and operation of all applicable COBie-supporting software
- Curate electronic O&M manuals and photographs from all parties
- Final preparation, review, and submission of electronic O&M manuals
- Submission of request for electronic information delivery media and encryption specification
- Preparation, review, and approval of all electronic media, as specified
- Encryption of all electronic media, as specified

COBie/Data Quality Control:

Perform Quality Control checks prior to all COBie submissions. COBie deliverable shall be tested using an automated QC tool such as COBie QC Reporter (or approved substitute). Resulting QC reports should be included with respective COBie submission. Ensure that content of each COBie file matches the data on drawing schedules, manufacturer's data or other definitive sources of data as appropriate, and that the data or documents is populated and formatted in compliance with the "GSA CDX and COBie Data Standard".

O&M Facility Data: Go to First Page of Sub-Section

Workflow Requirements: Section Continues Next Page

CDX & COBie Attribute Requirements Summary:

The following tables are provided as a conceptual reference so that designers and contractors can easily understand the bulk of data collection requirements of the GSA BIM, CDX & COBie Standard. **The tables below are only a quick reference, and do not represent a comprehensive listing of all data fields required to be able to produce a COBie spreadsheet from a Native Model.**

The final Record Models and As-built Models are required to contain data attributes that are compliant with the "GSA CDX and COBie Data Standard" which is a separate excel based document, but lists in detail all data requirements of this standard.

All attribute/data must be input into the Native Model by the indicated contractual party. The Design team is responsible for setting up the Design Model correctly so that all required CDX and COBie attribute fields are present in the model for appropriate equipment, assets and spaces, but does not enter data into the model assigned to the contractor. The Autodesk BIM Interoperability Tools provide the design team with an automated means to accomplish the application of attributes to the model when using the AutoDesk Revit Software.

CONTRACTOR RESPONSIBLE DATA ENTRY	
Attribute/Data	General Short Description
Asset Manufacturer	Indicates the Manufacturer of each type of Equipment/Asset
Asset Model Number	The manufacturer's model number of each Equipment/Asset
Asset Warranty information	Information about Equipment/Asset warranty, including: parts/labor durations, start date, etc.
Asset Dimensions	The rough nominal dimensions of each Equipment/Asset
Asset Serial Number	The serial number of the installed Asset found on equipment nameplates.
Asset Installation Date	The date the Equipment/Asset was placed in its final location
Asset Documents*	Each equipment/asset with manufacturer's documentation required to be submitted by GSA specifications must use the COBie documents tab. Each document must only apply to one asset type, and be organized in a file folder structure/directory that is also referenced properly within the COBie spreadsheet.
** Asset Documents and respective COBie organization is accomplished manually after exporting a COBie spreadsheet from the model. Documents and related data are not required to be in the model.*	

DESIGN TEAM RESPONSIBLE DATA ENTRY	
Attribute/Data	General Short Description
Floor Name & Number	The name and number of the floor as it appears on the design drawings.
Floor Category	A custom GSA description of the floor from a prescribed GSA list.
Space Room Number	Room number matching the value found on the architectural design floor plans.
Space OmniClass Space Category	OmniClass Table 13 classification of the room/space by function.
Space Floor Name	The name of the floor where the room/space is located.
Space Description	The description of the room/space found on design drawings.
Space Signage	Full text of the final signage installed for each space.
Space Room Name	Assigns a room name to each room/space in a building from a prescribed GSA list.
Space Category Code and Name	Assigns a Space Category to each room/space in a building from a prescribed GSA list.
Space Class and Name	Assigns a use type abbreviation to each room/space in a building from a prescribed GSA list.
Space ANSI BOMA Code	Assigns the applicable ANSI BOMA codes to each room/space in a building from a prescribed GSA list.
Space Agency AB Code	Assigns a 4-digit code unique to agency and/or sub-agency to each room/space in a building from a prescribed GSA list.
Space ANSI BOMA SF Calculation	Usable square footage value calculated by the native modeling software based upon ANSI BOMA, NBSAP and Measurement Policies as defined by GSA SDM documentation.
Space Agency Full Name	Assigns the Full name of the Agency using a room/space from a prescribed GSA list.
Space CUI-SBU	Indicate if the space is Controlled Unclassified Information (CUI)
Asset Type Name/Code	Each unique type of Equipment/Asset must be assigned a unique identification Name/Code
GSA Asset-Type Code	Each maintainable Equipment/Asset must be assigned values from a prescribed GSA list
Asset Instance Name/Code	Each unique instance of each type of Equipment/Asset must be assigned a unique identification Name/Code
Asset Room/Space	The name of the room/space associated with the specific occurance of each Equipment/Asset in the model.
List of System Names	A full list of all building systems that contain maintainable Equipment/Asset
System Category	Categorizes each building system using OmniClass Table 21.
Asset System	Assign a system to each piece of maintainable Equipment/Asset

