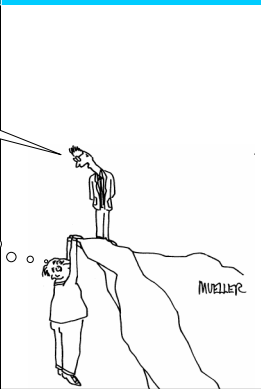
	<b>APPA Institute</b> Developing & Using Campus Standards	<b>Design Standards</b>
<p>Now repeat after me:  <i>I <u>will</u> use your campus standards,</i>  <i>I <u>will</u> use your campus standards,</i>  <i>I will use.....</i></p> <p>Why me!</p> <p>Presenter: Sadie Greiner, PE          Chief Construction Officer          Florida State University          sgreiner@fsu.edu</p>		

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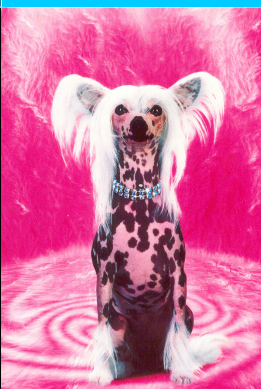
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	<b>APPA Institute</b> Developing & Using Campus Standards	<b>Outcomes</b>
<p>What Are Standards?          Why Have Standards?          How Do You Develop Them?          Who Are Project Stakeholders?          How Are They Integrated?          How To Create Feedback?          How Do You Revise Them?          How Do You Insure Their Use?</p>		

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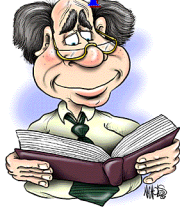
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	<b>APPA Institute</b> Developing & Using Campus Standards	<b>Definitions</b>
<p><b>What are Campus Standards?</b></p>  <p><i>"Describe &amp; set forth procedures, policies, <u>guidelines</u> and codes which the institution believes to be representative of <u>desirable practices for projects</u>"</i></p>		

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 **APPA Institute**  
Developing & Using Campus Standards

**What's Involved?**

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Time Commitment  
Resource Commitment

***What's Involved?***

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 **APPA Institute**  
Developing & Using Campus Standards

**What's Involved?**

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***What's Involved?***

- Time Commitment
- Resource Commitment
- Measurable ROI
- Negotiate Outcomes

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	<b>APPA Institute</b> Developing & Using Campus Standards	<b>Benefits</b>
<div style="display: flex; justify-content: space-between;"> <div style="width: 30%;"> <p style="font-size: 2em; font-weight: bold; text-decoration: underline;">Benefits of Standards?</p> <p style="font-size: 4em; font-weight: bold; text-align: center;">?</p> <p style="color: red; font-weight: bold; text-align: center;"> <i>To Standardize or Not to Standardize That is the Question !</i> </p> </div> <div style="width: 65%;"> <ul style="list-style-type: none"> <li>• <u>Advantages</u> <ul style="list-style-type: none"> <li>• Stakeholders Satisfied</li> <li>• Protects Institutional Interests</li> </ul> </li> </ul>  </div> </div>		

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	<b>APPA Institute</b> Developing & Using Campus Standards	<b>Benefits</b>
<div style="display: flex; justify-content: space-between;"> <div style="width: 30%;"> <p style="font-size: 2em; font-weight: bold; text-decoration: underline;">Benefits of Standards?</p> <p style="font-size: 4em; font-weight: bold; text-align: center;">?</p> <p style="color: red; font-weight: bold; text-align: center;"> <i>To Standardize or Not to Standardize That is the Question !</i> </p> </div> <div style="width: 65%;"> <ul style="list-style-type: none"> <li>• <u>Advantages</u> <ul style="list-style-type: none"> <li>• Stakeholders Satisfied</li> <li>• Protects Institutional Interests</li> <li>• Builds Bridges</li> <li>• Pays Dividends               <ul style="list-style-type: none"> <li>• Less time educating consultants</li> <li>• Ensures higher quality facilities</li> <li>• Increases consistency</li> <li>• Reduces maintenance needs</li> <li>• Limits Inventory of parts needed</li> </ul> </li> </ul> </li> </ul> </div> </div>		

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	<b>APPA Institute</b> Developing & Using Campus Standards	<b>Benefits</b>
<div style="display: flex; justify-content: space-between;"> <div style="width: 30%;"> <p style="font-size: 2em; font-weight: bold; text-decoration: underline;">Benefits of Standards?</p> <p style="font-size: 4em; font-weight: bold; text-align: center;">?</p> <p style="color: red; font-weight: bold; text-align: center;"> <i>To Standardize or Not to Standardize That is the Question !</i> </p> </div> <div style="width: 65%;"> <ul style="list-style-type: none"> <li>• <u>Advantages</u> <ul style="list-style-type: none"> <li>• Stakeholders Satisfied</li> <li>• Protects Institutional Interests</li> <li>• Builds Bridges</li> <li>• Pays Dividends</li> </ul> </li> <li>• <u>Disadvantages</u> <ul style="list-style-type: none"> <li>• Time Consuming</li> <li>• Costly and Drives up Overhead</li> <li>• Complicates Process</li> </ul> </li> </ul> </div> </div>		

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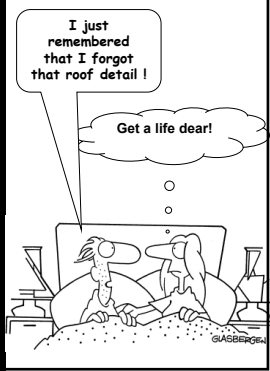
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Problems

Problems W/Out Standards

- High Maintenance Costs




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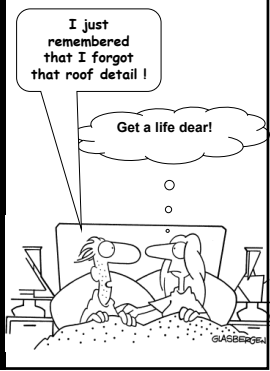
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Problems

Problems W/Out Standards

- High Maintenance Costs
- Bad Design




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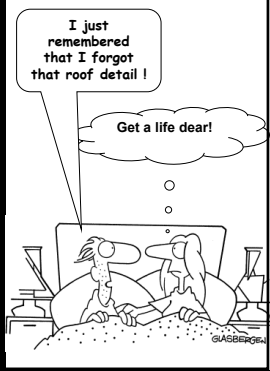
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Problems

Problems W/Out Standards

- High Maintenance Costs
- Bad Design
- Shortened Life Span
  - Product performance and longevity not always part of the design criteria




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**APPA Institute**  
 Developing & Using Campus Standards

**Problems**

**Problems W/Out Standards**

- High Maintenance Costs
- Bad Design
- Shortened Life Span
- No Continuity
  - Dozens of parts needed



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**APPA Institute**  
 Developing & Using Campus Standards

**Problems**


All of Above

Leads to

Frustration

Which Leads to

Mistrust



**When Standards Aren't Followed**

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Mistrust can lead to small mistakes...

