MEMORANDUM

FROM: Daniel Kay DK
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CIP: N/A

TO: Mark Watton
General Manager
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Rod Posada
Chief Engineering

Date: January 28, 2011

SUBJ: Construction Management Practices

Charge Time To: **N/A**

INTRODUCTION

The following is a brief explanation of the Otay Water District's (District) practices for Construction Management and Inspection Services (CMIS). This memo describes the District's CMIS methods, history of recent projects, and information on industry standards and practices. The District uses CMIS practices on all CIP projects where some type of construction activity is performed. Every construction project is managed to control time, scope, cost, and quality. In addition, CMIS is used to ensure the contract is completed according to the plans, specifications, District standards, and within budget.

CMIS METHODS

There are two basic components to the CMIS process; Construction Management and Inspection. Typically, the District uses three different methods to assign personnel to these components.

Method 1: This method is used when District Staff has enough in-house resources and expertise to perform the CMIS with District personnel. The construction value for this method is typically less than $2,500,000. Typical projects include but are not limited to reservoirs up to 2 million gallons, interconnections with other water agencies, and small diameter pipeline projects.

Method 2: This method is used when District Inspection Staff has enough resources and expertise to perform the inspection portion of the project, while the District's As-Needed CMIS Consultant provides the construction management. The Consultant is selected using Policy 21 for Selection of Professional Consultants as well as Engineering Guideline G1.17 for Consultant Selection. The Consultant's contract is typically for a not-to-exceed amount of $175,000 and for a period of two fiscal years. The construction value for this method is typically greater than $2,500,000 but less than $5,000,000. Typical projects include but are not limited to pump

stations, reservoirs up to 4 million gallons, reservoir coating projects and large diameter pipeline projects.

Method 3: This method is most commonly used on larger and more complex CIP projects with a construction value greater than $5,000,000. The Consultant is selected using the same process described in Method 2. However, this CMIS Consultant is hired specifically for the project and not on an as-needed basis. The Consultant will typically be selected during the design phase between the 60% and 90% design submittals to become familiar with the project prior to construction award and to provide a constructability review before the design is completed. Some examples of these projects include but are not limited to large diameter pipeline projects, large pump stations, jack and bore operations, tunneling, multiple regulatory agency coordination, and reservoirs greater than 4 million gallons.

TABLE 1

	Construction Manager	Inspection	Construction Budget	No. of Projects	% Method Used	Avg. Const. Value
Method 1	District Staff	District Staff	< $2.5 Million	11	61%	$729,146
Method 2	Consultant	District Staff	< $5.0 Million	3	17%	$1,454,114
Method 3	Consultant	Consultant	> $5.0 Million	4	22%	$14,569,371
Totals				**18**	**100%**	**$80,550,767***

*Total value for all 18 projects NOT the average.

There were a total of eighteen (18) construction projects since the beginning of Fiscal Year 2007. Table 1 indicates that Method 1 was used 61% of the time (or 11 out of 18 projects) while Methods 2 & 3 were used 39% of the time (or 7 out of 18 projects). The table also indicates that when the District uses Method 1, the contract values are relatively small compared to Method 3.

The determination of which method to use consists of a variety of factors including but not limited to project complexity, size, cost, duration, staff availability, and staff experience. The magnitude, complexity, and the level of in-house skills and/or resources are the major factors when considering the use of a CMIS Consultant. Other areas where a CMIS consultant is used but may not provide CMIS services are Value Engineering, Risk Management, and Constructability Reviews.

While District Staff has performed CMIS on most of the projects since 2007, the District continues to look for opportunities to improve in-house skills and technical abilities. District Engineering and Inspection Staff have attended an average of 12 hours per person, per year of seminars and training classes to stay up to date with the construction industry standards and practices (Attachment 2). District Staff is in the process of organizing a training session where a CMIS Consultant(s) will provide additional training and to expand on the District's standards and practices.

PROJECT HISTORY

Attachment 1 represents the cost of every CIP construction project from Fiscal Year 2007 to the present. The raw data shows the project name, construction contract value, CMIS costs, change orders, method used, and calculated percentages for each category.

Table 2 is a summary of Attachment 1 which represents the average, maximum, and minimum of the CMIS cost as a percentage of the construction value and of the total project budget. It also shows the change order incident rate for each Method.

TABLE 2

		Total CMIS Cost as a % of Construction Value	Total CMIS Cost as a % of Total Project Budget	Change Order as a % of Construction Cost
Method 1	Average Value	20%	11%	6.9%
	Max Value	75%	35%	25.3%
	Min Value	5%	3%	-9.4%
Method 2	Average Value	16%	10%	-4.1%
	Max Value	17%	10%	-0.8%
	Min Value	14%	10%	-8.3%
Method 3	Average Value	8%	6%	-3.5%
	Max Value	11%	7%	0.6%
	Min Value	6%	5%	-11.0%

Table 2 indicates the cost of CMIS goes down when a CMIS Consultant is hired (Method 2 or 3). It also indicates when a CMIS Consultant is hired the change order percentage drops significantly.

Comparing these results to "industry standards", Attachment 3 is a study done by the University of Southern California and California State University Long Beach comparing total project costs with a CMIS Consultant vs. without a CMIS Consultant. The total CMIS cost as a percentage of the project budget is slightly higher than the study, however the change order rate is significantly lower than the studies' results. Keep in mind the study is for a range of projects that include vertical construction, schools, hospitals, etc., whereas the District's projects are specifically for public works consisting of pump stations, reservoirs and pipelines.

Overall, the District's CIP construction projects have been very successful. The District has received awards from various organizations like Construction Management Association of America (CMAA), American Society of Engineers (ASCE), and the American Public Works Association (APWA). Some of the projects that have received awards are:

- 30" Recycled Water Pipeline (R2022)
- 450-1 Recycled Reservoir/680-1 Recycled Pump Station (R2001/R2004)
- 640-1 & 640-2 Reservoirs (P2185)
- 850-4 Reservoir (P2191)
- 1296-3 Reservoir (P2143)
- 1485-1 Pump Station (P2172)
- Jamacha Road 36-Inch Pipeline & 12-Inch Pipeline Replacement (P2009)

Each method has been used at least once for the above mentioned projects and the success of these projects is due to the CMIS staff assigned to the project. In addition to the awards <u>not one</u> of the listed projects has been subject to litigation. This is a direct result of in-house or consultant's CMIS staff's ability to solve any construction issues and resolve all potential

construction claims prior to project completion. Attachments 7 through 10 are construction manuals that were prepared by CMIS consultants for District specific CIP projects. These manuals provide a good window to observe and understand the planning and strategies that are part of the CMIS process for the District's flagship projects.

HOURLY RATE COMPARISON

The District performed an hourly rate comparison between the RBF CMIS team and District Staff for the Jamacha Pipeline Project. The District's billable hourly rates are slightly higher than RBF staff. This is primarily due to the District's higher overhead costs. Items generally included in overhead are as follows:

- Fringe Benefits
- Operational costs
- Errors/Omissions Insurance
- Training
- Cellular Telephones
- Computers
- Vehicle Costs (gas, maintenance, insurance, etc.)
- Legal advice
- Vacation/Sick Leave Time
- Leasing of building space

In our opinion, hiring a CMIS Consultant for the Jamacha Pipeline Project was more cost effective than utilizing District Staff. RBF provided the proper expertise and depth of personnel that was needed to provide CMIS for this complex project. The team that RBF assigned to this project had a combined construction experience of 85 years. The benefit of using a consultant team for this project and other similar District flagship projects is that the costs are short term in nature and end once the project construction is complete.

HISTORY OF CONSTRUCTION MANAGEMENT AND INDUSTRY STANDARD

In August 1975 the National Construction Management Committees of the Associated General Contractors of America (AGC), the American Institute of Architects (AIA), and the American Consulting Engineers Council (ACEC) met together for a joint national construction management Council. A general statement and position paper was unanimously adopted by the joint council and ratified by the Board of directors of AIA, AGC, and ACEC. These associations recognized the importance of the Construction Management process and agreed to work together on a National Comprehensive Construction Management Program to implement the following.

- To define, develop and disseminate the standards and levels of quality of construction management.
- To develop guidelines and educational programs for the assistance of members and Owners engaged in construction management.
- To relate and coordinate with all elements in the industry performing construction management services to develop acceptable industry-wide standards for construction management.
- To monitor and to make joint recommendation regulations at the federal, state, and local levels affecting construction management.

- To communicate and maintain liaison with the Owners and users of construction management services, advising and assisting them on the best and most economical procedures.

Since 1975, construction management is becoming more prevalent in the industry every year. The San Diego Chapter of Construction Management Association of America (CMAA) has exponentially grown over the last five years. The District's involvement with this group has also increased to continue to be up to date with current construction practices and standards. The District's Chief Engineer is a certified construction manager and other engineering staff is also actively pursuing this certification.

Both private and public sectors of the construction industry use CMIS. While the delivery method may vary from project to project, a CMIS Consultant ensures (whether it's a developer, city, agency, or special district) the contract is completed and within the time, scope and budget and with the highest quality. A developer or private owner goes through a similar process to determine whether their own staff and resources can sustain in-house CMIS or should they hire a CMIS Consultant to provide these services.

CONCLUSION

The determination to hire a CMIS Consultant or providing CMIS in-house involves a variety of factors including but not limited to project complexity, size, duration, staff resources, and staff experience. The District considers each of these factors when determining which method to use and the primary goal is to provide the most cost effective and efficient method possible.

'he attachments are included as part of this memorandum and provide additional information and insight on CMIS as well as highlighting specific District projects. Note that the District's CMIS Manual (Attachment 10) is in the process of being updated.

Attachments: Attachment 1 – CIP Projects from FY07-Present
Attachment 2 – Engineering/Inspection Training Log
Attachment 3 – Comparative Analysis of Total Project Costs With vs. Without a Construction Manager
Attachment 4 – Power Point Presentation, Benefits of Construction Management
Attachment 5 – The History of Construction Management Practice and Procedures (CMAA)
Attachment 6 – CMAA Mission and Vision
Attachment 7 – 1296-3 Reservoir Construction Management and Field Inspection Manual
Attachment 8 – 1485-1 Pump Station Construction Management and Field Inspection Manual
Attachment 9 – 640-1& 640-2 Reservoir Construction Management Project Manual
Attachment 10 – Otay Water District CMIS Manual (In Progress)

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ATTACHMENT 1

ATTACHMENT 1 - CIP CONSTRUCTION PROJECTS FROM FY07-PRESENT

CIP NO.	PROJECT TITLE	CONSTRUCTION CONTRACTOR	YEAR COMPLETE	CMIS METHOD *(See Note)*	CMIS NAME	TOTAL PROJECT BUDGET	FINAL CONST. CONTRACT VALUE	CONSULTANT CMIS			STAFF CMIS			TOTAL CMIS			CHANGE ORDER %	COMMENTS
								COST	% CONST. VALUE	% PROJECT BUDGET	COST	% CONST. VALUE	% PROJECT BUDGET	COST	% CONST. VALUE	% PROJECT BUDGET		
P2039 P2396 P2387	PL-12 Inch Upsize	Arrietta Const Inc	FY09	1	STAFF	$2,398,500	$1,715,307	$0	0%	0%	$154,325	9%	6%	$154,325	9%	6%	1.6%	Within Range
R2053	RWCWR Office Building & Meter Shop Remodel	Telliard Const	FY09	1	STAFF	$590,000	$297,263	$0	0%	0%	$46,244	16%	8%	$46,244	16%	8%	7.8%	Within Range
R2086	RWCWRF Force Main	Arrieta Const	FY09	1	STAFF	$1,325,000	$865,986	$0	0%	0%	$43,947	5%	3%	$43,947	5%	3%	2.5%	Within Range
P2465/ P2466	Regulatory Site Material Storage Bins	Fox Const	FY09	1	STAFF	$310,000	$239,000	$0	0%	0%	$27,835	12%	9%	$27,835	12%	9%	6.2%	Within Range
P2459	Olive Vista Utility Relocation	Ortiz Corp	FY09	1	STAFF	$1,242,000	$896,845	$0	0%	0%	$113,120	13%	9%	$113,120	13%	9%	7.9%	Within Range
S2015	Calavo Sewer Lift Station	NEWest Const	FY09	1	STAFF	$560,000	$287,461	$0	0%	0%	$52,917	18%	9%	$52,917	18%	9%	7.3%	Within Range
P2191	850-4 Reservoir	Spiess Const Co	FY10	1	STAFF	$3,410,000	$2,324,844	$0	0%	0%	$163,661	7%	5%	$163,661	7%	5%	-9.4%	Within Range
R2081	20-Inch Lane Avenue Conversion	ARB	FY10	1	STAFF	$1,210,000	$740,163	$0	0%	0%	$116,554	16%	10%	$116,554	16%	10%	12.1%	Within Range
P2422	Interagency Water Meter Connection	Jose Pereira Eng	FY10	1	STAFF	$350,000	$162,295	$0	0%	0%	$121,234	75%	35%	$121,234	75%	35%	25.3%	Contractor's Superintendent assigned to the project was inexperienced and unfamiliar with the Water Agency Standards (WAS), and not adept at water industry practices. This requires constant District oversight.
R2092	450-1 Reservoir Disinfection Facility	NEWest Const	FY10	1	STAFF	$742,000	$402,348	$0	0%	0%	$63,928	16%	9%	$63,928	16%	9%	17.3%	Within Range
S2021	Jamacha Rd. 8-Inch Sewer Replacement	A.B. Hashmi	FY11	1	STAFF	$160,000	$89,094	$0	0%	0%	$32,916	37%	21%	$32,916	37%	21%	-2.4%	Contractor's Superintendent assigned to the project was inexperienced and unfamiliar with the Water Agency Standards (WAS), and unable to perform within the expedited timeframe. This required more District oversight.
P2143	1296-3 Reservoir 2.0 MG Water Storage Facility	Natgun Corp	FY10	2	VALLEY CM/ STAFF	$3,540,000	$2,176,833	$52,420	2%	1%	$287,713	13%	8%	$340,133	16%	10%	-8.3%	Within Range
P2172	1485-1 Pump Station Replacement	SCW	FY10	2	VALLEY CM/ STAFF	$2,475,000	$1,517,928	$88,000	6%	4%	$170,913	11%	7%	$258,913	17%	10%	-0.8%	Within Range
P2490/ P2492*	1296-1 & 1296-2 Reservoir Coating & Upgrades	West Coast Industrial	FY11	2	VALLEY CM/ STAFF	$900,000	$667,580	$0	0%	0%	$95,840	14%	11%	$95,840	14%	11%	-3.2%	Contractor appears to be very disorganized and unprepared to carry out the scope of work. The Contractor has had to reassign numerous superintendants to the project. This requires constant District oversight.
P2022	30" Recycled Water	Ortiz Corp	FY07	3	RBF	$23,600,000	$14,842,710	$1,244,202	8%	5%	$137,599	1%	1%	$1,381,801	9%	6%	0.6%	Within Range
R2001/ R2004	450-1 Recycled Reservoir / 680-1 Recycled Pump Station	TC Construction	FY07	3	JACOBS	$18,300,000	$14,457,458	$804,232	6%	4%	$214,020	1%	1%	$1,018,252	7%	6%	-1.9%	Within Range
P2185	640-1 & 640-2 Reservoirs	Pacific Hydrotech Corp	FY09	3	RBF	$28,750,000	$24,459,709	$1,196,735	5%	4%	$168,258	1%	1%	$1,364,993	6%	5%	-1.7%	Within Range
P2009/ P2038	Jamacha Rd. 36-Inch Pipeline & 12-Inch Pipeline Replacement	CCL Contracting	FY11	3	RBF	$22,193,500	$14,407,944	$1,236,855	9%	6%	$343,049	2%	2%	$1,579,904	11%	7%	-11.0%	Within Range
***DESIGNATES AN ACTIVE PROJECT**					**TOTALS:**	**$112,056,000**	**$80,550,767**	**$4,622,444**	**6%**	**4%**	**$2,354,073**	**3%**	**2%**	**$6,976,517**	**9%**	**6%**	**-3.1%**	

