

# *"Preserving Brand-New Buildings"*

## **FACADE**

---

### Future-proofing Architectural Computer-Aided Design

William Reilly - Technical Projects Manager, Tech. R&D, MIT Libraries

[http://facade.mit.edu/presentations/REILLY\\_DLFFall2008/MIT\\_FACADE.ppt.htm](http://facade.mit.edu/presentations/REILLY_DLFFall2008/MIT_FACADE.ppt.htm)

- **MacKenzie Smith**

Associate Director for Technology, MIT Libraries  
Principal Investigator, FACADE Project

*In conjunction with:*

- **Ann Whiteside**

Head, Rotch Library of Art and Architecture  
MIT Libraries



SA+P

Department of Architecture

# Contents of Talk

---

- Project Scope
  - Problem, Goals
  - Audiences, Use Cases
  - Datasets We're Working With
- 3D CAD
  - Data Formats; Standards; CAD Tools
  - Preservation Strategies
- Ontology
  - Project Information Model, Workflow
  - Metadata, "Curators Workbench"
  - DSpace Archive
- User Interface

# Project Scope

# Problem, Goals

---

- Current architectural data is being lost.
  - Firms, libraries, museums, archives face challenge
- Develop Long-Term Archiving strategy for digital architecture data
  - Especially 3D CAD models
- Demonstrate in DSpace digital archive
  - Using SIMILE's Longwell faceted browser

# Audiences

---

- Practice (Architects, Designers, Engineers)
- Research (Historians, Scholars)
- Teaching (Instructors, Students)
- General (Public, Casual)

# Use Cases

Blue signifies *future* use cases

- Practice (Architects, Designers, Engineers)
  - (Internal) Perform current work; re-use recent work
  - (External) Data interoperation with partner firms
  - ("Read Only") Consult own work
- Research (Historians, Scholars)
  - (Design) Study history of design, "design intent"
  - (Business) Study process, techniques, economics
- Teaching (Instructors, Students)
  - (Design) Study history of design, "design intent"
  - (Practice) Study models to learn, extend CAD
  - (Computation) Capabilities, constraints, on design
- General (Public, Casual, Educational)
  - Study architectural history; view buildings, designs

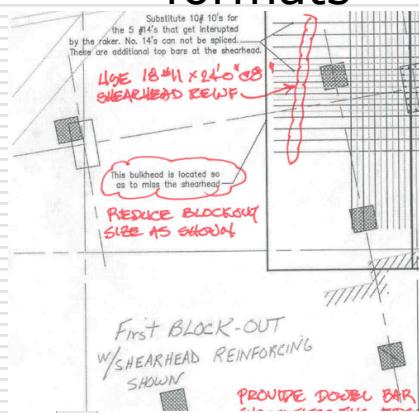
# Datasets We're Working With

- Frank Gehry, MIT Stata Center
  - Cambridge, Mass. (2004)
  - [CATIA](#)
  
- Moshe Safdie, U.S. Institute of Peace
  - Washington, D.C. (2009)
  - [Revit](#)
  
- Thom Mayne, Caltrans
  - Los Angeles, Calif. (2004)
  - [Microstation](#)



# “Meta” Data

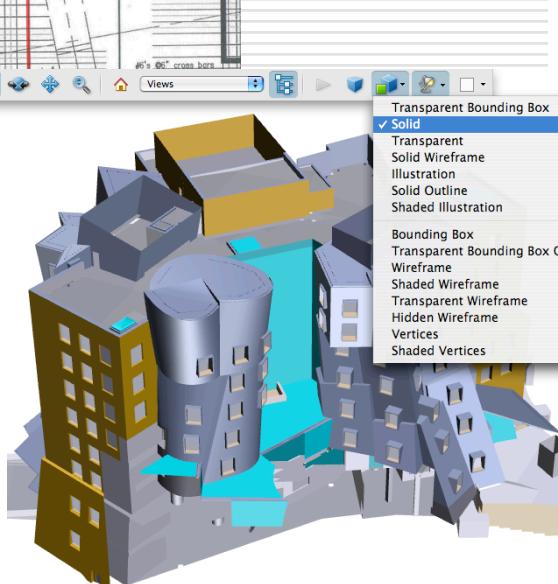
- 10Ks of files
- File system
- 10s of Gbs
- Almost no metadata
- 100+ file formats
- Collab. systems



```

70 Electronic Transmittal-
71 Volume in drive F is acad.
72 Volume Serial Number is 01AF-0203
73 Directory of F:\98001\transfer\out\01060401-jama...
74 06/04/01 09:29a <DIR>
75 06/04/01 09:27a <DIR>
76 06/04/01 10:00a 883 etrnsmt.txt
77 06/01/01 07:20p 82,433 s2_3-1-2b.dwg
78 06/01/01 07:19p 100,329 s2_3-1-2c.dwg
79 06/01/01 09:51p 341,764 s4_13.dwg
80 06/01/01 07:11p 339,014 x_zbot.dwg
81 06/01/01 07:16p 63,655 x_2t_pts.dwg
82 06/01/01 07:11p 36,641 x8998.dwg
83 06/01/01 07:11p 29,590 xfp_m1.dwg
84 06/01/01 07:17p 520,153 xfp_c02.dwg
85 06/01/01 07:12p 152,113 xfp_g02.dwg
86 06/01/01 07:16p 974,465 xsp_02.dwg
87 13 File(s) 2,641,940 bytes
88 524,288 bytes free

```



## REQUEST FOR INFORMATION

REF CODE:  
This RFI form is prepared by the Contracting party to request information from the architect or engineer, or to notify the architect of certain conditions.

AREA REF:  
RFI #: 7 REV #:  
SUBS RFI #:  
SUB: \_\_\_\_\_  
OR: Leblanc, Claude

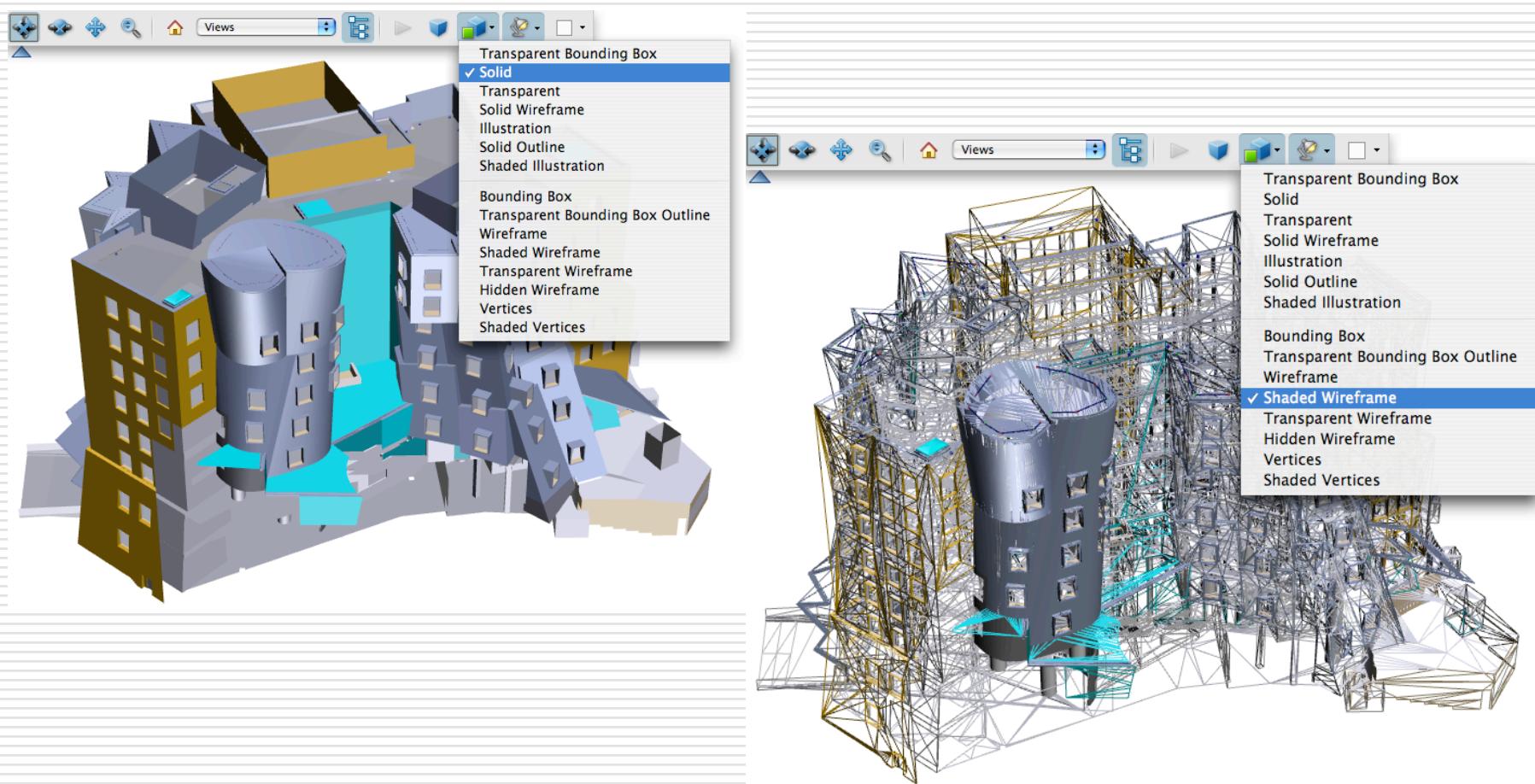
uest  
Provide a response to the following questions:  
CONFIRMATION needed by \_\_\_\_\_