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	<p><b>APPA Institute</b> Developing &amp; Using Campus Standards</p>	<p><b>Standards</b></p>
<ul style="list-style-type: none"> <li>• <u>Design</u> <ul style="list-style-type: none"> <li>Policies</li> <li>Graphics</li> </ul> </li> <li>• <u>Construction</u> <ul style="list-style-type: none"> <li>Systems</li> <li>Products</li> </ul> </li> </ul>		<p>History has forgotten Lambini &amp; Sons who are credited with the Sistine Chapel floor.</p>

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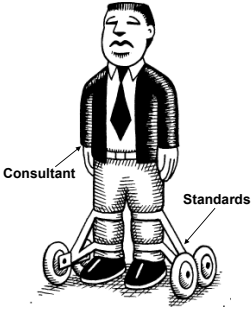
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**APPA Institute**  
Developing & Using Campus Standards

## Design Standards

- Design Philosophy
  - Quality/Consistent Design
  - Process
  - Aesthetics
  - Planning Principles
- Owner Responsibilities
- Design Submittals
  - Submittal Requirements
- Contract Forms



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**Facilities Management**  
UNIVERSITY OF COLORADO BOULDER

## Design Standards

**Introduction**

**Main Campus Design Guidelines**

**Body & Soul Video**

**Architectural Heritage**

**The Tuscan Vernacular Story**

**Campus Design Principles**

**Design Process**

**Photo Gallery**

**Building Materials Vocabulary**

**Campus Landscape**

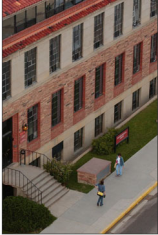
**Contact Campus Architect**

**Campus Architecture**

CU-Boulder Campus Architect is responsible for managing and monitoring all changes to the buildings and grounds of the university. This task is shared by administration, students, faculty, staff, alumni, and the outside city, state, and national interests who treasure the campus built environment. Campus Architect role and mission

CU-Boulder is recognized as one of the most beautiful and environmentally conscious college campuses in the nation. Set against a prominent mountain backdrop, its buildings are universally admired for their uniform style of sandstone walls, red tile roofs, limestone trim and black wrought iron accents - all in a romantic Italianate style.

The purpose of this website is to provide information for sustaining the quality of this remarkably designed campus when future changes or new facilities and buildings are contemplated.



Facilities Management  
Campus Box 453, Boulder, CO 80309-0453

University of Colorado Boulder  
© Regents of the University of Colorado

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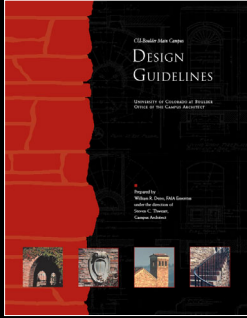
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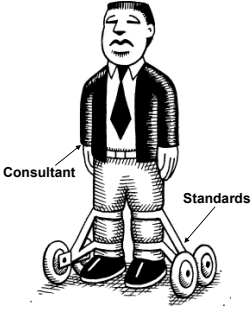


**APPA Institute**  
Developing & Using Campus Standards

## Design Standards

## Design Guidelines





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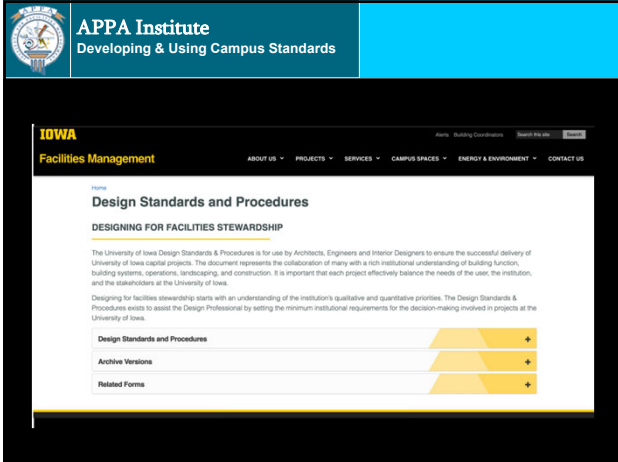
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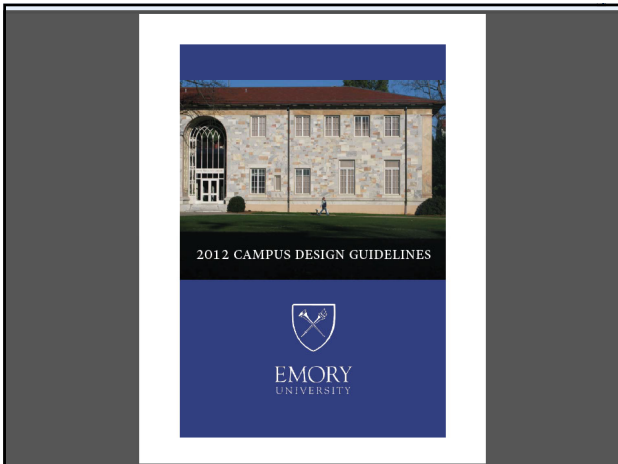
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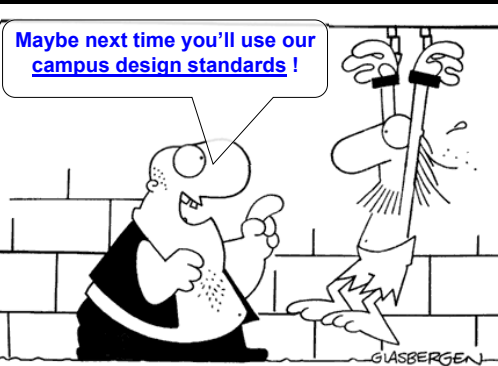
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Organization

Generic

Guidelines/ideas

Specific

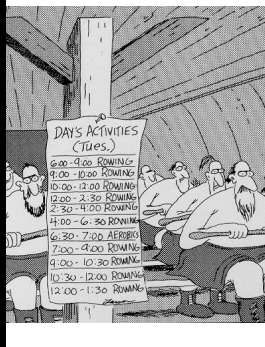
Detailed/specifications

Types

Prescriptive

Descriptive

Performance



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• General

- Life Expectancy
- Design Palette
- Graphic Standards (CAD)
- BIM
- Codes
- Acceptable Products
- Accessibility Issues
- Utilities / Haz. Materials
- Technical Sections