Notes: 1) Method 1 - CMIS industry standard costs as a percentage of the total project budget range from 0.63% to 14.44%

2) Method 2 & 3 - CMIS industry standard costs as a percentage of the total project budget range from 2.03% to 10.11%

Reference: Attachment 3, Comparative Analysis of Total Project Costs with verses without a Construction Manager, April 16, 2006, pg.7

ATTACHMENT 2

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ATTACHMENT 2 - ENGINEERING/INSPECTION TRAINING LOG

NAME	DATE OF TRAINING	COMPLETED	SEMINAR TITLE/DESCRIPTION	LOCATION	PURPOSE	HOURS	TOTAL COST
CHAMBERS							
	1/11/2005	Yes	Water Industry Confined Space Entry	OWD	Safety Requirement	1.00	$0
	1/13/2005	Yes	Water Industry Trenching and Shoring	OWD	Safety Requirement	1.00	$0
	4/19/2005	Yes	Backhoe Equipment Safety			1.00	
	4/28/2005	Yes	Water Industry Compressed Gas Safety	OWD	Safety Requirement	1.00	$0
	10/12/2005	Yes	Asbestos Handling Safety			1.00	
	10/18/2005	Yes	Water Industry General Construction Safety	OWD	Safety Requirement	1.00	$0
	10/18/2005	Yes	Water Industry Trenching and Shoring	OWD	Safety Requirement	1.00	$0
	7/31/2006	Yes	Water Industry Trenching & Shoring	OWD	Safety Requirement	1.00	$0
	11/8/2006	Yes	Water Industry Water Main Installation	OWD	Safety Requirement	1.00	$0
	11/16/2006	Yes	Trenching Excavation and Practices			1.00	
	2/28/2007	Yes	Water Industry Confined Space Entry	OWD	Safety Requirement	1.00	$0
	4/11/2007	Yes	Water Industry Disinfection Basics	OWD	Safety Requirement	1.00	$0
	4/11/2007	Yes	Water Industry Distribution System Materials and Equipment	OWD	Safety Requirement	1.00	$0
	11/30/2007	Yes	Water Industry Compressed Gas Safety	OWD	Required Training	1.00	$0
	12/7/2007	Yes	Water Industry General Construction Safety	OWD	Required Training	1.00	$0
	12/7/2007	Yes	Water Industry Personal Protective Equipment	OWD	Required Training	1.00	$0
	1/7/2008	Yes	Water Industry Lead Awareness	OWD	Required Training	1.00	$0
	2/29/2008	Yes	Plan Check Review	OWD	Enhanced Job Skills	1.00	
	4/23/2008	Yes	Trenching and Shoring	OWD	Required Training	1.00	
	8/19/2008	Yes	What to do when a construction project goes bad in CA			1.00	$329
	8/20/2008	Yes	Some Thoughts on Risk Management and Ethical Decision Making by Gordon Graham	OWD	Risk Management & Ethical Training	4.00	$0
	8/27/2008	Yes	General Construction Safety	PC/net	Safety Requirement - Update	1.00	
	9/16/2008	Yes	Confined Space Competent Person			1.00	
	10/23/2008	Yes	CMAA: CM - What is Working & Not Working	Town & Country	Enhance job skills	1.00	$85
	1/29/2009	Yes	Precast Concrete Manholes	OWD	Improve Job Skills	1.00	
	2/11/2009	Yes	Precast Concrete Manholes - Part 2	OWD	Improve Job Skills	1.00	
	2/25/2009	Yes	Sec. 3462 Precast Concrete Vaults	OWD	Improve Job Skills	1.00	
	3/10/2009	Yes	Are Trench Excavations Confined Spaces?	OWD	Improve Job Skills	1.00	
	3/17/2009	Yes	When should a hard hat be removed from service	OWD	Safety Training	1.00	
	3/24/2009	Yes	Safe Work Habits	OWD	Safety Training	1.00	
	3/25/2009	Yes	Fiberglass Reinforced Plastic Vaults Sec. 9620	OWD	Improve Job Skills	1.00	
	4/14/2009	Yes	Excavations are Serious Business	OWD	Safety Training	1.00	
	4/22/2009	Yes	WAS Sec. 09910 Field Painting and Coating	OWD	Improve Job Skills	1.00	
	5/12/2009	Yes	Crane Safety	OWD	Safety Training	1.00	
	9/24/2009	Yes	Confined Space Refresher	OWD	Safety Training	1.25	
	10/9/2009	Yes	Construction Inspection for Public Works	Mission Valley Marriott	Improve Job Skills	1.00	
	10/29/2009	Yes	EGCA Storm Water Pollution Prevention Program	San Diego	SWPPP Training	8.00	
	11/30/2009	Yes	Trenching & Shoring	OWD	Target Safety Training	0.50	
	12/7/2009	Yes	Water Industry Main Installation	OWD	Target Safety Training	1.00	
	12/8/2009	Yes	Water Industry Storm Water Pollution Prevention	OWD	Target Safety Training	1.00	
	5/5/2010	Yes	Water Industry Confined Space Entry	OWD	Target Safety Training	1.00	
	5/6/2010	Yes	Water Industry Personal Protective Equipment	OWD	Target Safety Training	1.00	
DEBLTHO							
	3/14/2007	Yes	Water Main Installation	PC/net	Safety Requirement - Update	1.00	
	3/14/2007	Yes	Ameron Pipes Training Update	OWD	Management Training	1.00	$0
	8/14/2007	Yes	W.A.S. Section 15508, Airvacs	OWD	Enhance Job Skills	1.00	
	11/30/2007	Yes	Confined-Space Entry	PC/net	Safety Requirement - Update	1.00	
	2/29/2008	Yes	Plan Check Review	OWD	Enhanced Job Skills	1.00	
	4/23/2008	Yes	Trenching and Shoring	OWD	Required Training	1.00	
	6/18/2008	Yes	Confined Space Recycled Water Cert.	City of San Diego La Mesa Treatment Plan	Improve job skills	1.00	
	6/4/2008	Yes	Cal-OSHA Regulatory Update	Handlery Hotel	Safety Training	1.00	
	8/19/2008	Yes	Gordon Graham Risk Management Training	OWD	Enhance job skills	1.00	$0
	7/31/2008	Yes	General Construction Safety	PC/net	Safety Requirement - Update	1.00	
	8/20/2008	Yes	Some Thoughts on Risk Management and Ethical Decision Making by Gordon Graham	OWD	Risk Management & Ethical Training	4.00	$0
	10/23/2008	Yes	CMAA: CM - What is Working & Not Working	Town & Country	Enhance job skills	3.00	$85
	1/29/2009	Yes	Precast Concrete Manholes	OWD	Improve Job Skills	1.00	
	2/11/2009	Yes	Precast Concrete Manholes - Part 2	OWD	Improve Job Skills	1.00	
	2/25/2009	Yes	Sec. 3462 Precast Concrete Vaults	OWD	Improve Job Skills	1.00	
	3/10/2009	Yes	Are Trench Excavations Confined Spaces?	OWD	Improve Job Skills	1.00	
	3/17/2009	Yes	When should a hard hat be removed from service	OWD	Safety Training	1.00	
	3/25/2009	Yes	Fiberglass Reinforced Plastic Vaults Sec. 9620	OWD	Improve Job Skills	1.00	
	4/14/2009	Yes	Excavations are Serious Business	OWD	Safety Training	1.00	
	4/22/2009	Yes	WAS Sec. 09910 Field Painting and Coating	OWD	Improve Job Skills	1.00	
	5/12/2009	Yes	Crane Safety	OWD	Safety Training	1.00	
	10/29/2009	Yes	EGCA Storm Water Pollution Prevention Program	San Diego	SWPPP Training	8.00	

Engineering Dept.
TR/ LOG
July 1, /resent

NAME	DATE OF TRAINING	COMPLETED	SEMINAR TITLE/DESCRIPTION	LOCATION	PURPOSE	HOURS	TOTAL COST
KAY							
	3/14/2007	Yes	Ameron Pipes Training Update	OWD	Management Training	1.00	$0
	3/16/2007	Yes	CMAA Certified Construction Management Association Information	OWD	Manager as well as the benefits of using	4.00	
	4/16/2007	Yes	No Dig Show - Trenchless Technologies	San Diego	trenchless excavation.	1.00	$0
	6/12/2007	Yes	Risk Assessment	OWD	Construction Project	1.00	$0
	7/17/2007	Yes	USF Vault Demo	OWD	Increase knowledge of USF Vault	1.00	$0
	11/8/2007	Yes	CMAA - Economic forecast	Town & Country	economy	1.00	
	1/17/2008	Yes	CMAA - Construction Law Update	Town & Country	construction industry	4.00	
	3/1/2008	Yes	CMAA - Change Orders, The Inevitable Reality	Town & Country	with them	4.00	
	6/5/2008	Yes	CMAA OSHA Update	Town & Country	OSHA	4.00	
	6/12/2008	Yes	CMAA - False Claims Act	Town & Country	and how to deal with them if encountered	4.00	
	6/20/2008	Yes	CMAA - Certified Construction Manger (CCM) Training	Beach	what steps need to be taken	4.00	
	6/27/2008	Yes	CMAA - Certified Construction Manger (CCM) Training	Beach	what steps need to be taken	4.00	
	7/18/2008	Yes	CMAA - Certified Construction Manger (CCM) Training	Beach	what steps need to be taken	4.00	
	8/20/2008	Yes	Some Thoughts on Risk Management and Ethical Decision Making by Gordon Graham	OWD	Risk Management & Ethical Training	4.00	$0
	10/23/2008	Yes	CMAA: CM - What is Working & Not Working	Town & Country	Enhance job skills	4.00	$55
	2/12/2009	Yes	Public Works Construction Projects	Lemon Grove	Effectively manage public works projects	4.00	
	3/26/2009	Yes	Lorman Education Services - Construction Management	Handlery Hotel	Managing construction projects in California	6.00	
	10/29/2009	Yes	EGCA Storm Water Pollution Prevention Program	San Diego	SWPPP Training	6.00	
KENNEDY							
	7/16/2008	Yes	Online Training for Confined Space	OWD	Safety Training	1.00	$0
	7/17/2008	Yes	Tailgate Training with Jake Vaclavek on Confined Space	OWD	Safety Training	1.00	$0
	8/20/2008	Yes	Some Thoughts on Risk Management and Ethical Decision Making by Gordon Graham	OWD	Risk Management & Ethical Training	4.00	$0
	9/19/2008	y	Confined Space Training	OWD	Entry Supervisor, Attendant and Entrant	1.00	$0
	9/22/2008	Yes	CARB Standards & Goals	OWD	Staff Training	1.00	$0
	4/6/2009	Yes	Processing Record Drawings	OWD	Staff Training	1.00	
	5/7/2009	Yes	CMAA San Diego Seminar - Change Orders	CMAA	Construction management seminars	4.00	
	8/16/2009	Yes	ASCE/Pipelines Conference 2009 - Pipeline Installation Manual of Practice (MOP) Workshop	Sheraton San Diego Hotel & Marina	Informational and Educational	8.00	$245
MARPLE							
	2/13/2008	Yes	Confined Space E & A Competent Person	Pacific Safety Council, 9880 Via Pasar, Suite F, San Diego	Goals & Objectives requirement	4.00	
	2/20/2008	Yes	Plan Check Review	OWD	Enhanced Job Skills	1.00	
	8/20/2008	Yes	Some Thoughts on Risk Management and Ethical Decision Making by Gordon Graham	OWD	Risk Management & Ethical Training	4.00	$0
	1/21/2009	Yes	General Construction Safety	OWD	Target Safety Training	1.00	
	1/29/2009	Yes	Precast Concrete Manholes	OWD	Improve Job Skills	1.00	
	2/11/2009	Yes	Precast Concrete Manholes - Part 2	OWD	Improve Job Skills	1.00	
	2/25/2009	Yes	Sec. 3462 Precast Concrete Vaults	OWD	Improve Job Skills	1.00	
	3/10/2009	Yes	Are Trench Excavations Confined Spaces?	OWD	Improve Job Skills	1.00	
	3/17/2009	Yes	When should a hard hat be removed from service	OWD	Safety Training	1.00	
	3/25/2009	Yes	Fiberglass Reinforced Plastic Vaults Sec. 6620	OWD	Improve Job Skills	1.00	
	3/26/2009	Yes	Managing Construction Projects	Handlery Hotel	Improve Job Skills	4.00	
	4/22/2009	Yes	WAS Sec. 09910 Field Painting and Coating	OWD	Improve Job Skills	1.00	
	5/12/2009	Yes	Crane Safety	OWD	Safety Training	1.00	
	10/8/2009	Yes	Confined Space Safety Course	OWD	Safety Training	1.00	
	12/11/2009	Yes	Water Industry Storm Water Pollution Prevention	OWD	Target Safety Training	1.00	
	12/16/2009	Yes	Water Industry Water Main Installation	OWD	Target Safety Training	1.00	
	2/4/2010	Yes	EGCA Storm Water Pollution Prevention Program	City of San Diego North City Reclamation Plant	Improve Job Skills	9.00	
	5/19/2010	Yes	Water Industry Confined Space Entry	OWD	Target Safety Training	1.00	
	5/18/2010	Yes	Water Industry Personal Protective Equipment	OWD	Target Safety Training	1.00	
	5/25/2010	Yes	Trenching and Shoring	Pacific Safety Council	Safety Training	1.00	

Engineering Dept.
TR/ LOG
July 1, Present

NAME	DATE OF TRAINING	COMPLETED	SEMINAR TITLE/DESCRIPTION	LOCATION	PURPOSE	HOURS	TOTAL COST
PORADA							
	1/31/2002	Yes	Public Contract Code and Competitive Public Bidding in California	San Diego		4.00	$215
	3/6-8/02	Yes	Public Works Officers Institute	San Diego		4.00	$425
	5/16-27/02	Yes	Construction Seminar (EarthTech presentation)	San Diego	Project Document Control ref: 680/944 Reservoir	4.00	$0
	12/1/2002	Yes	Water Distribution System Operation, Maintenance	Continuing Educ.	Job requirement	4.00	
	3/6/2003	Yes	Change Orders (CMAA Seminar)	San Diego	Increase knowledge base	1.00	$80
	5/5-7/03	Yes	CMAA Annual Conference	Scottsdale, AZ	Construction management seminars	16.00	$1,200
	3/14/2007	Yes	Ameron Pipes Training Update	OWD	Management Training	1.00	$0
	Dec-10	Yes	Operation and Maintenance of Wastewater Collection Systems 1	Ca State University, Sacramento	Continuing Education	4.00	
	6/10/2008	Yes	Gordon Graham Risk Management Training	OWD	Enhance job skills	4.00	$0
	6/24/2008	Yes	Gordon Graham Performance Review Training	OWD	Enhance job skills	4.00	$0
	8/20/2008	Yes	Some Thoughts on Risk Management and Ethical Decision Making by Gordon Graham	OWD	Risk Management & Ethical Training	4.00	$0
	3/7/2010	Yes	Perspectives on Recycled Water Site Supervisor Training - Watereuse Conference	San Diego	Continuing Education	4.00	$75
	3/8/2010	Yes	Desalination and Brine Management - Watereuse Conference	San Diego	Continuing Education	4.00	$0
	3/9/2010	Yes	Public Outreach and Education - Watereuse Conference	San Diego	Continuing Education	4.00	$0
KRYSTINE R.							
	6/20/2007	Yes	Presentation by So Cal Pump & Well	OWD	Management Training	1.00	
	7/17/2007	Yes	USF Vault Demo	OWD	Increase knowledge of USF Vault	1.00	$0
	6/10/2008	Yes	Gordon Graham Risk Management Training	OWD	Enhance job skills	1.00	$0
	8/20/2008	Yes	Some Thoughts on Risk Management and Ethical Decision Making by Gordon Graham	OWD	Risk Management & Ethical Training	1.00	$0
	9/18/2008	Yes	Type III Tank Construction	OWD	Learn about Nelson	1.00	
	9/24/2008	Yes	Construction 101	OWD	Review Overall Construction Process	1.00	
	10/3/2008	Yes	Paths to Partnership	Town & Country	Share info about OWD	5.00	
	11/3/2008	Yes	Change Order Policy	OWD	To update staff on Change Orders	1.00	
	2/19/2009	Yes	WRMP Hydraulic Model Training	OWD		1.00	
	8/24/2009	Yes	As-built Process	OWD	To share information regarding survey involvement	1.00	
	10/1/2009	Yes	OSHA	OWD	Explaining the basics of OSHA	1.00	
	10/9/2009	Yes	Contract Expiration	OWD	To explain the process of amending agreements and contracts	1.00	
	11/30/2009	Yes	SWPPP	OWD	To provide an update to staff on the latest regulations	1.00	
	3/8/2009	Yes	WaterReuse	OWD	Update to professional staff by attending seminar	4.00	
	5/1/2010	Yes	CMAA Conference	Atlanta, GA	Attended workshops on CMAA processes being implemented across the country	24.00	

