Process Map

Name GSA – Circulation & Security Analysis at Concept Design Phase

Change Log		
15-May-08	Version 0.5 created, based on GSA BIM Series documents developed by Yeon-Suk Jeong and Chuck Eastman of Georgia Tech.	RichSee@DigitalAlchemyPro.com
01-Jun-08	Version 0.7 – adding task descriptions and updates to the process diagram	RichSee@DigitalAlchemyPro.com
24-Jun-08	Version 0.9 – finalizing the process, task descriptions, data objects, exchange definitions, and Decision Gateway definitions	RichSee@DigitalAlchemyPro.com
28-Jun-08	Version 0.91 – Edits to address issues found in first review	RichSee@DigitalAlchemyPro.com
23-Aug-08	Version 0.92 - Edits to address issues reported by the Georgia Tech team.	RichSee@DigitalAlchemyPro.com
25-Aug-08	Version 0.93 - addresses more feedback from Georgia Tech Team.	RichSee@DigitalAlchemyPro.com
29-Jan-09	Version 0.96 - addresses comments from Statsbygg	RichSee@DigitalAlchemyPro.com
18-Aug-09	Version 1.0 - addresses more comments and requests from Statsbygg and Senate Properties	RichSee@DigitalAlchemyPro.com

Contents

Overview

Circulation and Security Analysis 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 requirements for separation of, and access security between, human circulation zones in buildings. This is commonly defined in the architectural program (or client brief) 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.

The rules/requirements for separation of these zones vary by building type. In some cases, such as US Federal Courthouses, the rules/requirements will be extensive and very specific. In the case of Courthouses, they are defined in the US Courts Design Guide. In other cases, such as an office bilding, they may be quite minimal and defined only in the architectural program. Other examples of buliding types that have significant circulation/security rules include: prisons, detention centers, airports, shipping ports, border crossing stations, embassies, train and buss stations, sports and performance stadiums and arenas. In all cases, certain information about human circulation spaces and doors are required to check the design for conformance to these rules/requirements.

Circulation and Security analysis during concept design is focused on the following things:

- Pre-Check of the building model for valid structure and for completeness (relative to what is required for these analyses)

- Analysis of the building design for conformance to human circulation and separation security requirements defined by the building owner. In particular, there may be as many as 3 distinct circulation zones – for:
  - Security/Facilities staff - called Restricted
  - Employees/Service Staff – for employees only - called Staff
  - Public – for the general public - called Public

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 Circulation and Security Analysis (a.k.a. GSA BIM series 06) in concert with requirements for:

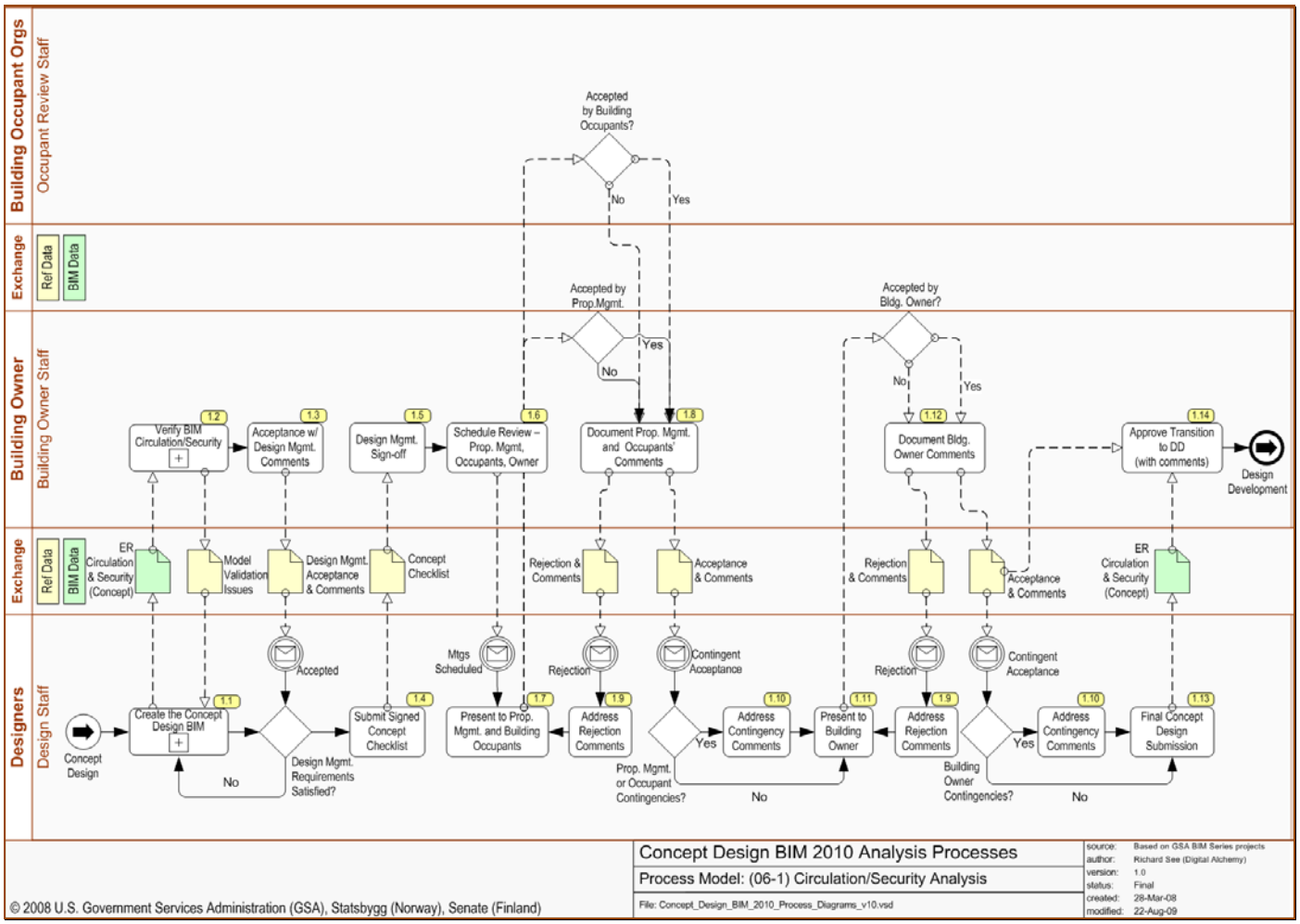
- Spatial Program Validation (GSA BIM series 02)
- Energy Performance Analysis (GSA BIM series 05)
- Quantity Takeoff and Cost Estimating (GSA BIM series 07)

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 Circulation & Security Analysis



[1.1] Create the Concept Design BIM

Type	Sub-Process
Name	Create the Concept Design BIM
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 GSA for circulation and security analyses. As with all design processes, this process will be iterative, using the sub-process defined below.

[1.2] Verify BIM Circulation/Security

Type	Sub-Process
Name	Verify BIM Circulation/Security
Documentation	The building owner or its consultants will use one or more analysis applications to load the BIM and measure conformance of the design with requirements for both circulation and security defined by the buidling owner. As with the design process defined in 1.1, this process will be iterative, providing feedback to the design team throughout the final concept design phase of the project. The process for this analysis/feedback loop is defined in the sub-process definition

	below.

[1.3] Acceptance with Design Management Comments

Type	Task
Name	Acceptance with Design Management Comments
Documentation	At some point in the iterative design loop, the owner's design management team will accept the design as sufficiently meeting requirements for circulation and security. The owner's design management team will, at that time, issue an acceptance with final comments.

[1.4] Submit Signed Concept Checklist

Type	Task
Name	Submit Signed Concept Checklist
Documentation	After addressing final comments in the OCA Acceptance and Comments, the architects or designers will submit to GSA a signed Concept Design Checklist.

[1.5] Design Management Sign-Off

Type	Task
Name	Design Management Sign-Off
Documentation	After receiving the architect’s signed Concept Design Checklist, the owner's design management team will 'sign off’ on the Concept Design.

[1.6] Schedule Review - Property Management, Occupants, and Owner

Type	Task
Name	Coordinate Review - Property Management and Significant Occupants
Documentation	After signing off on the Concept Design, the owner's design management team will schedule reviews with each of: the property management group, significant occupants with special requirements, and the building owner.

[1.7] Present to Property Management and Building Occupants

Type	Task
Name	Present to Property Management and Building Occupants
Documentation	The architects or designers will then present to the owner's property management group and to any significant occupants with special requirements.

[1.8] Document Property Management and Occupants' Comments

Type	Task
Name	Document Property Management and Occupants' Comments
Documentation	The property management and building occupant reviewers will provide comments about the design in support of their acceptance or rejection of the design. The owner's design management team will document these comments and, if rejected, provide direction to the designer about addressing them and schedule another presentation. This cycle will continue until the design is accepted by the property management and signficant occupants invited to review the design.

