

IPD on Small Projects

Is it possible?

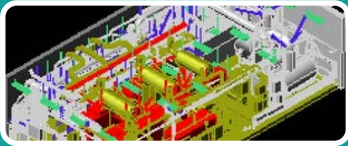
Is it worth it?

November 30, 2016
Integrated Project Delivery 2016
James Pease – Sutter Health

Presentation Summary



Chilled Water Replacement



Electrical System Replacement



ED to Urgent Care

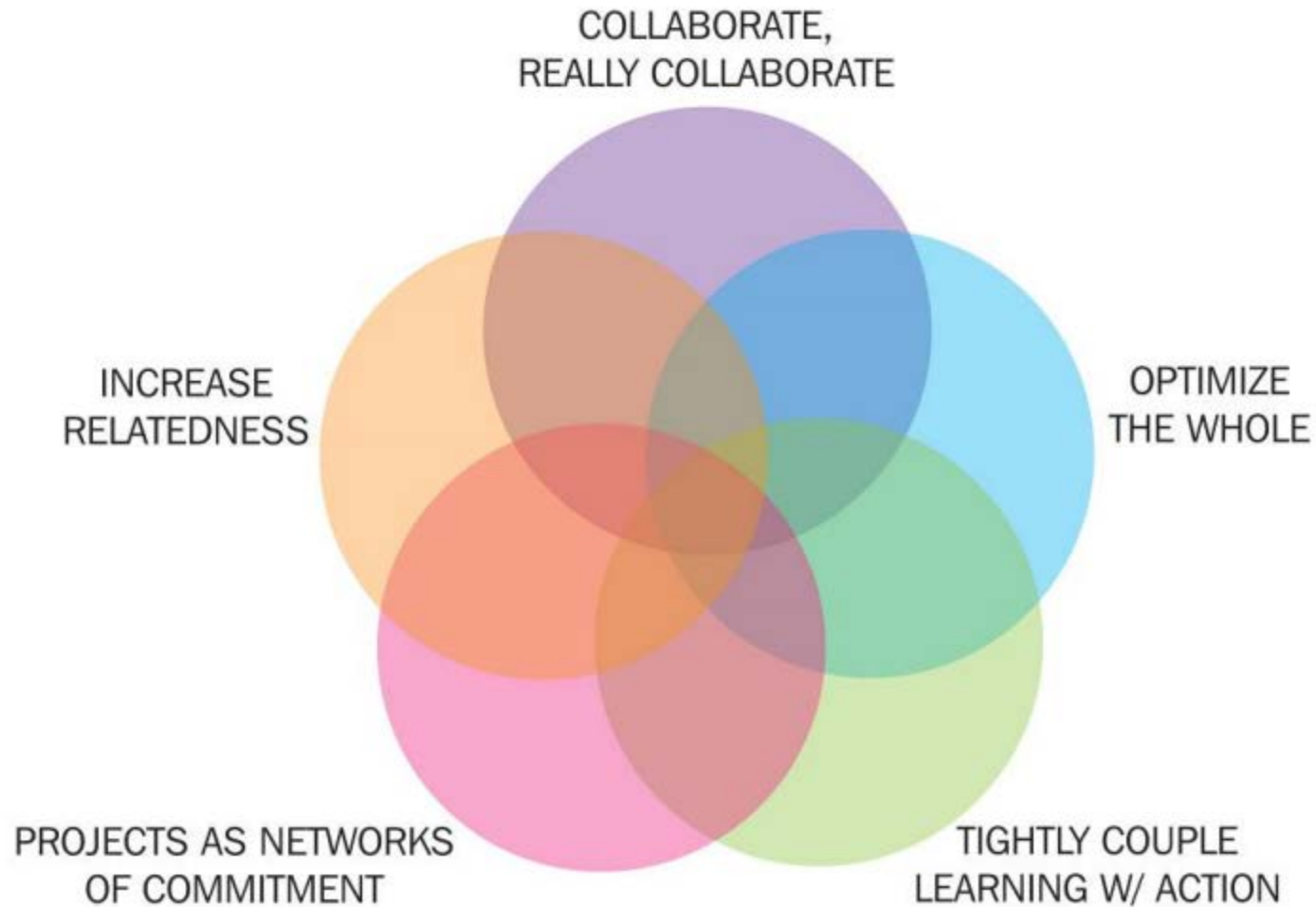


Lessons Learned



Going Forward

5 Big Ideas



Mills Campus – San Mateo



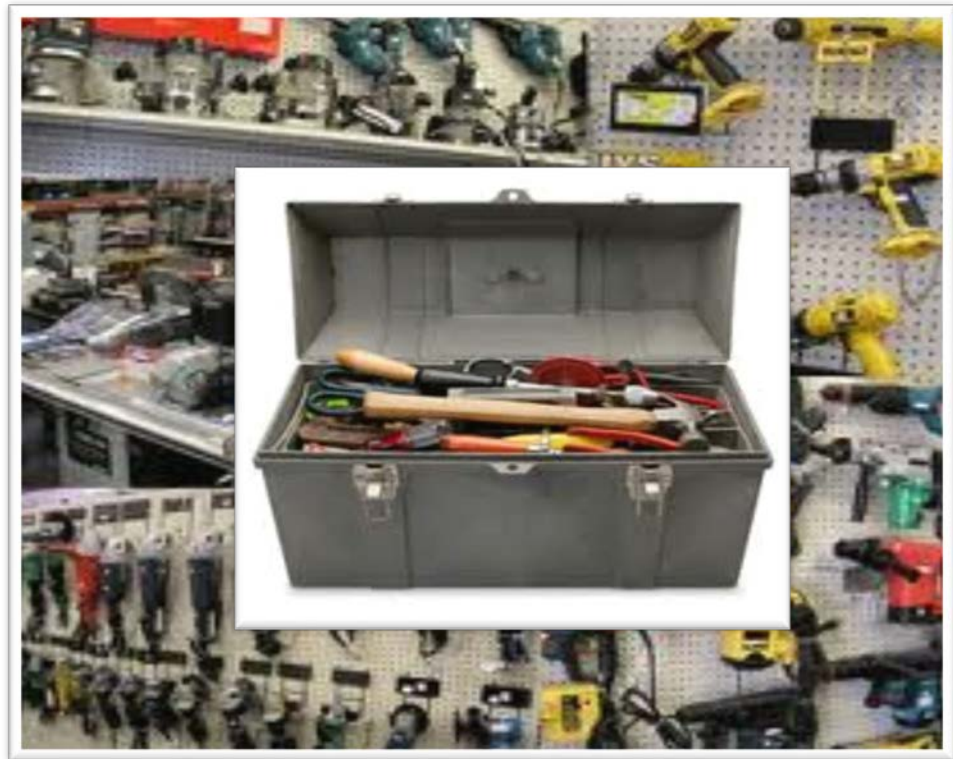
Chilled Water System Replacement



- \$3 Million Construction - OSHPD
- Part time project commitment for team
- Short construction duration
- Limited economies of scale
- Limited “Production” work

Project Kick Off

1. “We are already Collaborative”
2. Tools would make us “LEAN”
3. **1st IPD Project** for Every Team Member
(including me)



Tools – What did we use?

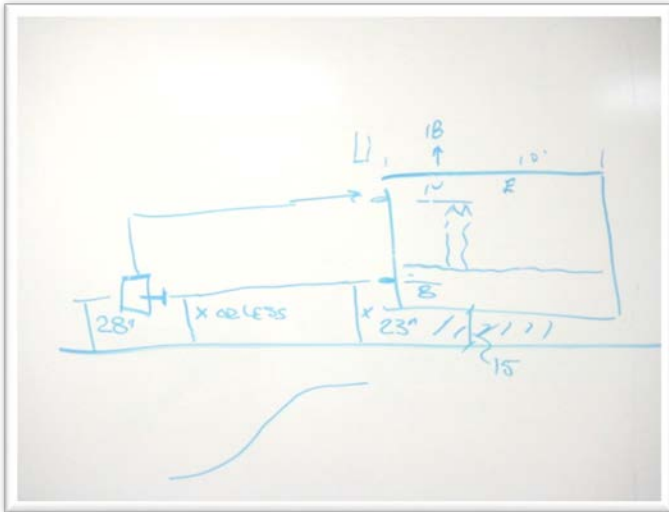
- “Big Room”
- Pull Scheduling
- Weekly Work Plan
- **No BIM**