ATTACHMENT 3

Comparative Analysis of Total Project Costs with verses without a Construction Manager

Research Report to the CMAA Research and Development Committee
From the Departments of Civil Engineering,
University of Southern California and California State University, Long Beach
Contacts: John A. Kuprenas (kuprenas@usc.edu); Elhami B. Nasr

April 16, 2006

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Introduction

A fundamental issue within the construction management profession is demonstration of the value of a construction manager to a project. This research quantifies the project cost savings (measured through either lower change order amounts and/or a lower project total cost) by comparing projects that have varying amounts of management services. The research also identifies types of management services used and includes "best practices" type actions for managers/clients to use to ensure project cost success. A statistical validation of the strengths of the conclusions of the analysis of the research is included.

Limitations of this research project are based on the availability of data. The primary source of data for this research is a web-based survey (with telephone follow-up) completed by to CMAA member firms on completed building projects throughout the United States. In addition, through the principal investigator's association with Vanir Construction Management, the research team was able to access additional project data recently completed public sector education projects from Southern California.

Data Sources

Data for the research was obtained from a survey of CMAA member companies with date submitted from 01/17/06 to 03/27/06. The National Office of the CMAA sent the survey notice and a reminder follow-up email in February and March respectively. The Principal Investigator from USC answered questions regarding the survey online and by phone (about a dozen total inquires). A total of 219 surveys were submitted of which only 24 were complete in terms of usable cost date in order to allow true analysis. All surveys were done online through the survey site "zoomerang.com"". The survey consisted of 40 questions (shown in Appendix I). The survey was broken into thee sections – collection of basic project data (location and size), detailed project costs (by phase and activity), and detailed management costs and processes (by phase and services). Unfortunately, each section of the survey contained less complete information. For example, nearly 100 completed surveys included the complete section one information. Only 24 data points included the section two information, and only a few data points included the complete section three information. In order to obtain better results in future research, perhaps even a shorter survey should be used in future CMAA research projects.

Instructions for the survey were included in the survey and were also included in the solicitation. The introduction explained that the objective of this research is to quantify the total project cost savings by comparing total project costs on projects that do and projects that do not use professional construction management. Respondents were instructed to:

- Complete at least 5 surveys (5 separate projects)
- Provide only data on complete ed, new construction, building projects procured using a traditional design-bid-build method
- Provide data on not necessarily for their "best" projects, but for a representative sample of projects based on typical types of projects and types of services

The respondents were also informed that:

- Each survey (each project) should probably take 10 to 30 minutes complete, but that one did not have data to answer every question on the survey since the survey is designed to drill down to very specific information.

- All project data would be confidential, but all survey participants would be emailed the research results.

Characteristics of the survey data set are shown in Figure 1 to 3 on the next pages. Figure 1 shows the project locations. The figure shows that large majority of the completed projects are from California with over 75% of the projects from the Western United States. Figure 2 shows the breakdown of the client for the project with the majority of the projects being Government projects (47%) and Private Sector (37%). All projects in the date set are building projects, and Figure 3 shows the specific type of project. The figure shows about 1/3 of the projects are educational/institutional and 1/3 of the projects are other (defined to be a building project but not a educational/institutional, housing/lodging, healthcare, corporate, developer project). The figure also shows 18% corporate projects.

One important question on the survey is whether manager on the project was an Outside Consultant project/construction manager or an In-house manager (someone who works for the agency constructing the building project). In addition, for projects that used In-house management, another important question was whether the In-house manager had any additional duties beyond managing the project.

Figure 1. Breakdown of Survey Project Data by the State in which the Project was Built.

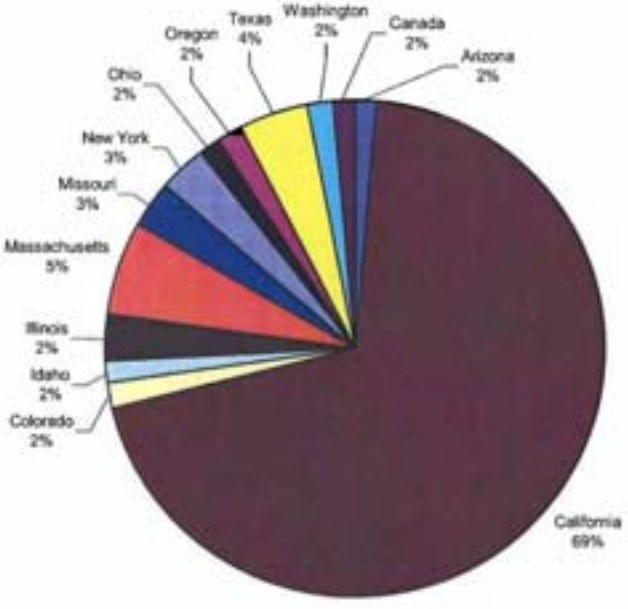


Figure 2. Breakdown of Survey Project Data by the Client for the Project

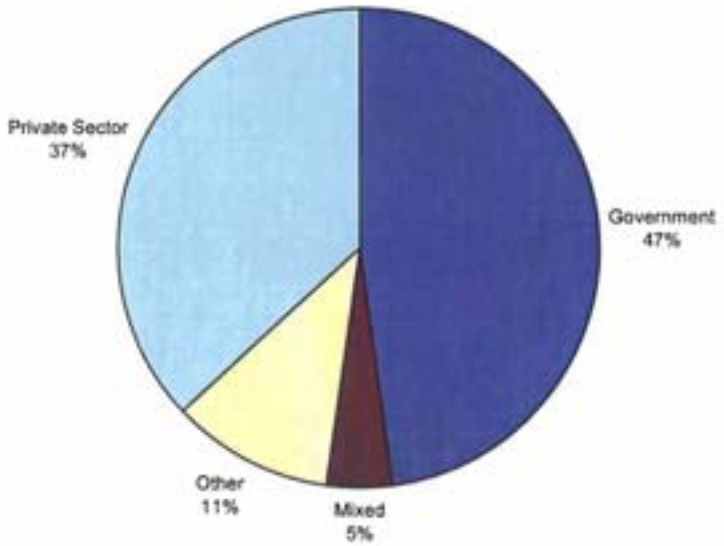


Figure 3. Breakdown of Survey Project Data by the Type of the Project

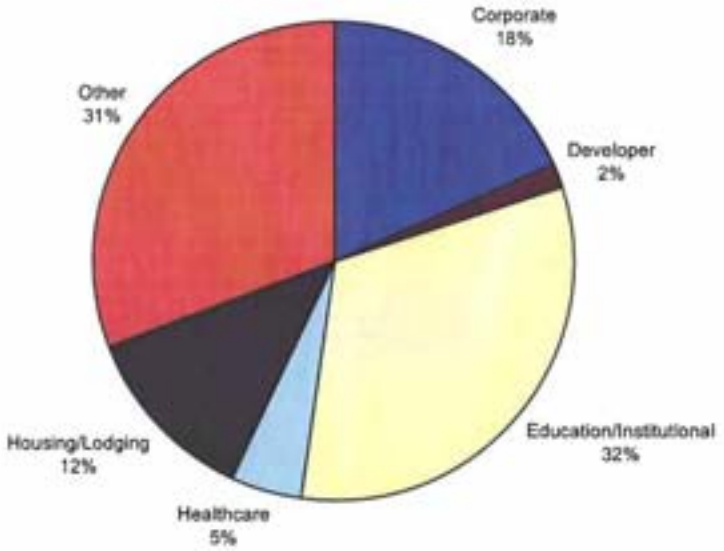


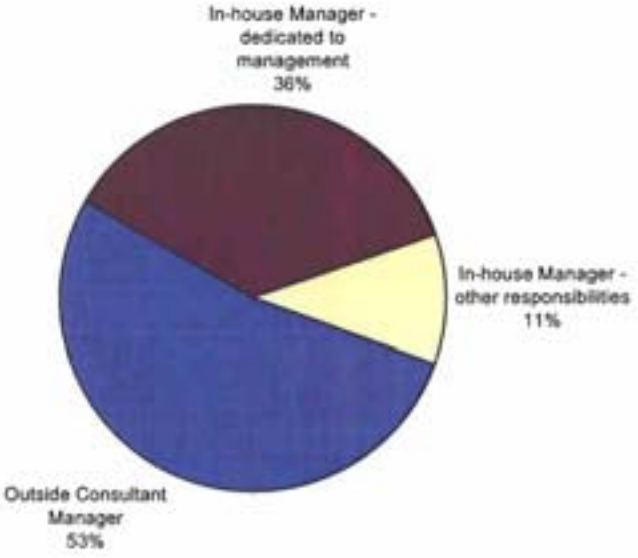
Table 1 shows the project size (measured in squre feet) and total project cost (measured in dollars) for the project data used in all of the research. The table shows a wide range of project sizes (from 1,035 s.f. to 1,500,000 s.f.) and total project costs (from $80,000 to $350,000,000). The table also subdivides the data into projects managed by In-house and Outside Managers and projects without a manager. On average, the largest projects (measured through square feet or dollars of TPC) are managed by Outside Consultant Managers and the smallest projects do not use a manager (either Outside or In-house).

Table 1. Survey Project Size and Cost Information

Measure		Project Square Feet	Total Project Cost (TPC)
Number of Data Points		42	65
Average Value		156,112	$47,676,558
Maximum Value		1,500,000	$350,000,000
Minimum Value		1,035	$80,000
Outside Consultant Manager	Number of Data Points	20	29
	Average Value	230,744	$53,150,272
	Maximum Value	1,500,000	$350,000,000
	Minimum Value	5,500	$1,837,000
In-house Manager	Number of Data Points	17	26
	Average Value	99,402	$50,753,015
	Maximum Value	300,000	$290,000,000
	Minimum Value	6,000	$1,200,000
No Manager	Number of Data Points	5	10
	Average Value	50,397	$23,804,000
	Maximum Value	200,000	$120,000,000
	Minimum Value	1,035	$80,000

Two figures are used to show the breakdown of the data set into what type of management is used on projects that do use a manager. Three options were given – projects with In-house managers with additional responsibilities, projects with In-house managers without additional responsibilities, and projects with Outside managers. Figure 4 shows the breakdown based on the number of projects in each data subset. As shown in the figure, most projects from the survey were managed by Outside Consultant managers with a little more than 10% using In-house managers with additional responsibilities. Figure 5 shows the breakdown based on the total project cost value of the projects in the data subset. As shown in the figure, like Figure 4, most projects (on a cost basis) were managed by Outside Consultant managers with even less (only5%) using In-house managers with additional responsibilities.

Figure 4. Breakdown of Management Approach (based on number of projects)



A second data source was obtained by the research team to help to develop usable conclusions for the study. The second set of data for this study comes from traditional low bid, building construction work from the new construction program currently underway at the Los Angeles Unified School District (LAUSD). The District is in the middle of building new schools and making their existing schools better through the largest school construction and repair program – $19.2 Billion – in the nation's history. The building program will complete more than 150 new schools (LAUSD 2005).

Figure 5. Breakdown of Management Approach (based on TPC of projects)

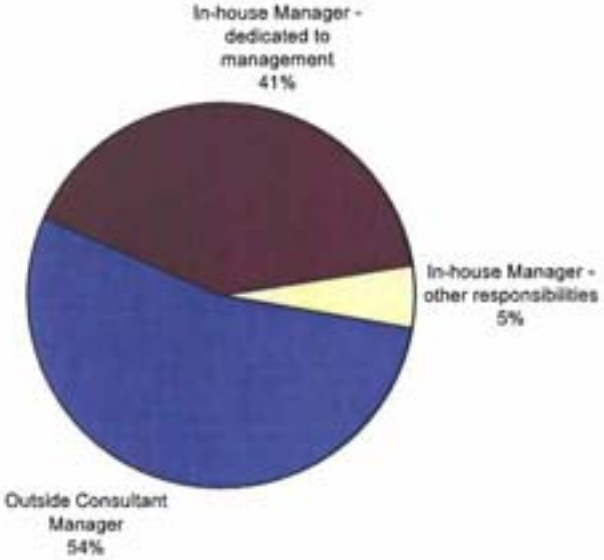


Table 2 shows the project statistics for the 26 additional completed projects. Like the data obtained from the CMAA survey, the school district projects included in this study are complete, new construction, building projects procured using a traditional design-bid-build method. The projects are all building addition projects (a new classroom building on an existing school) to existing school projects. The **data set is not the district's "best" projects,** but in fact all completed school additions projects as of January 2006. Data available for each project includes total project cost (and TPC elements), construction cost, design cost, design duration, project square footage, and change order values.

Table 2. School District Project Size and Cost Information

Measure	Project Square Feet	Total Project Cost (TPC)
Count	26	26
Average	15,815	$6,058,563
Maximum	55,570	$16,464,237
Minimum	2,800	$1,706,313

Analysis – Survey Data

Analysis consists of comparisons of project cost performance under different management conditions. Table 3 compares non-construction, construction, and construction management costs based on the type of manager for the survey data set. The table shows that management costs (expressed as a percentage of total project cost) are on average lower for projects that use Outside Consultant managers than for projects that use In-house managers. The table also shows that non-construction and construction costs are nearly the same regardless of management use (even the use of no manager).