[1.9] Address Rejection Comments from Property Management/Occupants

Type	Task
Name	Address Rejection Comments from Property Management/Occupants
Documentation	The architects or designers will address any rejection comments from the property management and signficant occupants invited to review the design. After these have been resolved, they will schedule through the owner's design management team -- to present the revised building design.

[1.10] Address Contingency Comments

Type	Task
Name	Address Contingency Comments
Documentation	The architects or designers will then address any contingent acceptance requirements.

[1.11] Present to Building Owner

Type	Task
Name	Present to Building Owner
Documentation	The architects or designers will then present to the building owner for approval.

[1.12] Document Building Owner Comments

Type	Task
Name	Document Building Owner Comments
Documentation	The building owner will provide comments about the design in support of their acceptance or rejection of the design. The owner's design management team will document these comments and, if rejected, provide direction to the designer about addressing them. This cycle will continue until the design is accepted by the building owner.

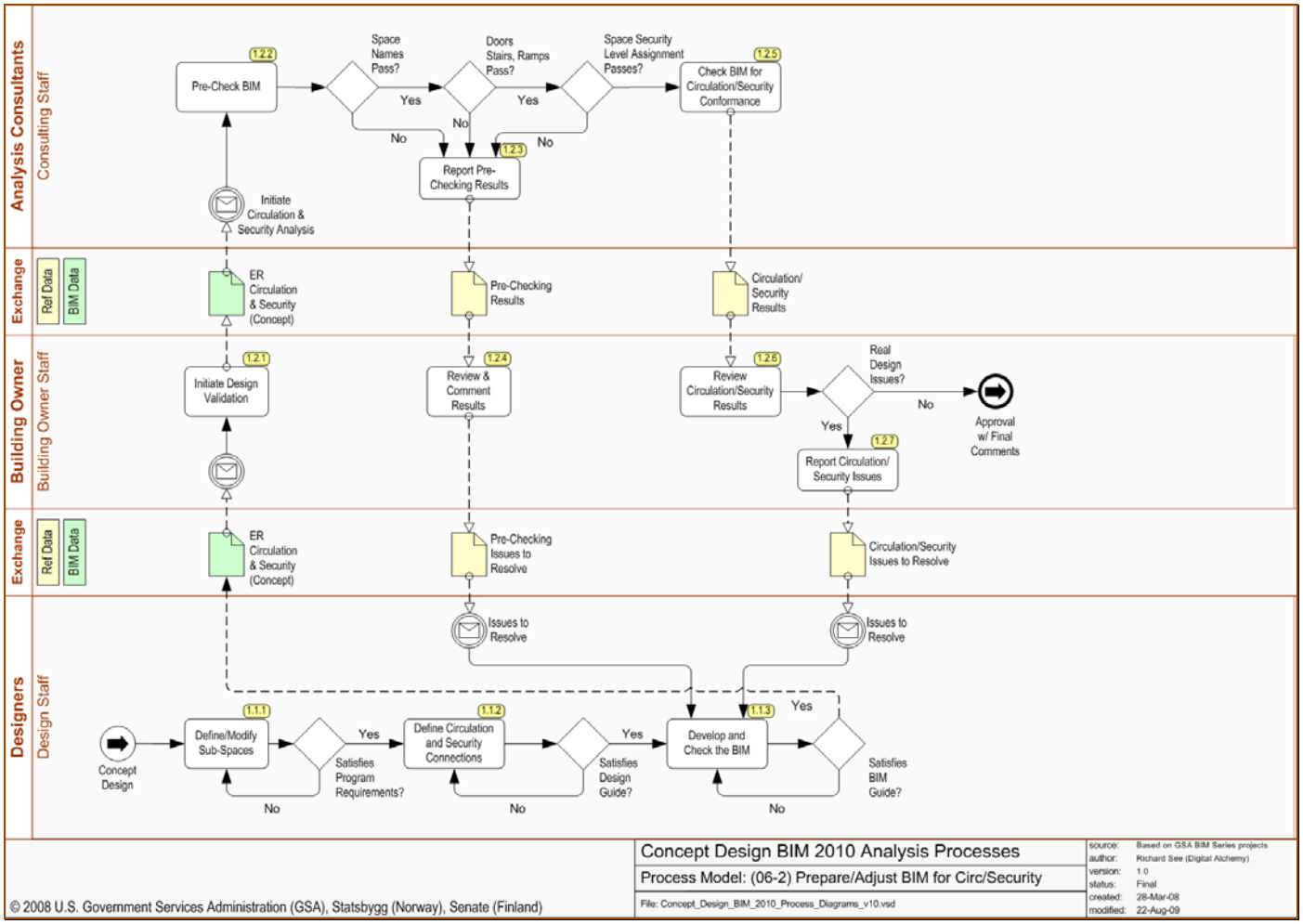
[1.13] Final Concept Design Submission

Type	Task
Name	Final Concept Design Submission
Documentation	With all approvals and contingent approvals addressed, the architects or designers will make the final Concept Design submission to the owner's design management team, including the final Concept Design version of the BIM.

[1.14] Approve Transition to Design Development

Type	Task
Name	Approve Transition to Design Development
Documentation	Upon acceptance of Final Concept Design submissions, the owner's design management team will give approval for the designers to proceed into the Design Development phase of the project.

Create/Verify Concept Design BIM



[1.1.1] Define/Modify Sub-Spaces

Type	Task
Name	Define/Modify Sub-Spaces
Documentation	The architects will define groups of spaces and subspaces in the BIM as required for circulation and security analysis.

[1.1.2] Define Circulation and Security Connections

Type	Task
Name	Define Circulation and Security Connections
Documentation	The architects will then define connections in the BIM between spaces as required for circulation and security analysis.

[1.1.3] Develop and Check the BIM

Type	Task
Name	Develop and Check the BIM
Documentation	Finally, the architects will complete their own internal ‘check’ of the BIM for

	conformance to the owner's BIM Guide and circulation/security requirements. Where conformance is not confirmed, the architects will make changes as needed to achieve conformance. Additionally, feedback from the owner's independent analysis and verification of conformance to the requirements in these guides will be addressed in this task.

[1.2.1] Initiate Design Validation

Type	Task
Name	Initiate Design Validation
