TECH REPORT 2
SANTA ROSA JUNIOR COLLEGE STUDENT CENTER

Cost and Schedule Analysis

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2009 SENIOR THESIS

TECH REPORT 2
SANTA ROSA JUNIOR COLLEGE STUDENT CENTER

EXECUTIVE SUMMARY

Mobilization for the Santa Rosa Junior College Student Center began in December of 2007. Work on the geothermal field was the first thing started on the project followed by excavation for footings, structural steel placement, along with slab on grade placement. This work was completed in September of 2008 and was followed by exterior envelope construction which was completed in December of 2008. The exterior envelope construction was followed by framing, interior finishes, landscaping, and irrigation which is scheduled to be completed in late November of 2009 (originally September but the project was delayed about 2 months). The SRJC Student Center is schedule to be completed on November 24, 2009, and be ready for students for the 2010 spring semester.

The construction sequence on the building flows from east to west in three different sections. Construction begins on the East Building section and then moves to the Center Building section and ends with the West Building. Clean and punch is scheduled for November 24, 2009 and the building turnover will be just in time for the Spring 2010 semester.

This technical report contains a site plan for the superstructure phase of construction. The plan shows locations of the two construction entrances, material storage locations, office trailers, crane location, and many other items that make up this phase of construction.

The structural system of the building costs about 3.5 million dollars and $52.52 per SF. The estimate for the SRJC student center comes from RS Means Costworks and the unit costs have been adjusted for time and location. The complexity of the center made it nearly impossible to do an entire takeoff, so the estimate is based on a typical bay in the center and is then multiplied out through the rest of the building.

The general conditions estimate is derived using RS Means Costworks. While being given very limited information I was able to put together the most accurate general conditions estimate possible. Where information is lacking, general assumptions are made. The prices obtained are adjusted for time and location. Although I am unaware of what the exact estimate obtained for the project was, I am confident in the effort put forth on this estimate with what information was given.

The PACE Roundtable began with a dinner on Wednesday night and continued on Thursday with discussion about the state of the construction industry, communication patterns of the “now” generation, continuous personal growth, and breakout sessions highlighting energy and the construction industry, business networking, and building information modeling (BIM). Overall the roundtable seminar was a great experience that I was able to come away from with a great amount of knowledge and useful contacts from the industry who may be able to help me in the future with my senior thesis project.

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DETAILED PROJECT SCHEDULE

Summary of Schedule:

Construction on the Santa Rosa Junior College Student Center began with the Notice to Proceed which was granted on December 7, 2007. Mobilization soon followed on December 13 of 2007. After mobilizing work began on setting structural concrete, steel, SOG's and metal decking. Construction throughout the project was set up in three phases (East Building, Middle Building, West Building). Construction started on the east side of the site and finished up on the west. Work on the building began with excavation for footings and grade beams and was followed by placement of embeds, rebar, anchor bolts and finally inspection before the placement of concrete. Next steel columns and beams were set in place by the use of a mobile crane where they were then plumbed up and welded in place. Following the columns and beams was the erection of stairs and placement of metal decking. After the placement of steel the SOG was formed, reinforced and poured. Construction then moved to the second and finally third floor where concrete slabs were placed on metal decking. This process of setting steel and pouring concrete for the East Building section was completed in June of 2008. The Middle and West sections of construction which started while construction was still being done on the East section would finish in October and September of 2008 respectively.

Once the steel and concrete placement was completed, work then moved on to the exterior envelope of the SRJC student center. The sequence of work would again move in three sections from east to west. Envelope construction began on the second floor and then moved to the third floor before coming back to finish the first floor up last. Exterior envelope construction began in June of 2008 and was completed successfully in December of the same year. Framing/Rough-in was next on the schedule followed by interior finishes, fixtures, and trim. This work is scheduled to be done November 24, 2009 which would allow the student center to open its doors to students and faculty for the first time at the beginning of the 2010 spring semester at SRJC.

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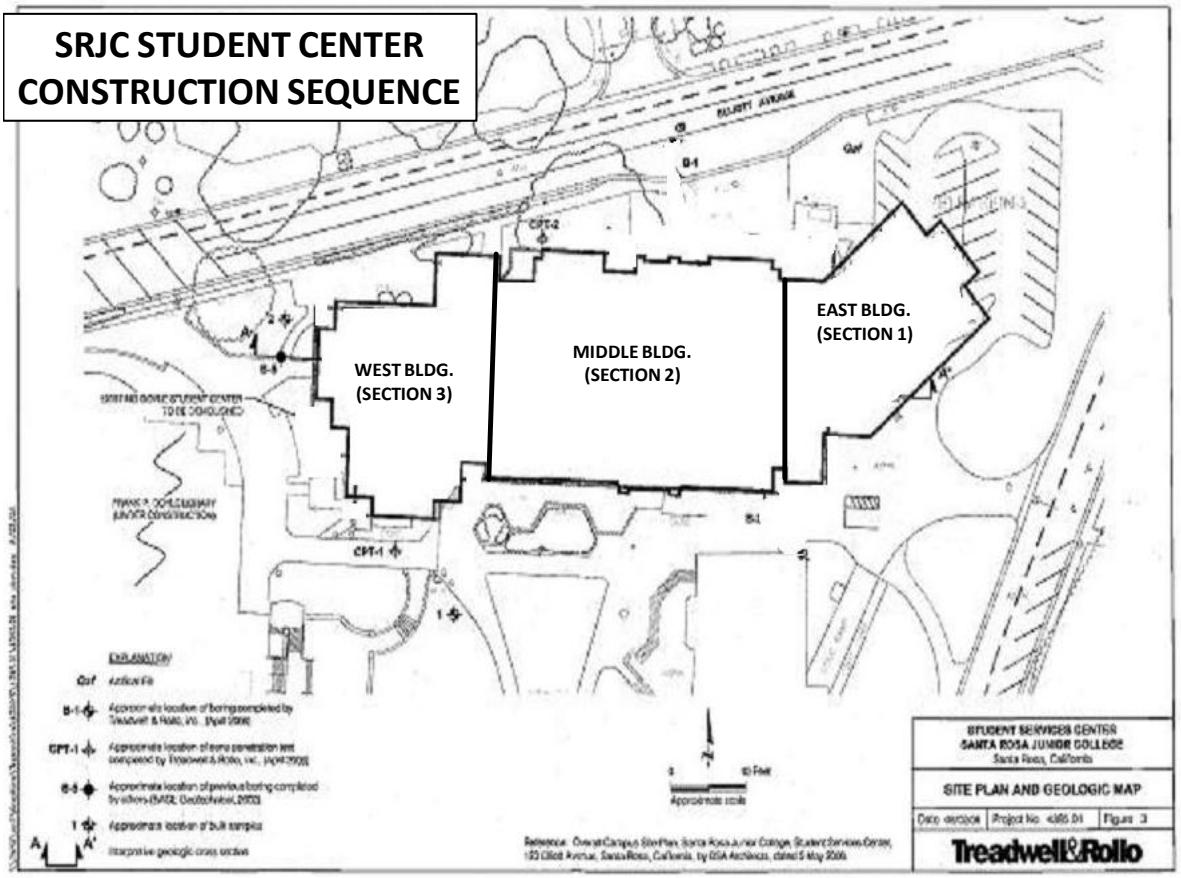

This image illustrates the construction sequence of the student center. Work began at the east side of the building and worked across to the middle and finally west side (right to left on site plan).