Table 3. Survey Project Costs Compared Based on Management

Measure		Non Construction Cost as a Percentage of TPC	Construction Cost as a Percentage of TPC	Construction Management Cost as a Percentage of TPC
Number of Data Points		24	24	28
Average Value		20.89%	79.11%	4.82%
Maximum Value		40.00%	94.35%	14.44%
Minimum Value		5.65%	60.00%	0.63%
Outside Consultant Manager	Number of Data Points	16	16	14
	Average Value	21.17%	78.83%	4.63%
	Maximum Value	40.00%	94.35%	10.11%
	Minimum Value	5.65%	60.00%	2.03%
In-house Manager	Number of Data Points	7	7	14
	Average Value	20.37%	79.63%	5.02%
	Maximum Value	35.00%	90.00%	14.44%
	Minimum Value	10.00%	65.00%	0.63%
No Manager	Number of Data Points	1	1	0
	Average Value	20.00%	80.00%	0.00%
	Maximum Value	20.00%	80.00%	0.00%
	Minimum Value	20.00%	80.00%	0.00%

Table 4 compares change order values (in dollars and as a percentage of construction value based on the type of manager for the survey data set. The table shows an average change order value of 7.50% (which is within industry standards for building projects). The table also shows the average change order value to be much higher for projects managed by In-house managers (10.90%) as compared to projects managed by Outside managers (6.20%). No change order data was reported through the survey for projects that did not use a manager, and the data set for projects for In-house manager change orders was already too small to try to differentiate based on whether the manager had additional responsibilities or was only performing management duties.

Table 4. Survey Project Change Costs Compared Based on Management

Measure		Change Order Value	Change Order Amount as a Percentage of Construction Value
Number of Data Points		18	20
Average Value		$1,408,341	7.50%
Maximum Value		$16,700,000	34.43%
Minimum Value		$184	0.50%
Outside Consultant Manager	Number of Data Points	13	14
	Average Value	$547,022	6.20%
	Maximum Value	$5,404,729	21.24%
	Minimum Value	$184	1.00%
In-house Manager	Number of Data Points	5	6
	Average Value	$3,647,771	10.90%
	Maximum Value	$16,700,000	34.43%
	Minimum Value	$45,000	0.50%
No Manager	Number of Data Points	0	0
	Average Value	NA	NA
	Maximum Value	NA	NA
	Minimum Value	NA	NA

The survey also collected very limited data to identify the project phases when management services were provided and what management practices were included in the services. Table 5 shows the phase in which the services were provided. Not unexpectedly, the large majority (over 90%) of management services are provided in the construction phase (based on percentage of total expenditures for the services). Table 6 shows that project management, project/contract administration, and other (constructability review, partnering, etc.) were the management practices used in performing the management services.

Table 5. Survey Phase in which Management Services are Provided

Project Phase	Percentage
Pre-design	1.00%
Design	4.00%
Bid / Procurement	1.00%
Construction Phase	91.00%
Close-out / Occupancy	2.00%
Other	1.00%

Table 6. Survey Types of Management Practices Provided

Management Practice	Percentage
Project Management	27.5%
Scheduling	5.0%
Cost Management / Estimating	7.5%
Quality Assurance	7.5%
Contract/project administration	20.0%
Other (Construct. Review, Partnering, etc.)	27.5%

Tables 7 and 8 show a further breakdown of project costs. Figure 7 shows the three elements included in the non-construction costs, and Figure 8 shows the two elements included in the construction project costs. The tables show on average a 20-80 **relationship for the non-construction – construction** cost breakdown. The highest individual value is the construction cost element of the construction contract. The management cost is included in the construction contract cost (based on the way the survey asked these questions). All of these values are as expected and consistent with industry norms.

Table 7. Breakdown of Project Costs – Non-construction Costs

Measure	Pre-design Phase	Design Phase	Bid / Procurement Phase
Number of Data Points	12	12	12
Average Value	5.97%	10.04%	6.10%
Maximum Value	15.00%	21.28%	10.00%
Minimum Value	1.68%	4.00%	1.04%

Table 8. Breakdown of Project Costs – Construction Costs

Measure	Construction Contract	Change Orders
Number of Data Points	20	20
Average Value	72.88%	6.28%
Maximum Value	92.46%	28.92%
Minimum Value	49.27%	0.45%

Similar tables were also created for the school district data set, but fewer conclusions can be learned form these table since the only one type of management (staff augmentation In-house) was used on all of the projects in the data set. Table 9 compares non-construction and management costs for the school district data set. The table shows that management costs (expressed as a percentage of total project cost) were significantly higher than the survey projects. This is undoubtedly because the school district projects have a project manager throughout all project phases while the survey projects have much more management emphasis during construction phase (as shown in Table 5). Table 10 shows change order values (in dollars and as a percentage of construction value) for the school district data set. The table shows an average change order value of 6.20% which is less than the 7.50% from all projects in the survey but exactly the same as the survey data set value for projects managed by Outside managers.

Table 9. School District Project Costs

Measure	Construction Cost (CC)	Management Cost	Management Cost as a Percentage of TPC
Count	26	26	26
Average	$3,974,232	$631,272	12.50%
Maximum	$12,061,755	$1,635,417	29.42%
Minimum	$733,927	$170,007	6.51%

Table 10. School District Project Change Costs

Measure	Change Order Value	Change Orders (Percentage of CC)	Final TPC variance (Percentage of Original TPC)
Count	26	26	26
Average	$169,702	6.20%	-2.17%
Maximum	$461,025	19.70%	12.23%
Minimum	-$8,099	-0.26%	-28.30%

Correlation plots with statistical test were used to test relationships between project costs and management variables. Figure 6 examines the relationship between management and change orders. The x-axis of the figure is management cost (measured as a percentage of total project cost). The y-axis of the figure is change orders (measured as a percentage of the construction value). The figure shows a weak negative correlation. A statistical best fit line is also shown providing a slope of -0.8896, which means for every extra percentage of management cost, change orders will go down 0.89% (of construction cost). The figure also shows a correlation coefficient value (R^2) of 0.1063. This value does not prove a statistical correlation, but is a strong value based on construction research standards. A R^2 value of1.00 would mean a perfect correlation (all points on the line). A R^2 value of 0.00 would mean no correlation (all **points random). The figure's value of** 0.1063 means that a correlation exists but other variables are influencing the relationship (i.e. type of service, management practices, phase of service, design quality, etc.). The line is also based a linear relationship. Examining the small number of points on the chart, it appears that a threshold value for management costs of 3% to 4% of TPC is needed to be reached in order to control changes. Costs spent above the threshold value may have less impact on change costs; costs spent below this value appear to have a strong influence on change costs. Based on this threshold concept, a non-linear relationship may exist.

Other practices within the construction industry have been proven to have non-linear relationships. Most researched is the learning curve concept which is based on a logarithmic relationship between output and repetitions. Figure 7 shows the same data but with a logarithmic trend line. Note the correlation is slightly better in this figure as compared to Figure 6. This figure supports the idea of a management services threshold to control change costs.

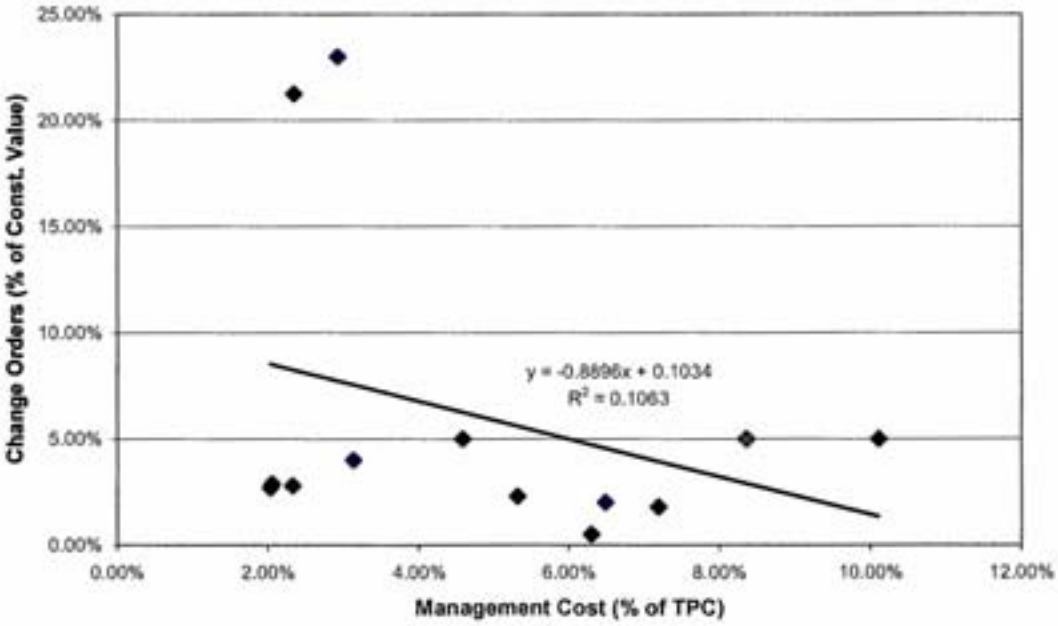


Figure 6. Management Cost Influences to ***Change Orders – Linear Trend Line***

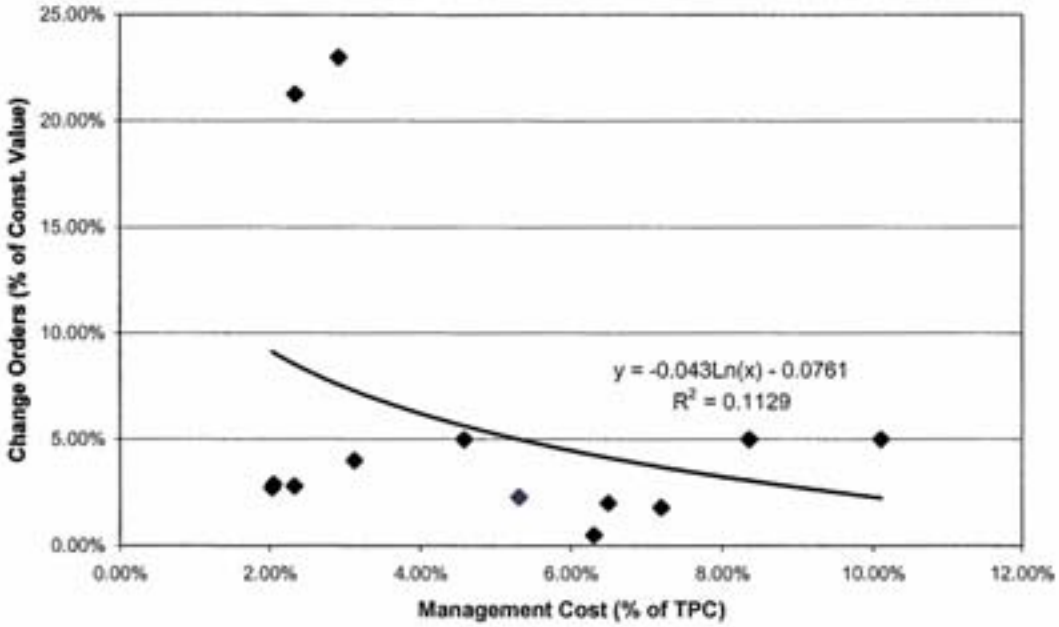


Figure 7. Management Cost Influences to ***Change Orders – Logarithmic Trend Line***

In an attempt to improve the correlation of the variables in Figures 6 and 7, one potential variable influencing the correlation is type of manager (In-house or Outside). Figure 8 shows the relationship between type of management and change orders. The x-axis of the figure is management cost but is subdivided for management by Outside managers and by In-house managers (again measured as a percentage of total project cost). The y-axis of the figure is change orders (measured as a percentage of the construction value). Both plots within the figure show a weak negative correlation. Linear statistical best fit lines are also shown with slopes of -1.4373 for In-house managers with a $R^2 = 0.1338$ and -0.7161for the Outside managers with a good $R^2 = 0.1071$. Logarithmic best fit lines were also computed for these plots (but not plotted in order to keep the Figure **readable). The In-house manager's curve was**

$y = -0.0479Ln(x) - 0.0969$ with $R^2 = 0.0863$. eq. 1

The Outside manager's curve was

$y = -0.0424Ln(x) - 0.0715$ with $R^2 = 0.1529$ eq. 2

These logarithmic plots again support the idea of a threshold for management services effectiveness with respect to change costs, but do not statistically prove the concept. Additional data is needed.

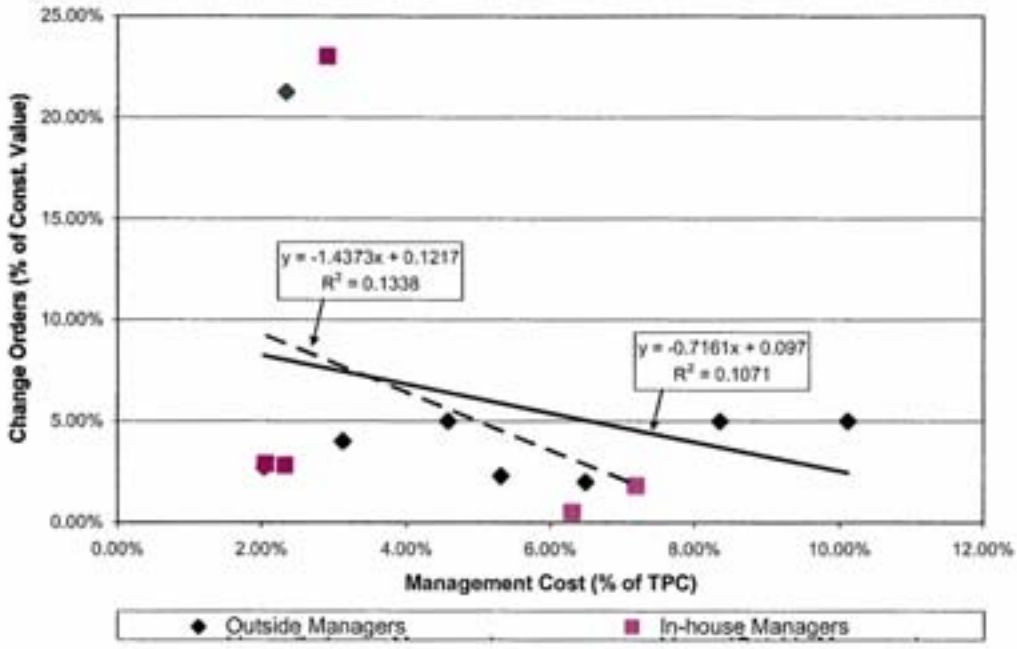


Figure 8. Management Type Influences to Change Orders – Linear Trend Line

Analysis – School Data

Given the availability of a second data set, similar correlation plots were created for the school district data to validate the survey. Figure 9 examines the relationship between management and change orders for the school district building additions projects. The plot axes are identical to Figure 6 with the x-axis of the figure measuring management cost (measured as a percentage of total project cost) and the y-axis measuring change orders (measured as a percentage of the construction value). The figure shows no correlation. A statistical best fit line shows an R^2 value of nearly zero (0.0036). Figure 10 also examines the relationship between management and change orders for the school district building additions projects but with a different x-axis variable measure. The x-axis of the figure is still management cost but is now measured as a dollars spent on management. The y-axis remains the value of change orders (measured as a percentage of the construction value. Interestingly, as expected based on Figure 6 but not expected based on Figure 9, the plot shows a weak negative correlation with a poor $R^2 = 0.0816$. It appears that in the case of the school district data, other variables are influencing the correlation. Recall that Table 9 showed that management costs for the school district data set were significantly higher than for the survey projects because the school district projects have managers throughout all project phases. This is likely a significant impact to the management/change cost correlation since management costs could be highly impacted by numerous non-construction project activities (i.e. project re-design, project re-bidding, etc.).

