# TECH REPORT 1
# SANTA ROSA JUNIOR COLLEGE STUDENT CENTER

**Construction Project Managament**

**Dan Vallimont**

**2009 SENIOR THESIS**

# TECH REPORT 1
## SANTA ROSA JUNIOR COLLEGE STUDENT CENTER

# EXECUTIVE SUMMARY

On December 12, 2007 construction began on the 66,646 SF Santa Rosa Junior College Student Center (Bertolini Student Center). Because the old student center had become old and outdated, the SRJC decided that it wanted to demolish the old student center and construct the new, roughly $50,000,000 center in the same place. The new center would include offices, classrooms, meeting rooms, and a cafeteria. The final completion date of the center is set for November 24, 2009 after suffering a delay of 72 days since the beginning of construction in 2007. The brand new student center should be ready to accommodate students and faculty starting in the spring of 2010 school year.

The foundation of the building will rest on spread footings that support structural steel members that make up the structure of the student center. Major excavation will not be needed since the footings are shallow on the site. Traditional methods will be used to place the concrete footings and once they concrete is placed it will be machine vibrated. The walls of the building are made mostly of brick veneer and precast concrete accent bands that are all anchored to metal studs from behind. The mechanical system that serves the building is a geothermal system. Each room is supplied with its own geothermal heat pump. A 376 SF mechanical room is located on the first floor and an emergency recovery unit is located on the second floor. Power is distributed through the student center at 480/277V and is further stepped down to 208/120V using 6 local transformers. The building is backed up by a 125kW emergency backup generator.

The site of the student center is complicated by the constant student traffic and close proximity of other college buildings. The primary construction entrance for the site is located on Burbank Circle which is on the southeast side of the site. The secondary entrance is located on the north side of the site right off of Elliot Avenue. Multiple staging areas are set up around the site to make it easy to access materials from any location on site.

The Santa Rosa Junior College Student Center is being delivered as a lump sum bid project where the architect and CM contract directly with the owner and the architect subcontracts the rest of the design team. The job of the CM is to oversee the prime contractors and design team but he does not have a contractual agreement with anyone accept the owner.

# TECH REPORT 1

## SANTA ROSA JUNIOR COLLEGE STUDENT CENTER

# TABLE OF CONTENTS

# TECH REPORT 1
## SANTA ROSA JUNIOR COLLEGE STUDENT CENTER

# PROJECT SCHEDULE SUMMARY

**Key Elements of the Construction Sequence:**

**Foundation Sequence:**

Foundation work for the student center is broken into three different sections, east, center, and west. The work begins on the east side of the building and moves across the building, finishing with the western foundation. Work begins by excavating for the footings and grade beams. After excavation embeds for MEP are placed, rebar and anchor bolts are placed, and isolated footings are inspected. Next the concrete for is placed for the eastern third of the foundation. The next step is to let the concrete cure and simultaneously begin placing CMU walls. Once this is done rough in electric work is done underground. Next MEP under the slab is done followed by prepping for SOG placement. Mechanical and plumbing rough in is taken care of next. Foundation work on the east side of the building is complete after MEP in slab is placed along with rebar, an inspection is carried out, and the SOG is finally placed. The same pattern of work is followed on the center and west part of the student center.

**Structural Sequence:**

Structural work on the building begins immediately after foundation work is completed. Staging areas in multiple locations around the site make the steel easily accessible. The structural steel erection process starts out by setting the columns up first. After the columns are all set in the east section, the horizontal beams begin to be placed. Plumbing and welding take place after the steel has been put into place. Next the staircases are erected followed by the setting of metal decking on the second and third floor. Any remaining metal is placed at this point. Rebar and MEP work is done on the metal decking and the concrete slab is poured to finish out the procedure. This work is done in order, starting with the second floor decking done first followed by the third floor decking and slab.

**Finishing Sequence:**

Like the foundation and structural work the finishing is done in three different sections, east center and west. Finishing begins with drywall being placed on the first floor followed by taping and texturing. Paint and wall covering, ceiling grid work, and placing ceramic tile in the bathrooms follows. After this is done, stainless steel rails and miscellaneous architectural steel is placed. HVAC work is done in the ceiling grid next followed by light installment in the grid. HVAC and electrical is then trimmed and finished. Ceramic and quarry tile work on the rest of

# TECH REPORT 1
## SANTA ROSA JUNIOR COLLEGE STUDENT CENTER

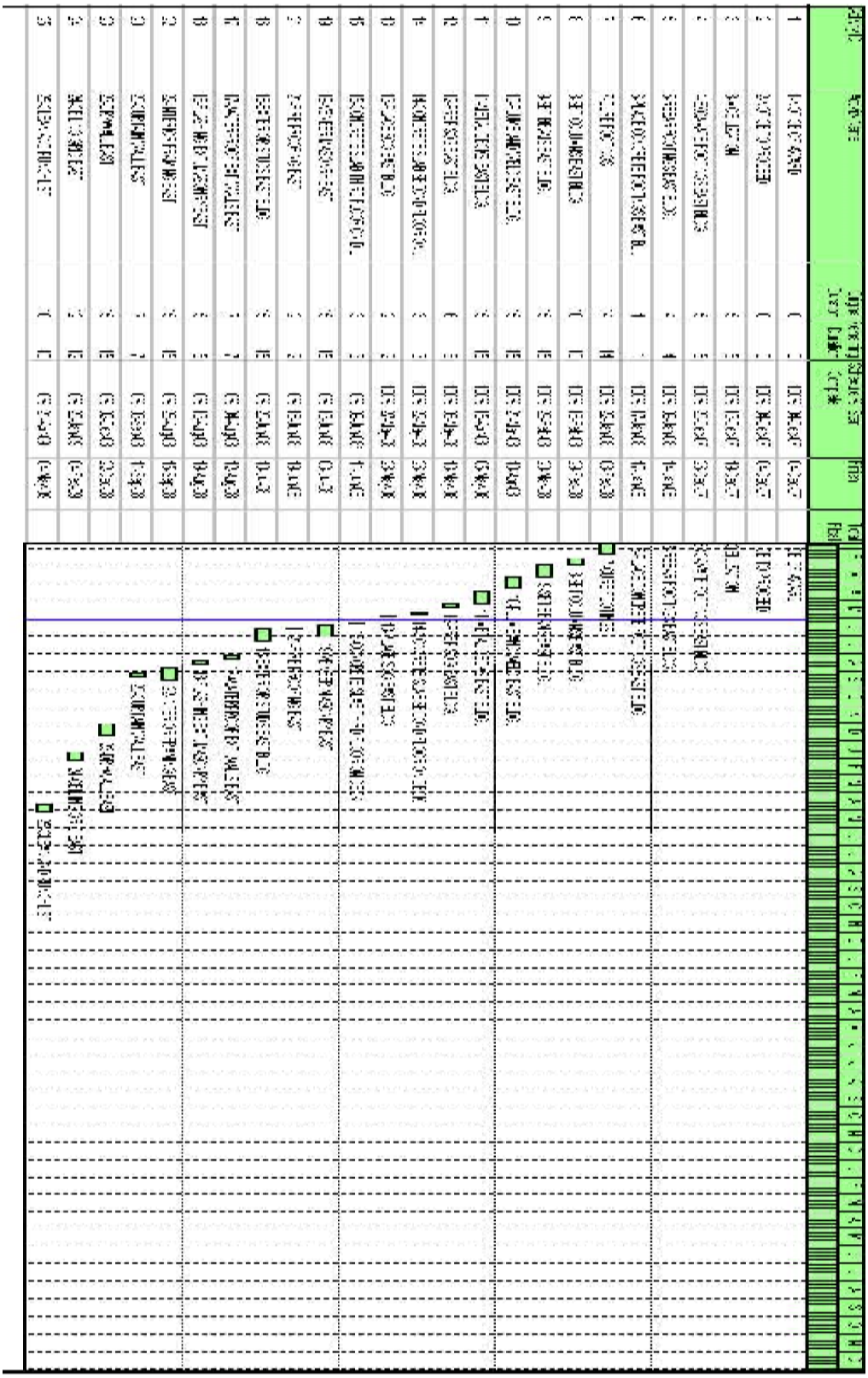
the first floor is done next followed by the installation of acoustical tile where needed. Next up is window treatment followed by millwork, plumbing trim, and toilet partitions set up in the bathrooms. Interior glass and glazing, millwork, and casework are done next. Tackable walls and boards, lockers, carpet placement, interior door and sign placement, and finally cleaning and punchlist finishes everything up. This process is repeated on the second and third floors before moving on to the center section and then finally the west side of the building.