Documentation	After receiving the BIM from the architect, the owner's design management team will initiate design analysis in order to ensure an optimal design – in this case, from the human circulation and security points of view. This analysis may be done in-house, by the owner's design analysis specialists, or it may be contracted out to a consultant.

[1.2.2] Pre-Check BIM

Type	Task
Name	Pre-Check BIM
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 BIM Exchange (see ER_Circulation_&_Security_Exchange_Requirements. Exceptions will be reported in a standard format.

[1.2.3] Report Pre-Checking Results

Type	Task
Name	Report Pre-Checking Results
Documentation	After ensuring that the pre-checking criteria have been checked (i.e. space names, door/stair information sufficiency), the owner's desgn analysis specialist or consultant will return the pre-checking results to the owner's design management team.

[1.2.4] Review and Comment on Results

Type	Task
Name	Review and Comment on Results
Documentation	The owner's design management team will review the pre-checking results and document issues for discussion with the architects.

[1.2.5] Check BIM for Circulation/Security Conformance

Type	Task
Name	Check BIM for Circulation/Security Conformance
Documentation	After all of the pre-checking criteria met, the owner's design analysis specialist or consultant will check the BIM for conformance to circulation and security requirements. Results will be reported in a standard format for interpretation by the owner's design management team.

[1.2.6] Review Circulation/Security Results

Type	Task
Name	Review Circulation/Security Results
Documentation	The owner's design management team will review the circulation & security checking results, decide which of the reported issues must be resolved, and document these for discussion with the architects.

[1.2.7] Report Circulation/Security Issues to be Resolved

Type	Task
Name	Report Circulation/Security Issues to be Resolved
Documentation	Design issues are then discussed with the architects for resolution in the next design iteration.

Specification of Data Objects

Model Validation Issues

Type	Data Object
Name	Model Validation Issues
Documentation	This is a high level abstraction for the more detailed design feedback objects shown in the sub-processes for ‘Create the Concept Design BIM’ and ‘Verify BIM Circulation/Security’.

Design Management Acceptance & Comments

Type	Data Object
Name	Design Management Acceptance & Comments
Documentation	This is the document which accepts the concept design on behalf of the owner's design management team, but this acceptance may be contingent upon some further changes or optimization.

Concept Checklist

Type	Data Object
Name	Concept Checklist
Documentation	This is a standard checklist, as defined in the owner's design submission requirements (P-100 for GSA), which the architect must submit to the buildling owner after the design has been approved by the design management team.

Rejection & Comments

Type	Data Object
Name	Rejection & Comments
Documentation	This document notifies the desgners that the concept design presented has been rejected -- and enumerates the issues/comments associated with that rejection.

