

Process Map

Name **Spatial Program Validation**

<u>Change Log</u>		
15-May-08	Version 0.5 created, based on GSA BIM Series 02 documents developed in 2006.	RichSee@DigitalAlchemyPro.com
01-Jun-08	Version 0.7 – adding task descriptions and updates to the process diagram	RichSee@DigitalAlchemyPro.com
26-Jun-08	Version 0.9 – finalizing the process, task descriptions, data objects, exchange definitions, and coordination point definitions	RichSee@DigitalAlchemyPro.com
25-Aug-08	Version 0.92 - Updates to address comments from Peggy Ho (GSA) and Anne Aaltonen (Solibri)	RichSee@DigitalAlchemyPro.com
06-Nov-08	Version 0.95 -- Updated process diagram to address comments from Solibri.	RichSee@DigitalAlchemyPro.com
30-Nov-08	Version 0.96 -- Updates to address comments/requests from Statsbygg and Senate.	RichSee@DigitalAlchemyPro.com
15-May-09	Version 1.00 -- updates to address comments/requests from Statsbygg/Senate.	RichSee@DigitalAlchemyPro.com
25-Jul-09	Version 1.10 -- updates to address comments/requests to generalize the verbiage to work for any building owner.	RichSee@DigitalAlchemyPro.com
19-Aug-09	Version 1.2 -- more updates to address comments/requests to generalize the verbiage to work for any building owner.	RichSee@DigitalAlchemyPro.com

Exchange Requirements	ER_Spatial_Program_Validation_(concept)

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Overview

Spatial Program Validation done for and by building owner organizations involves the building owners' staff or consultants performing an assessment of the degree to which the building design meets all of the building owner's space requirements, as defined in the architectural program for the building. Such an assessment will, of course, be done by the design team as well. This building owner assessment can be viewed as a cross-check of design performance in this important area.

Spatial program validation during concept design is focused on the following things:

- A Pre-Check of the building model for valid model structure and for completeness (relative to what is required in the building owner's BIM Guide for Spatial Program Validation)
- Measurement of space areas, by space type and occupant
- Assessing and documenting differences between space areas provided in the design and what is required in the space program for the building --- by space type and occupant
- Assessing and documenting differences between the design and requirements in other areas (e.g. space proximity, floor location, etc.)

Design issues discovered through these analyses, are communicated back to the building designer for resolution before the design will be accepted by the building owner.

Some building owner/property management organizations, like US GSA, Statsbygg, and Senate have been requiring BIMs that meet the requirements of their respective BIM Guidelines for a few years now. This project will update BIM requirements for Spatial Program Validation (a.k.a. GSA BIM series 02) in concert with requirements for:

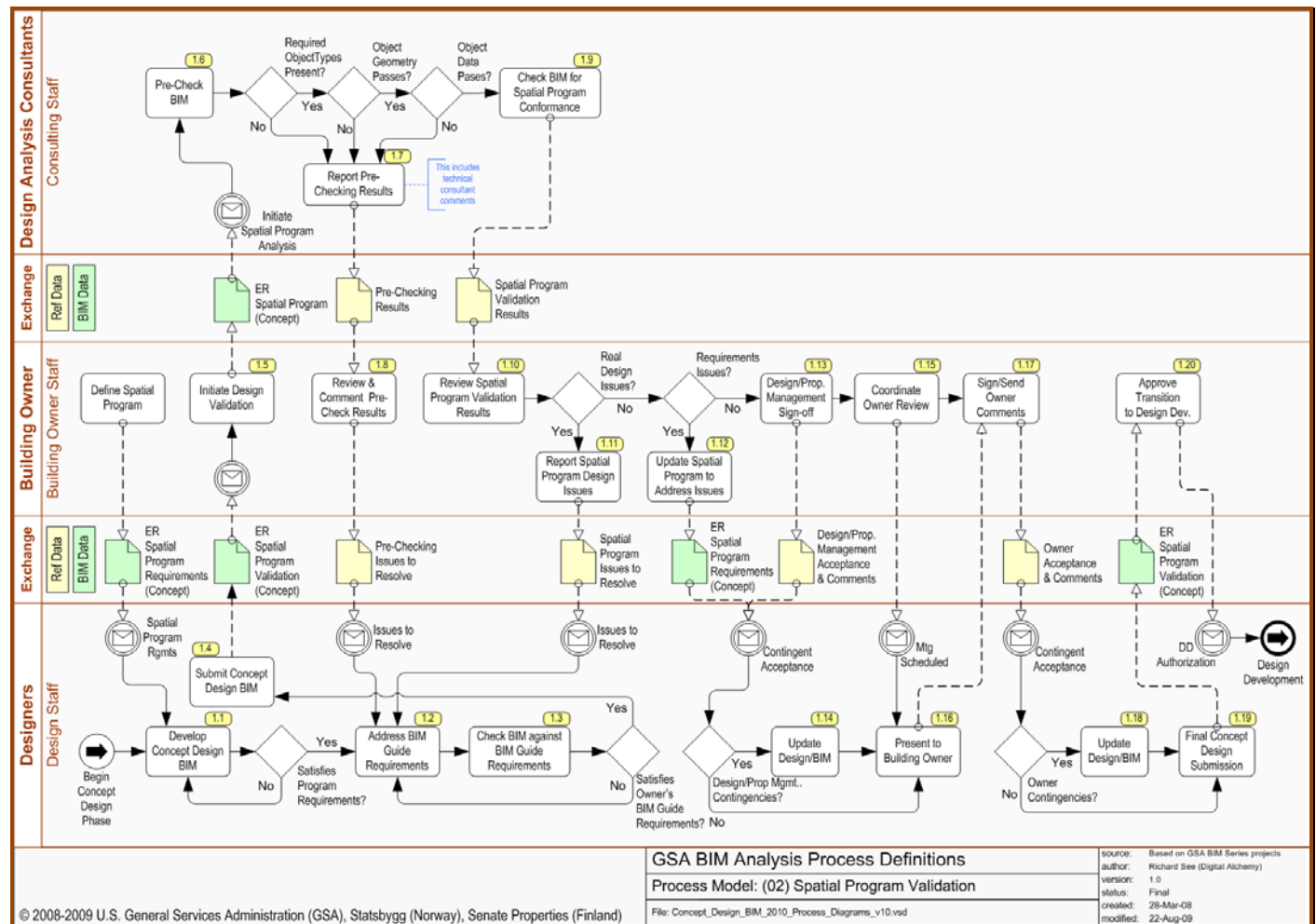
- Energy Performance Analysis (GSA BIM series 05)
- Circulation/Security Analysis (GSA BIM series 06)
- Quantity Takeoff and Cost Estimating (GSA BIM series 07)

The MVD which integrates all of these requirements and enables 4 types of analysis on one BIM submission from the building designer is called the 'Concept Design BIM 2010.'

Several building owner/property management organizations, including US GSA, Statsbygg, and Senate, will begin requiring submission of BIMS that satisfy these exchange requirements beginning late in 2010 or early in 2011. Their intent is to use consultants and/or analysis applications to perform the target analyses in order to provide feedback to the design team. The motivation for this process is to ensure better design of buildings --- designs that deliver all of these owner organizations' spatial program requirements.

Specification of Process

Concept Design Phase Spatial Program Validation



[1.1] Develop the Concept Design BIM

Type	Task
Documentation	The architects or designers will use an approved or certified BIM authoring application to create a Building Information Model (BIM) that will be used by the building owner organization for spatial program validation.

[1.2] Address BIM Guide Requirements

Type	Task
Documentation	The architects or designers must then extend/expand the BIM to address the requirements defined in the building owner organization's BIM Guide for spatial program validation.