Top: placement of steel beams
Bottom: First floor room during finishing process
Right: Rebar being placed for foundation pour

# TECH REPORT 1

## SANTA ROSA JUNIOR COLLEGE STUDENT CENTER



# TECH REPORT 1

## SANTA ROSA JUNIOR COLLEGE STUDENT CENTER

# BUILDING SYSTEMS SUMMARY

| YES/NO | SCOPE OF WORK (IF YES, ADDRESS) |
|---|---|
| YES | **Demolition Requirements**<br>Demolition of the pre-existing structure was done under a separate bid. Demolition was considered phase one of the project while phase two encompasses construction. |
| YES | **Structural Steel Frame**<br>The structural system used for the Santa Rosa Junior College Student Center is structural steel. The floor system that is utilized is a 3 ¼" lightweight concrete on 3" 18 gauge composite decking. The final floor thickness is 6 ¼". The typical reinforcement for the decking is #3 rebar at 18" on center. The roof system is made up of 1 ½", 16 gauge decking on steel beams. Flexible flashing underneath concrete tile covers the steel decking on the roof. Typical exterior columns used are W12x50 and W12x40 members. Typical interior columns used throughout the project are W12x58, W12x53, and W12x40. The braced frame on the Student Center is supported mainly by diagonal W10x68 beams connected to structural beams and columns by gusset plates ranging from 1" to 1 ¼" in size. |
| YES | **Cast in Place Concrete**<br>As far as cast in place concrete utilized on the Student Center project, the foundation, slab on grade, and concrete fill on metal decking comprise the majority of it. The slab on grade is 5" thick with a vapor barrier, 4" rock course, and 6" of select fill below. Reinforcing for the SOG is comprised of #4 rebar at 12" on center at mid-depth along with staggered 30" lap bars. The 18 gauge 3"decking on the second and third floors uses 3 ¼" concrete with #3 rebar at 18" on center. Shear studs are used to tie the concrete into the metal decking and structural steel. Concrete footings range in size from 3x3 to 10.5x10.5 and are located at depths ranging from 1.5 to 2.5 feet below grade comprising the foundation of the center. |
| YES | **Precast Concrete**<br>The precast concrete used on the project is architectural in function and creates an elegant and institutional look to the façade of the building. The precast concrete is light in color and complements the red brick on the façade nicely. The concrete is located all around the building at window heads and sills, and also several accent bands that wrap the building. The concrete along with the brick masonry on the façade of the building are tied into the structure through a connection to metal stud framing. |
| YES | **Mechanical System**<br>The mechanical system for the Student Center is a geothermal heat pump loop with 8" geothermal vault mains (860GMP @ peak load), 5 geothermal circuit |

| | |
|---|---|
| | loops, and 150 geothermal bore loops making up the system. The geothermal system was installed according to IGSHPA and ASHRAE standards and recommendations. Coordination with the landscape architect and civil drawings is used for irrigation and utilities (existing and new). Extra care is also taken when selecting bore drilling locations as to preserve existing trees on campus. The main mechanical room is 376 SF and is located on the first floor of the center. Each room is served by its own geothermal water source heat pump which range in air flow values from 180 to 2260 CFM. Cooling capacities of these heat pumps also have a wide range of 3.5 to 61.5 MBH.<br><br>A 15,000 pound energy recovery unit is located on the second floor of the building. The unit, which sits atop a 6" concrete pad, has a designed 26,000 CFM supply plan along with a 24,500 CFM exhaust fan. The recovery unit runs at 3 phase power and 460 volts.<br><br>Two special fans are required in the kitchen/servery areas as exhaust hoods. The units are a combination of fans and grease filtration, which meet exhaust requirements for the kitchen and servery areas of the building on the first floor. Two other fans are used in the kitchen area to provide makeup air. Fans are also located in restrooms, janitor spaces, and the AV room.<br><br>Fire Alarm System:<br>The fire alarm system is an addressable, non-coded, manual initiating system with supplemental detectors for door holders, fire/smoke dampers, and HVAC shut-down. The devices consist of addressable initiating devices and non-addressable notification appliances. The stand-alone system is supervised by a California state approved supervision station. The next nearest building is over 25 feet away and therefore the center is allowed to have a stand-alone system according to code. |
| YES | **Electrical System**<br>The Santa Rosa Junior College Student Center gets its power from the 12 kV campus main power service. The power is stepped down from 12kV to 480/277V (power at which the main switchboard runs at) before being stepped down further to 208/120V to be distributed throughout the building by 6 local transformers. The power is further distributed throughout the center by 24 panel boards. The main switchboard is located in the main electrical room on the northeast side of the buildings first floor. Smaller electrical rooms are located on the second and third floors. Along with the electrical rooms, there are also telecommunication rooms on each floor of the building.<br><br>A 125kW emergency backup generator is located directly outside of the building |

