

## DESIGNING FOR MAINTAINABILITY



### 442 Designing for Maintainability

PRESENTED BY  
**Joel K. Sims, AIA**



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Credit(s) earned on completion of this course will be reported to American Institute of Architects (AIA) Continuing Education Session (CES) for AIA members.

Certificates of Completion for both AIA members and non-AIA members are available upon request.

Questions related to specific materials, methods, and services will be addressed at the conclusion of this presentation.

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## COURSE DESCRIPTION

### #442 Designing for Maintainability

Aesthetics and maintenance both play an integral role in facility design.

We will evaluate facilities and look at designs that work and others that do not. As part of the design team you will become an integral part of the team and become a "DESIGNER".

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## Learning Objectives

1. Discuss procedures to assure campuses achieve the best value from investment in new or renovated facilities.
2. Discuss how to understand balance between aesthetics and durability
3. Discuss the evaluation of facility designs based on life cycle costs
4. Discuss what questions to ask during design process to create an overall better product

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## MAINTENANCE:

1. The act of maintaining; the state of being maintained.
2. The upkeep of property and equipment.

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Merriam-Websters

## DESIGN:

1. To create, fashion, execute, or construct according to plan.

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Merriam-Websters

**D** O BECOME PART OF THE DESIGN TEAM

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GOSHEN COLLEGE




**PHYSICAL PLANT  
MISSION STATEMENT**

- Our Mission is to support and serve the mission of Goshen College.
- To provide a pleasant and safe environment that is conducive to learning in a Christian community by maintaining college buildings, grounds, and equipment through the professional and disciplined management of physical, financial, and human resources.
- To respond to the needs of students, faculty, and staff through excellence in support services.
- To support student employees by modeling positive work ethics and providing real-life work experience as part of their education.
- To accomplish these goals together through cooperation, support, and respect.

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YOUR COLLEGE



**PHYSICAL PLANT  
MISSION STATEMENT**

- Our Mission is to support and serve the mission of our college and the prestigious architectural firm they have retained for design services.
- To respond to the needs of the architect, realizing that the building may win numerous design awards.
- To exert our creativity in trying to understand how to clean so many different building materials in hard to reach locations.
- To work diligently towards the key project milestone date: The day the architectural photographer shows up to take pictures!
- To try hard to believe that the design of this campus building will finally transform the way college students behave once and for all.

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**D** O BECOME PART OF THE DESIGN TEAM

**E** STABLISH A MAINTENANCE/ OPERATION PROGRAM

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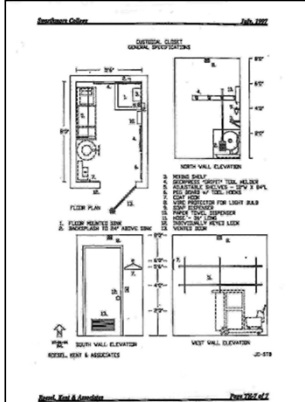
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**D** O BECOME PART OF THE DESIGN TEAM

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**S** ELECT THE RIGHT PRODUCTS

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## SELECTING THE RIGHT PRODUCT