QUIET / MPFS - MILLS CHILMERS RELATIONS														
Working Order		IPD Team		Last Meeting Date		Next Meeting Date		Meeting Date		Meeting Date		Meeting Date		LOOK-HEAD PLAN
				Meeting Date		Meeting Date		Meeting Date		Meeting Date		Meeting Date		
4Q		Working Group		Commitments & Progress		Requestor		Proposer		Due Date		WEEK 1		LOOK-HEAD PLAN
												WEEK 1		
												WEEK 1		
												WEEK 1		
												WEEK 1		
												WEEK 1		
												WEEK 1		
												WEEK 1		
												WEEK 1		
												WEEK 1		
												WEEK 1		
												WEEK 1		
												WEEK 1		
												WEEK 1		
												WEEK 1		
												WEEK 1		
												WEEK 1		
												WEEK 1		
												WEEK 1		
												WEEK 1		
												WEEK 1		
												WEEK 1		
												WEEK 1		
												WEEK 1		
												WEEK 1		
												WEEK 1		
												WEEK 1		
												WEEK 1		
												WEEK 1		
												WEEK 1		
												WEEK 1		
												WEEK 1		
												WEEK 1		
												WEEK 1		
												WEEK 1		
												WEEK 1		
												WEEK 1		
												WEEK 1		
												WEEK 1		
												WEEK 1		
												WEEK 1		
												WEEK 1		
												WEEK 1		
												WEEK 1		
												WEEK 1		
												WEEK 1		
												WEEK 1		
												WEEK 1		
												WEEK 1		
												WEEK 1		
												WEEK 1		
												WEEK 1		
												WEEK 1		
												WEEK 1		
												WEEK 1		
												WEEK 1		
												WEEK 1		
												WEEK 1		
												WEEK 1		
												WEEK 1		
												WEEK 1		
												WEEK 1		
												WEEK 1		
												WEEK 1		
												WEEK 1		
												WEEK 1		
												WEEK 1		
												WEEK 1		
												WEEK 1		
												WEEK 1		
												WEEK 1		
												WEEK 1		
												WEEK 1		
												WEEK 1		
												WEEK 1		

Project Outcomes

1. Project completed **late**
2. Project finished **well under** budget
3. **No issues with hospital operations**

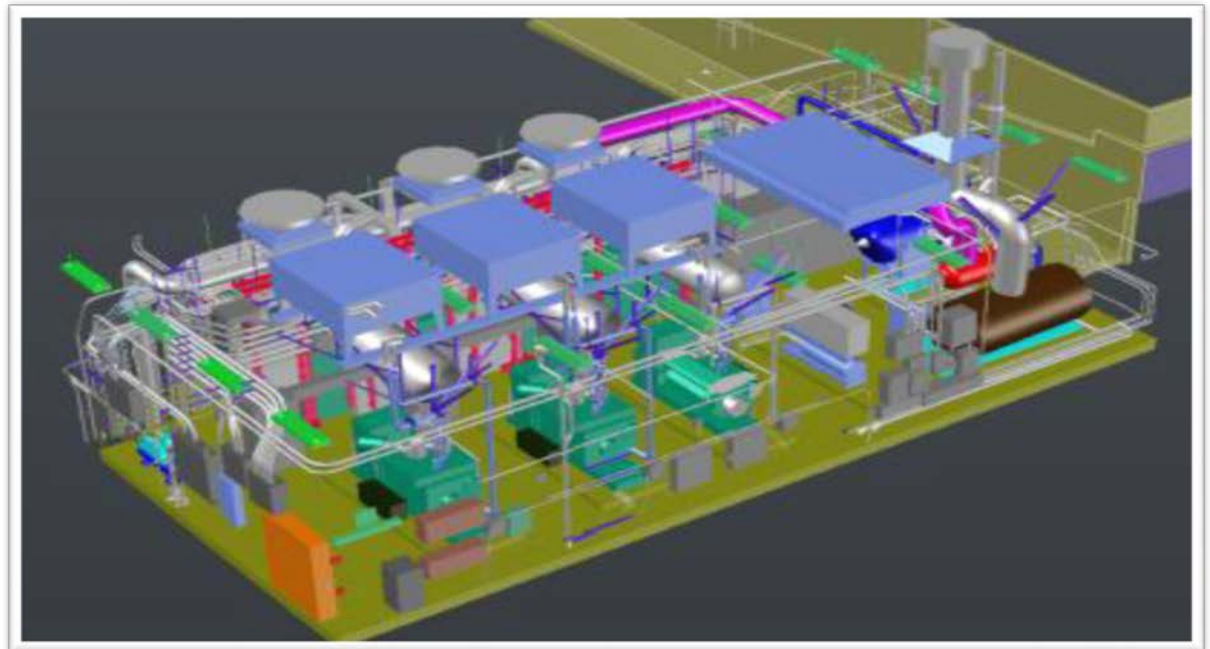
PDCA – Lessons Learned

[illegible]

1. Last Planner was not the **Last** Planner
2. Project Below Budget
3.but not for “**right**” reasons
4. We **didn't create a culture**
5. Didn't do Weekly Work Plan in person (or weekly)
6. **Planning was Effective** for Hospital Operations

Electrical System Replacement

- \$6 Million Construction - OSHPD
- Major Electrical Shutdowns
- Many phases of work
- Longer Construction Duration
- Majority of Work was One Trade



Electrical Project Kick Off

Start by creating a culture!

- IFOA Informational Sessions
- Intro to Lean Training (Including the Last Planners)
- Study Action Teams
- Internal Pankow help
- External help – a different perspective
- Field Info Sessions – 5S, Explanation of the IFOA to the **Foremen (Real Last Planners)**



Estimate Speed Dating

Mills - Emergency Power Generator Project
EMP - Estimate Review Meeting

8:00 a.m. to 8:30 a.m. Introduction
Schedule meeting to set (2) short term team goals and (1) long term team goal for Lean improvement

8:30 a.m. to 9:00 a.m. Cluster 1

9:00 a.m. to 9:15 a.m. Out brief 1

9:15 a.m. to 9:45 a.m. Cluster 2

9:45 a.m. to 10:00 a.m. Out brief 2

10:00 a.m. to 10:30 a.m. Cluster 3

10:30 a.m. to 10:45 a.m. Out brief 3

10:45 a.m. to 11:15 a.m. Cluster 4

11:15 a.m. to 11:30 a.m. Out brief 4

11:30 a.m. to 12:00 p.m. Plus/Delta

Ask Questions		BFHL	PANKOW	E STRUCTURE	YOUNG ELECTRIC	MCGUIRE & HESTER	CAMISSA & WIPF	ROMAK	TEC ACCUTITE
Answer Questions									
BFHL					4				2
PANKOW		1		3					
E STRUCTURE			2						4
YOUNG ELECTRIC		3		1					
MCGUIRE & HESTER					2		4		
CAMISSA & WIPF						1		3	
ROMAK			4				2		
TEC ACCUTITE						3		1	



Detailed Budgeting

SUMMARY LABOR PROJECTION WORKSHEET

Mills Emergency Power Generator Upgrades

PROJECT MANAGEMENT DATA ENTRY

BASELINE PROJECTION

PCO No. 1
COR No.
OCO No.

Week No.: 15 16 17 18 19 20
Week Ending: 8/8 8/15 8/22 8/29 9/5 9/12
Projected/Actual: P P P P P P

SUB JOB	COST CODE	DESCRIPTION	ORIG. BUDGET	BUDGET	TOTAL CHANGES	BUDGET TO DATE	BUDGET TO DATE	REMAINING BUDGET	% OF BUDGET USED	ACTUAL TO DATE	ADD TO COMPLETE	TOTAL @ COMPLETION
					0	0		0	N/A	0	0	0
		Young Field Labor			0	0		0	N/A	0	0	0
		Young Electric Precon - Jim verify hours			0	0		0	N/A	0	0	0
		Elec Work & Precon			0	0		0	N/A	0	0	0
		Interior Lighting	184		0	184	16	30	32	441	0	441
					0	184		176	4%	8	158	166
		Site Lighting	257		0	257	75		62%	160	91	251
		Roof Conduits	163		0	163	48	48	12	56	108	164
		Switchgear	1,050		0	1050		2	0%	2	935	937
		Feeder Conduit/Wire	2,637		0	2637	20	30	30	76.5	2530	2606.5
		Service Conduits	1,012		0	1012	25	84	50	330.5	603	933.5
		Buss Duct	682		0	682	22	13	90	107	575	682
		Generator	909		0	909	27	33		7	844	851
		Cut Overs	1,002		0	1002			0%	0	982	982
		Fire Alarm	196		0	196			14%	27	80	107
		Temp Power & Lighting	120		0	120			31%	37.5	0	37.5
		Demo	640		0	640			4%	24	580	604
		Meetings & Precon overage	1,800		0	1800	6	8	6	120	332	452
		Misc. Additional work							N/A	35	0	35
Total:			10652	0	0	10652	239	248	190	128	120	160
										1431.5	7818	9249.5

