

College of Engineering



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Building Usability

Issues that architects and engineers face while designing buildings that are usable, accessible, and enhance overall user experience.



The screenshot shows a professional website for James E. Mitchell, an Associate Professor of Civil, Architectural & Environmental Engineering. The page includes a navigation menu with links for Home, Schedule, Courses, Papers, and CV/Resume. A secondary menu lists AE Resources. The main content area features contact information for the Alumni Engineering Labs (4)-260H, including the address (3141 Chestnut Street, Philadelphia, PA 19104), phone (215) 895-1374, office (215) 895-1363, fax (215) 732-2262, and email (James.Mitchell@drexel.edu). A small portrait photo of James E. Mitchell is displayed. Below the contact info are search boxes for Google Custom Search and Drexel Search, and a Google Scholar link. A 'Some of My Sites' sidebar lists various academic and professional resources like Academic Tools Blog, Tools for Academics, and New Faculty Working Info.

James E. Mitchell Engineer, Architect, Teacher

Home Schedule Courses Papers CV/Resume

AE Resources

Associate Professor
Civil, Architectural & Environmental Engineering

Alumni Engineering Labs (4)-260H - map
3141 Chestnut Street
Philadelphia, PA 19104
(215) 895-1374 Office
(215) 895-1363 Fax
(215) 732-2262 Home
E-Mail: James.Mitchell@drexel.edu

Google Custom Search Drexel Search

Google Scholar

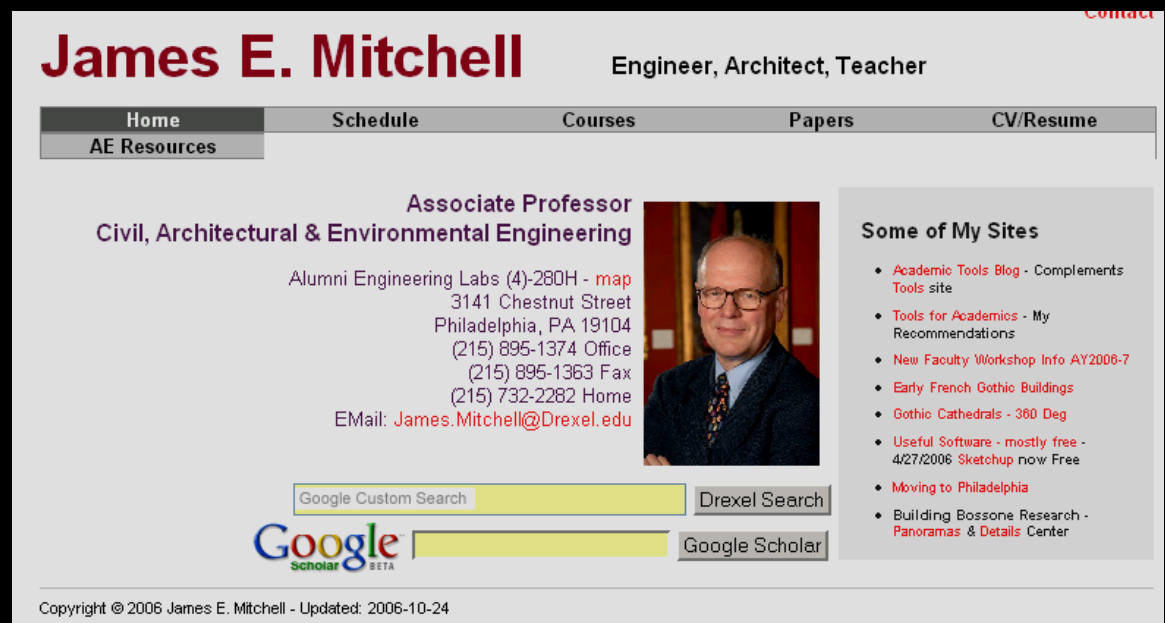
Some of My Sites

- Academic Tools Blog - Compliments Tools site
- Tools for Academics - My Recommendations
- New Faculty Working Info A17288.7
- Early French Gothic Buildings
- Gothic Cathedrals - 390 Dwg
- Useful Software - mostly free - 4277086
- Training - free
- Mapping to Philadelphia
- Building Research - Research - Pantheon & Details Center

