

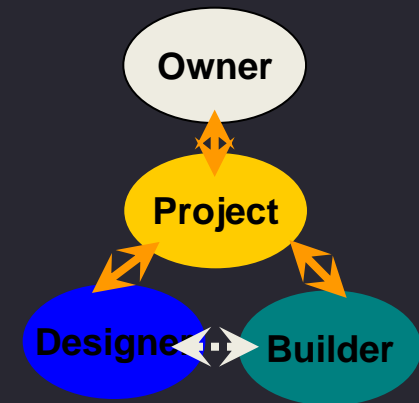
IPD Case Study

UCSF Hospital at Mission Bay

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Director UCSF

IPD Case Study

UCSF Medical Center, Mission Bay: San Francisco, CA



Virtual IPD

Scope-Status

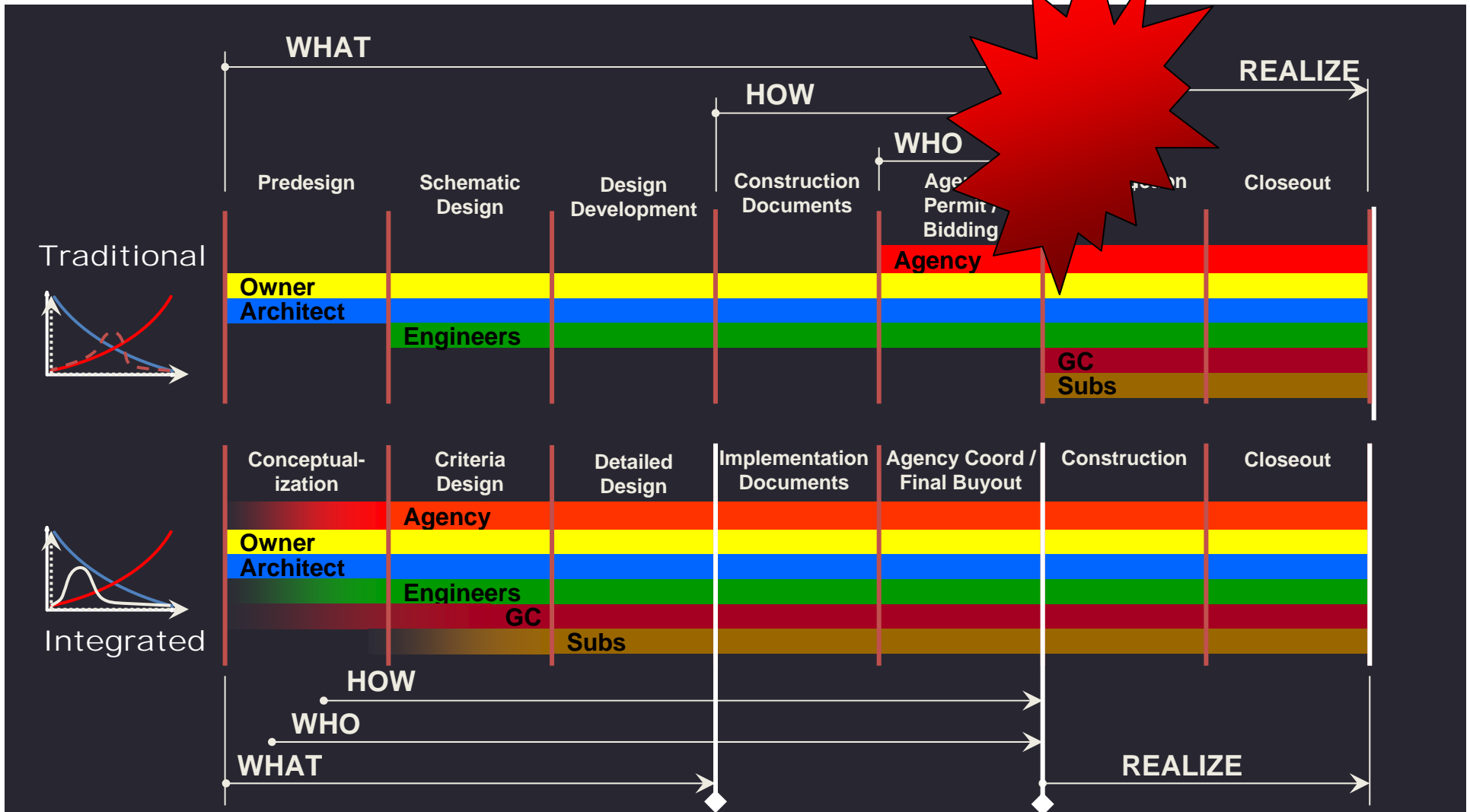


- Academic Medical Center
- 289 Beds
 - Women's
 - Children
 - Cancer
- 3 Buildings
- 50% CDs

Why IPD?

- Competition
 - 6 Major Hospitals on similar schedule
 - Limited GC's and Sub contractors
 - Limited Labor pool
- High Risk for claims for uncoordinated documents
- Cost Control