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Asset Coding Methodology:

The design team must develop the model and uniquely code all required assets in a consistent method, but the exact nomenclature is not prescribed. All asset codes in the model must follow a structured, coordinated, clearly understood, and enumerated nomenclature to uniquely code each asset type and instance. This applies specifically to two standard COBie attribute fields found in the GSA BIM and COBie Data Standard: "COBie.type.name" and "COBie.component.name"

Often, asset types can be coded with industry common shorthand, but there is no GSA prescribed shorthand notation for creating the asset code nomenclature. Proposed approach of coding for assets should be reviewed with GSA BIM Team for input as part of the BEP process.

- Examples of common shorthand for assets/equipment include: Air Handling Unit (AHU), or Variable Air Volume Box (VAV), and similar.
- Most assets/equipment should be coded with a more complete description such as "Chiller", "Fire Damper", or "Diffuser" instead of a shorthand notation such as "CH", "FD", or "DIF".

Example: 3 different types of VAV devices are specified during the design process, found on the MEP equipment schedules. Each of these types have a different number of instances throughout the building. The following table describes a possible approach for developing an appropriate value for these two COBie fields.

Example of Proper Asset Coding Nomenclature (VAV Boxes)				
# of different Types	**COBie.type.description** *Acceptable Description Example*	**COBie.type.name** Acceptable Value Example	**# of unique Instances of ea. Type**	**COBie.component.name** Acceptable Value Example
3	Variable Air Volume Box (passive, cooling only)	VAV-01	4	VAV-01-01
				VAV-01-02
				VAV-01-03
				VAV-01-04
	Variable Air Volume Box (passive with reheat)	VAV-02	3	VAV-02-01
				VAV-02-02
				VAV-02-03
	Variable Air Volume Box (fan powered with reheat)	VAV-03	2	VAV-03-01
				VAV-03-02

GSA Asset Type List:

The GSA Asset type list identifies the types of maintainable equipment required to be modeled, and have their specific data attributes captured within the model. This list is found in the GSA CDX & COBie data Standard, under the "COBie.type.category Picklist". All assets fall under one of the GSA Asset Type codes in this list and are part of the project scope must be modeled and have CDX & COBie data provided.

The "GSA BIM and COBie Data Standard excel spreadsheet" contains a list of GSA Asset Type Codes that must be applied to equipment and assets in the Design Model. A small subset of the list is provided below for reference, but the full list is located in the "GSA CDX & COBie Data Standard" excel spreadsheet.

Type.Category Picklist	
Asset Type (ABRV)	**Asset Type (DESCRIPTION)**
ABL	Air Blower
ACC	Condenser, Air-Cooled
ACR-01	Computer Room Air-Conditioning Unit, Package: or Special Systems
ACR-02	Heat Pumps, Water Cooled (WSHP)
ACR-03	Air Conditioning Unit or Heat Pump Split System,
ACR-04	Air Conditioning Unit, Ceiling/Wall/Window Mounted
ACR-05	Air-Cooled Condenser
ACR-06	Evaporative Condenser
ACT	Air Curtain

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The COBie Spreadsheet:

A COBie file is a standardized Microsoft Excel workbook that contains important information about a given facility including such things as equipment lists, product data sheets, warranties, spare parts lists, and preventive maintenance schedules. The file contains a series of tabs and each tab has a series of columns. Project- specific COBie files must always be identical in structure to the COBie standard template. These files must always retain the series of worksheet tabs as found in the COBie standard template, and the tabs must always retain the same order as the template. Similarly, within each tab, all of the columns in the template must be retained and kept in the same order as the template.

