

**Managing Effective Plan Reviews:**  
APPA Facilities Institute  
 Faculty Members: Jeff Gee and Sadie Greiner



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**AIA Credits**

- 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.
- This course is registered with AIA CES for continuing professional education. As such, it does not include content that may be deemed or construed to be an approval or endorsement by the AIA of any material of construction or any method or manner of handling, using, distributing, or dealing in any material or product.

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

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**Core Description**

- Discuss the strategies and approaches to managing an effective plan review. Learn how to manage the plan review process well to reach the goals you have for your project. You'll hear about challenges and opportunities each project has and learn how items such as an invitation list, industry tools (paper and/or electronic), scheduling and timing of reviews, campus standards and expertise needed all play a part in an effective plan review.
- Faculty: Jeff Gee and Sadie Greiner

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3

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### Learning Objectives

1. Discuss the different stages of design and importance of the plan reviews at each stage.
2. Learn basic tools and resources used in the industry to assist with plan reviews.
3. Discuss how campus standards and expertise play a part in an effective review.
4. Discuss the impact an effective and ineffective plan review has on construction.

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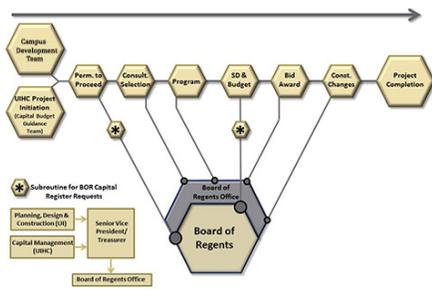
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### Path of a Major Project –



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### Why? Risk Management - Mitigation

- Project scope changes
- Project budget creep
- Project schedule extension
- Quality concerns
- Material delays
- Safety concerns – construction / occupancy
- Incomplete design documents
- A/E and GC resource availability

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Case Example – Golf Club House Project



North Elevation

The image shows two views of a golf clubhouse. The top view is a technical architectural drawing labeled 'North Elevation', showing the building's structure, rooflines, and windows. The bottom view is a 3D perspective rendering of the same building, showing its exterior design, including a large porch, multiple gables, and a mix of brick and stone finishes.

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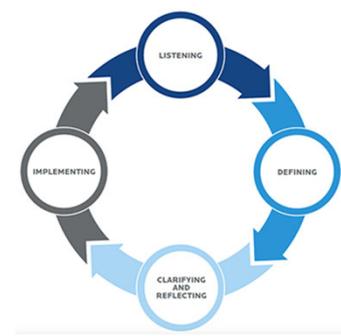
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Engage campus stakeholders, customers, agencies, and outside experts



The diagram is a circular flow with four stages connected by arrows. Starting from the top and moving clockwise: 1. LISTENING (top, blue circle), 2. DEFINING (right, blue circle), 3. CLARIFYING AND REFLECTING (bottom, light blue circle), and 4. IMPLEMENTING (left, grey circle). The arrows are also colored to match their respective stages.

8

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**Hold Kick Off Meeting**

- Define Project Team and Roles
- Set Customer Expectations
- Review Project Scope
- Discuss Schedule and Budget
- Document Decisions (Meeting Minutes)

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**Project Scope Review**

- Align to Campus Master Plan
- Review Project Team Members
- Establish Process for Decision Approvals
- Initiate Participation
- Validate Programming (space/equipment)
- Review Design Submittal Requirements

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**Program Compliance**

- Capital Project Programming
- Space Requirements
- System Requirements
- Campus Design Standards
- Local / State / Federal Requirements
- Safety Review
- Life Cycle Analysis
- Sustainability/LEED
- Commissioning (Building Envelop/MEPT)

11

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**Construction Document Review Checklist**

ARCHITECTURAL SHEET(S) REVIEW

Include codes, general notes, standard details, demo, floor layout, interior elevations and sections, door schedule and details.

- Review General Notes
- Review Demo Notes
- Look for areas that will affect other building occupant functions (Will utilities have to be turned off? Walkways closed off?)
- Review Building Standard Specs for the following:
  - Door finishes when adjacent to common areas
  - Door hardware, cores/keys
  - Fire cabinet color/type and other emergency fixtures
  - Light fixture type, bulb type (T-5, T-8, ECT) and temperature
  - Sprinkler head types and locations (center of tile and visually aligned)
- Look for areas that will affect other building or tenant functions. Will utilities have to be turned off? Walkways shut down?

12

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### Construction Document Review Checklist

#### MECHANICAL SHEET(S) REVIEW

Symbol legend, schedules, mech. demo, mech. finish out.