**1. DURABILITY**  
Will it handle the day-to-day abuse a vandalism of your students?

**6. A.R.A. COMPLIANCE**  
Is it universally accessible?

**2. LONGEVITY**  
How long will it last?  
Examine life-cycle costs

**7. APPLICATION**  
Is it the right product for your specific application?

**3. SAFETY**  
Is the product safe for the environment?  
Does it have sharp edges, breakable ends, etc?

**8. INSTALLATION**  
Are there special installation requirements?  
Who will install it?

**4. FIRE-RESISTANT**  
Will it burn? If so, what precautions can be taken to make it more fire-resistant?

**9. WARRANTY**  
What is covered?  
Is service available locally?

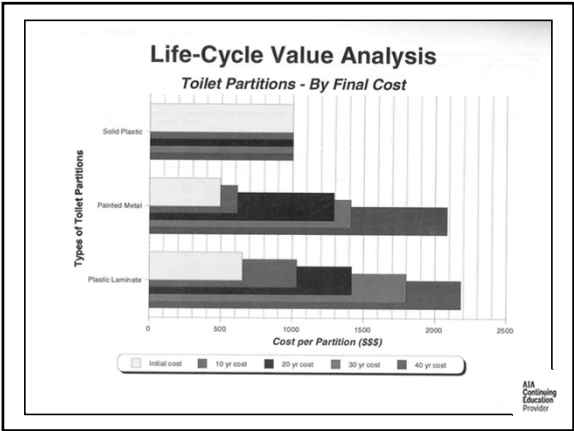
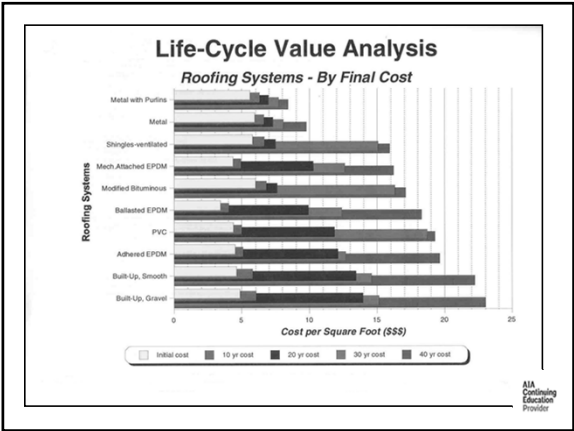
**5. CODE**  
Does it relate to any federal, state, or local codes?

**10. HISTORY**  
How has the product performed in this type of application in the past?

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## LIFE CYCLE COST ANALYSIS

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## DESIGN

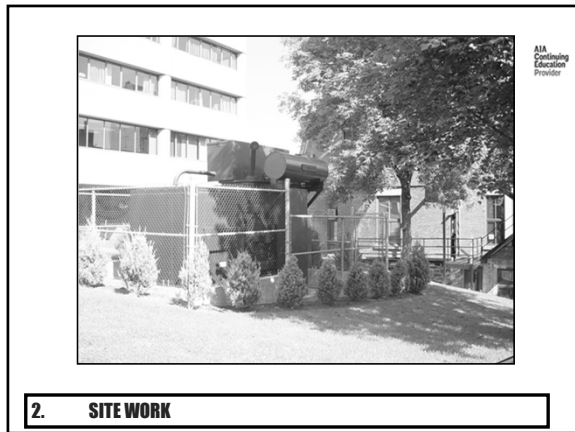
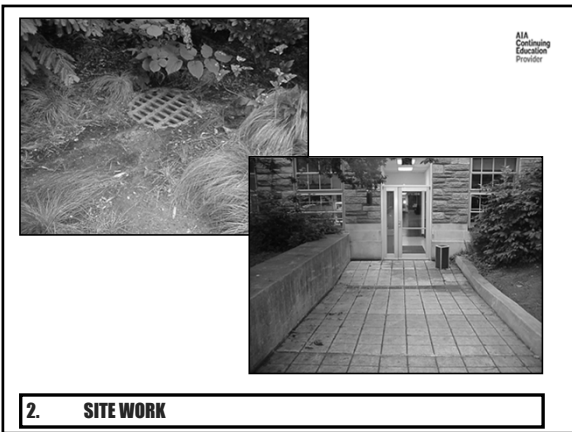
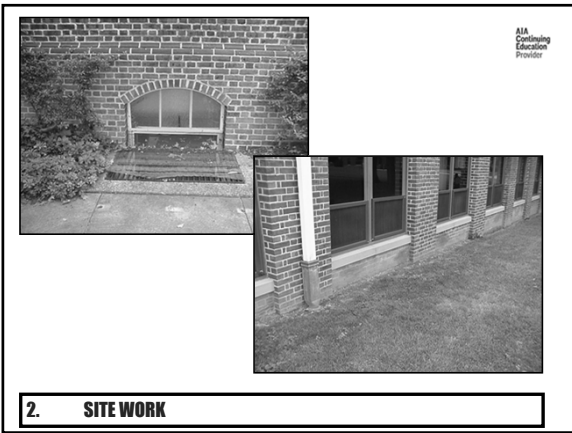
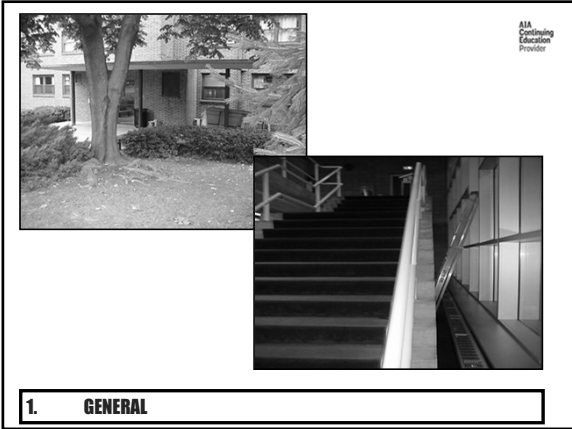
- D**O BECOME PART OF THE DESIGN TEAM
- E**STABLISH A MAINTENANCE/ OPERATION PROGRAM
- S**ELECT THE RIGHT PRODUCTS
- I**NSTITUTE POST OCCUPANCY EVALUATIONS

