

2013 Project Delivery Webinar Series

Lean Case Study Webinar Handout
Tuesday, September 24, 2013

The Project

THR Methodist Alliance Hospital, Fort Worth, Texas.

Hospital;

188,000 s.f. \$46.5m

58 beds with growth potential of 300 beds

MOB;

74,000 s.f. \$10m

Project of identical scale completed within the last year set the base budget number.

The Project

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The Project



THR Presbyterian Hospital, Flower Mound, Texas
Final Cost \$43,500,000

The Project



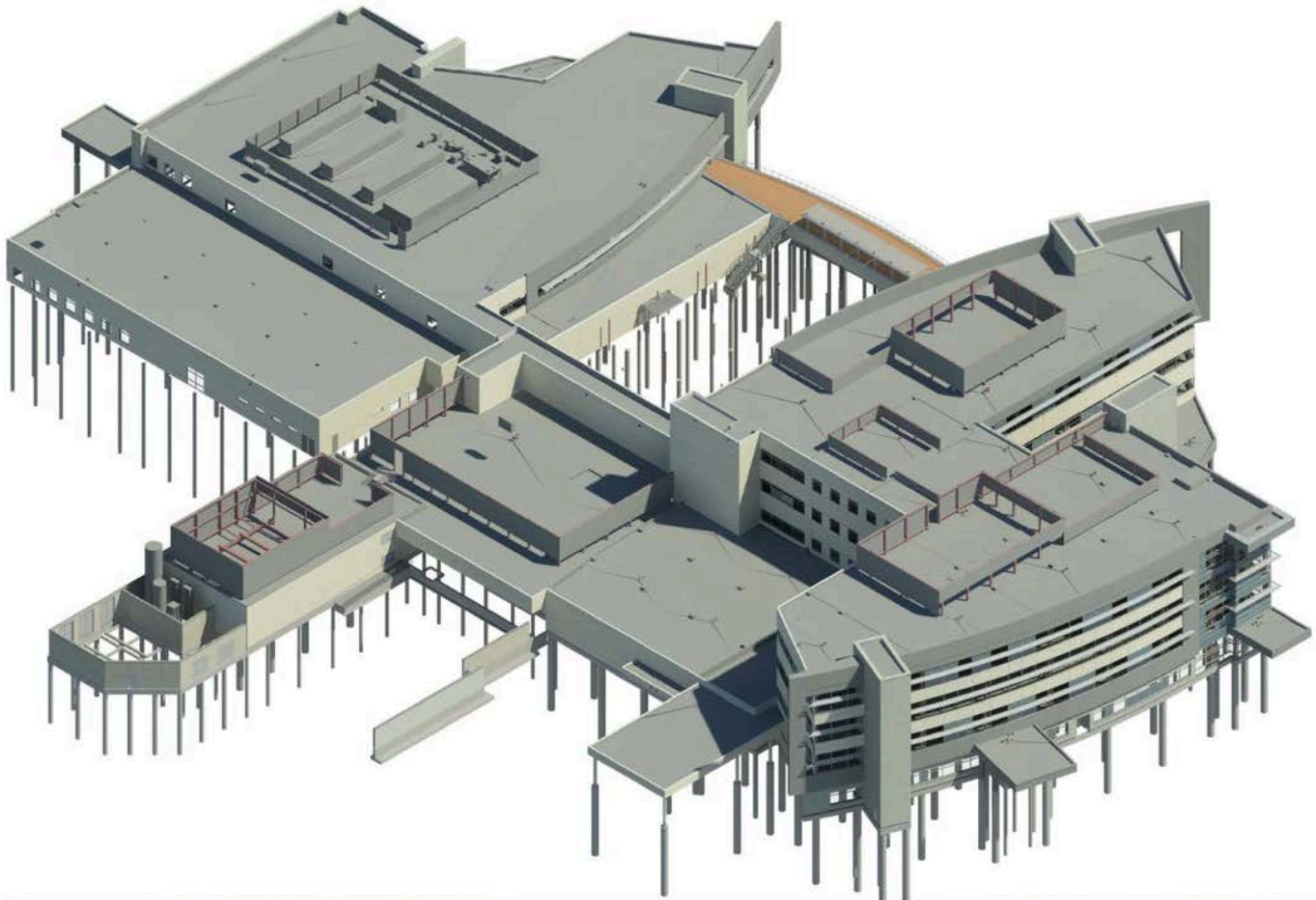
The Project



The Project



The Project



Contractual Issues

Perkins + Will in Dallas is the architect, no IPD experience, no Lean experience.