IPD Delivery Process

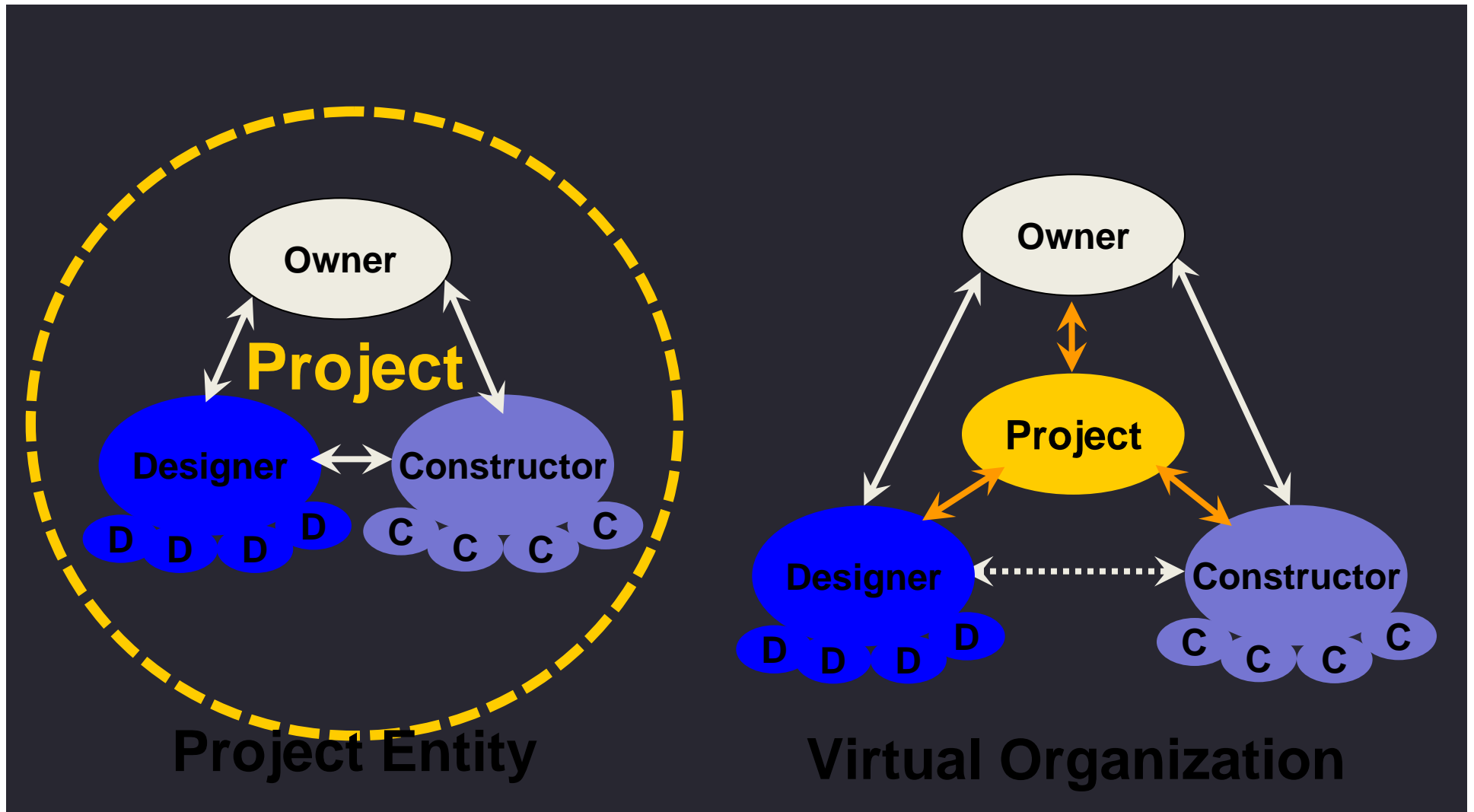


UCSF Case Study-Public Project

Challenges

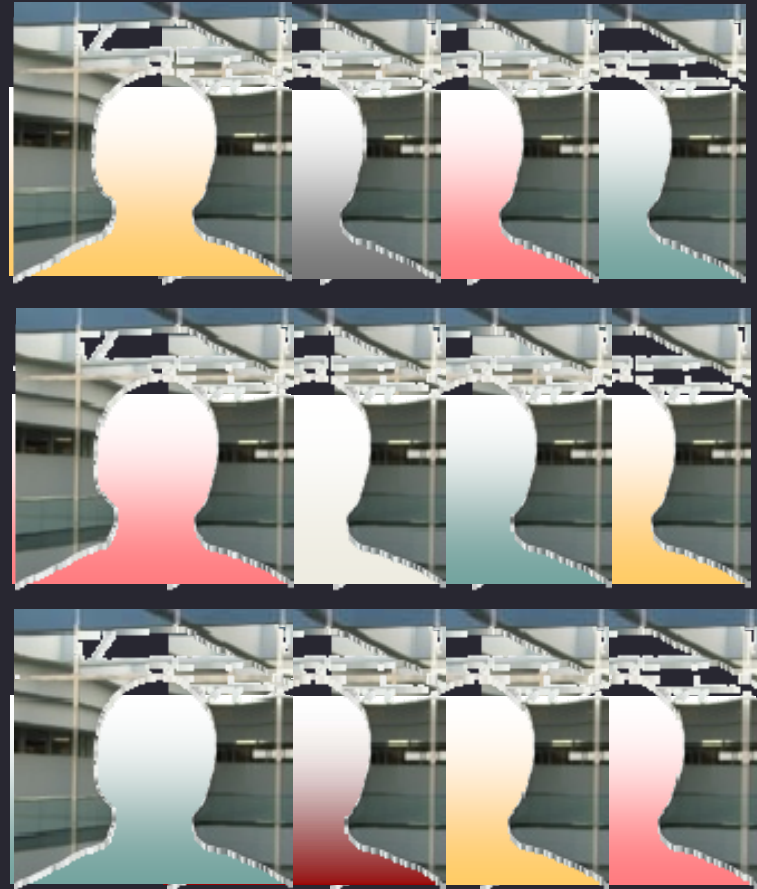
- Contracts-Public Contracting versus Policy
- Team Selection Process
- Participation prior to **inception** of design:
- Shared Project Control
- Collaborative Decision Making
- Cost Control

Contracts-Project Team Organization



Assembling the project team

- Progressive selection
 - Owner selects Lead
 - Owner + Lead select next team member
 - Participate in preparing RFQ and Interviews
- Get all on board-up front



