

Integrated Model Based Processes:

Collaboration:

- IPD Tool
- QC
- Risk Analysis and Mitigation

Geometry and Design QC - 3D

- Constructability Reports
- Clash Detection
- Coordination Conflict Resolution

Time and Cost - 4D and 5D

- Virtual Building

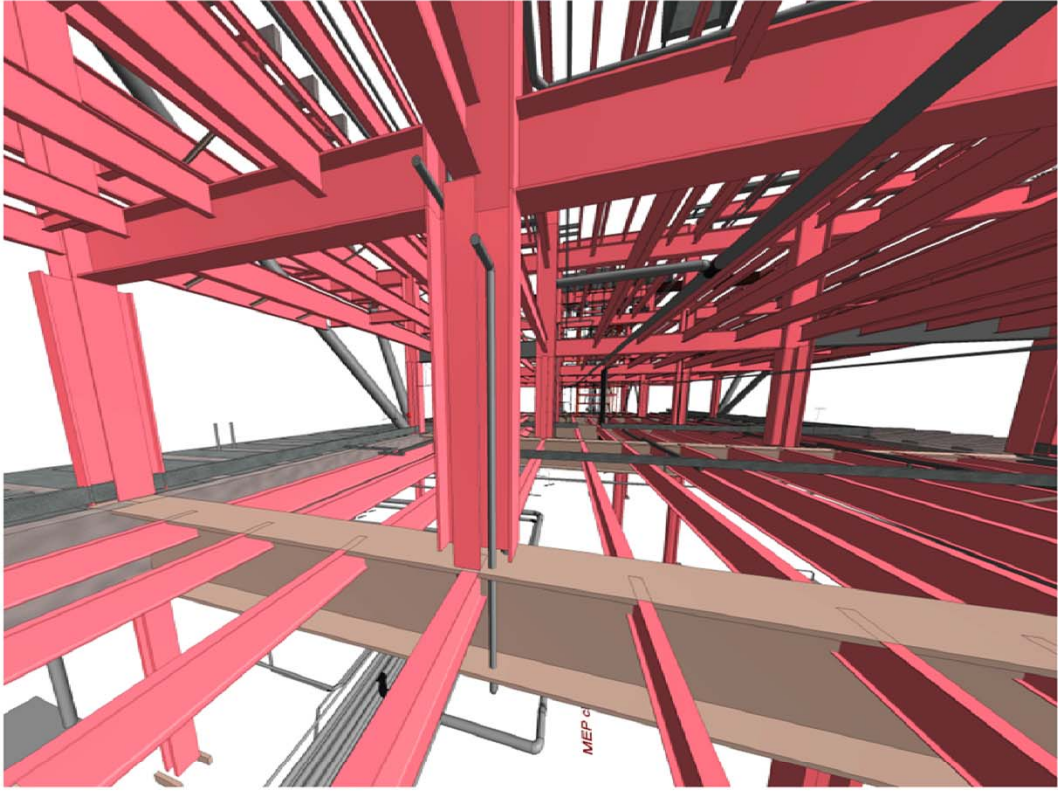
Reporting – 3D -4D -5D

- Cost Planning
- Variance Reporting
- Trade Package Development
- Site Logistics
- Workforce Planning
- LEED Certification Analysis and Tracking