- Review mechanical notes and equipment schedules to ensure building standards are maintained.
- Air balance report should be required for any affected areas.
- Plans should indicate who is responsible to do the controls if they are of proprietary nature.
- Look to make sure that return air transfer ducts are shown in any walls going to patio or gathering areas. Make sure return air grills are called out in any rooms that the walls lead to patios.
- Make sure plans call out for the mechanical units and t-stats to be labeled.
- Plans should require protective pre-filters on any units prior to them being run during any of the construction process and new filters to be installed prior to project completion.
- Look for equipment that would require sub meters. This could include ...

13

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### Construction Document Review Checklist

#### ELECTRICAL SHEET(S) REVIEW

Symbol legend, schedules, demo and electrical finish out.

- Review electrical notes and equipment schedules to ensure building standards are maintained.
- Plans should call for circuits to be labeled on the panel schedule and any new panels to be labeled with engraved markers permanently mounted.
- Plans should call out for all abandoned cabling and conduits to be removed.
- No receptacles or data/phone jacks in the party walls, including stairwells.
- In kitchens and wet locations, GFI outlets are required within 4' of a sink and should be dedicated. Refrigerators should also be on dedicated circuits.

#### PLUMBING SHEET(S) REVIEW Symbol legend, schedules, demo and plumbing finish out.

- Review plumbing notes and equipment schedules to ensure building standards are maintained.
- Verify backflow preventers have been installed where necessary.
- When a sump drain is required, verify a solenoid valve shutoff has been provided for cold & hot water lines.

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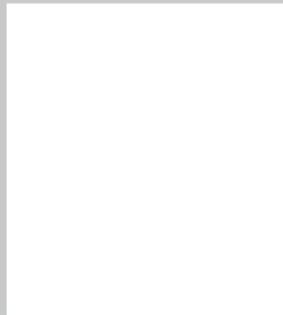
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### Design Review Schedule

- Review project timeline goals
- Construction Season Impact
- Availability of Market Resources
- Material Availability
- Budget Constraints
- Design Review Time
- Build in Contingency
- Drive project forward



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Benefits

- Reduced Change Orders
- Reduced Request for Information (RFI)
- Reduced Cost Overruns
- Reduced Schedule Delays
- Reduced Potential for Disputes and Litigation

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19

Cost Benefits

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- Various studies
- \$10 worth of savings for every constructability review dollar spent
- 3% - 5% of the entire construction cost
- Costs are avoided with a complete constructability review, so detailed numbers are not regularly available

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Managing Expectations

- Not all issues will be found
- Change Orders and RFI's will not be eliminated
- Design changes after reviews may likely cause issues

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### Elements of a Constructability Review



- Coordination
- Build-ability
- Bid-ability
- Building Systems Integrity

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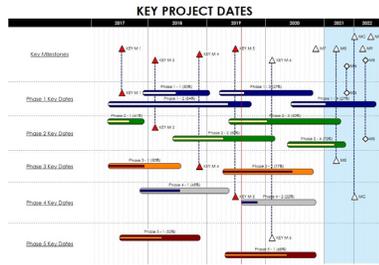
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### Constructability Review Milestones

- 100% Design Development
- 50% Construction Documents
- 90% Construction Documents



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### Constructability Review Team

- Architect
- MEPT
- Construction Superintendent
- Owner
- Commissioning Agent

24

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## Document and Backcheck

- Document all issues identified
  - Clear and concise
  - Spreadsheet
  - Comments directly on plans
- Backcheck – absolutely required
- Build in time for constructability review in project schedules

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## Constructability Review Format

- Name of Reviewer
- Phase of Plans
- Item Number
- Location (sheet/page/specification)
- Issue Identified
- Acceptance by Designer
- Conformance
- Comment/Backcheck

26

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## Constructability Review vs. BIM

- Clash detection is not a Constructability Review
- Clash detection identifies issues that may be in conflict
- Clash detection does not identify what is missing
- Clash detection works best in a collaborative team environment
- Will not work in design-bid-build delivery

27

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Constructability Reviews

- Reviews need to be planned for:
  - Budget
  - Schedule
- Reviews need to be managed and checked
- Reviews can save money/avoid costs
- Reviews can avoid costly time delays
- The architects and engineers retain their professional obligations

28

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Bidding – Addenda Review

- Postpone bidding
- Bid Set
- Construction Set

29

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Construction Phase

- Change Orders
- Program Alignment – Documentation!
- Commissioning

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This concludes The American Institute of  
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