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A Bit About Me

- Trained as Engineer & Architect
- Principal of Architectural firm for 9 years
 - ◆ Jordan-Mitchell , Inc.
 - ◆ We specialized in health care, banks and
- 1988 Joined Drexel to build the brand new Architectural Engineering program
- Teach Architectural Engineering Design
 - ◆ And lots of other things
 - ◆ Play with web – many sites



The screenshot shows a personal website for James E. Mitchell. At the top right, there is a red "Contact" link. The main header features the name "James E. Mitchell" in a large, dark red font, followed by the title "Engineer, Architect, Teacher" in a smaller black font. Below the header is a navigation menu with five items: "Home", "Schedule", "Courses", "Papers", and "CV/Resume". The "Home" item is highlighted with a grey background. Underneath the navigation menu, the text "AE Resources" is visible. The main content area is divided into two columns. The left column contains the following text: "Associate Professor", "Civil, Architectural & Environmental Engineering", "Alumni Engineering Labs (4)-280H - [map](#)", "3141 Chestnut Street", "Philadelphia, PA 19104", "(215) 895-1374 Office", "(215) 895-1363 Fax", "(215) 732-2282 Home", and "E-Mail: James.Mitchell@Drexel.edu". To the right of this text is a portrait photograph of James E. Mitchell, an older man with glasses wearing a suit and tie. Below the text and photo are three search boxes: "Google Custom Search", "Drexel Search", and "Google Scholar". The right column is titled "Some of My Sites" and contains a list of links: "Academic Tools Blog - Complements Tools site", "Tools for Academics - My Recommendations", "New Faculty Workshop Info AY2006-7", "Early French Gothic Buildings", "Gothic Cathedrals - 360 Deg", "Useful Software - mostly free - 4/27/2006 Sketchup now Free", "Moving to Philadelphia", and "Building Bossone Research - Panoramas & Details Center". At the bottom of the page, there is a copyright notice: "Copyright © 2006 James E. Mitchell - Updated: 2006-10-24".

A Tour of Drexel University



What did you see?