TTC

Conflict Resolution and CR Reporting



MEP clash at Girder

MEP clash

WEBCOR **OBYASHI**
JOINT VENTURE
175 Beale Street
San Francisco, CA

Transbay Transit Center
San Francisco, CA

MARK	DATE	DESCRIPTION
PROJECTING		X
MODEL FILE		X
QUANTITY		X
CLASH		X
CONFLICT		

MEP TITLE

Pipe Clash at Girder

CR - 3

VIEW AS SHOWN



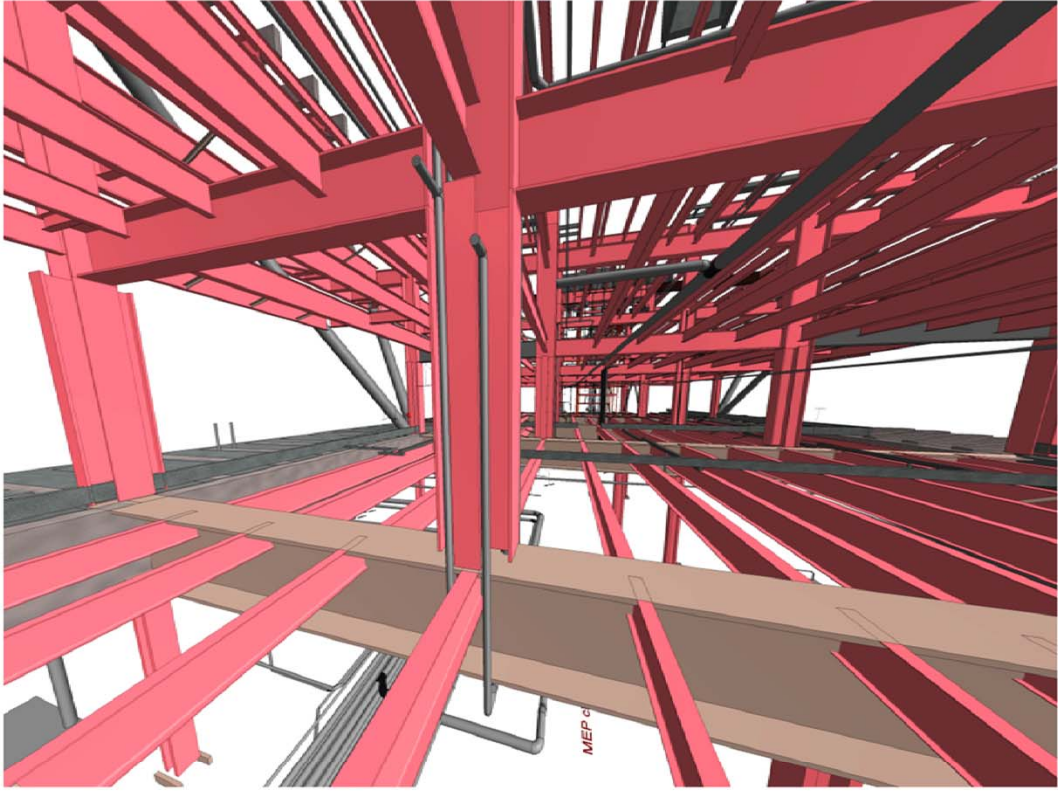
MEP clash at Girder

MEP clash

CR - 3

VIEW AS SHOWN

Conflict Resolution and CR Reporting



MEP clash at Girder

MEP clash

WEBCOR **OBAYASHI**
JOINT VENTURE
175 Beale Street
San Francisco, CA

Transbay Transit Center
San Francisco, CA

MARK	DATE	DESCRIPTION
PROJECT		X
MODEL FILE		X
QUANTITY		X
CONFLICT		X
COMMIT		

MEP TITLE

Pipe Clash at Girder

CR - 3

VIEW AS SHOWN



MEP clash at Girder

MEP clash

CR - 3

VIEW AS SHOWN

Conflict Resolution and CR Reporting

Webcor / Obayashi Joint Venture					
CR #	D-006				
Sheet/Detail Reference:	A1-2847, S1-2207	Grid Ref:	D-F/11-12	Sheet Approval Date:	3/5/2012
Level:	Lower Concourse Level	Trades Involved:	Structural, Architectural	Date Submitted:	N/A
Title:	Elevator PE704/PE705 Pit Dimensions and Location				
Description:	The eastwest location of the pit for elevator PE704/PE705 per A1-2847 leaves a 3" gap to the edge of the concrete girder at 32.4-line. Should the pit or girder shift to align the east edge, or should the width of the girder be increased 3" towards the west.				
Screenshots:					
Modeling Assumption:	Modeled per dimensions, resulting in 3" gap. Acknowledged - Item will be coordinated and updated for the next issue (AA)				
Notes:					
Cost Notification:	Information required prior to buyout of TG6.0 Below Grade Package				

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Virtual Building



4D and 5D Model Data



Market Analysis

Labor Cost Analysis

Trade	2012			2011			Delta	% Increase
	Total	Base Rate	Fringes	Total	Base Rate	Fringes		
Carpenter	58.52	37.5	21.02	56.91	37.5	19.41	1.61	2.83%
Laborer	41.59	26.99	14.6	40.70	26.99	13.71	0.89	2.19%
Cement Mason	43.87	28.65	15.22	42.10	28.68	13.42	1.77	4.20%
Bricklayer	60.45	38.13	22.32	58.77	36.45	22.32	1.68	2.86%
Ironworker	58.41	34.1	24.31	58.41	34.1	24.31	0.00	0.00%
Waterproofofer	52.52	37.43	15.09	49.52	34.43	15.09	3.00	6.06%
Glazier	68.80	62.1	6.70	68.80	62.1	6.70	0.00	0.00%
Plumber	97.94	57.75	40.19	93.94	55.25	38.69	4.00	4.26%
Sheet Metal	78.98	46.85	32.13	74.30	42.47	31.83	4.68	6.30%
Electrician	79.81	53.05	26.76	77.81	53.05	24.76	2.00	2.57%
Elevator Mechanic	84.04	57.14	26.90	82.61	56.14	26.47	1.43	1.73%