Acceptance & Comments

Type	Data Object
Name	Acceptance & Comments
Documentation	This document notifies the designers that the concept design presented has been accepted; although this acceptance may be contingent upon some further changes or optimization.

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 (includes all data required in the Exchange

	Requirements for this exchange) to ensure that the circulation and security checking results will be valid.

Pre-Checking Issues to be Resolve

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

Circulation/Security Analysis Results

Type	Data Object
Name	Circulation/Security Analysis Results
Documentation	This documents results from checking the design model for conformance to owner's circulation and security requirements for the building.

Circulation/Security Issues to Resolve

Type	Data Object
Name	Circulation/Security Issues to Resolve
Documentation	After reviewing the circulation and security checking results, the owner's design management team will document the issues the architect must resolve before the design will be approved.

Exchange Requirement Data Objects

ER_Circulation_&_Security_(concept)

Type	Data Object
Name	ER_Circulation_&_Security_(concept)
Documentation	Building information model resulting from the concept design process that includes all of the following object types: Project/Building Information • Project • Building • Building Story Spatial Information • Space • Space Boundary • Zones Building Element Information • Door

	• Openings • Ramp & Ramp Flight • Stair & Stair Flight • Wall • Windows

Specification of Coordination Points & Decision Gateways

Design Management's Requirements Satisfied?

Type	Decision Gateway
Name	Design Management's Requirements Satisfied?
Documentation	The purpose here is for the architects and the owner's design management team to agree that all concept design requirements and submission requirements defined by the owner have been met.

Accepted by Property Management?

Type	Decision Gateway
Name	Accepted by Property Management?
Documentation	The Concept design must be approved by the owner's property management group before the project can proceed to Design Development.

Accepted by Building Occupants?

Type	Decision Gateway
Name	Accepted by Building Occupants?
Documentation	The Concept design must be approved by significant occupant organizations (varies by building) before the project can proceed to Design Development.

Preperty Management or Occupant Contingencies?

Type	Decision Gateway
Name	Property Management or Occupant Contingencies?
Documentation	Before Final Concept design documents can be considered complete, designers must address any contingencies put on approvals by the owner's property management group and/or the significant occupant organizations invited to the design review.

Building Owner Contingencies?

Type	Decision Gateway
Name	Property Management or Occupant Contingencies?
Documentation	Before Final Concept design documents can be considered complete, designers must address any contingencies put on approval by the building owner.

Satisfies Program Requirements?

Type	Decision Gateway
Name	Satisfies Program Requirements?
Documentation	After designers define groups of spaces and subspaces in the BIM as required for circulation and security analysis, a review must be done to ensure that the design still satisfies the spatial program requirements. This could be done through an informal review or a formal spatial program validation (see 'Owner Spatial Program Validation'), but in the end, the designer is responsible for ensuring conformance to the spatial program AND circulation/security

	requirements.

Satisfies Design Guide?

Type	Decision Gateway
Name	Satisfies Design Guide?
Documentation	After designers define connections between spaces in the BIM (as required for circulation and security analysis), an internal (design office) review should be done to ensure that the design satisfies all requirements of and building design guide provided by the owner for this building type. Examples include the GSA's US Courts Design Guide and the US State Departments Embassy Design Guide.

Satisfies BIM Guide?

Type	Decision Gateway
Name	Satisfies BIM Guide?
Documentation	After designers have completed their own internal checking of BIM for conformance to both the design program and any applicable design guide, they will complete their internal review to confirm compliance with the owner's applicable BIM Guide (e.g. the GSA's Series 06 BIM Guide for Circulation and Security Analysis. This should be done before submission of the design BIM to the owner for their independent circulation and security analysis.

Space Names Pass?

Type	Decision Gateway
Name	Space Names Pass
Documentation	Are all space names from the approved space names list required by the owner?

Doors, Stairs, Ramps Pass?

Type	Decision Gateway
Name	Doors, Stairs, Ramps Pass?
Documentation	Do all of the doors, stairs, and ramps meet requirements for circulation & security analysis?

Space Security Level Assignment Passes?

Type	Decision Gateway
Name	Space Security Level Assignment Passes?
Documentation	Do all space security level assignments pass requirements for circulation & security analysis?

Real Design Issues?

Type	Decision Gateway
Name	Real Design Issues?
Documentation	Are one or more of the issues reported by circulation/security analysis true design issues or false negatives?