BOK



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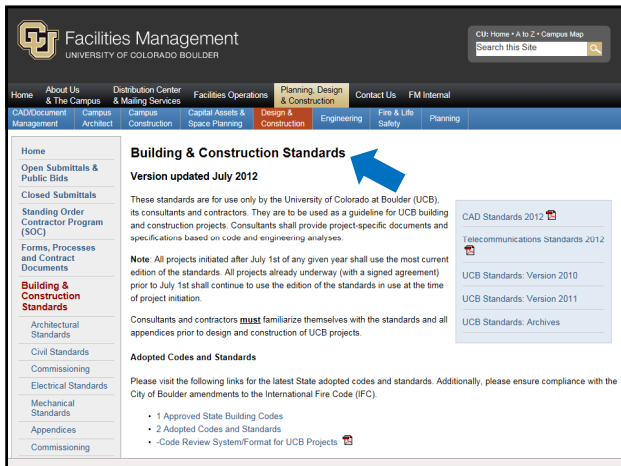
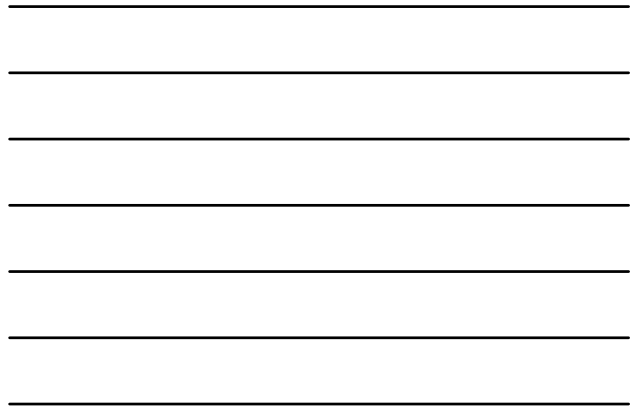
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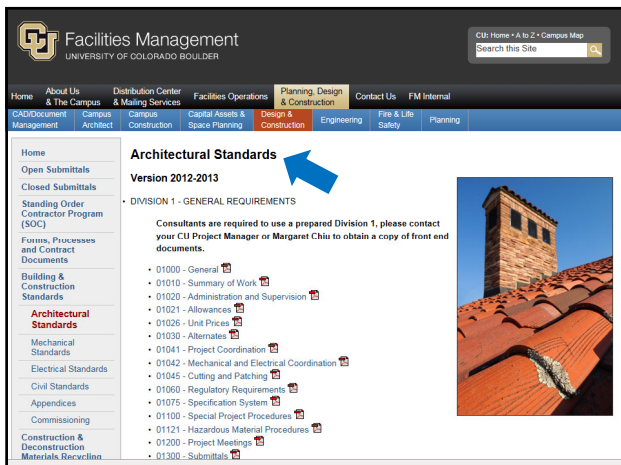
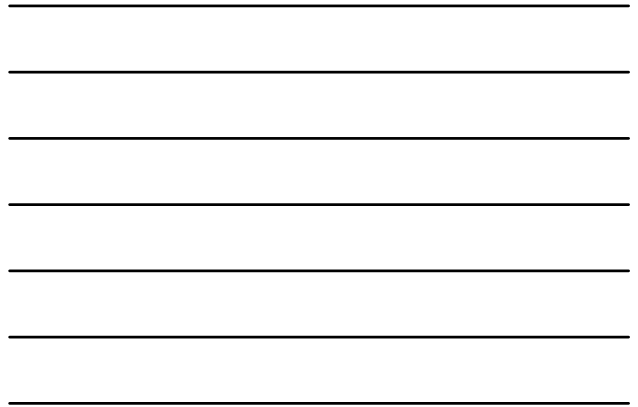
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GENERAL

PART I - GENERAL

1.1 CONDITIONS AND REQUIREMENTS

A Division I - General Requirements shall govern work under all Divisions of the Specifications.

1.2 SPECIFICATION LANGUAGE EXPLANATION:

A. Specifications are of abbreviated, simplified or streamlined type and include incomplete sentences. Omissions of words or phrases such as "the Contractor shall," "in conformity therewith," "shall be," "as noted on the Drawings," "a," "the" are intentional. Supply omitted words or phrases by inference in same manner as they are when "NOTE" occurs on Drawings. Supply words "shall be" or "shall" by inference when colon is used within sentences or phrases. Supply words "on the Drawings" by inference when "as indicated" is used with sentence or phrase.

B. Where reference is made to specifications, societies, institutes, or associations or manufacturer's directions, they are, except as may be inconsistent herewith, made part of specifications. In same extent as if written out in full herein. Use latest editions, at time of bidding, if a date is not given.

1.3 ABBREVIATIONS:

A. References in Contract Documents to trade associations, technical societies, recognized authorities and other institutions include following organizations, which are sometimes referred to only by corresponding abbreviations:

1. AA	Aluminum Association
2. AAMA	Architectural Aluminum Manufacturer's Association
3. ACI	American Concrete Institute
4. ASMA	Acronical and Laminating Materials Association (successor to AMA and IBI)
5. AISI	American Institute of Steel Construction
6. AISI	American Iron and Steel Institute
7. AITC	American Institute of Timber Construction
8. ASMA	Acronical Materials Association
9. ANSI	American National Standards Institute (successor to USASI and ASA)
10. APA	American Plywood Association
11. ASHRAE	American Society of Heating, Refrigerating and Air Conditioning Engineers

JULY 2012                      UCB STANDARDS                      01000 - 1

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SCHOOLS   LIBRARIES   RESOURCES   SEARCH

**EMORY UNIVERSITY**   **Planning, Design, and Construction**  
Division of Campus Services

ABOUT US   **PLANNING/CONSTRUCTION**   ACCESSIBILITY   ENGINEERING   GRAPHIC DESIGN   INTERIOR DESIGN

Planning/Construction   **Design and Construction Standards and University Architect's Campus Design Guidelines**   Standards and Guidelines

FAQ

Starting A Project

Design & Construction Standards and Campus Design Guidelines

Download additional standards and design guidelines using links to the right of this page.

**Design and Construction Standards:**

Emory's Design and Construction Standards provide architects, engineers, design consultants and contractors with specific standards and specifications for construction activity on Emory University property. They serve to summarize principles unique to the University's aesthetic and structural preferences, specialized nature of each facility, requirements applied by the University's insurance carrier, and knowledge gained from experience with construction, operations and maintenance issues.

For further information about Emory's Design and Construction Standards, contact Stuart Adler at 404.727.4794.

**STANDARDS:**

- Design and Construction Standards
- Document Delivery Standards
- Architectural Floor Plan Template.dwg
- Evacuation Template.dwg
- URS Communication standards

**GUIDELINES:**

- Campus Master Plan Information
- 2012 Draft Campus Design Guidelines
- College Classroom Design Guidelines

**SUSTAINABILITY:**

- Sustainability Design Reporting Part 1
- Sustainability Design Reporting Part 2
- Green Building Sustainability Initiatives
- Emory Green Cleaning Manual

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- Warranty Matrix - Summary of warranty requirements throughout Design and Construction [Standards](#)
- Division 00 - Procurement and Contracting Requirements
  - 00 00 00 Introduction
  - 00 00 01 Basic Program Requirements
  - 00 00 02 Clarifications and Proposals
- Division 01 - Internal Requirements
  - 01 10 00 Summary of Work Requirements
  - 01 20 00 Project Management and Coordination
  - 01 21 00 Submittals, Shop Drawings, Product Data
  - 01 40 00 Standard Quality and Regulatory Requirements
  - 01 42 00 Book Use
  - 01 50 00 Temporary Facilities and Contractor Mobilization
  - 01 51 00 Access
  - 01 52 00 Clearing and Grading
  - 01 53 00 Close-out Procedures
  - 01 70 00 Operation and Maintenance
  - 01 70 00 Demonstration and Turnover
  - 01 80 00 Construction Close-out Procedures
  - 01 81 00 General Commissioning Requirements
  - 01 82 00 Facility Start Commissioning
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- Division 02 - Existing Conditions
  - 02 02 00 Rehabilitate Waste Recovery Processes
- FACILITY CONSTRUCTION**
- Division 03 - Concrete
  - 03 00 00 Concrete
- Division 04 - Masonry
  - 04 00 00 Masonry
- Division 05 - Metals
  - 05 00 00 Metals
- Division 06 - Wood, Plastic, and Composites
  - 06 00 00 Wood, Plastic, and Composites
- Division 07 - Thermal and Moisture Protection
  - 07 00 00 Thermal Protection
  - 07 01 00 Sheet Membrane Roofing
  - 07 02 00 Clay Tile Roofing
  - 07 03 00 Built-up Bituminous Roofing
  - 07 04 00 Application for Acceptance of Roofing System's Iam
  - 07 05 00 User Guide Application for Acceptance of Roofing System Form
  - 07 06 00 Roofing and Sheet Metal
  - 07 07 00 Flashing