| | |
|---|---|
| | in the service yard (northeast part of site). The generator is diesel powered with NEMA 3R base day tank and NEMA 3R sound attenuated housing mounted on a 6" high, 55x123 inch concrete pad. The 12kV transformer, a fire pump with integral automatic transfer switch, booster pump and cooling tower with control panel are also located in the service yard.<br><br>The 63 types of lighting used in the building run at 277V. Dimmable lighting is a available in the leadership center and also in multiple meeting rooms. Rooms with dimmable fluorescent lights must have a LUTRON, HI-LUME or ECO HI-10 dimming ballast rated at 277V. Interior lighting systems on each floor have separate automatic shut-off controls. Rooms larger than 100SF and greater than .8 watts per SF of lighting are controlled with bi-level switching for uniform light reduction. |
| YES | **Masonry**<br>The masonry walls in the Student Center on non-load bearing. The façade of the buildings is comprised mainly of anchored brick veneer that is reddish in color. The bricks are installed over gypsum sheathing and cold-formed metal stud framing, or over CMU or cast in place concrete. Construction conforms to the Masonry Institute of America (MIA) standards. Horizontal reinforcement is provided at 16" on center. In the first joint below top of walls joint reinforcement is continuous. Anchors or ties are located every 16 inches on center horizontally and every 12 inches on center vertically. Self sealing membrane is installed under each anchor, accept ones at concrete level. Along with the elegant image that the brick veneer façade creates, there is also a fair amount of brick pavers used around the building serving as walkways. |
| YES | **Curtain Wall**<br>The curtain wall system used on this project is most evident at the main entrance where a giant glass entrance way welcomes students and faculty into the Student Center. The three story framed glazing is held in place horizontally by W24 beams and vertically by HSS 10x3x3/8. Other than at the main entrance there is no other significant use of a curtain wall system on this project. |
| NO | **Support of Excavation**<br>Excavation below grade on this project is held to a minimum. The footings on the project are located only a few feet below grade and therefore support for the needed footing excavation is not needed. If need be, step backs could be used for foundation construction instead of an actual support system. |

# TECH REPORT 1
## SANTA ROSA JUNIOR COLLEGE STUDENT CENTER

# PROJECT COST EVALUATION

**Actual Building Construction Cost (CC):**

- $30,000,000 Bid Building Cost
- Roughly $450/SF ($30,000,000/66,646 sq ft)

**Total Project Cost:**

- $50,000,000 Bid Project Cost (total building cost)
- Roughly $750/SF ($50,000,000/66,646 sq ft)

| Building Systems Costs: Cost and Cost/SF | | |
|---|---|---|
| **BUILDING SYSTEMS** | **COST** | **COST/SF** |
| Concrete | $2,000,000 | $30.01 |
| Masonry | $5,500,000 | $82.53 |
| Structural | $3,500,000 | $52.52 |
| HVAC | $8,000,000 | $120.04 |
| Electrical/Data | $12,000,000 | $180.06 |
| Flooring Finishes | $1,000,000 | $15.00 |
| General Conditions | $1,000,000 | $15.00 |

# TECH REPORT 1

## SANTA ROSA JUNIOR COLLEGE STUDENT CENTER

# RS MEANS ESTIMATE

CostWorks® RSMeans

**Square Foot Cost Estimate Report**

Back Print Export

Estimate Name: **Santa Rosa Junior College Student Center**
Santa Rosa Junior College
400 Burbank Circle, Santa Rosa, California, 95401

**Building Type:** **College, Student Union with Brick Face with Concrete Block Back-up / Steel Frame**

| | |
|---|---|
| Location: | **SANTA ROSA, CA** |
| Stories: | **4** |
| Story Height (L.F.): | **15.00** |
| Floor Area (S.F.): | **66646** |
| Labor Type: | **Union** |
| Basement Included: | **No** |
| Data Release: | **Year 2009** |
| Cost Per Square Foot: | **$192.52** |
| Building Cost: | **$12,831,000** |

Costs are derived from a building model with basic components. Scope differences and market conditions can cause costs to vary significantly. **Parameters are not within the ranges recommended by RSMeans.**

| | | | % of Total | Cost Per S.F. | Cost |
|---|---|---|---|---|---|
| **A** | **Substructure** | | **3.4%** | **$5.60** | **$373,000** |
| **A1010** | **Standard Foundations** | | | **$2.61** | **$174,000** |
| | Strip footing, concrete, reinforced, load 5.1 KLF, soil bearing capacity 3 KSF, 12" deep x 24" wide | | | | |
| | Spread footings, 3000 PSI concrete, load 300K, soil bearing capacity 6 KSF, 7' - 6" square x 25" deep | | | | |
| | Spread footings, 3000 PSI concrete, load 400K, soil bearing capacity 6 KSF, 8' - 6" square x 27" deep | | | | |
| **A1030** | **Slab on Grade** | | | **$1.41** | **$94,000** |