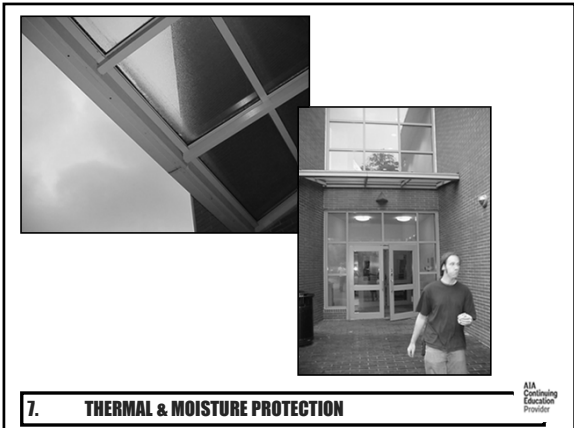
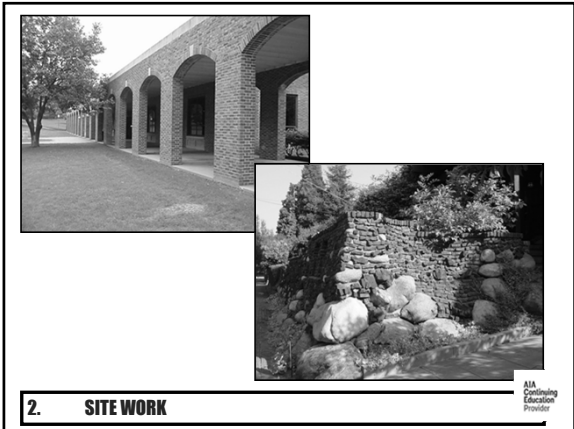
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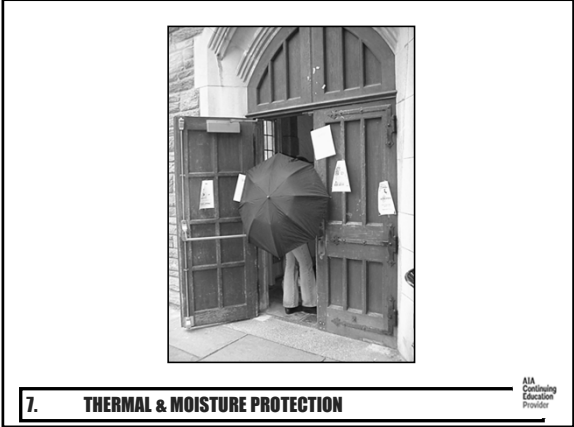
## CSI FORMAT