current\_master\_model\_list.xls

	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X
<b>12 ISSUE DATES</b>																				
<b>S.I. 201</b>	<b>41.12.0</b>																			
S.I. 186	9.17.02																			
S.I. 176	9.17.02																			
S.I. 175	8.13.02																			
S.I. 122																				
S.I. 69 & issue #10																				
Appendendum 1 3.16.02																				
Structure Refresh																				
3.15.02																				
Issue #10	01.21.02																			
S.I. 41	01.21.02																			
PR 12	12.19.01																			
S.I. 41	12.05.01																			
S.I. 37	10.25.01																			
S.I. 24	10.18.01																			
Appendendum #3	(To issue #8) 08.27.01																			
S.I. 18	01.8.21																			
Appendendum #2	(To issue #8) 07.30.01																			
Appendendum #1	(To issue #8) 07.02.01																			
Issue 8 Shell & Core (Part 4)	Construction & Permit Set 04-30-01																			
Issue #8 Shell & Core (Part 4)	For construction Set 04-30-01																			
ISSUE#6.1 Construction Set 03-05-01	ISSUE#6.2 Construction Set 03-05-01																			
ISSUE#6.3 Construction Set 03-05-01	ISSUE#6.4 Construction Set 03-05-01																			

# 3D CAD

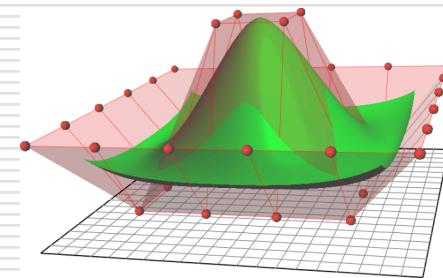
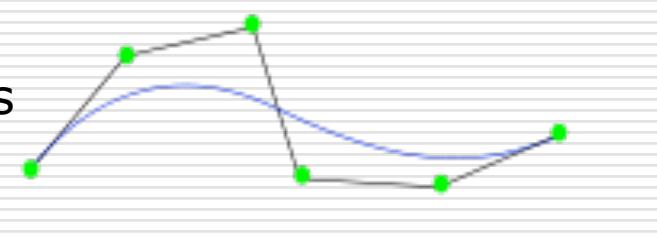
# 3D PDF: Quick Look



# Terminology: Geometry

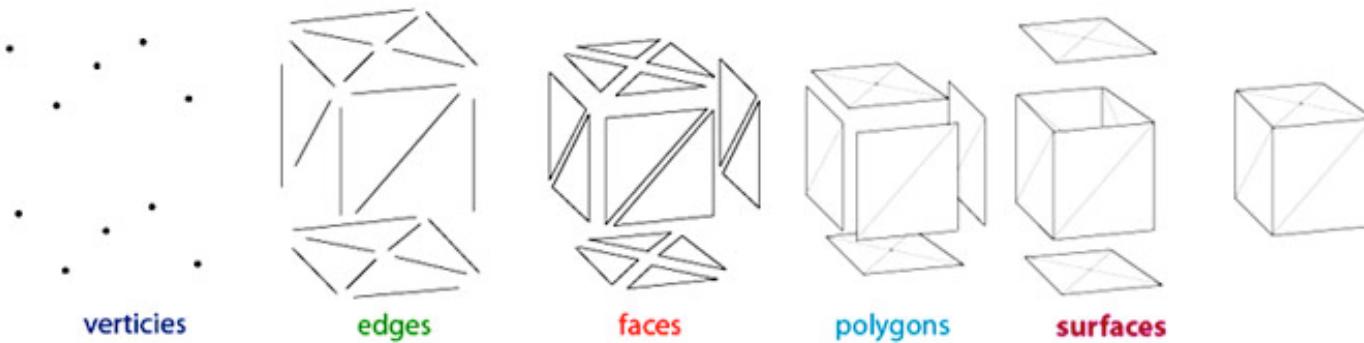
□ **NURBS** “Non-Uniform Rational Basis Splines”

Freeform curves, surfaces. Weighted points



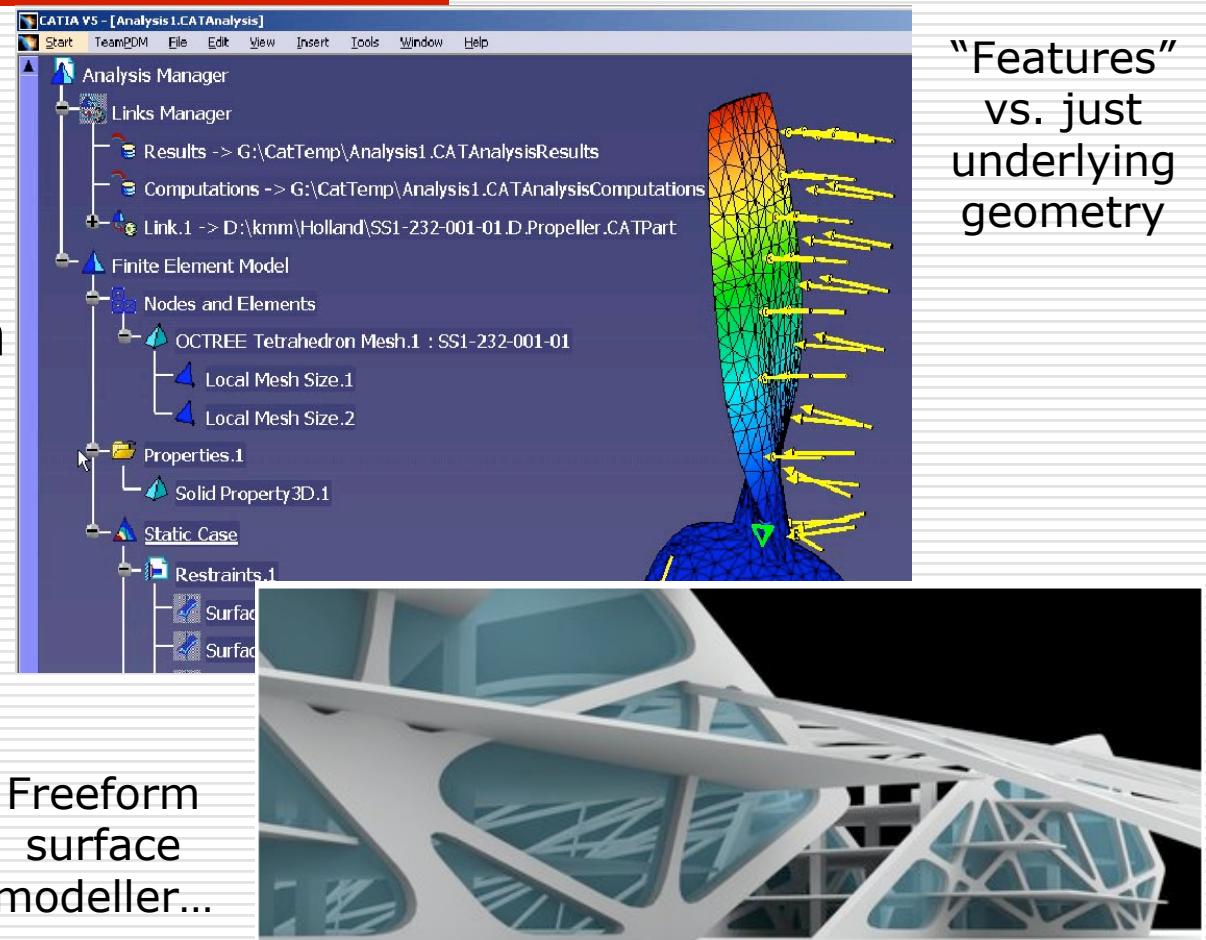
□ **Mesh** Collection of vertices, edges and faces

<http://en.wikipedia.org/wiki/Nurbs>  
[http://en.wikipedia.org/wiki/Polygon\\_mesh](http://en.wikipedia.org/wiki/Polygon_mesh)



# Terminology: Parametric

- Parametric
  - CATIA
  - Revit
  - Microstation
  
- Non-Parametric
  - Rhino
  - Maya



# 3D CAD Systems in Architecture

---

- Dassault Systemes' **CATIA** (Stata Center)
- Autodesk's **Revit** (U.S. Inst. Peace)
- Bentley's **MicroStation** (Caltrans)
  
- Vary in **parametric** modeling v. inert geometry support
- Vary in complex (**NURBS**) v. simple geometry (**Mesh**) support

***How CAD products encode geometric and parametric models is unique and proprietary***

- Project deliverable: format representation information

# Data Exchange Formats

- Open, Standards-Based
  - Model Information
    - STEP (ISO 10303)**
    - IFC (ISO 16739)**
  - Geometry Information
    - IGES**
    - VRML
    - STL
- Display formats (generally available)
  - 3D PDF**
  - Flash

