

design line

The newsletter of Rainforth ■ Grau ■ Architects

The *Real Value* of Commissioning

Design, engineering and installation of building systems are the sum of many individual pieces that inter-relate much like a complex jigsaw puzzle. For building systems to operate successfully, all pieces must fit together precisely.

To ensure success, **a single point of responsibility is critical for the oversight of all pieces from design through operation.** However, this role does not exist in today's traditional model, leaving many opportunities for failures through the process. **The incorporation of Commissioning and use of a Commissioning Agent serve to fill this void.**

Pieces of the puzzle:

Identification of User Requirements

The use of the space, the number of occupants and the equipment housed within the space all affect the function and design of the building systems. If information is not accurate and complete, or the needs are not interpreted correctly, the building systems cannot be properly designed and will not adequately support the use.

Energy Efficiency

Beyond supporting the use of the space, there is also an expectation for the building systems to operate efficiently and cost effectively. Wherein there needs to be flexibility designed into systems for future changes in use, allowing too much flexibility can itself be counterproductive.

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10 years in the making, Vista del Lago High School opens Folsom Cordova Unified School District

In August 2007, the community of Folsom opened the doors to Vista del Lago High School, nearly 10 years after first conceiving the need for a second comprehensive high school.



Photography By Digital Sky Aerial Imaging

From early on, the project was presented with many challenges, the first being acceptance that the City was truly growing enough to require a second high school. When the commitment was finally made in 2000, nearly all the available land was either mapped or developed. This made locating a suitable parcel to house the school, in the appropriate geographic area, a big obstacle. The most viable site came with its' own physical challenges, which included over 100 feet of grade change, limited street frontage and the presence of naturally occurring asbestos (NOA); challenges requiring complex solutions to make the site a functional high school campus.

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Vista del Lago High School will be featured on the C.A.S.H. 29th Annual Conference School Tour on February 27, 2008.

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Vista del Lago High School (From page 1)

The goal of the district Planning Committee was for the High School **to reflect the Vision and Educational Values of the Folsom Cordova Unified School District and the Community it serves.** The 3 primary concepts envisioned for the school were 1) Connectivity of the students and staff; 2) Joint-Use with the community and 3) emphasizing the importance of school. These concepts formed the basis for the planning and design process.



Student Union-Connecting Staff and Students

As a key component of the plan, **a centralized Student Union was created to foster connectivity and increase communication between staff and students.** This dedicated space brings together various student services including student accounts, attendance, a student store, student activities and a snack bar, in a single location to create a support center and a social gathering area. Administration, Counseling and Career Center are also grouped here, creating opportunities for formal and casual interaction between staff and students. **The Student Union has become the nucleus of student activities and the center of campus life.**



Joint-Use

The School District / City of Folsom Joint-Use library is a unique facility which demonstrates the benefits of partnering. This multi-use facility, jointly funded and operated by two different entities, allows for a larger library, with resources not found in a typical high school facility. The ability to provide **extended hours and share staff and expenses,** results in an enhanced resource for the school and the community.



Energy Efficiency

The inclusion of energy efficient design concepts helps to demonstrate the communities' commitment to energy efficiency and sustainability while saving operational costs and creating a more healthy and inspiring environment. Careful use of materials, lighting systems, natural light and HVAC design creates teaching spaces which support the educational process and deliver exceptional environments.

With Phase 2 of construction nearing completion, the district will occupy the Library, Career Technology/Performing Arts Center and Pool in March of 2008. After seven years of planning and over two years of construction, the school is a tribute to the efforts of all involved in making it a reality. **The project embraces the District's concepts and integrates them into the physical constraints of the site to realize a school that not only works, but also captures and reinforces the importance of education within the local community.**



Science Classroom

School Facts:

Estimate:	\$91,300,838
Accepted Bid:	\$99,364,514
Difference:	8.8% over budget
Building Area:	168,287 SF
Cost per SF:	\$590/SF
Bid Date:	Bid in 3 phases, August 2005, September 2005 and August 2006

"The design of the facility does a wonderful job of integrating the vision of the Educational Specifications Committee to foster communication and collaboration between students and staff"

Matt Washburn, Director, Facilities & Planning



Student Union

"The student union is widely used by students. It provides them a place on campus to call their own."