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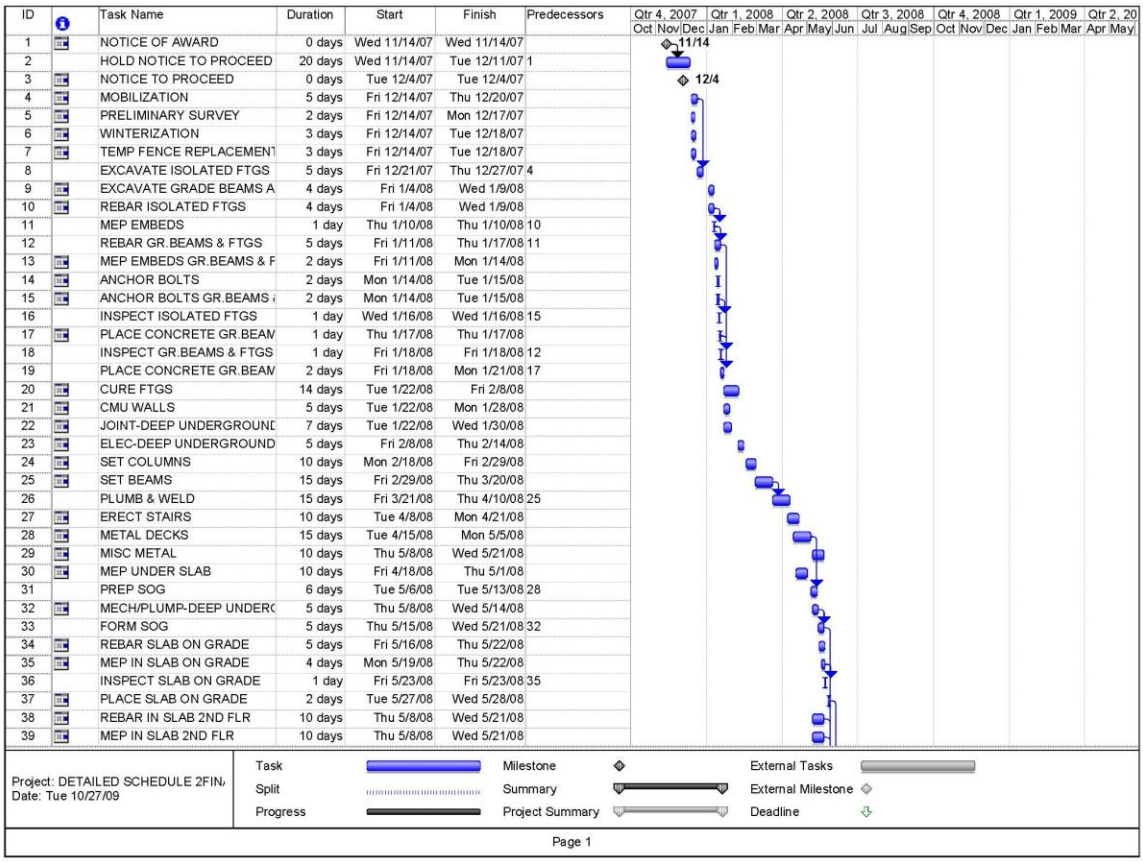
Detailed Project Schedule:

The detailed schedule that I put together for the SRJC Student Center focuses on one of the three sequences of construction on the building. All of the activities and durations are taken from the East Building (section 1) part of the schedule. The middle and west parts of the schedule contain nearly identical activities and are only a few months behind the East Sequence, which was the initial sequence of construction.



ID	Task Name	Duration	Start	Finish	Predecessors
1	NOTICE OF AWARD	0 days	Wed 11/14/07	Wed 11/14/07	
2	HOLD NOTICE TO PROCEED	20 days	Wed 11/14/07	Tue 12/11/07	1
3	NOTICE TO PROCEED	0 days	Tue 12/4/07	Tue 12/4/07	
4	MOBILIZATION	5 days	Fri 12/14/07	Thu 12/20/07	
5	PRELIMINARY SURVEY	2 days	Fri 12/14/07	Mon 12/17/07	
6	WINTERIZATION	3 days	Fri 12/14/07	Tue 12/18/07	
7	TEMP FENCE REPLACEMENT	3 days	Fri 12/14/07	Tue 12/18/07	
8	EXCAVATE ISOLATED FTGS	5 days	Fri 12/21/07	Thu 12/27/07	4
9	EXCAVATE GRADE BEAMS A	4 days	Fri 1/4/08	Wed 1/9/08	
10	REBAR ISOLATED FTGS	4 days	Fri 1/4/08	Wed 1/9/08	
11	MEP EMBEDS	1 day	Thu 1/10/08	Thu 1/10/08	10
12	REBAR GR.BEAMS & FTGS	5 days	Fri 1/11/08	Thu 1/17/08	11
13	MEP EMBEDS GR.BEAMS & F	2 days	Fri 1/11/08	Mon 1/14/08	
14	ANCHOR BOLTS	2 days	Mon 1/14/08	Tue 1/15/08	
15	ANCHOR BOLTS GR.BEAMS	2 days	Mon 1/14/08	Tue 1/15/08	
16	INSPECT ISOLATED FTGS	1 day	Wed 1/16/08	Wed 1/16/08	15
17	PLACE CONCRETE GR.BEAM	1 day	Thu 1/17/08	Thu 1/17/08	
18	INSPECT GR.BEAMS & FTGS	1 day	Fri 1/18/08	Fri 1/18/08	12
19	PLACE CONCRETE GR.BEAM	2 days	Fri 1/18/08	Mon 1/21/08	17
20	CURE FTGS	14 days	Tue 1/22/08	Fri 2/8/08	
21	CMU WALLS	5 days	Tue 1/22/08	Mon 1/28/08	
22	JOINT-DEEP UNDERGROUND	7 days	Tue 1/22/08	Wed 1/30/08	
23	ELEC-DEEP UNDERGROUND	5 days	Fri 2/8/08	Thu 2/14/08	
24	SET COLUMNS	10 days	Mon 2/18/08	Fri 2/29/08	
25	SET BEAMS	15 days	Fri 2/29/08	Thu 3/20/08	
26	PLUMB & WELD	15 days	Fri 3/21/08	Thu 4/10/08	25
27	ERECT STAIRS	10 days	Tue 4/8/08	Mon 4/21/08	
28	METAL DECKS	15 days	Tue 4/15/08	Mon 5/5/08	
29	MISC METAL	10 days	Thu 5/8/08	Wed 5/21/08	
30	MEP UNDER SLAB	10 days	Fri 4/18/08	Thu 5/1/08	
31	PREP SOG	6 days	Tue 5/6/08	Tue 5/13/08	28
32	MECH/PLUMP-DEEP UNDERG	5 days	Thu 5/8/08	Wed 5/14/08	
33	FORM SOG	5 days	Thu 5/15/08	Wed 5/21/08	32
34	REBAR SLAB ON GRADE	5 days	Fri 5/16/08	Thu 5/22/08	
35	MEP IN SLAB ON GRADE	4 days	Mon 5/19/08	Thu 5/22/08	
36	INSPECT SLAB ON GRADE	1 day	Fri 5/23/08	Fri 5/23/08	35
37	PLACE SLAB ON GRADE	2 days	Tue 5/27/08	Wed 5/28/08	
38	REBAR IN SLAB 2ND FLR	10 days	Thu 5/8/08	Wed 5/21/08	
39	MEP IN SLAB 2ND FLR	10 days	Thu 5/8/08	Wed 5/21/08	