# TECH REPORT 1

## SANTA ROSA JUNIOR COLLEGE STUDENT CENTER

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|---|---|---|---|
| | Slab on grade, 4" thick, non industrial, reinforced | | |
| **A2010** | **Basement Excavation** | **$0.05** | **$3,500** |
| | Excavate and fill, 30,000 SF, 4' deep, sand, gravel, or common earth, on site storage | | |
| **A2020** | **Basement Walls** | **$1.52** | **$101,500** |
| | Foundation wall, CIP, 4' wall height, direct chute, .148 CY/LF, 7.2 PLF, 12" thick | | |
| **B Shell** | **47.9%** | **$79.07** | **$5,269,500** |
| **B1010** | **Floor Construction** | **$30.16** | **$2,010,000** |
| | Steel column, W12, 400 KIPS, 10' unsupported height, 79 PLF | | |
| | Floor, composite concrete slab on fireproofed W beam, 5.5" slab, 25'x25' bay, 24.5" total depth, 125 PSF superimposed load, 200 PSF total | | |
| **B1020** | **Roof Construction** | **$6.36** | **$424,000** |
| | Floor, composite slab on steel beam, 25'x25' bay, 4.5"slab, 20.5" total depth, 40 PSF superimposed load, 99 PSF total load | | |
| **B2010** | **Exterior Walls** | **$28.69** | **$1,912,000** |
| | Brick wall, composite double wythe, standard face/CMU back-up, 8" thick, perlite core fill | | |
| **B2020** | **Exterior Windows** | **$11.44** | **$762,500** |
| | Aluminum flush tube frame, for 1/4"glass,1-3/4"x4", 5'x6' opening, no intermediate horizontals | | |
| | Glazing panel, plate glass, 1/4" thick, clear | | |
| **B2030** | **Exterior Doors** | **$0.47** | **$31,000** |
| | Door, aluminum & glass, without transom, bronze finish, hardware, 3'-0" x 7'-0" opening | | |
| **B3010** | **Roof Coverings** | **$1.93** | **$128,500** |
| | Roofing, asphalt flood coat, gravel, base sheet, 3 plies 15# asphalt felt, mopped | | |
| | Insulation, rigid, roof deck, composite with 2" EPS, 1" perlite | | |
| | Roof edges, aluminum, duranodic, .050" thick, 6" face | | |
| | Flashing, aluminum, no backing sides, .019" | | |
| | Gravel stop, aluminum, extruded, 4", mill finish, .050" thick | | |
| **B3020** | **Roof Openings** | **$0.02** | **$1,500** |
| | Skylight, plastic domes, insulated curbs, 30 SF to 65 SF, single glazing | | |
| **C Interiors** | **19.3%** | **$31.79** | **$2,118,500** |
| **C1010** | **Partitions** | **$5.24** | **$349,000** |
| | Metal partition, 5/8"fire rated gypsum board face, 1/4" sound deadening gypsum board, 2-1/2" @ 24", same opposite face, no insulation | | |
| **C1020** | **Interior Doors** | **$7.01** | **$467,500** |
| | Door, single leaf, kd steel frame, hollow metal, commercial quality, flush, 3'-0" x 7'-0" x 1-3/8" | | |
| **C2010** | **Stair Construction** | **$1.53** | **$102,000** |
| | Stairs, CIP concrete, w/landing, 20 risers, with nosing | | |
| **C3010** | **Wall Finishes** | **$5.82** | **$388,000** |
| | 2 coats paint on masonry with block filler | | |
| | Painting, interior on plaster and drywall, walls & ceilings, roller work, primer & 2 coats | | |
| | Vinyl wall covering, fabric back, medium weight | | |
| **C3020** | **Floor Finishes** | **$7.17** | **$478,000** |
| | Carpet, tufted, nylon, roll goods, 12' wide, 36 oz | | |
| | Carpet, padding, add to above, maximum | | |
| | Vinyl, composition tile, maximum | | |
| **C3030** | **Ceiling Finishes** | **$5.01** | **$334,000** |
| | Acoustic ceilings, 3/4" fiberglass board, 24" x 48" tile, tee grid, suspended support | | |

# TECH REPORT 1

## SANTA ROSA JUNIOR COLLEGE STUDENT CENTER

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| **D Services** | | **29.5%** | **$48.62** | **$3,240,500** |
| **D1010** | **Elevators and Lifts** | | **$6.77** | **$451,500** |
| | 3 - Hydraulic, passenger elevator, 3500 lb, 2 floors, 100 FPM | | | |
| | Hydraulic passenger elevator, 2500 lb., 2 floor, 125 FPM | | | |
| **D2010** | **Plumbing Fixtures** | | **$2.12** | **$141,000** |
| | Water closet, vitreous china, tank type, 2 piece close coupled | | | |
| | Urinal, vitreous china, wall hung | | | |
| | Lavatory w/trim, vanity top, PE on CI, 19" x 16" oval | | | |
| | Kitchen sink w/trim, countertop, stainless steel, 19" x 18" single bowl | | | |
| | Service sink w/trim, PE on CI, corner floor, 28" x 28", w/rim guard | | | |
| | Shower, stall, baked enamel, molded stone receptor, 32" square | | | |
| | Water cooler, electric, floor mounted, dual height, 14.3 GPH | | | |
| **D2020** | **Domestic Water Distribution** | | **$0.26** | **$17,500** |
| | Gas fired water heater, commercial, 100< F rise, 200 MBH input, 192 GPH | | | |
| **D2040** | **Rain Water Drainage** | | **$0.12** | **$8,000** |
| | Roof drain, CI, soil,single hub, 5" diam, 10' high | | | |
| | Roof drain, CI, soil,single hub, 5" diam, for each additional foot add | | | |
| **D3050** | **Terminal & Package Units** | | **$21.09** | **$1,405,500** |
| | Rooftop, multizone, air conditioner, schools and colleges, 25,000 SF, 95.83 ton | | | |
| **D4010** | **Sprinklers** | | **$3.02** | **$201,500** |
| | Wet pipe sprinkler systems, steel, light hazard, 1 floor, 10,000 SF | | | |
| | Wet pipe sprinkler systems, steel, light hazard, each additional floor, 10,000 SF | | | |
| **D5010** | **Electrical Service / Distribution** | | **$0.84** | **$56,000** |
| | Service installation, includes breakers, metering, 20' conduit & wire, 3 phase, 4 wire, 120/208 V, 600 A | | | |
| | Feeder installation 600 V, including RGS conduit and XHHW wire, 600 A | | | |
| | Switchgear installation, incl switchboard, panels & circuit breaker, 600 A | | | |
| **D5020** | **Lighting and Branch Wiring** | | **$11.95** | **$796,500** |
| | Receptacles incl plate, box, conduit, wire, 8 per 1000 SF, .9 W per SF, with transformer | | | |
| | Wall switches, 2.0 per 1000 SF | | | |
| | Miscellaneous power, 1.2 watts | | | |
| | Central air conditioning power, 4 watts | | | |
| | Motor installation, three phase, 460 V, 15 HP motor size | | | |
| | Motor feeder systems, three phase, feed to 200 V 5 HP, 230 V 7.5 HP, 460 V 15 HP, 575 V 20 HP | | | |
| | Fluorescent fixtures recess mounted in ceiling, 3 watt per SF, 60 FC, 15 fixtures @40 watt per 1000 SF | | | |
| **D5030** | **Communications and Security** | | **$2.30** | **$153,500** |
| | Communication and alarm systems, includes outlets, boxes, conduit and wire, sound systems, 12 outlets | | | |
| | Communication and alarm systems, fire detection, non-addressable, 25 detectors, includes outlets, boxes, conduit and wire | | | |
| | Communication and alarm systems, includes outlets, boxes, conduit and wire, master TV antenna systems, 12 outlets | | | |
| | Internet wiring, 8 data/voice outlets per 1000 S.F. | | | |
| **D5090** | **Other Electrical Systems** | | **$0.14** | **$9,500** |
| | Generator sets, w/battery, charger, muffler and transfer switch, gas/gasoline operated, 3 phase, 4 wire, 277/480 V, 11.5 kW | | | |
| **E Equipment & Furnishings** | | **0.0%** | **$0.04** | **$2,500** |