John Dixon, Principal



Multi-Purpose Room



Gymnasium



Photographs © George Wedding/Geopix

Bid Report

Podesta Ranch Elementary School Lodi Unified School District



The Podesta Ranch Elementary School is the district's third re-use of the 2-story proto-type school. The basic school, including administration, multi-purpose, kitchen, library and support facilities, is fully housed in a single permanent building. With the exception of 7 relocatable classrooms, all teaching stations are housed in the main building.



Contracted under a Lease/Lease-Back methodology, the project was delivered 13% under estimate, an indicator that the bid market has significantly altered. Subcontractor interest was particularly strong and competitive, delivering exceptional pricing and value.

Project Statistics:	
Estimate:	\$15,000,000
Accepted bid:	\$13,993,255
Difference:	13.3% below estimate
Cost per SF:	\$238.46/sf
Bid date:	May 2007
Contractor:	C.T. Brayton, Escalon
Capacity:	804 (including 175 in portables)
Building area:	58,683 sf (including portables)
Site area:	10.9 acres

Tracy High School – New West Building Tracy Unified School District



This new classroom building was designed to replicate the traditional mission architecture of the original building which was structurally outdated and demolished to make way for the new structure. With 40 teaching stations, the building also replaces many of the school's older portables and provides new classrooms in a single, compact structure.

At only \$214/sf, this 2-story concrete tilt-up building is surprisingly cost effective while conserving precious site area needed for increased parking demands. The exterior architecture features are steel framed and plastered.

Project Statistics:	
Estimate:	\$20,000,000
Accepted bid:	\$14,350,000
Difference:	28.25% below estimate
Cost per SF:	\$214.18/sf
Bid date:	July 2007
Contractor:	Roebelen Construction Management Services (RCMS), El Dorado Hills
Capacity:	40 teaching stations
Building area:	67,000 sf

Modernization/Addition Unit E – Rio Vista High School River Delta Unified School District

A complex modernization/addition project at Rio Vista High School, this is the first major building work on the campus in realizing the Master Plan vision for the school. While modernizing 12,678 sf of existing space, the Classroom/Music Theater building also adds 2,724 sf of new area to compliment and expand the programs.



Major additions include construction of a steel-framed covered entry and interior lobby for the newly converted theater space and new student toilet rooms. These physical changes, as well as the complete interior remodel of the existing spaces, are the start of an ambitious plan to improve the aging campus and reinvent the image of the high school.

Project Statistics:	
Estimate:	\$4,746,840
Accepted bid:	\$4,267,988
Difference:	10.1% below estimate
Bid date:	June 2007
Contractor:	S.W. Allen Construction, Sacramento
Building area:	15,402 sf

Building Information Modeling – What is BIM and why should I care?

BIM (Building Information Modeling) is the newest technology advancement in the Architectural/Engineering/Construction world and **will dramatically affect how projects are conceived and executed by all involved parties**. The advancement is no less significant, and possibly more significant, than the change from hand drafting to CADD. It is a technology that RGA has embraced and is applying to all new projects within the office.

What is BIM? The term "BIM" is generally used to describe the creation of an electronic 3-dimensional model of a building. This model can then be viewed and presented in many ways, becoming the source of many drawings. The model is accurate, can be easily changed, and allows early viewing of how the building appears in true 3-Dimensions. It is a very new and evolving process; one that will continue to change as the capabilities of technology and our own abilities grow to maximize the effectiveness and abilities of the program.

The National Building Information Model Standard Project Committee defines BIM as:

"...a digital representation of physical and functional characteristics of a facility. A BIM is a shared knowledge resource for information about a facility forming a reliable basis for decisions during its life-cycle; defined as existing from earliest conception to demolition."