The GSA CDX and COBie Data Standard defines the meaning of each tab and the meaning of each column within each tab. It also defines milestones for when each tab and each column within a tab are required during the course of the design and construction of a building. Changing of the tabs, columns within each the tabs, the meaning of tabs and columns, and the milestones is not allowed.

The final COBie Spreadsheet must be exported directly from the Contractor's As-Built Model during the turnover process. This export must then be completed by populating the Documents tab, and configuring building O&M manuals and other related turnover documents and data sheets appropriately.

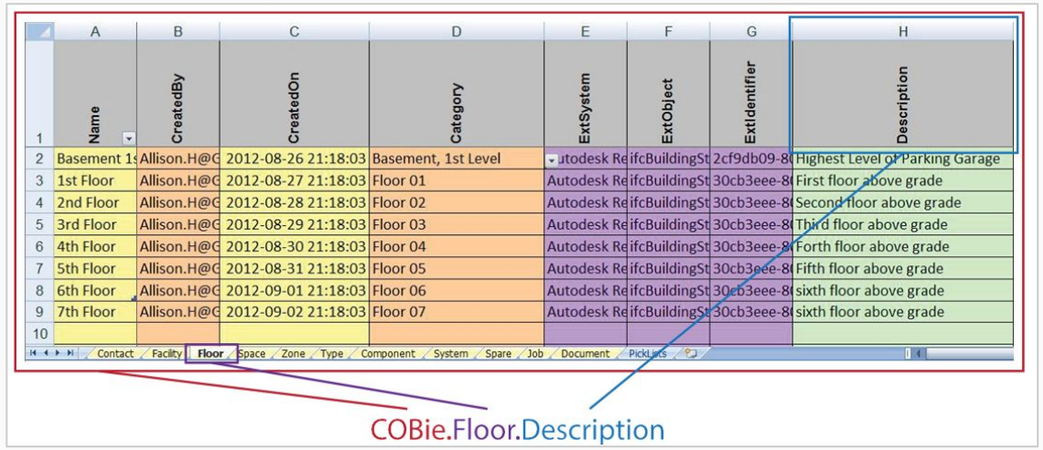
Required COBie Tabs

The following tabs are required to be populated in the final COBie spreadsheet: Contact, Facility, Floor, Space, Type, Component, System and Document. With the exception of document, the Autodesk BIM interoperability tools facilitates the assignment of all required COBie fields to the model and related assets, and the export of all other tabs directly from a Revit model.

The Documents Tab must be completed by the Contractor after export form the model.

Reading COBie Nomenclature:

There is a standard way of referring to the standard structure of COBie files. Using standardized language when referring to the parts of a COBie file is important to ensure clarity and efficiency. When referring to a COBie file's tabs and columns - use a "dot" notation that looks like this: COBie.Tab.Column. The CDX and COBie Standard requires use of this nomenclature within the Native Model as well for COBie related attributes.



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COBie Documents Tab Requirements:

The objective of conforming O&M submittals with the COBie Standard is to capture turnover documents digitally, and with basic standardized naming and organization methods. Requirements for O&M Manuals and other turnover data are detailed in Division 01 specifications of the construction documents. The majority of this documentation is required to be provided prior to the end of the project as standard submittals by the Contractor. The requirements of this standard further require and detail additional requirements for turnover documentation to be organized and delivered as a properly structured COBie compliant digital submission.

The Contractor must also check with the GSA Project team to confirm if the project management information system (PMIS) requires documentation to be submitted electronically in a prescribed organization structure. The directory of PDF files created to support the development of the COBie submission must align with the organization structure of the PMIS.

The table below lists common document types that pertain to maintainable building assets.

