



IPD: Lessons from the Trenches

AGC of America Project Delivery Committee
IPD Working Group
February 26, 2009

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Vice Chairman, Holder Construction Company

John Tocci, Sr., Chief Enabling Officer, Tocci Building Companies,
Chair of AGC BIMForum

Jim Frey, Sr. Vice President, Alberici Group, Inc, AGC IPD Working Group



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Learning Objectives

- Define Integrated Project Delivery (IPD)
- Recognize the advantages and disadvantages of IPD
- Identify IPD best practices
- Explain how the project and stakeholders benefit on IPD projects



Overview

- Welcome and Webinar Instructions
- Brief Introduction to Integrated Project Delivery
- Case Study: Alberici Constructors
- Case Study: Tocci Building Companies
- Moderated Discussion
- Wrap Up



Degrees of Collaboration

	"Classic" Collaboration	"Non-Multi Party" IPD	"True" IPD
Level of Collaboration	Lower		Higher
Nicknames	?	Non-Multi-Party IPD; IPD Lite; Technology Enhanced Collaboration	Multi-Party Contracting; "True" IPD; Relational Contracting; Allowing; Least Project Delivery
Delivery Approaches:	CM at-Risk or Design-Build	CM at-Risk or Design-Build	IPD
Typical Selection Process:	Qualifications Based Selection of all team members or Best Value Proposal	Qualifications Based Selection of all team members	Qualifications Based Selection of all team members
Nature of Agreement:	Transactional	?	Relational
Key Characteristics:	<ul style="list-style-type: none"> No contract language requiring collaboration Limited team risk sharing CM or DB share in savings 	<ul style="list-style-type: none"> Contract language requiring collaboration Some team risk sharing All parties compensation tied to project success Co-location of team 	<ul style="list-style-type: none"> Owner-Designer-Constructor (and possibly other key team members) all sign one contract that outlines collaboration Team risk sharing Team decision making Optimizing the Project Open/Lean Design Limits on litigation Co-location of team
Typical Basis of Reimbursement	GMP	GMP	No GMP or GMP (some costs guaranteed)

Today

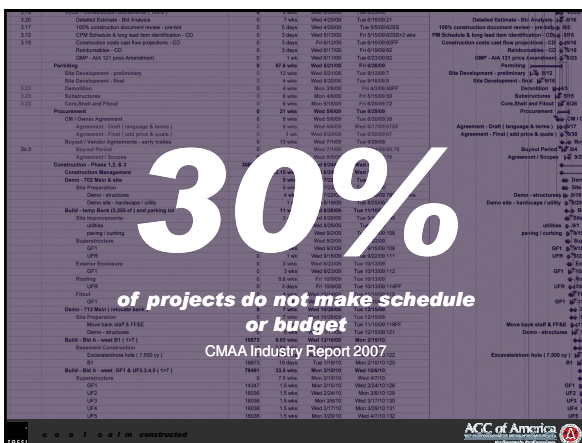
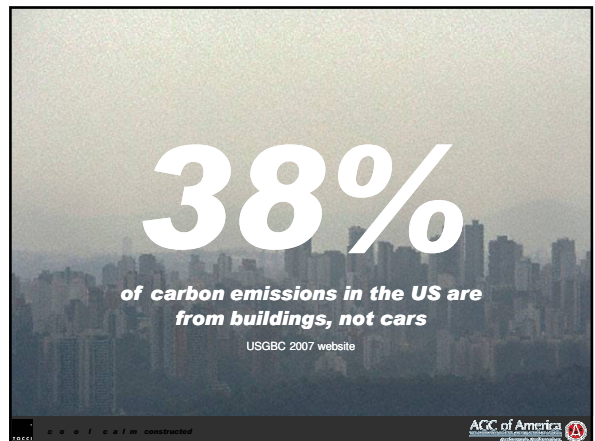
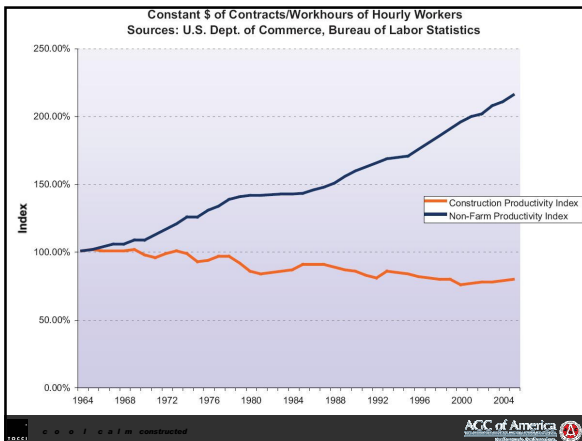
AGC Project Delivery Committee, February 2009

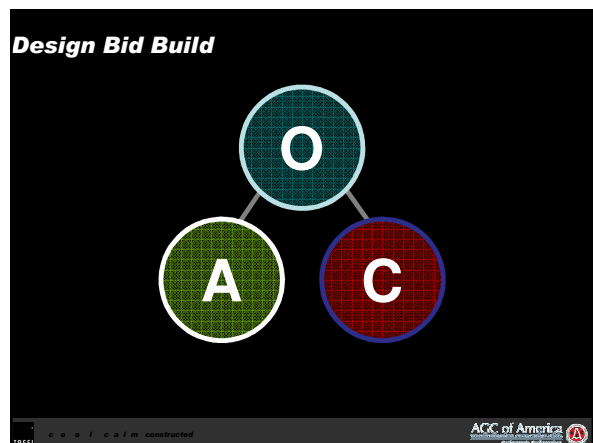
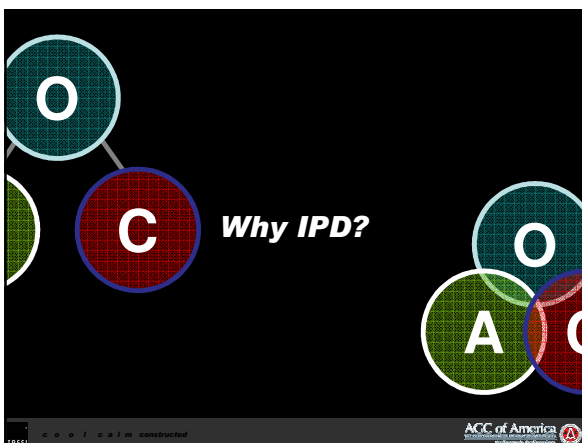