**Blue** signifies formats under study

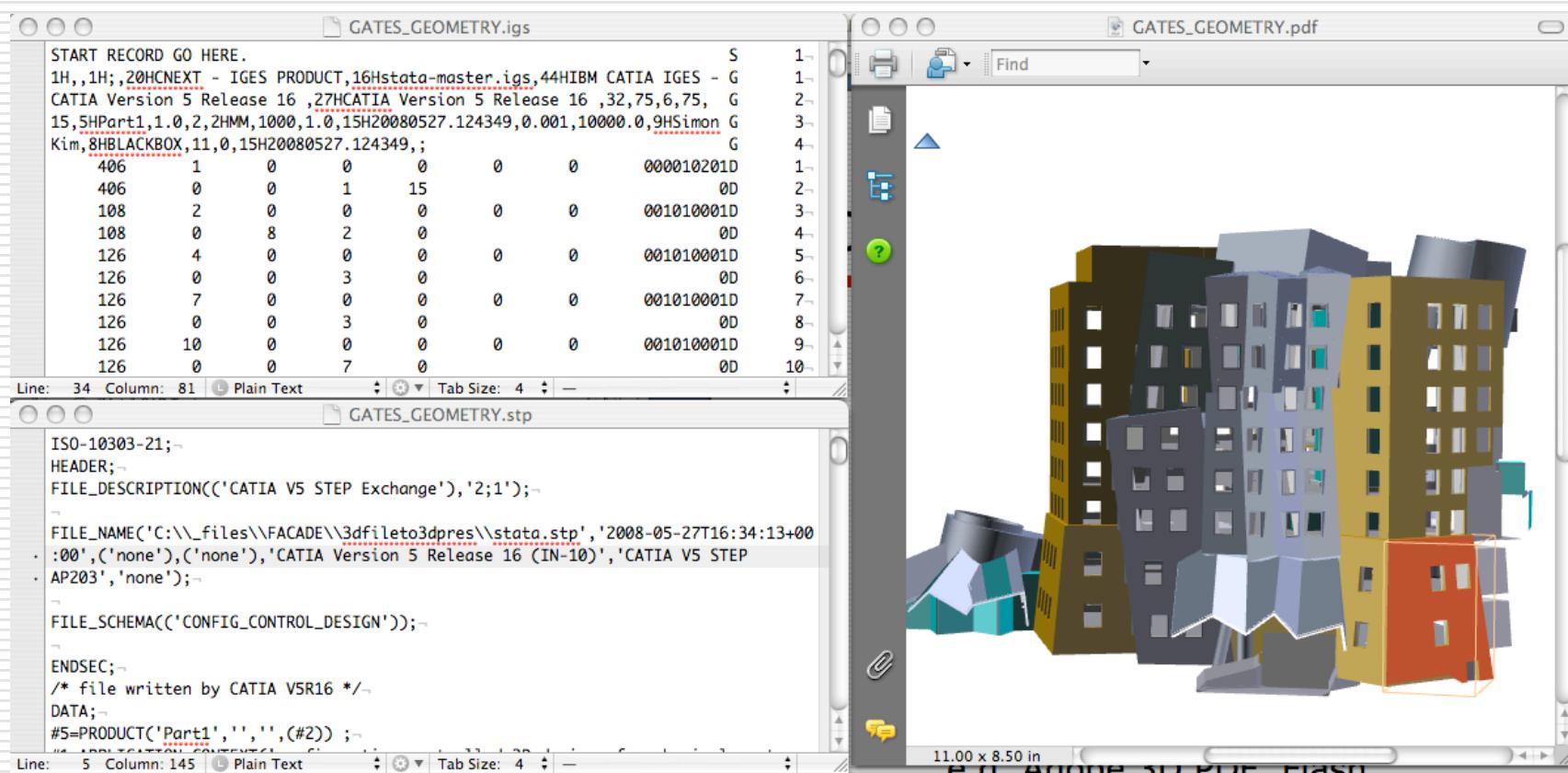
- Various Industry Data Exchange Solutions*
  - Navisworks
  - Collada
  - DXF / DWF
  - DWG / DGN
  - Viewers
  - ...

# 3D CAD Preservation

---

- Original as Received:
  - 0. Save ***original*** model and software
    - e.g. CATIA, Revit, DWG
  
- Derivatives:
  - 1. Export to ***rich*** standards-based 3D CAD model format
    - IFC best ("Coordination" Model View)
    - Otherwise STEP (AP203 and other parts)
  
  - 2. Export to ***desiccated*** standards-based shape file format for pure geometry
    - e.g. IGES, VRML
  
  - 3. Export to a Web-based ***display*** format
    - e.g. Adobe 3D PDF, Flash

# 3 Derivative Formats: IGES, STEP, 3D-PDF



# 3D Model Interactivity

---

If CAD software only exports *inert geometry*,  
the original parametric model is lost – i.e.  
**the preservable artifact is not authentic**

*Does that matter?* probably not...

- Doesn't fully represent design intent
- Can recreate a parametric model later
- Can manipulate the model view (e.g. 3D PDF)

# Preserving Other Data

---

- Adopt existing best practices
  - 2D drawings, other documents in **PDF/A**
  - Images in **TIFF**
  - Video in **MPEG-4**
  - **ASCII (mbox)** for email archives
  
- But what about project management system data??
  - e.g. Buzzsaw, Constructware, Newforma

# Ontology

# PIM - Project Information Model

---

Entire architecture/design ***project***

- Initial sketches
- 3D CAD models, 2D CAD drawings
- Formal outputs (e.g. client presentations)
- Correspondence, RFIs, ASIs, etc.
- Contracts and surveys
- Images, video, other media files
- Every client issuance

Linked together in a ***relationship map***

## F.A.C.A.D.E.

## Project Information Model / ONTOLOGIES

### the Project Information Model

*sort and classify all the available data - 2d, 3d and construction administration (RFI's, change orders) - and map their relations. Model this as an ontology that can be called in an environment such as DSpace or the semantic web.*

*this formalization of building components is required so that they can be linked/represented in a predictable structure. In this manner, a reasoning methodology can be applied to other works.*



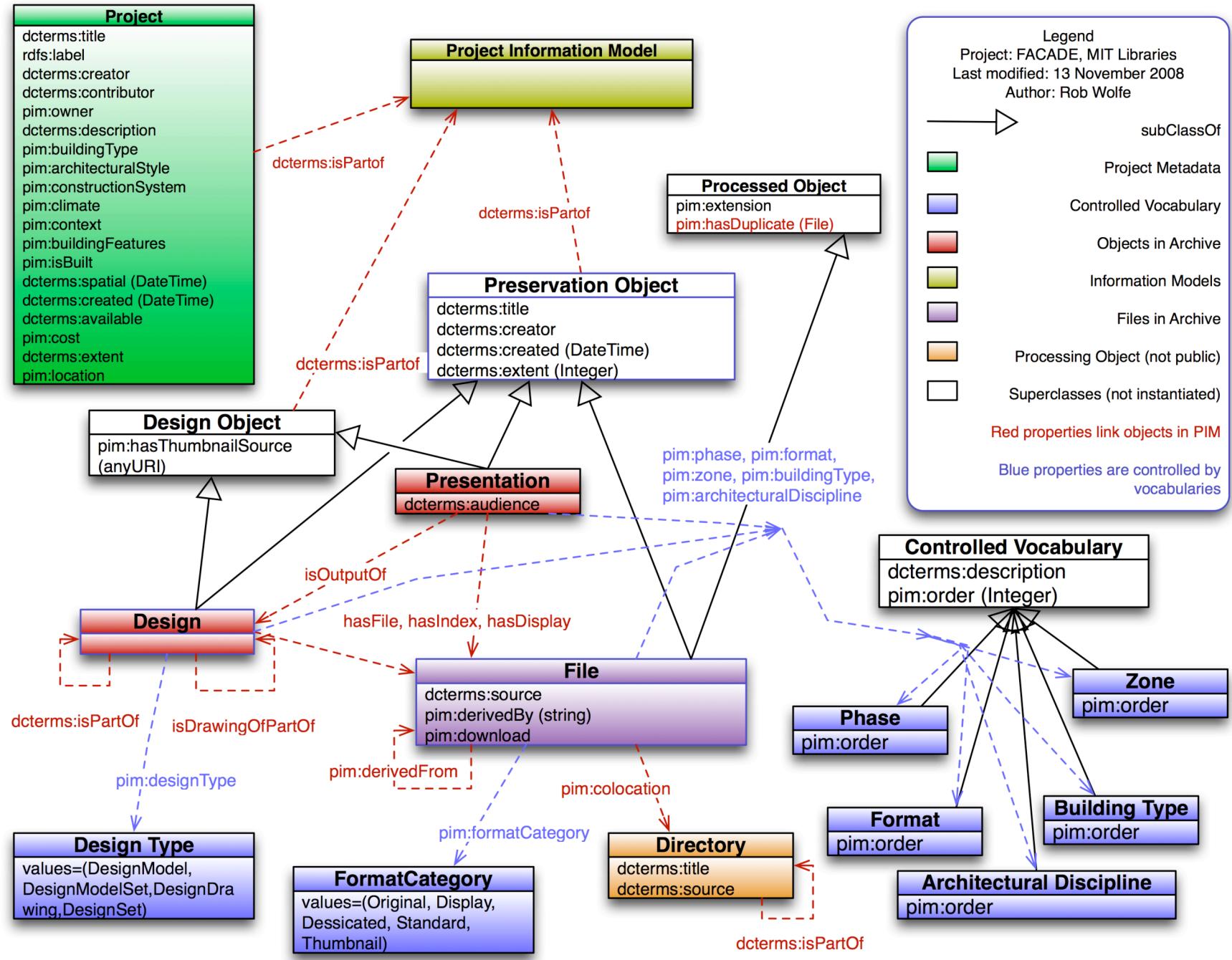
Moshe Safdie Associates, Institute of Peace