Document Types/Submittals to Include in COBie Scope *(if applicable to a specific Asset)*
Always Required for COBie Compliance
Certificates of Operation
Manufacturer Field Reports
Manufacturer Instructions
Operation and Maintenance
Product Data / Specifications
Environmental Product Declaration (EPD)
Test Reports
Warranties

Document Naming and Requirements:

Naming Requirements:

The Contractor's COBie QC Manager will use the following default naming convention for all COBie submittal files when documenting the location in the COBie Submittal. If a different naming convention is necessary, or better suits project needs, the contractor will provide an alternate method to GSA for review and document in the BIM Execution Plan. **<COBie.TypeName> _ <Submittal Type> _ <version>**

In the following example these three document types are associated with the same VAV Box, and separate files are provided for each document type.

- VAV-03_ManufacturerProductData_v02.pdf
- VAV-03_OperatingInstructions_v01.pdf
- VAV-03_WarrantyCertificate_v02.pdf

Document Requirements:

- Each document in the COBie spreadsheet must apply to only one type of equipment/asset, and one type of document listed in the table to the left. COBie QC Manager is responsible to split files appropriately into individual files.
- Some assets/equipment documentation may list multiple models or configurations of a specific model. These types of documents must be electronically marked to indicate the correct information for the asset.
- Documents provided for COBie must be formally approved Submittals.
- Documents are to be provided electronically, in PDF format.
- Provide original manufacturer vectorized PDF's (text searchable). Scanned/image copies are not permitted.
- Annotations of deviations to an asset configuration from the manufacturer's documentation shall be electronically noted in the body of the related PDF document.
- Published all PDF's at "Standard Quality" of the PDF Writing Software to ensure minimum file size.
- The relative file path from the location of the COBie spreadsheet is to be provided in the COBie.Document.Directory column of the COBie spreadsheet.

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3D Design Coordination

Applicability:	Required for all projects
Required Software:	Autodesk Navisworks or equivalent
Deliverables:	All coordination model files, clash reports
Submitted with:	See Submission Matrix section for official submission definitions.
Validated with:	Final Design Model

Summary:

3D Design Coordination is a process executed during the design stage of the project by the design team. Each design model is compiled into a design coordination model using coordination software to validate that the major building systems are modeled such that they do not collide with each other. The GSA requires that the design team demonstrate that all the components of the major building systems have been appropriately coordinated so that no two systems occupy the same physical space.

This process must be completed prior to issuing 95% Construction Documents (see P100 Submittal Matrix) for GSA review, and the related set of 2D plans must be generated after this process is complete. The final coordination model and reports showing the major systems have been coordinated are to be submitted along with other 95% CD documentation.

Requirements:

The design team is required to document the software and summary of the process they will use to perform 3D Design Coordination in the BIM Execution Plan (BEP) & Information Delivery Plan (IDP). The BEP & IDP must list all systems that will be coordinated.

A coordination report will only compare two systems at a time (e.g. ductwork vs. sanitary), and show that those two systems do not interfere with each other. Multiple coordination reports will be necessary, totalling all the possible permutations between each major building system to be coordinated.

At a minimum, the following will be coordinated between each other (unless design SOW does not have any significant impact on the system):

- Structural framing systems - e.g. columns, beams, slabs, foundations, etc.
- Architectural ceiling systems - e.g. ceiling grid/tile, soffits, drywall/framing, etc.
- HVAC Distribution systems - e.g. ductwork, AHUs, VAVs, etc.
- HVAC piping systems - e.g. boilers, chillers, pumps, distribution piping, etc.
- Plumbing - e.g. hot/cold water distribution, sanitary systems, storm water, etc.
- Electrical Distribution systems - e.g. conduit, switchgear, panelboards, etc.
- Lighting systems - e.g. light fixtures, etc.
- Specialty systems - e.g. medical gas supply, etc.
- Fire Protection systems - e.g. sprinklers, etc.

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3D Construction Coordination

Applicability:	Required for all projects
Required Software:	Autodesk Navisworks or equivalent
Deliverables:	All coordination model files, clash reports
Submitted with:	See Submission Matrix section for official submission definitions.
Validated with:	Federated Construction Model and As-Built Model (final version)

Summary:

3D Construction Coordination is a process executed during the construction stage of the project by the contractor and subcontractors. Each subcontractor responsible for one or more of the required systems will use BIM software to develop the fabrication drawings (submittals) that represent what will be installed. Fabrication Models are compiled into a Federated Construction Model using coordination software to validate that the major building systems are modeled such that they do not collide with each other. The contractor must demonstrate that all the components of the major building systems have been appropriately coordinated so that no two systems occupy the same physical space.