Assembling the Project Team

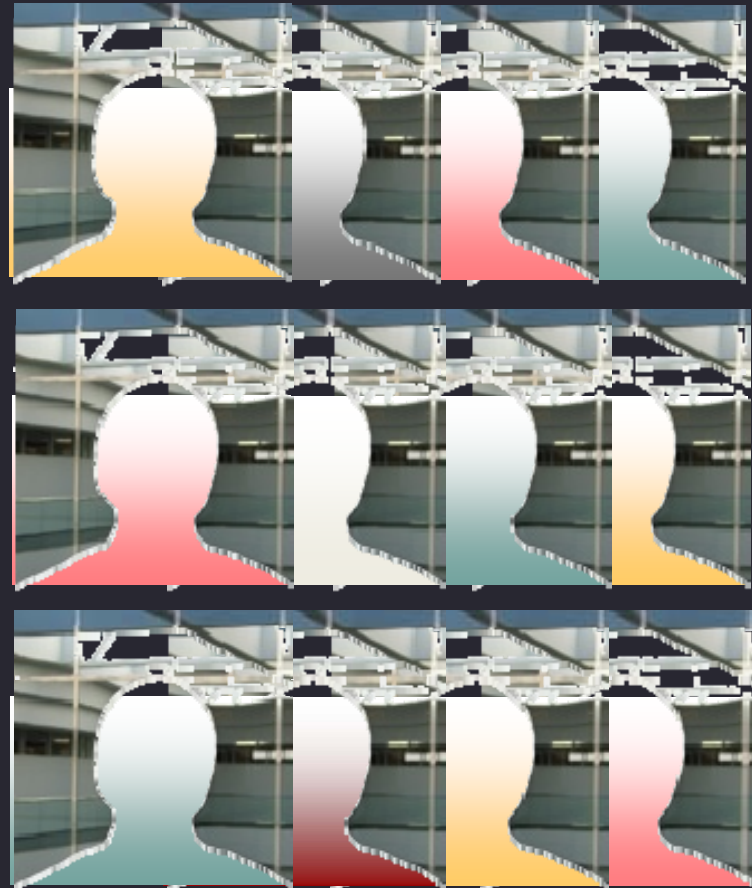
RFPs-RFQs

- Pre-qualification criteria
- Business Model
 - Traditional/Non Traditional Delivery Methods
 - BIM - System compatibility-getting to fabrication
 - Collaboration -Co-location – Essential
 - Whose behind the contract?
- Experience-IPD
- Results- Innovations brought to projects

Assembling the Project Team

Major Sub Contractors

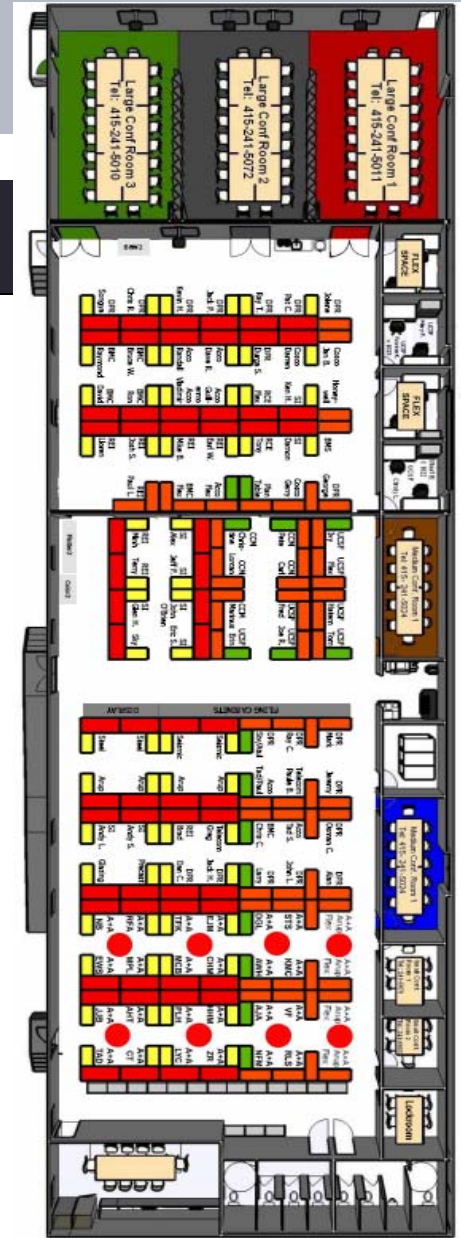
- MEP
- Drywall
- Concrete
- Steel
- Pre-Cast
- Glazing
- BMS