A basic premise of BIM is collaboration by different stakeholders at different phases of the life cycle of a facility to insert, extract, update or modify information in the BIM to support and reflect the roles of that stakeholder."

What does that mean at RGA? With 60% of our projects now being created in a BIM environment, we are quickly retiring AutoCAD and are committed to Revit (one of several software solutions designed to meet the growing demand for BIM based projects). Every technical staff member has had formal classroom training in Revit and our CAD manger is dedicated to supporting the full implementation of the software. First used on a pilot project by our firm in 2005, all new work is now initiated and produced in Revit.

Why is BIM Better? Building a 3-D model of the building has many benefits for every party involved in the process; particularly the design team, the owner and the contractor.

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The *Real* Value of Commissioning (From page 1)

Oversized equipment, equipment not running at maximum efficiency, too much lighting, and conditioning space when not occupied, all contribute to inefficiency and increased costs.

System Design

User needs and comfort need to be balanced with the demands for conservation and efficiency when designing integrated building systems that satisfy the requirements in a cost-conscious environment. A successful design is solely dependent on the engineer's ability to 1) assess the criteria; 2) interpret the needs; and 3) design an operating system based on a correct understanding of how the equipment will best perform within the overall system.

Installation

For many public projects, low bid is the basis of award for construction. Low bid does not always equate to the most qualified, skilled installations. With multiple complex systems required to interface, communication between the various trades is imperative for a smooth running system. A successful installation is dependant upon the skills and competence of the contractor's implementation of design intent and coordination of equipment between systems.

Inspection

As part of installation, inspection is necessary. In school construction, inspection services are very specific as required by the Division of the State Architect. The responsibility of the Project Inspector is to ensure compliance with the design documents with particular focus on structural and fire & life safety. **There should be no illusion that building systems are being observed and scrutinized at the level necessary to ensure optimum efficiencies.** The Project Inspector is not contracted for this level of service, nor typically do they have the technical expertise to provide such inspection.

Utilization

Once the spaces are built and occupied, it is common that the users occupying the space are different from the users who provided the design criteria. The introduction of unforeseen equipment, personal preferences, changes in use are all issues that are user induced

which ultimately affect and may alter the operation and effectiveness of the systems.

Maintenance

Maintenance is a critical component of the process in the long-term operation of the system. **If the systems are not maintained and serviced on a regular basis, not even the best designed and properly installed systems are sustainable.**

Solving the problem:

Summary of the Issues

As a project progresses, there has been no single source oversight to monitor the processes and development. It originates with the users, is designed and engineered by the designers, is constructed by the contractors and then turned back to the users to maintain. The successful implementation of each step is critical to the function and performance of the overall system. But **the lack of consistent oversight through the process makes it very difficult to obtain a system which truly works as intended.**

Commissioning Agent Service

Optimal Commissioning Services start early in the planning stages and continue through system initiation and operation, even serving as a resource for maintenance in the future. As the project evolves, the commissioning agent is able to identify issues that need modification or remedy, verify that the design meets user expectation, ensure that the installation is meeting design intent and ultimately confirm that systems are functioning at optimal operation and efficiency for the owner.

Wherein commissioning efforts could be accommodated by an owner's agent, engineer or inspector, the true benefit of a third party commissioning agent is the ability to provide an unbiased checks and balances to the entire process. They are not allied with the design, or the construction, or the use, so they have no vested interest or bias (thus reducing the finger pointing). The **commissioning process ensures that the systems are turned over to the owner in optimum operating condition.**

still be made without starting over. Design changes are quickly made, reconsidered and re-evaluated. This early input is critical in today's fast-paced environment.

As we strive to improve quality and exceed client expectations, we believe **Building Information Modeling will increase collaboration within the design team, as well as with the client and contractor, and result in a significantly better process and project for all.**

Building Information Modeling (From page 5)

From our perspective, creating an accurate model allows for better coordination with consultants and identification of conflicts and problems early in the design. Sharing the model, each discipline must fit within the parameters of the physical design, demanding more accuracy and better understanding of other's work.