# TECH REPORT 1

## SANTA ROSA JUNIOR COLLEGE STUDENT CENTER

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| E1090 | Other Equipment | | $0.04 | $2,500 |
| | 2 - Locker, bench, pedestals, steel pipe | | | |
| | 2 - Locker, bench, laminated maple, top only | | | |
| | 20 - Lockers, steel, baked enamel, double tier, 60" or 72", minimum | | | |
| F Special Construction | | 0.0 % | $0.00 | $0 |
| G Building Sitework | | 0.0 % | $0.00 | $0 |

| | | | |
|---|---|---|---|
| SubTotal | 100 % | $165.11 | $11,004,000 |
| Contractor Fees (GC,Overhead,Profit) | 10.0 % | $16.51 | $1,100,500 |
| Architectural Fees | 6.0 % | $10.90 | $726,500 |
| User Fees | 0.0 % | $0.00 | $0 |
| Total Building Cost | | $192.52 | $12,831,000 |

**Note: estimate does not match given information but was done to accurate to the best of my knowledge.**

The estimate done with RS Means was very low compared to the actual cost of about $50,000,000. The reason for this is due to the fact that assumptions are automatically made by means and they are not always accurate. In this case, the data and electrical work alone in the student center are roughly $12,000,000 not to mention an expensive mechanical system and many other factors that are not taken into consideration by RS Means.

# TECH REPORT 1

## SANTA ROSA JUNIOR COLLEGE STUDENT CENTER

# D4 COST ESTIMATE

| Code | Division Name | % | Sq. Cost | Projected |
|---|---|---|---|---|
| | | | | |
| 01 | General Requirements | 3.03 | 15.00 | 999,690 |
| | GENERAL CONDITIONS | 3.03 | 15.00 | 999690.00 |
| 03 | Concrete | 6.06 | 30.01 | 2,000,046 |
| | CONCRETE | 6.06 | 30.01 | 2000046.46 |
| 04 | Masonry | 16.67 | 82.53 | 5,500,294 |
| | MASONRY | 16.67 | 82.53 | 5500294.38 |
| 05 | Metals | 10.61 | 52.52 | 3,500,248 |
| | STRUCTURAL | 10.61 | 52.52 | 3500247.92 |
| 09 | Finishes | 3.03 | 15.00 | 999,690 |
| | FLOORING FINISHES | 3.03 | 15.00 | 999690.00 |
| 15 | Mechanical | 24.24 | 120.04 | 8,000,186 |
| | HVAC | 24.24 | 120.04 | 8000185.84 |
| 16 | Electrical | 36.36 | 180.06 | 12,000,279 |
| | ELECTRICAL/DATA | 36.36 | 180.06 | 12000278.76 |
| | | | | |
| | Total Building Costs | 100.00 | 495.16 | 33,000,433 |

Although D4s estimate was much higher and closer to the actual cost than RS Means, it is still very far off. The reason for this is that there is much information lacking about some of the CSI subdivision material costs. The bulk of the work is taken into consideration and makes up $33,000,000 of the total cost. The remaining $17,000,000 is split up over the rest of the CSI divisions and subdivisions. Given more time and information a more accurate estimate could be arrived it with RS Means and D4.

# TECH REPORT 1

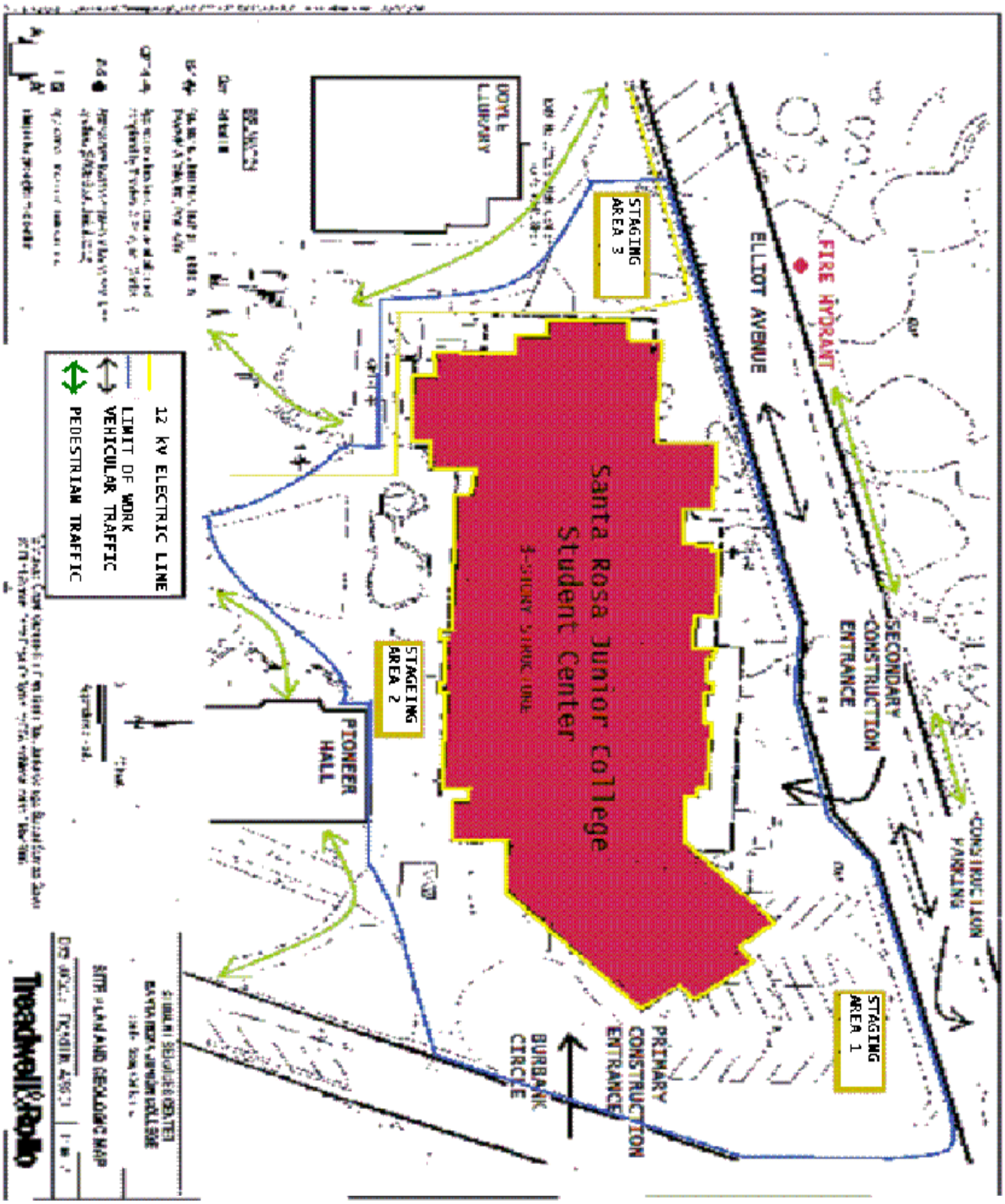
## SANTA ROSA JUNIOR COLLEGE STUDENT CENTER