Gehry Partners, Stata Center

systematics / hierarchies				ex. 1 (incomplete)	PIM representations
<project>					<p>&lt;Bldg&gt; &lt;Issue&gt; &lt;3D&gt; &lt;2D&gt; &lt;Email&gt; &lt;photos&gt;</p> <p>part of read @ 3D obj of relates to email</p>
<issue>					
<3D>					
<revisions>					
<2D>					
<sheets>					
<consultant coordination>					
Bidding					
<small>* F. Gehry establishes and maintains his own contract separate from Gehry Partners</small>					

workflow				organization modules
hierarchies	example	ontology	mapping	
directories	architectural _3d, 2d, renderings) consultants _struct, mech, etc) minutes	_element _instance _class _attributes _relations _events	_office building _admin suite _senior, executive, support,... _archl, struct., mech, energy efficiency,... _issue sets _evaluation (client review, code compliance cost analysis)	PIM Project Information Model
files	3d model _exterior cladding			
data	reference files _steel profiles _assemblies _mat'l specs _cost spreadsheet			



# Properties on Objects [1 of 2]

---

## □ Every *File* gets five properties

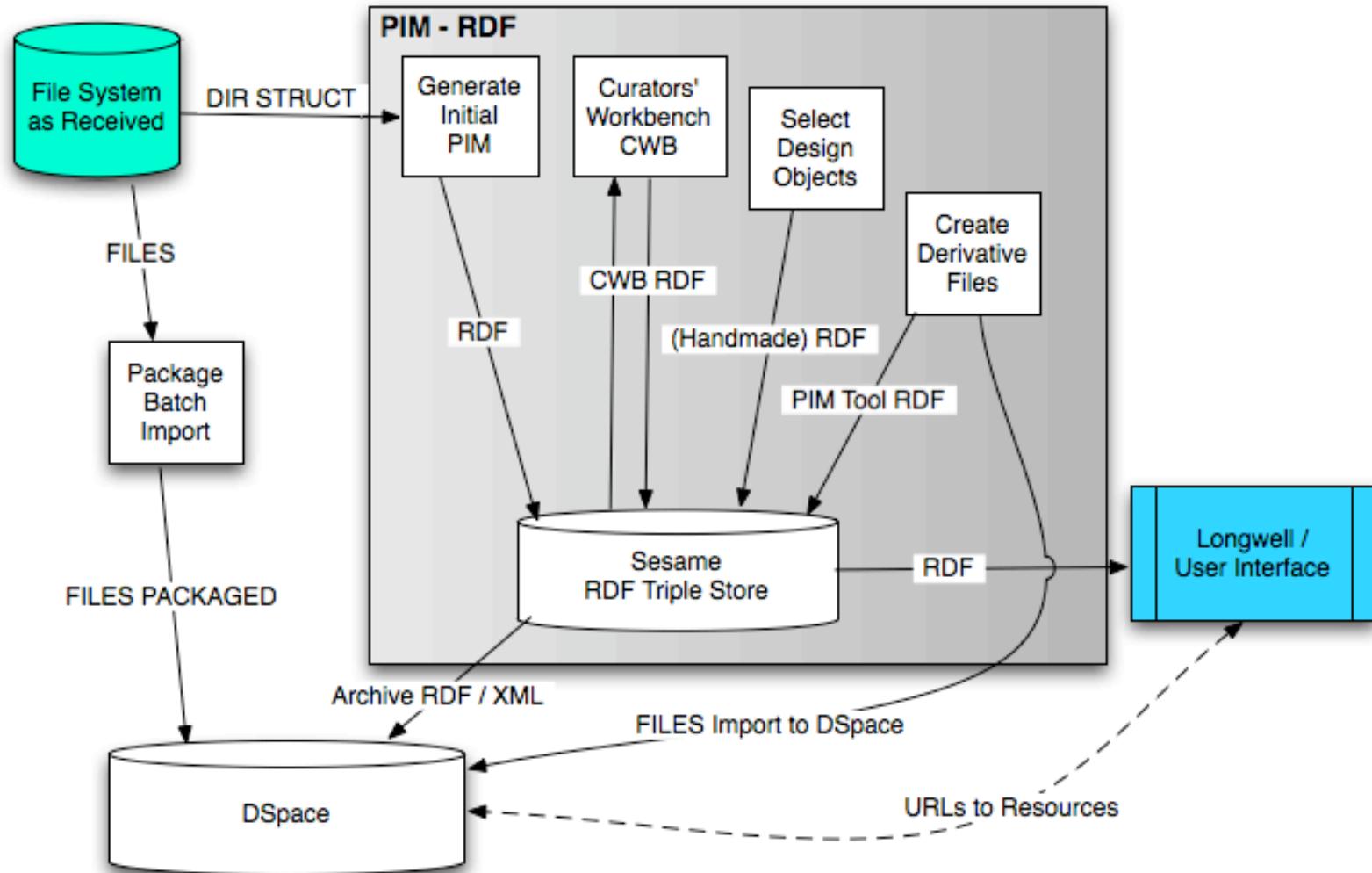
- Project Phase
  - e.g. concept, design, construction, etc.
- Building Zone/System
  - e.g. Stata Center, Gates Tower, 4<sup>th</sup> floor
- Architectural Discipline
  - e.g. architectural, electrical, mechanical, structural
- Document Type
  - e.g. presentation, drawing, communication
- File Format
  - e.g. CATIA, AutoCAD, Word, PDF

# Properties on Objects [2 of 2]

---

- *Important files* further tagged
  - Hand-selected “Design Objects”
    - Client presentations, etc.
    - 3D models and 2D drawing sets
  - Privileged access in user interface

## Preliminary Workflow



# Curators' Workbench (CWB)

FACADE CWB 0.2   Project: Full USIP   User: wreilly   Save! Revert!   Download PIM as: N3   w/Prov.

Project Files & Dirs   Controlled Vocabularies

Select Directory: all + all -

▼ usip (3 files)
 

- Archive
- Atrium (13 files)
- Construction Documents (1 files)
- ASK-Sketches (586 files)
- Drawings (1 files)
  - 100% CD
  - 80% CD (1 files)
    - 80% Frozen Backgrounds
  - Architecture
  - AudioVisual
  - Civil
    - Cad (12 files)
      - Pdf (12 files)
    - Electrical
    - FS\_Food Service
    - Fire Protection

On Selected Files: Set Format | Set Document Type | Set Zone | Set Phase

-status messages--

Select Files (showing 12 of 12): Select All | Clear | Invert Selection | Fill

	name	created	size	Format	Document Type	Zone	Phase	Discipline
<input type="checkbox"/>	C00 00 excon.pdf	2007/11/07	2 Mb	Portable..	Drawing	USIP	Construction..Civil	
<input type="checkbox"/>	C10 00 demo.pdf	2007/11/07	2 Mb	Portable..	Drawing	USIP	Construction..Civil	
<input type="checkbox"/>	C20 00 sec.pdf	2007/11/07	2 Mb	Portable..	Drawing	USIP	Construction..Civil	
<input type="checkbox"/>	C30 00 site.pdf	2007/11/07	2 Mb	Portable..	Drawing	USIP	Construction..Civil	
<input type="checkbox"/>	C40 00 grading.pdf	2007/11/07	2 Mb	Portable..	Drawing	USIP	Construction..Civil	
<input type="checkbox"/>	C50 00 utility.pdf	2007/11/07	2 Mb	Portable..	Drawing	USIP	Construction..Civil	
<input type="checkbox"/>	C60.00 dsite.pdf	2007/11/07	2 Mb	Portable..	Drawing	USIP	Construction..Civil	
<input type="checkbox"/>	C60.01 dsite.pdf	2007/11/07	2 Mb	Portable..	Drawing	USIP	Construction..Civil	
<input type="checkbox"/>	C70 00 dsec.pdf	2007/11/07	2 Mb	Portable..	Drawing	USIP	Construction..Civil	
<input type="checkbox"/>	C80 00 dswm.pdf	2007/11/07	2 Mb	Portable..	Drawing	USIP	Construction..Civil	

Preview of C40 00 grading.pdf

▼ Drawings (1 files)
 