1. General Requirements	9. Finishes
2. Site Work	10. Specialties
3. Concrete	11. Equipment
4. Masonry	12. Furnishings
5. Metals	13. Special Construction
6. Wood and Plastics	14. Conveying Systems
7. Thermal and Moisture Protection	15. Mechanical
8. Doors and Windows	16. Electrical

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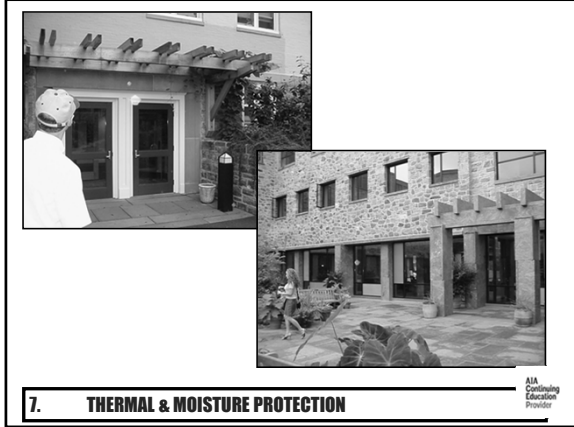






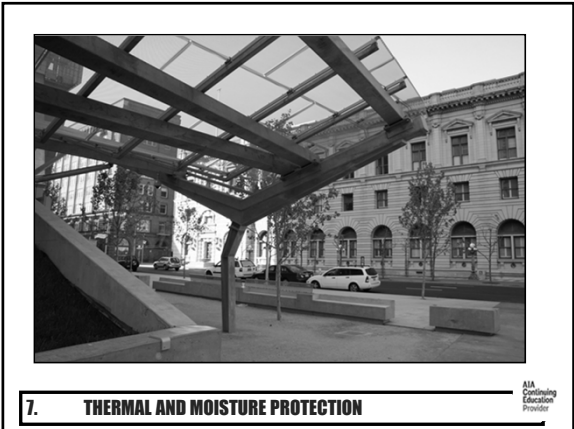
**7. THERMAL & MOISTURE PROTECTION**

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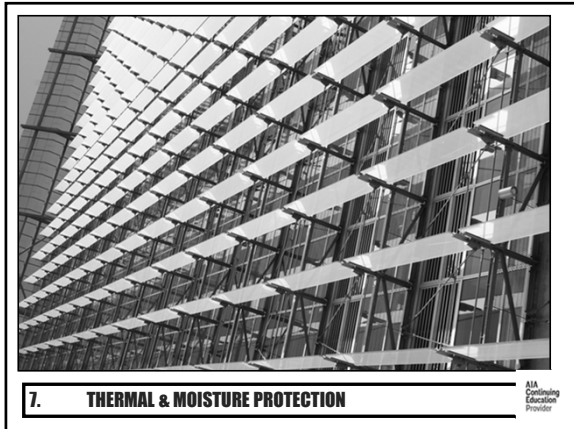
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## Why it is So Easy to Hate Architects