Material Cost Analysis

Description	2012		2011		Delta	% Increase
	U/P	Unit	U/P	Unit		
Base Plates - ASTM A709 Grade 70W	64.5	CWT	61.28	CWT	3.22	5.25%
Base Plates - ASTM A 572, Grade 42, > 4"	62.09	CWT	60.22	CWT	1.87	3.11%
W-Shape - ASTM A 992	64.96	CWT	61.28	CWT	3.68	6.01%
Plates - ASTM A 572, Grade 50	65.82	CWT	62.09	CWT	3.73	6.01%
Large Dia. Tubular Pipe - API 5L-2007 Grade X52, X65	153.22	CWT	145.92	CWT	7.30	5.00%
HSS - ASTM 500 Grade B	78.32	CWT	73.89	CWT	4.43	6.00%
Rebar - ASTM A615/A706 - Deck	.54	LB	0.52	LB	0.02	3.85%
Steel Deck, Type W, 18 GA, 3" Height, Non-Vented	170	SQ	150	SQ	20.00	13.33%
Concrete, 5000 PSI - Suspended Deck - (5" Slump)	166.14	CY	161.2	CY	4.94	3.06%
Concrete, 8000 PSI - Vertical Concrete - w/ Midrange (7" Slump)	195.20	CY	185.44	CY	9.76	5.26%

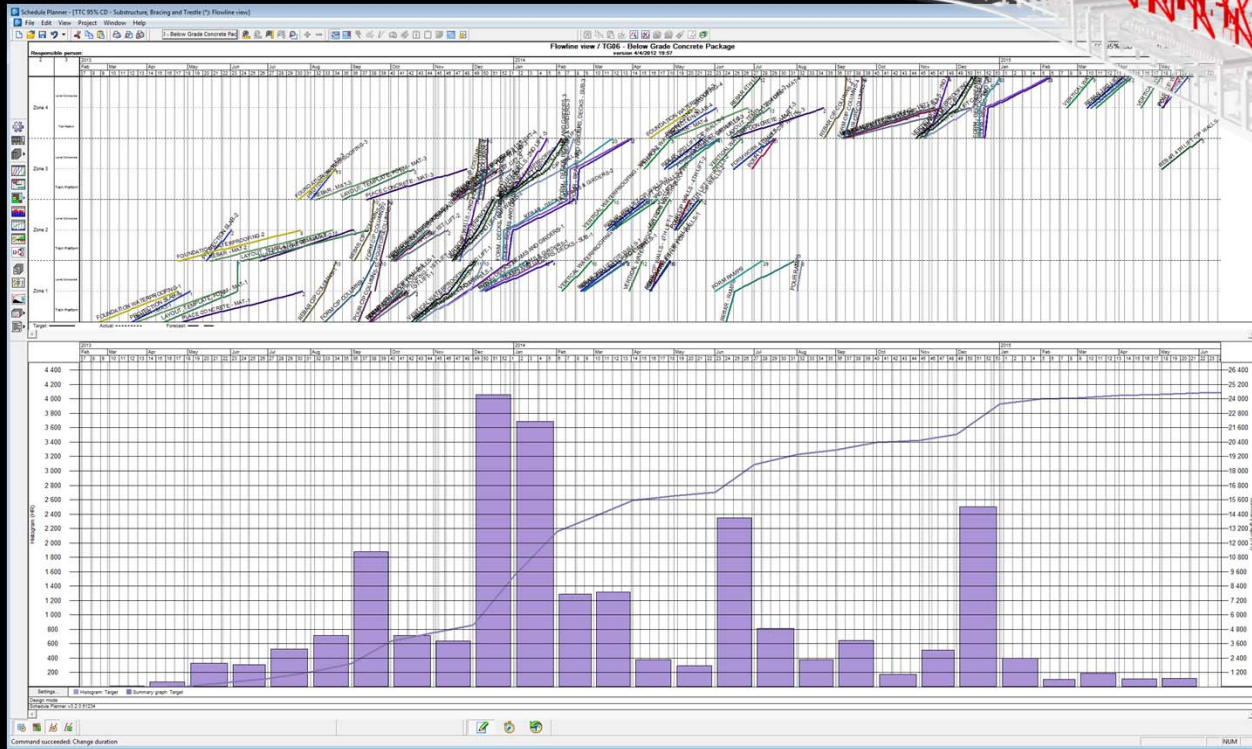
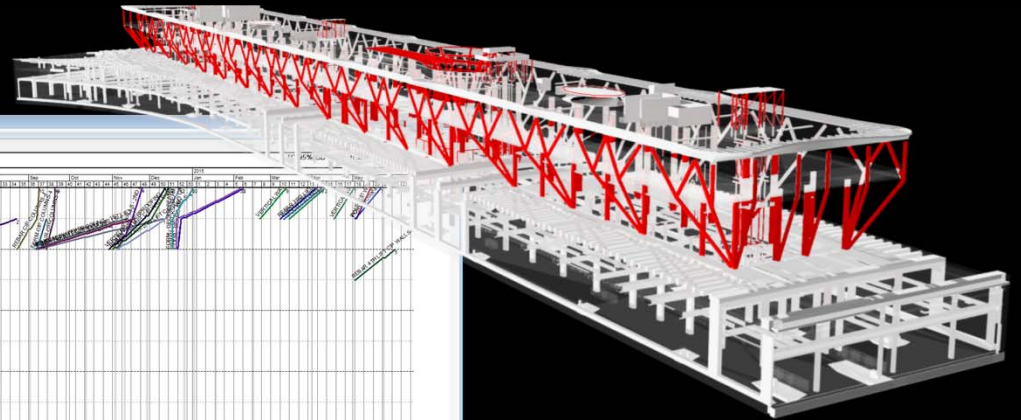
Cost Planning Variance reporting