Introduction

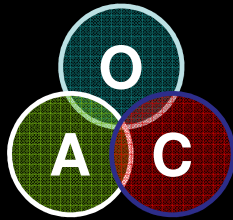
John Tocci, Sr., CEO, Tocci Building Companies





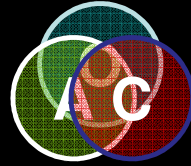


CM at Risk with Preconstruction



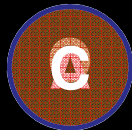
CM at Risk with Preconstruction

BIM-Enabled Delivery



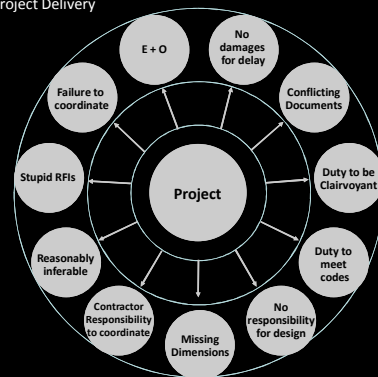
BIM-Enabled Delivery

Integrated Project Delivery



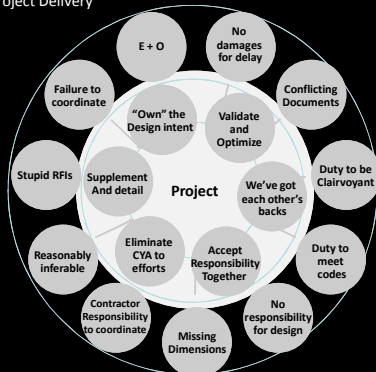
Integrated Project Delivery

"Repulsive" Project Delivery



"Repulsive" Project Delivery

"Attractive" Project Delivery



"Attractive" Project Delivery

Transforming Risk Management

Avoid and Transfer



Accept and Manage

Transforming Risk Management

Repulsive (Traditional) Project Delivery



We all fight about the project

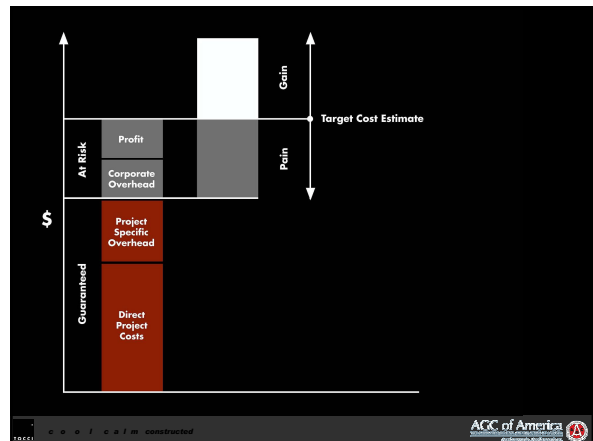
Attractive (IPD) Project Delivery



We all work for the project

IPD Contract Principles

- 1) early substantive involvement of key participants
- 2) joint sharing of risk and reward through a profit/incentive pool
- 3) joint project management
- 4) Zero Litigation



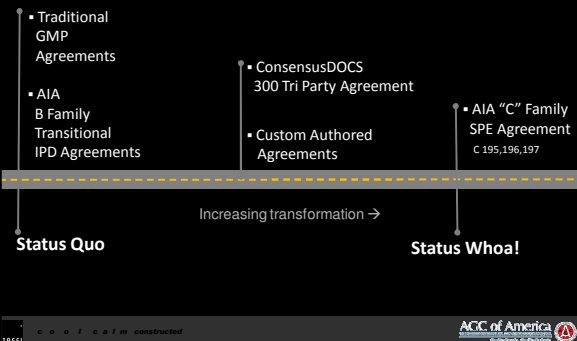
Typical Performance Goals

- Delivering the Owner's Program
- Design Quality
- Schedule
- Budget
- Sustainability
- Lean delivery
- Long term value

List of IPD projects in the USA

- SSM Cardinal Glennon Children's Medical Center
- SSM St. Clare Health Center, St. Louis
- Multiple Sutter Health projects
- Autodesk Waltham
- Autodesk One Market
- Northbay Healthcare
- BJC Healthcare

IPD Contract Types | the scale of transformation



Consensus Documents and Others

ConsensusDOCS

- ConsensusDOCS 300 Standard Form of Tri-Party Agreement for Collaborative Project Delivery
- ConsensusDOCS 301 BIM Addendum

Privately Authored Docs

- Sutter Health Templates by Will Lichtig
 - Autodesk and other private contracts by Howard Ashcraft, Pat O'Connor and others
 - Surgically modified two-headed dogs
- ACC of America

AIA Contract Documents

Transitional Agreements

- A195 – Standard Form of Agreement Between *Owner and Contractor* for IPD
- B195 – Standard Form of Agreement Between *Owner and Architect* for IPD
- A295 – General Conditions of the Contract for IPD

Single Purpose Entity

- C195 - Standard Form of Single Purpose Entity Agreement for IPD
 - C196 - Standard Form of Agreement Between *SPE and Owner* for IPD
 - C197 - Standard Form of Agreement Between *SPE and Non-owner Member* for IPD
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IPD Benefits for Owners