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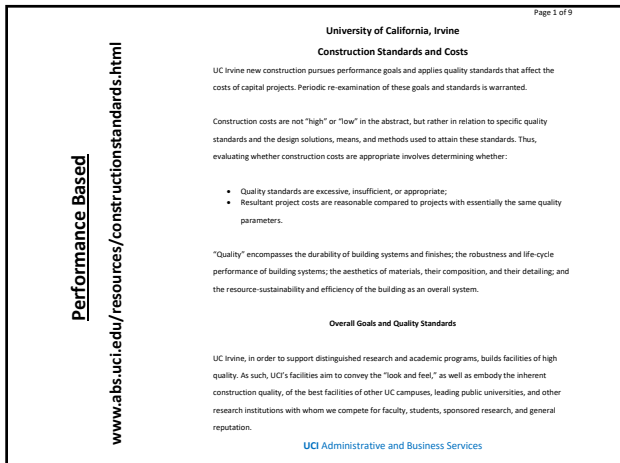


Brady University Design & Construction Standards			
Code	Section	Comments/Revisions	Response & Action Taken
000001	000001	Introduction	Standard for design requirements language
<b>Division 01 - General Requirements</b>			
010101	010101	Summary	Standard for design requirements
0110	0110	SECTION 011000 - GENERAL BUILDING REQUIREMENTS	Standard for design requirements
01110	01110	SECTION 011100 - CONSTRUCTION METHODS	Standard for design requirements
01111	01111	SECTION 011100 - CONSTRUCTION METHODS	Standard for design requirements
01112	01112	SECTION 011110 - CONSTRUCTION METHODS	Standard for design requirements
01113	01113	SECTION 011120 - CONSTRUCTION METHODS	Standard for design requirements
01114	01114	SECTION 011130 - CONSTRUCTION METHODS	Standard for design requirements
01115	01115	SECTION 011140 - CONSTRUCTION METHODS	Standard for design requirements
01116	01116	SECTION 011150 - CONSTRUCTION METHODS	Standard for design requirements
01117	01117	SECTION 011160 - CONSTRUCTION METHODS	Standard for design requirements
01118	01118	SECTION 011170 - CONSTRUCTION METHODS	Standard for design requirements
01119	01119	SECTION 011180 - CONSTRUCTION METHODS	Standard for design requirements
01120	01120	SECTION 011190 - CONSTRUCTION METHODS	Standard for design requirements
01121	01121	SECTION 011200 - CONSTRUCTION METHODS	Standard for design requirements
01122	01122	SECTION 011210 - CONSTRUCTION METHODS	Standard for design requirements
01123	01123	SECTION 011220 - CONSTRUCTION METHODS	Standard for design requirements
01124	01124	SECTION 011230 - CONSTRUCTION METHODS	Standard for design requirements
01125	01125	SECTION 011240 - CONSTRUCTION METHODS	Standard for design requirements
01126	01126	SECTION 011250 - CONSTRUCTION METHODS	Standard for design requirements
01127	01127	SECTION 011260 - CONSTRUCTION METHODS	Standard for design requirements
01128	01128	SECTION 011270 - CONSTRUCTION METHODS	Standard for design requirements
01129	01129	SECTION 011280 - CONSTRUCTION METHODS	Standard for design requirements
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01131	01131	SECTION 011300 - CONSTRUCTION METHODS	Standard for design requirements
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01135	01135	SECTION 011340 - CONSTRUCTION METHODS	Standard for design requirements
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01138	01138	SECTION 011370 - CONSTRUCTION METHODS	Standard for design requirements
01139	01139	SECTION 011380 - CONSTRUCTION METHODS	Standard for design requirements
01140	01140	SECTION 011390 - CONSTRUCTION METHODS	Standard for design requirements

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Since 1992, new buildings have been designed to achieve these five broad goals:

1. New buildings must **"create a place,"** rather than constitute stand-alone objects – forming social, aesthetic, contextually sensitive relationships with neighboring buildings and the larger campus.
2. New buildings reinforce a **consistent design framework** of classical contextual architecture, applied in ways that convey a feeling of permanence and quality, and interpreted in ways that meet the contemporary and changing needs of a modern research university.
3. New buildings employ materials, systems, and design features that will **avoid the expense of major maintenance** (defined as >1 percent of value) for 20 years.
4. New buildings attain exemplary sustainability performance – at least **LEED Gold** and outperforming California's Title 24 energy efficiency standards by as much as 50 percent.
5. Capital construction projects are designed and **delivered within the approved project budget, scope, and schedule.**

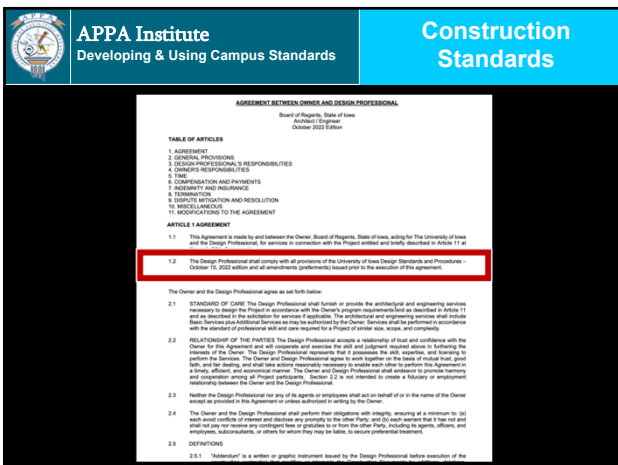
The balance of this document expresses the building performance criteria and quality standards generally outlined above, organized according to building systems component classes. Each section discusses key cost-drivers, cost-control strategies, and important cost trade-offs. Design practices cited are consistently applied, although some fall short of hard-and-fast "rules."

UCI Administrative and Business Services



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	<b>APPA Institute</b> Developing & Using Campus Standards	<b>Construction Standards</b>
<p>What about BIM?  <u>Building Information Modeling</u></p> <p>It is Changing:</p> <ul style="list-style-type: none"> <li>• Project Delivery</li> <li>• Project Documentation</li> <li>• Commissioning</li> <li>• O&amp;M Manuals</li> <li>• Building Maintenance</li> </ul>		 <p><b>800 Pound Gorilla?</b></p>

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	<b>APPA Institute</b> Developing & Using Campus Standards	<b>Process</b>
<p><u>Process Decisions</u></p> <ul style="list-style-type: none"> <li>• <u>Closed</u> <ul style="list-style-type: none"> <li>• Exclusive</li> </ul> </li> </ul> 		

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	<b>APPA Institute</b> Developing & Using Campus Standards	<b>Process</b>
<p><u>Process Decisions</u></p> <ul style="list-style-type: none"> <li>• <u>Closed</u> <ul style="list-style-type: none"> <li>• Exclusive</li> </ul> </li> <li>• <u>Open</u> <ul style="list-style-type: none"> <li>• Inclusive               <ul style="list-style-type: none"> <li>• Identify Stakeholders</li> </ul> </li> </ul> </li> </ul>		

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	<b>APPA Institute</b> Developing & Using Campus Standards	<b>Process</b>
<p><u><i>Process Decisions</i></u></p> <ul style="list-style-type: none"> <li>• <u>Closed</u> <ul style="list-style-type: none"> <li>• Exclusive</li> </ul> </li> <li>• <u>Open</u> <ul style="list-style-type: none"> <li>• Inclusive               <ul style="list-style-type: none"> <li>• Identify Stakeholders</li> <li>• Establish Format</li> </ul> </li> </ul> </li> </ul>		