- 100% CD
- 80% CD (1 files)
  - C30 00 site.pdf
  - C40 00 grading.pdf

Setting Document Type

Purpose or general nature of item's contents.

- ~~~DELETE VALUE~~~
- Agreement
- Audio/Video
- Communication
- Drawing
- Index
- Log
- Model

Accept | Cancel

On Selected Files: Set Format | Set Document Type | Set Zone | Set Phase | Set Discipline

- PIM Tools pre-process initial RDF
- File object properties assigned using CWB

# DSpace Archive

---

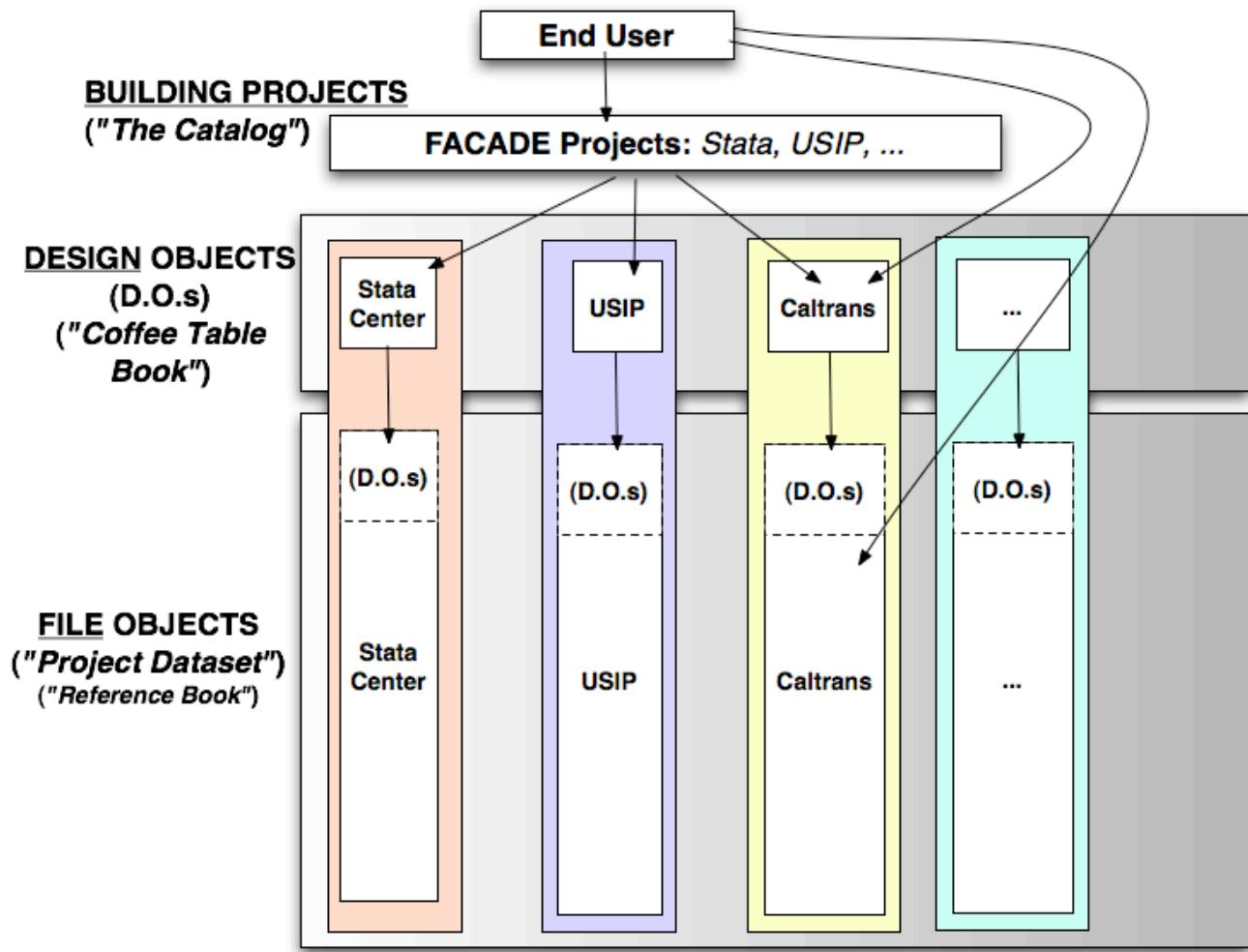
- Preservation and dissemination
- UI external to DSpace
- Bulk ingest tools (e.g. Curators' Workbench; DSpace "packager" importer)
- Format registry integration for technical curation (GDFR, PRONOM, DSpace internal)



# User Interface

# End User Path to Datasets

- Different faceted browse tools
- Different scaling issues
- Different audience needs
- Some navigation, linking, indexing challenges



# What We're Going to See

---

- Exhibit for FACADE Projects
  - Exhibit / Longwell for "Coffee Table Book"
- Longwell for USIP "Reference Book"
  - Design Objects (slides)
    - Client Presentation (.PPT)
    - Design Model (.RVT), then Derivative File (.IFC)
    - Design Set, Index (.DOC), Drawing (.DWG)
  - Files (demo)
    - Arch. Discipline: Landscape
    - Phase: Schematic Design
    - Doc. Type: Sketch, Specification

# FACADE PROJECTS

**9 Projects**

[ITEMS](#) • [MAP](#) • [TIMELINE](#) • [CAROUSEL](#)

sorted by: [labels](#); then by... •  grouped as sorted



## CALTRANS DISTRICT 7 HEADQUARTERS

The new Caltrans District 7 Headquarters covers an entire city block downtown Los Angeles, directly opposite City Hall, in the midst of an increasingly revivified area. The building is the first to be commissioned under the State of California's Design Excellence Program. Roughly L-shaped in plan the building is composed of two main volumes. The 13 story larger volume stretches along the entire block between 1st and 2nd Streets and is set back 155 feet from Main Street. The smaller four story volume, extends from the larger volume to Main Street and occupies approximately one-half the length of the site, from mid-block to 2nd Street. Enrobed in a constantly changing mechanical skin that is

alternately open or closed depending on the conditions of outside temperature and sunlight, the building's fundamental property is that of transformation. At dusk the building is transparent, textured and windowed everywhere to invite the voyeur, while at mid-day it is buttoned up against the sun, appearing to be devoid of windows entirely.

### Building Light-reactive metal

Features: skin, skip-stop elevators, public exhibition gallery.

Cost: \$190,000,000

Type: Government Facility  
Building Administrative

Contributor: The Clark Construction Group, Inc.

Location Los Angeles, CA, U.S.A.

### Architectural Interactive

#### Style:

Alternative Caltrans names:

Extent 1,050,000 sq. ft.

Is built? true

Climate: Dry-Summer Subtropical Zone

### Creator: Morphosis

Construction Structural steel System: framing, steel moment frames, steel reinforced concrete slabs, perforated aluminium panels, and glass.

#### Context:

Start Date: 2002

End Date: 2004

## Search

### Is Built?

false (3)  
true (6)

### Extent

1,050,000 sq. ft. (1)  
111,000 square feet (1)  
150,000 square feet (1)  
18,000 sq. ft. (1)  
200,000 sq. ft. (1)  
258,333 sq. ft. (1)  
6,000,000 square feet (1)  
605,000 sq. ft. (1)  
720,000 sq. ft. (1)

### Creator

Gehry Partners, LLP (3)  
Morphosis (3)  
Moshe Safdie and Associates (3)

### Context

Government Campus (1)  
Small town (1)  
Urban (4)  
Urban University Campus (2)  
Urban Waterfront (1)

### Climate

Dry-Summer Subtropical Zone (2)  
Humid Continental (2)  
Humid Subtropical (2)  
Mediterranean (1)  
Oceanic (1)  
Tropical rainforest (1)

### Construction System

Custom perforated stainless steel panels attached to a tube steel frame bolted to concrete building frame. (1)  
Poured-in-place concrete, custom steel frame, hand-set brick, custom metal cladding, glass curtainwall and aluminum framing. (1)  
Skylit galleries over masonry and brick. (1)  
Stainless steel panels on steel frame (1)  
Steel and Concrete. (2)  
Steel, concrete and glass (1)  
Structural steel framing, steel moment frames, steel reinforced concrete slabs, perforated aluminium panels, and glass. (1)  
Titanium panels on steel frame. (1)

### Architectural Style

Deconstructivist (1)  
Expressionist (3)  
High Tech (1)  
Interactive (2)  
Neo-Vernacular (1)  
Postmodern (1)

### Contributor

Beacon Skanska Inc. (1)  
F.J. Sciame Construction Co., Inc (1)  
M.A. Mortenson (1)



## COOPER UNION NEW ACADEMIC BUILDING

Designed largely to house Cooper Union's Albert Nerken School of Engineering—one of the top three specialized engineering schools in the nation—the building will also provide institutional space for the Humanities and Social Sciences, the Irwin S. Chanin School of Architecture and the School of Art. The structure will function as both a space for study and