# SITE PLAN OF EXISTING CONDITIONS


Existing site prior to demolition of old student center (bing.com/maps/)

# TECH REPORT 1

## SANTA ROSA JUNIOR COLLEGE STUDENT CENTER



# TECH REPORT 1
## SANTA ROSA JUNIOR COLLEGE STUDENT CENTER

# LOCAL CONDITIONS

### Preferred Methods of Construction:

The preferred method of construction on the project is that of most of the pre-existing buildings on campus. The structural steel frame with precast concrete and brick veneer and tile roof is common on many buildings throughout the Santa Rosa Junior College campus and also fits the style of many nearby off campus buildings.

### Construction Parking:

Parking for construction workers is located just north of the site. It is directly across Elliot Avenue, which runs directly between the construction site and the lot. The close proximity of the parking lot allows for quick access to the site.

### Recycling and Tipping Fees:

Multiple dumpsters are located on site to encourage recycling on the project. The project target goal for recycling is 75% of materials. To make this goal a reality, materials must be sorted out ahead of time.

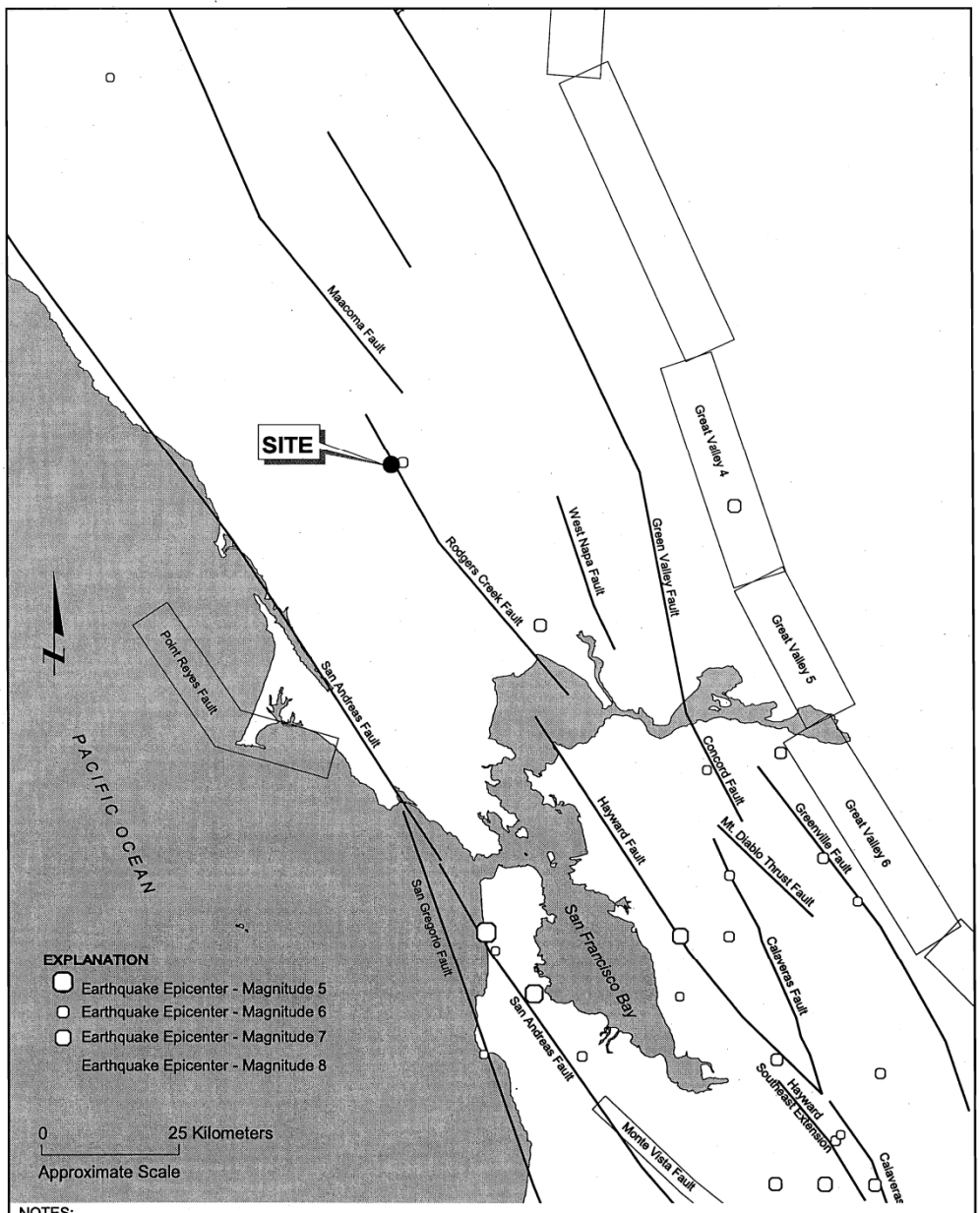
### Soil and Subsurface Water Condition:

The Student Center construction site is underlain by alluvial soils. The top 25 feet of soil on site consists of a mixture of stiff to very stiff clay along with layers of medium dense to dense sand. The upper portion of the clay is moderately compressible and has a low to moderate potential of expansion. The anticipated high groundwater level is roughly 4 feet below the soil surface. The primary geological hazard that could potentially affect construction is strong ground shaking due to earthquakes due to the fact that the site is located in the seismically active San Francisco Bay Region. Major faults in the area include the San Andreas, Hayward, San Gregorio Rodgers Creek, and Calaveras faults (a map of local epicenters can be found below). Primary geotechnical issues include the presence of clay on the surface that is moderately compressible with low to moderate expansion potential as well as shallow groundwater.

Taking into account the soil conditions it has been determined that the student center can be supported on spread footings bearing on at least 3 feet of engineered fill. To reduce the potential of expansion the footings are to be placed at least 24 inches below the adjacent soil subgrade. If construction of footings is done in the wet season, there is a potential for ground water may be encountered during the three feet of excavation required for the engineered fill below footings.

