



Application of Integrated Project Delivery Practices in Residential Construction

Paper #125

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Where does IPD make sense?

Research suggests:

- Hospitals
- Large Commercial
- Sports Arenas

(Aslesen et al. 2018, Dargham et al. 2019, Gomez et al. 2018)

What do these projects have in common?

COMPLEXITY



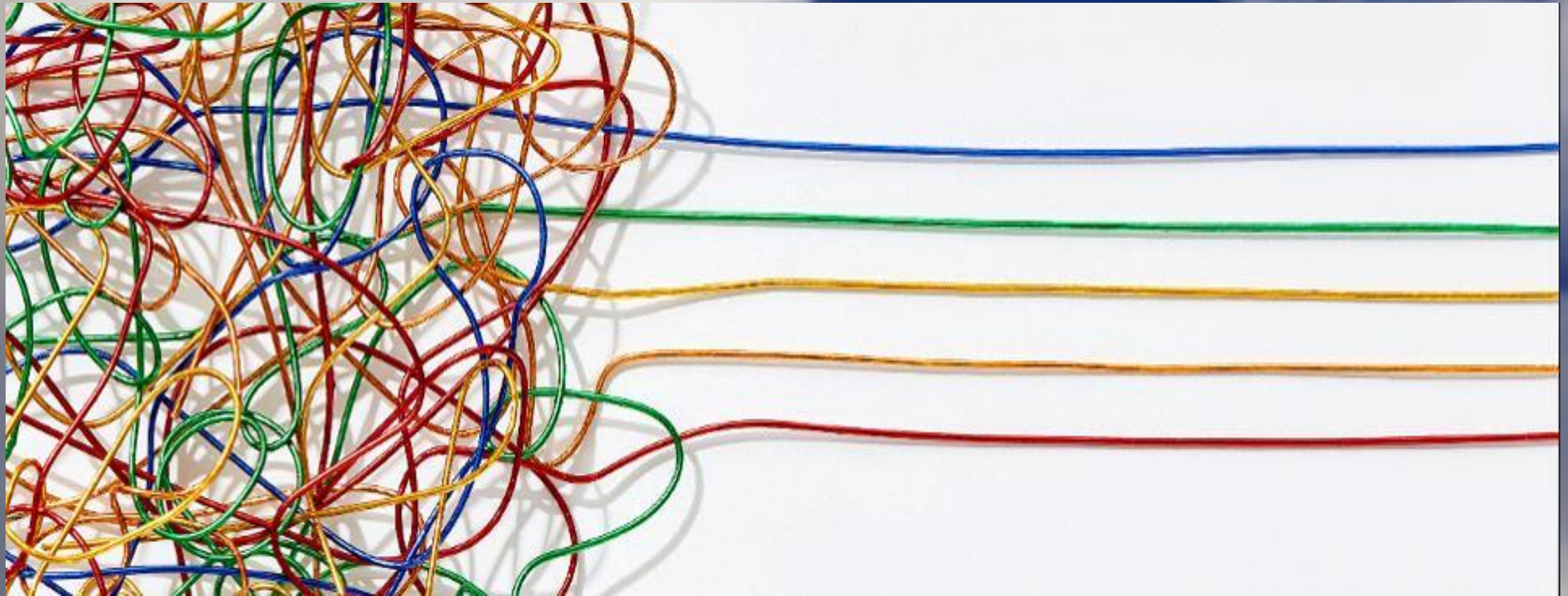
Image from <https://www.forbes.com/sites/waynerash/2019/11/26/the-risk-of-complexity-and-how-to-fix-it/#733befb254a9>