**Why it is so Easy to Hate Architects**

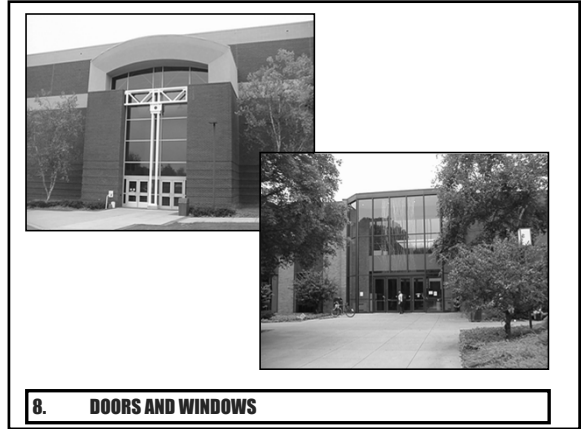
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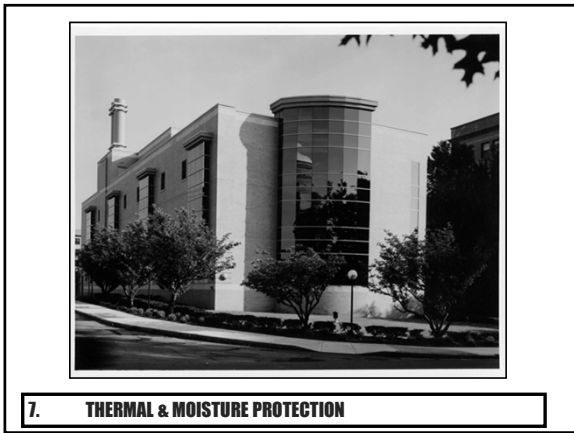
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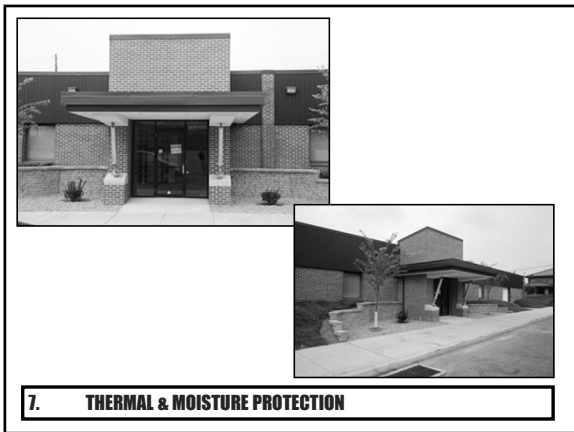
**8. DOORS AND WINDOWS**