USIP Data {Unselect Drawing Sheet Master Index (100% DD) in facet Organized Via} - Mozilla Firefox

File Edit View History Bookmarks Tools Help

FACADE projects USIP Data {Unselect Drawing Sh...}

## USIP PROJECT FILES

CAROUSEL • ITEMS • **TIMELINE**

15 DesignObject filtered from 19 originally (Reset All Filters)

080%

Roof Plan (80% CD)

Roof Slab Edge Plan (80% CD)

USIP Roof Skin 3D Model (80% CD)

Roof and Facade Enclosure General Notes and Key Plan (80% CD)

Structural Framing Roof Plan (80% CD)

Mechanical Roof Level (80% CD)

Lightning Protection Roof (80% CD)

Electrical Power Roof Level (80% CD)

Structural Setting Out Roof Plan (80% CD)

Feb Mar Apr May Jun Jul Aug Sep Oct Nov

2006 2007 2008 2009

Timeline

DesignObject

References

Organized Via

Search

Type

ProjectObject (15)

References

United States Institute of Peace (15)

Organized Via

Drawing Sheet Master Index (100% DD) (2)

Drawing Sheet Master Index (80% CD) (1)

(others) (2)

File Type

Image (13)

Image, 3D (2)

File Format

Adobe PDF (14)

AutoCAD DWG (13)

AutoCAD DXF (15)

IFC (2)

Revit (2)

Creator

Moshe Safdie & Associates (15)

Phase

Construction Documents (9)

Design Development (6)

Number of Files

0 - 5 (15)

Contains Format Category

Geometry (15)

Original (15)

Presentation (15)

Standard (2)

Has File Derived By

AutoCAD (15)

Discipline

Architectural (5)

Electrical (4)

Mechanical (2)

Structural (4)

Recipient

(missing this field) (15)

Stata Data {select Carousel view} - Mozilla Firefox

File Edit View History Bookmarks Tools Help

FACADE projects Stata Data {select Carousel view}

## STATA PROJECT FILES

CAROUSEL · ITEMS · TIMELINE

### GATES GEOMETRY (3D MODEL)

Design Object  
3D Model of Gates Wing of Stata Center.

Discipline: Architectural  
Creator: Gehry Partners, LLP.  
Phase: Construction  
Date: 2002-12-03

Referenced by:

Organized Via:

4 file(s) ►

Search

Type

- Organization (2)
- ProjectObject (9)

References

- Gates Geometry 3D Model (1)
- Gates Pattern 3D Model (1)
- MIT Stata Center (7)
- RFI 1244 (1)
- (others) (4)

Organized Via

- Catia Master Model Issue List (2)
- Stata Center Drawing Sheet Master Index (2)
- (others) (7)

File Type

- Image (2)
- Image, 3D (2)
- Other (2)
- Presentation (2)
- Text (3)

File Format

- Adobe PDF (6)
- AutoCAD DWG (2)
- AutoCAD DXF (2)
- AVI Video (1)
- CATIA 4 Model (3)
- ICES (2)
- JPEG (1)
- Microsoft Excel (3)
- Microsoft Powerpoint (1)
- STEP (2)
- Text (1)

Creator

- Beacon Skanska (1)
- Bonet, Frances (1)
- Gehry Partners, LLP. (9)

Phase

- Construction (8)
- Design Development (1)
- Issue #8 Construction/Permit Set (2)

Number of Files

- 0 - 5 (10)
- 5 - 10 (1)

Contains Format Category

- (missing this field) (4)
- Geometry (4)
- Original (7)
- Presentation (4)
- Standard (2)

Has File Derived By

- (missing this field) (7)
- AutoCAD (2)
- CATIA v5 (2)

Discipline

- (missing this field) (7)
- Architectural (4)

Recipient

- (missing this field) (6)

# Longwell, "Starting Points"



FACADE

Future-proofing Architectural Computer-Aided DDesign // Data-set: CWB Complete (Oct 27)

Type here to search

## Phases

- [\(missing\)](#) 23119
- [Construction Documents](#) 19142
- [Design Development](#) 6968
- [Schematic Design](#) 1183
- [Unknown](#) 512
- [Does Not Apply](#) 1

## Document Types

- [\(missing\)](#) 23144
- [Drawing](#) 22539
- [Specification](#) 1296
- [Sketch](#) 775
- [Photograph](#) 684
- [Model](#) 649
- [Rendering](#) 541
- [Presentation](#) 326
- [Other](#) 259
- [Study](#) 258
- [Index](#) 178
- [Product Brochure](#) 116
- [Work File](#) 42
- [Communication](#) 40
- [Audio/Video](#) 27
- [Project Book](#) 22
- [Unknown](#) 18

## Zones

- [USIP](#) 23758
- [\(missing\)](#) 23110
- [Roof](#) 3599
- [Navy Buildings](#) 375
- [Unknown](#) 82
- [Does Not Apply](#) 1

## File Formats

- [Portable Document Format](#) 13091
- [AutoCAD Drawing](#) 11339
- [JPEG File Interchange Format](#) 5554
- [\(missing\)](#) 3559
- [Revit artifact](#) 3211
- [OLE2 Compound Document Format](#) 3014
- [ASCII Text](#) 2718
- [ESRI MapInfo Data File](#) 1955
- [Portable Document Format - Archival](#) 1420
- [Exchangeable Image File Format \(Compressed\)](#) 1010
- [CATIA 5 model](#) 622
- [ZIP Format](#) 491
- [Unknown](#) 423
- [Rhinoceros/OpenNURBS 3D model](#) 418
- [Adobe Photoshop](#) 209
- [Tagged Image File Format](#) 193
- [Binary Interchange File Format \(BIFF\) Workbook](#) 182
- [Microsoft Word for Windows](#) 171

## Architectural Discipline

- [\(missing\)](#) 23113
- [Structural](#) 10373
- [Architecture](#) 9302
- [Interiors](#) 1441
- [Mechanical](#) 1400
- [Electrical](#) 1300
- [Landscape](#) 1156
- [Security](#) 838
- [Plumbing](#) 663
- [Civil](#) 352
- [Lighting](#) 277
- [Info Tech](#) 250
- [Audiovisual](#) 204
- [Food Service](#) 147
- [Signage](#) 73
- [Geotechnical](#) 22
- [Unknown](#) 13
- [Does Not Apply](#) 1

# Longwell, Table w. Popup



http://libaxis2.mit.edu:8082 – SIMILE Longwell

CWB Recent cha... Longwell SIMILE Lon... SIMILE Long... SIMILE Long... FACADE pr... Stata Data ... USIP Data USIP Data (s...