Beck is the contractor, internal integrated experience, but no IPD experience, no Lean experience

Owner representative, Denton Wilson, had become a national spokesman for IPD and Lean, left halfway through the project.

The Project

Initial Budget; \$43,500,00

Budget with Additional Scope; \$46,500,000

Initial Design Estimate; \$49,500,000

Mechanical Upgrades; \$2,500,000

- Heat pump chillers
- Additional Generator
- Fanwall technology

Final Cost; \$46,500,000

Contractual Issues

AIA C191 contract-multi party agreement, similar to C195 but does not require the formation of an LLC.

Owner/Architect/Contractor agree to waive all claims.

Not operating under a true C191 'cost-plus' model;
Architect has a fixed fee
Contractor has a GMP

Project began \$3m above baseline goal, project ended \$800,000 below budget, with \$2.5m in added value. No accounting for added value.

Incentive Plan

Fee at risk;

Beck	\$230,000 (.05%)
P+W	\$230,000 (.05%)

Savings incentive;

Beck	\$230,000 (.05%)
P+W	\$230,000 (.05%)

THR retained savings; \$460,000

Any additional savings beyond \$1,380,000 will be split equally between the owner, architect, and contractor.

Incentive Plan

Fee at risk recovered with four factors;

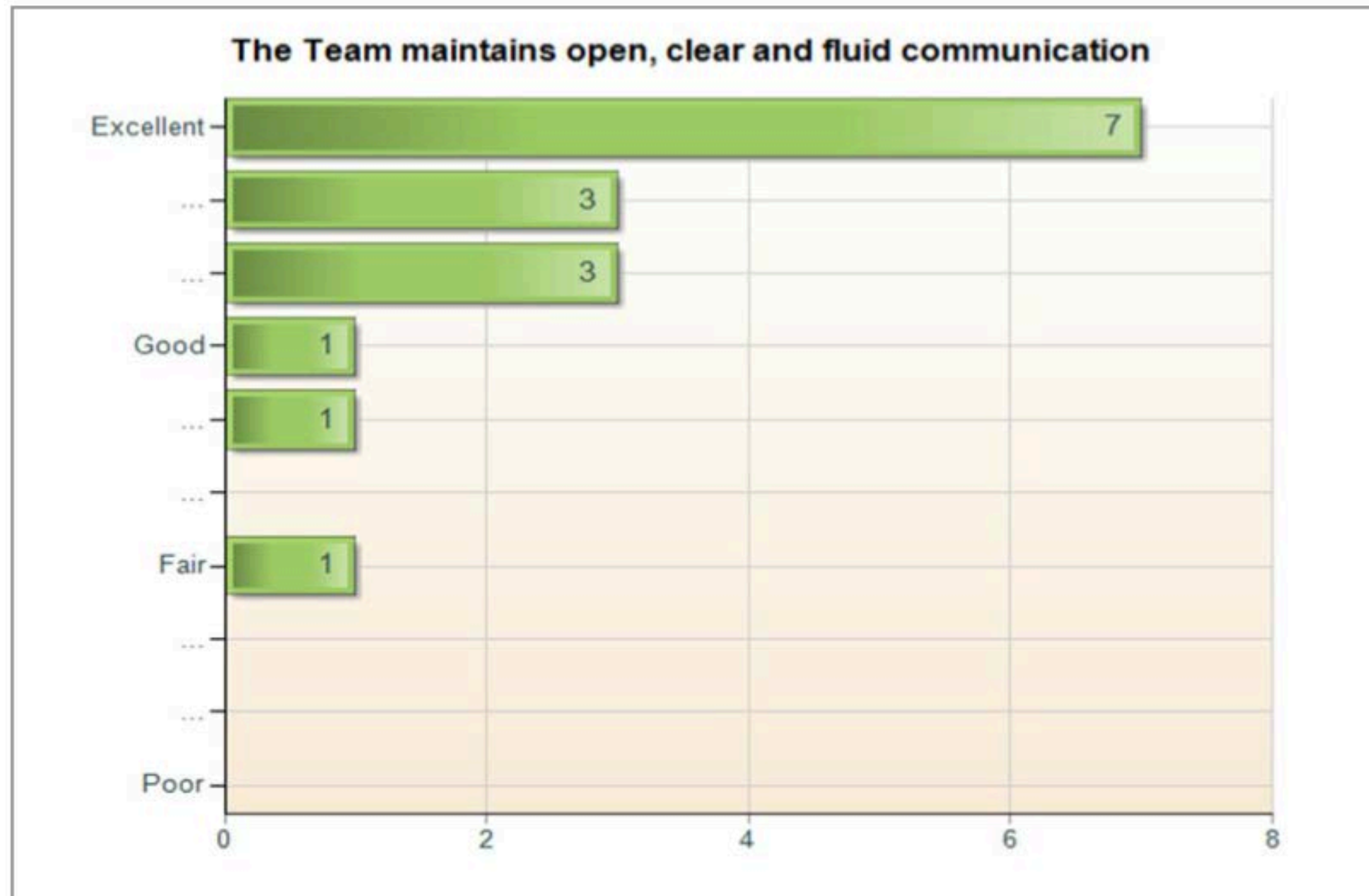
- 1-Overall client satisfaction achieved
- 2-Final cost less than target cost
- 3-Substantial completion achieved
- 4-Quality meets owner standards