What I had in mind

- Some issues of building usability

*New building - Famous architects –
Pei, Cobb, Freed*



Stair to an empty terrace



Entrance – That usually doesn't open



Hazardous corner



*Unused,
expensive space*



No provision for trash



Stair with unsettling motion



Existing Building - Strange Fire Cabinet



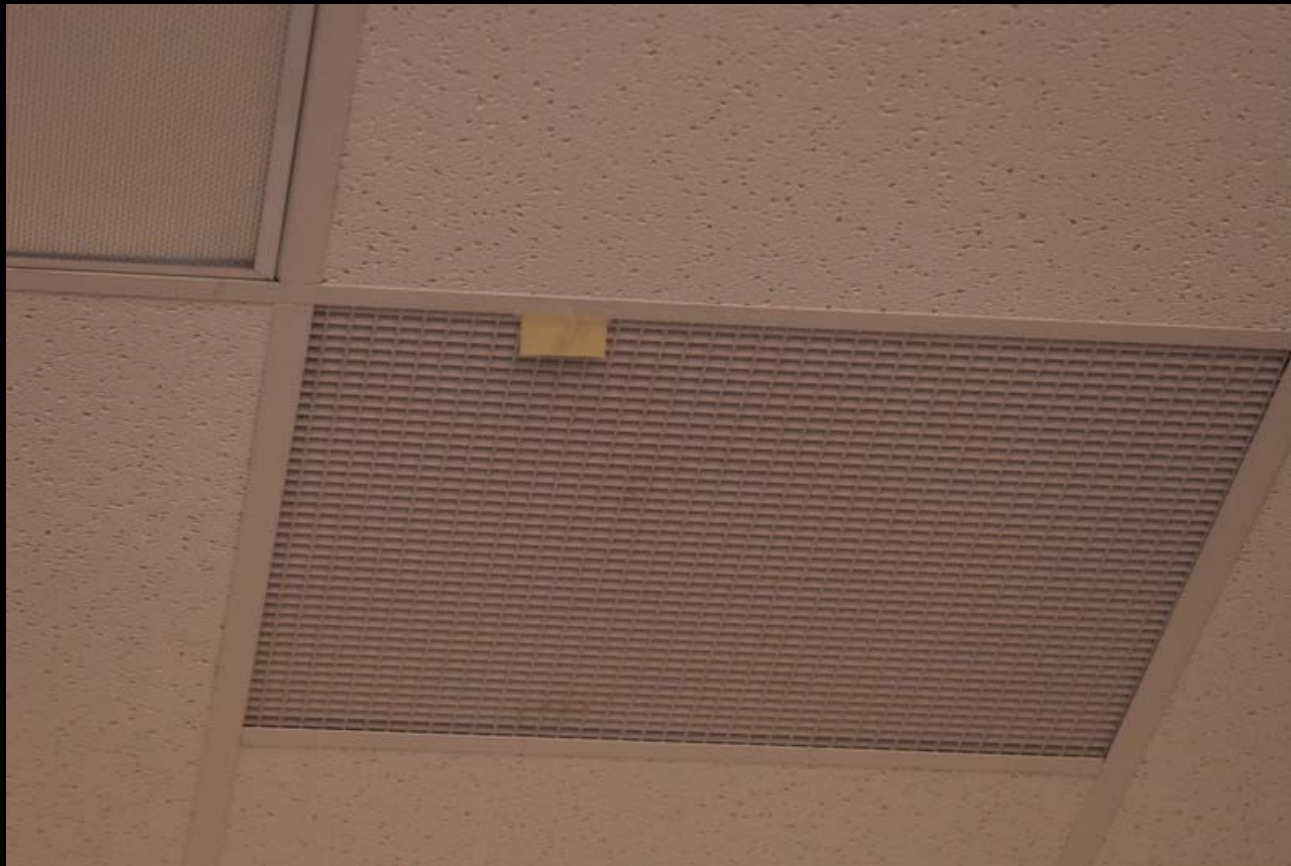
Confusing Signs



Fan to fight summer heat



Telltale to visualize air flow



Sweaters for Winter Cold



Uncontrollable Thermostat



What are Your Pet Peeves about Buildings?



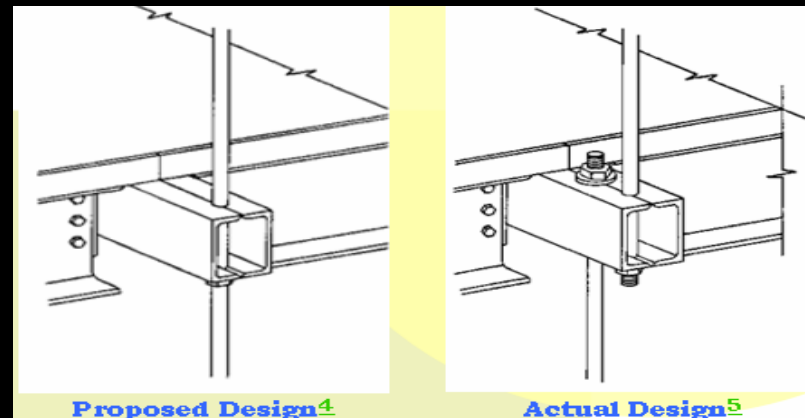
<http://www.baddesigns.com/mopsnk.html>

What happens when YOU “get it wrong”

- “Frustration” is the usual answer for computer programs.
- May lose money

In buildings we can kill or maim

- Hyatt Regency Hotel
- 114 Dead
- 200 Injured
- July 17, 1981



Padlocked fire Exit

- Whose usability does this address?



