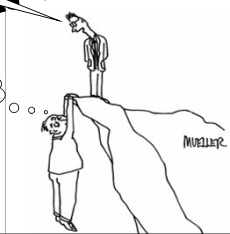






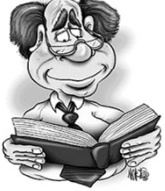




 <p>APPA Institute Developing & Using Campus Standards</p>	<p style="text-align: center;">Now repeat after me: <i>I will use your campus standards, I will use your campus standards, I will use.....</i></p> <h1 style="font-size: 2em; transform: rotate(-15deg);">Designing to Campus Standards</h1> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"> <p style="font-size: 0.8em;">I hate working for universities!</p> </div>  </div> <p style="font-size: 0.8em;">Steven C. Thweatt Vice Chancellor for Administration (emeritus) University of Colorado at Boulder Steven.thweatt@colorado.edu (720) 525-8638</p>
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 <p>APPA Institute Developing & Using Campus Standards</p>	<div style="display: flex;"> <div style="flex: 1;">  <p>Fun in the air</p> </div> <div style="flex: 1;">  <p>Grandson's first fish</p> </div> </div> <div style="margin-top: 10px;"> <p>Quit to the journey</p> </div> <div style="margin-top: 10px;"> <ul style="list-style-type: none"> • Licensed Architect <ul style="list-style-type: none"> • Colorado • Georgia • North Carolina • Louisiana • Private Practice 15 years • Higher Education 27+ Years <ul style="list-style-type: none"> • <u>Duke University</u> -6 Years <ul style="list-style-type: none"> • Director Facilities Design Office • Assistant Dean Facilities • <u>Emory University</u> - 5-1/2 Years <ul style="list-style-type: none"> • AVP PDC • <u>University of Colorado</u> -16 Yrs. <ul style="list-style-type: none"> • Director PDC • Campus Architect • AVC FM • VC Administration </div>
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 <p>APPA Institute Developing & Using Campus Standards</p>	<h2 style="text-align: center;">Outcomes</h2> <div style="display: flex;"> <div style="flex: 1; padding-right: 10px;"> <p>What Are Standards?</p> <p>Why Have Standards?</p> <p>How Do You Develop Them?</p> <p>Who Are Stakeholders?</p> <p>How Are They Integrated?</p> <p style="padding-left: 20px;">How To Create Feedback?</p> <p style="padding-left: 20px;">How Do You Revise Them?</p> <p>How Do You Insure Their Use?</p> </div> <div style="flex: 1; text-align: center;">  </div> </div>
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	APPA Institute Developing & Using Campus Standards	Definitions
<h1 style="text-align: center;">What are Campus Standards?</h1> <div style="text-align: center;">  </div> <p style="text-align: center;"> <i>"Describe & set forth procedures, policies, <u>guidelines</u> and codes which the institution believes to be representative of <u>desirable practices</u>"</i> </p>		

	APPA Institute Developing & Using Campus Standards	What's Involved?
<div style="display: flex; align-items: center; justify-content: center;">  +  </div> <p style="margin-top: 20px;"> <u>What's Involved?</u> Time Commitment Resource Commitment Measurable ROI Negotiate Outcomes </p>		

	APPA Institute Developing & Using Campus Standards	Benefits
<div style="display: flex;"> <div style="flex: 1;"> <p><u>Benefits of Standards?</u></p> <div style="font-size: 4em; text-align: center; margin: 20px 0;">?</div> <p style="text-align: center;"><u>To Standardize or <u>Not</u> to Standardize</u> <i>That is the Question !</i></p> </div> <div style="flex: 2;"> <ul style="list-style-type: none"> • <u>Advantages</u> <ul style="list-style-type: none"> • Stakeholders Satisfied • Protects Institutional Interests • Builds Bridges • Pays Dividends <ul style="list-style-type: none"> • Less time educating consultants • Insures higher quality facilities • Increases consistency • Reduces maintenance needs </div> </div>		