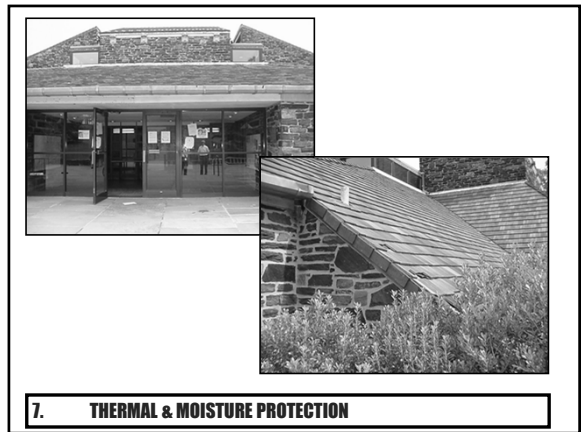
**7. THERMAL & MOISTURE PROTECTION**



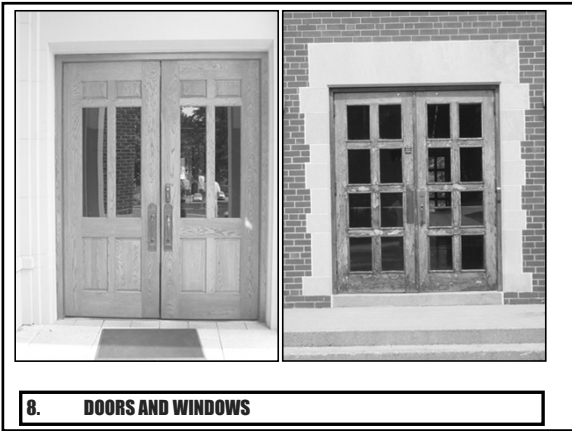
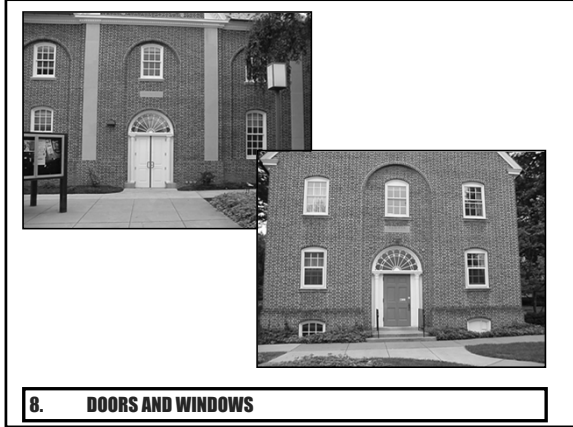
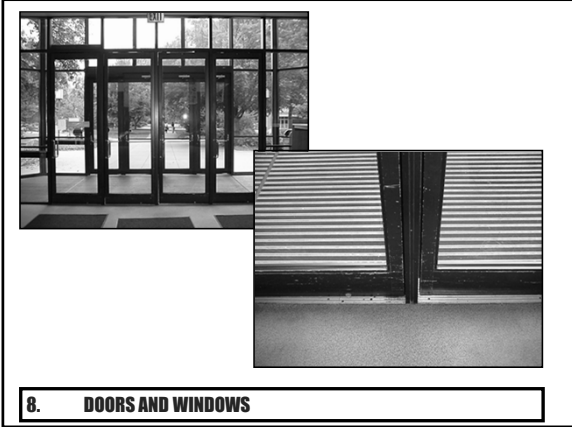
**7. THERMAL AND MOISTURE PROTECTION**