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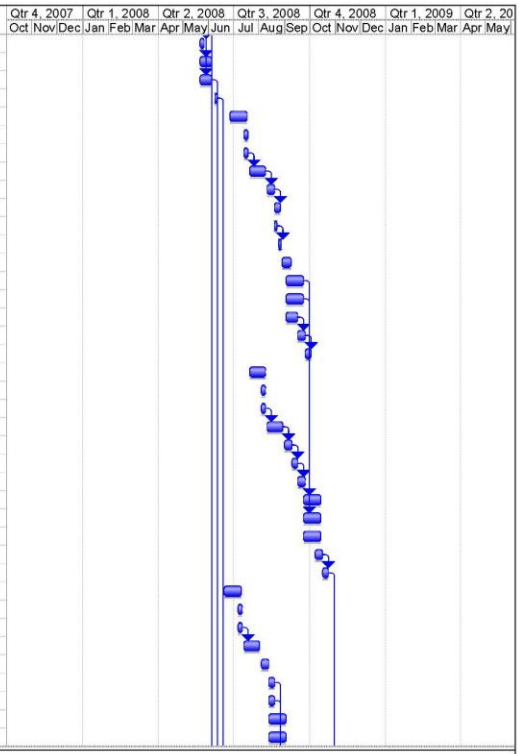
ID	Task Name	Duration	Start	Finish	Predecessors
40	CONCRETE SLAB ON DECK	3 days	Thu 5/22/08	Mon 5/26/08	39
41	REBAR IN SLAB 3RD FLR	10 days	Thu 5/22/08	Wed 6/4/08	38
42	MEP IN SLAB 3RD FLR	10 days	Thu 5/22/08	Wed 6/4/08	33
43	CONCRETE SLAB ON DECK 3	3 days	Mon 6/9/08	Wed 6/11/08	
44	EXTERIOR STUDS L2	15 days	Fri 6/27/08	Thu 7/17/08	
45	ROUGH-IN PLUMBING EXT W	5 days	Mon 7/14/08	Fri 7/18/08	
46	ELECTRICAL ROUGH-IN EXT	5 days	Mon 7/14/08	Fri 7/18/08	
47	EXTERIOR GYP SHEETING L2	15 days	Mon 7/21/08	Fri 8/8/08	46
48	WATERPROOF EXT WALLS L	7 days	Mon 8/11/08	Tue 8/19/08	47
49	FLASHING EXT MASONRY L2	5 days	Wed 8/20/08	Tue 8/26/08	48
50	WATERPROOF EXT DECK #2	3 days	Wed 8/20/08	Fri 8/22/08	
51	PAVERS DECK #293 L2	3 days	Mon 8/25/08	Wed 8/27/08	50
52	WINDOWS L2	7 days	Fri 8/29/08	Mon 9/8/08	
53	VENEER MASONRY L2	15 days	Wed 9/3/08	Tue 9/23/08	
54	GFRC PRECAST L2	15 days	Wed 9/3/08	Tue 9/23/08	
55	ALUM WINDOWS L2	10 days	Wed 9/3/08	Tue 9/16/08	
56	CURTAIN WALL L2	7 days	Wed 9/17/08	Thu 9/25/08	55
57	CAULKING WINDOWS L2	5 days	Fri 9/26/08	Thu 10/2/08	56
58	EXTERIOR STUDS L3	15 days	Mon 7/21/08	Fri 8/8/08	
59	ROUGH-IN PLUMBING EXT W	5 days	Mon 8/4/08	Fri 8/8/08	
60	ELECTRICAL ROUGH-IN EXT	5 days	Mon 8/4/08	Fri 8/8/08	
61	EXTERIOR GYP SHEETING L3	15 days	Mon 8/11/08	Fri 8/29/08	60
62	WATERPROOF EXT WALLS L	7 days	Mon 9/1/08	Tue 9/9/08	61
63	FLASHING EXT MASONRY L3	5 days	Wed 9/10/08	Tue 9/16/08	62
64	WINDOWS L3	7 days	Wed 9/17/08	Thu 9/25/08	63
65	ALUM WINDOWS L3	15 days	Wed 9/24/08	Tue 10/14/08	54
66	VENEER MASONRY L3	15 days	Wed 9/24/08	Tue 10/14/08	53
67	GFRC PRECAST L3	15 days	Wed 9/24/08	Tue 10/14/08	
68	CURTAIN WALL L3	7 days	Wed 10/8/08	Thu 10/16/08	
69	CAULKING WINDOWS L3	5 days	Fri 10/17/08	Thu 10/23/08	68
70	EXTERIOR STUDS L1	15 days	Fri 6/20/08	Thu 7/10/08	
71	ROUGH-IN PLUMBING EXT W	5 days	Mon 7/7/08	Fri 7/11/08	
72	ELECTRICAL ROUGH-IN EXT	5 days	Mon 7/7/08	Fri 7/11/08	
73	EXTERIOR GYP SHEETING L1	15 days	Mon 7/14/08	Fri 8/1/08	72
74	WATERPROOF EXT WALLS L	7 days	Mon 8/4/08	Tue 8/12/08	
75	FLASHING EXT MASONRY L1	5 days	Wed 8/13/08	Tue 8/19/08	
76	PLASTER SOFFETS L1	5 days	Wed 8/13/08	Tue 8/19/08	
77	VENEER MASONRY L1	15 days	Wed 8/13/08	Tue 9/2/08	
78	GFRC PRECAST L1	15 days	Wed 8/13/08	Tue 9/2/08	