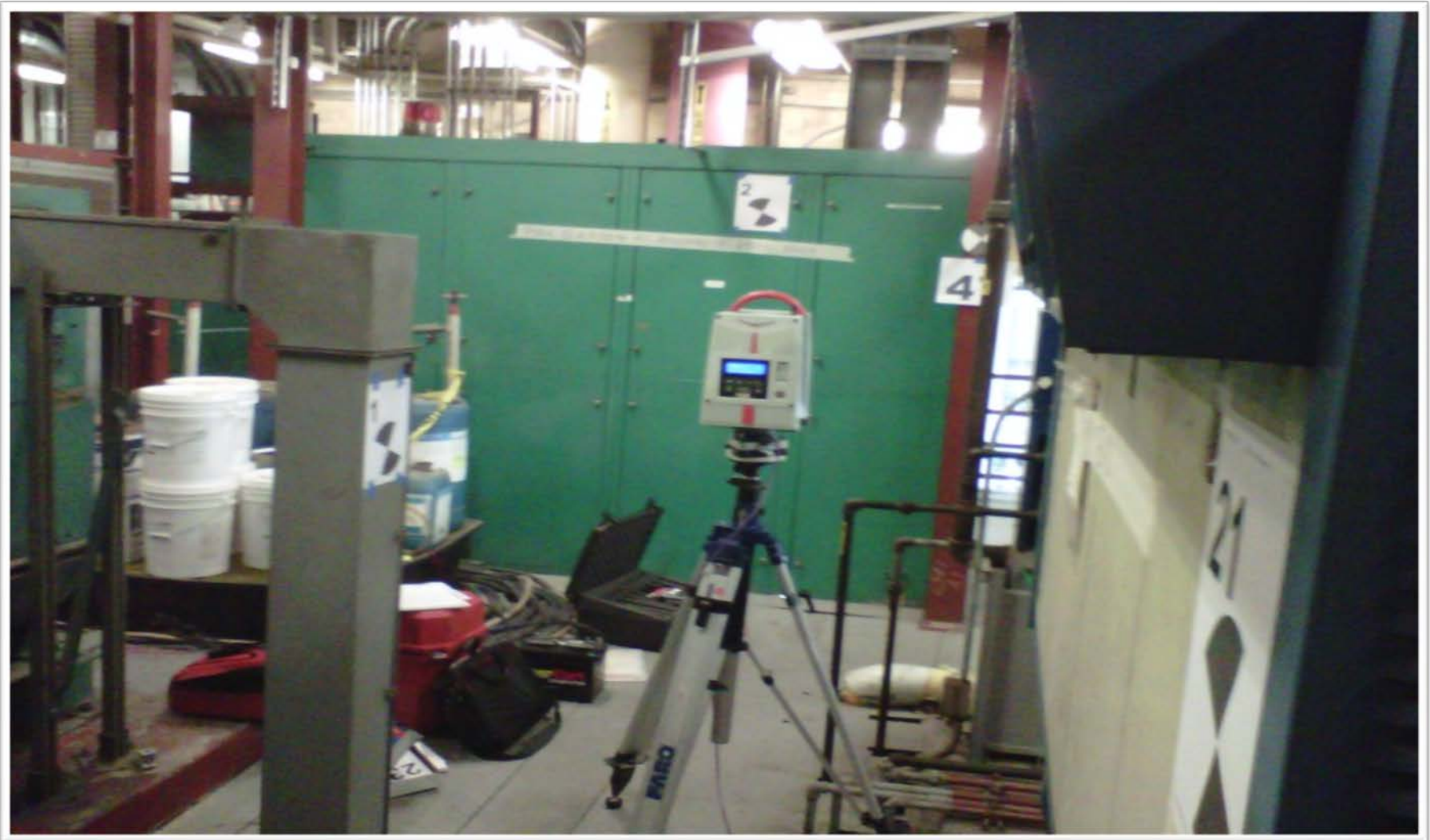
Total Man Hours/Day: 30 31 24 16 15 20
Total Man/Day: 6.0 6.2 4.8 3.2 3.0 4.0
Cumulative Total: 1671 1919 2109 2237 2357 2517

Cost Projections Based on Budgets

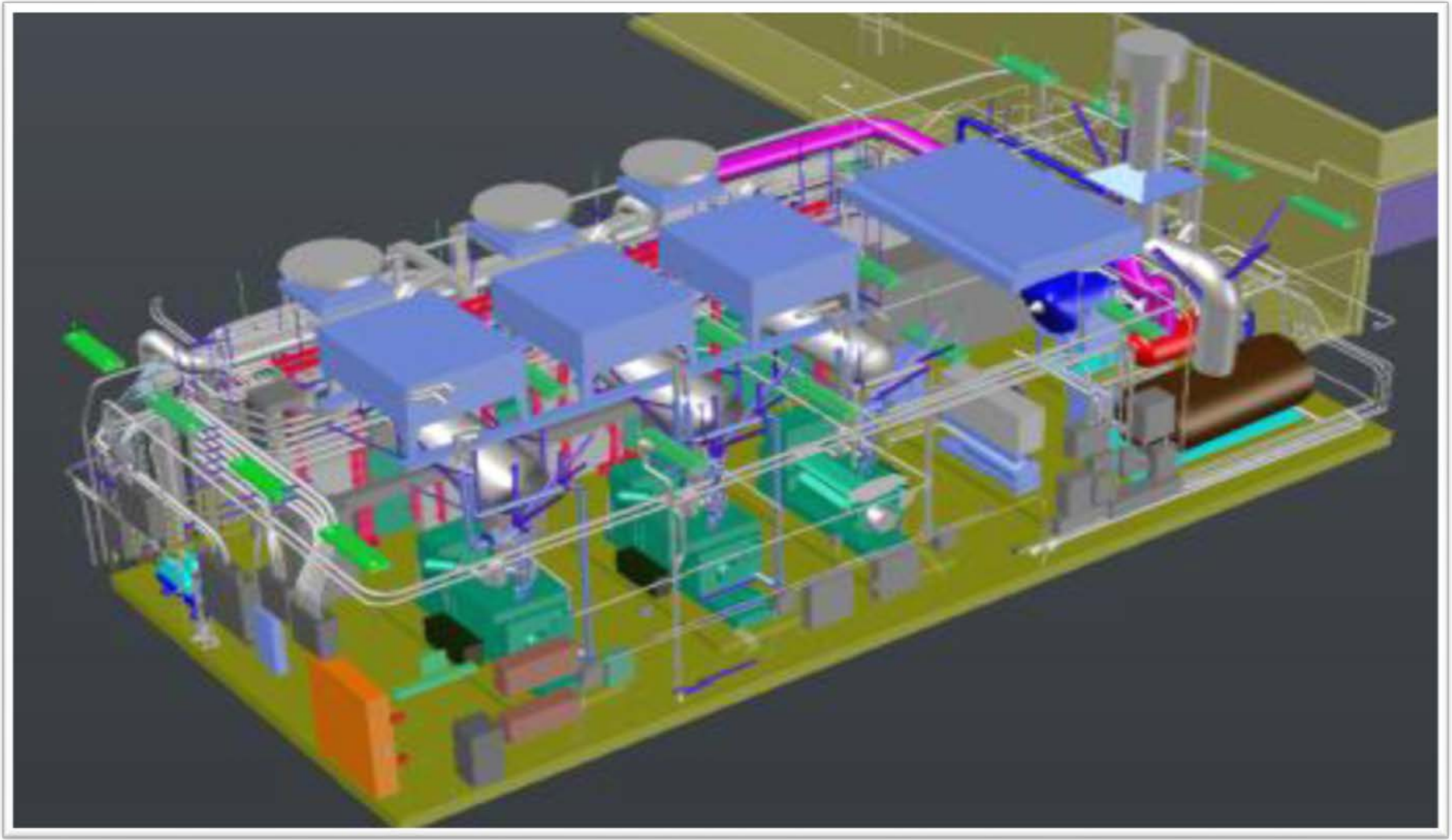
ACTUALS				PCO No. 1	Week No.: 13 14 15 16 17 18 19 20 21 7/25 8/1 8/8 8/15 8/22 8/29 9/5 9/12 9/19																			
COR No. 000 No.				Project/Actual:																				
SUB JOB	COST CODE	DESCRIPTION	ORIG. BUDGET	BUDGET	TOTAL CHANGES	BUDGET DATE														BUDGET TO DATE	REMAINING BUDGET	% OF BUDGET USED	ACTUAL TO DATE	ADD TO COMPLETE
					0	0											0	0	0	0	0			
		Young Field Labor			0	0											0	0	0	0	0			
		Young Electric Precon - Jim verify hours			0	0											0	0	0	0	0			
		Elec Work & Precon			0	0											0	-44.1	44.1	0	0			
		Interior Lighting	184		0	184											184	97.5	47%	88.5	80			
		Site Lighting	257		0	257											257	32	88%	225	16			
		Roof Conduits	163		0	163											163	55	66%	108	0			
		Switchgear	1,050		0	1050											1050	1044	1%	6	933			
		Feeder Conduit/Wire	2,637		0	2637											2637	2453	7%	184	2450			
		Service Conduits	1,012		0	1012											1012	474	53%	538	356			
		Buss Duct	682		0	682											682	417	61%	365	318			
		Generator	909		0	909											909	515	57%	494	415			
		Cut Overs	1,002		0	1002											1002	1002	0%	0	982			
		Fire Alarm	196		0	196											196	169	14%	27	169			
		Temp Power & Lighting	120		0	120											120	82.5	31%	37.5	0			
		Demo	640		0	640											640	516	4%	24	580			
		Meetings & Precon overage	1,800		0	1800											1800	1643	9%	157	268			
		Misc. Additional work															0	-35	N/A	35	0			
																			0	0	0			
																			0	0	0			
																			0	0	0			
																			0	0	0			
																			0	0	0			
																			0	0	0			
																			0	0	0			
																			0	0	0			
																			0	0	0			
																			0	0	0			
																			0	0	0			
																			0	0	0			
																			0	0	0			
																			0	0	0			
																			0	0	0			
																			0	0	0			
																			0	0	0			
																			0	0	0			
																			0	0	0			
																			0	0	0			
																			0	0	0			
																			0	0	0			
																			0	0	0			
																			0	0	0			
																			0	0	0			
																			0	0	0			
																			0	0	0			
																			0	0	0			
																			0	0	0			
																			0	0	0			
																			0	0	0			
																			0	0	0			
																			0	0	0			
																			0	0	0			
																			0	0	0			