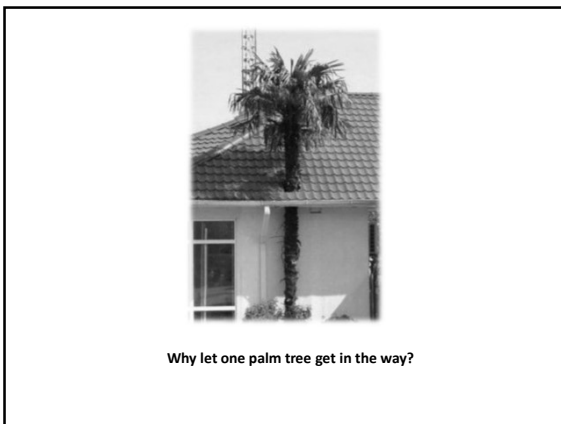
	APPA Institute Developing & Using Campus Standards	Benefits
<div style="display: flex; justify-content: space-between;"> <div style="width: 30%;"> <p><u>Benefits of Standards?</u></p> <p style="font-size: 48px; text-align: center;">?</p> <p><u>To Standardize or Not to Standardize</u> <i>That is the Question !</i></p> </div> <div style="width: 65%;"> <ul style="list-style-type: none"> • <u>Advantages</u> <ul style="list-style-type: none"> • Stakeholders Satisfied • Protects Institutional Interests • Builds Bridges • Pays Dividends • <u>Disadvantages</u> <ul style="list-style-type: none"> • Time Consuming • Costly and Drives up Overhead • Complicates Process </div> </div>		



	APPA Institute Developing & Using Campus Standards	Problems
<div style="display: flex; justify-content: space-between;"> <div style="width: 30%;"> <p><u>Problems W/Out Standards</u></p> <ul style="list-style-type: none"> • High Maintenance Costs </div> <div style="width: 65%;"> </div> </div>		



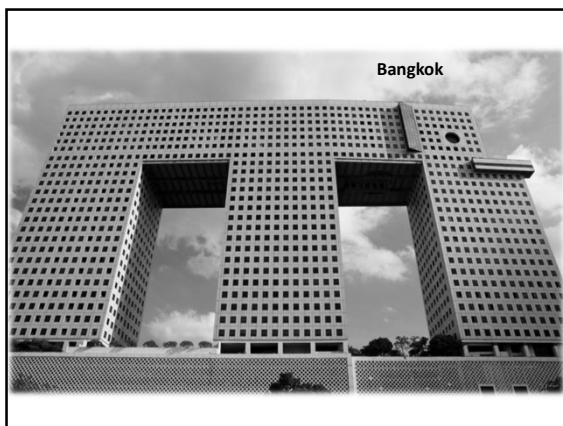






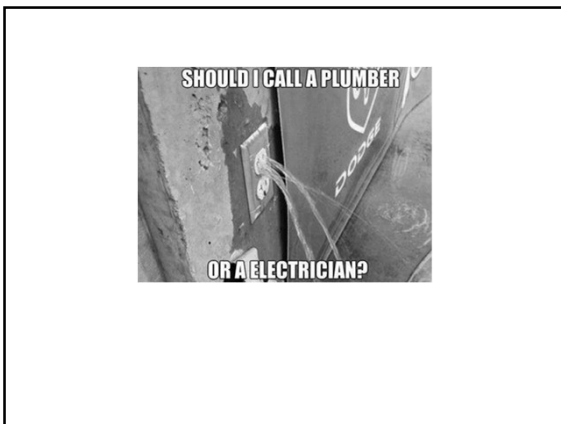
 <p>APPA Institute Developing & Using Campus Standards</p>	<p>Problems</p>
<p><u>Problems W/Out Standards</u></p> <ul style="list-style-type: none">• High Maintenance Costs• Bad Design	











	APPA Institute Developing & Using Campus Standards	Problems
<p><u>Problems W/Out Standards</u></p> <ul style="list-style-type: none">• High Maintenance Costs• Bad Design• Shortened Life Span<ul style="list-style-type: none">• Product performance and longevity not always design criteria		<p>I just remembered that I forgot that roof detail !</p> <p>Get a life dear!</p>

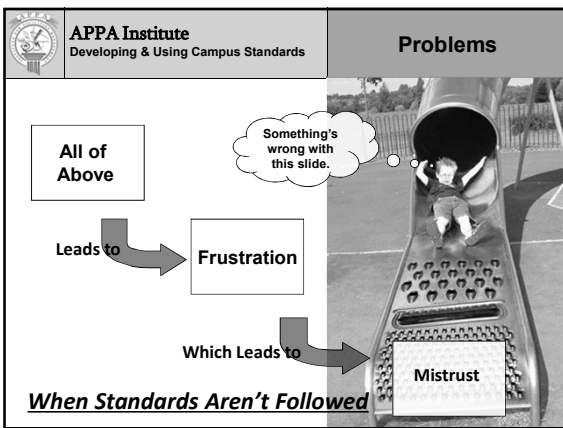


 <p>APPA Institute Developing & Using Campus Standards</p>	Problems
<p><u><i>Problems W/Out Standards</i></u></p> <ul style="list-style-type: none">• High Maintenance Costs• Bad Design• Shortened Life Span• No Continuity<ul style="list-style-type: none">• Dozens of parts needed	