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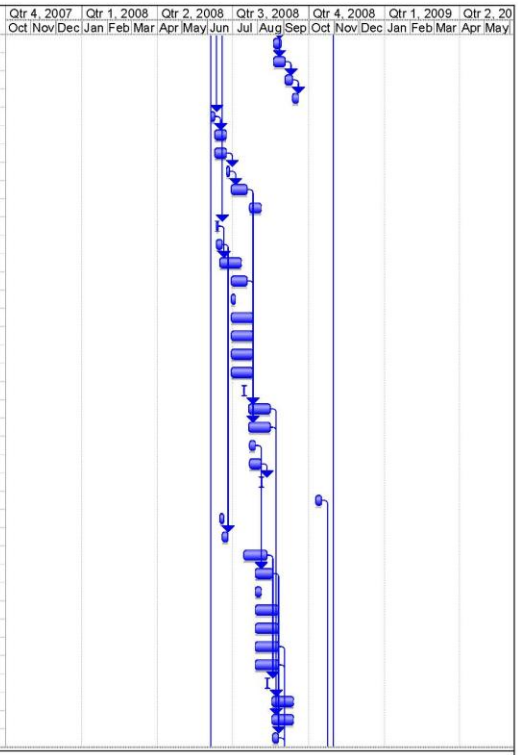
ID	Task Name	Duration	Start	Finish	Predecessors
79	WINDOWS L1	7 days	Wed 8/20/08	Thu 8/28/08	76
80	ALUM WINDOWS L1	10 days	Wed 8/20/08	Tue 9/2/08	75
81	CURTAIN WALL L1	7 days	Wed 9/3/08	Thu 9/11/08	80
82	CAULKING WINDOWS L1	5 days	Fri 9/12/08	Thu 9/18/08	81
83	ROOF CARPENTRY	3 days	Thu 6/5/08	Mon 6/9/08	42
84	ROOF MASONRY VENEER	10 days	Tue 6/10/08	Mon 6/23/08	83
85	ROOF PRECAST	10 days	Tue 6/10/08	Mon 6/23/08	
86	ROOF MASONRY FLASHING	4 days	Tue 6/24/08	Fri 6/27/08	85
87	ROOF INSULATION	15 days	Mon 6/30/08	Fri 7/18/08	86
88	ROOFING	10 days	Tue 7/22/08	Mon 8/4/08	
89	FIRE PROOFING STEEL L2	2 days	Thu 6/12/08	Fri 6/13/08	43
90	MEP RISERS L2	5 days	Thu 6/12/08	Wed 6/18/08	
91	ROUGH-IN OVERHEAD DUCT	20 days	Mon 6/16/08	Fri 7/11/08	89
92	INTERIOR FRAMING L2	15 days	Mon 6/30/08	Fri 7/18/08	
93	HOLLOW METAL FRAMES IN	5 days	Mon 6/30/08	Fri 7/4/08	
94	ROUGH-IN AV/TELECOM/SEC	20 days	Mon 6/30/08	Fri 7/25/08	
95	ROUGH-IN ELECTRICAL/FIRE	20 days	Mon 6/30/08	Fri 7/25/08	
96	ROUGH-IN PLUMBING L2	20 days	Mon 6/30/08	Fri 7/25/08	
97	ROUGH-IN HVAC CONTROLS	20 days	Mon 6/30/08	Fri 7/25/08	
98	CLOSE UP INSPECTION 1/2 L	1 day	Tue 7/15/08	Tue 7/15/08	
99	ROUGH-IN FIRE SPRINKLER	20 days	Mon 7/21/08	Fri 8/15/08	92
100	ROUGH-IN HVAC WET-SIDE L	20 days	Mon 7/21/08	Fri 8/15/08	87
101	ROLL UP GRILLS & DOORS L	5 days	Tue 7/22/08	Mon 7/28/08	
102	MECH. RM.#255- ROUGH-IN/S	10 days	Tue 7/22/08	Mon 8/4/08	
103	CLOSE UP INSPECTION 2/2 L	1 day	Tue 8/5/08	Tue 8/5/08	102
104	BLDG INSULATION L2	5 days	Fri 10/10/08	Thu 10/16/08	
105	FIRE PROOFING STEEL L3	5 days	Mon 6/16/08	Fri 6/20/08	
106	MEP RISERS L3	5 days	Thu 6/19/08	Wed 6/25/08	90
107	ROUGH-IN OVERHEAD DUCT	20 days	Tue 7/15/08	Mon 8/11/08	
108	INTERIOR FRAMING L3	15 days	Tue 7/29/08	Mon 8/18/08	101
109	HOLLOW METAL FRAMES IN	5 days	Tue 7/29/08	Mon 8/4/08	
110	ROUGH-IN AV/TELECOM/SEC	20 days	Tue 7/29/08	Mon 8/25/08	
111	ROUGH-IN ELECTRICAL/FIRE	20 days	Tue 7/29/08	Mon 8/25/08	
112	ROUGH-IN PLUMBING L3	20 days	Tue 7/29/08	Mon 8/25/08	
113	ROUGH-IN HVAC CONTROLS	20 days	Tue 7/29/08	Mon 8/25/08	
114	CLOSE UP INSPECTION 1/2 L	1 day	Tue 8/12/08	Tue 8/12/08	107
115	ROUGH-IN FIRE SPRINKLER	20 days	Mon 8/18/08	Fri 9/12/08	100
116	ROUGH-IN HVAC WET-SIDE L	20 days	Mon 8/18/08	Fri 9/12/08	99
117	ROLL UP GRILLS & DOORS L	5 days	Tue 8/19/08	Mon 8/25/08	108



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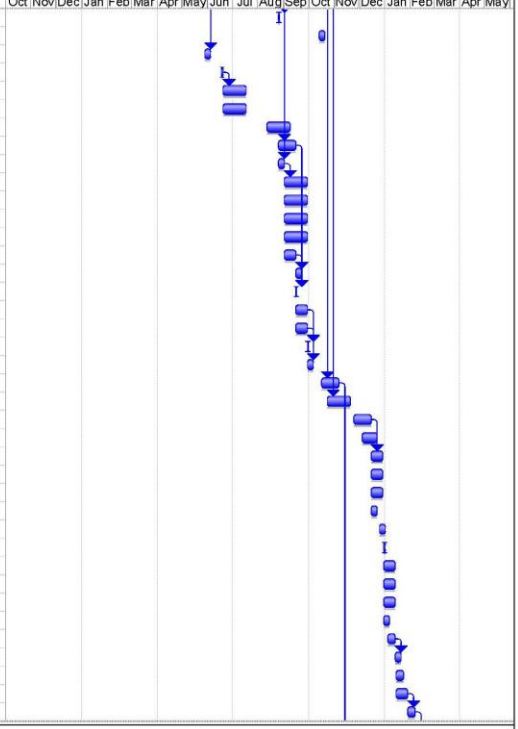
ID	Task Name	Duration	Start	Finish	Predecessors
118	CLOSE UP INSPECTION 2/2 L	1 day	Tue 8/26/08	Tue 8/26/08	117
119	BLDG INSULATION L3	5 days	Tue 10/14/08	Mon 10/20/08	
120	MEP RISERS L1	5 days	Thu 5/29/08	Wed 6/4/08	37
121	FIRE PROOFING STEEL L1	2 days	Wed 6/18/08	Thu 6/19/08	
122	ROUGH-IN FIRE SPRINKLER	20 days	Fri 6/20/08	Thu 7/17/08	121
123	ROUGH-IN HVAC WET-SIDE L	20 days	Fri 6/20/08	Thu 7/17/08	
124	ROUGH-IN OVERHEAD DUCT	20 days	Tue 8/12/08	Mon 9/8/08	
125	INTERIOR FRAMING L1	15 days	Tue 8/26/08	Mon 9/15/08	113
126	HOLLOW METAL FRAMES IN	5 days	Tue 8/26/08	Mon 9/1/08	112
127	ROUGH-IN AV/TELECOM/SEC	20 days	Tue 9/2/08	Mon 9/29/08	126
128	ROUGH-IN ELECTRICAL/FIRE	20 days	Tue 9/2/08	Mon 9/29/08	
129	ROUGH-IN PLUMBING L1	20 days	Tue 9/2/08	Mon 9/29/08	
130	ROUGH-IN HVAC CONTROLS	20 days	Tue 9/2/08	Mon 9/29/08	
131	ELECT. RM#125- ROUGH-IN/S	10 days	Tue 9/2/08	Mon 9/15/08	
132	ROLL UP GRILLS & DOORS L	5 days	Tue 9/16/08	Mon 9/22/08	131
133	CLOSE UP INSPECTION 1/2 L	1 day	Tue 9/16/08	Tue 9/16/08	125
134	ELECT. RM#126-ROUGH-IN/S	10 days	Tue 9/16/08	Mon 9/29/08	
135	MECHANICAL ROOM #127 L1	10 days	Tue 9/16/08	Mon 9/29/08	
136	CLOSE UP INSPECTION 2/2 L	1 day	Tue 9/30/08	Tue 9/30/08	135
137	BLDG INSULATION L1	5 days	Tue 9/30/08	Mon 10/6/08	134
138	DRYWALL L2	15 days	Fri 10/17/08	Thu 11/6/08	104
139	TAPE & TEXTURE L2	20 days	Fri 10/24/08	Thu 11/20/08	69
140	PAINT & WALL COVERING L2	15 days	Tue 11/25/08	Mon 12/15/08	
141	CEILING GRID L2	12 days	Fri 12/5/08	Mon 12/22/08	
142	CERAMIC TILE RESTROOM #	10 days	Tue 12/16/08	Mon 12/29/08	140
143	HVAC IN CEILING GRID L2	10 days	Tue 12/16/08	Mon 12/29/08	
144	LIGHTING/DEVICES IN CEILI	10 days	Tue 12/16/08	Mon 12/29/08	
145	STAINLESS STEEL RAILS & M	5 days	Tue 12/16/08	Mon 12/22/08	
146	PROJECTION SCREENS L2	5 days	Fri 12/26/08	Thu 1/1/09	
147	MILLWORK RESTROOMS #25	2 days	Wed 12/31/08	Thu 1/1/09	
148	HVAC TRIM & FINISH L2	10 days	Wed 12/31/08	Tue 1/13/09	
149	ELECTRICAL TRIM & FINISH I	10 days	Wed 12/31/08	Tue 1/13/09	
150	ACOUSTICAL TILE L2	10 days	Wed 12/31/08	Tue 1/13/09	
151	WINDOW TREATMENT L2	5 days	Wed 12/31/08	Tue 1/6/09	
152	PLUMBING TRIM RESTROOM	7 days	Mon 1/5/09	Tue 1/13/09	
153	TOILET PARTITIONS & ACCE	5 days	Wed 1/14/09	Tue 1/20/09	152
154	INTERIOR GLASS & GLAZING	7 days	Thu 1/15/09	Fri 1/23/09	
155	MILLWORK & CASEWORK L2	10 days	Thu 1/15/09	Wed 1/28/09	
156	CARPET L2	7 days	Thu 1/29/09	Fri 2/6/09	155