Incentive Plan

Project Savings Incentive Distribution based on the average survey score from a 20 question survey taken by the team. A sample;

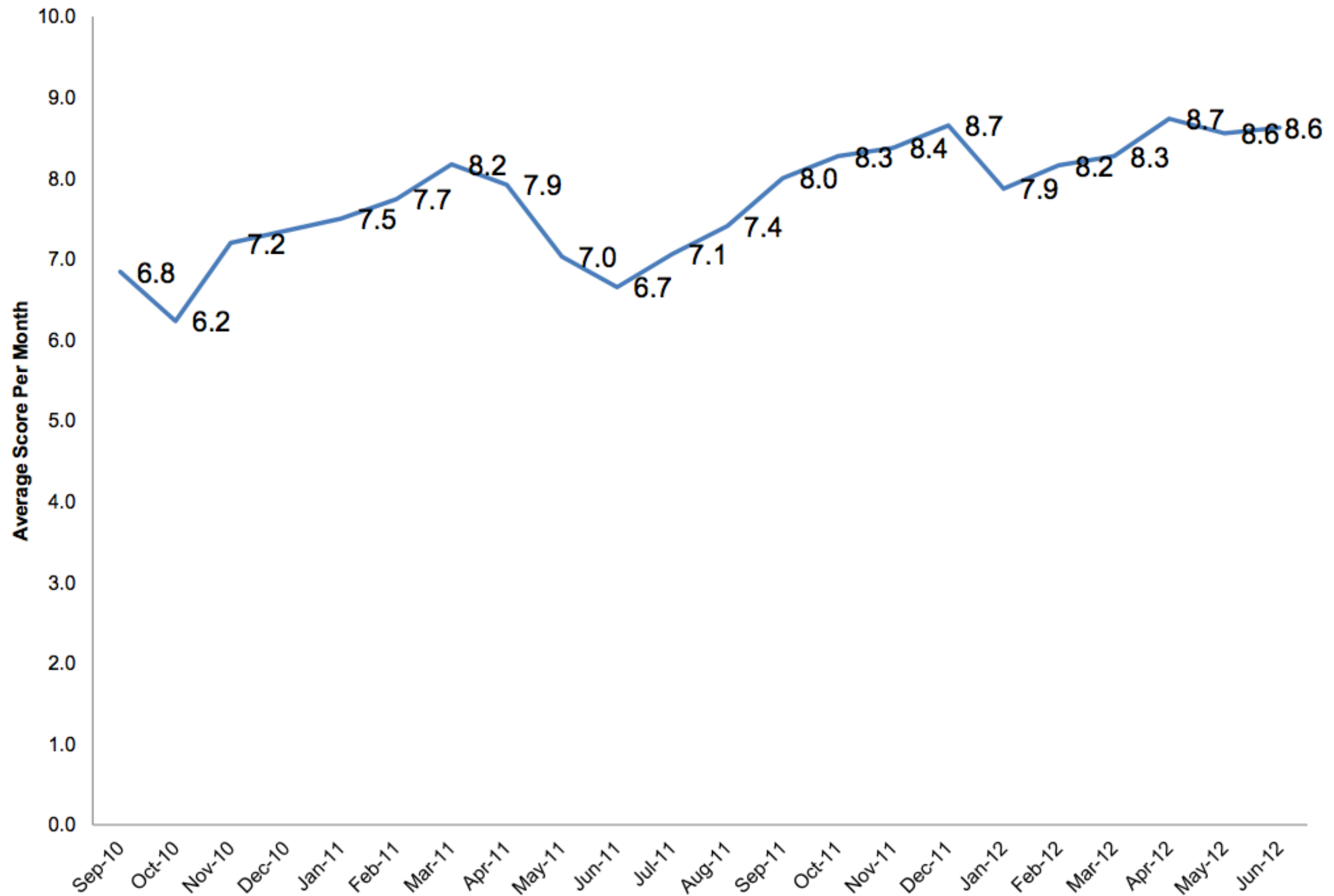
- Team members demonstrate trust and respect across all levels within the Team
- Project participant's time is used wisely and productively
- Team successfully incorporates and executes Building Information Modeling for the betterment of the project.
- The project team uses LEAN principles for making project decisions that are based upon current relevant data and are for the betterment of the PROJECT.