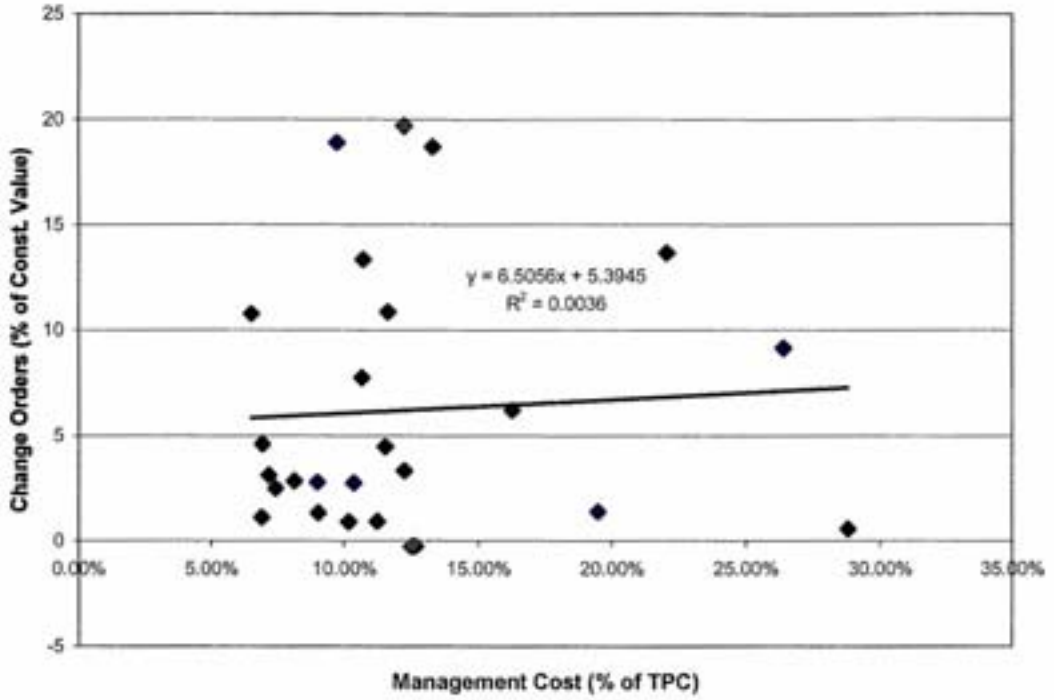


Figure 9. School Project Management Cost (% of TPC) Influence to Change Orders

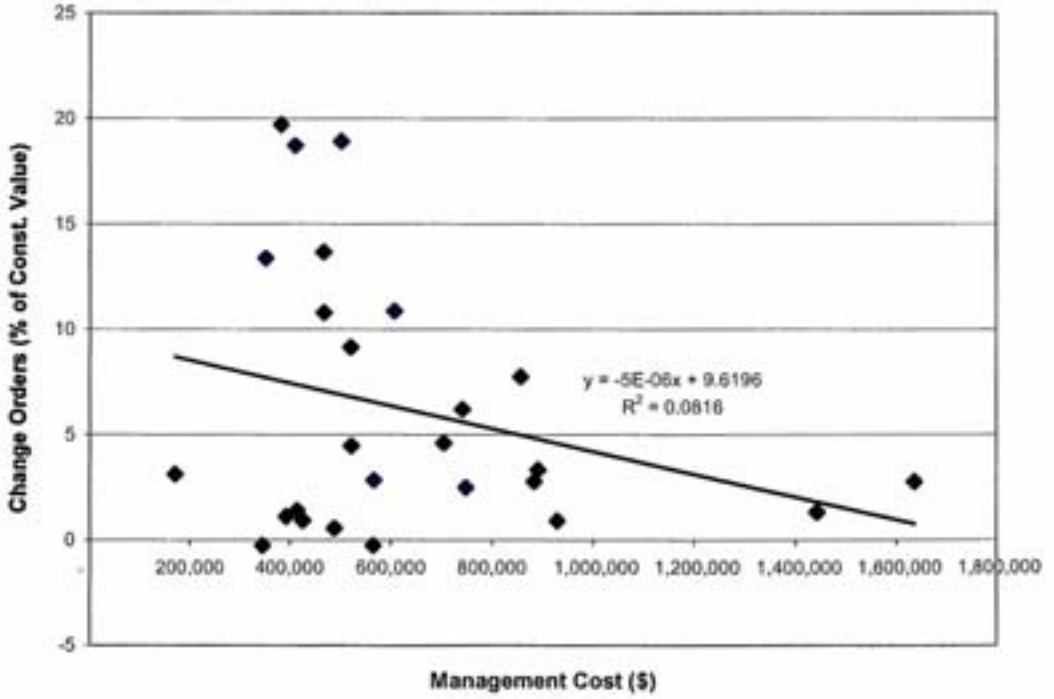


Figure 10. School Project Management Cost (dollars) Influence to Change Orders

Given that the school district manager is managing a project from the pre-design phase onward, one may expect that increased management cost would improve total project cost. Figure 11 tests this hypothesis. Figure 11 shows the relationship between management and total project cost. The x-axis of the figure is management cost (measured as a percentage of total project cost). The y-axis of the figure is change in total project cost (measured as a percentage change from the original budget for total project cost). The correlation coefficient for the best fit linear line is nearly zero (0.0005) but it appears that four data points may be deemed outliers (perhaps a down scope of the project) or are costs expenditure records that were in the original budget. Figure12 shows the same analysis but excluding these three points from the analysis data set. Figure 12 shows the revised plot with x-axis of the figure is management cost (measured as a percentage of total project cost). The y-axis of the figure is change in total project cost (measured as a percentage change from the original budget for total project cost). The correlation coefficient for the best fit linear line is still poor (0.0421).

The low R^2 values for Figures 11 and 12 show the difficulty of analysis of project data when examining the entire cost of a project. A project is a complex, long term endeavor with dozens of people and sub-processes all significantly contributing the process. Any analysis hoping to achieve a strong correlation value would need enough data to make all variables equal expect for a critical few under analysis. For the dozens of major potential influences on a typical project, this requirement for a strong correlation would require thousands of data points so that an analysis subset of projects with dozens of common variables could be extracted.

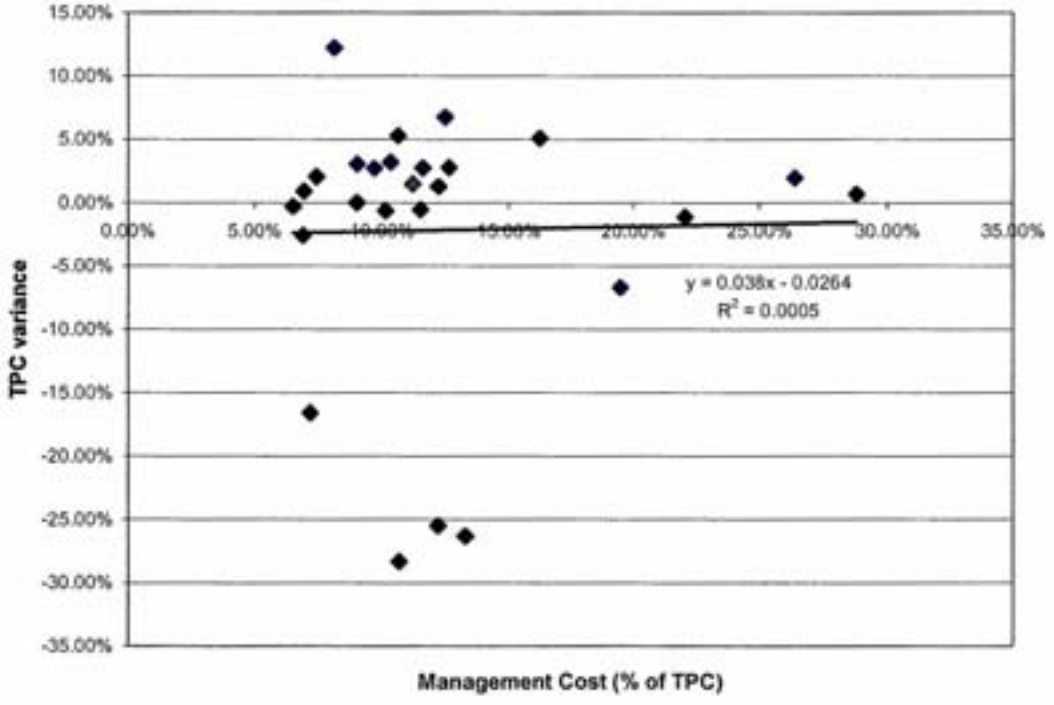


Figure 11. School Project Management Cost (dollars) Influence to TPC Variance

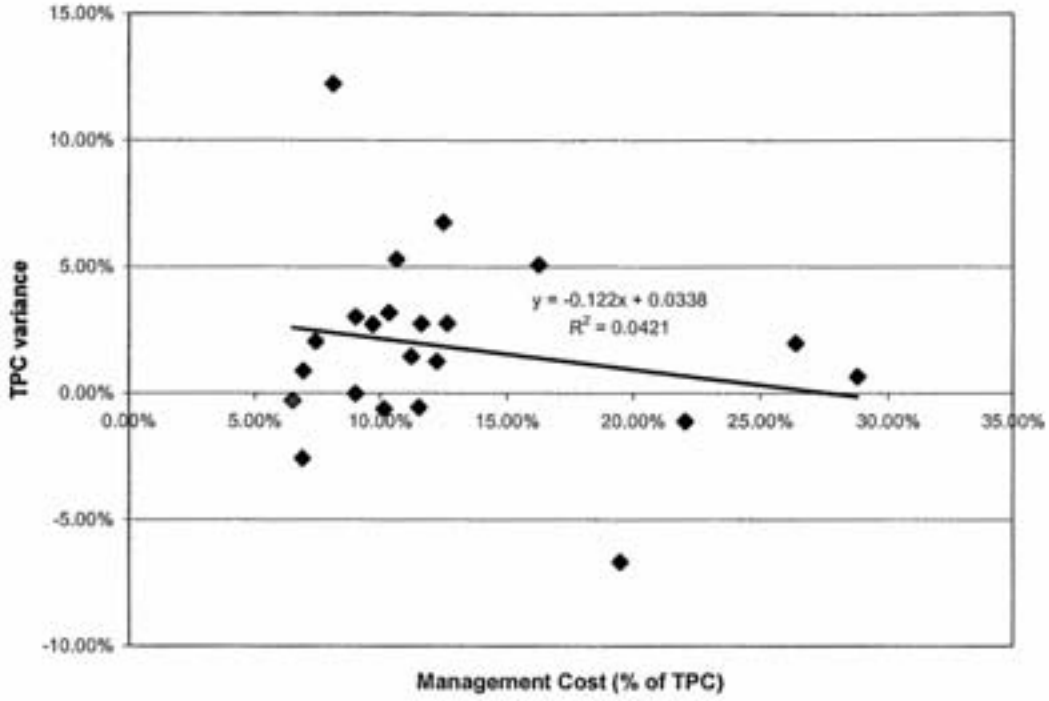


Figure 12. School Project Management Cost (dollars) Influence to TPC Variance – with excluded data points

Best Practices / Lessons Learned

Based on the preceding analyses, the following best practices / lessons learned have been identified:

- The largest projects (on average more than $50M) are managed by Outside Consultant Managers. Slightly smaller sized projects are also managed by In-house managers. The smallest projects (on average less than $25M) do not use a manager (either Outside or In-house).

- Nearly all projects (90%) projects were managed by managers with over 50% managed by Outside Consultant managers, 30% by In-house managers with a little more than 10% using In-house managers with additional responsibilities.

- Management costs (expressed as a percentage of total project cost) are on average lower for projects that use Outside Consultant managers than for projects that use In-house managers.

- Non-construction and construction costs (expressed as a percentage of total project cost) are nearly the same regardless of management use (Outside or In-house).

- The average change order value (expressed as a percentage of construction contract value) is much higher for projects managed by In-house managers (10.90%) as compared to projects managed by Outside managers (6.20%). No change order data was reported through the survey for projects that did not use a manager.

- The large majority (over 90%) of management services are provided in the construction phase (based on percentage of total expenditures for the services). *(Note: based on limited data)*

- Project management and project/contract administration were the most common management practices. Scheduling, estimating, and QA/QC were much less commonly used. *(Note: based on limited data)*

- A correlation exists between management costs (both Outside and In-house) and value of construction change orders. A linear statistical best fit line provides a slope of -0.8896, which means for every extra percentage of management cost, change orders will go down 0.89% (of construction cost).

- A threshold value for management costs of 3% to 4% of TPC is needed to be reached in order to control changes. Costs spent above the threshold value may have less impact on change costs; costs spent below this value appear to have a strong influence on change costs. Based on this threshold concept, a non-linear relationship (logarithmic) may exist.

- No correlation was found to exist between management cost and change in total project cost (measured as a percentage change from the original budget for total project cost).

Conclusions

This research project has analyzed data obtained from an online CMAA member survey done in early 2006 and data from completed building addition projects done within the Los Angeles Unified School District. The analysis has found a correlation between management cost and value of construction change orders. The researchers suggest that a threshold value for management costs of 3% to 4% of TPC is needed to be reached in order to control changes. Costs spent above the threshold value may have less impact on change costs; costs spent below this value appear to have a strong influence on change costs. Based on this threshold concept, a non-linear relationship (logarithmic) may exist. No correlation was found to exist between management cost and change in total project cost (measured as a percentage change from the original budget for total project cost). A significant limitation to this research project was the lack of data. Future research project should attempt to expand upon the initial conclusions of this study through collection and analysis of more data ad should attempt to identify specific management practices influence on all project costs

Appendix I. Survey Questions

General Information:

1. Company Name:

VIEW 124 Responses

2. Type of Respondent?

		Number of Responses	Response Ratio
CM Practitioner		32	23%
General Contractor		40	28%
AEC		1	1%
Public Owner		19	13%
Private Owner		17	12%
Architect		1	1%
Other		31	22%
	Total	141	100%

3. Please provide your key contact information (if you have already entered this once, you need not re-enter it):

VIEW 119 Responses

PART 1. PROJECT INFORMATION

4. Project Name

VIEW 132 Responses

5. Project Description? Type in description of project

VIEW 136 Responses

6. Project Location? Please, Type in State.

VIEW 135 Responses

7. Project Location? City

VIEW 135 Responses

8. Clientele (select one)?

	Number of Responses	Response Ratio
Government	53	38%
Private Sector	62	45%
Mixed	5	4%
Other	18	13%
Total	138	100%

9. Project Timing? Date (Month / Year)

VIEW 120 Responses

10. Type of Project (select category)?		Number of Responses	Response Ratio
Healthcare		7	4%
Housing/Lodging		33	21%
Developer		7	4%
Corporate/administrative/commercial		22	14%
Education/Institutional		46	29%
Other		41	26%
	Total	156	100%

11. If the project is healthcare, what is the sub-category of the project?		Number of Responses	Response Ratio
Hospital		3	60%
Clinic/outpatient facility		0	0%
Medical Office		0	0%
Extended Care/nursing		0	0%
Other		2	40%
	Total	5	100%

12. If the project is Housing/Lodging, what is the sub-category of the project?		Number of Responses	Response Ratio
Hotel/Motel		2	6%
Apartment/Condominiums		8	24%
Single Family		17	52%
Custom		5	15%
Other		1	3%
	Total	33	100%

13. If the project is Developer, what is the sub-category of the project?	Number of Responses	Response Ratio
High-rise office building	0	0%
Mid-rise office building	0	0%
Low-rise office building	2	33%
Shopping Malls (enclosed)	1	17%
Strip Shopping Centers	0	0%
Other	3	50%
Total	6	100%

14. If the project is Corporate / Administrative / Commercial, what is the sub-category of the Project?	Number of Responses	Response Ratio
General Offices	6	27%
Retail Stores	3	14%
Restaurants	2	9%
Other	11	50%
Total	22	100%

15. If the project is Education/Institutional, what is the sub-category of the project?	Number of Responses	Response Ratio
Classrooms	29	64%
Science/research labs	4	9%
Dormitories	0	0%
Sports/athletic facilities	3	7%
Other	9	20%
Total	45	100%

16. If the project is considered as Other, Please describe your project?

VIEW 33 Responses

PART 2: PROJECT SIZE / COST INFORMATION

17. Project Size (fill in values- use NA (Not Applicable) as needed)?

VIEW 126 Responses

Total Project Cost and Cost by Phase (fill in $ or use % - indicate which phases are included in the total project cost.