Project Responsibility Matrix

Design/Documentation Item		Phase 1 Precon			OSHPD Submittal	Phase 2 Construction		
		Primary	Secondary	Review		Primary	Secondary	Review
Design Coordination								
<i>Design/Assist Team Meetings</i>								
<i>Building Official/Permitting Agency</i>								
Costing during design								
	<i>perform construction cost analysis of proposed cost alternative</i>	C		E				
	<i>maintenance + life cycle cost analysis</i>	E		C				
	<i>make decision on cost alternative to pursue</i>	ECO						
Construction Documents								
<i>Mechanical Systems; General Items</i>								
	<i>Symbols, notes and schedules</i>	E		C				
	<i>Establish CAD standards, layering, symbols, title block & sheet numbering requirements, etc</i>	E	C					
	<i>Produce Specifications to match owners requirement and budget</i>	E	C					
HVAC Equipment Schedules								
<i>Criteria, sizing and initial vendor selection</i>								
	<i>AC Units</i>	E	C					
	<i>Boilers</i>	E	C					
	<i>Exhaust Fans</i>	E	C					
	<i>Air Outlets</i>	E	C					
	<i>Pumps</i>	E	C					
	<i>Other HVAC Equipment</i>	E	C					
	<i>Terminal Box Schedules</i>	E	C					
	<i>Reheat Coil Schedules</i>	E	C					
<i>Vendor procurement, submittal prep and costing</i>								
	<i>AC Units</i>	C		E				
	<i>Boilers</i>	C		E				
	<i>Exhaust Fans</i>	C		E				
	<i>Air Outlets</i>	C		E				
	<i>Pumps</i>	C		E				
	<i>Other HVAC Equipment</i>	C		E				
	<i>Terminal boxes</i>	C		E				
	<i>Reheat Coils</i>	C		E				

Integrated Center for Design and Construction



Cost Controls-Budget Distribution

Foundations / Slab on Grade	5.16%	Plumbing Systems	9.78%
Vertical Structure	4.35%	HVAC	18.75%
Floor and Roof Structure	8.15%	Electrical	11.96%
Exterior Cladding	9.51%	Fire Protection	1.36%
Roofing and Waterproofing	1.63%	MECH/ELECT	41.85%
STRUCTURE and SHELL	28.80%	Site Preparation	0.27%
Interior Partitions	11.96%	Site Development	4.89%
Interior Finishes	6.52%	Utilities on Site	0.82%
INTERIORS	18.48%	SITE	5.98%
Functional Equipment	1.63%	<hr/>	
Vertical Transportation	3.26%	Total	100%
EQUIP/TRANS	4.89%		

Note: Information provided is an example. Different building types will have different composite percentages

Cost Control-Estimate First, Design Second

Overall Cost Target Summary

OVERALL PROJECT TOTALS

Cost Target	\$650,060,463.00
Current Cost	\$575,645,988.00
Over/(Under) Target	<u><u>(\$74,414,475.00)</u></u>

Overall Cost Target Summary

GROUP 4: HVAC, Plumbing & Fire Protection
Overall Project

Owner Lead:
Estimating Lead:
Architect Lead:

HVAC, Plumbing & Fire Protection Totals

- An Overall Cost Target Summary is shown above.

Groups 1 & 4 (of 6) are shown to the right.

Overall Cost Target Summary

GROUP 1: Foundations & Superstructures
Overall Project

Owner Lead:
Estimating Lead:
Architect Lead:

Foundations & Superstructures Totals

Foundation	
Cost Target	\$15,285,881.00
Current Cost	\$17,434,284.00
Over/(Under) Target	<u><u>\$2,148,403.00</u></u>
Superstructure	
Cost Target	\$60,026,026.00
Current Cost	\$75,428,021.00
Over/(Under) Target	<u><u>\$15,401,995.00</u></u>

HVAC

Cost Target	\$104,015,114.00
Current Cost	\$116,331,699.00
Over/(Under) Target	<u><u>\$12,316,585.00</u></u>

Plumbing

Cost Target	\$46,223,148.00
Current Cost	\$51,587,062.00
Over/(Under) Target	<u><u>\$5,363,914.00</u></u>

Fire Protection

Cost Target	\$10,077,859.00
Current Cost	\$13,376,329.00
Over/(Under) Target	<u><u>\$3,298,470.00</u></u>

Groups are further broken down by Sections and Cost Drivers

(A section detail for Group 4 shown on next slide.)