Incentive Plan



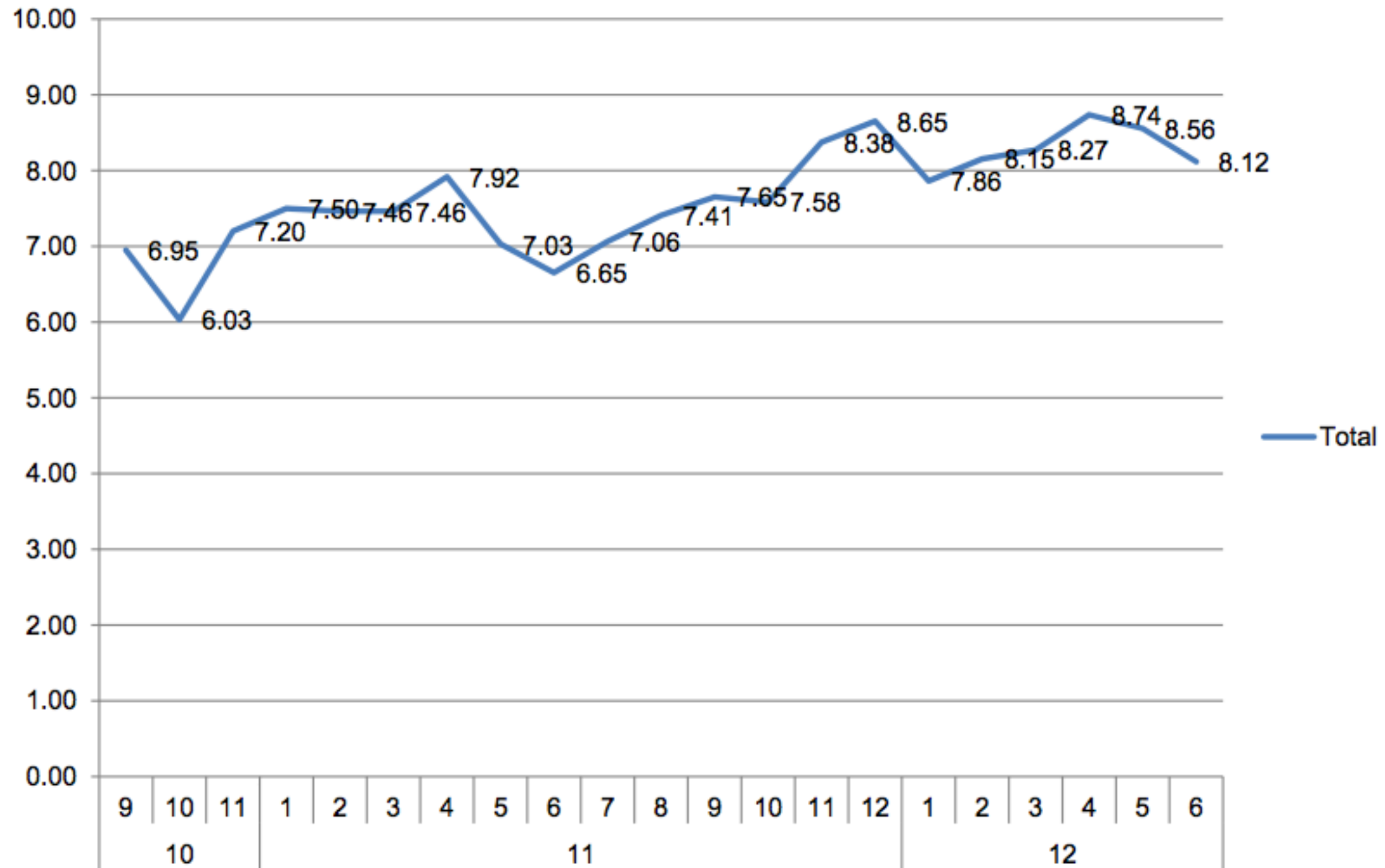
Incentive Plan

8. The Team maintains open, clear and fluid communication

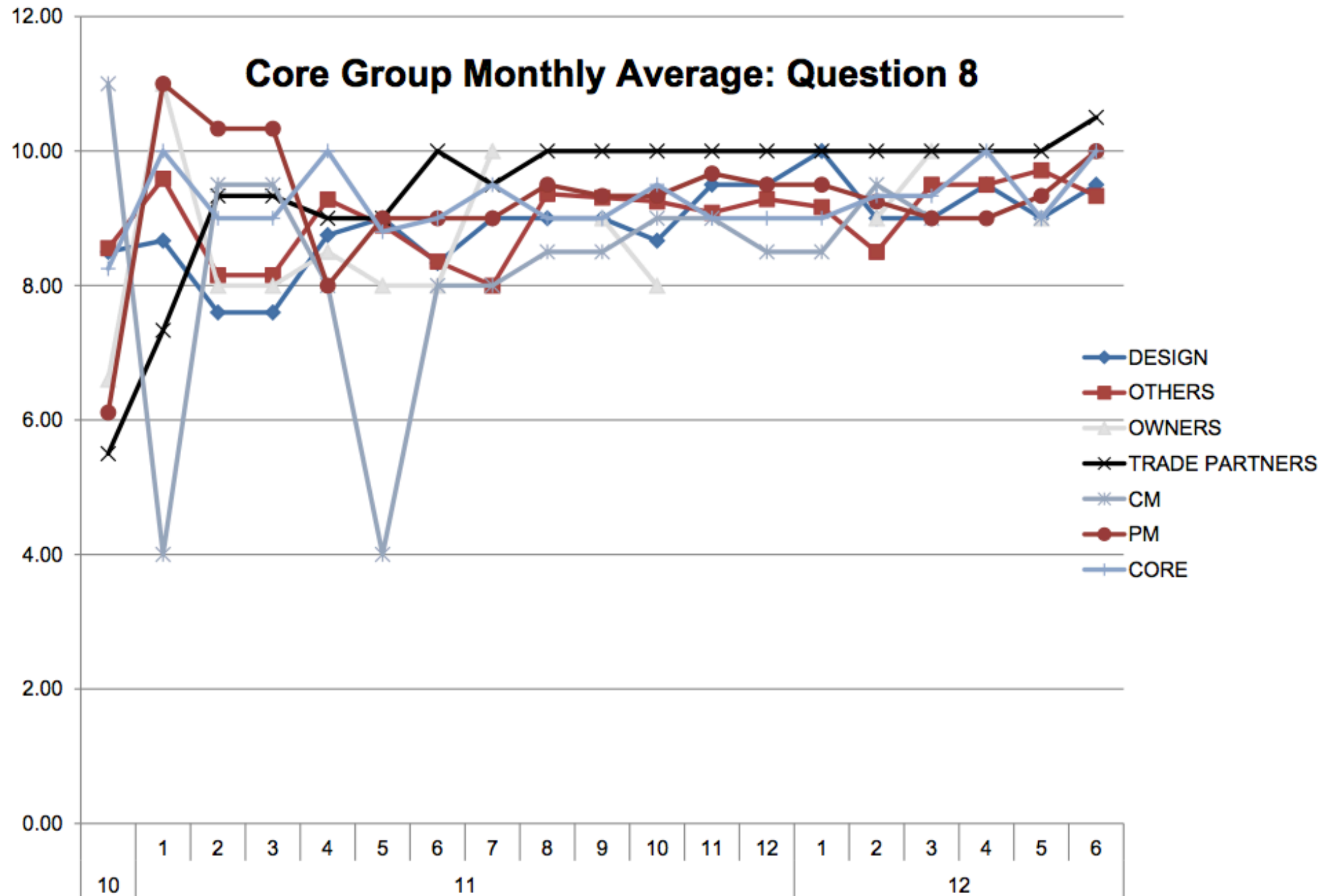


Incentive Plan

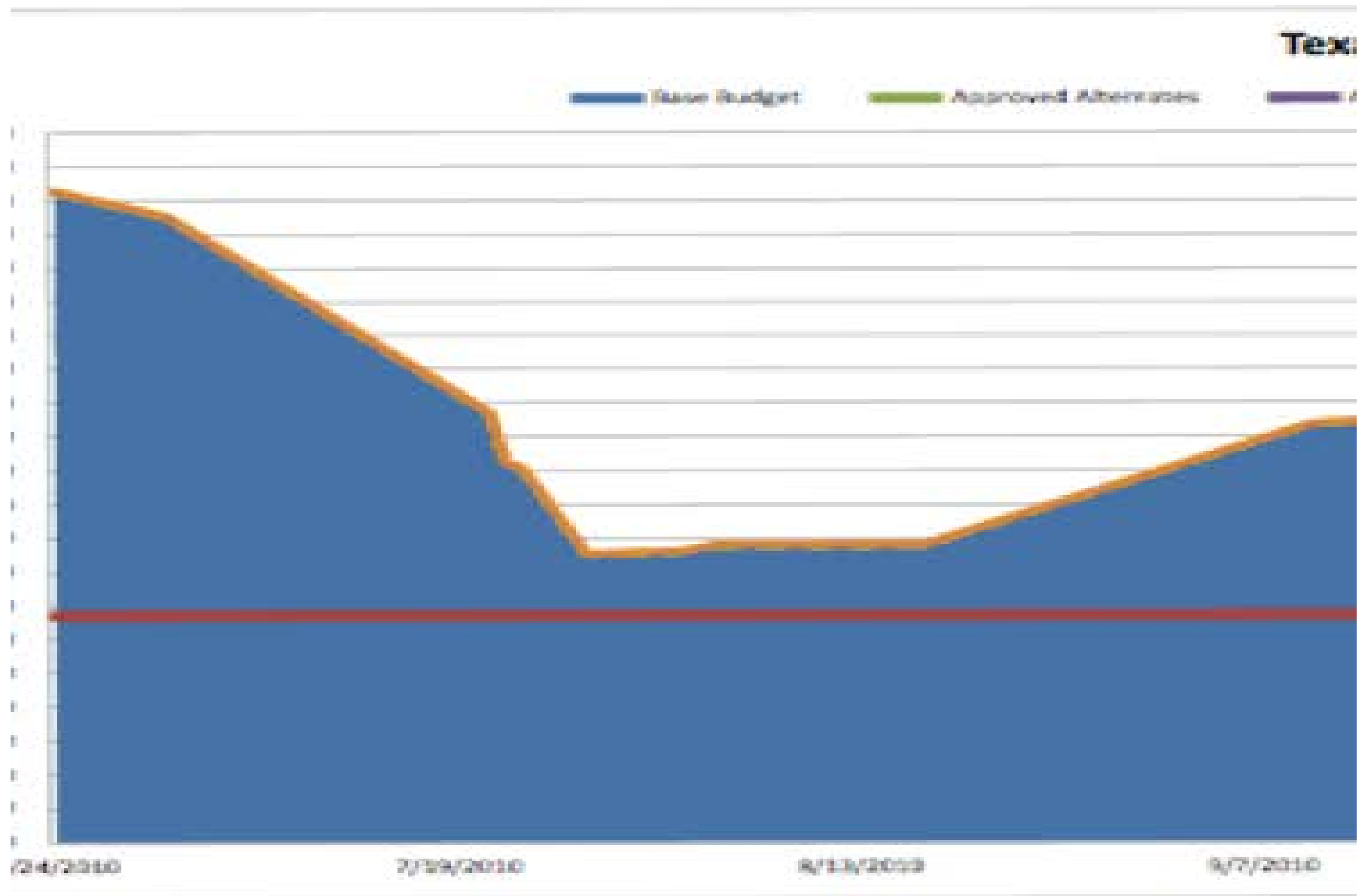
Core Group AverageResponse: Question 8



Incentive Plan



Project Budget vs. Estimate



Project Savings Distribution

THR / P+W / Beck Project Savings Distribution

FINAL: 12/19/12 - ALL C.O.W. has been verified			TOTAL SAVINGS: \$ 1,469,115		
	THR	Perkins + Will	Beck	Total	Evaluation Method
1) Fee at Risk returned to partners	-	262,040.00	262,040.00		By Four (4) Goals