**7. THERMAL & MOISTURE PROTECTION**



**7. THERMAL & MOISTURE PROTECTION**







9/10. FINISHES/SPECIALTIES



9/10. FINISHES/SPECIALTIES



### Selecting Colors

9/10. FINISHES/SPECIALTIES



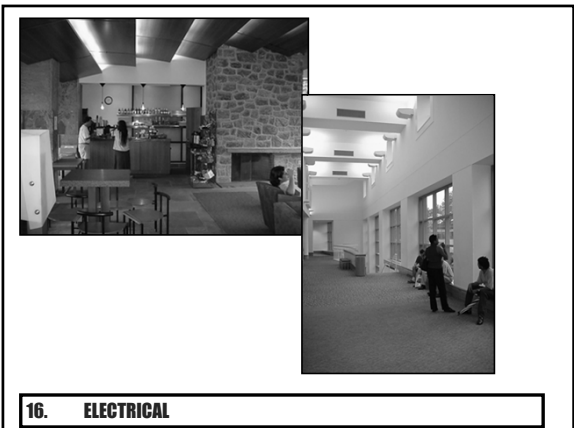
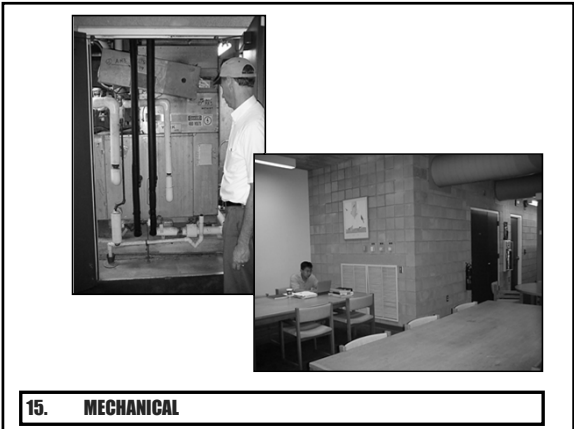
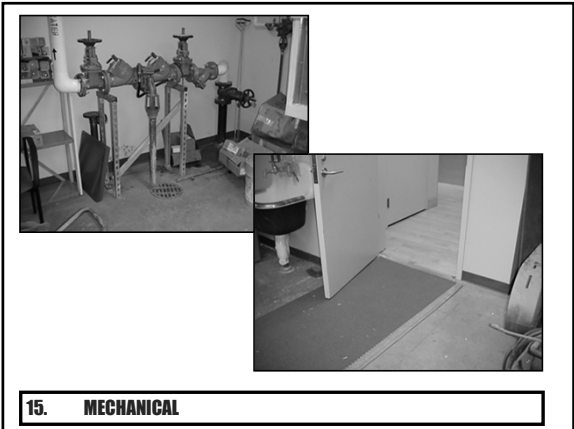
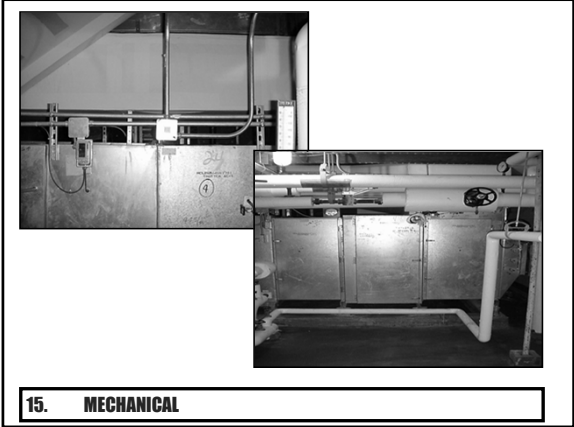
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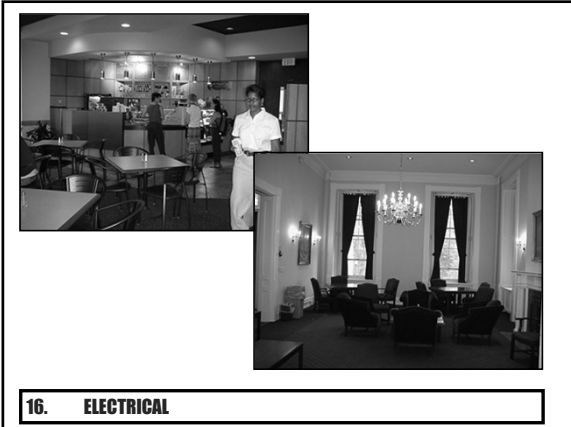