ACTUALS			PCO No. COR No. OCO No.	1	Week No.: Week Ending: Projected/Actual:																												
					1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 5/2 5/9 5/16 5/23 5/30 6/6 6/13 6/20 6/27 7/4 7/11 7/18 7/25 8/1 8/8 8/15 8/22 8/29 9/5 9/12 9/19 9/26 P																												
SUB COST JOB CODE	DESCRIPTION	ORIG. BUDGET	BUDGET	TOTAL CHANGES	BUDGET TO DATE	PROJECTED AND ACTUAL HOURS PER WEEK																											
DESIGN TEAM																																	
	RFHL	1946		0	1946	1282	77		46		36								31											36			
	BKF	461		0	461	328		8		19		13							3											12			
	ESTRUCTURE	722		0	722	524		19		4		6							24											8			
	JANSWORTH	145		0	145	79		4		3		1							2											2			
	CAMISSA & WIPF	2052		0	2052	1418		37		10		37							39											40			
				0	0																												
				0	0																												
				0	0																												
				0	0																												
				0	0																												
				0	0																												
				0	0																												
				0	0																												
				0	0																												
				0	0																												
				0	0																												
				0	0																												
				0	0																												
				0	0																												
				0	0																												
				0	0																												
				0	0																												
				0	0																												
				0	0																												
				0	0																												
				0	0																												
				0	0																												
				0	0																												
				0	0																												
				0	0																												
				0	0																												
				0	0																												
				0	0																												
				0	0																												
				0	0																												
				0	0																												
				0	0																												
				0	0																												
				0	0																												
				0	0																												
				0	0																												
				0	0																												
				0	0																												
				0	0																												
				0	0																												
				0	0																												
				0	0																												
				0	0																												
				0	0																												
				0	0																												
				0	0																												
				0	0																												
				0	0																												
				0	0																												