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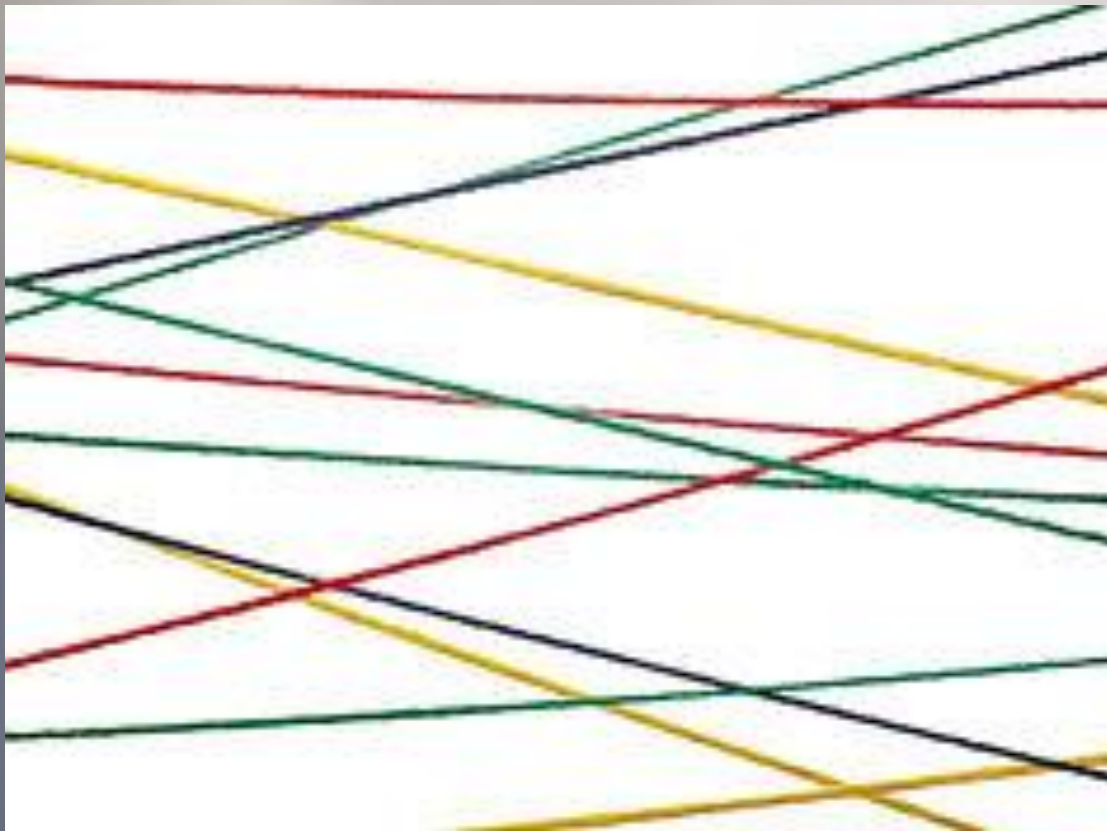
Does IPD make sense here?



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Hypothesis



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IPD principles can be implemented on residential projects to improve project outcomes for key stakeholders.

Research Questions:

1. What IPD principles are being applied to residential projects?
2. How are the identified IPD principles being applied?
3. How do project participants perceive the impact of applied IPD principles?

Characteristics of IPD



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- Multi-party contract
- Early involvement of key participants
- Collaborative decision making and goal definition
- Intensified planning
- Financial transparency
- Shared risks and rewards
- Co-location of team members
- Liability waivers among key participants
- Jointly developed project goals
- Lean principles
- BIM application
- Mutual respect and trust
- Open communication and willingness to collaborate

(Adapted from Lee et al. 2014)



“FULL IPD”

(versus IPD-lite or IPD-ish)

Methodology



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Case Study

- Limited research to draw on (Fox-Wolfgramm 1997)
- Seeking answers to “how” and “why” for unique processes (Yin 2017)
- Focus on singular case to know particulars in order generalize for application to other situations (Stake 1995)

Mixed Methods:

- Surveys ($n=21$ made up of project management and trade partner foremen)
- Observations (attendance during co-location meetings)
- Interviews (2 senior management personnel for the GC to understand “how”)