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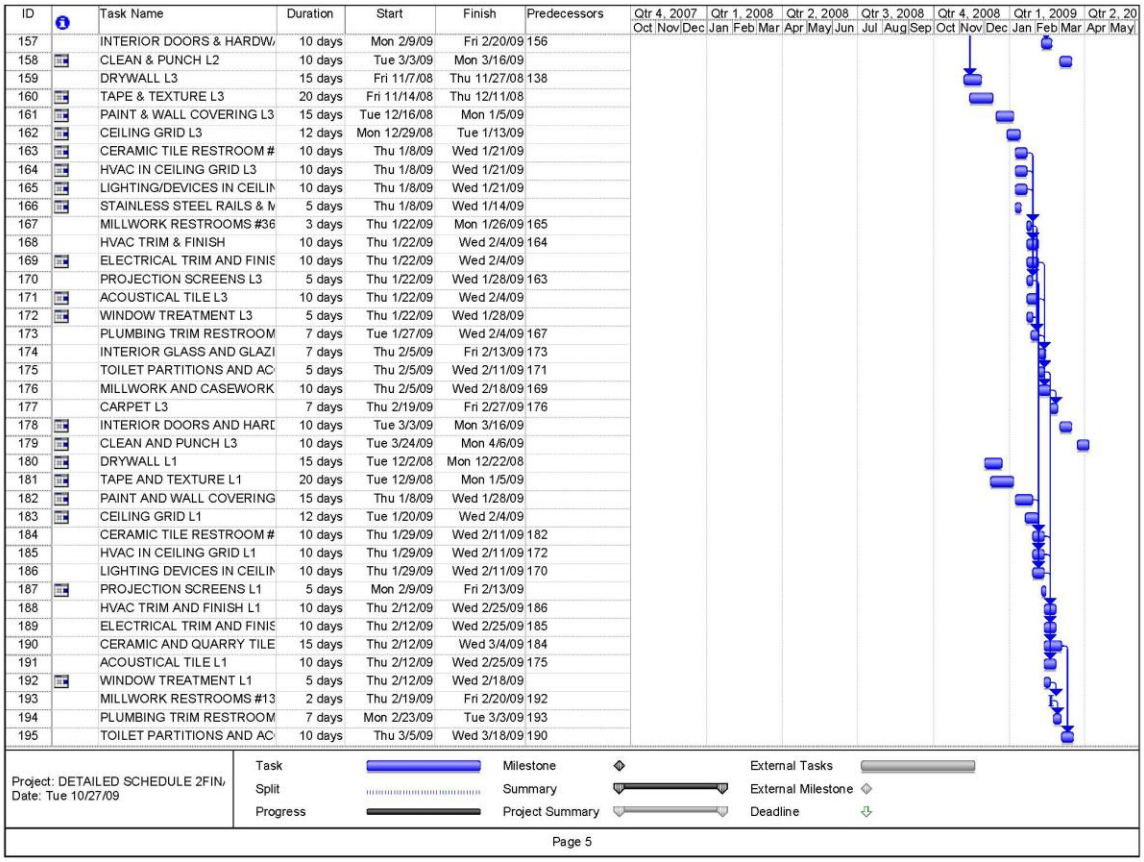

ID	Task Name	Duration	Start	Finish	Predecessors
157	INTERIOR DOORS & HARDW/	10 days	Mon 2/9/09	Fri 2/20/09	156
158	CLEAN & PUNCH L2	10 days	Tue 3/3/09	Mon 3/16/09	
159	DRYWALL L3	15 days	Fri 11/7/08	Thu 11/27/08	138
160	TAPE & TEXTURE L3	20 days	Fri 11/14/08	Thu 12/11/08	
161	PAINT & WALL COVERING L3	15 days	Tue 12/16/08	Mon 1/5/09	
162	CEILING GRID L3	12 days	Mon 12/29/08	Tue 1/13/09	
163	CERAMIC TILE RESTROOM #	10 days	Thu 1/8/09	Wed 1/21/09	
164	HVAC IN CEILING GRID L3	10 days	Thu 1/8/09	Wed 1/21/09	
165	LIGHTING/DEVICES IN CEILI	10 days	Thu 1/8/09	Wed 1/21/09	
166	STAINLESS STEEL RAILS & M	5 days	Thu 1/8/09	Wed 1/14/09	
167	MILLWORK RESTROOMS #36	3 days	Thu 1/22/09	Mon 1/26/09	165
168	HVAC TRIM & FINISH	10 days	Thu 1/22/09	Wed 2/4/09	164
169	ELECTRICAL TRIM AND FINIS	10 days	Thu 1/22/09	Wed 2/4/09	
170	PROJECTION SCREENS L3	5 days	Thu 1/22/09	Wed 1/28/09	163
171	ACOUSTICAL TILE L3	10 days	Thu 1/22/09	Wed 2/4/09	
172	WINDOW TREATMENT L3	5 days	Thu 1/22/09	Wed 1/28/09	
173	PLUMBING TRIM RESTROOM	7 days	Tue 1/27/09	Wed 2/4/09	167
174	INTERIOR GLASS AND GLAZI	7 days	Thu 2/5/09	Fri 2/13/09	173
175	TOILET PARTITIONS AND AC	5 days	Thu 2/5/09	Wed 2/11/09	171
176	MILLWORK AND CASEWORK	10 days	Thu 2/5/09	Wed 2/18/09	169
177	CARPET L3	7 days	Thu 2/19/09	Fri 2/27/09	176
178	INTERIOR DOORS AND HARD	10 days	Tue 3/3/09	Mon 3/16/09	
179	CLEAN AND PUNCH L3	10 days	Tue 3/24/09	Mon 4/6/09	
180	DRYWALL L1	15 days	Tue 12/2/08	Mon 12/22/08	
181	TAPE AND TEXTURE L1	20 days	Tue 12/9/08	Mon 1/5/09	
182	PAINT AND WALL COVERING	15 days	Thu 1/8/09	Wed 1/28/09	
183	CEILING GRID L1	12 days	Tue 1/20/09	Wed 2/4/09	
184	CERAMIC TILE RESTROOM #	10 days	Thu 1/29/09	Wed 2/11/09	182
185	HVAC IN CEILING GRID L1	10 days	Thu 1/29/09	Wed 2/11/09	172
186	LIGHTING DEVICES IN CEILI	10 days	Thu 1/29/09	Wed 2/11/09	170
187	PROJECTION SCREENS L1	5 days	Mon 2/9/09	Fri 2/13/09	
188	HVAC TRIM AND FINISH L1	10 days	Thu 2/12/09	Wed 2/25/09	186
189	ELECTRICAL TRIM AND FINIS	10 days	Thu 2/12/09	Wed 2/25/09	185
190	CERAMIC AND QUARRY TILE	15 days	Thu 2/12/09	Wed 3/4/09	184
191	ACOUSTICAL TILE L1	10 days	Thu 2/12/09	Wed 2/25/09	175
192	WINDOW TREATMENT L1	5 days	Thu 2/12/09	Wed 2/18/09	
193	MILLWORK RESTROOMS #13	2 days	Thu 2/19/09	Fri 2/20/09	192
194	PLUMBING TRIM RESTROOM	7 days	Mon 2/23/09	Tue 3/3/09	193
195	TOILET PARTITIONS AND AC	10 days	Thu 3/5/09	Wed 3/18/09	190