What's Different about Buildings?

- Many simultaneous users doing different, unpredictable (in detail) things
- Many different user types
- All senses involved
- Physical motion
- Long time span – Up to 1000s of years

Building Stakeholders

- Builders
 - ◆ Owners
 - ◆ Architects
 - ◆ Engineers
 - ◆ Contractors
- Operators
 - ◆ Maintenance
 - ◆ Security
 - ◆ Emergency
 - ◆ Housekeeping
- Government
- Occupants = “Users”



How do building designers strive for Usability?

● Codes

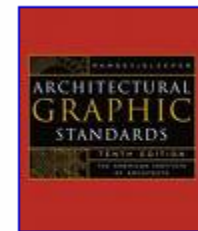
- ◆ Zoning
- ◆ Building
- ◆ Aesthetic
- ◆ Environmental
- ◆ Life Safety
- ◆ Health
- ◆ Disabilities

● Standards

- ◆ Materials
 - Steel
 - Concrete
 - +++++
- ◆ Layout
 - Graphics Standards



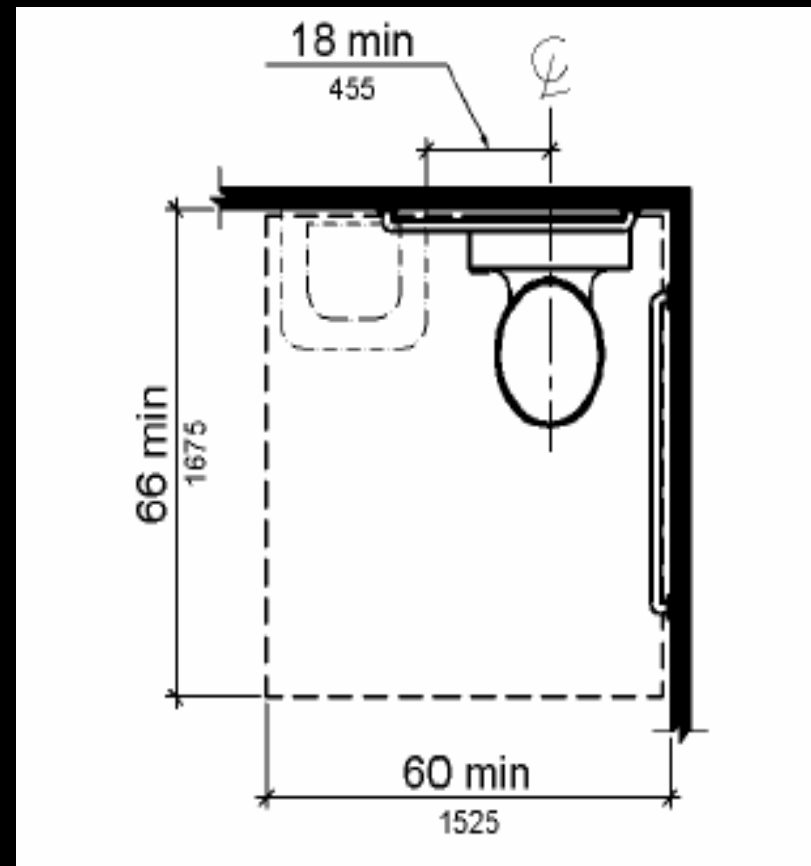
Interior Graphic Standards
180 x 254 pixels - 7k - jpg
images.bestwebbuys.com



Architectural Graphic Standards ..
209 x 254 pixels - 11k - jpg
images.bestwebbuys.com