	<p>Problems Can Develop Without Standards</p> 
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	<p>Problems Can Develop Without Standards <small>Dallas</small></p>
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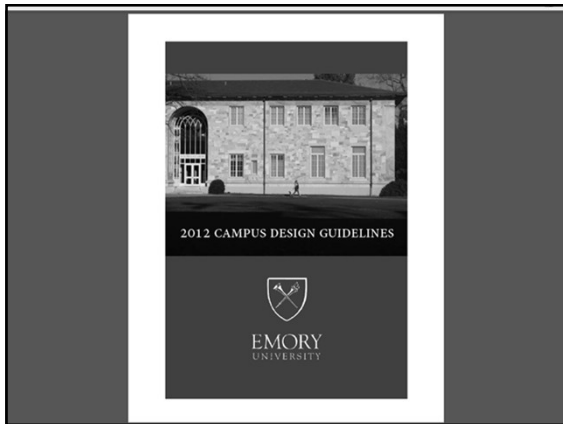


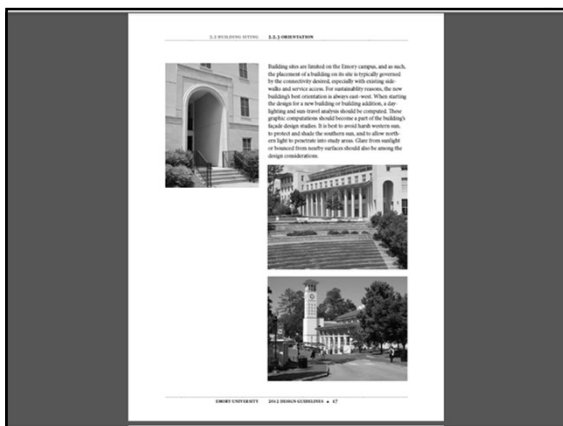


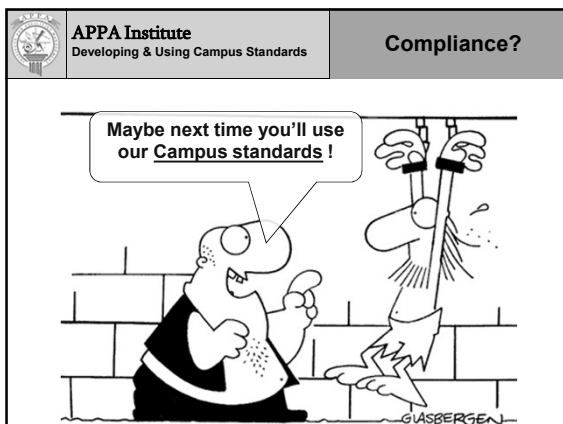


	APPA Institute Developing & Using Campus Standards	Standards
<ul style="list-style-type: none"> • <u>Design</u> <ul style="list-style-type: none"> Policies Graphics • <u>Construction</u> <ul style="list-style-type: none"> Systems Products 		<p>History has forgotten Lambini & Sons who are credited with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

	APPA Institute Developing & Using Campus Standards	Design Standards
<ul style="list-style-type: none"> • Design Philosophy <ul style="list-style-type: none"> • Quality • Process • Aesthetics • Planning Principles • Owner Responsibilities • Design Submittals <ul style="list-style-type: none"> • Submittal Requirements • Contract Forms 		







Performance Based
www.abs.uci.edu/resources/constructionstandards.html

Page 1 of 9

**University of California, Irvine
Construction Standards and Costs**

UC Irvine new construction pursues performance goals and applies quality standards that affect the costs of capital projects. Periodic re-examination of these goals and standards is warranted.

Construction costs are not "high" or "low" in the abstract, but rather in relation to specific quality standards and the design solutions, means, and methods used to attain these standards. Thus, evaluating whether construction costs are appropriate involves determining whether:

- Quality standards are excessive, insufficient, or appropriate;
- Resultant project costs are reasonable compared to projects with essentially the same quality parameters.

"Quality" encompasses the durability of building systems and finishes; the robustness and life-cycle performance of building systems; the aesthetics of materials, their composition, and their detailing; and the resource-sustainability and efficiency of the building as an overall system.