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SANTA ROSA JUNIOR COLLEGE STUDENT CENTER

ID	Task Name	Duration	Start	Finish	Predecessors
196	INTERIOR GLASS AND GLAZI	5 days	Fri 3/6/09	Thu 3/12/09	
197	MILLWORK AND CASEWORK	3 days	Fri 3/6/09	Tue 3/10/09	
198	CARPET L1	7 days	Fri 3/20/09	Mon 3/30/09	
199	INTERIOR DOORS AND HARD	10 days	Tue 3/31/09	Mon 4/13/09	198
200	CLEAN AND PUNCH L1	10 days	Tue 4/21/09	Mon 5/4/09	

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SANTA ROSA JUNIOR COLLEGE STUDENT CENTER

SITE LAYOUT PLANNING

Summary of Site Layout Plan:

The construction site has two entrances, the primary entrance being located on Burbank Circle on the east side of the site, and the secondary entrance being right off of Elliot Avenue on the north part of the site. The primary entrance will continue to serve as a permanent entrance once construction is completed at the end of November 2009. Job trailers are located off site, across Elliot Avenue due to the limitation of space on the actual site. Portable toilets can be located at the north-east part of the site near the corner of Burbank Circle and Elliot Avenue. The main dumpsters are located in the same area as the job trailers but there is also a dumpster located on site for easy accessibility. The student center construction site has three main staging areas located in areas that are easily accessible by the crane or forklifts regardless of what part of the site they are working on at that time. These staging areas are located at the east, south, and west locations of the site which makes sense due to the fact that construction takes place in three sequences, each sequence basically having its own lay down area for materials. A single mobile crane was used to erect steel and worked from east to west erecting steel in sequence with the rest of construction. Material storage trailers are located on the southernmost part of the site, out of the way of construction. Although the site is small in comparison to the size of the student center, it does not pose any problems logistically. Everyone on site has plenty of room to move around the site without getting in anyone else's way. This is an amazing fact in itself considering the constant traffic of students and other pedestrians on all sides of the site.

Evaluation of Contractors Layout Plan:

Overall I think that the way that the site was laid out was a success. I do not believe that there is any better way to lay out so much on such a small site. The contractor was able to do this successfully while keeping delays to a minimum. One thing I would have changed if granted more space for the site would have been to have the job trailers and dumpsters located on site for easier accessibility. Due to the small site though, an empty lot across Elliot Ave. offered the best alternative. Overall I believe that the way the site was laid out has offered for a successful project that could not have been handled any better. This success will be evident when the project is completed in the upcoming month.

TECH REPORT 2
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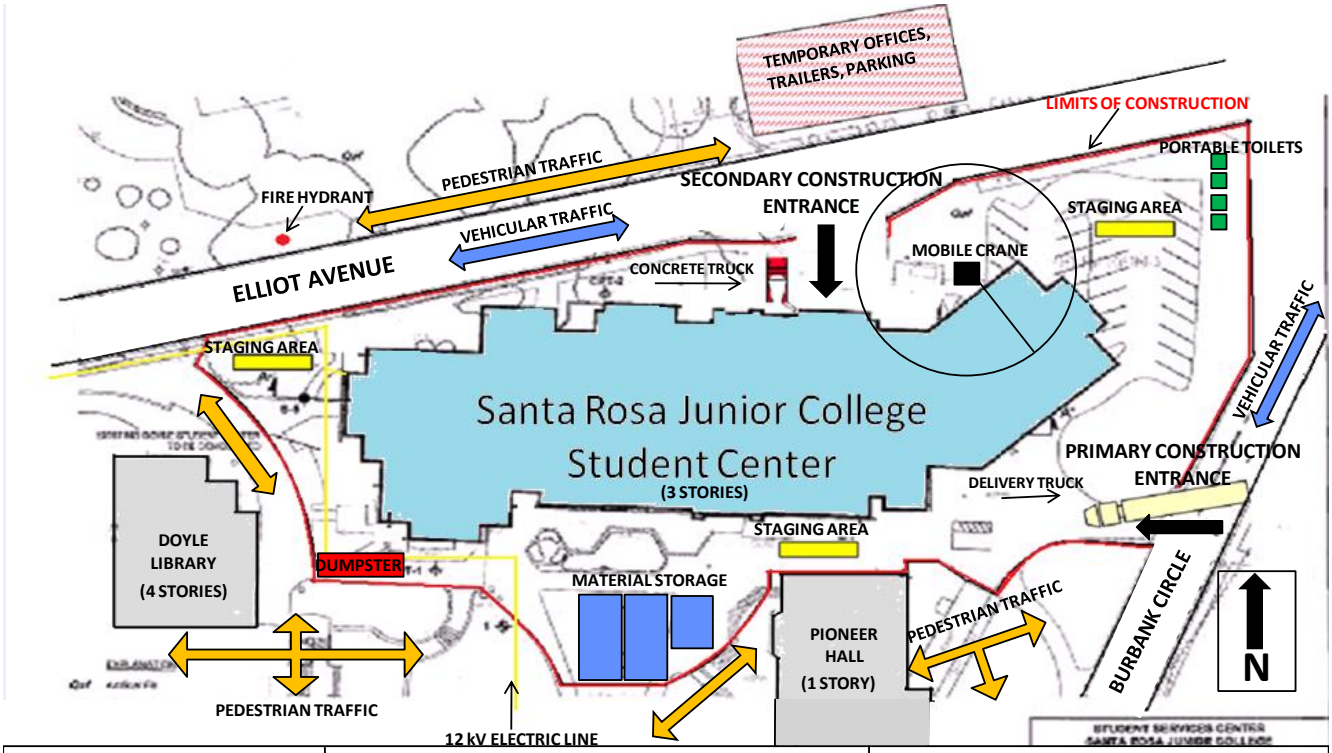

DAN VALLIMONT October 28, 2009	**SANTA ROSA JUNIOR COLLEGE STUDENT CENTER**	**SUPERSTRUCTURE PHASE OF CONSTRUCTION**

TECH REPORT 2
SANTA ROSA JUNIOR COLLEGE STUDENT CENTER

DETAILED STRUCTURAL SYSTEMS ESTIMATE

Detailed Structural Estimate Summary:

The estimate performed below was done using RS Means Costworks and represents the structural system estimate of the Santa Rosa Junior College Student Center. The estimate includes foundation, footings, Slabs, decking, and structural steel. Although a full takeoff for the structural steel would have been ideal, I was forced to resort to estimating a typical bay in the building which was repeated throughout the entire structure. The reason for this was due to time constraints and the complexity of the project. Upon asking the project estimator for advice on alternatives I was met with the response of:

> "We would never try to do a complete takeoff (going through the plans and counting everything) on a building the size of Bertolini. Especially with steel, the estimates are way too complicated for a general contractor to do accurately in house. You would need to figure in the number of bolted connections (cheaper) vs. welded, all of the miscellaneous bracing, stiffener plates, etc...plus adding up all of the beams, columns, and brace frames."

Upon receiving this response I decided to go with the typical bay estimate method and then multiplied my findings out through the rest of the building. Although it is not as detailed as a full takeoff it is still a good representation of the structural estimate on the Bertolini Student Center at SRJC.