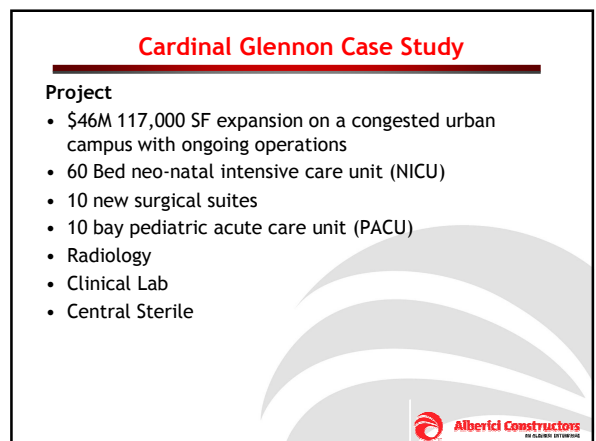
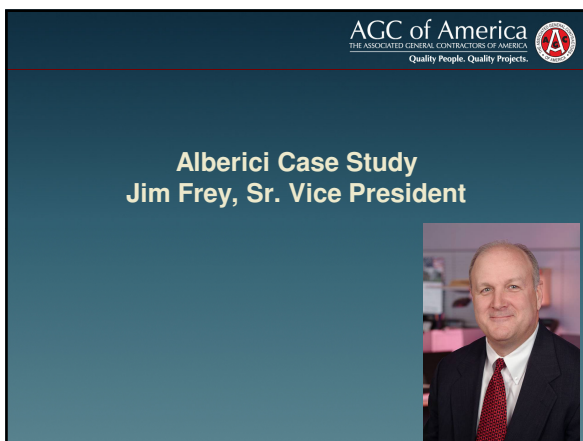
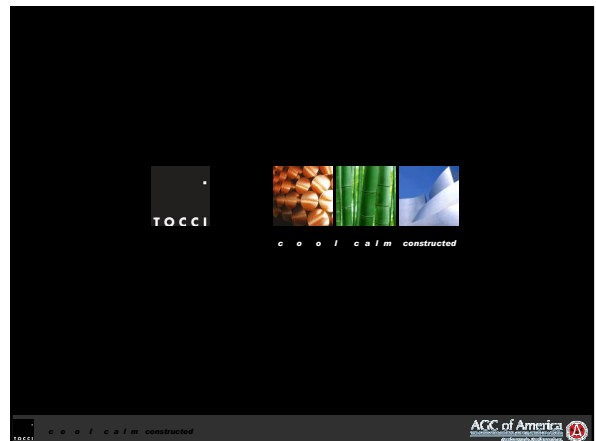
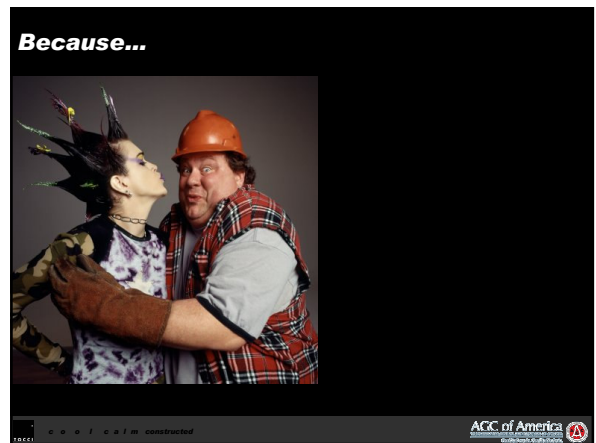
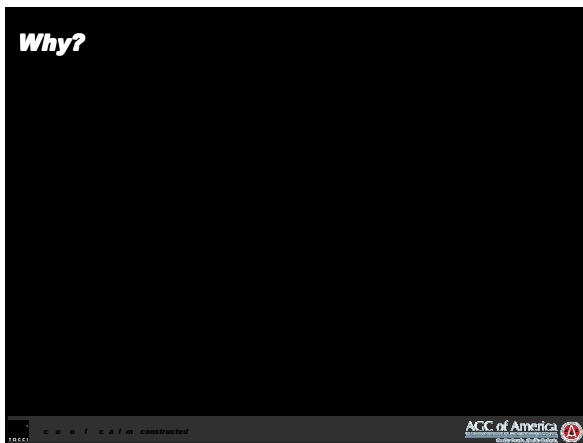
- Designers and contractors together "own" your program and vision
 - Continuous design validation and optimization
 - Zero non-discretionary change orders
 - Faster
 - Lower final cost
 - Owner advocates everywhere
 - More building for the dollar
- ACC of America

IPD Benefits for Architects

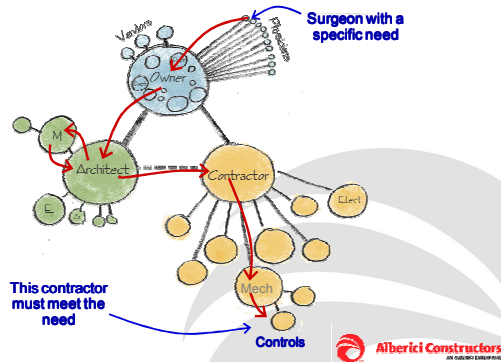
- True Alignment with your Builder
 - Joint 'ownership' of your Design
 - Design quality is the builders (financial) goal
 - Eliminates out of pocket losses
 - 85% liability risk reduction
 - Significant upside fee potential
 - More building for the money
 - IPD magic
- ACC of America

IPD Benefits for Contractors

- Eliminates conflict
 - Participation in the creative process
 - Higher quality subcontractors
 - Smarter, leaner, safer and faster
 - Builds relationships and repeat clients
 - Lowers risk
 - Unemployment of your attorneys
- ACC of America



Traditional Contracts don't anticipate this:

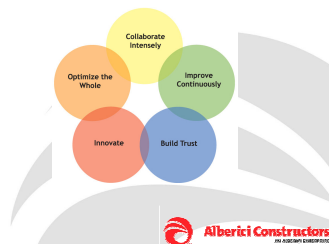


Why the Collaborative/Lean Approach

- Frustrated with conventional delivery
- Owner wanted to save money
- The Team thought we could do better
- Sought permission to “try some things out”
- Contacted the Lean Construction Institute
- Got a copy of Sutter Health Contract
- Team started to learn what we didn't know
- Decided to go for it
- Negotiated Collaborative Agreement

Key Elements

- Core Group
- Production Control System
- Financial/Incentive Agreement
- Model Behaviors
 - Collaborate intensely
 - Optimize the whole
 - Improve continuously
 - Innovate
 - Build Trust



Core Group Function

- Core Group = Owner, Designers and CM
- Provide day-to-day leadership and govern the project
- Define project criteria
- Establish communication protocol
- Manage budget and design process
- Implement production control (Last Planner System)
- Select team
- Resolve problems
- Optimize the whole

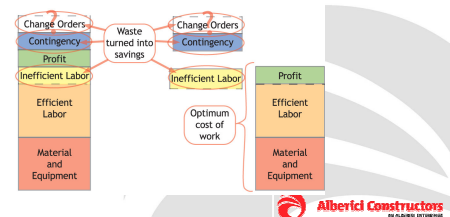
Last Planner System

- Use LPS as Production Control System
- Changes how the work is planned and who plans it
- Driven by Tradespeople
- Changes the dialogue
- Changes the commitments
- Measures the Office and Field
- Lowers the “noise level” by focusing on real priorities

Incentive Program

Elimination of waste creates bonus pool

- Incentive is to generate savings on a project level
- Aligns the interests of all stakeholders
- Thrives on cooperation
- Rewards collaboration



Select Subcontractors

- Team selection is critically important
- Criteria for selecting Contractors and Designers
 - Willingness to embrace innovation
 - Use Open Book approach
 - Select early enough to participate in design
 - Selected on value, not necessarily low price
 - Provide confidence-inspiring expertise
 - Willing to collaborate
- Interviewed contractors including field personnel (The List)



What makes your work unproductive?

- The answers we received (The List)
 - ✓ Access to the work area
 - ✓ Schedule bottlenecks
 - ✓ Out of sequence work
 - ✓ Loading and hoisting
 - ✓ Material deliveries
 - ✓ Needing information and decisions
 - ✓ Working around material, floor congestion
 - ✓ No clean up
 - ✓ Changes
 - ✓ Not being able to finish what is started
 - ✓ Changing priorities
 - ✓ Too often people walk out of meetings and do their own thing
 - ✓ Selection by price = less quality people and less commitment



What makes your work unproductive?

- The answers we received (The List) continued
 - ✓ No consequence for failure to meet commitments
 - ✓ Sequence, wall studs too early
 - ✓ Redoing and undoing work
 - ✓ Moving material
 - ✓ Uncoordinated design drawings
 - ✓ Compressed time and spiking manpower
 - ✓ Real issues not addressed in coordination meetings
 - ✓ Lack of schedule commitment
 - ✓ Lack of accountability by other team members
 - ✓ "Show" work, show pipe
 - ✓ Jumping around
 - ✓ Late drawing approvals
 - ✓ Other trades in the way
 - ✓ Not having answers to questions
 - ✓ Conflicting motivations
 - ✓ Waiting



Recognized Counter-Incentives

- GMP contracts and management styles drive counterproductive behavior
- GMP contracts drive territorial behavior
- Parties are often afraid to make decisions
- Cooperation can reduce profit, due to the way conventional contracts are written
- Every man for himself - no incentive for trades to work collaboratively in the execution of the project



Surprises

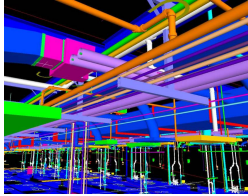
- This is hard to do
- It's easy to slip into conventional ways
- How significant it was to eliminate the GMP
- Reduction in strife
- Cross discipline understanding of work
- How quickly the field embraced the concept
- How little the Core Group fought/talked about money
- The reduction of the CM effort



Lessons Learned - Big Room



Lessons Learned - BIM



3D model



Field installation

Think it through and build it right the first time



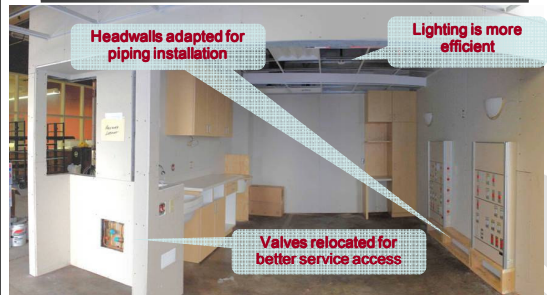
Lessons Learned - Prefabrication



Lessons Learned - Prefabrication



Lessons Learned - Mock Ups



Improvements X 70 rooms
Think it through and build it right the first time



What Happened?

- Planning and scheduling improved
- Coordination and communication improved
- Team functioned as a unit
- Trust level increased
- Project was actually fun
- The Core Group worked




The Results

- Only 63 RFIs
- 2.1% savings from original construction budget
- Owner re-invested its portion of savings in added scope
- No change orders that added cost
- No disputes or claims
- Project completed 45 days ahead of schedule even with additional scope of work
- High morale - a preferred site
- High quality
- 8 minor first aid cases and no Lost Time Injuries




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Quality People. Quality Projects.

Tocci Case Study
John Tocci, Sr. , Chief Enabling Officer



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Quality People. Quality Projects.