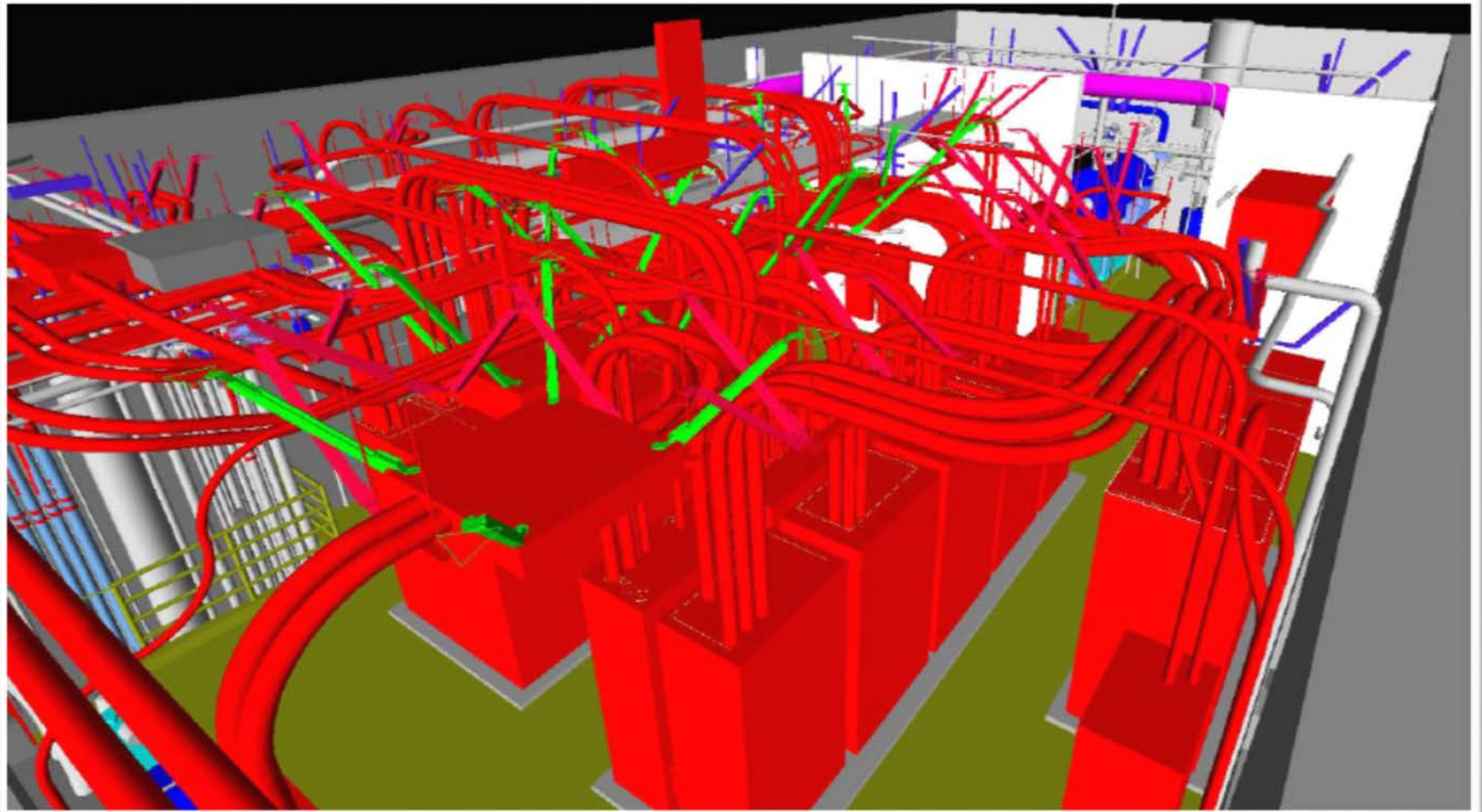
BIM - Laser Scanning



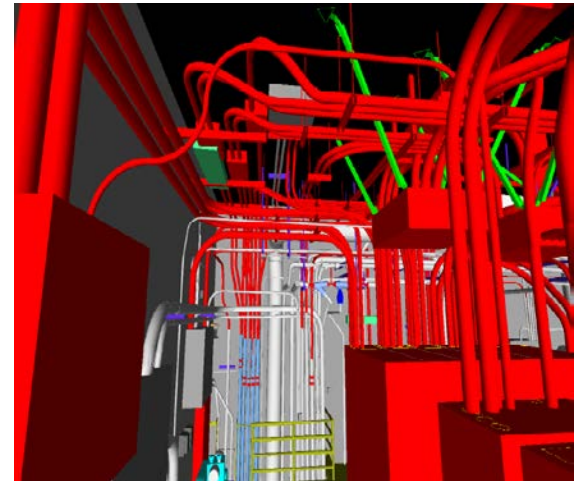
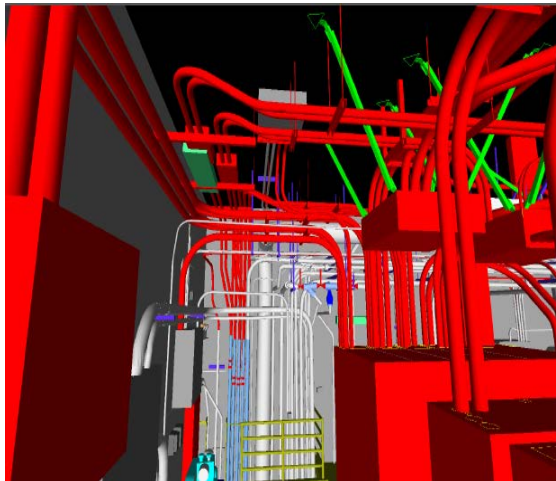
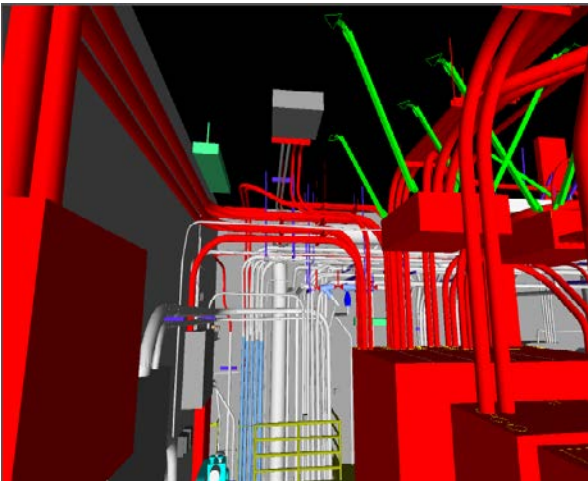
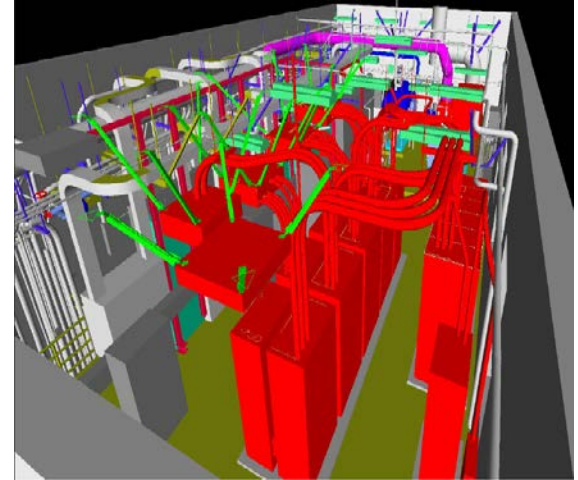
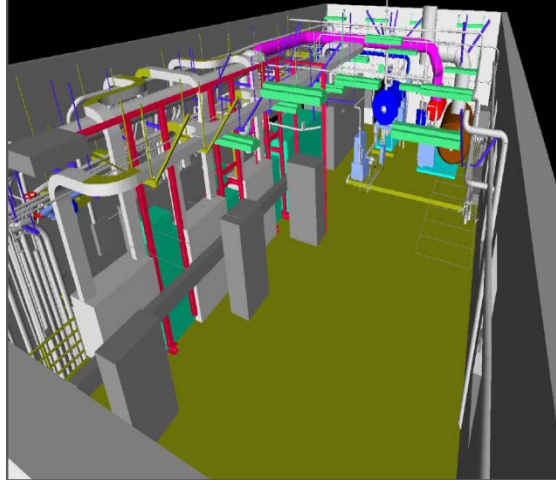
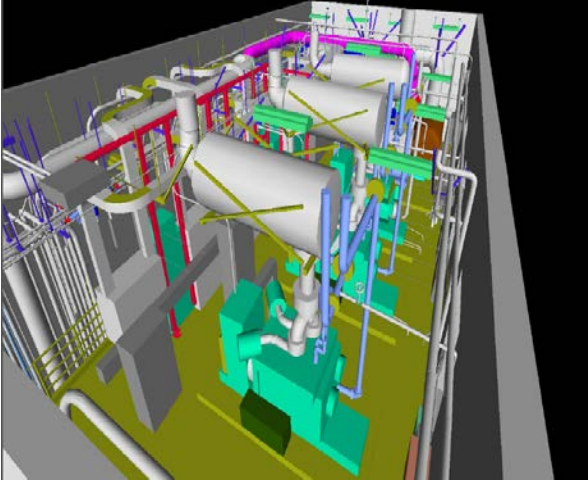
BIM - Existing Conditions Model



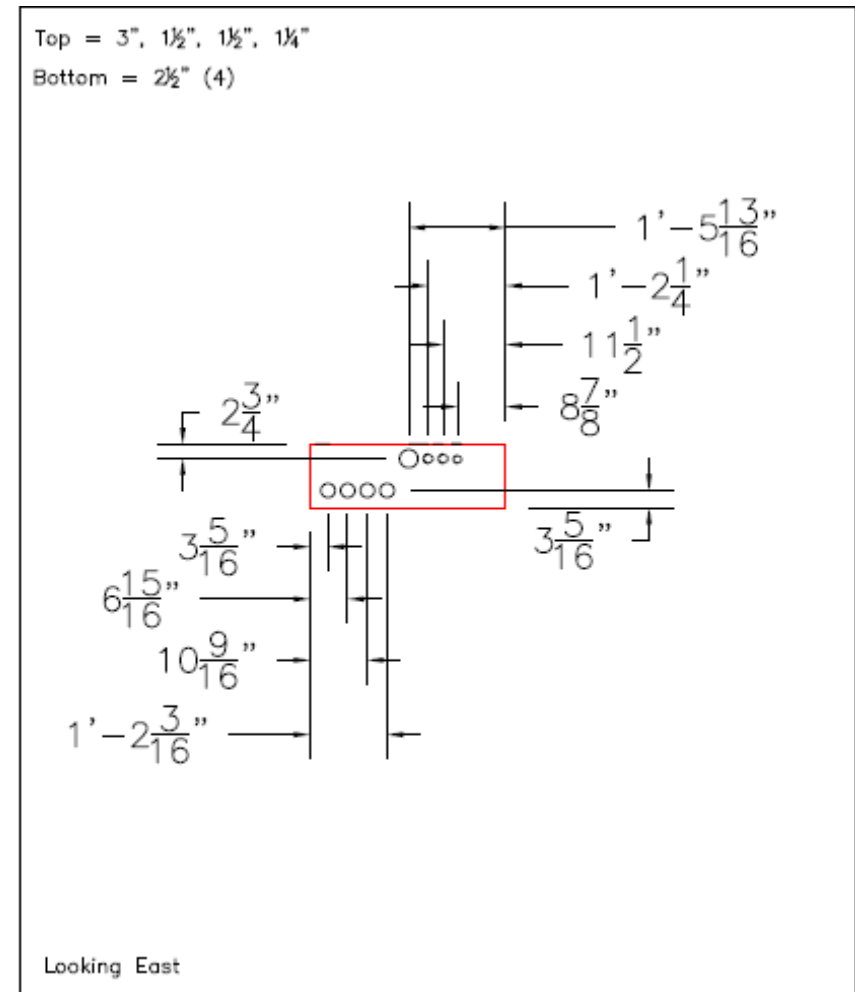
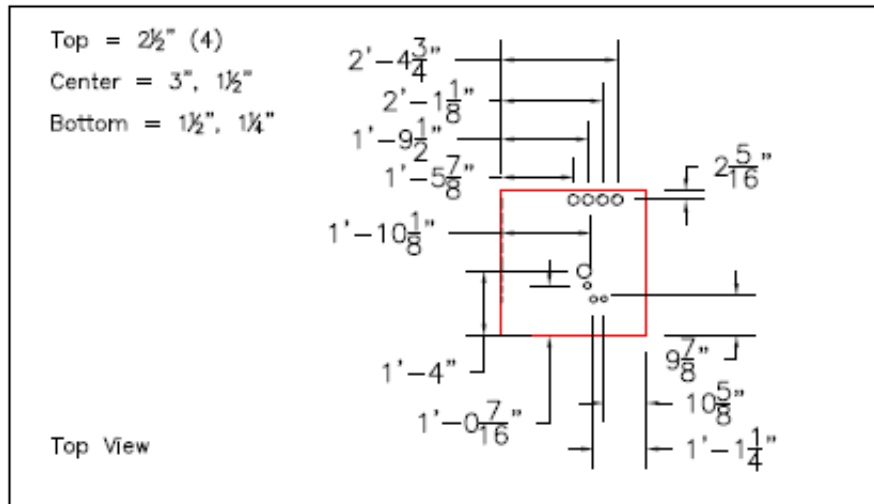
BIM - Final Condition Model