[1.3] Check BIM Against BIM Guide Requirements

Type	Task
Documentation	The final step before submitting a BIM to the building owner organization is for the architects or designers to check the BIM for conformance to the building

	owner organization's BIM Guide requirements. This could be done manually, but will most likely use a model checking application like that Spatial Program Validation plug-in to the Solibri Model Checker (SMC), developed in the US GSA BIM program.
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[1.4] Submit Concept Design BIM

Type	Task
Documentation	When the architects/designers are satisfied that both the spatial program and BIM Guide requirements have been met, they will submit the BIM for review by the building owner organization.

[1.5] Initiate Design Validation

Type	Task
Documentation	After receiving the BIM from the architect, the building owner organization's design management team will initiate a design analysis process in order to ensure an optimal design – in this case, from the points of view of design performance relative to spatial program requirements defined by the building owner organization at the outset of design. This analysis may be done in-house, by specialists within the building owner's organization, or it may be contracted out to a consultant.

[1.6] Pre-Check BIM

Type	Task
Documentation	The BIM will first be checked for correct model structure (i.e. structured as specified in the IFC BIM standard model schema) and for completeness (i.e. includes all of the information required in the ER_Spatial_Program_Validation_(concept) exchange requirements. Exceptions will be reported in a standard format.

[1.7] Report Pre-Checking Results

Type	Task
Documentation	After ensuring that all of the pre-checking criteria have been checked (i.e. space geometry and data sufficiency), the building owner organization's specialist or consultant will return the checking results, including their comments, to the building owner organization's design management team.

[1.8] Review and Comment Pre-Check Results

Type	Task
Documentation	The building owner organization's design management team will review the pre-checking results, decide which of the reported issues must be resolved, and document these for discussion with the architects.

[1.9] Check BIM for Spatial Program Conformance

Type	Task
Documentation	After all of the pre-checking criteria are met, the building owner organization's specialist or consultant will check the BIM for conformance to Spatial Program requirements. Results will be reported for interpretation by the building owner organization's design management team.

[1.10] Review Spatial Program Validation Results

Type	Task
Documentation	The building owner organization will review the Spatial Program Validation checking results, decide which of the reported issues must be resolved, and document these for discussion with the architects.

[1.11] Report Spatial Program Design Issues to be Resolved

Type	Task
Documentation	Real design issues are then discussed with the architects for resolution in the next design iteration.

[1.12] Update Spatial Program to Address Program Issues

Type	Task
Documentation	Spatial Program issues will sometimes be resolved by the building owner organization's Spatial Programming team -- through adjustments to the Spatial Program, instead of changes to the design.

[1.13] Design/Property Management Sign-Off

Type	Task
Documentation	At some point in this iterative design cycle, the building owner organization's design management team will approve the concept design with a final set of comments.

[1.14] Update Design/BIM – Design/Property Management Final Comments

Type	Task
Documentation	The architects or designers will then update the design to address final comments from the building owner organization's design management team.

[1.15] Coordinate Owner Review

Type	Task
Documentation	After signing off on the Concept Design, the building owner organization's design management team will schedule reviews with their upper management and/or by tenant organizations that were significant in driving the spatial program for the building..

[1.16] Present to Building Owner

Type	Task
Documentation	The architects or designers will then present to the building owner management for approval.

[1.17] Sign/Send Building Owner Comments

Type	Task
Documentation	The building owner's design management team will be responsible for securing the owner's approval and final comments. These will be addressed by the architects or designers before final concept design submission.

[1.18] Update Design/BIM – Building Owner Final Comments

Type	Task
Documentation	The architects or designers will then update the design to address final comments from the building owner management team.

[1.19] Final Concept Design Submission

Type	Task
Documentation	With all approvals and contingent approvals addressed, the architects or designers will make the final Concept Design submission to the building owner, including the final Concept Design version of the BIM.

[1.20] Approve Transition to Design Development

Type	Task
Documentation	After verifying all the requirements for final submission have been delivered, the building owner's design management team will give approval for the design team to proceed to the next phase of design = Design Development.