Autodesk AEC Headquarters

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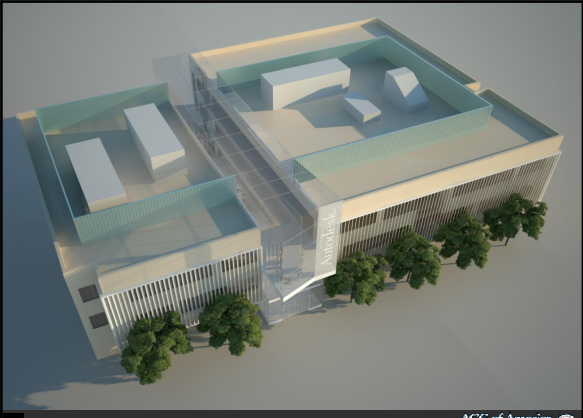
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Autodesk
First IPD Project in New England
TOCCI

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Quality People. Quality Projects.



Autodesk

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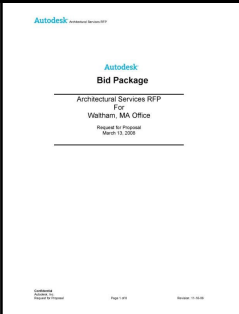
Our Partner : KlingStubbins



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RFP Summary



- 5 Architects invited
- Architects selected Builders
- IPD & Goals clearly defined
- Owner's IPD Contract included

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Project Specific Rating Criteria

- Functionality
- Aesthetics
- Materials
- Workmanship
- Sustainability



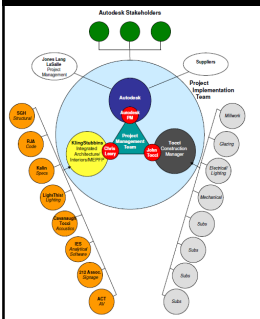
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It's not about you... it's about us

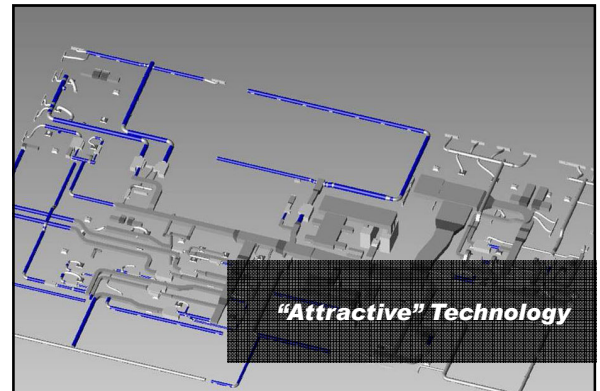
- Integration from the start
- Prior Experience, important but...
- Common 'theology'
- The One-Company feel

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It's not about you... it's about us



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Technical Objectives

- Shared Revit Model = Shared Revit Files
- NavisWorks Manage BIM Management
- Direct From Model Fabrication
- LEED/Sustainability Analysis
- Quantities Extracted
- Schedule "Infused"

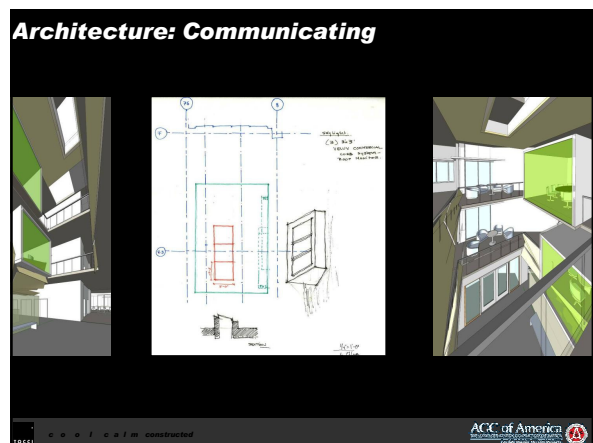
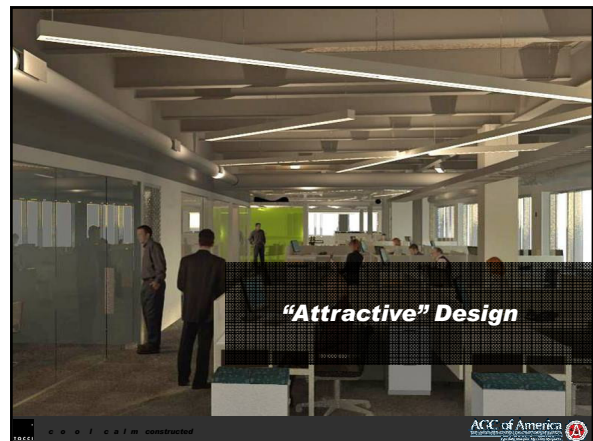
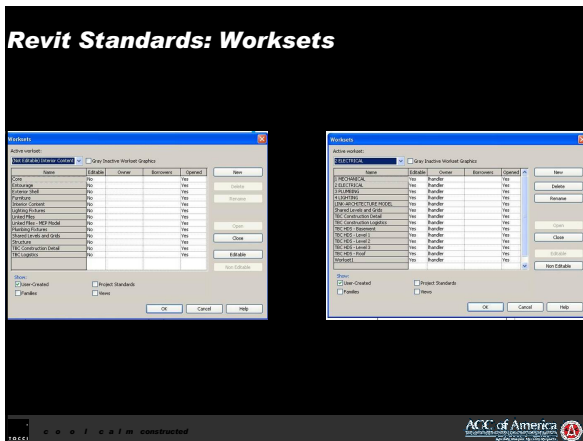
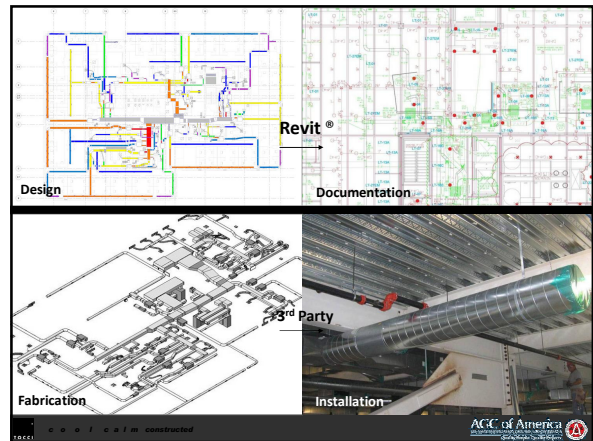
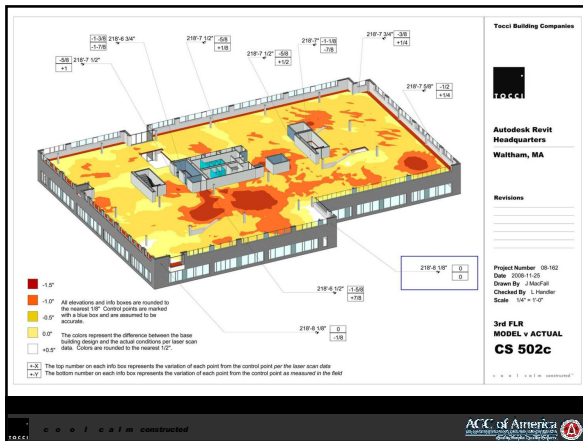