# TECH REPORT 1

## SANTA ROSA JUNIOR COLLEGE STUDENT CENTER



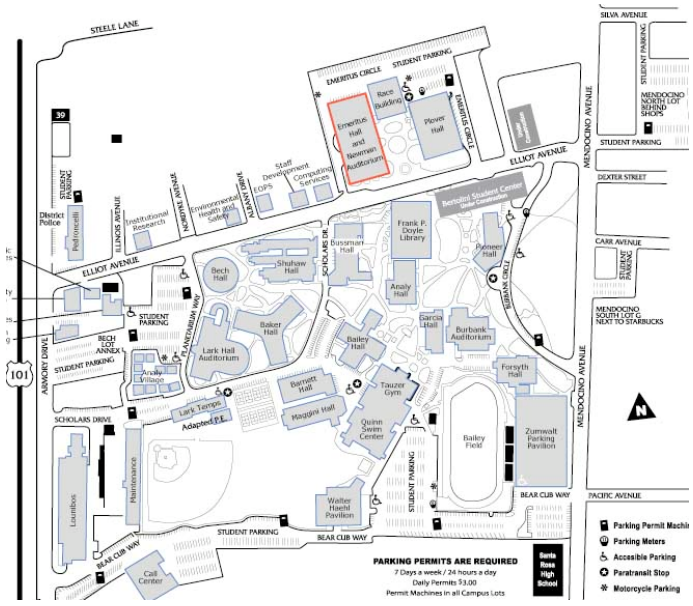
# TECH REPORT 1

## SANTA ROSA JUNIOR COLLEGE STUDENT CENTER

# CLIENT INFORMATION

Santa Rosa Junior College is located in the Sonoma County Junior College district of Sonoma County California which encompasses roughly 1600 square miles and has a population of 464,568 people (2008 estimate, Economic Modeling Specialists Inc.). The school is designed as a public, two year community college. Santa Rosa has two different campus locations in California: the Santa Rosa campus and the Petaluma campus. The Student Center being constructed is located in the Santa Rosa Campus which is located directly off of route 101 in Sonoma County California which is less than an hour north of San Fransisco. As of 2008, the enrollment between the two campuses was 36,460 students.

Santa Rosa's mission statement is as follows: **Sonoma County Junior College District's Mission is to promote student learning throughout our diverse communities by increasing the knowledge, improving the skills, and enhancing the lives of those who participate in our programs and enroll in our courses,** and the addition of the new student center will help the university to fulfill this statement. The original student center, which was demolished prior to construction of the new, Bertolini Student Center, was very outdated and failed to meet the needs of the students and the college's mission. Upon completion, the nearly 70,000 SF center will give students a place to relax and be social, get administrative advice, and also further their education.



# TECH REPORT 1

## SANTA ROSA JUNIOR COLLEGE STUDENT CENTER

As with all projects, the owner wants the lowest cost, highest quality, and no accidents and the Santa Rosa Junior College Student Center is no exception. Midstate Construction and the construction manager on the project monitor the safety, correct deficiencies, and send out notices when appropriate. The only issue of importance to the owner, dealing with sequencing, is getting the project completed as soon as possible, although the most important part to the college is the cafeteria and student dining area. These areas are the most complicated on the project and will be the last things completed. On the student center project there are no joint, dual, or phased occupancy requirements to meet. The owner does have the right, per specifications, to partially occupy the building when areas have been completed. This would make things a bit more difficult for the tracking punchlist work and finishing the rest of the building if the owner would choose to do so. Some keys that would be important to completing the project to the owner's satisfaction would be finishing the center by December of 2009 so that it is ready to be fully utilized in the spring 2010 semester. As for accommodating students and faculty while they are without a student center, faculty has been spread out in temporary space all over campus until they are able to move in to the new center. As for students, they have had to deal without a student center at all and are most likely excited for the opening of the building in the near future.

Aerial view of the Bertolini Student Center after structural steel is completed

# TECH REPORT 1
## SANTA ROSA JUNIOR COLLEGE STUDENT CENTER

# PROJECT DELIVERY SYSTEM

The project is being delivered using a lump sum method with the architect and construction manager contractually bound directly to the owner. Although the project is not entirely a design-build project, several of the items were bid that way. The majority of the design-build items include, precast, curtain wall, elevators, and fire sprinkler system for the student center. The reason that the project was offered as a lump sum bid was due to the fact that it is very difficult to do a public works bid a design-build. Public contracting laws put constraints on it that are difficult to get around, therefore a lump sum method is more suitable. Private owners have more leeway, but design-build always offers a bit of a struggle to control scope vs. price.

The project was bid in 5 different pieces. Sitework landscaping, building construction, mechanical systems, electrical, and geothermal are the 5 different items that were bid on. Each bid was required to be made out on the Bid Proposal Form that was included in the contract documents and must conform and be fully responsive to the plans, specifications, and all other documents included in pertinent contract documents. Also, each bid was required to be accompanied by cash, a cashier's or certified check, or a bidder's bond from an admitted surety insurer. The check or bid bond ensures that the bidder who is awarded the contract will execute the contract documents and provide the required payment, performance bonds, and insurance certificates within 10 days of being notified of being awarded the contract.