Specification of Data Objects

Pre-Checking Results

Type	Data Object
Name	Pre-Checking Results
Documentation	This documents results from pre-checking the BIM for structural validity and sufficient completeness to ensure that the circulation and security checking results will be valid.

Pre-Checking Issues to Resolve

Type	Data Object
Name	Pre-Checking Issues to Resolved
Documentation	After reviewing the pre-checking results, the building owner's design management team will document the issues the architect must resolve before the design will be approved.

Spatial Program Validation Results

Type	Data Object
Name	Spatial Program Validation Results
Documentation	This documents results from checking the design model for conformance to the building owner's Spatial Program requirements for the building.

Spatial Program Issues to Resolve

Type	Data Object
Name	Spatial Program Issues to Resolve
Documentation	After reviewing the Spatial Program Validation results, the building owner's design management team will document the issues the architect must resolve before the design will be approved.

Design/Property Management Acceptance & Comments

Type	Data Object
Name	Design/Property Management Acceptance & Comments
Documentation	This documents acceptance of the concept design by the owner's design management and property management teams, but this acceptance may be contingent upon some further changes or optimization.

Owner Acceptance & Comments

Type	Data Object
Name	Owner Acceptance & Comments
Documentation	This documents acceptance of the concept design by the building owner; although this acceptance may be contingent upon some further changes or optimization.

Exchange Requirement Data Objects

ER_Spatial_Program_Validation_(concept)

Type	Data Object
Name	ER_Spatial_Program_Validation_(concept)
Documentation	<p>Building information model resulting from the concept design process that includes all of the following object types:</p> <p>Project/Building Information</p> <ul style="list-style-type: none"> • Project • Building • Building Story <p>Spatial Information</p> <ul style="list-style-type: none"> • Space • Space Boundary • Space floor area • Space classification • Space Occupant • Zone • Space membership in zones <p>Building Element Information</p> <ul style="list-style-type: none"> • Beam • Column • Door • Ramp • Slab • Stair • Wall • Window

Specification of Coordination Point Gateways

Satisfies Program Requirements?

Type	Coordination Point
Name	Satisfies Program Requirements?
Documentation	The point as which the architects or designers confirm whether the design satisfies requirements in the spatial program.

Satisfies Owner's BIM Guide Requirements?

Type	Coordination Point
Name	Satisfies Owner's BIM Guide Requirements?
Documentation	The point at which the architects or designers confirm whether the design satisfies requirements in the owner's BIM Guidelines for spatial program validation.

Required Object Types Present?

Type	Coordination Point
Name	Required Object Types Present
Documentation	The point at which the building owner organization (or its consultants) check the BIM to ensure all the required object types have been included.

Object Geometry Passes?

Type	Coordination Point
Name	Object Geometry Passes
Documentation	The point at which the building owner organization (or its consultants) check the BIM objects' geometry to ensure it meets requirements in the BIM Guide.

Object Data Passes?

Type	Coordination Point
Name	Object Geometry Passes
Documentation	The point at which the building owner organization (or its consultants) check the BIM objects' data to ensure the object properties required in the BIM Guide have been provided.

Real Design Issues?

Type	Coordination Point
Name	Real Design Issues?
Documentation	The point at which the building owner organization decides whether 'potential issues' reported in the Spatial Program Validation Results are real design issues.

Requirements Issues?

Type	Coordination Point
Name	Requirements Issues?
Documentation	The point at which the building owner organization decides whether 'potential issues' reported in the Spatial Program Validation Results are issues of non-conformance to the spatial program that was required.

Design/Property Management Contingencies?

Type	Coordination Point
Name	Object Geometry Passes
Documentation	The point at which the architects or designers ascertain if the owner's design and property management acceptance of the design is contingent upon some specified design change.

Owner Contingencies?

Type	Coordination Point
Name	Object Geometry Passes
Documentation	The point at which the architects or designers ascertain if the building owner's acceptance of the design is contingent upon some specified design change.