Additionally, the design is easier to share with the client in 3-D form, creating better understanding, reaction and input while changes can

Welcome New Staff

Through 2007, we have added a number of new staff members, many who have already been working with our clients and consultants. We are pleased to welcome them to the firm and share with you a little about each of them.



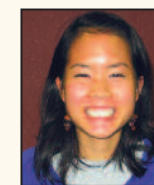
Deborah Stevens was hired in January 2007 as an Architect. At the age of 30, she returned to college and graduated from the San Joaquin Delta College in 1988 with an AA degree in Construction Technology. Since then, Deborah has obtained her license and has been a part of all aspects of the architectural industry. She enjoys reading and designing hook-latch rugs.

Anthony Fejarang-Herrera joined the RGA team as an Architect in May of 2007. A graduate from Southern California Institute of Architecture, he obtained his BA Degree in Architecture in 1991. He has over 14 years experience in commercial architecture and was a licensed partner with his previous firm. Anthony is passionate in all that he does, from saving the environment to the impact of Architecture in our daily lives.



Vipul Safi was hired in May 2007 as an Architect with 7 years prior experience. Vipul did undergraduate work at Academy of Architecture in Bombay, received his Masters in Architecture at the University of Colorado, Denver and obtained a diploma in Interior Design from Bombay India. Prior work experience includes Commercial, Hospitals, Retail, Senior and Multi-family Housing. With a fascination in design, he enjoys creating computerized 3D models and animation.

Nelly Lam graduated from UC Berkeley in the spring of 2007 with a BA in Architecture and a minor in City Planning. She joined RGA as an intern in July 2007. Being Nelly's first job doing Architecture, she is passionate about applying herself to learn all she can. Her hobbies are traveling, photography, and Italian food.



Carrie Tsang was hired in August 2007 after graduating from UC Berkeley with a degree in Architecture. Past work experience includes student assistant for the State of California Department of Conservation and as an intern for Roebbelen Construction. Carrie loves to travel and has studied

architecture in Copenhagen and Denmark, as well as backpacked through parts of Europe and Japan. She also enjoys drawing, painting and reading comic books.



Laura Wang graduated in May 2007 from UC Berkeley with a BA in Architecture and a minor in City Planning before joining RGA as an Intern in August 2007. She interned during her senior year of college for MWH, a design and engineering company that focused on water treatment facilities. Laura enjoys art, painting, and is planning to attend the 2008 Olympics in Beijing, China.

Sonja Cheng was hired as an Intern in August 2007 after graduating from UC Berkeley with a BA in Architecture. She has previous experience interning for ED2 International, San Francisco. Sonja spent 6 weeks backpacking through Europe after graduating and enjoys swimming, tennis, reading and cooking.



Sandy Zanotti joined RGA in August 2007 as a Job Captain. Sandy was a stay at home mom until venturing back to school and gaining a degree in Interior Design from CSU, Sacramento in 2000. While interning for Comstock Johnson Architects, she realized how much she enjoyed Architecture and began taking the licensing exams, working towards her architecture license. Sandy has been married for 22 years and enjoys spending time with her family, traveling, cooking and reading.

Cathy Heylmun was hired in August 2007 as our receptionist. Past work experience has consisted of coordinating travel for companies like Microsoft and HP. She graduated from the International Air Academy in 1985. Cathy enjoys gardening, hiking, camping and the beach. She is starting to jog and intends to take up golf.



Joseph Stoffers came to RGA in August 2007 as an intern, relocating from Bozeman, MT. Joseph graduated from Montana State University with a BA in Environmental Design (December 2003) and a Masters in Architecture (December 2005) with honors. He was president of the MSU Fencing Club and led them to the nationals in 2005. Joseph is studying for the ARE's while continuing his professional development.