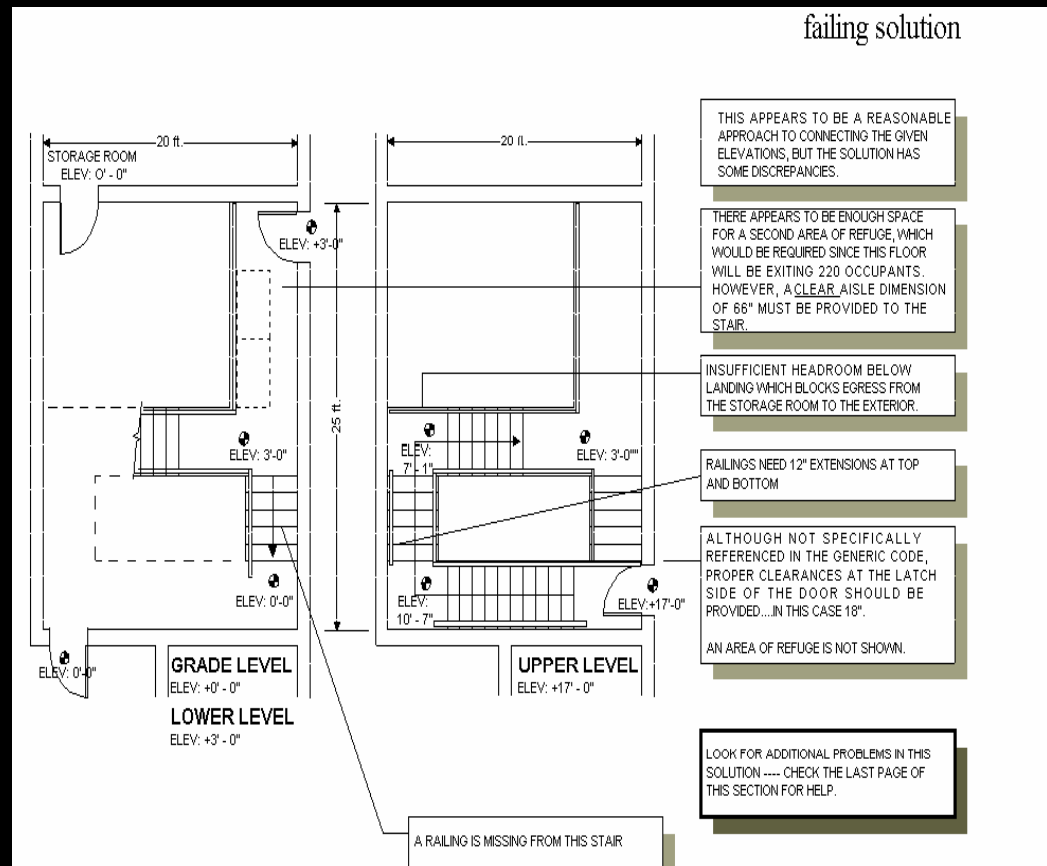
ADA – American with Disabilities

- Accessible
 - ◆ Clearances
 - ◆ Slopes
 - ◆ Steps
- Like the web disabilities requirements, but more inclusive



Licensing

- Who
 - ◆ Architects
 - ◆ Engineers
- Steps
 - ◆ Education
 - ◆ Internship
 - ◆ Exams



What affects Usability in Buildings?

- Stakeholder's different interests
- Money – some things cost more
- Knowledge – or lack of it
- Legal Fear
- Time – usually = money
 - ◆ Designers
 - ◆ Contractors
- Existing conditions – very important in buildings

Are there connections between our fields?

- Yes

- ◆ Computers are increasingly used throughout design
- ◆ They are used increasingly to build operate buildings
- ◆ Our concerns about safety will be increasingly yours

- No

- ◆ We operate in a more complex domain
- ◆ We must address more senses

Are there lessons from our field

- Standards and Codes
- Analytic vs. visual creators – necessity of both
- Big changes may well come from disasters
- Don't forget people – it's easy to do so

Questions?



Laon Cathedral