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No changes? Validate



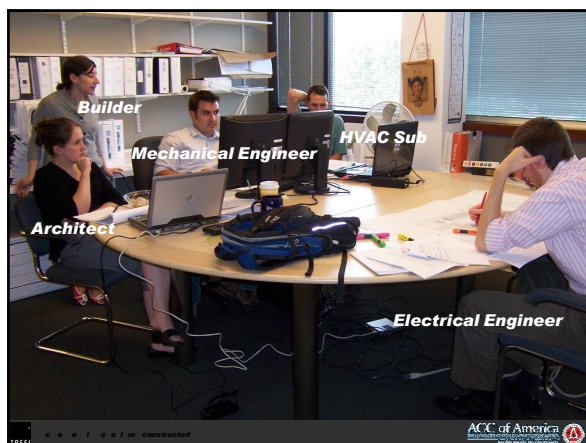
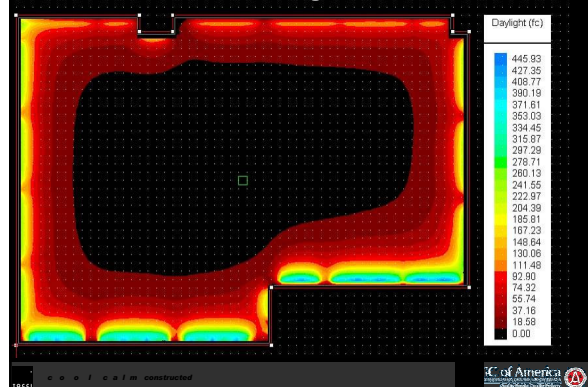
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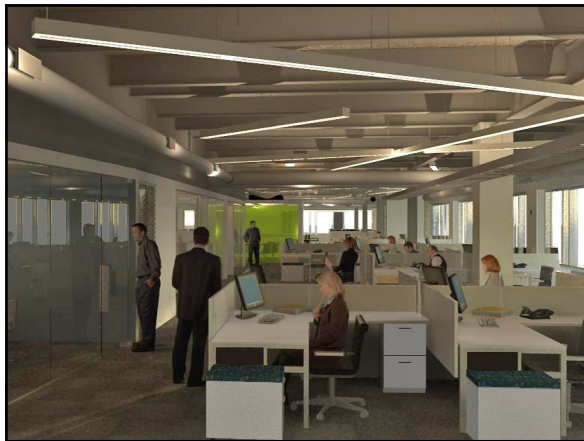
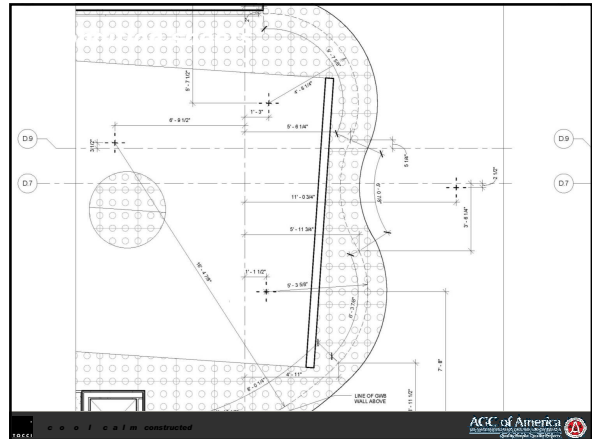
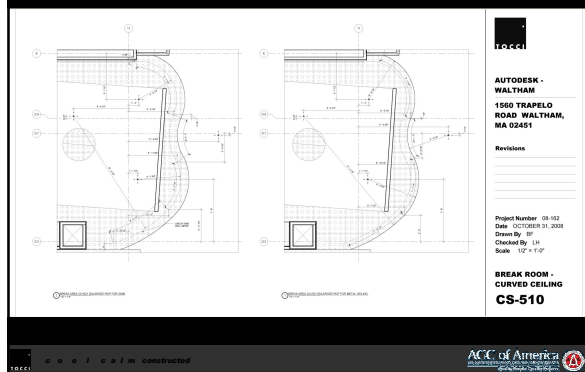
Decision-ready information