TTC 85% CD Estimate 02-29-2011				TTC 50% CD Estimate				Variance				
Code	Description	Quantity	Unit	Unit Cost	Price	Quantity	Unit	Unit Cost	Price	Quantity Variance	Unit	Price Variance
Project	TRANSBAY TRANSIT CENTER	1,436,410.00	SF	399.83	574,315,716.23	1,447,810.00	SF	361.22	522,981,257.94	11,400.00	SF	51,334,458.29
A	SUBSTRUCTURE	1,436,410.00	SF	39.71	57,045,236.09	1,447,810.00	SF	34.72	50,261,882.89	11,400.00	SF	6,783,353.20
A10	FOUNDATIONS	1,436,410.00	SF	18.70	26,862,013.30	1,447,810.00	SF	15.14	21,925,639.51	11,400.00	SF	4,936,373.79
A20	BASEMENT CONSTRUCTION	1,436,410.00	SF	17.73	25,471,225.12	1,447,810.00	SF	15.22	22,031,267.30	11,400.00	SF	3,439,957.82
A40	SLABS ON GRADE	1,436,410.00	SF	3.28	4,711,997.68	1,447,810.00	SF	4.31	6,233,093.69	11,400.00	SF	-1,521,096.01
A90	BASEMENT EXCAVATION	0.00		0.00	0.00	1,447,810.00	SF	0.05	71,882.39	1,447,810.00	SF	-71,882.39
B	SHELL	1,436,410.00	SF	178.58	256,508,552.08	1,447,810.00	SF	159.26	230,578,802.56	11,400.00	SF	25,929,749.52
B10	SUPERSTRUCTURE	1,436,410.00	SF	118.11	169,653,078.68	1,447,810.00	SF	101.64	147,149,951.01	11,400.00	SF	22,503,127.67
B20	EXTERIOR ENCLOSURE	1,436,410.00	SF	49.47	71,062,791.06	1,447,810.00	SF	49.58	71,776,593.30	11,400.00	SF	-713,802.24
B30	ROOFING	1,436,410.00	SF	10.99	15,792,682.35	1,447,810.00	SF	8.05	11,652,258.25	11,400.00	SF	4,140,424.10
C	INTERIORS	1,436,410.00	SF	42.41	60,925,155.64	1,447,810.00	SF	40.15	58,128,966.59	11,400.00	SF	2,796,189.05
C10	INTERIOR CONSTRUCTION	1,436,410.00	SF	12.06	17,321,334.12	1,447,810.00	SF	8.11	11,735,601.35	11,400.00	SF	5,585,732.77
C20	INTERIOR FINISHES	1,436,410.00	SF	30.36	43,603,821.52	1,447,810.00	SF	32.04	46,393,365.24	11,400.00	SF	-2,789,543.72
D	SERVICES	1,436,410.00	SF	61.33	88,099,646.04	1,447,810.00	SF	57.36	83,045,050.41	11,400.00	SF	5,054,595.63
D10	CONVEYING	1,436,410.00	SF	8.33	11,962,242.23	1,447,810.00	SF	7.11	10,286,793.06	11,400.00	SF	1,675,439.17