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	<b>APPA Institute</b> Developing & Using Campus Standards	<b>Process</b>
<p><u><i>MSU Case Study</i></u></p> <p>July/August 2018 Facilities Manager Magazine</p> <ul style="list-style-type: none"> <li>• 10 Staff are designated: "Construction Standards Stewards"</li> <li>• Responsible for changes to standards in their "field of expertise"</li> <li>• Emphasize collaboration</li> <li>• Project teams can also make decisions w/approval</li> <li>• 100 year buildings called into question</li> </ul>		

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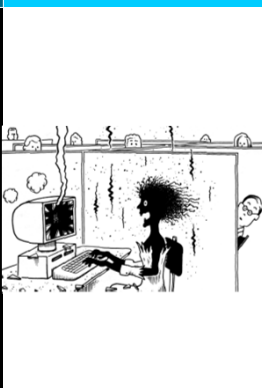
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	<b>APPA Institute</b> Developing & Using Campus Standards	<b>Format</b>
<p><u><i>Format Evolution</i></u></p> <ul style="list-style-type: none"> <li>• Word of Mouth</li> <li>• Printed</li> <li>• Electronic</li> <li>• Web Based</li> </ul>		

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 **APPA Institute**  
Developing & Using Campus Standards

**Critical Reviews**

Critical Reviews

- UCB
  - Why? Complaints about "gold plated"
  - Good Practice - 2001

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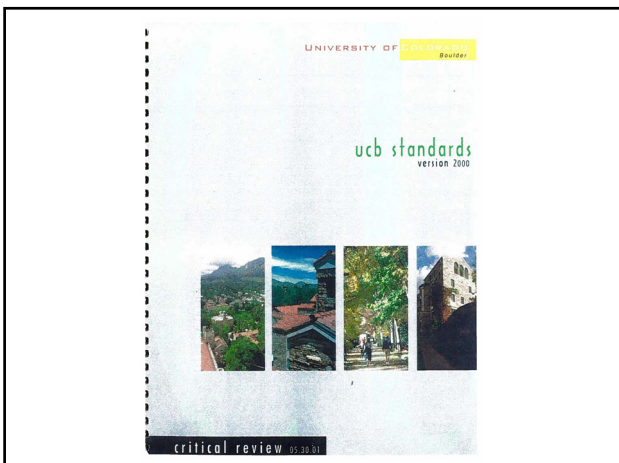
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University of Colorado at Boulder  
UCB Standards Review

June 22, 2001

**SHORT-LIST SUMMARY LIST OF ITEMS HAVING SIGNIFICANT COST SAVINGS POTENTIAL FOR THE COLLEGE OF BUSINESS AND ADMINISTRATION EXPANSION AND RENOVATION PROJECT**

Section	Part	Description	Accepted	Rejected
General Plumbing Fixture Counts	UBC Table 29A	Allow minimum required fixture counts based on an approach to calculating total occupancy acknowledging all parts of the building will not be fully occupied at the same time. For instance, it is unlikely that the Library and all Classrooms and all Social Spaces would be fully occupied simultaneously.		
0221 - Trenching, Backfilling and Compaction	Part 3.3 Item A	Allow pipe bedding to be 6-inches above pipe in lieu of 7-inches.		
0230 - Portland Cement Concrete Paving	Part 2.1 Item B	Allow the use of fly ash in the concrete.		
0265 - Water Systems	Part 2.1 Item B	Allow use of steel reinforcing in precast slabs.		
0272 - Drainage Structures and Piping	Part 2.1 Item A	Allow Class 150 PVC pipe instead of Class 200 for four-inch through twelve-inch diameter. Most jurisdictions, including Denver Water Department, allow the Class 150.		
0310 - Formwork	General	Manholes for drainage structures are specified based on pipe sizes. Most jurisdictions in this area allow four-foot diameter manholes to be used for pipe sizes of twenty-four inches and smaller. Five-foot manholes are used for pipes thirty to thirty-six inches in diameter. Allow manhole sizing on this basis.		
0330 - Cast-in-place Concrete	General	Allow use of Class B formwork tolerance for concrete exposed to public view and Class C otherwise. <del>Require the following (Emory's) Base Detail to allow the mechanical equipment to anchor to the hoodkeeping pad which is itself anchored to the structural slab.</del>		
0450 - Architectural Precast Concrete	General	Allow industry standard finishes and levellness tolerances for concrete floors with kneeholed finish.		
	Part 2.1 Item B	Delete requirement for roller seats.		
	Part 1.3 Item A1	Delete requirement for an independent testing laboratory, hired by the precaster, if the precaster is <del>is</del> certified.		
	Part 1.3 Item A, 1.1 C	Delete requirement for a UL labeled on precast products.		
	Part 2.1, Item A, 1.1 C	Relax the tolerance on embedded anchors and inserts from +/- 1/8 inch to +/- 1/4 inch.		

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**APPA Institute**  
Developing & Using Campus Standards

**Critical Reviews**

## Critical Reviews

- UCB
  - Good Practice – 2001
  - Business School - 2004
  - 20% Savings Claim
- Emory
  - Recession Driven – 2010
    - Gave us credibility
    - Deflected criticism
    - Saved money

• 53

A Critical Review of Emory Design & Construction Standards  
January 2010

A thorough review was conducted of the Emory University Design & Construction standards in an attempt to ensure that the University's standards are appropriate without being excessive. Emory has traditionally built high quality buildings to minimize future maintenance expenses, maximize its value for capital expenditures and maintain the exceptional aesthetic appeal of the campus. This initiative is meant to challenge the "status quo" and bring forward recommendations that could result in potential savings to the capital program without compromising the long term investment that the capital program represents.

This report identifies potential ideas for revisions to specific areas of the standards that should be investigated and considered. After an exploration of the ideas are completed, including the potential consequences of implementation, then revised sections of the standards should be written for implementation in the next standards updates cycle (0/10).

The sections identified for potential revisions are as follows:

Section 02.33.21 – Submittals

Our current standards require PM Global to review all of Emory's capital projects individually. While a review of our project design is an important element for risk mitigation, we should examine the process utilized to conform to this requirement.

For example:

1. Multiple sets of plans are submitted (one for each phase of development);
2. Recommendations are made on the project from PM Global that, at times, add cost and expense to the project with questionable added benefit;
3. PM Global recommendations are incorporated with very few questions since the Campus Services project managers do not feel that they have the authority to challenge the recommendations.

Recommendation: PM Global should review the Emory Design & Construction standards as a routine effort and make recommendations to embed their comments into the standards. This could replace the lengthy, time consuming and costly duplication and review of each capital project. These recommendations should be reviewed and registered between Campus Services personnel, Risk Management and PM Global. Individual project submittals should then be made available to PM Global.