This process must be completed prior to issuing construction submittals for GSA/Designer review, and the related set of 2D plans must be generated after this process is complete. The final coordination model and reports showing the major systems have been coordinated are to be submitted along with other 2D submittal documentation.

Requirements:

The contractor is required to document the software and summary of the process they will use to perform 3D Design Coordination in the BIM Execution Plan (BEP) & Information Delivery Plan (IDP). The BEP must list all systems that will be coordinated.

A coordination report will only compare two systems at a time (e.g. ductwork vs. sanitary), and show that those two systems do not interfere with each other. Multiple coordination reports will be necessary, totalling all the possible permutations between each major building system to be coordinated.

At a minimum, the following will be coordinated between each other (unless construction SOW does not have any significant impact on the system):

- Structural framing systems - e.g. columns, beams, slabs, foundations, etc.
- Architectural ceiling systems - e.g. ceiling grid/tile, soffits, drywall/framing, etc.
- HVAC Distribution systems - e.g. ductwork, AHUs, VAVs, etc.
- HVAC piping systems - e.g. boilers, chillers, pumps, distribution piping, etc.
- Plumbing - e.g. hot/cold water distribution, sanitary systems, storm water, etc.
- Electrical Distribution systems - e.g. conduit, switchgear, panelboards, etc.
- Lighting systems - e.g. light fixtures, etc.
- Specialty systems - e.g. medical gas supply, etc.
- Fire Protection systems - e.g. sprinklers, etc.
- Support systems - e.g. MEP hangers, equipment supports, Precast concrete supports, etc.
- Access Panels/Zones - includes “clearance space” required for access/maintenance of equipment/assets

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Reality Capture

Applicability:	Optional (Becomes required by GSA RFP or proposed by Design or Contractor)
Required Software:	Faro Scene, AutoDesk Recap, StructionSite, Reconstruct or similar technologies
Deliverables:	See below - Dependent on technology proposed or required by RFP
Submitted with:	See “Summary” below - Dependent on “Use Case”
Validated with:	N/A

Summary

Reality Capture is not a requirement of every GSA project, but may be required by the GSA on a project-by-project basis. Reality Capture includes a wide range of technologies, including Laser Scanners, 360 Cameras, LiDar and similar technologies.

GSA highly values all forms of reality capture on its projects, either to aid in developing more accurate design documents, or to have better insight into what was installed during construction.

If not required by GSA RFP/Contract, designers and contractors are highly encouraged to propose additional services to GSA for Reality Capture work - and can use this document as guidance.

When the GSA has requested Reality Capture be included in the scope of work for a project, or if conducting a Reality Capture as a stand alone scope of work -- this document outlines the high-level requirements of the firm responsible for execution of the Reality Capture.

Use Cases

Existing Conditions:
Where a building exists, Reality Capture can be deployed to capture the physical objects that can be seen via line of sight for future design or existing conditions modeling.

Hidden Conditions:
An extension of “Existing Conditions”, it may be desirable to gain location data about building objects typically hidden by walls, ceilings, etc. This may require a two-phased approach, where the existing conditions are captured, then selective demolition occurs such that the laser scanning firm can return to collect further details about select areas or objects.

Construction Documentation:
This applies to projects during construction, typically to capture the installed conditions of select building elements before they are permanently covered by other structures such as walls, ceilings, etc. With this application, there will be an archive of scans documenting the same space of a building at different times during construction.

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Requirements

The scope of work (what building objects or areas must be scanned) will be established in a separate document from this standard.

The required accuracy of Reality Capture will be determined by GSA or proposed by the Designer/Contractor. GSA has defined three categories of accuracy. For each level of accuracy, different software and hardware may exist or be developed in the future that will achieve the required accuracy. The software and hardware used to meet the selected level of accuracy will be documented with the GSA by the Designer/Contractor.