TECH REPORT 2
SANTA ROSA JUNIOR COLLEGE STUDENT CENTER

Assembly Detail Report

Cost Estimate Report
CostWorks
RSMeans

Year 2009

Date: 28-Oct-09

DETAILED STRUCTURAL ESTIMATE

Prepared By:
DAN VALLIMONT
psu

Assembly Number			Description	Quantity	Unit	Total Incl. O&P	Ext. Total Incl. O&P
10 Non-CSI							
10201241255	U		Concrete Reinforcement	40,000.00	L.F.	$0.00	$115,000.00
10 Non-CSI Subtotal							**$115,000.00**
A Substructure							
A10102102200			Spread footings, 3' - 0" square x 12" deep, 3 KSF soil bearing capacity, 25 K load	24.00	Ea.	$199.42	$4,786.08
A10102104800			Spread footings, 9' - 6" square x 24" deep, 3 KSF soil bearing capacity, 250 K load	15.00	Ea.	$2,364.57	$35,468.55
A10102105600			Spread footings, 12' - 0" square x 28" deep, 3 KSF soil bearing capacity, 400 K load	15.00	Ea.	$4,535.30	$68,029.50
A Substructure Subtotal							**$108,284.13**
B Shell							
B10102084600			Steel column, W10, 200 KIPS, 10' unsupported height, 45 PLF	1,200.00	V.L.F.	$108.94	$130,728.00
B10102085000			Steel column, W12, 200 KIPS, 20' unsupported height, 58 PLF	2,995.00	V.L.F.	$118.00	$353,410.00
B10102087000			Steel column, W12, 600 KIPS, 10' unsupported height, 120 PLF	1,130.00	V.L.F.	$271.54	$306,840.20
B10102251500			Floor - ceiling, concrete slab, 4000 PSI, reinforced, 7" thick, no columns	20,000.00	S.F.	$26.00	$520,000.00
B10102411600			W beam and girder, 20'x15' bay, 40 PSF superimposed load, 14" deep, fireproofing .659 SF/SF, 50 PSF total load	29,000.00	S.F.	$8.36	$242,440.00
B10102412650			W beam and girder, 20'x20' bay, 40 PSF superimposed load, 14" deep, fireproofing .746 SF/SF, 50 PSF total load	40,400.00	S.F.	$9.45	$381,780.00
B10102481200			Floor, concrete, slab form, open web bar joist @ 2' OC, on W beam, 15'x20' bay, 17" deep, 40 PSF superimposed load, 83 PSF total load	50,000.00	S.F.	$12.74	$637,000.00
B10102581170			Floor, metal deck, 18 ga, 3" deep, concrete slab, 11' span, 5.5" deep, 150 PSF superimposed load, 194 PSF total load	50,000.00	S.F.	$9.10	$455,000.00
B10201341250			Steel deck, cellular, single span, 14' span, 3" deep, 5 PSF, 30 PSF TL	30,000.00	S.F.	$18.56	$556,800.00
B20101082100			Concrete block (CMU) wall, 12" thick, slump	6,200.00	S.F.	$35.75	$221,650.00
B Shell Subtotal							**$3,805,648.20**

TECH REPORT 2
SANTA ROSA JUNIOR COLLEGE STUDENT CENTER

GENERAL CONDITIONS ESTIMATE

General Conditions Estimate Summary:

The Conditions Estimate was derived using RS Means Costworks. Going into this estimate I was given very limited data. I was given only an approximate value of the general conditions and a list of a few items that were included, but no specific information. The reason for this is that Midstate Construction considers general conditions to be a very sensitive area. A common belief at Midstate is that winning or losing bids is often a result of how general conditions and fees are priced. They also believe that making some of that information available to the public (through my thesis project) creates a risk that it may also become available to competitors in the market which puts very real jobs and very real money at stake. Due to this I formulated my estimate using all of the data that was available to me while also making some general project assumptions in some areas of the estimate. Having stated all of this, I believe that my estimate of the general conditions on the Santa Rosa Junior College Student Center is as good a representation of the actual estimate as I was able to develop with the information made available to me.

TECH REPORT 2
SANTA ROSA JUNIOR COLLEGE STUDENT CENTER

Unit Detail Report

Cost Estimate Report
CostWorks®
RSMeans

Year 2009

Date: 26-Oct-09

gen conditions

LineNumber			Description	Quantity	Unit	Total Incl. O&P	Ext. Total Incl. O&P
Division 01 General Requirements							
013113200180			Field Personnel, project manager, minimum	102.00	Week	$2,550.00	$260,100.00
013113200260			Field Personnel, superintendent, average	102.00	Week	$2,750.00	$280,500.00
013113200265	U		Assistant Superintendent	102.00	week	$0.00	$230,000.00
014523500100			Field Testing, for building, costing $10,000,000, minimum	1.00	Project	$37,369.90	$37,369.90
015113200185	U		Construction lay-down areas	1.00	project	$0.00	$95,000.00
015113500140			Temporary electrical power equipment (pro-rated per job), underground feed, 3 uses, 600 amp	1.00	Ea.	$3,496.13	$3,496.13
015113500140	A		Contingencies, for estimate at preliminary working drawings stage (Design Development)	1.00	Project	$349.61	$349.61
015113500140	A		Contingencies, at conceptual design stage	1.00	Project	$699.23	$699.23
015113500560			Temporary electrical power equipment (pro-rated per job), temporary feeder cords, 100 amp, 3 uses, 100' long	1.00	Ea.	$616.46	$616.46
015113500560	A		Contingencies, for estimate at preliminary working drawings stage (Design Development)	1.00	Project	$61.65	$61.65
015113500560	A		Contingencies, at conceptual design stage	1.00	Project	$123.29	$123.29
015113800100			Temporary Heat, per week, 12 hours per day, incl. fuel and operation	700.00	CSF Flr	$36.84	$25,788.00
015113800100	A		Contingencies, for estimate at preliminary working drawings stage (Design Development)	1.00	Project	$3.68	$2,576.00
015113800100	A		Contingencies, at conceptual design stage	1.00	Project	$7.37	$5,159.00
015113800360			Temporary Power, lighting, incl. service lamps, wiring and outlets, max	700.00	CSF Flr	$48.12	$33,684.00
015113800360	A		Contingencies, for estimate at preliminary working drawings stage (Design Development)	1.00	Project	$4.81	$3,367.00
015113800360	A		Contingencies, at conceptual design stage	1.00	Project	$9.62	$6,734.00
015113800700			Temporary Utilities, temporary construction water bill per month, average	51.00	Month	$70.24	$3,582.24
015113800700	A		Contingencies, for estimate at preliminary working drawings stage (Design Development)	1.00	Project	$7.02	$358.02
015113800700	A		Contingencies, at conceptual design stage	1.00	Project	$14.05	$716.55
015213200020			Office Trailer, furnished, buy, 20' x 8', excl. hookups	2.00	Ea.	$10,583.83	$21,167.66