Emory Design & Construction Standards Review Page 1

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A Critical Review of Emory Design & Construction Standards		
Issue	Recommendation	Outcome
<b>General</b>		
FM Global reviews are sometimes inefficient and unchallenged	Review the review process for more efficiency and challenge FM Global recommendations that do not add sufficient value	We are actively engaging FM Global with each project and questioning their recommendations with the intent of ensuring the best value to Emory while recognizing their recommendations. We have revised the review process to be more efficient and have an on the response process.
Construction lights are on all night	Require the construction lights to be turned off at night after work hours	This requirement has been added to the documents.
Amount of space dedicated to support functions in new buildings, i.e. custodial, maintenance, security, Netcom, etc. is burdensome	Streamline the actual need and amount for dedicated service space and consider some sharing of spaces. This will require broad discussion	This issue will be discussed on a project by project basis with the actual need requiring justification before implementation, rather than just default to an administrative assignment of space.
The use of expensive security screens on residence halls is expensive	Explore lower cost alternatives	The application of alternative screen materials resulted in a conclusion that this change would increase long term maintenance costs and have the potential to degrade the exterior aesthetic quality of the buildings for the residence halls and should not be pursued further.
Testing new wallboard products for wallbase	Eliminate EHSO required testing of new products and rely on manufacturer's certifications	EHSO has agreed to eliminate this requirement with the confirmation of appropriate manufacturer verification for the exclusion of asbestos in the manufacturing of their products.
Built in walk off mats are required	Use floor mats	While this was previously recommended, the USGBC has now agreed to allow EHSO credits for the use of floor mats.
Fume hood face velocity and air changes are higher than necessary	Explore reductions in the face velocity and air change requirements for fume hoods, this will require discussion with EHSO	We have worked cooperatively with EHSO to reduce the air change per hour in fume hoods (15 air changes down to 12) to consider the use of high performance fume hoods, lower operation. This change has resulted in a projected savings of \$1.2 million in capital costs and \$73,300/year savings in energy costs in the new wing project alone.
Elevator rooms require strict environmental conditions	Relax environmental requirements on elevator machine rooms	There have been some code requirements that have been relaxed recently, so our new elevator elevators will meet these relaxed requirements. We are also exploring the effects of loosening the range of allowable environmental conditions for the machine rooms so that we can utilize the most energy efficient HVAC unit or combine the unit with the VTS requirements for a more efficient and cost effective design. This is an ongoing discussion.
<b>Painting</b>		
Property and safe source requirements on many painting materials are burdensome	Broaden allowable product line	The acceptable manufacturers for these products have been expanded.
Secondary containment traps are required for laboratory vacuum systems	Confirm technician containment procedures and eliminate secondary traps	This is a secondary containment protocol that supports current technician job procedures. We should not change this in the Construction file, but we are in discussion with EHSO to see if this requirement can be relaxed in other jobs.
<b>Recycling</b>		
Light environmental controls in the design of mechanical systems	Relax allowable range of design parameters	After a great deal of research and discussion on the topic, we reached the conclusion that any changes to the accepted design parameters could result in numerous occupant complaints about light fluctuating during various weather cycles. This could lead to a perception that new systems are faulty or poorly controlled. Consequently, it was felt that a broader discussion with surrounding project stakeholders, it was felt that a broader discussion with surrounding project stakeholders would be required before implementation.
All mechanical rooms are to be served by elevators	Consider alternative building designs to eliminate the need for elevator access to all mechanical rooms	This requirement will be revised to read "The need for elevator serving mechanical rooms shall be discussed with Campus Services Engineering prior to

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Emory Design & Construction Standards 2009 Edition - Room Requirements			
	Room Name	Requirement	Notes
<b>Sustainability Requirements</b>			
Basic Program Requirements			
	Changing Rooms (USGBC LEED Credit 4.2)	0.5% of FTE	Single Occupancy ADA compliant shower and changing room
	Bicycle Storage Rooms (USGBC LEED Credit 4.2)	0.2% of FTE	Every project must consider covered bicycle storage. Emory is conscientiously locating these spaces throughout the campus and a new project may or not be required to have this space depending on
	Recycling Room (Section 01 78 23)	100 sq. ft. for 100,000 sq. ft. bldg. One recycling room per floor is required for residential projects.	10 x10 ft., close to loading dock
<b>Universal Design</b>			
Basic Program			
	Lactation Rooms	Single occupant ADA compliant room	except for residential projects. Typically located near a women's restroom.
	Single Occupant Family Restroom	Unisex ADA compliant restroom	except for residential projects. Can be used as a single changing room.
<b>Building Services, Custodial &amp; Building Maintenance</b>			
	Custodial Rooms	80 sq. ft. per floor	min. 8 ft x 10 ft.
	Custodial Support Room	Up to 50,000 sq. ft. = 10' x 10' Between 50,000 & 100,000 sq. ft. = 15'x15' Between 100,000 & 200,000 sq. ft. = 20' x 20' Over 200,000 sq. ft. = 25' x 25'	Convenient access to the loading dock. Lockable double doors are preferred.
	Custodial Staff Support Room	Up to 50,000 sq. ft. = 10' x 10' Between 50,000 & 100,000 sq. ft. = 15'x15' Between 100,000 & 200,000 sq. ft. = 20' x 20' Over 200,000 sq. ft. = 25' x 25'	
	Building Maintenance Shop	Up to 50,000 sq. ft. = 10' x 10' Between 50,000 & 100,000 sq. ft. = 15'x15' Between 100,000 & 200,000 sq. ft. = 20' x 20' Over 200,000 sq. ft. = 25' x 25'	
	Building Maintenance Office	Up to 50,000 sq. ft. = 10' x 10' Between 50,000 & 100,000 sq. ft. = 15'x15' Between 100,000 & 200,000 sq. ft. = 20' x 20' Over 200,000 sq. ft. = 25' x 25'	


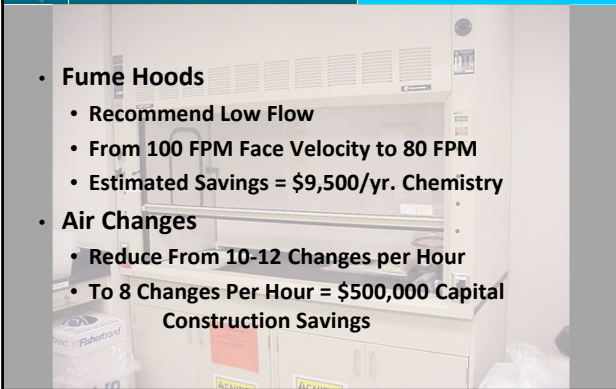
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A calculation of the cost of these spaces when applied to a new 200,000 SF building:

Changing Room (Bicycle riders)	50 SF
Bicycle Storage	100 SF
Recycling	100 SF
Lactation Room	30 SF
Unisex Restroom	30 SF
Custodial Closet	450 SF (80 per floor X 5 floors)
Custodial Support	225 SF
Custodial Staff	200 SF
Building Maintenance Shop	625 SF
Building Maintenance Office	625 SF
Attic Stock Storage	100 SF
Communications Room (Netcom)	2200 SF (110 SF per 10,000 SF floor area)
Building Security Room (access services)	80 SF
	4,815 SF

Total area required = 4,815 SF @ \$200 / SF = **\$963,000**

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	<b>APPA Institute</b> Developing & Using Campus Standards	<b>Critical Reviews</b>
 <ul style="list-style-type: none"> <li>• <b>Fume Hoods</b> <ul style="list-style-type: none"> <li>• <b>Recommend Low Flow</b></li> <li>• <b>From 100 FPM Face Velocity to 80 FPM</b></li> <li>• <b>Estimated Savings = \$9,500/yr. Chemistry</b></li> </ul> </li> <li>• <b>Air Changes</b> <ul style="list-style-type: none"> <li>• <b>Reduce From 10-12 Changes per Hour</b></li> <li>• <b>To 8 Changes Per Hour = \$500,000 Capital Construction Savings</b></li> </ul> </li> </ul>		