[Link to This Page](#)

**FACADE**

Future-proofing Architectural Computer-Aided DDesign // Data-set: CWB Complete (Oct 27)

Add View | Start New Search

18 items. << 1 next >>

auto-pick columns | add column...

**TABLE**

label	source	phase	zone	extent
1. FILE-18206	Images/071031_Landscape Images 2 Flags/071031_Aerial_11.jpg	Design Development	USIP	9831322
2. FILE-37811	in/sd/images from balmori/schemeA.model1.jpg	Design Development	USIP	11203126
3. FILE-37812	in/sd/images from balmori/schemeA.plan.jpg	Design Development	USIP	9363140
4. FILE-37813	in/sd/images from balmori/schemeB.model1.jpg	Construction Documents	USIP	842955
5. FILE-37814	in/sd/images from balmori/schemeB.model2.jpg	Construction Documents	USIP	837038
6. FILE-37815	in/sd/images from balmori/schemeB.model3.jpg	Construction Documents	USIP	9975422
7. FILE-37816	in/sd/images from balmori/schemeB.model4.jpg	Construction Documents	USIP	3611911
8. FILE-37817	in/sd/images from balmori/schemeC.model1.jpg	Schematic Design	USIP	421761
9. FILE-37818	in/sd/images from balmori/schemeC.model2.jpg	Schematic Design	USIP	561453
10. FILE-37819	in/sd/images from balmori/schemeC.model3.jpg	Schematic Design	USIP	442613
11. FILE-37820	in/sd/images from balmori/schemeC.model4.jpg	Schematic Design	USIP	1113753
12. FILE-37821	in/sd/images from balmori/schemeD.model1.jpg	Schematic Design	USIP	769786
13. FILE-37822	in/sd/images from balmori/schemeD.model2.jpg	Schematic Design	USIP	657236
14. FILE-37823	in/sd/images from balmori/schemeD.model3.jpg	Schematic Design	USIP	548356

**Text Search**

Q

**Attribute Filters**

architecturalDiscipline 1  
 Architecture  
 Structural  
 Landscape

colocation

created

derivedBy

derivedFrom

documentType 1

extension

extent

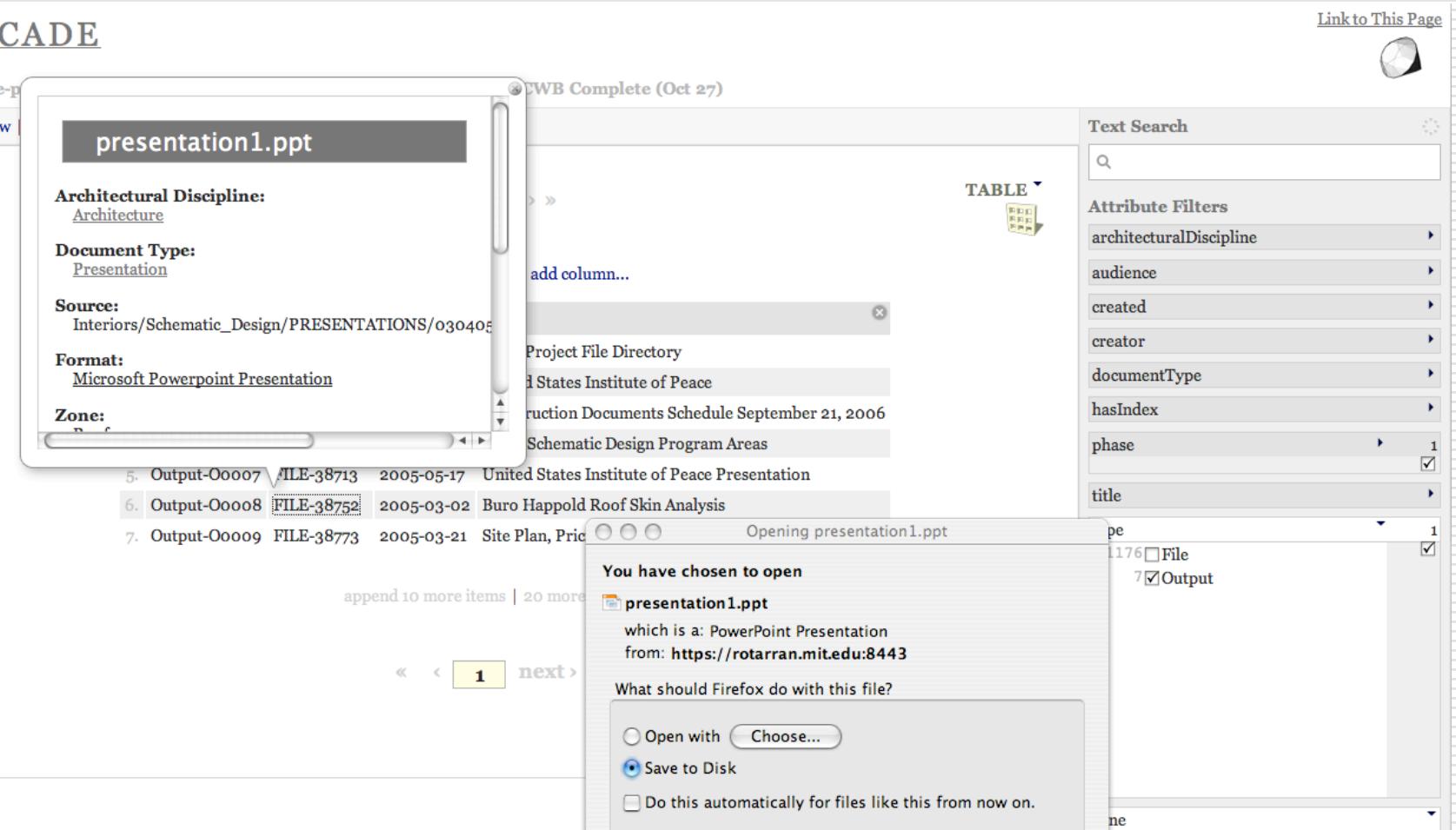
format 1  
 Exchangeable Image File Format (Compre  
 JPEG File Interchange Format  
 OLE2 Compound Document Format  
 Adobe Photoshop  
 Portable Document Format

Done

# “Presentation” 0008 (.PPT)

## FACADE

[Link to This Page](#)



**presentation1.ppt**

**Architectural Discipline:** Architecture

**Document Type:** Presentation

**Source:** Interiors/Schematic\_Design/PRESENTATIONS/030405

**Format:** Microsoft Powerpoint Presentation

**Zone:**

5. Output-Oooo7 FILE-38713 2005-05-17 United States Institute of Peace Presentation

6. Output-Oooo8 FILE-38752 2005-03-02 Buro Happold Roof Skin Analysis

7. Output-Oooo9 FILE-38773 2005-03-21 Site Plan, Pric

append 10 more items | 20 more

« < **1** next »

**CWB Complete (Oct 27)**

**add column...**

**TABLE**

**Text Search**

**Attribute Filters**

- architecturalDiscipline
- audience
- created
- creator
- documentType
- hasIndex
- phase
- title

**You have chosen to open**

**presentation1.ppt**

which is a: PowerPoint Presentation  
from: <https://rotarran.mit.edu:8443>

What should Firefox do with this file?

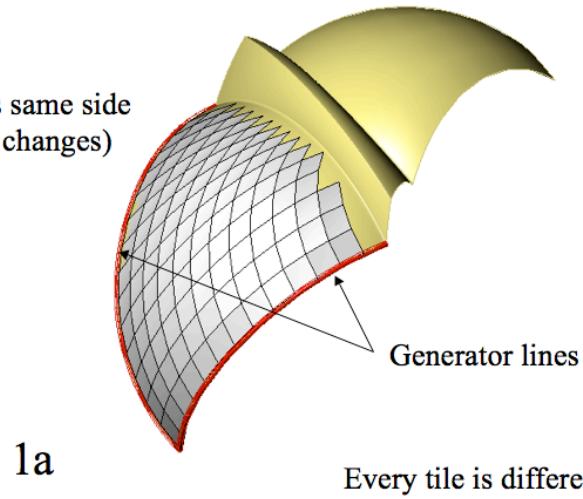
Open with  Choose...  
 Save to Disk  
 Do this automatically for files like this from now on.

# Client Presentation Design Object O-0008 (.PPT)



Option 1: 'Draped net'

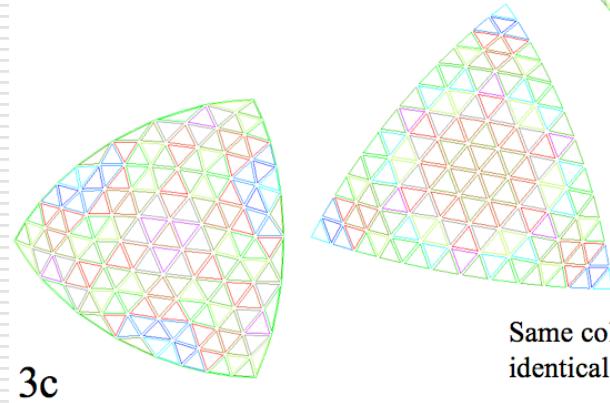
Every tile has same side length (angle changes)



1a

Option 3: Polyhedron mapping

Triangular panels can be generated in a number of ways (using various base and generators)



3c

Moshe Safdie Assoc. presentation1.ppt

# Mall, Washington DC



Moshe Safdie Assoc. NCPC\_03\_06.ppt

# View, without USIP Building...



Moshe Safdie Assoc. NCPC\_03\_06.ppt

A: View from West Potomac Park, South of USIP adjacent to Lincoln Memorial  
without USIP building  
November 14, 2008

© MIT

DLF Fall Forum

39

# There it is!

---



Moshe Safdie Assoc. NCPC\_03\_06.ppt

A: View from West Potomac Park, South of USIP adjacent to Lincoln Memorial

November 14, 2008

© MIT

DLF Fall Forum

40

# Design Model (d0003)

**FACADE**

[Link to This Page](#)



Future-proofing Architectural Computer-Aided DEsign // Data-set: CWB Complete (Oct 27)

[Add View](#) | [Start New Search](#)

4 items.

« first < previous 1 next page > last »

Sort by hasIndex

ascending

1. **Design-d0003**

<b>architecturalDiscipline</b>	Architecture
<b>created</b>	2006-09-01
<b>creator</b>	Moshe Safdie & Associates
<b>designType</b>	DesignModel
<b>hasFile</b>	FILE-50729 FILE-50730
<b>hasIndex</b>	FILE-22046
<b>phase</b>	Design Development
<b>title</b>	USIP 3D Model 100% Design Development
<b>type</b>	Design

LIST

**Text Search**



**Attribute Filters**

architecturalDiscipline

created

creator

designType

13  DesignDrawing

4  DesignModel

2  DesignSet

hasFile

hasIndex

# Derivative File .IFC (50729)

## FACADE

[Link to This Page](#)

Future-proofing Architectural Computer-Aided DDesign // Data-set: CWB Complete (Oct 27)

Add View | Start New Search

9 items. << 1 next >>

auto-pick columns | add column...

label	source
1. FILE-50725	Design Development/Drawings/revit/Roof_skin_only.ifc
2. FILE-50726	Design Development/Drawings/revit/50% DD revit file/USIP-50 DD file.ifc