Case Study Details



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- Nationally recognized residential general contractor
 - Attempting implementation of IPD principles since 2016
 - Highend custom homes in Intermountain West (Utah, Idaho, Wyoming and Colorado)
- Residential Project in Southern Idaho
 - \$700-800 K
 - 300 square meters (3200 square feet)
 - 7 month construction schedule
 - 30 trade partners
 - Traditional contracting with trade partners, BUT selection based on previously proven willingness to participate in collaborative approach

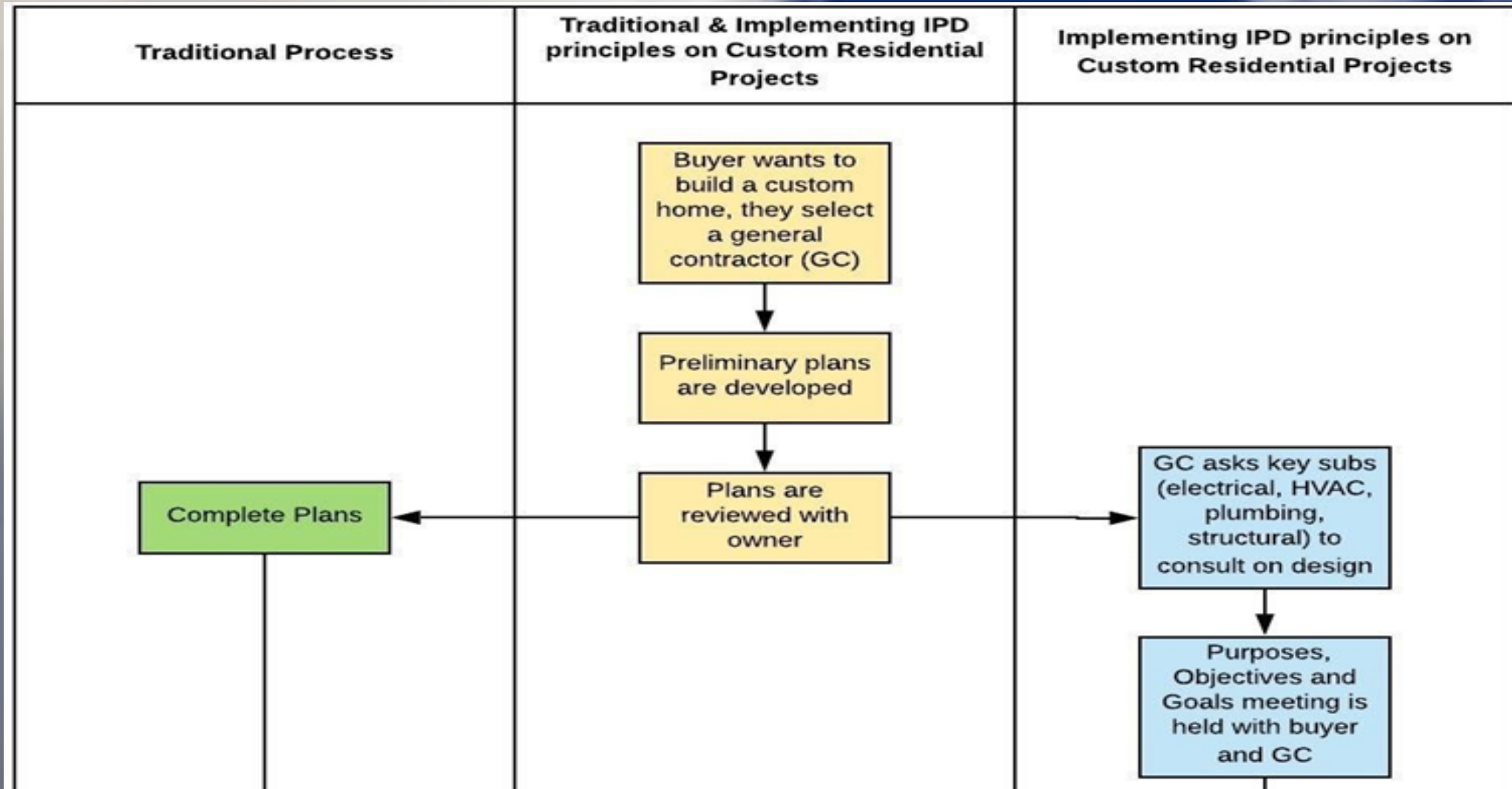
Process Comparison



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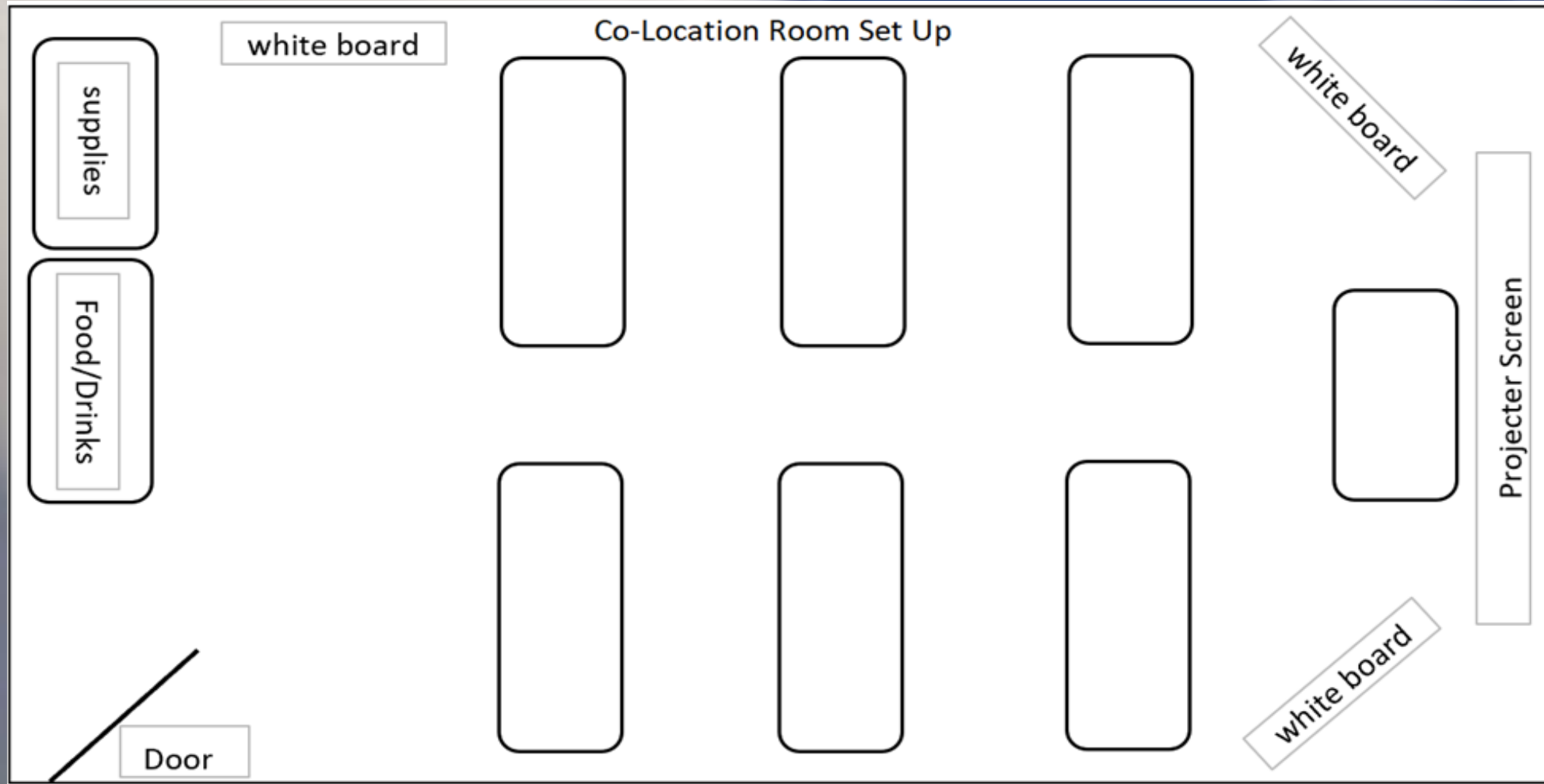
Co-location Meetings