Overall Goals and Quality Standards

UC Irvine, in order to support distinguished research and academic programs, build facilities of high quality. As such, UCI's facilities aim to convey the "look and feel," as well as embody the inherent construction quality, of the best facilities of other UC campuses, leading public universities, and other research institutions with whom we compete for faculty, students, sponsored research, and general reputation.

UCI Administrative and Business Services

Performance Based
www.abs.uci.edu/resources/constructionstandards.html



Page 2 of 9



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."

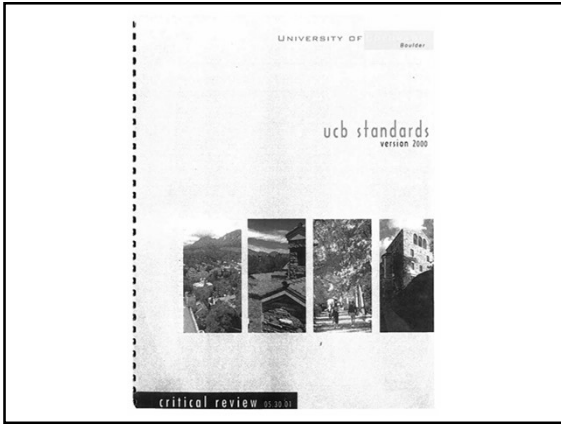
UCI Administrative and Business Services

 <p>APPA Institute Developing & Using Campus Standards</p>	<p>Construction Standards</p>
<p style="text-align: center;">What about BIM? <u>B</u>uilding <u>I</u>nformation <u>M</u>odeling</p> <p>It is Changing:</p> <ul style="list-style-type: none"> • Project Delivery • Project Documentation • Commissioning • O&M Manuals • Building Maintenance 	 <p style="text-align: center;">800 Pound Gorilla?</p>

	APPA Institute Developing & Using Campus Standards	Process
<p style="text-align: center;"><u>Process Decisions</u></p> <ul style="list-style-type: none"> • <u>Closed</u> <ul style="list-style-type: none"> • Exclusive <div style="display: flex; justify-content: space-around; font-size: 8px;"> <div> <p>STANDARDS MEETING: EACH OF YOU HAS BEEN CHOSEN TO REPRESENT THE INTERESTS OF YOUR RESPECTIVE COMPANIES.</p> </div> <div> <p>AS YOU KNOW, THE BEST WAY TO CREATE STANDARDS IS TO PUSH TOGETHER A BUNCH OF MUTUALLY EXCLUSIVE PREFERENCES.</p> </div> <div> <p>I HOPE I'M NOT THE ONLY ONE WHO'S JOINED THIS GROUP JUST FOR THE LAUGHS.</p> </div> </div>		

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

	APPA Institute Developing & Using Campus Standards	Critical Reviews
<p style="text-align: center;">Critical Reviews</p> <ul style="list-style-type: none"> • UCB <ul style="list-style-type: none"> • Why? Complaints about "gold plated" • Good Practice - 2001 		



University of Colorado at Boulder June 22, 2001
UCB Standards Review

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

Section	Part	Description	Accepted	Rejected
General Planning Future Costs	1.16 Table 27A	Allow minimum regional future costs based on an approach to calculating final 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.		
10201 Landfilling Backfilling and Compaction	Part 1.1 Item A	Allow pipe bedding to be maximum above pipe in lieu of 12-inches.		
10202 Portland Concrete	Part 2.1 Item B	Allow the use of fly ash in the concrete.		
10203 Concrete Paving	Part 2.1 Item A	Allow use of steel reinforcing in pavement slabs.		
10203 Water Systems	Part 2.1 Item B	Allow Class 150 PVC pipe instead of Class 200 for flow only through main-line diameters. Most jurisdictions, including Denver Water Department, allow for Class 150.		
10204 Drainage Structures and Piping	Part 2.1 Item A.3	Minimum 18" drainage structures are specified based on pipe size. Most jurisdictions in this area allow for 18" diameter manholes to be used for pipe sizes of twenty-four inches and smaller. Four-foot manholes are used for pipes thirty to thirty-six inches in diameter. Allow manholes using on this height.		
10300 Footcure	General	Allow use of Class B Recrecrete in place of concrete exposed to public view and Class C for interior or unexposed concrete.		
10300 Cast-in-place Concrete	General	Review the Reinforcing Schedule Item 1.14 to allow the mechanical equipment to be anchored to the reinforcing pad which is itself anchored to the structural slab.		
	General	Allow industry standard Review and review of ledgers for concrete forms with bonded finish.		
10400 Architectural Finish Concrete	Part 2.1 Item B	Detail Requirements for water stains.		
	Part 1.3 Item A.1	Detail requirements for an independent testing laboratory based on the procedure. If the procedure is not confirmed.		
	Part 1.3 Item A.1	Detail requirements for a U.S. based on process products.		
	Part 2.1 Item A.1	Detail the tolerance on embedded anchors and inserts from concrete to steel anchors.		