GSA has defined level of accuracy for reality capture as follows:

Level 100: Investigative Tolerance. This level is used when installed/existing object size and location only need to be within 2" +/- 1" of field conditions. Example: little or no as-built information exists about a building, and the design team needs general size and location information for: walls, light fixtures, exterior doors, columns, etc.

Level 200: Construction Tolerance. This level is used when an installed/existing object size and location requires a constructability tolerance of ¾" +/- ¼". This is typically to assist general construction planning and installation. Example: An addition to a building where the two structures must align and connect.

Level 300: Fabrication Tolerance. This level is used when an installed/exiting object size and location is required at ⅛ +/- ⅛" for specific retrofitting or renovation work. Examples: replacement of large mechanical equipment such as boilers and chillers while intending to re-utilize existing pipes and other mechanical fittings.

Submission Requirements

Submission requirements will be defined based upon the technology deployed for the Reality Capture and the solicitation of services. These may include:

2D Key Plan:
Developed collaboratively with GSA and submitted and approved prior to field work. This plan will be color coded and labeled appropriately such that it can be used for establishing the file naming convention for scanning. Upon final delivery, the Key Plan will be updated to reflect any changes incurred during the Reality Capture process. The Key plan must be usable by future third parties to understand which Reality Capture files correspond to which areas of the building when looking at the file structure and file names. The size of each area should be chosen based on achieving a workable file size for each area. Each area may vary in size based on the density of data captured. Where possible, logical area breakdowns should be used, such as: bathroom, Mechanical room, Lobby, Cafeteria/Kitchen, etc.

Project Approach and Site Access Plan:
Submitted and approved prior to field work. The Reality Capture firm will work through their contacts at the GSA to arrange for an appropriate time to conduct the scans, establish on-site contacts for the duration of the scanning, and to review their plan. The firm will develop a plan/schedule for on-site scanning that they anticipate to follow while on-site. The GSA recognizes that plans may need to be altered based on unforeseen field conditions, and any changes to this plan should be coordinated with the on-site contact as issues arise. This will include:

- Contact information of the scanning team,
- Key Plan (see above) plus a 2D plan or schedule showing the flow of scanning throughout the building with an estimate of how much time and on what days the firm will be scanning in a given area.
- Establish a list of secure areas, or areas typically behind locked doors that need to be coordinated with the on-site contact
- Additional recommendations from the scanning team to help them conduct their work efficiently while on-site
- This plan will be provided to the on-site contact as a means to help them coordinate access

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Submission Requirements (continued)

File Naming Convention:
Submitted and approved prior to fieldwork. If previous data for the same site exists and conforms to the standard, the naming convention established by that data is to be followed for all new scans. Use a standard naming convention for individual or registered point cloud files that aligns with the 2D Key Plan. The naming convention will use the following format to describe a registered group of scans:

< GSA BUILDING CODE >_<BUILDING NAME>_< FLOOR>_< KEY PLAN AREA >_< DESCRIPTION >

GSA BUILDING CODE:	*Provided by GSA*
Building Name:	*An abbreviated building name, documented in the BEP.*
FLOOR:	*The floor designation of the scan area*
KEY PLAN AREA:	*Name of the group in the 2D key plan*
DESCRIPTION:	*Describes the capture/group such that an individual without access to the Key Plan can discern useful information. Examples: Room #, Department Name, Mechanical Room, Bathrooms, etc.*

Registered Point Clouds:
All file types, organized and named according to the conventions of this document. This includes:

- E57 file format: These are all industry standard format files that can be exported by the software deployed for scanning.
- Compressed Files RCP/RCS (or equivalent): File format that reduces the file size of point clouds to be more resource friendly when imported into Revit.

360 Photos:
Reality capture technologies typically leverage cameras to capture a 360 degree view of the location where each individual capture was taken. These can sometimes be “structured data” that aligns with the point cloud, or simple stand alone 360 degree photos that are approximately “geo-located” on a floorplan to the place on the site or in the building where they were taken. Stand alone images are often aligned to 2D PDF documents using software such as Structionsite, OpenSpace or similar, while structured data/photos require specialized software to view together. Only the GSA CO approved, FedRAMP authorized photo documentation tool may be used on projects. Contact the GSA PM for access to this software.