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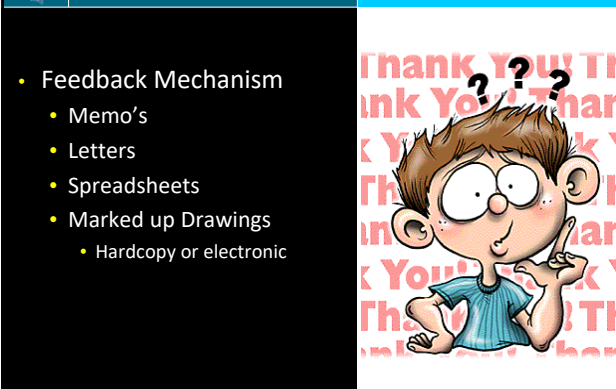
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	<b>APPA Institute</b> Developing & Using Campus Standards	<b>Process</b>
 <ul style="list-style-type: none"> <li>• <b>Feedback Mechanism</b> <ul style="list-style-type: none"> <li>• Memo's</li> <li>• Letters</li> <li>• Spreadsheets</li> <li>• Marked up Drawings               <ul style="list-style-type: none"> <li>• Hardcopy or electronic</li> </ul> </li> </ul> </li> </ul>		

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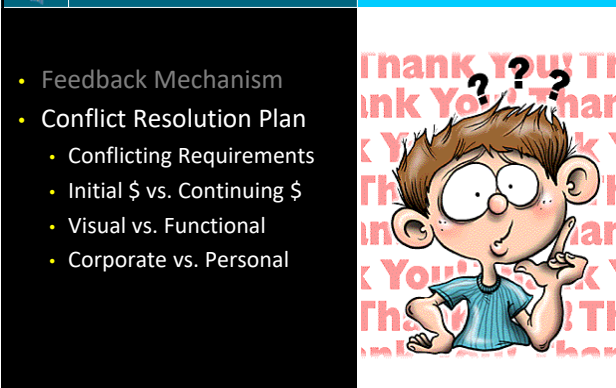
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	<b>APPA Institute</b> Developing & Using Campus Standards	<b>Process</b>
 <ul style="list-style-type: none"> <li>• <b>Feedback Mechanism</b></li> <li>• <b>Conflict Resolution Plan</b> <ul style="list-style-type: none"> <li>• <b>Conflicting Requirements</b></li> <li>• <b>Initial \$ vs. Continuing \$</b></li> <li>• <b>Visual vs. Functional</b></li> <li>• <b>Corporate vs. Personal</b></li> </ul> </li> </ul>		

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**APPA Institute**  
 Developing & Using Campus Standards

**What's Important?**



In your opinion, what one single thing can make or break the effectiveness of campus design standards?

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**APPA Institute**  
 Developing & Using Campus Standards

**Process**

- Feedback Mechanism
- Conflict Resolution Plan
  - Conflicting Requirements
  - Initial \$ vs. Continuing \$
  - Visual vs. Functional
  - Corporate vs. Personal
- Plan Reviews
  - Collaboration between PDC and Operations



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**APPA Institute**  
 Developing & Using Campus Standards

**Plan Reviews**

Purpose of Plan Reviews

- Ensures Standards are Followed
- Confirm / Challenge Design



Some Choices are Tough!

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### Plan Reviews

#### Purpose of Plan Reviews

- Ensures Standards are Followed
- Confirm / Challenge Design
- Code Review



Some Choices are Tough!

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### Plan Reviews

#### Purpose of Plan Reviews

- Ensures Standards are Followed
- Confirm / Challenge Design
- Code Review
- Match Situation w/ Standards
- Shares Experiences



Some Choices are Tough!

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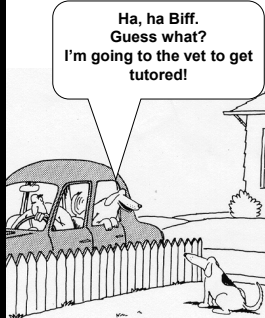
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### Plan Reviews

#### Benefits of Plan Reviews

- Involve Stakeholders
- Ensures Quality
- Establish Expectations
- Verify Results
- Develops Process



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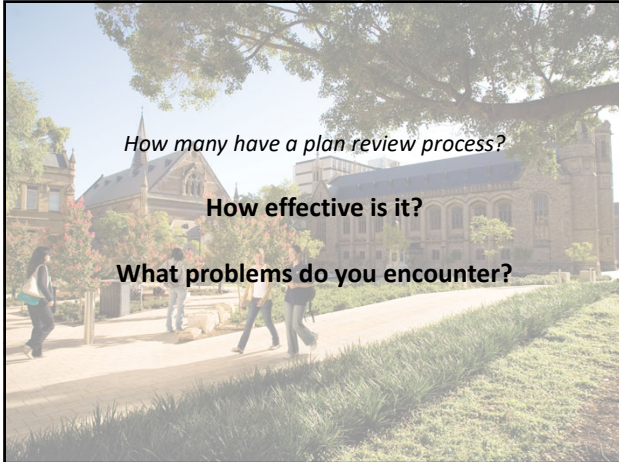
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 <p><b>APPA Institute</b> Developing &amp; Using Campus Standards</p>	<p><b>Process</b></p>
<p><b><u>UT Austin Case Study</u></b> Kate Haenchen</p> <ul style="list-style-type: none"><li>• 5+/- Staff are designated: <u>"Plan Review Team"</u></li><li>• Responsible for plan reviews in their "field of expertise"</li><li>• Emphasize collaboration</li><li>• In place for 3+ years</li><li>• &lt; 5% construction change orders</li></ul>	

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**APPA Institute**  
Developing & Using Campus Standards

Plan Reviews

- Mandated / Sanctioned from top
- Expectations clearly delineated
- Process benefits participants
- Front line input/empowerment
- Follow-up
- Collaborative environment
- Training 2X annually

**Why Does it Work?**



What, me worry?

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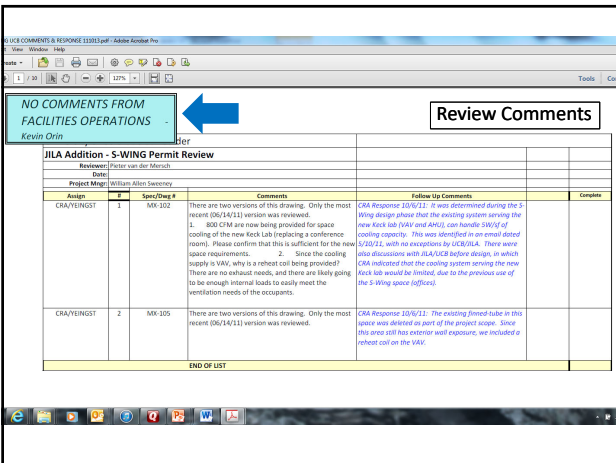
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Assign	Spun/Dwg #	Comments	Follow Up Comments	Complete
CRAVENGT	1 MK-302	There are two versions of this drawing. Only the most recent (06/14/11) version was reviewed. 1. 800 CFM are now being provided for space cooling of the new Rack Lab (replacing a conference room). Please confirm that this is sufficient for the new space requirements. 2. Since the cooling largely is VAV, why is a reheat coil being provided? There are no exhaust needs, and there are likely going to be enough internal loads to easily meet the ventilation needs of the occupants.	CRK Response 10/16/11: It was determined during the 5-Wing design phase that the existing system serving the new Rack Lab (VAV and AHU), can handle SW/SE of cooling capacity. This was identified in an email dated 1/20/11, with no exceptions by UC/UC/LA. There were also discussions with JILA/UCB before design, in which CRK indicated that the cooling system serving the new Rack Lab would be limited, due to the previous use of the 5-Wing space (offices).	
CRAVENGT	2 MK-305	There are two versions of this drawing. Only the most recent (06/14/11) version was reviewed.	CRK Response 10/16/11: The existing lined tube in this space was deleted as part of the project scope. Since this area still has exterior wall exposure, we included a reheat coil on the VAV.	
END OF LIST				