UNIVERSITY OF COLORADO
AT
BOULDER


CRITICAL REVIEW
OF
UCB STANDARDS – VERSION 2004
TOWARDS CREATING
“UCB STANDARDS LITE”

November 5, 2004


Prepared by:



Shaffer Beason Engineering 7513 West Jefferson Avenue Suite 250 Lakewood, Colorado 80225 303-986-8100 Phone 303-986-8122 FAX	Davis Partnership Architects 2301 Blake Street Suite 100 Denver, Colorado 80205 303-861-8255 Phone 303-861-8267 FAX
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Again in 2004



 <p>APPA Institute Developing & Using Campus Standards</p>	<p>Critical Reviews</p>
<p>Critical Reviews</p> <ul style="list-style-type: none"> • UCB <ul style="list-style-type: none"> • Good Practice - 2001 • Business School - 2004 • 20% Savings Claim 	



<p>University of Colorado at Boulder UCB Standards - Version 2004</p> <p>SCOPE OF REVIEW: Review of the University of Colorado at Boulder (UCB) Construction Standards, Version 2004 has been conducted in accordance with Shafiq Hossain's proposal letter dated August 16, 2004.</p> <p>The focus of this review is to suggest changes that create a revised set of building and construction standards titled "UCB Standards Lite" that are intended to result in cost savings for suitable construction projects. Therefore, the committee focuses on all future UCB work. Review and corrections of references to outdated national standards, grammatical errors, and numbering/sequence errors were not requested, but are occasionally indicated in the comments.</p> <p>GENERAL COMMENTS: The current standards described a construction specification as carefully written. "UCB Standards Lite" should be unique to construction on UCB projects that are not required to implement the full standards. These include items that affect:</p> <ul style="list-style-type: none"> • Building Aesthetics • Materials • Design Criteria • Durability • Maintenance <p>These "standards" are found in the sections and should be retained, but the normal up-to-date content may absorb discussion and consideration for omission. A simplification in format, and elimination of unnecessary information should reduce the cost of implementing the "lighter" version of the standards and highlight the important content - those items unique to the campus.</p> <p>A comprehensive review and evaluation of LEEDs certification requirements as they may pertain to the standards is beyond the scope of this review. However, some comments were made in response to some references to LEEDS requirements in Division 15. The University may want to further consider the cost impact of LEEDS requirements as they pertain to "Standards Lite."</p> <p>Division 1 - General requirements were also excluded from the scope of this review. Here again the University may want to further consider reviewing these General Requirements, as well as any potential cost saving that might be realized in a "Standards Lite" version of the General Requirements.</p> <p>TESTING AND INSPECTION STANDARDS: Many of the sections include testing requirements. Most testing details are already covered in the building code and should not be included in the Standards. Special, project-specific, testing requirements should be developed by each Design Team on a project-by-project basis. The Standards should include Section 01400, Quality Control, to address the fact that the University will have the testing agency to perform quality assurance testing and special inspections on the following materials:</p>	<p style="text-align: right;">November 5, 2004 CRITICAL REVIEW</p>
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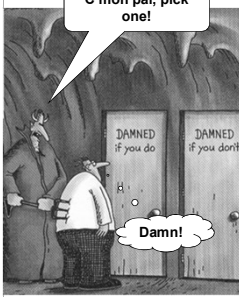
 <p>APPA Institute Developing & Using Campus Standards</p>	<p>Critical Reviews</p>
<p>Critical Reviews</p> <ul style="list-style-type: none"> • UCB <ul style="list-style-type: none"> • Good Practice - 2001 • Business School - 2004 • 20% Savings Claim • Emory <ul style="list-style-type: none"> • Recession Driven - 2010 <ul style="list-style-type: none"> • Gave us credibility • Deflected criticism • Saved money 	

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



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


	APPA Institute Developing & Using Campus Standards	What's Important?
 <p>In your opinion, what <u>one single thing</u> can make or break the effectiveness of campus standards?</p>		