9/10. FINISHES/SPECIALTIES

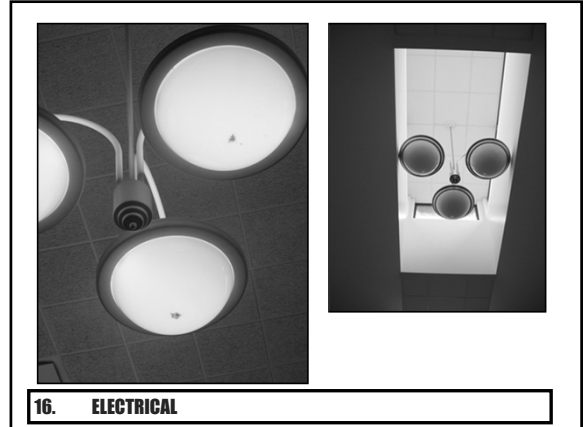


11/12. EQUIPMENT/FURNISHINGS

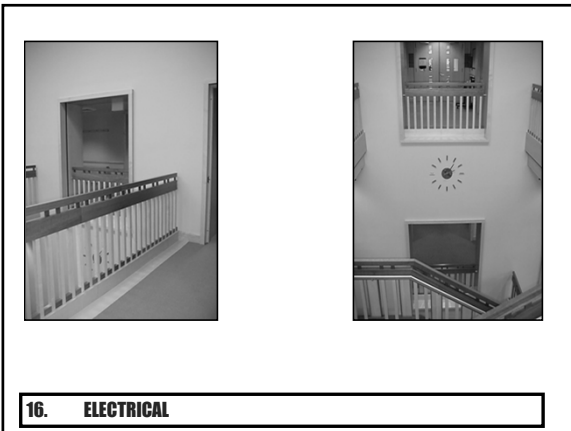




16. ELECTRICAL



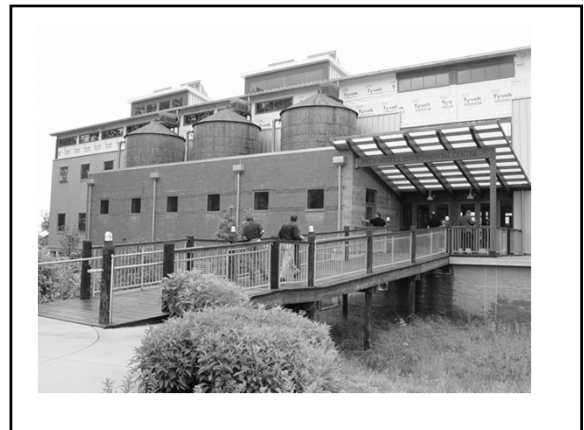
16. ELECTRICAL



16. ELECTRICAL

**D** O BECOME PART OF THE DESIGN TEAM  
**E** STABLISH A SPECIFIC MAINTENANCE/ OPERATION PROGRAM  
**S** ELECT THE RIGHT PRODUCTS  
**I** NSTITUTE POST OCCUPANCY EVALUATIONS  
**G** REEN YOUR BUILDING  
 (Get environmentally sensitive)  
**N**  
**E**  
**R**

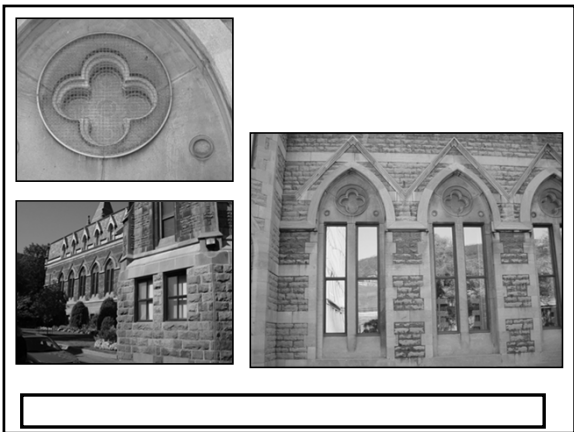
**SHADES  
 OF  
 GREEN**





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- G** REEN YOUR BUILDING  
(Get environmentally sensitive)
- N** EVER COMPROMISE ON IMPORTANT ISSUES
- E**
- R**

**WHEN MAINTENANCE  
RULES ...  
... AT ALL COST!!**



**D** O BECOME PART OF THE DESIGN TEAM

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**G** REEN YOUR BUILDING  
(Get environmentally sensitive)

**N** EVER COMPROMISE ON IMPORTANT ISSUES

**E** NLIST THE HELP OF OTHERS

**R**

**WHEN DESIGN  
RULES ...  
... AT ALL COST!!**



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**E** NLIST THE HELP OF OTHERS

**R** EMEMBER EVERYTHING !

## BIBLIOGRAPHY

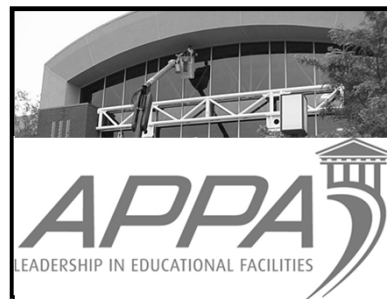
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## DESIGNING FOR MAINTAINABILITY



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