Cost Control-Target Driven Summary

Cost Target Driven Summary

GROUP 4: HVAC, Plumbing & Fire Protection

SECTION 1: DRIVERS
GFA :632, 738 SF

Date of Summary

	50% DD					100% SD					Reason for Variance
	Quantity	Unit	\$/Unit	COST		Quantity	Unit	\$/Unit	COST		
			\$/GSF	\$,000				\$/GSF	\$,000		
PLUMBING											
<i>Fixtures</i>	1,558	EA	3,551.65	8.75	\$5,533,463.00	1,405	EA	3,551.65	8.75	\$5,533,463.00	Increased quantity but decreased installed rates
<i>Waste Drainage System</i>	43,560	LF	104.16	7.17	\$4,537,413.00	48,637	LF	104.16	7.17	\$4,537,413.00	Decreased quantity, increased labor & material rates
<i>Condensate Drainage System</i>	8,600	LF	42.28	0.57	\$363,567.00	8,600	LF	42.28	0.57	\$363,567.00	Increased labor & material rates
<i>Storm Drainage System</i>	19,700	LF	152.21	4.74	\$2,998,442.00	21,168	LF	152.21	4.74	\$2,998,442.00	Decreased quantity, increased labor & material rates
<i>Domestic Hot & Cold Water</i>	139,780	LF	42.11	9.30	\$5,885,851.00	127,780	LF	42.11	9.30	\$5,885,851.00	Increased quantity for 1st floor piping, increased labor & material rates
<i>Industrial Hot & Cold Water</i>	34,606	LF	71.84	3.93	\$2,486,257.00	34,606	LF	71.84	3.93	\$2,486,257.00	Increased labor & material rates
<i>Medical Service Piping</i>	95,194	LF	132.94	20.00	\$12,655,550.00	90,406	LF	132.94	20.00	\$12,655,550.00	Increased quantity for 1st floor piping, increased labor & material rates
<i>Natural Gas Piping</i>	1,123	LF	91.01	0.16	\$102,203.00	1,123	LF	91.01	0.16	\$102,203.00	Increased labor & material rates
<i>Food Services</i>	632,738	GFA	1.19	1.19	\$749,800.00	640,841	GFA	1.19	1.19	\$749,800.00	Increased labor & material rates
<i>Other Items</i>	632,738	GFA	8.23	8.23	\$5,207,433.00	640,841	GFA	8.23	8.23	\$5,207,433.00	Increased labor & material rates
Sub-total - Plumbing				64.04	\$40,519,977.00				64.04	\$40,519,977.00	
HVAC											
<i>Chilled Water Piping - Main runs</i>	14,760	LF	261.64	6.10	\$3,861,749.00	10,680	LF	250.25	4.22	\$2,672,638.00	Quantity and rate increase
<i>Low Temperature Chilled Water Piping - Main runs</i>	32,765	LF	10.23	0.53	\$335,073.00	XXX	XX	XXX	XXX	XXX	Not included in 100% SD
<i>Heating Hot Water Piping - Main runs</i>	32,765	LF	94.59	4.90	\$3,099,244.00	30,940	LF	93.66	4.58	\$2,897,842.00	Quantity & rate increase, pipe size & length changes
<i>Steam & Condensate Piping - Main runs</i>	14,590	LF	99.22	2.29	\$1,447,549.00	10,590	LF	99.37	1.66	\$1,052,333.00	Quantity increase
<i>Piping Connections</i>	897	EA	4,079.28	5.78	\$3,659,116.00	697	EA	4,286.67	4.72	\$2,987,810.00	Quantity & rate decrease, Updated FCU/CRAC/Re-heat
<i>Valves - Controls</i>	632,738	GSF	2.42	2.42	\$1,530,203.00	640,841	GFA	2.36	2.39	\$1,509,974.00	No significant change
<i>AHU's</i>	805,000	CFM	12.27	15.62	\$9,881,244.00	751,056	CFM	9.77	11.60	\$7,339,077.00	Quantity increase and rate increase
<i>Air Distribution - Standard</i>	1,464,500	LB	21.92	50.73	\$32,101,336.00	1,474,000	LB	20.16	46.96	\$29,713,491.00	Adjusted to updated FCU/CRAC, provided sizes & rate increase
<i>Air Distribution - Stainless Steel, Aluminum, Phoenix Boxes</i>	97,500	LB	33.13	5.11	\$3,230,317.00	97,500	LB	31.51	4.51	\$2,851,448.00	Quantity increase & rate increase
<i>Controls</i>	775	EA	5,802.11	7.11	\$4,496,633.00	850	EA	4,954.02	6.66	\$4,210,920.00	Rate increase
<i>Testing & Balancing</i>	632,738	GFA	13.50	13.50	\$8,539,020.00	640,841	GFA	18.87	19.12	\$12,095,050.00	Scope Change
<i>Other Items</i>	632,738	GFA	2.71	2.71	\$1,714,438.00	640,841	GFA	2.58	2.61	\$1,651,633.00	Rate increase
Sub-total - Mechanical				128.02	\$81,000,421.00				117.99	\$74,656,508.00	
FIRE PROTECTION											
<i>Ordinary Hazard System</i>	632,738	GFA	15.00	15.00	\$9,491,063.00	640,841	GFA	10.86	11.00	\$6,960,113.00	Rate increase
<i>Other Systems</i>	3,810	GFA	72.46	0.44	\$278,086.00	640,841	GFA	0.37	0.37	\$235,421.00	Rate increase
Sub-total - Fire Protection				15.44	\$9,767,149.00				11.37	\$7,195,533.00	