D20	PLUMBING	1,436,410.00	SF	9.54	13,700,381.78	1,447,810.00	SF	9.55	13,819,487.54	11,400.00	SF	-119,105.76
D30	HEATING, VENTILATING, AND AIR CONDITIONING (HVAC)	1,436,410.00	SF	9.51	13,653,396.59	1,447,810.00	SF	9.29	13,447,324.56	11,400.00	SF	206,072.03
D40	FIRE PROTECTION	1,436,410.00	SF	5.24	7,526,881.45	1,447,810.00	SF	4.75	6,874,296.17	11,400.00	SF	652,585.28
D50	ELECTRICAL	1,436,410.00	SF	19.60	28,157,908.23	1,447,810.00	SF	26.39	38,204,118.49	11,400.00	SF	-10,046,210.26
D60	COMMUNICATIONS AND SECURITY	1,436,410.00	SF	6.42	9,220,773.76	1,447,810.00	SF	0.29	413,120.59	11,400.00	SF	8,807,653.17
D70	ELECTRONIC SAFETY AND SECURITY	1,436,410.00	SF	2.70	3,878,062.00	0.00	SF	0.00	0.00	-1,436,410.00	SF	3,878,062.00
E	EQUIPMENT AND FURNISHINGS	1,436,410.00	SF	0.57	815,000.00	1,447,810.00	SF	0.84	1,215,000.00	11,400.00	SF	-400,000.00
E10	EQUIPMENT	1,436,410.00	SF	0.57	815,000.00	1,447,810.00	SF	0.84	1,215,000.00	11,400.00	SF	-400,000.00
F	SPECIAL CONSTRUCTION AND DEMOLITION	1,436,410.00	SF	0.17	241,760.37	1,447,810.00	SF	2.66	3,850,600.00	11,400.00	SF	-3,608,839.63
F10	SPECIAL CONSTRUCTION	1,436,410.00	SF	0.17	241,760.37	1,447,810.00	SF	2.66	3,850,600.00	11,400.00	SF	-3,608,839.63
G	BUILDING SITework	1,436,410.00	SF	26.20	37,640,050.77	1,447,810.00	SF	29.90	43,291,606.02	11,400.00	SF	-5,651,555.25
G10	SITE PREPARATION	1,436,410.00	SF	0.03	50,000.00	0.00	SF	0.00	0.00	-1,436,410.00	SF	50,000.00
G20	SITE IMPROVEMENTS	1,436,410.00	SF	24.70	35,474,587.19	1,447,810.00	SF	27.58	39,925,954.02	11,400.00	SF	-4,451,366.83
G30	SITE CIVIL/MECHANICAL UTILITIES	1,436,410.00	SF	1.47	2,115,463.57	1,447,810.00	SF	2.07	3,000,000.00	11,400.00	SF	-884,536.43
G40	SITE ELECTRICAL UTILITIES	0.00		0.00	0.00	1,447,810.00	SF	0.25	365,652.00	1,447,810.00	SF	-365,652.00
Z	GENERAL	1,436,410.00	SF	50.85	73,040,315.24	1,447,810.00	SF	36.34	52,609,349.47	11,400.00	SF	20,430,965.77
Z10	GENERAL REQUIREMENTS	1,436,410.00	SF	50.85	73,040,315.24	1,447,810.00	SF	36.34	52,609,349.47	11,400.00	SF	20,430,965.77