BIM - Experimenting with 4D



BIM - Spool Sheets



Project Outcomes

- Project Completed **on Schedule**
- Project Completed **under Budget**
- Major Resequencing completed without a hitch
- 16 shutdowns completed as scheduled with **no unplanned effect on operations**

Lessons Learned

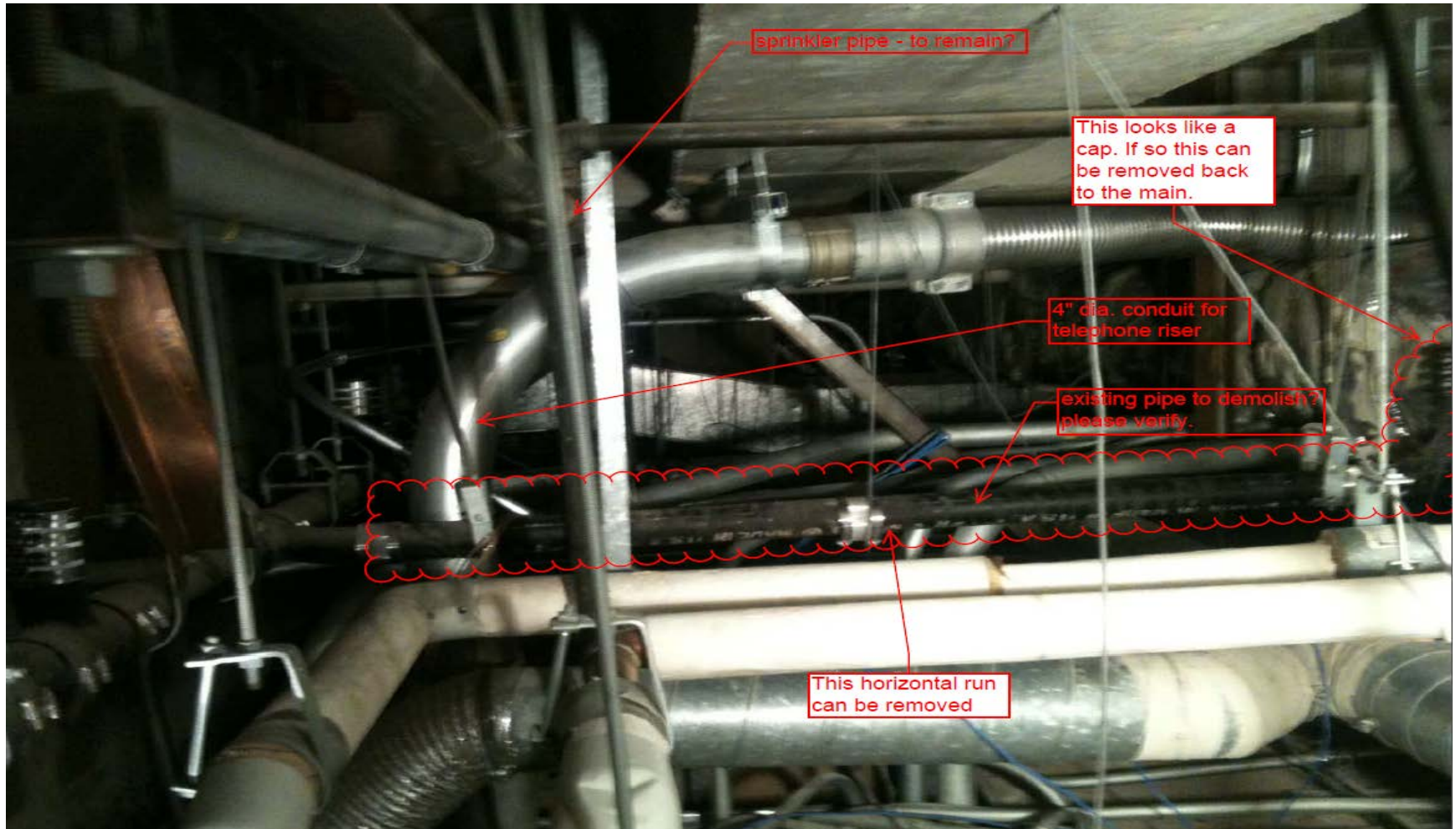
- Evaluate Cost vs. Benefit of BIM
 - \$140,205 invested up front
 - 300+ hrs of electrical foreman prior to permit
- Focus on Commitments
- Solve Problems Face to Face
- Go to Mtgs for Downtime and SATs
- Train 2nd tier subs and journeymen
- Impressed OSHPD

Converting the ED to an Urgent Care

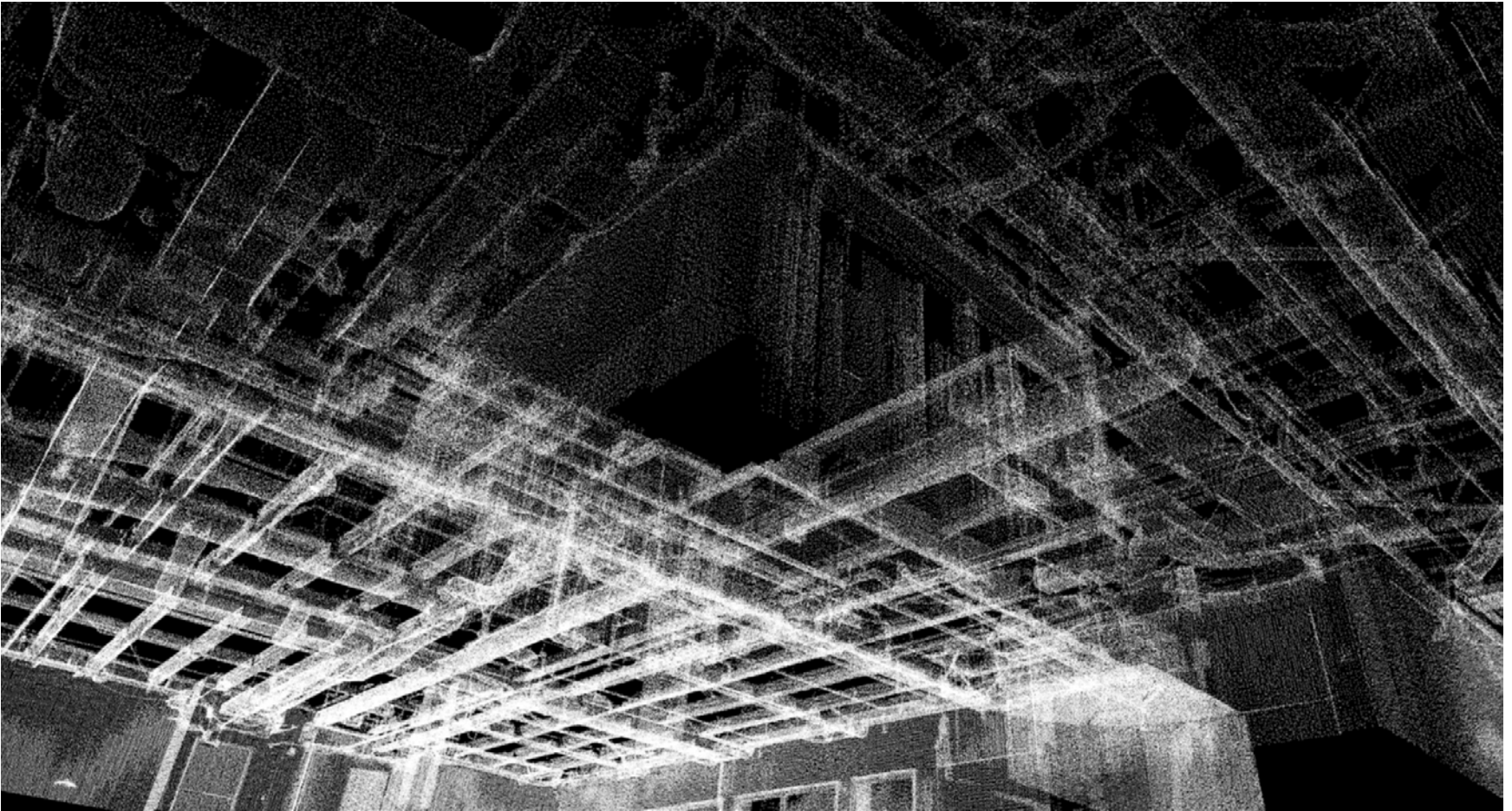
- \$2.5 Million Construction - OSHPD
- Full gut remodel of Emergency Department
- Design/Permit submittal while occupied
- Tight schedule in occupied areas
- Significant work for all trades



