An Integrated Approach to Low Voltage Design

Timothy Smith
RCDD, RTPM, LEED GA
HOK
Dallas, Texas
• Understanding the dynamics of an A&E team

• Understand the impact of project delivery type

• Understanding discipline specific needs

• Understand when to challenge and when to compromise

• Understanding the difference between needs and wants
## DYNAMICS OF A&E TEAM

<table>
<thead>
<tr>
<th>PIC</th>
<th>PRINCIPAL IN CHARGE</th>
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<tbody>
<tr>
<td>PM</td>
<td>PROJECT MANAGER</td>
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<tr>
<td>PD</td>
<td>PROJECT DESIGNER</td>
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<tr>
<td>PA</td>
<td>PROJECT ARCHITECT</td>
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<td>AI</td>
<td>ARCHITECTURAL INTERN</td>
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![Diagram](image_url)
DYNAMICS OF A&E TEAM

PIC | PRINCIPAL IN CHARGE
PM  | PROJECT MANAGER
ER  | ENGINEER OF RECORD
EIT | ENGINEER IN TRAINING

ENGINEERING

STRUCTURAL ER  | ELECTRICAL ER  | MECHANICAL ER  | PLUMBING ER  | CIVIL ER  | TECHNOLOGY ER
STRUCTURAL EIT | ELECTRICAL EIT | MECHANICAL EIT | PLUMBING EIT | CIVIL EIT | TECHNOLOGY EIT
DYNAMICS OF A&E TEAM

TEAMING PARTNERS

- LOCAL ARCHITECT
- LOCAL ENGINEER
- MINORITY SET-ASIDE
- SMALL BUSINESS SET-ASIDE
- COMPLIANCE
IMPACT OF PROJECT DELIVERY

- DESIGN-BID-BUILD
- DESIGN-BUILD
- CONSTRUCTION MANAGER - AGENT
- CONSTRUCTION MANAGER AT RISK
- PUBLIC-PRIVATE-PARTNERSHIP

A&E TEAM ➔ CONTRACTOR
A&E/CONTRACTOR ➔ OWNER
A&E TEAM ➔ CM ➔ CONTRACTOR
A&E TEAM ➔ CM ➔ CONTRACTOR
A&E/CONTRACTOR/OWNER
IMPACT OF PROJECT DELIVERY

DESIGN-BID-BUILD
• Traditional, historical approach
• Seldom used today in the public sector
• Slowest delivery method
• A&E team vs. Contractor

DESIGN-BUILD
• Team approach
• Faster delivery than design-bid-build
• Less opportunity for adversarial relationship between A&E and Contractor
IMPACT OF PROJECT DELIVERY

CM AGENT
• Owners Representative
• Assist with decision making and management
• No responsibility to deliver the project

CM AT RISK
• Popular today in the public sector
• CM is responsible for delivering the project on time and on budget
• CM is contracted to the owner and construction trades are contracted to the CM
PUBLIC PRIVATE PARTNERSHIP (P3)

- A&E, Contractor, Developer, Owner all teamed together
- Developer or Concessionaire finances the project
- Owner pays over time
- Creates opportunity for projects that otherwise wouldn't be possible
**DYNAMICS OF THE A&E TEAM**

- Know your teammates and your client.
- Know your place on the team.
- Understand the client’s overall project vision.
- What are the priorities for the project?
- Are there multiple clients?
- Are their priorities in conflict with each other?
- How is the technology scope affected by the client’s priorities?
- Knowing this will help you decide when to challenge and when to compromise.

**IMPACT OF PROJECT DELIVERY**

- What is the schedule?
- What are the deliverables?
- What do you owe the other disciplines?
- What does integrated design really mean?
WHERE DO YOU FIT IN?

EXAMPLE TEAM

- Owner Agency 1
- Owner Agency 2
- Owner Agency 3
- Owner Agency 4
- PM Firm 1
- PM Firm 2
- Technology
- Architect of Record
- Associate Architect
- ID
- Civil
- MEP
- Structural
- Landscape
WHERE DO YOU FIT IN?

EXAMPLE TEAM

OWNER AGENCY
1

OWNER AGENCY
2

OWNER AGENCY
3

OWNER AGENCY
4

PM FIRM
1

PM FIRM
2

ARCHITECT
OF RECORD

ASSOCIATE
ARCHITECT

ID

CIVIL

MEP

STRUCTURAL

LANDSCAPE

TECHNOLOGY
WHERE DO YOU FIT IN

EXAMPLE TEAM

OWNER AGENCY 1
OWNER AGENCY 2
OWNER AGENCY 3
OWNER AGENCY 4

PM FIRM 1
PM FIRM 2

ARCHITECT OF RECORD
ASSOCIATE ARCHITECT
ID

CIVIL
TECHNOLOGY
MEP
STRUCTURAL
LANDSCAPE

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WHAT DOES INTEGRATED DESIGN REALLY MEAN?

• It’s not just coordination
• Technology affects Architecture
• Technology affects Engineering
• Each is impacted by AND has an impact on the others
WHAT DOES THIS MEAN FOR YOU?

- Insert yourself into the process early
- Tell them what you need
- Give them ideas that help reduce power and space needs
- Don’t let them squeeze ERs and TRs beyond what you need
- Talk to the engineers about heat loads and power needs early
- Compromise where it makes sense based on the clients vision
IMPACT OF PROJECT DELIVERY

• Deliverables
  • SD Phase
    • Narratives
  • DD Phase
    • Floor Plans
    • Outline Specs
  • CD Phase
    • Floor Plans
    • Reflected Ceiling Plans
    • Enlarged Plans
    • Details
    • Schedules
    • Three Part Specs

• Coordination Deliverables
  • SD Phase
    • Location and size of ERs and TRs
  • DD Phase
    • Electrical loads
    • Mechanical Loads
  • CD Phase
    • Coordination of ceiling mount devices with lighting plans
    • Coordination of ceiling mount devices with mechanical plans
    • Coordination of access control with door hardware
    • Coordination of telecommunications outlets with electrical outlets
    • Coordination of cameras and WAPs with architectural finishes
IMPACT OF PROJECT DELIVERY

• Coordination Deliverables
  • SD Phase
    • Location and size of ERs and TRs
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    • Coordination of cameras and WAPs with architectural finishes
• Why integrated design?
  • Early involvement
  • Help drive the architectural design in favor of technology
It doesn’t stop there...

- Early involvement
  - Proper placement of ERs and TRs
  - Stacking of closets
  - Keep wet piping out of technology overheads
  - Manage Landscape Planning with Video Surveillance
- The later these issues are brought up, the more difficult they are to change
TAKEAWAYS

- Learn and understand your team AND your teammates
- Know the overall project priorities
- Know that decisions can be technical, emotional or political
- Don’t just think technical, think in context