a. Overall Client Satisfaction Achieved?	YES	-	65,510.00		
b. Final Cost less than Target Cost?	YES	-	65,510.00		
c. Substantial Completion Achieved?	YES	-	65,510.00		
d. Design and Construction Quality meets Owners Standard?	YES	-	65,510.00		
Earned Fee at Risk:		(PAID)	262,040.00	262,040	
Remaining				1,207,075	
2) Project Savings Incentive Distribution	-	262,040.00	262,040.00		By Team Survey
Distribution		235,836.00	235,836.00		
Savings Kept by Owner based on Survey	52,408.00			524,080	90%
Remaining				682,995	
THR Funds Retained 100%	460,000			460,000	
Remaining				222,995	
3) Bonus Incentive Distribution	55,749.00	55,749.00	55,749.00	222,996	By Team Survey
Distribution	50,174.10	50,174.10	50,174.10	222,996	90%
Savings Kept by Owner based on Survey	22,299.60	25,087.05	25,087.05		
Remaining				(1)	
Savings Reallocation	-				
c Total Saving Distribution	584,881.70	311,097.15	311,097.15	1,207,076	(1.10)
4) Bonus Incentives at Owner's Discretion		TBD	TBD		

Contractual Lessons

The reward structure has to be sufficient to compensate the architect for the additional work.

The reward structure modified the architect's behavior, but they felt that they would prefer to collaborate without the fee incentive.