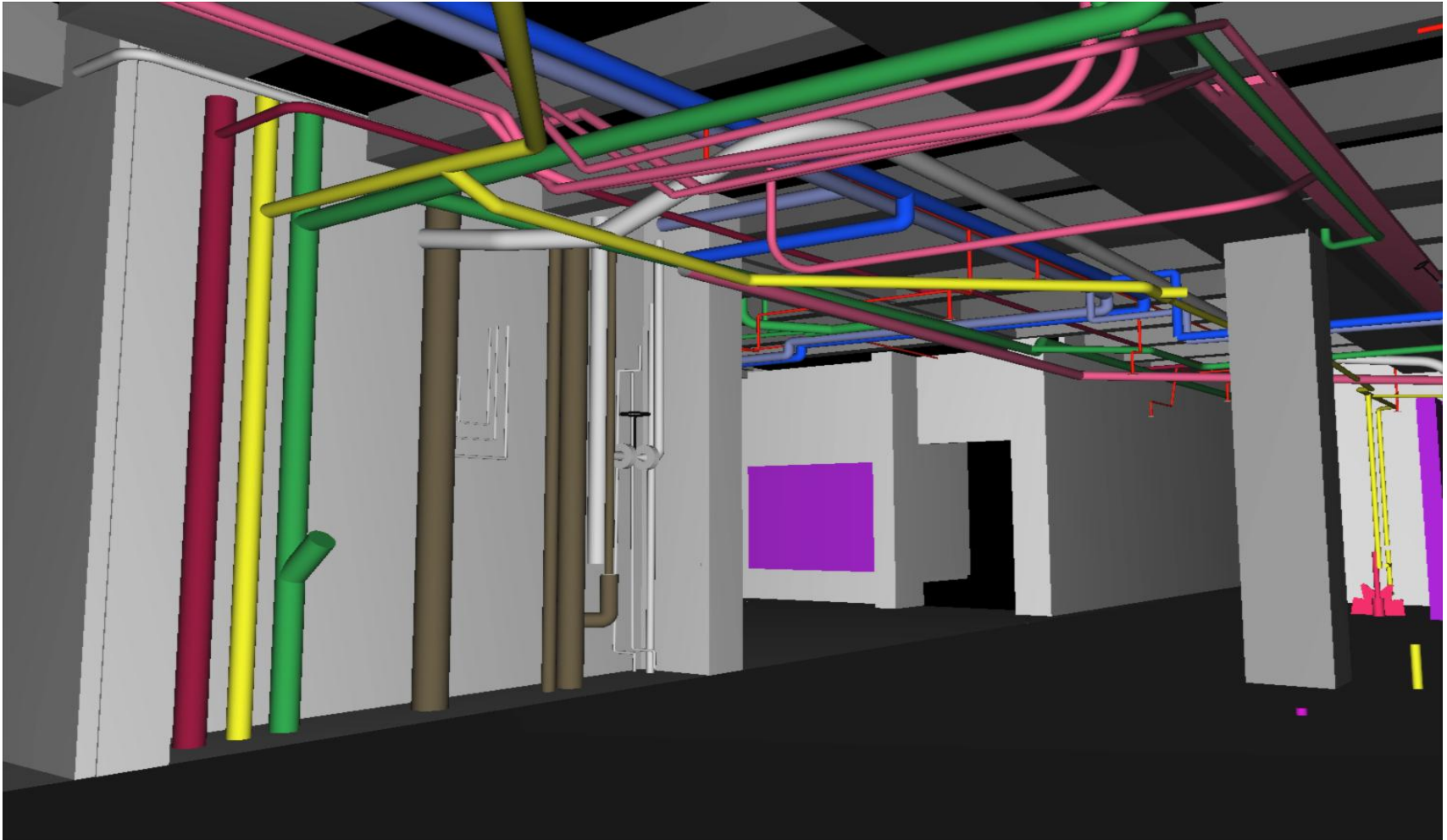
Existing Conditions



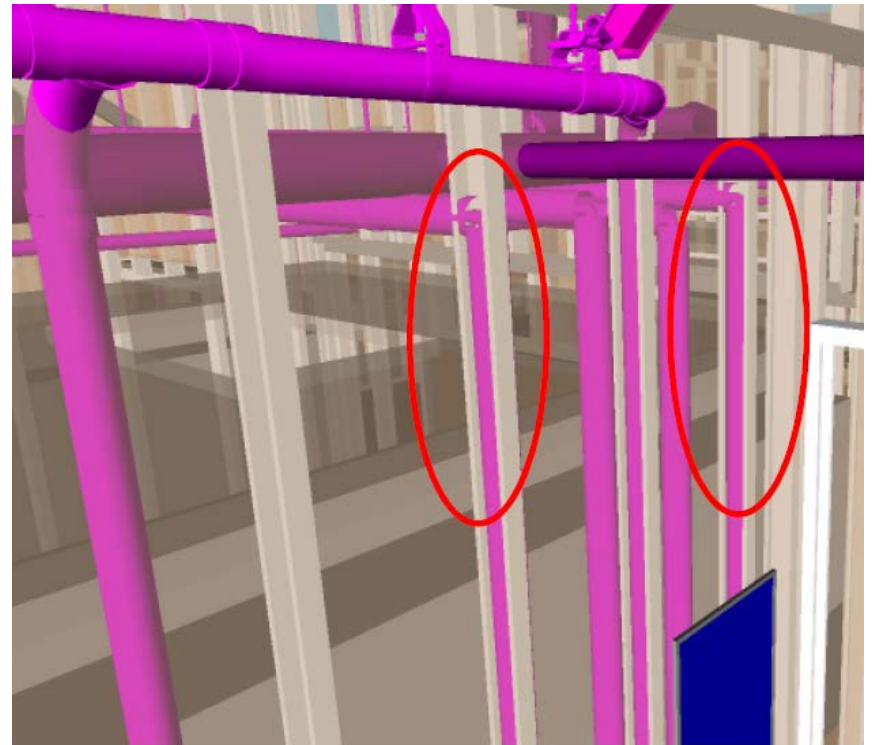
Laser Scanning



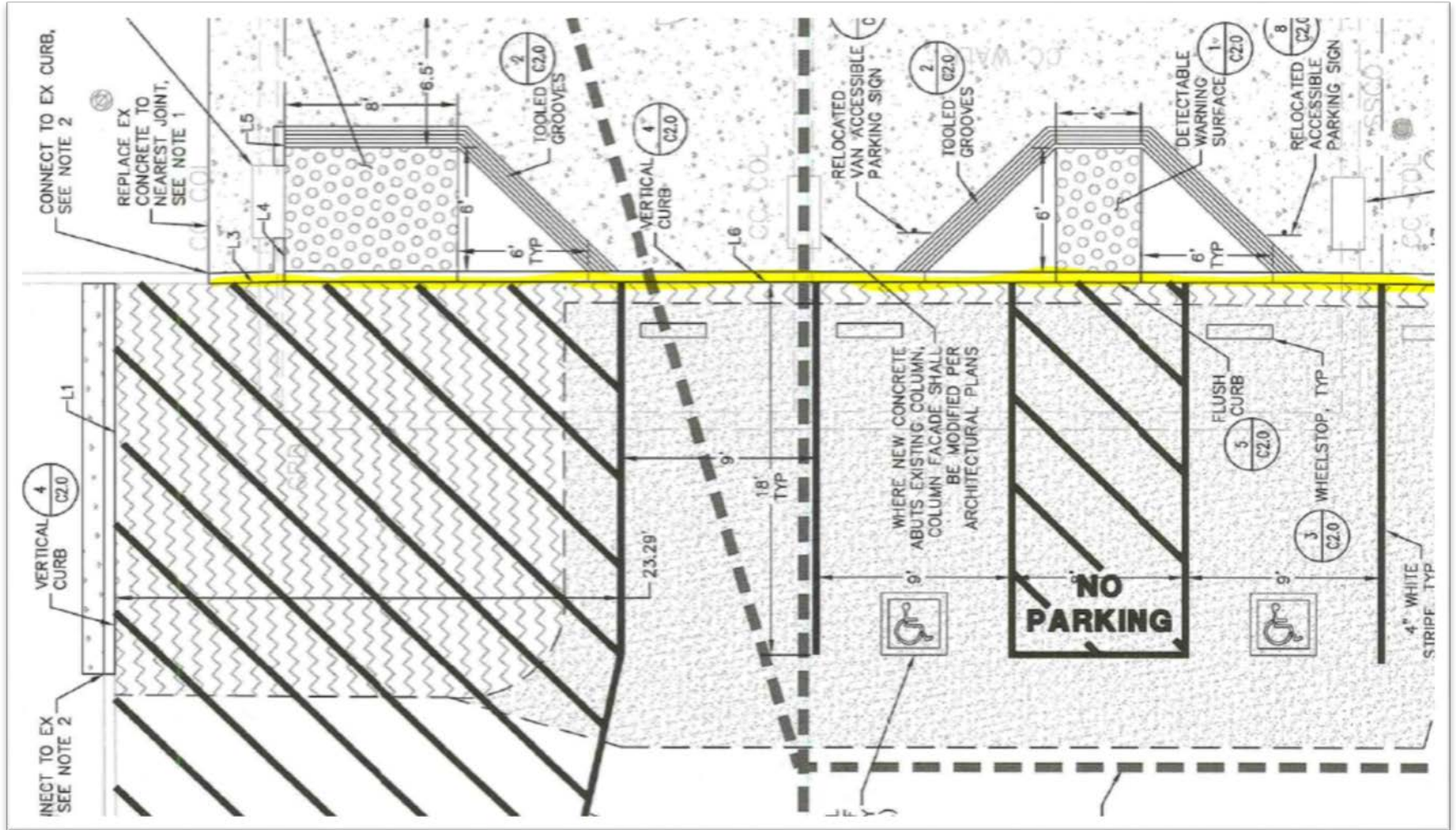
Model of Existing Conditions



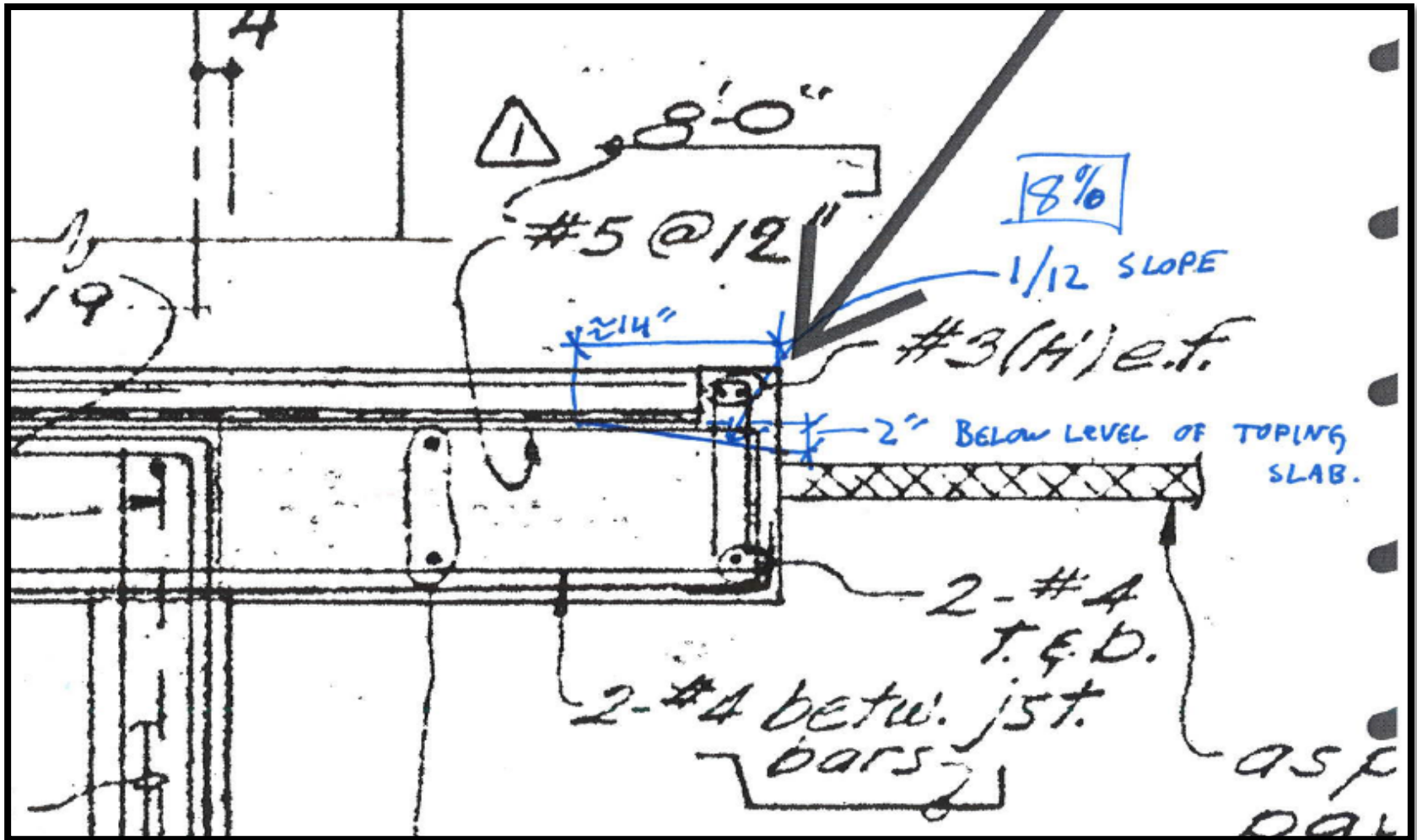
Clash Detection of New Model



Two phased entry work



Mind the details



The easy part turned out to be difficult. .

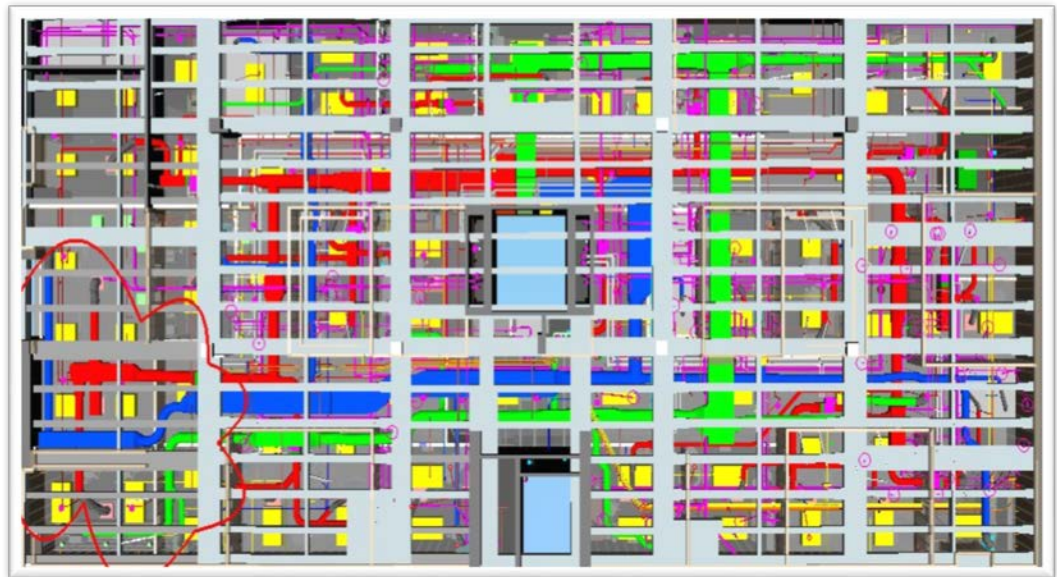


Project Outcomes

1. Project completed **late**
2. Project finished **slightly over** budget
3. Construction went **very well**
4. **No issues with hospital operations**
5. **Innovations:**
 - Prefab walls installed in 4 days
 - 95% of roto hammering done in 1 day
 - Takt time reduced TI schedule 7 weeks

Lessons Learned

1. **Install according to the model**
2. **Pay attention to the details - small stuff can hurt you**
3. **You can spend too much on Precon**
4. **Watch scope creep carefully**



Challenges with IPD on Small Projects

Large Project	Small Project
Dedicated Staff	Part-time Staff
"Big Room"	Can't Find a Room
Long-term Involvement	Short-term Involvement
Large Economies of Scale	Limited Economies of Scale
Extended Schedule	Compressed Schedule
Opportunities for Target Value Production	Limited Opportunities for Target Value Production
Availability of Tools	Choose tools wisely

Overall Lessons Learned

1. Works great

- small complex projects
- when schedule is important
- when working with OSHPD

2. May not be cheapest option

3. Be prepared for the early cost

4. Learning takes time, allow the team to develop



Going Forward (Recommendations)

1. **Start with medium size project** then move to smaller projects
2. Deliberately create and foster a culture
 - **Invest in your partners**
3. Be careful when starting the engine
4. **Start tracking costs / risks early**
5. Analyze risks then determine if BIM will help



When is IPD worth it?

VALUE OF IPD ON PROJECTS		
	Large	Small
Complex	HIGH	MODERATE TO HIGH
Simple	MODERATE	LOW

Questions?

Thank you



James Pease
Regional Manager – Project Delivery
Sutter Health
peasejd@sutterhealth.org
(Cell) 650-833-8773

<http://leanipd.com>