18. What is the Total Project Cost (in dollars)? This is the cost for all elements of the project (i.e. design, procurement, etc.) - not just construction.

VIEW 107 Responses

19. Do you know the Cost Breakdown Percentage (%)?

	Number of Responses	Response Ratio
Yes	46	29%
No	110	71%
Total	156	100%

Project Cost Breakdown (%) Information

20. What is the Cost Breakdown by Phase (% of total project cost)?

VIEW 40 Responses

21. Do you know the cost breakdown for non-construction costs?

	Number of Responses	Response Ratio
Yes	35	76%
No	11	24%
Total	46	100%

22. What is the cost breakdown for non-construction costs (% of total project costs)?

VIEW 28 Responses

23. Do you know the breakdown of the pre-design, design, bid / procurement costs?

	Number of Responses	Response Ratio
Yes	18	51%
No	17	49%
Total	35	100%

24. What is the cost breakdown of the Pre-design Phase (%)?

VIEW 10 Responses

25. What is the cost breakdown of the Design Phase (%)?

VIEW 10 Responses

26. What is the cost breakdown of the Bid / Procurement Phase (%)?

VIEW 10 Responses

27. Do you know the cost breakdown for construction costs (i.e. change order amount)?	Number of Responses	Response Ratio
Yes	35	76%
No	11	24%
Total	46	100%

28. What is the cost breakdown of Construction phase (%)?

VIEW 29 Responses

PART 3: CM SERVICES INFORMATION

29. Did the project use project / construction / program management services?	Number of Responses	Response Ratio
Yes	104	67%
No	52	33%
Total	156	100%

30. Were the management services provided by In-house	Number of Responses	Response Ratio

staff or Outside Consultants?		
In-house Staff	49	47%
Outside Consultants	60	58%

31. Were the In-house staff considered to be dedicated management staff (i.e. they had no other significant duties other than the management of the project)?	Number of Responses	Response Ratio
Yes	38	78%
No	11	22%
Total	49	100%

32. What type of contract was used to pay the Outside firm providing management consulting services?	Number of Responses	Response Ratio
Negotiated fixed fee	19	40%
Lump sum bid	1	2%
Cost plus fixed fee	7	15%
Time spent (with maximum or time and materials)	7	15%
Percentage of construction contract	11	23%
Other	3	6%
Total	48	100%

33. Who provided the Outside management consulting services?	Number of Responses	Response Ratio
Professional Management Firm	20	36%
Contractor / CM firm	21	38%
A/E / CM firm(extension of services)	13	24%
Other	1	2%

Total	55	100%

34. Who performed the Outside Consultant management services (please explain "other")?

VIEW 1 Responses

35. What is the total cost of PM / CM / Management Services ($)?

VIEW 61 Responses

36. Do you know the breakdown of the PM /CM / Management services across types of services (i.e. scheduling or estimating)

	Number of Responses	Response Ratio
Yes	14	13%
No	90	87%
Total	104	100%

37. What is the approximate breakdown of PM / CM / Management services (% of total cost of services)?

VIEW 6 Responses

38. Do you know the breakdown of the PM / CM / Management services cost into the project phases?

	Number of Responses	Response Ratio
Yes	11	79%
No	3	21%

Total	14	100%

39. What is the Cost breakdown of the PM / CM / Management cost across the following phases (%)?

VIEW 4 Responses

40. THANKS FOR ADDING A PROJECT TO THE DATABASE! Please use the space below to add any additional comments. To add another project, just restart the survey.

VIEW 39 Responses

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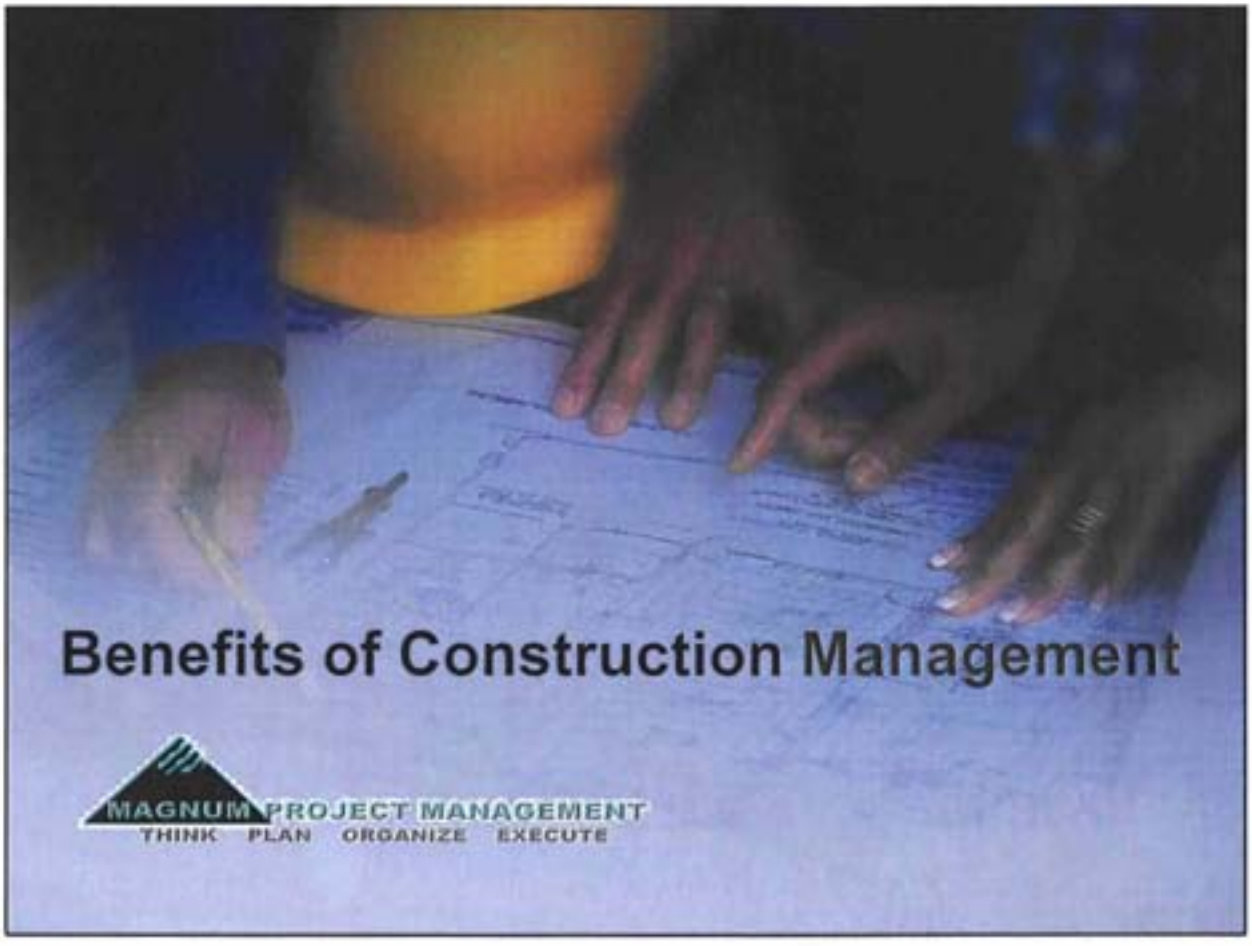
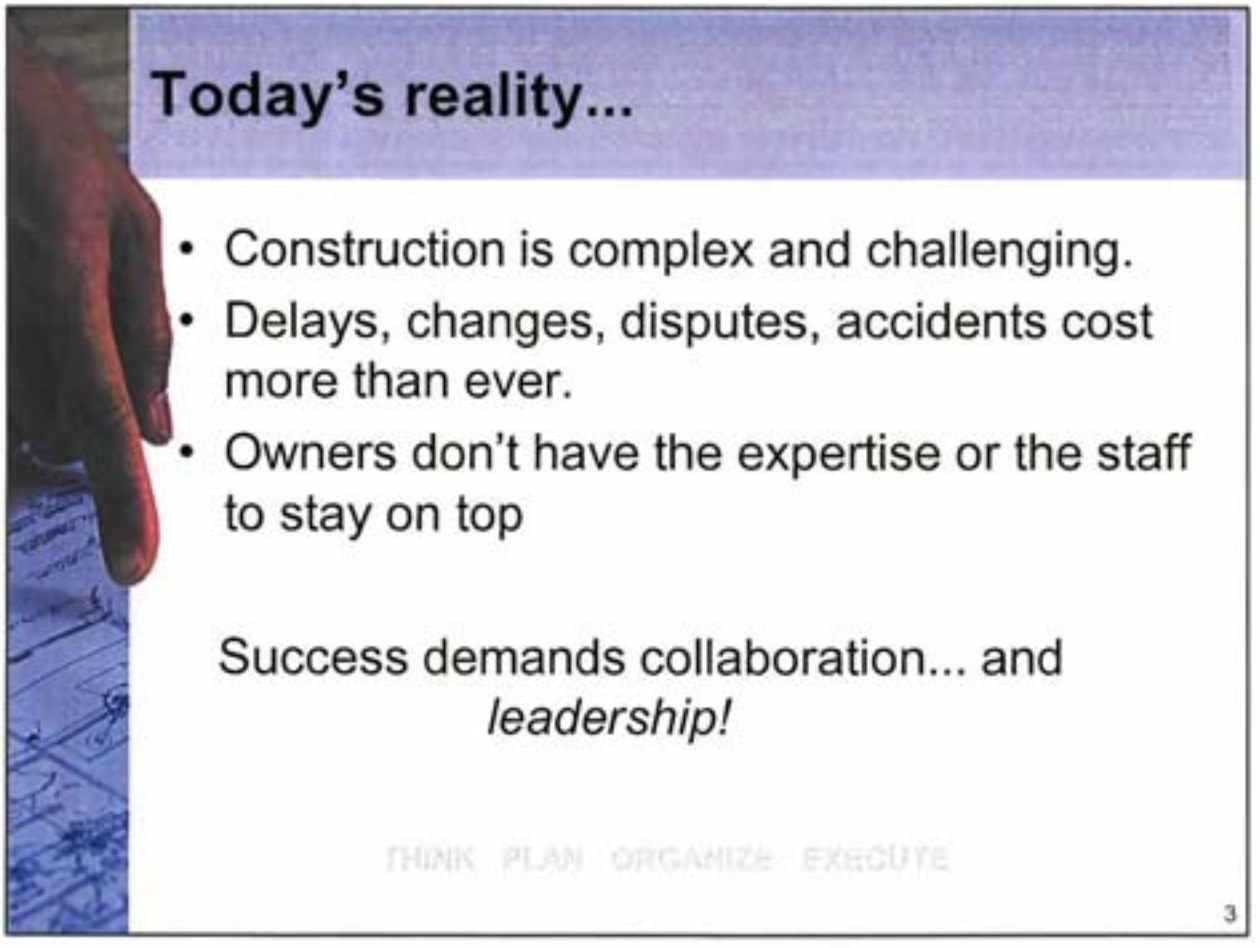
ATTACHMENT 4


Benefits of Construction Management
MAGNUM PROJECT MANAGEMENT
THINK PLAN ORGANIZE EXECUTE

MAGNUM PROJECT MANAGEMENT
THINK PLAN ORGANIZE EXECUTE
Randy Jenkins PMP
LEADERSHIP FOR PROJECT & PROGRAM SUCCESS
2


Today's reality...
• Construction is complex and challenging.
• Delays, changes, disputes, accidents cost more than ever.
• Owners don't have the expertise or the staff to stay on top
Success demands collaboration... and
leadership!
THINK PLAN ORGANIZE EXECUTE
3

What is Construction Management ?

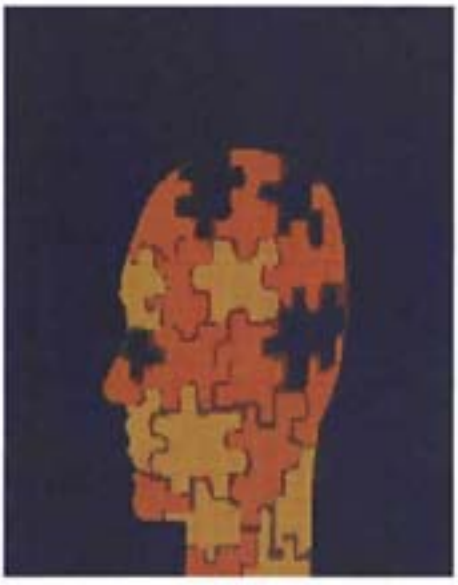
- **Construction Management is a professional service that applies effective management techniques to the planning, design and construction of a project from inception to completion for the purpose of controlling time, cost and quality.**

THINK PLAN ORGANIZE EXECUTE

4

Construction Management Values

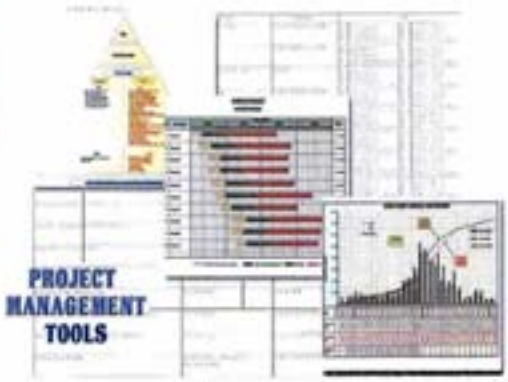
- Construction Management is a discipline and management system specifically created to promote the successful execution of capital projects for owners.
- These projects can be highly complex. Few owners maintain the staff resources necessary to pay close, continuing attention to every detail; yet these details can "make or break" a project.



THINK · PLAN · ORGANIZE · EXECUTE

5

The Client & Construction Management



- A professional CM firm can augment the owner's existing resources with pre-planning, design, construction, engineering and management expertise that can assure the best possible project outcome no matter what type of project delivery method is used.

Professional CM pays off in:

- Speed of project completion.
- Claims and dispute avoidance.
- Cost savings.
- Quality of finished job.
- Quality of the construction process.
- Project safety.