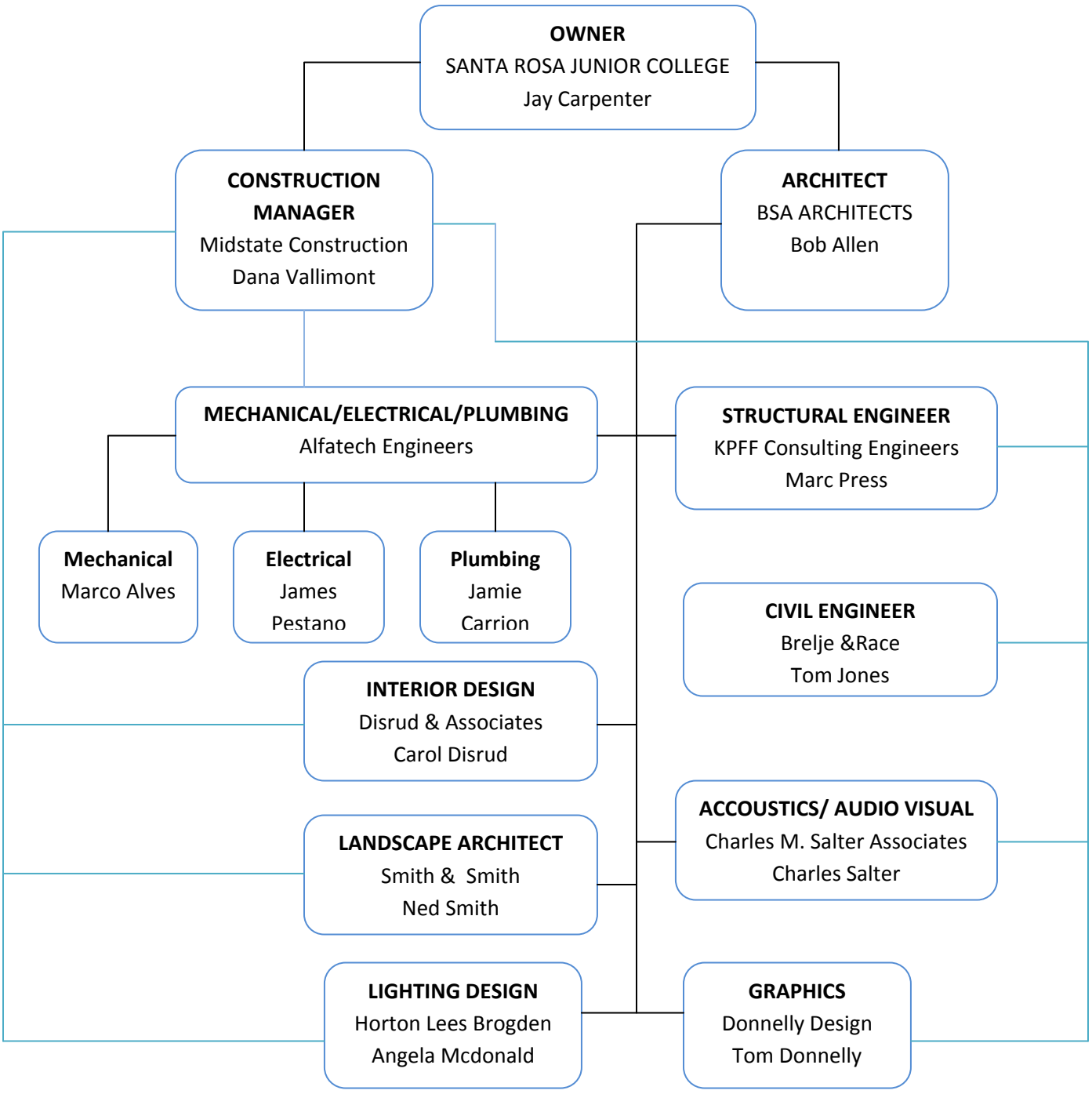
On the Santa Rosa Junior College Student Center, the architect works directly for the SRJC. The other design teams on the project work underneath the architect as subcontractors. These design teams include lighting design, civil engineer, structural engineer, graphics, acoustics/audio video, mechanical/electrical/plumbing, landscape architect, and interior design. Since the student center is such a large project, it makes sense to have the design teams contract with the architect instead of the owner so that the architect can have control over everything and avoid any clashing issues. The construction manager on the project, like the architect, holds a contract with the owner. The construction managers job is to oversee the prime contractors and design team but he does not have a contractual relationship with them.

The organizational hierarchy can be summed up by the chart seen below. The black lines stand for contractual agreements. The CM and the architect are the only people that contract directly with the owner. All other design teams contract directly with the architect and are permitted to subcontract on their own. The blue lines represent the CMs job to oversee design team members. Although he does not have a contractual agreement with them, it is his job to make sure that everything is going ahead smoothly.

# TECH REPORT 1

## SANTA ROSA JUNIOR COLLEGE STUDENT CENTER

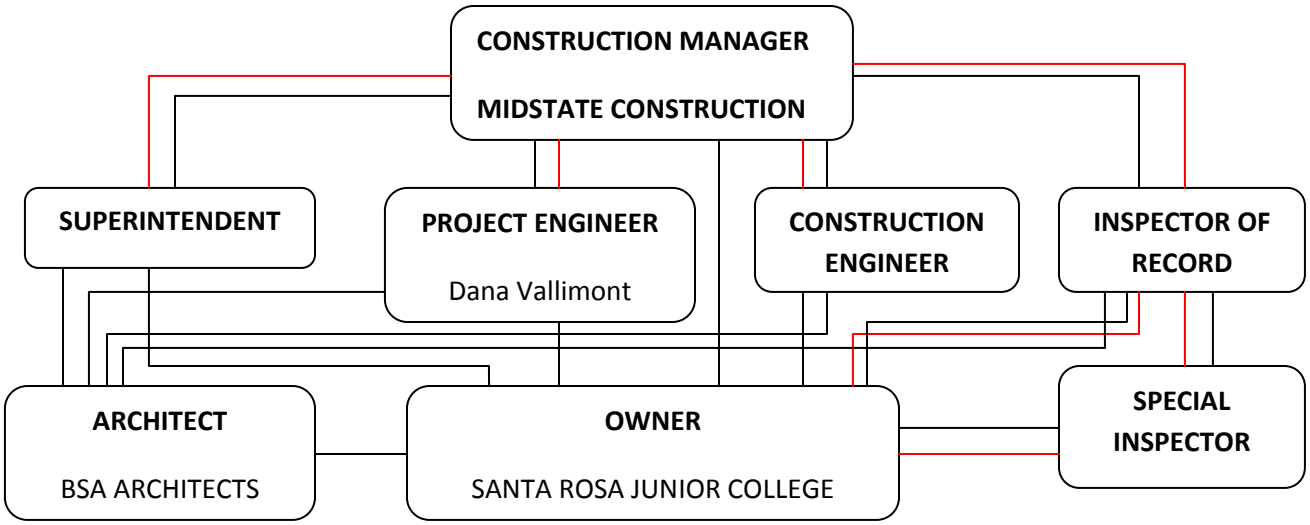
### ORGANIZATIONAL CHART



# TECH REPORT 1
## SANTA ROSA JUNIOR COLLEGE STUDENT CENTER

# STAFFING PLAN

### ORGANIZATIONAL CHART




The construction manager on this project as assigned a project manager, superintendent, and construction engineer to the student center project at SRJC. An assistant superintendent was just recently hired to help with the final push to finish the project as well. The superintendent and construction engineer work on site every day while the project engineer works out of the trailer. The construction manager monitors RFIs and the change order process and helps pass information between contractors and the design team. The CM has a full tie to the superintendent on site as well. The project also has an Inspector of Record (IOR) who works directly for the SRJC and is managed by the CM. He is on site every day and has his own trailer. The IOR does general inspections and monitors the special inspectors (a separate company also contracted directly to the SRJC). Special inspectors do weld inspections and testing, concrete samples and breaks, etc. The IOR is heavily involved with the job and is busy pretty much from day one till the project is complete.

The organizational chart above shows the basic relationships between the staff. The black lines represent lines of communication/passing of information, while the red lines represent a direct tie between the members ( boss).