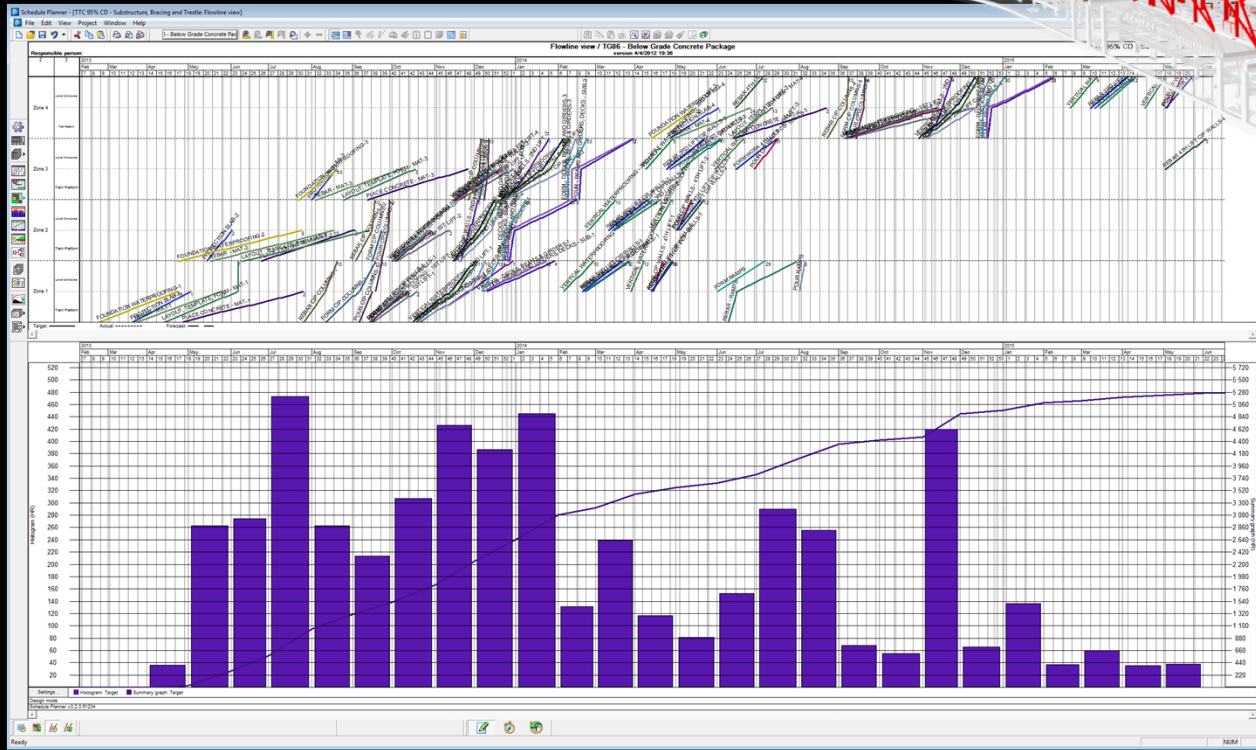
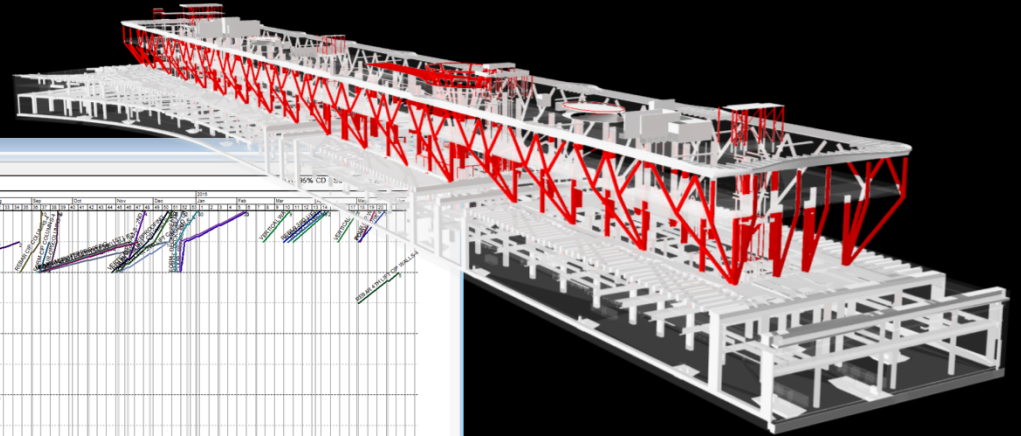
TRANSBAY TRANSIT CENTER

Workforce Planning



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Virtual Building