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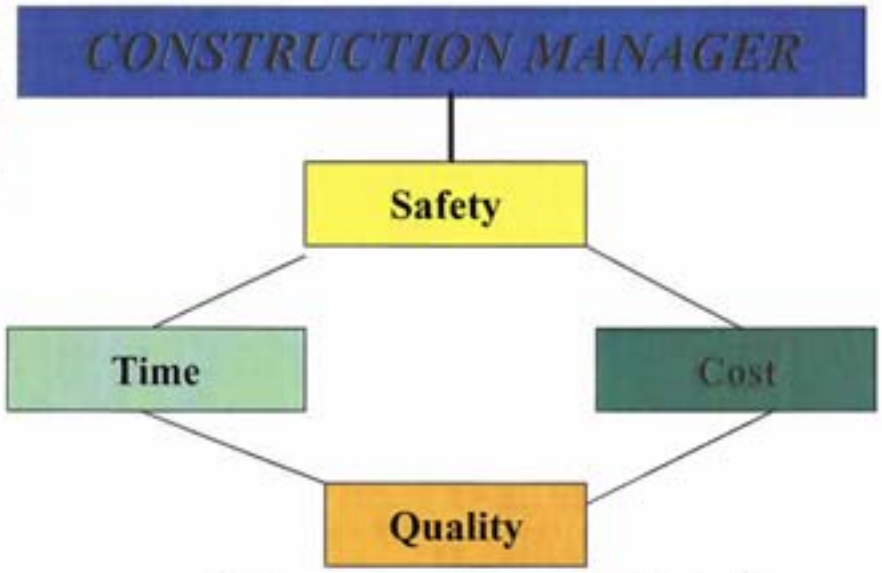
7

The CM works in the Owner's Benefit



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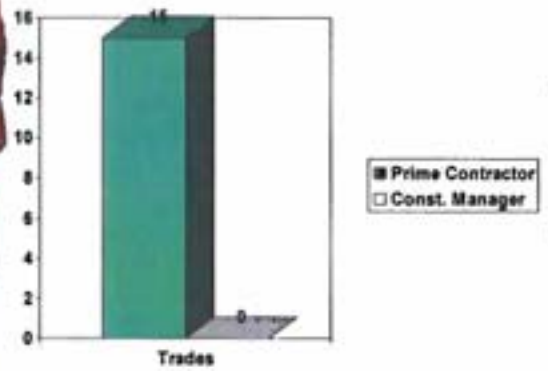
8

Tendered Projects



- A Prime Contractors lump sum contract has a profit and risk equation built in
- The market can sustain up to 15% mark-up on labour and materials
- Internal disciplines such as office administration, construction management and trades are marked up too

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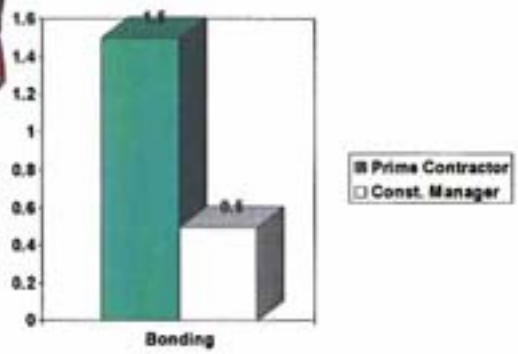
9

Bonding & Project Performance



- Client stipulated surety bonding typically costs up to 1.5%
- Often developers projects fail financially as well as, contractors fail to perform or go broke
- CM's recommend using risk analysis to pinpoint where bonding is sensible

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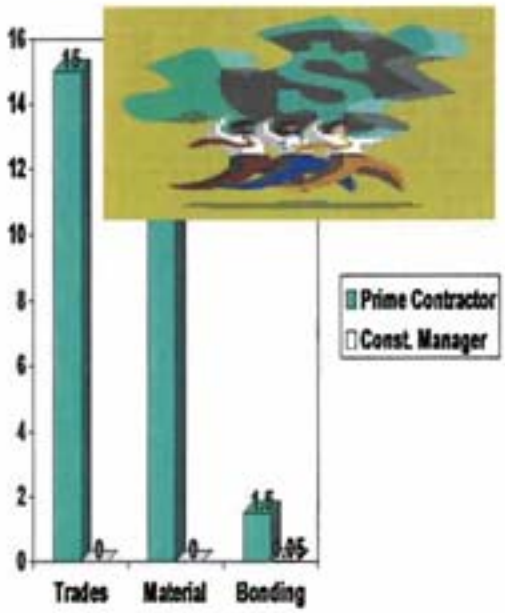
10

Cost Savings

The fact is …
dollars run away
without
Construction Management

- Trades
- Materials
- Bonding
- Owner Profits



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11

Magnum Project Management Ethics

THINK PLAN ORGANIZE EXECUTE

Owners need...

- Involvement in pre-construction and planning.
- Continued commitment all the way through project delivery and commissioning.
- Responsive leadership and collaboration throughout.

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13

Collaboration
• The new imperative for today's complex construction projects and programs.
• Collaboration is *everyone's* responsibility.
• CM provides leadership and coordinates a multi-disciplinary team.
• Owners don't want stars – they want successful projects.
THINK PLAN ORGANIZE EXECUTE
14

The new "master builder"

- A TEAM including design pro, construction contracting entity, and qualified trade subcontractors.
- Working *together...sharing* respect, knowledge, information and capabilities.
- Communication, recognition, acceptance of each team member's role.

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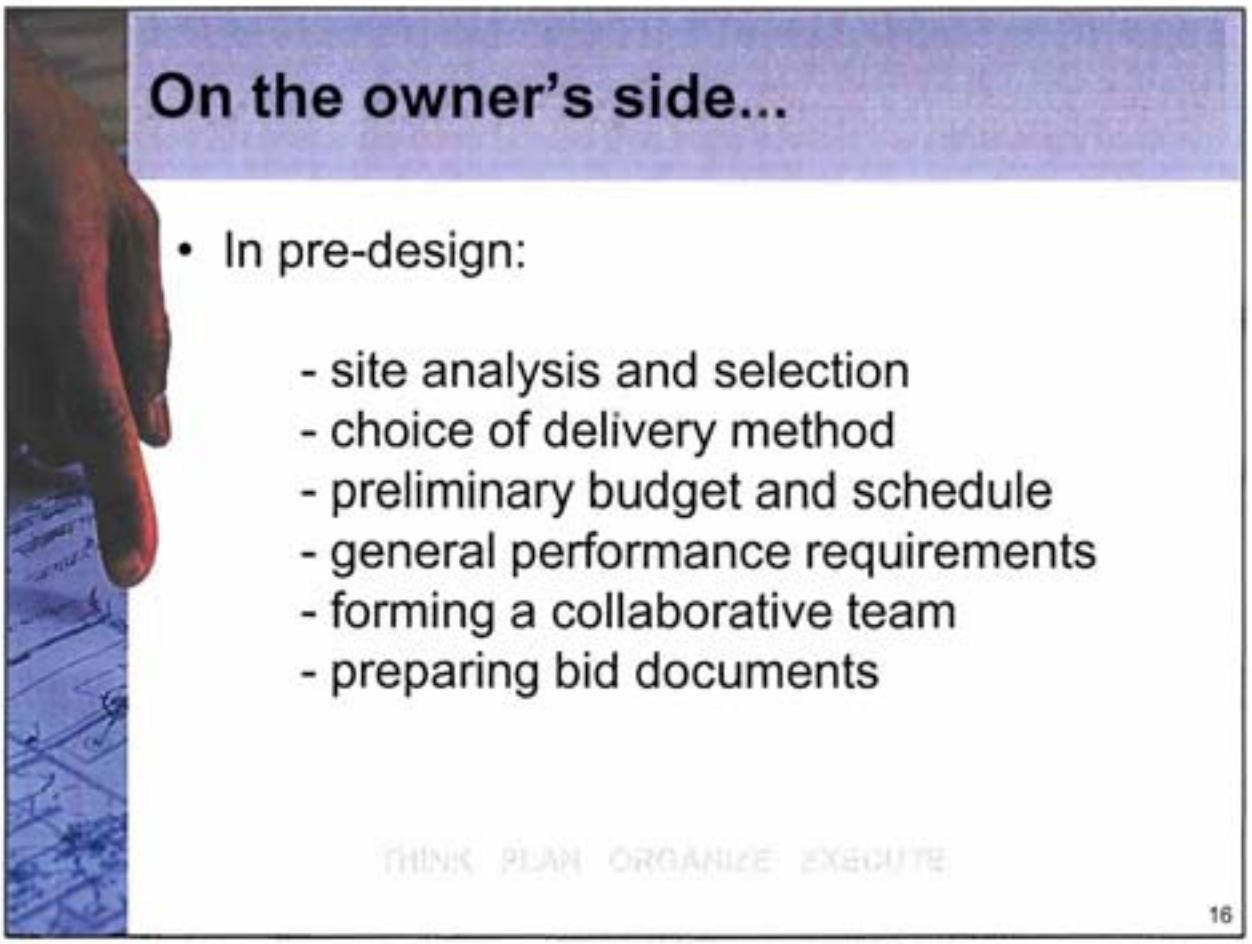
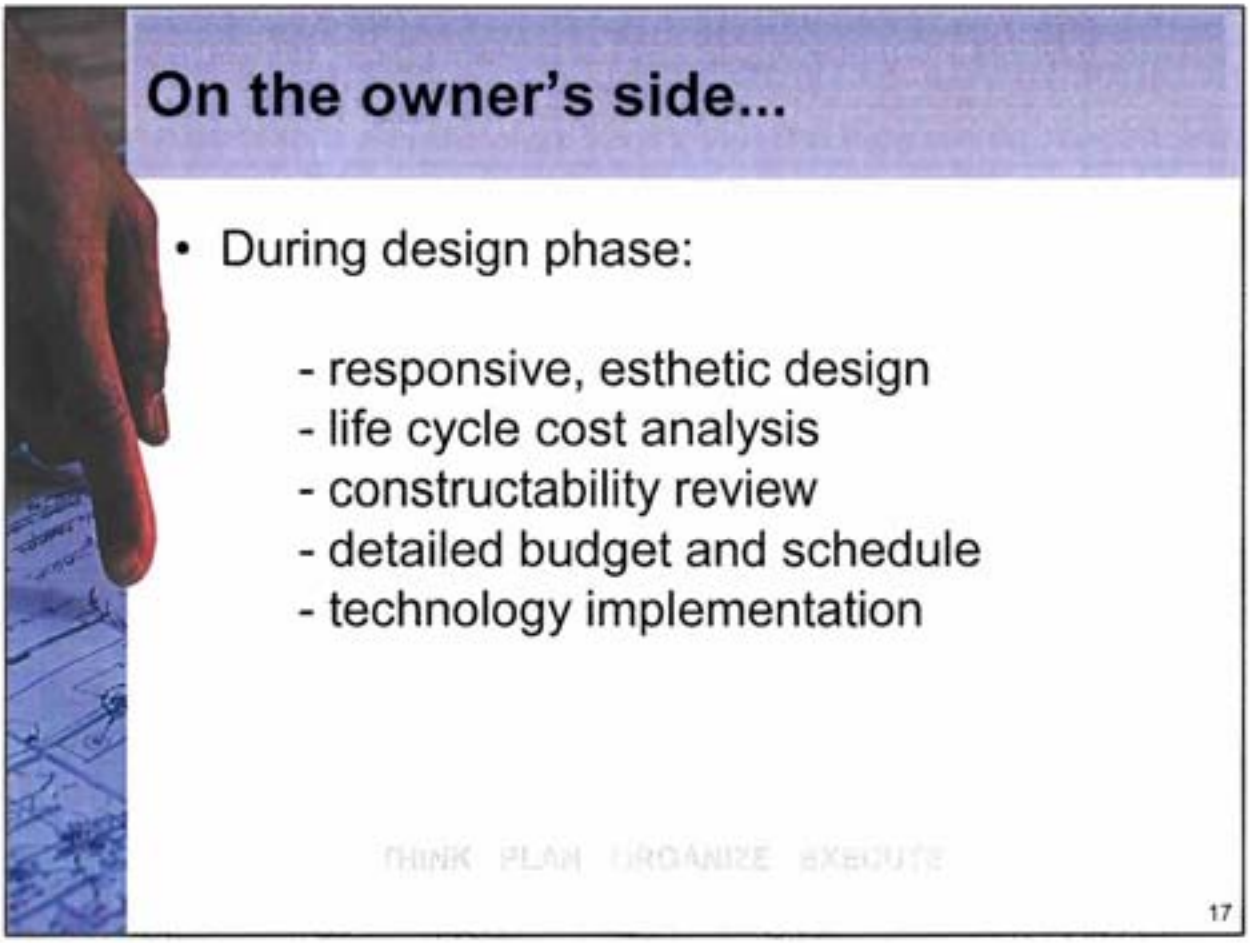
15


On the owner's side...
• In pre-design:
- site analysis and selection
- choice of delivery method
- preliminary budget and schedule
- general performance requirements
- forming a collaborative team
- preparing bid documents
THINK PLAN ORGANIZE EXECUTE
16


On the owner's side...
• During design phase:
- responsive, esthetic design
- life cycle cost analysis
- constructability review
- detailed budget and schedule
- technology implementation
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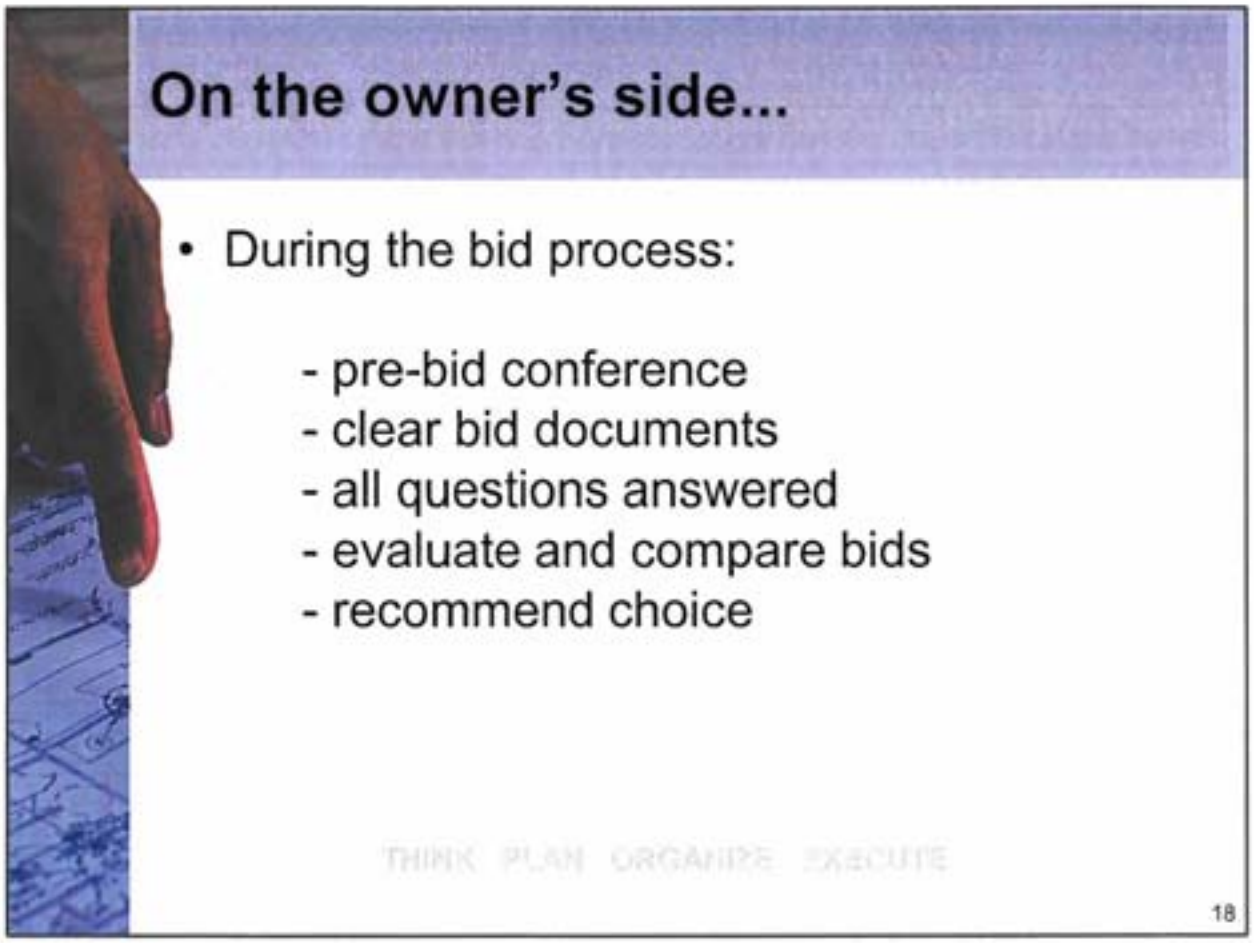
17


On the owner's side...
• During the bid process:
- pre-bid conference
- clear bid documents
- all questions answered
- evaluate and compare bids
- recommend choice
THINK PLAN ORGANIZE EXECUTE
18

On the owner's side...