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Schematic Design Package		Review Comments				
To:	Greg Johnson	Date:	8/27/07			
Company:	Newcomb & Boyd Suite 525 303 Peachtree Center Ave. NE Atlanta, GA 30308-1277	From:	Bill Chaffee			
Emory Project #:	Clinic Utilizes Relocation	Address:	Emory University 301 FM Drive Atlanta, GA 30322			
Emory Building ID #:	n/a					
Item No.	From	Date Rec'd	Sheet/ Spec #	Comment/Issue	Response	Date Action Required
SD-1	H Manchester	1/3/06	MS.1	Example Text		
SD-2	T Bozeman	1/13/07	SS.1	Example Text		

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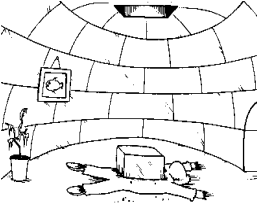
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 <b>APPA Institute</b> Developing & Using Campus Standards	Standards
	<b><u>Standards Utilization</u></b> <ul style="list-style-type: none"> <li>• Guide Only           <ul style="list-style-type: none"> <li>• Oops list/hot buttons</li> </ul> </li> </ul> 

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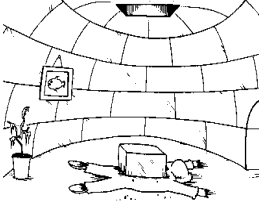

**APPA Institute**  
 Developing & Using Campus Standards

**Standards**

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***Standards Utilization***

- Guide Only
- Doesn't Relieve Consultants
  - Codes
  - Standard of Care
  - Professional Judgment
- Professional Duty



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**APPA Institute**  
 Developing & Using Campus Standards

**Standards**

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Should Deviations be Allowed?

If so...

Under What Conditions?

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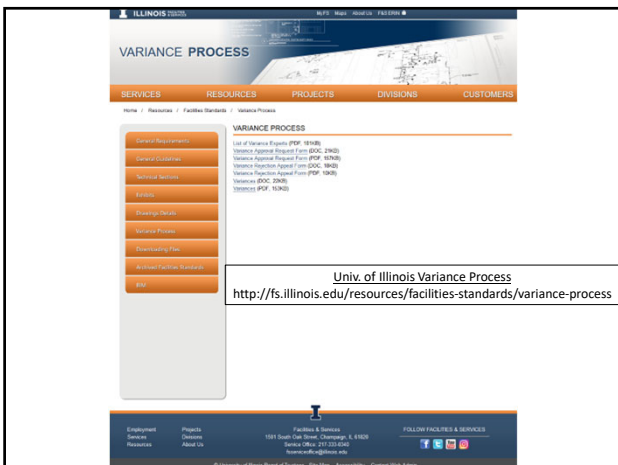
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ILLINOIS STATE UNIVERSITY  
 VARIANCE PROCESS  
 SERVICES RESOURCES PROJECTS DIVISIONS CUSTOMERS  
 Home / Resources / Facilities Standards / Variance Process  
 VARIANCE PROCESS  
 List of Variance Types (PDF, 187KB)  
 Variance Approval Request Form (DOC, 204KB)  
 Variance Approval Request Form (PDF, 167KB)  
 Variance Approval Request Form (DOC, 194KB)  
 Variance Approval Request Form (PDF, 154KB)  
 Variance (DOC, 204KB)  
 Variance (PDF, 103KB)

Univ. of Illinois Variance Process  
<http://fs.illinois.edu/resources/facilities-standards/variance-process>

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**Facilities Management DEVIATION REQUEST FORM**  
**Design & Construction**

Deviation Request Number: \_\_\_\_\_

This form shall be used by the Design Professional to request a deviation from the Design Standards & Procedures and must be completed prior to the Bidding Phase. Please complete and return via email to the UI Design Project Manager.

Date: \_\_\_\_\_ Project Phase: \_\_\_\_\_ (01, 02, 03)

UI Project Name: \_\_\_\_\_

UI Project Number: \_\_\_\_\_ Owner's Design Project Manager: \_\_\_\_\_

Design Professional (DP): \_\_\_\_\_ DP Representative: \_\_\_\_\_ (first and last name)

Email Address: \_\_\_\_\_ Phone: \_\_\_\_\_

Design Standards Edition: \_\_\_\_\_ Section Number: \_\_\_\_\_ Page Number: \_\_\_\_\_

Description of Deviation: (attach additional page(s) as needed)

Justification for Deviation Request: (attach additional page(s) as needed) Include Total Cost of Ownership Comparison

Attachment List: \_\_\_\_\_ Total number of pages attached: \_\_\_\_\_

**Reviewed / Approved By:**

Response Code: **NA** - reviewed & approved, **NK** - not applicable, **NO** - reviewed as noted, **BR** - review & re-submit, **NR** - not recommended

UI _____	UI _____	UI _____	UI _____
(Department Name)	(Department Name)	(Department Name)	(Department Name)
Response	Response	Response	Response
Signature & Date	Signature & Date	Signature & Date	Signature & Date

\*RHS, UII (then FMS), Public Safety (then VPS), Fire & Life Safety (then Ambulance), and FMS (then North) are required for main campus deviations.  
 \*Campus Management, Engineering Services, and Safety & Security required for OLC deviations.  
 \*Include all other project stakeholders impacted: P&T, IT, Campus Planning, HCOL, etc.

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**APPA Institute**  
 Developing & Using Campus Standards

**Standards**

### What Challenges do We Face?

- Technology
  - WiFi
  - A/V
- New Learning Pedagogies
- Advancements in Products
- Enforcement
- Commissioning Agent!




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**APPA Institute**  
 Developing & Using Campus Standards

**Standards**

### Why Aren't They Followed?

- Too Long
- Too Detailed
- Can Override Design Ideas
- Can Deflect Liability
- Might Be Outdated




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Compliance

Ensure Compliance?

- Contractual Obligation
- Shared Cost
- Be Reasonable
- Don't Use as Specifications



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How Often Should You Update?

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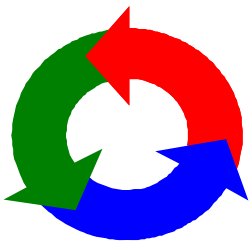
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Updates

Updates

- Continuous
- Semi-Annual
- Annual
- Formal vs. Informal



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**CHANGE REQUEST FORM**

This form shall be used to request a change to the UI Design Standards & Procedures manual. Please complete and return via e-mail for further consideration:

Facilities Management – Design Standards & Procedures  
 Attn: Mike Kearns  
 200 UOB  
 Iowa City, IA 52242  
[michael.kearns@uiowa.edu](mailto:michael.kearns@uiowa.edu)

Requestor's First and Last Name: \_\_\_\_\_ Date: \_\_\_\_\_  
 Department Name: \_\_\_\_\_  
 Email address: \_\_\_\_\_ Phone: \_\_\_\_\_  
 Design Standards Edition: \_\_\_\_\_ Section Number: \_\_\_\_\_ Page Number: \_\_\_\_\_

**Change suggested:**  
 Please use additional paper or the back of this form to provide as much detail as possible (if needed).

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Justification:  
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Reviewed and Approved for Submittal by: \_\_\_\_\_  
(Signature of Requestor, Department's AD or Director)

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Questions

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