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LineNumber			Description	Quantity	Unit	Total Incl. O&P	Ext. Total Incl. O&P
015213200020	A		Contingencies, for estimate at preliminary working drawings stage (Design Development)	1.00	Project	$1,058.38	$2,116.76
015213200020	A		Contingencies, at conceptual design stage	1.00	Project	$2,116.77	$4,233.54
015213201200			Storage Boxes, buy, 20' x 8'	5.00	Ea.	$6,026.11	$30,130.55
015213201200	A		Contingencies, for estimate at preliminary working drawings stage (Design Development)	1.00	Project	$602.61	$3,013.05
015213201200	A		Contingencies, at conceptual design stage	1.00	Project	$1,205.22	$6,026.10
015213400120			Field Office Expense, office supplies, average	23.00	Month	$96.59	$2,221.57
015213400120	A		Contingencies, for estimate at preliminary working drawings stage (Design Development)	1.00	Project	$9.66	$222.18
015213400120	A		Contingencies, at conceptual design stage	1.00	Project	$19.32	$444.36
015213400120	A		Contingencies, at conceptual design stage	1.00	Project	$19.32	$444.36
015626500100			Temporary Fencing, chain link, 6' high, 11 ga	1,500.00	L.F.	$12.12	$18,180.00
015626500100	A		Contingencies, for estimate at preliminary working drawings stage (Design Development)	1.00	Project	$1.21	$1,815.00
015626500100	A		Contingencies, at conceptual design stage	1.00	Project	$2.42	$3,630.00
015626500100	A		Contingencies, at conceptual design stage	1.00	Project	$2.42	$3,630.00
017413200050			Cleaning Up, cleanup of floor area, continuous, per day, during construction	70.00	M.S.F.	$50.21	$3,514.70
017413200050	A		Contingencies, for estimate at preliminary working drawings stage (Design Development)	1.00	Project	$5.02	$351.40
017413200050	A		Contingencies, at conceptual design stage	1.00	Project	$10.04	$702.80
017413200050	A		Contingencies, at conceptual design stage	1.00	Project	$10.04	$702.80
017413200055	U		Progress Cleanup	70.00	day	$0.00	$300,000.00
017413200100			Cleaning Up, cleanup of floor area, final by GC at end of job	70.00	M.S.F.	$104.24	$7,296.80
017413200100	A		Contingencies, for estimate at preliminary working drawings stage (Design Development)	1.00	Project	$10.42	$729.40
017413200100	A		Contingencies, at conceptual design stage	1.00	Project	$20.85	$1,459.50
017413200100	A		Contingencies, at conceptual design stage	1.00	Project	$20.85	$1,459.50
Division 01 Subtotal							**$1,403,773.11**

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SANTA ROSA JUNIOR COLLEGE STUDENT CENTER

CRITICAL INDUSTRY ISSUES

18TH ANNUAL PACE ROUNDTABLE SUMMARY OF EVENTS

WELCOME ADDRESS AND BANQUET

The banquet, held at the Penn Stater, was a time for the students to get a chance to talk to industry workers on a more casual basis than normal. The evening started with a cocktail hour during which I was able to talk casually with a few members from the Barton Malow Company. During dinner conversation was kept very casual and had very little to do with construction. The evening ended with Dr. Riley and Dr. Anumba thanking everyone for coming and also giving a heads up on what the general schedule was for the following day of events.

INDUSTRY PANEL: STATE OF CONSTRUCTION

Day two of the PACE Roundtable started out by having a panel of members in the industry share their observations about the impact of the downturn of the construction industry due to the failing economy. They then stated the strategies that their individual firms planned on using to move forward.

A reoccurring theme in this opening part of the roundtable was that the market as a whole is not doing well but education and healthcare projects still provide big markets. Some examples of strategies that were mentioned to help in moving forward included incorporating BIM into renovation projects and not just new ones, work on building up smaller markets, going “back to basics” by looking within the company (employee development, internal company re-tooling), and being able to diversify so that any size job is capable of being carried out.

ENERGY AND THE CONSTRUCTION INDUSTRY: DR. DAVID RILEY

This is the breakout session that I decided to attend. The first thing we did upon getting into our room was to arrange ourselves in a circle and then go around the room introducing ourselves and saying why we decided on this session. The industry side of the group was made up of a mixture of people who were very knowledgeable about the topic and also a few who were new to it and were looking to learn. Most of the students were there to search for ideas for their thesis proposals.

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The first half of the session was spent listing key construction issues in today's society pertaining to energy design and construction. Some of the topics listed as issues included increased energy costs, deregulation, alternative forms of energy, stimulus package, incentives, life cycle costs, green washing, LEED performance, and the integration of building systems.

After a short break the second half of the breakout session began. This was the most interesting part to me. The second half of the session was spent analyzing the issues listed in the first half and searching for answers. The information that stood out most to me was that which was said about alternative forms of energy and new materials. The information that I was able to gather will ultimately help me to develop my thesis proposal. Some of the ideas that were thrown out in the group included…

1. Integrating PV systems with schools not only as an alternative source of energy, but also as an educational tool for students.
2. Switching out fluorescent light bulbs with LED lights where possible to lessen the HVAC loads.
3. Incorporating a geothermal system.
4. Using solar thermal technology, which is widely used in California (where the Santa Rosa Junior College is located), for solar cooling throughout the building. Southland Industries has had a lot of success with this already (solar chillers).

These are only a few of the ideas that were talked about in our session. Many other great ideas were mentioned but these are ones that I am the most interested in researching more for my thesis project.

BUSINESS AND NETWORKING: DR. JOHN MESSNER

I was not able to attend the business and networking session but through a review at the end of the breakout sessions I was able to hear briefly about some of the main topics of conversation.

1. Shifts in delivery methods from negotiated to hard bids.
2. Joint ventures take risk away from the owner and allow expansion to new markets, new geographic regions, etc.
3. Chase clients and not projects. By chasing individual clients and developing relationships you increase the chance of getting repeat business.
4. Identify trends so that you are able to stay ahead of the market rather than play catch up.
5. Get everyone involved from the start by incorporating integrated project delivery.

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BIM EXECUTIVE PLANNING: CRAIG DUBLER

Like the business and marketing session I was not able to attend the BIM breakout session either. A review was done briefly for this session as well and I was able to get an idea of what some of the main topics discussed were. Because of the short time of the review, the information I was able to gather was minimal. Topics discussed included…

1. BIM implementation
2. Benefits from working as a team
3. Value of BIM vs. Delivery method
4. Owners role in BIM
5. Ways to filter use of BIM down through sub contractors

STUDENT PANEL: COMMUNICATION PATTERNS OF THE "NOW" GENERATION

After the short review of the breakout sessions a panel of students was brought to the front of the room to talk about methods of communication and social networking used by the younger generation. The panel started conversation by individually stating their view of the "now" communication and how it is used in everyday life for them. Next the panel was opened up for questions from the rest of the room. Some of the topics that were discussed involved the use of informal email vs. phone calls, use of social networking sites such as facebook and twitter, and text messaging on the job site. Although everyone has their own idea of how communication should be perfected at a professional level a few ideas seemed to be agreed upon by the majority of those in attendance. One of the ideas that was stated was to find a way to identify the "norms" and make them known to everyone in the company. This would let employees know when an email, text message, or phone call would be sufficient for whatever purpose on a job. Another idea for a way to tackle the communication issue is to find out what form of communication works best for an individual and stick to that.

GROUP DISCUSSION: CONTINUOUS PERSONAL GROWTH

The last topic of discussion for the day was that of continuous personal growth. As the snow outside began to accumulate this session was cut short. Because of this only a few methods and personal opinions of training for personal growth were discussed.

1. Webinars: are very convenient but 2-way conversation opporunity is lost

2. 5 day intensive training
3. Professional organizational development (ASHRAE for example)
4. Try to keep the time per day to only a few hours at a time otherwise interest is lost.
5. Start with face to face meetings and then move on to webinar later

KEY CONTACTS

Throughout the Roundtable discussion I met multiple useful contacts. Jeremy Silbert of Hensel Phelps is very knowledgeable about a new type of insulation called aero-gel. He has been involved with the incorporation of this new form of insulation into the Pentagon. Should I have any questions about the performance or cost of the insulation Jeremy will be able to help me. Another important contact that I may be able to use is Dr. David Riley of Penn State University. Dr. Riley is very knowledgeable about the emerging solar thermal technology and could answer valuable questions that I will have in the upcoming months pertaining to this since I plan on incorporating this technology into the SRJC. Other than these two I also met valuable contacts from Barton Malow who may be able to help to answer a variety of other questions that I may have throughout the continued development of my thesis project.