Not including Structural and MEP engineers in the reward structure caused problems on the team.

Without an active and supportive owner the process will not succeed.

Contractual Lessons

The waiver of liability was valuable in creating an environment of collaboration and BIM sharing.

Contractual Lessons

In comparison to your normal process do you find IPD to currently be beneficial to you?

Why or Why Not?

No

Yes

16

0

5

10

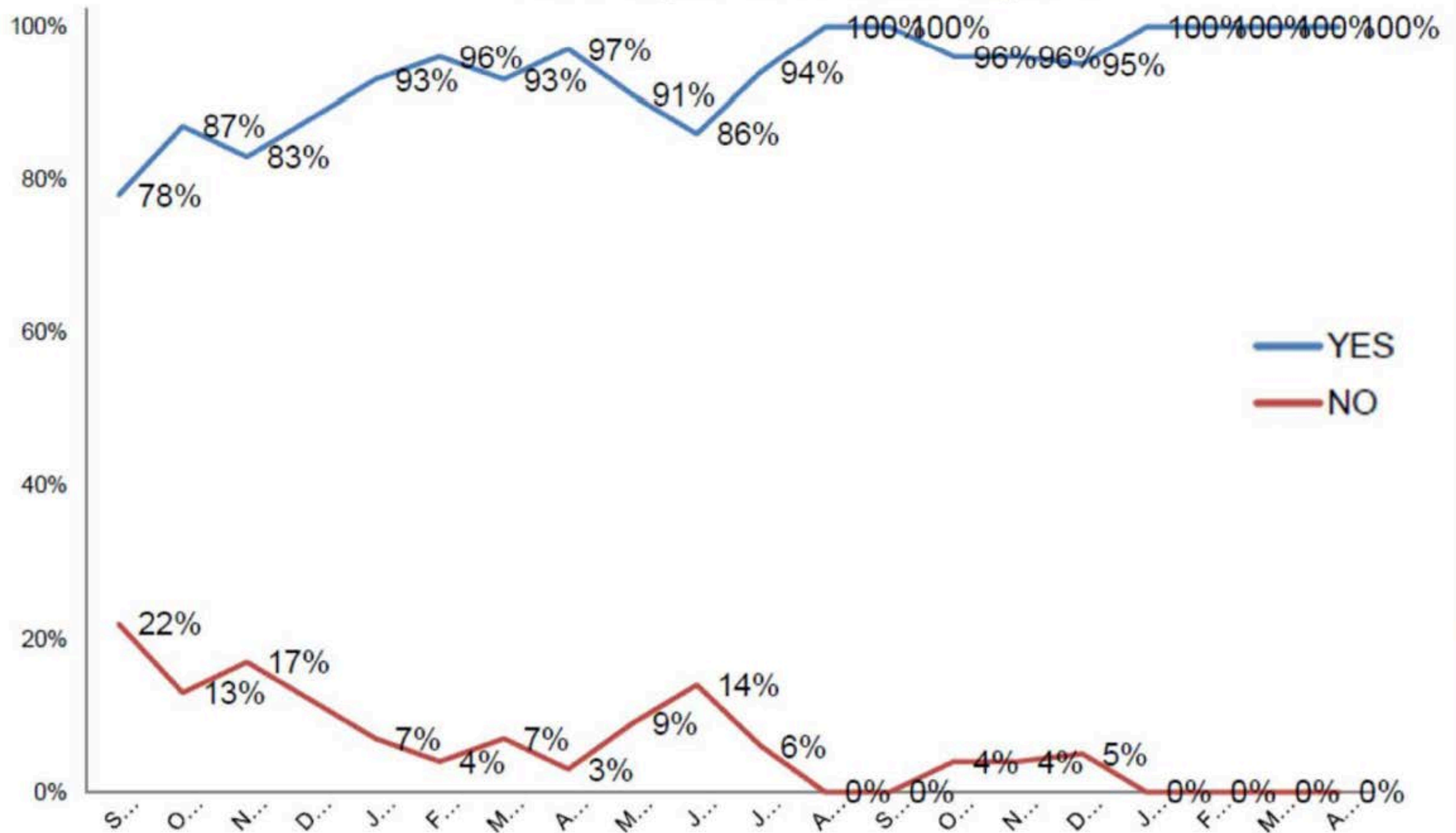
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20