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

	APPA Institute Developing & Using Campus Standards	Plan Reviews
<p><u>Purpose of Plan Reviews</u></p> <ul style="list-style-type: none"> • Insures Standards are Followed • Confirm / Challenge Design 		 <p>Some Choices are Tough!</p>

 <p>Some designs need to be challenged</p>

 APPA Institute Developing & Using Campus Standards	Plan Reviews
<p><u>Purpose of Plan Reviews</u></p> <ul style="list-style-type: none">• Insures Standards are Followed• Confirm / Challenge Design• Code Review	 <p>Some Choices are Tough!</p>



<p>Possible code issue? You be the judge...</p>	
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 APPA Institute Developing & Using Campus Standards	Plan Reviews
<p><u>Purpose of Plan Reviews</u></p> <ul style="list-style-type: none">• Insures Standards are Followed• Confirm / Challenge Design• Code Review• Match Situation w/ Standards• Shares Experiences	 <p>Some Choices are Tough!</p>





	APPA Institute Developing & Using Campus Standards	Plan Reviews
<p><u>Benefits of Plan Reviews</u></p> <ul style="list-style-type: none"> • Involve Stakeholders • Insures Quality • Establish Expectations • Verify Results • Develops Process 		

	Review Reminders for Project Managers
<p><u>Program Plan Review:</u></p> <ol style="list-style-type: none"> 1. Do the scope and budget match? 2. Have relationships to other construction projects (if applicable) been identified? 3. How is the "constructability" (construction feasibility)? Is staging adequately addressed? 4. Have any necessary parts of the project been left out? <p><u>Schematic Design Review:</u></p> <ol style="list-style-type: none"> 1. Is the estimate accurate? Is it within the budget? (Be sure the budget is current and correctly formatted.) 2. Is schematic design complete? 3. How is the "constructability" (construction feasibility)? 4. Do the plans comply with major code provisions (especially UBC)? <p><u>Design Development Review:</u></p> <ol style="list-style-type: none"> 1. Is the project within budget? 2. Are the drawings and outline specifications complete to Design Development standard? 3. Is there good coordination of disciplines? 4. Is construction of this project reasonable as proposed? 	

 <p>APPA Institute Developing & Using Campus Standards</p>	<p>Plan Reviews</p>
<ul style="list-style-type: none"> • Plan Review Coordinator <ul style="list-style-type: none"> • Part time retiree • Email request for plan review • Log the request • Establish due date • Check for required information • Reviewers log-in each morning to check for new notices • Plan review room w/30" HD monitor (all electronic) 	<p><i>Current Process</i></p> 



 <p>APPA Institute Developing & Using Campus Standards</p>	<p>Plan Reviews</p>
<ul style="list-style-type: none"> • Plan Review Coordinator <ul style="list-style-type: none"> • Part time retiree • Email request for plan review • Log the request • Establish due date • Check for required information • Reviewers log-in each morning to check for new notices • Plan review room w/30" HD monitor (all electronic) • PRC checks deadlines • Emails comments to PM's • 3-5 day turnaround 	<p><i>Current Process</i></p> 




	APPA Institute Developing & Using Campus Standards	Standards
<p><u>Standards Utilization</u></p> <ul style="list-style-type: none"> • Guide Only • Doesn't Relieve Consultants <ul style="list-style-type: none"> • Codes • Standard of Care • Professional Judgment • Professional Duty 		

	APPA Institute Developing & Using Campus Standards	Standards
<p style="text-align: center;">Should Deviations be Allowed?</p> <p style="text-align: center;">If so...</p> <p style="text-align: center;">Under What Conditions?</p>		



	<p>APPA Institute Developing & Using Campus Standards</p>	<p>Standards</p>
<p><u><i>Why Aren't They Followed?</i></u></p> <ul style="list-style-type: none"> • Too Long • Too Detailed • Can Override Design Ideas • Can Deflect Liability • Might Be Outdated 		

	<p>APPA Institute Developing & Using Campus Standards</p>	<p>Compliance</p>
<p><u><i>Insure Compliance?</i></u></p> <ul style="list-style-type: none"> • Contractual Obligation • Shared Cost • Be Reasonable • Don't Use as Specifications 		

	APPA Institute Developing & Using Campus Standards	Updates
<p><u>Updates</u></p> <ul style="list-style-type: none">• Continuous• Semi-Annual• Annual• Formal vs. Informal		