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Survey Responses - PLUS



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Identified Themes	Responses
Accountability	Making everyone accountable to each other, at least to pay attention.
	Getting everyone on board with joint-accountability.
	Having the ability to voice issues experienced during the last construction phase, and having the opportunity to talk with related trade partners and management upfront in hopes of finding solutions to those issues so going forward, everyone can perform their tasks with greater efficiency.
Communication	Getting things out in the open.
	The direct input from the different people involved in the project, General Contractor being receptive to Trade Partner input.
	Understanding client needs and desires better to produce a final project people are excited about being part of.
Finding Solutions	It helps to meet with the architect and engineer face to face.
	Great having input up front with the designers and other subcontractors. I think it will help solve some of the problems we encountered on the last phase.
	Everyone working together to reach the same goal.
	Feedback from door installer on door issues and solutions to implement.
	Working together to find the most efficient way to get the project built.
Other	Talking through the previous problems.
	Positive team mentality, better work environment.
	Open mindedness and new ideas for future phases.
	Being part of the team.
	We may have a great set of drawings.
	Good flow to the project, scheduling has been good.

Survey Responses - DELTA



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Identified Themes	Suggestions
Time Management	To move through things a little quicker and when we come to a stumbling block that's really up to the engineer or the architect, let them have adequate time to come up with solutions and then we can regroup and look at the recommended solutions.
	It's hard to block out an entire day for meetings, but if it must be then it must be.
	Trying not to get into so many details with a large group.
	Have those trade partners with less imperative, time consuming, concerns participate earlier in the round tables so they don't have to sit through the entire session.
Plans/Drawings	Focus on creating a clear, better set of plans.
	Up-to-date set of plans for review would be great.
	Finishing the site work package earlier so I can provide better budgets.
	Notify trades if they are effected by any changes to plans in addition to updating sheets on plan grid.
Follow Up	Just want to make sure we implement everything we talked about and not make this week a waste. Build on it and keep the momentum.
	Follow up with meeting notes, white board images, and/or a summary of what was discussed.
	Keeping the communication going throughout the project.
Other	More snacks for the people that are there all day 😊

Survey – other highlights



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1. 100% of respondents found being involved early to be beneficial to them.
2. 100% of respondents felt this process created an environment where they were able to be more efficient.

Observations



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Key Takeaways

1. Owner buy-in
2. GC must stimulate and facilitate discussion
3. Owner present during Kick-off meeting with trade partners
4. GC must engage trades and validating input and encouraging open dialogue

Conclusions



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IPD principles **CAN** be implemented on residential projects to improve project outcomes for key stakeholders

1. Requires application of principles *AND* supporting practices
2. Perceived positive impact on quality, efficiency and cost.

Conclusions



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Trade Partners

- Feel process benefits them
- Increased input during design makes them more efficient and produce better product
- Limits costly change orders

Owners

- Appreciate involvement and alignment
- Recommended the process to others

Conclusions



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Starting point for interested residential builders?

1. Early involvement of team members
 - Jointly developed project goals (*value* identified by a Purpose, Objectives and Goals Meeting – shared with trade partners during the Project Kick-off Meeting)
2. Encourage and enable collaborative decision making
 - Co-location meetings as possible
 - Wellness checks (continuous improvement)
3. Mutual respect and trust
 - Financial transparency



Thank you for
watching/listening!