Contractual Lessons

13. In comparison to your normal process do you find IPD to currently be beneficial to you?



LEAN Process

THR hired a Lean consultant to assist on the project. He was an Industrial Engineer with experience on refineries and industrial projects.

The processes used were;

A3; suggestions fit onto an 11x17 piece of paper

Scorecards; the team's monthly self-rating

Pull schedule; starting at the end result

Weekly Work Plan; review tasks at the start of each week, no PPC used.

Target value design; designing to a set budget

Retrospective; a one month review of process

LEAN Process

Target Value Design

Hospital building structural steel system using target based design; .05% over budget

MOB structural steel not using target based design; 8.0% over budget. Engineer was out of fee to continue meetings.

Fabricator completed the steel detailing to minimize tube and angle steel, minimizing the labor while adding slightly to the tonnage.

Lean Lessons

Very difficult to match the flow between architecture and construction.

Architect felt financially challenged because of the process. 25% more hours than in a traditional process, half of those hours based on owner decisions.

Architectural team found the process rewarding, architectural management not so much.

Architectural management struggled with the risk and inability to predict profit on the job.

LEAN Lessons

LEAN does not mesh with typical efficient architectural processes; 'go slow to go fast', 'target based design', many more meetings.

'If I had to do this on every project we would go broke.' P+W Associate Principal.

Be careful when selecting a consultant, begin by implementing a few key processes; PPC, Last Planner, Pull Scheduling.....

'The greatest benefits accrued to the owner'

BIM in IPD

Signed the AIA E202 but referred to the P+W BIM protocol for more detail.

Model is no longer primarily for 2D documentation, it is now a tool for estimating, coordination, and phasing.

Everything gets modeled, eliminate 2D content in the 3D model.

Accuracy of model is critical, floor and roof slopes modeled, walls modeled to correct height.

BIM in IPD

P+W agreed to follow some key BIM standards from Beck, these have now been adopted for all their projects.

BIM in IPD 2.0

Separation of model elements into objects that match estimating elements.

Coding all library items into cost database.

Focus on model not drawings as building tool to minimize notation.

Generating datapoints to feed directly into Trimble for layout.

Model generated by the team for the team.

BIM final thoughts

BIM is not a substitute for an experienced estimator.

Without the IPD liability waiver true BIM cooperation becomes more challenging.

He/she who controls the model controls the process, do not give this up lightly.

The general standard of architectural documentation is currently low, this will hurt the profession. How to get paid for higher quality?

Completed Project



Completed Project



Completed Project



Completed Project



Completed Project



Completed Project



Final result

Compared to the comparable building used to set the base budget, this project was;

- Delivered in three months less time.
- Cost the owner \$584,000 less.
- Contained \$2,500,000 of upgraded mechanical.
- Significantly upgraded design.