Revit File:
Containing only Reality Capture data (commonly called point clouds), organized and named according to the conventions defined in collaboration with GSA. Shall be aligned with Key Plan. Shall be aligned to the project coordinate system detailed in the BEP (if applicable). May also contain a 3D “Existing Condition” model of the scanned conditions aligned with the Reality Capture (if part of the scope of work). If delivering a Revit model, with Revit objects representing the scanned conditions, it will comply with Section 7 of the BIM Standard (as applicable) and use the GSA Revit Template

Scan Report:
Documenting the accuracy of the Reality Capture and deviations from expectations. Report shall contain:

- Key Plan
- Accuracy/precision reports
- File structure of registered scan groups
- Variations from scope (list of areas/items/rooms that were in scope but which the scanning team could not reasonably gain access while on-site)
- Call out deviations from expected accuracy, with explanations for deviation or planned remediation if required.

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Schedule Simulation

Applicability:	Optional (Becomes required by GSA RFP or if proposed by Contractor)
Required Software:	Autodesk Navisworks or equivalent
Deliverables:	All native simulation model files, Exported Video (.AVI or equivalent)
Submitted with:	Monthly Construction Project Schedule Update
Validated with:	N/A

Summary:

Also known as 4D modeling, this simulation is used to coordinate the work with subcontractors and GSA project teams. The Design Model and Contractor's official schedule (which is officially provided to GSA) are combined using simulation software. GSA values this workflow to help project teams better understand the planned and installed conditions, as well as evaluate schedule progress more easily. The simulation can be used for all or a defined portion of the project (such as Structural and facade sequencing, site logistics, supply chain management, etc.).

Requirements:

If not required by GSA per the RFP, and proposed by the Contractor in their proposal - Contractor will define the purpose of the simulation and the scope of the project or work that will be simulated in their proposal. This will be documented and detailed in the BEP after the contract is awarded.

The simulation will be actively tied to the most recent project CPM schedule and updated with each CPM submission.

Contractor will review the Schedule Simulation with the GSA project team during formal project reviews/updates.

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Energy Analysis

Applicability:	Optional (Becomes required by GSA RFP or proposed by Designer)
Required Software:	Green Building Studio, Trane Trace or similar
Deliverables:	Data included in Design Model as applicable, Software Reports
Submitted with:	See Submission Matrix section for official submission definitions.
Validated with:	N/A

Summary

During the early design phases, massing models can be used to analyze the whole-building energy performance. Iterative studies of various design options can be quickly analyzed for energy and water consumption, carbon emissions, daylighting, and natural ventilation. During later design phases, HVAC design data from the Design Model can be exported then be imported to common HVAC analysis software such as Trane Trace, Carrier HAP, and eQUEST for more detailed information and analysis.

GSA has internal groups that look at projected and actual building performance to conduct analysis on how to optimize the energy footprint of their portfolio. Energy Analysis is valuable to help GSA better understand it's buildings and evaluate performance metrics during operations.

It is desired by GSA to document the process and software used by the design team for Energy Analysis - and to understand what data contained in the Design Model was used to conduct the designer's energy analysis.

Requirements

If not required by GSA per the RFP, and proposed by the designer in their proposal - Designer will define the purpose of Energy Analysis and the scope of the project or work that will be simulated in their proposal. This will be documented and detailed in the BEP after the award.

Always provide the native Energy Analysis software files along with their respective reports during design development aligned with P100.

If the native Design BIM was used for energy analysis, and the model objects contain energy analysis specific data, provide an overview description of what data is included in the Design BIM in the BEP.

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Change Log

Version numbering guide: [x] . [y]

[x] = major revisions, added new requirement(s), or other significant restructuring

[y] = edits to existing contents, new information added to existing contents, minor edits

Change Log History		
Version Number	**Date**	**Summary of Changes**
1.0	07/16/2024	First Published version of this standard.

Detailed Change Log - Version x.y		
Change #	**Page Reference**	**Description of Change**

Change Log: End Section

GSA BIM, CDX & COBIE STANDARD

Version: 1.0
Date: 07/16/2024

END OF DOCUMENT.