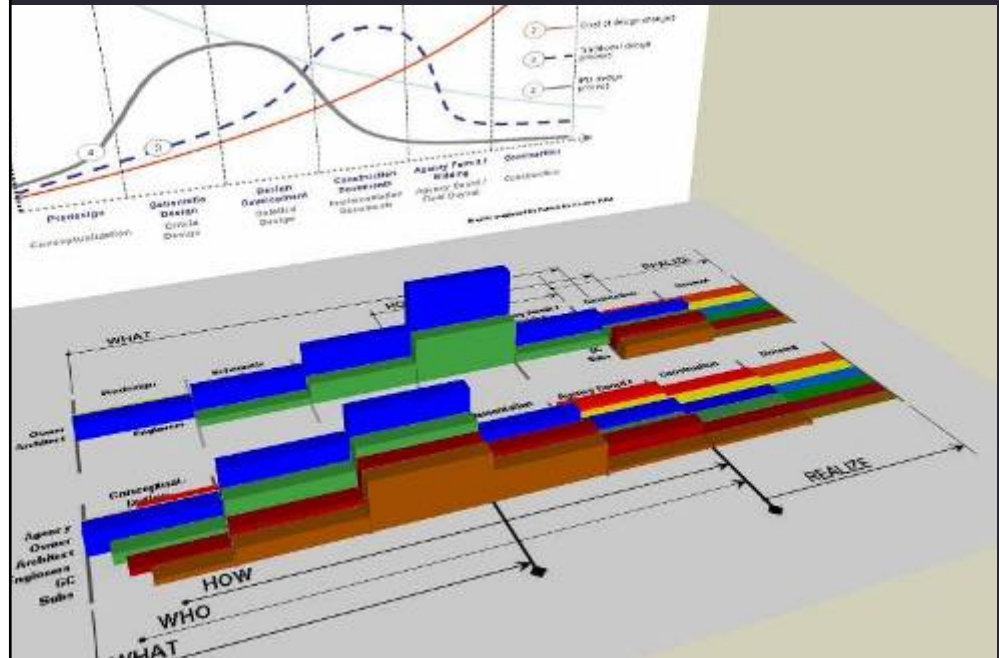
Questions & Answers



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Integrated Project Delivery: A Guide



www.aia.org/ipdg

The Integrated Project Delivery Seminar
San Diego

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