Stair Systems	Stair Option 1 - Single floor opening				Stair Option 2 - Double Stacked			
	103	103	103	103	202	202	202	202
temp/shore opening	103	103	103	103	202	202	202	202
sealant concrete and steel 6" thick	103	103	103	103	202	202	202	202
form and remove debris labor, equip/material	103	103	103	103	202	202	202	202
debris haul	24	24	24	24	62	62	62	62
concrete slab and stairs labor equip/material	20	20	20	20	68	68	68	68
testing for new column design 48" dia 7.5 line	1	1	1	1	1	1	1	1
structural steel rework	2.6	2.6	2.6	2.6	8	8	8	8
glass curtain wall (including glass rail)	1	1	1	1	1	1	1	1
steel frame	23	23	23	23	44	44	44	44
steel columns/beam cladding - 100 stainless	17	17	17	17	39	39	39	39
supplemental railing trans/connection	103	103	103	103	202	202	202	202
finishing, caulking and misc metal details	17	17	17	17	39	39	39	39
glass/stainless steel	51	51	51	51	103	103	103	103
stainless steel	102	102	102	102	206	206	206	206
the shutter core wall with door system	103	103	103	103	202	202	202	202
smoke partition 18"	23	23	23	23	44	44	44	44
glass wall 48" x 7.5 line 1.2.2 - n.i.e.	23	23	23	23	44	44	44	44
steel frame	23	23	23	23	44	44	44	44
caulking and seal finishes - base contact scope	13	13	13	13	28	28	28	28
fire protection additional roads	647	647	647	647	1,006	1,006	1,006	1,006
vertical circulation/deck/stair smoke meet	647	647	647	647	1,006	1,006	1,006	1,006
lighting, power, is and control requirements	647	647	647	647	1,006	1,006	1,006	1,006
A & B cost	647	647	647	647	1,006	1,006	1,006	1,006
Pracoon and CM Staff cost	647	647	647	647	1,006	1,006	1,006	1,006
total EDC	647	647	647	647	1,006	1,006	1,006	1,006
total VTC	647	647	647	647	1,006	1,006	1,006	1,006
total VTC	647	647	647	647	1,006	1,006	1,006	1,006
Stair System Budget	647	647	647	647	1,006	1,006	1,006	1,006
Cost / sq ft (stair)	647	647	647	647	1,006	1,006	1,006	1,006
cost / sq ft of opening	647	647	647	647	1,006	1,006	1,006	1,006

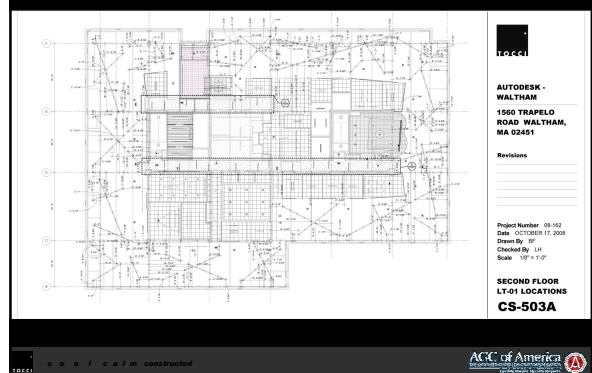
Performance based design



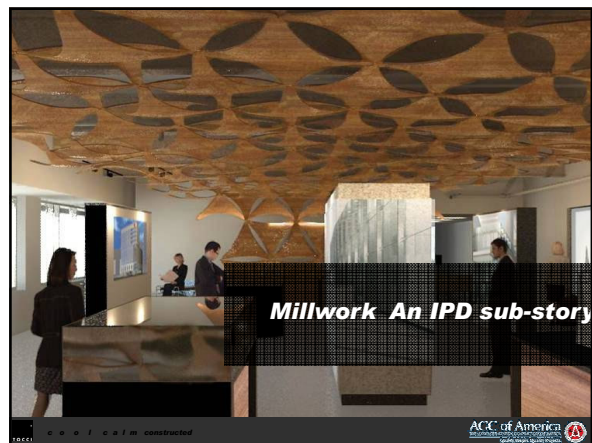
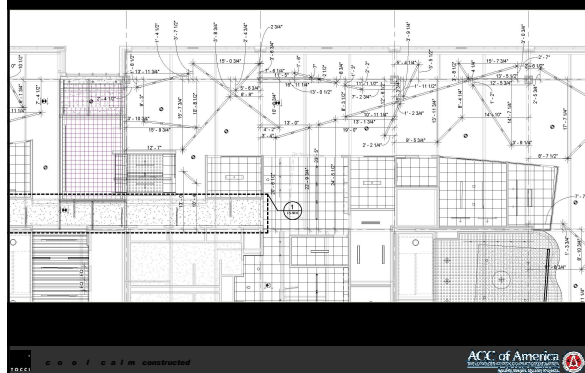
Condition Sheets



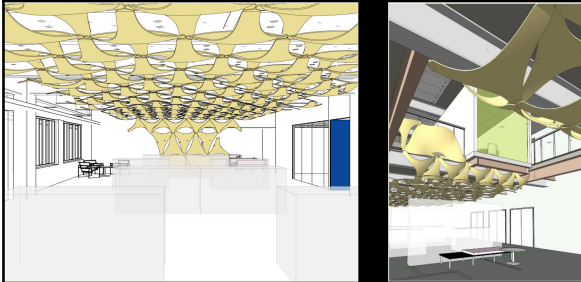
Condition Sheets



Condition Sheets

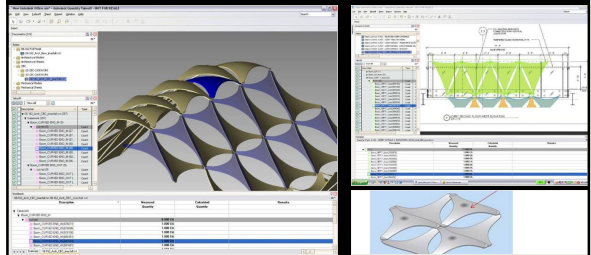


Millwork Re-Design



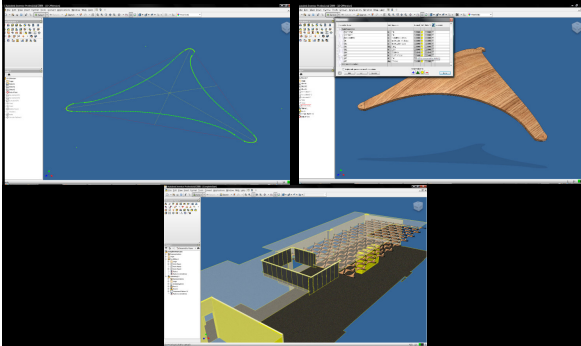
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Millwork: Collaboration and competition