3. FILE-50727	Design Development/Drawings/revit/50% DD revit file/USIP-50DDfile-3DView-{3D}.dwg
FILE-50729	Design Development/100% DD - 2006-09-04/REVIT model/USIP_100%DD.ifc

**USIP\_100%DD.ifc**

**Architectural Discipline:**  
[Architecture](#)

**Document Type:**  
[Model](#)

**Source:**  
 Design Development/100% DD - 2006-09-04/REVIT model/USIP\_100%DD.ifc

**Format:**  
[ASCII Text](#)

**Zone:**

TABLE

Text Search

Attribute Filters

architecturalDiscipline

colocation

created

derivedBy

6959  (missing)  Revit  Acrobat 9 Pro Extended

derivedFrom

documentType

extension

extent

format

formatCategory

# Design Set (d0014)

## FACADE

[Link to This Page](#)


Future-proofing Architectural Computer-Aided DDesign // [Data-set: CWB Complete \(Oct 27\)](#)

[Add View](#) | [Start New Search](#)

1 item. << < **1** next > >

auto-pick columns | add column...

label	hasIndex	hasFile	title
1. Design-d0014	FILE-21314	FILE-21967 • FILE-21762 • FILE-21532 • FILE-21329 • FILE-21489	80% Construction Documents Drawing Set

**Design-d0014**

architecturalDiscipline	Architecture
created	2006-09-12
creator	Moshe Safdie & Associates
designType	DesignSet
hasFile	FILE-21329 FILE-21489 FILE-21532 FILE-21762 FILE-21967
hasIndex	FILE-21314

TABLE 

Text Search 

Attribute Filters

- architecturalDiscipline
- created
- creator
- hasIndex

phase

- Construction Document
- Design Development

title

type

zone

- USIP

# Index File to Design Set (21314)

## FACADE

[Link to This Page](#)



Future-proofing Architectural Computer-Aided DEsign // Data-set: CWB Complete (Oct 27)

Add View | Start New Search

4 items. << < 1 next > >

auto-pick columns | add column...

label	source	created
FILE-21314	Design Development/100% DD - 2006-09-04/USIP-DD Drawing List.doc	2006-09-12T20:42:46
	work/yb/Drawing Lists/USIP Civil Drawing	2007-03-12T16:17:42
	work/yb/Drawing Lists/USIP Security Drawing	2007-03-12T15:00:32
	work/yb/Drawing Lists/USIP Security Drawing	2007-02-28T18:50:38

0 more items | 20 more | 50 more

< < 1 next > >

**TABLE**

**Text Search**

drawing list

drawing list

**Attribute Filters**

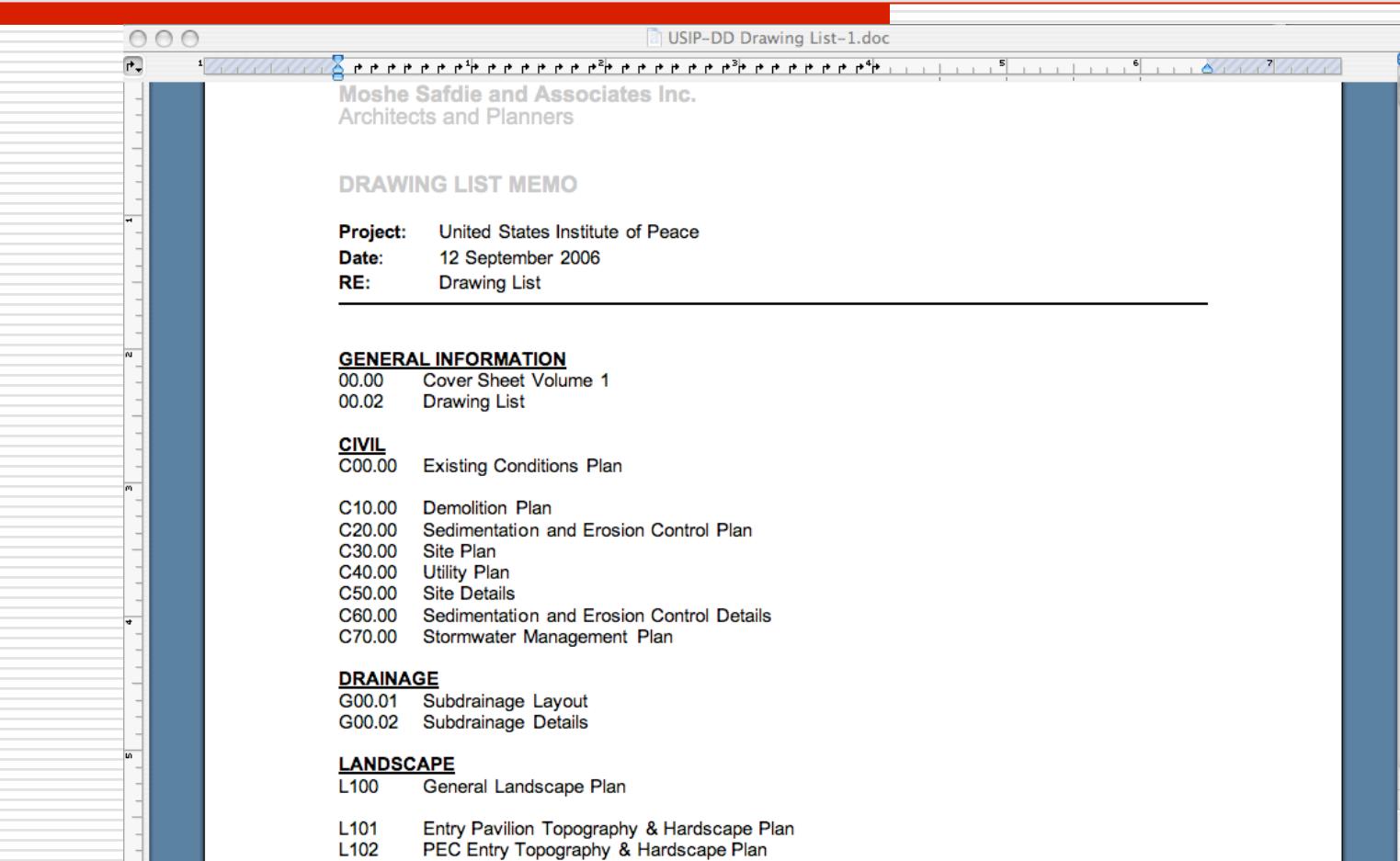
extension

- 1817 dwg
- 605 txt
- 592 dat
- 588 rfa
- 514 pdf
- 385 catpart
- 139 rws
- 94 pcp
- 67 db
- 62 jpg
- 46 zip

phase

- 16 (missing)
- 8 Construction Doc
- 4 Design Developme
- 2 Schematic Design

# Word .DOC Index to .DWGs



# DWG "L101," from Index (21693)

## FACADE

Future-proofing Architectural Computer-Aided DEsign // Data-set: CWB Complete (Oct 27)

[Add View](#) | [Start New Search](#)

56 item(s) in 6 pages.



« first < previous 1 next page > last »

Sort by requires   ascending



1.

L101-00 - Entry Pavilion Topo-Hardscape.dwg

[Complete](#) [Summary](#)

**Architectural Discipline:**  
[Landscape](#)

**Document Type:**  
[Drawing](#)

**Source:**  
Design Development/100% DD - 2006-09-04/Drawings/Landscape/dwg/L101-00 - Entry Pavilion Topo-Hardscape.dwg

**Format:**  
[AutoCAD Drawing](#)

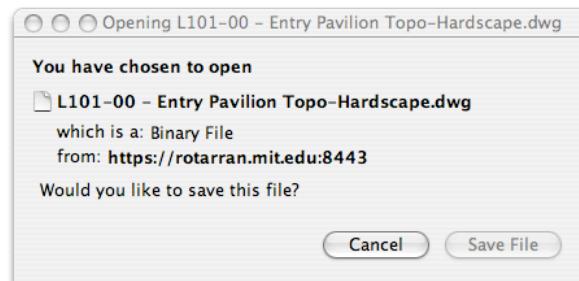
**Zone:**  
[USIP](#)

**Phase:**  
[Design Development](#)

**Extension:**  
dwg

**Created:**  
2006-09-05T15:06:20

**DOWNLOAD:**  
[\[external link\]](#)



## Text Search

Entry Pavilion Topography & Hardscape Plan



## Attribute Filters

architecturalDiscipline

colocation

created

derivedBy

derivedFrom

documentType

## extension

36 dwg

11 pcp

5 pdf

1 psd

1 jpg

1 dwl

1 db

extent

format

formatCategory

hasDuplicate

# What We're Going to See

---

- Longwell for USIP “Reference Book”
  - Design Objects (slides)
    - Client Presentation (.PPT)
    - Design Model (.RVT), then Derivative File (.IFC)
    - Design Set, Index (.DOC), Drawing (.DWG)
  - **Files (demo)**
    - **Arch. Discipline: Landscape**
    - **Phase: Schematic Design**
    - **Doc. Type: Sketch, Specification**

# Contents of Talk *(review)*

---

- Project Scope
  - Problem, Goals
  - Audiences, Use Cases
  - Datasets We're Working With
- 3D CAD
  - Data Formats; Standards; CAD Tools
  - Preservation Strategies
- Ontology
  - Project Information Model, Workflow
  - Metadata, "Curators Workbench"
  - DSpace Archive
- User Interface

# Outcomes, *forthcoming ...*

---

## **INSTITUTIONS:**

- Open source, production quality software (repository; U/I)
- Format representation for 3D CAD
- Preservation strategy for 3D CAD
- Ontology, workflow for other materials
- Intellectual property issue

## **USERS:**

- Avail. of materials
- Improvement over “File System” organization
- Some add'l. metadata

# Acknowledgement

---



**This project is made possible by a grant from the U.S. Institute of Museum and Library Services**

The views and conclusions contained of this presentation are those of the author and should not be interpreted as representing the official policies, either expressed or implied, of the IMLS or the U.S. Government.

<http://facade.mit.edu>

[http://facade.mit.edu/presentations/REILLY\\_DLFFall2008/MIT\\_FACADE.ppt.htm](http://facade.mit.edu/presentations/REILLY_DLFFall2008/MIT_FACADE.ppt.htm)