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BIM for the ASSET Lifespan
Consider This:

- 92% believe it will be ‘de facto’ design standard in 3 years

- Only 25% of US owners have ‘very high involvement’ in BIM

- 75% of these stated that the AEC team used BIM when it wasn’t required by the owner

- UK is a leader in BIM with over 98% of owners having some involvement in BIM compared to 59% in the US

(Sources: NBS National BIM survey, 2015; McGraw Hill Construction, 2014)
SF BIM Program Timeline

• 2013: Planning for BIM
  – Market and industry survey
  – Use Case Analysis, SI staff and AEs
  – In-house BIM Technician

• 2014: BIM Pilots, Standards and Wiki Sites
  – Identified major upcoming design project
  – Developed draft language for SOW
  – Create BIM templates & Guidance
  – BIM Viewer and Model Checker recommendations
  – Develop internal BIM Wiki sites using MS Sharepoint

• 2014 – 2015:
  – Updated AE Center, public facing website
  – Refine BIM guidelines and design deliverable requirements through pilot project feedback
  – Implement BIM Viewer
  – Focus on Asset replacement workflows

• 2015 – 2016:
  • Developing AE Scope of work language
  • Developing Div 1000 construction specification language
  • Implement Model Checker
Establishing a BIM Foundation
SF BIM: Begin with the End in Mind

**Required Outcomes of using BIM**
- BIM usefulness required long after design and construction
- Asset management
- Portable for maintenance and operations personnel
- Accessible at multiple user levels across the institution

**During Design**
- Incorporate specific BIM design review capabilities
- Address multiple user capabilities: equipment & skills
- Develop standards for AE to follow

**During Construction**
- Define ‘As-Built BIM’
- Asset management
- Integration with Computerized Facility Maintenance System (Tririga Facility center)
Use Cases

Capital Program
  • Introduce use of 2D and 3D (low detail) to visualize location and extent of capital project areas

Design
  • More efficient access to accurate as-builts, shop drawings

Facilities Management
  • Support *preventative maintenance* through visualization of work tasks and asset location

Energy Management
  • Introduce geospatial component to existing power and water usage analysis

Smithsonian Gardens
  • Support geospatial analysis of exterior spaces

Historic Preservation
  • Identify rooms and spaces of historic importance
SI BIM Templates

- Provides a standardized Revit work environment to foster consistency in BIM development for both AEC project teams and internal SI initiatives
- Support SI spatial data management by providing SI data fields and geometry for rooms and floors, and standard attributes
- Standardize model development, BIM guidelines and CAD exports with National CAD Standard and SI document conventions, standardize views and naming conventions
- Provide SI-specific asset data parameters and schedule views for O&M
Revit Template User’s Guide

- Guidance for AEC project teams (primarily)
- Develop consistent model development across projects (and in-house)
- Not a tutorial – expect reader to know Revit
- Walks the user through Smithsonian minimum standards
- Based on National CAD Standard (v5)
- Customized title blocks, syntax for SI
- Identifies “Best Practices” (items not required)
FM BIM: Data Development

IWMS/CAFM

- Provide critical asset data, “ready” for Tririga Facility Center Upload
- Focus: less data and higher quality

GIS

- BIM exchanges CAD geometry + data attributes for rooms and spaces

SI Revit templates organize data to be developed in the project BIM, and delivered to SI at project turnover, exported to GIS and IWMS
Guidance for BIM Deliverables

Level of Development Guide *(DRAFT)*

- SI has developed a guidance framework for the level development required for BIM deliverables.

- BIM LOD will be identified early in the project (passed on to the team to detail in the project BIM Pxp).

- The **Scope of Work** of the project ultimately defines the BIM requirements.
BIM Project Execution Plan (PxP)

- A living document populated and updated by the project team
- Clarifies and maintains the project BIM development process for the owner, and the team
- Provides a vetting process for any changes made in the BIM development process
Supporting SI BIM Project Reviews

BIM Viewers

• Provides a means to review developing project models by SI users who are not Revit experts
• Offers versatile methods for viewing BIM: PDFs, mobile devices

Model Checkers

• Provides an automated means to check a BIM against a customized rule set
• Useful by SI and by their project consultants
How will it all work?

BIM data improvement over time
How will it all work?

BIM data improvement over time
How will it all work?

BIM data improvement over time
How will it all work?

BIM data improvement over time
Building Information Management Portal

**BIM “Wiki”**

**Develop a go-to source for information about SI facilities**
- Highly visual
- Collaborative web-based environment
- Leveraging SI’s SharePoint expertise

**Provide links and information from existing SI systems**
- No new data, just a clearinghouse for existing systems
- SI campus specific
- Simplifies access to critical facilities information
BIM “Wiki” – Home Page

Top level page – access to all building pages and support documentation

Access:

- Individual Building Wikis

Search

Access:

- Top level access to OFEO systems
3D Models

Direct Download of Autodesk Revit Files
SI Explorer – GIS Mapping & Viewer

Visualize 2D drawings and sites
A different way of getting to document locator
- - same data
Lessons Learned

Welcome to the Lessons Learned SharePoint Site!

To Begin using the Lessons Learned (LL) database:
1) Click the link under Document Locator Lessons Learned to activate the site.
2) Use the search box to search lessons learned related to a key word.
3) Or expand "Documents" to browse the library.

Projects Lessons Learned

LL Document Library

(modified by)
Other OFEO resources
NMAI – BIM Wiki Page
Building - Home Page (NMAI)

- National Museum of American Indian
- NMAI Floorplans
- Views of floor plans
- Building Photos
- Projects List (Excel download – live link to MOPS)
- NMAI IFT Calendar
- NMAI IFT contacts
- Document Locator: Building specific shortcuts to Projects, BIM, Architectural Master Records
- Reports
- Related links

SharePoint functions
Architectural Description

History:
The National Air and Space Museum, designed by Gyo Obata of Hellmuth, Obata and Obata, is a series of alternating masses of Tennessee marble and glass. Four sections are clad in this marble, chosen to complement the National Gallery of Art’s west building. The marble alternates between glass in three recessed exhibit bays; flooded with even, north-facing light, these glass areas feature heavy truss systems to support the planes suspended above. Window walls were placed at the end of each building to bring in large artifacts; the one at the west end is still active.

In 1988 the original architects designed a restaurant at the east end with panes of glass to echo the original building. The grounds of the museum contain several sculptures:
- Delta Solar by Alejandro Otero (1921-90).
- Continuum by Charles O. Perry (b.1920).
- Ad Astra by Richard Leopold (1915-2002).

The building features exhibition spaces that show airplanes suspended against the natural backdrop of the sky.

For more information, please contact Amy Beland, SALLAF@si.edu, Senior Historic Preservation Specialist

Building Facts

Location:
600 Independence Ave SW
Washington, DC 20560
Coordinates: 38°53′17″N 77°01′12″W / 38.8889°N 77.0203°W

Building Measurements:
- Gross Exterior: 247,677 sq ft (22,917 m²)
- Gross Interior: 247,677 sq ft (22,917 m²)
- Basements: 599,068 sq ft (55,723 m²)

Construction History:
Completed in 1976
Architect: Gyo Obata
General contractors: Gilbane Building Company

Historic Image Gallery
Future Plans

• More templates – life safety and security templates
• BIM Viewer – easy to use -- to facilitate early project visualization by clients and reviewers
• Model Checker to assist both contractors and SI staff in verifying data accuracy – especially in complex deliverables.
Questions

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