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Millwork Fabrication Models



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Millwork Fabrication Process



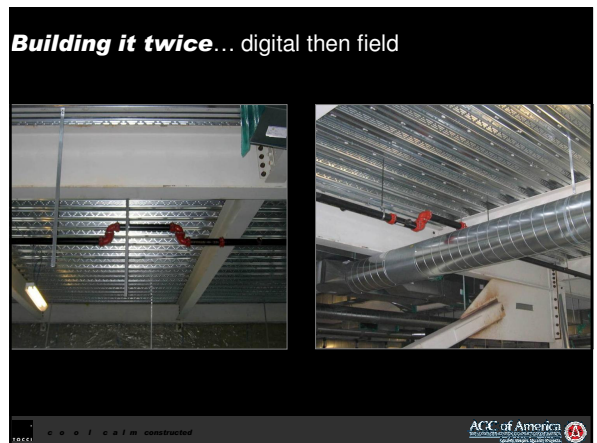
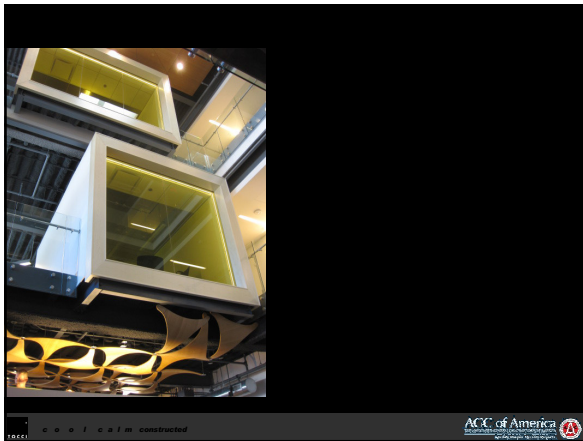
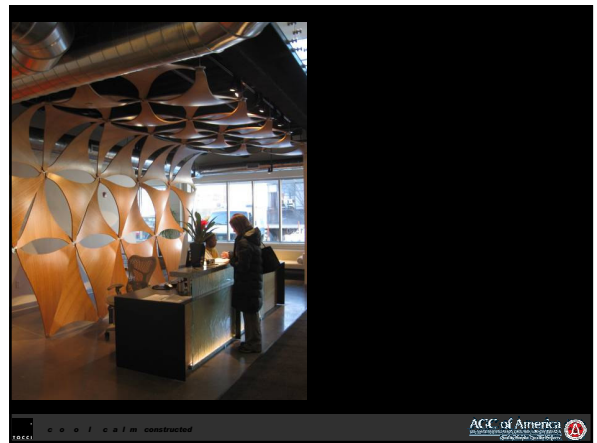
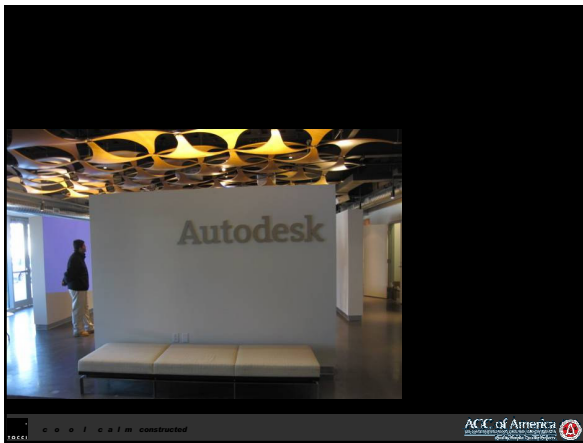
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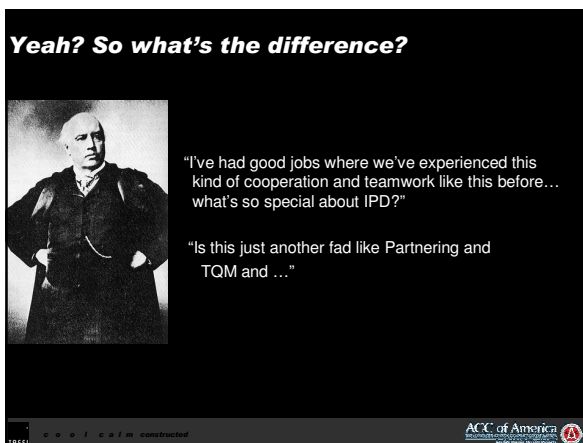
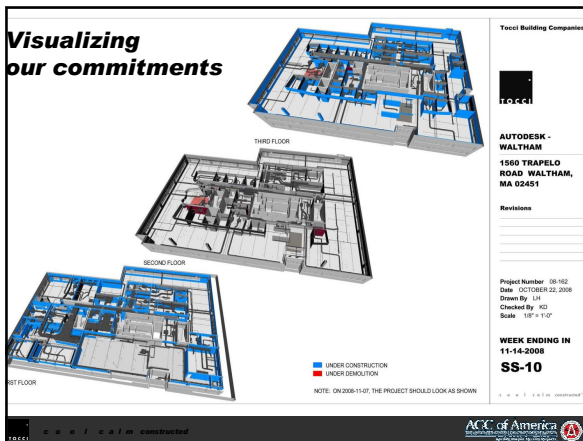


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**On behalf of the
AGC Project Delivery Committee,
thank you for your time!**

This concludes The American Institute of Architects Continuing
Education Systems Program.