- During construction:

  - timely and full reports
  - financial management and control
  - manage change order process
  - assure a safe workplace
  - minimize delays and disputes
  - manage close-out and commissioning

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19

What to look for:

- *Individuals* who have earned the PMP designation. [Project Management Professional]
- *Firms* with ISO 9000 qualifications.
  - ***INTERNATIONAL STANDARDS ORGANIZATION***
- *Firms* that encourage staff members to pursue certification as a sign of qualification & commitment to continuous improvement.

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20

MAGNUM PROJECT MANAGEMENT

THINK PLAN ORGANIZE EXECUTE

Honorable Dr James Lunney Mr. Jenkins Honorable Bob Mills

Mr. Jenkins recently met with Federal Energy Critic *the* Honorable Bob Mills regarding national energy strategies for a **Magnum Project Management** venture

Randy Jenkins PMP [Principal]

Member of: The Project Managers Institute – ISO 9000
The Vancouver Island Project Managers Association
Affiliate of The Canadian Management Consultants

250.752.3699 1.866.624.6868
1532 Sunrise Drive
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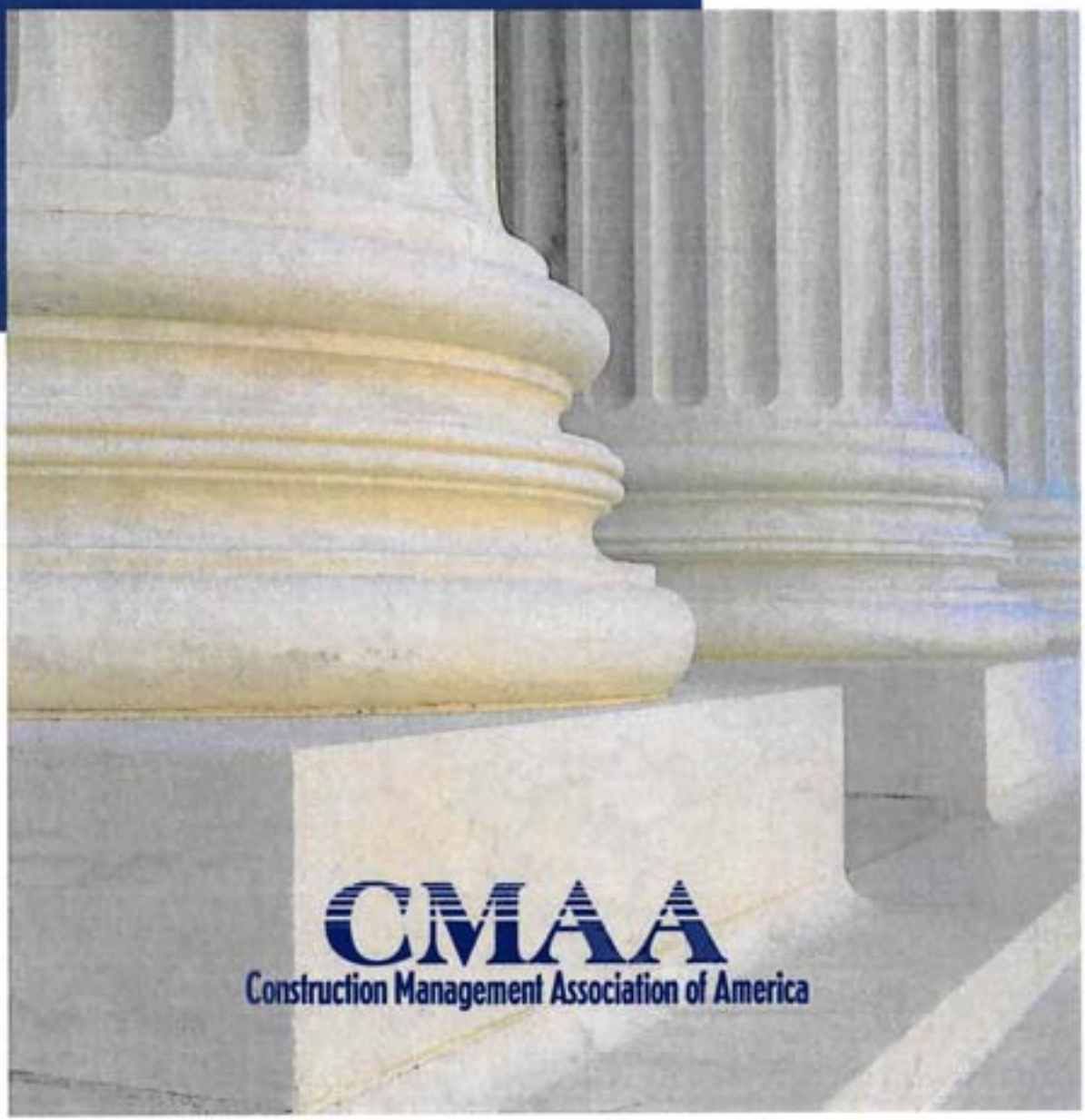
21

ATTACHMENT 5

Capstone:

The History of Construction Management Practice and Procedures



CMAA

Construction Management Association of America

1.0 THE CM AS A PROFESSIONAL

1.1 CM'S ROLE AND RESPONSIBILITIES AS A PROFESSIONAL

Construction management is the practice of professional management applied to the planning, design and construction of projects from inception to completion for the purpose of controlling time, scope, cost and quality. It is a management approach that focuses on the delivery of professional services. Construction management is a fundamental realignment of traditional construction relationships. It removes management functions from both the Contractor and the Designer and coalesces them in a specific entity, the Construction Manager (CM).

To engage in the profession of construction management requires training and advanced study concerning the specialized management services that a CM furnishes. An individual or firm possessing competence in this specialized management field and who is a CM as a livelihood furnishes a professional service to its clients. As a result, a CM will be held to a higher or professional standard of care with respect to its activities and business relationships. The application of this standard to the practice of construction management has far-reaching implications for the CM.

Construction management is a service business, and the CM performs those services that are specified in its contract with its client, the Owner. It is best to take a contract-based approach in determining the role and responsibilities of a CM with respect to the cornucopia of services offered by a CM from the pre-design planning through the design, procurement, construction, substantial completion and occupancy by the Owner and final completion of the project.

Defining the CM's role and responsibilities for a particular project cannot occur until:

- The scope of CM services is clearly defined.
- The type of Owner-CM contract is chosen.
- The responsibilities among the CM and other project participants are clearly coordinated.

The CM's role and responsibilities are affected also by (1) laws that regulate the construction management practice (e.g. those requiring certification, licensing or registration); (2) federal and state statutes and (3) case law interpretations.

There are several forms and variations of the construction management practice. Each has its own definition, characteristics and menu of services. All variations can be placed in either the "agency" or "at-risk" forms of construction management. The agency CM generally acts as the Owner's principal agent to advise on or manage the process from

project conception to completion, but does not perform design or actual construction work. When the CM's role includes a construction performance function for an established price, it is known as the "CM-at-risk" approach. The CM provides professional management assistance to the Owner prior to construction and advice on constructibility, budget and schedule considerations. The CM later converts to the equivalent of a contractor during construction. The key difference between these two forms is that the CM-at-risk is in fact a distinct delivery method due to its responsibility for construction performance. Agency construction management, on the other hand, is a distinct set of services that can be applied to any delivery method. Regardless of approach, the CM is performing professional tasks throughout all phases of program/project implementation.

1.2 HISTORICAL EVOLUTION OF CONSTRUCTION MANAGEMENT

Construction management had its beginnings in the early to mid 1960's. At that time, the need for capital facilities and improvements in the marketplace was in great demand. Major urban cities were in need of new or replacement facilities and infrastructure. The private sector had increasing demands for capital expansion and the Federal Government had major requirements for new and expanded facilities. And, the Americans were racing the Russians to the moon.

The type of capital projects needed across the marketplace was getting larger and more sophisticated. In addition, there was a demand by Owners for better time and cost controls, more accurate information, and a reduction in the risks associated with project delivery. Owners were looking for alternatives to the extended duration of the traditional approach and the need to reduce the overall time and cost associated with project delivery. This situation was compounded by:

- The increasing cost of money to finance capital expansion.
- Unpredictable labor demands.
- The need for additional, timely and cost effective facilities.
- The changing role of the general contractor from master builder to master broker.
- The ever increasing numbers of highly specialized trade contractors.

Owners were also seeking to streamline their complex capital construction delivery processes. They wanted timely delivery, with central controls, and a unified team approach. They also wanted priority attention given to their time, cost and quality objectives.

At the same time, major technology and methodology developments were occurring that would play a significant role in the evolution of construction management. First was the advent of the electronic computer and the information explosion which followed. Next

was the development of sophisticated scheduling techniques such as the critical path method (CPM). These were followed by other new techniques such as fast tracking, value engineering, life cycle costing, and constructibility reviews. These management tools and capabilities significantly enhanced the ability of the construction participants to be more successful in the delivery of capital projects.

Early Construction Management Projects

One of the earliest reported projects to use construction management was the New York City Madison Square Garden in 1963. This project was successfully managed by a CM acting as an agent of the Owner. Other early-on CM assignments include projects such as the 100-story John Hancock Center in Chicago, the twin 110-story towers of New York's World Trade Center, the John Manville World Headquarters building in Denver, First National City Bank Building in New York City, projects for the Universities of Ohio, Massachusetts, New York and Illinois; the Albany Mall Complex, Dallas/Fort Worth Airport, Ramapo State College in New Jersey, and the New Jersey College of Medicine and Dentistry, just to name a few. Since the construction and success of these early CM projects, the construction management practice has continued to evolve, refine and improve.

Construction Management in the Public Sector

The General Services Administration (GSA) was one of the pioneers with construction management in the public sector and the first of several federal agencies to begin using construction management. It all began with a 1970 study by GSA of its construction methods on Public Building Services Construction Contracting. GSA was primarily using the traditional project management approach and was not happy with the results being achieved in comparison to those achieved in the private sector. GSA wanted to capitalize on the experiences of the private sector and to change the way it had been doing its design and construction business.

The study concluded that the sequential method of contracting being used by GSA at that time, resulted in a total design and construction time on major building projects, of 59 months, compared to 24 months for similar projects in the private sector. Also, inflationary cost escalation was rampant while numerous delays occurred between the many consecutive design stages, and subsequent construction phases. Most significant was the requirement for returning to the Congress for separate construction appropriations, often after the design documents were completed and on the shelf awaiting funds. The report recommended that GSA abandon its outmoded procedures and use phased construction in conjunction with construction management in a new dynamic approach to its nationwide building program.

In 1971, GSA awarded its first construction management assignment and began its program with great enthusiasm, anticipating dramatic time savings ranging from one and a half to two years for its major projects. The first construction management contract let was for the new Federal Law Enforcement Training Center in Beltsville, Maryland. After awarding the construction management contract, this assignment was delayed and ultimately canceled. The first actual application of construction management by GSA was on the three Social Security Payment Centers located in Chicago, Philadelphia and Richmond, California with a total contract value of $97 million. These three projects also involved the first building system projects for GSA. In 1975, the $42 million National Air and Space Museum project located in Washington, D.C. became the first GSA project to be completed using construction management.

Other Federal Agencies which followed the lead of GSA include the Department of Health, Education and Welfare (HEW) and the Veterans Administration (VA). The volume and complexity of these capital programs and the shortage of in-house skills and/or resources were major factors in these agencies considering the use of construction management.

Problems with Construction Management at the Federal Level

After implementing construction management on more than a dozen major projects, including several projects involving building systems concepts, GSA abandoned the use of construction management in the latter part of 1979. This decision was based on the belief that the benefits expected by GSA were not being achieved. A number of reasons given for abandonment include:

- GSA moved too quickly without allowing time for change to occur.
- The government was not able to delegate the same authority that a CM would have in the private sector.
- Federal contracting procedures were cumbersome and not efficiently structured to accommodate the CM's role.
- Coordination and delay problems associated with multiple trade contracts were difficult to manage.
- A large number of claims and unexpected delays were encountered.
- All construction management contracts by GSA were priced on a lump sum and low bid basis. This resulted in disputes with a number of CMs.
- Funding restrictions caused problems. In certain cases, GSA took over part of the CM's role because of the lack of funds.

HEW (later Health and Human Services or HHS) began using the CM-At-Risk with a guaranteed maximum price (GMP) approach in the early 1970's. While some success with construction management had been reported, claims and litigation with a major project in North Carolina (Research Triangle Park) resulted in HHS imposing a national moratorium on construction management in March 1981. In September 1982, HHS issued a departmental policy that required approval by the Office of Facilities Engineering Director before construction management arrangements could be used on directly funded federal projects.

The VA used an agency CM approach to build a hospital in New York City during the mid 1970's. Unfortunately, this project also encountered delay claims and dampened the VA's further interest in using construction management for its projects.

With the abandonment of construction management, GSA basically returned to the traditional approach. However, in 1986, through the encouragement of CMAA leadership, GSA began to reconsider using construction management for its projects under a different format. After much study, GSA decided to use "Construction Quality Management" (CQM) as one of its options to manage projects. This time, instead of multiple prime trade contracts being coordinated by a CM acting as an agent, GSA began awarding a single construction contract to a general contractor and hiring a CM to act as GSA's agent under a CQM contract. Invitations for proposals for such services issued by the GSA, indicate that while the number of construction contracts changed, the basic principles and guidelines of the original *GSA System for Construction Management* essentially remained the same.

Construction Management and the Professional Associations

With the advent of construction management and the rapid trend among Owners toward using it, in 1972 the Associated General Contractors of America (AGC) adopted guidelines for its suggested approach to construction management. This was followed by the development of a family of standard contract forms for use by its membership. In establishing these guidelines, AGC maintained that it did not endorse construction management as a substitute for any other successful contracting format. Instead, AGC reasserted its long-standing position relative to competitive bidding, while at the same time it recognized that the construction management type contract does present certain distinct advantages on some projects.

The American Institute of Architects (AIA) likewise embraced construction management as a viable alternative and they too published a family of construction management documents in 1976.

In August 1975 the National Construction Management Committees of AGC, AIA, and the American Consulting Engineers Council (ACEC) met together for a joint national Construction Management Council. A general statement and position paper was unanimously adopted by the joint council and ratified by the Board of Directors of AIA, AGC, and ACEC. These associations recognized the importance of the construction management process and agreed to work together on a National Comprehensive Construction Management Program to implement the following:

- To define, develop and disseminate the standards and levels of quality of construction management.
- To develop guidelines and educational programs for the assistance of members and Owners engaged in construction management.
- To relate and coordinate with all elements in the industry performing construction management services to develop acceptable industry-wide standards for construction management.
- To monitor and to make joint recommendation regulations at the federal, state, and local levels affecting construction management.
- To communicate and maintain liaison with the Owners and users of construction management services, advising and assisting them on the best and most economical procedures.

While the intent and the objectives stated above were sound, the joint national cooperation and central focus on standards, quality, education and legislation, never became a reality. Despite their good intentions, none of these organizations are primarily devoted to the practice of construction management, and each has its own vested interest in the marketplace.

Founding of the Construction Management Association of America

In October 1981, representatives of 37 firms practicing construction management met to explore mutual interest in forming a national construction management association. The overwhelming consensus of the group was that there was a very real need for a national organization having the growth and development of the construction management profession as its primary focus. Meeting the challenges of the critical issues raised within the construction management discipline—such as definition of scope, standards of practice, ethics, education, client awareness, and legislative and professional liaison—clearly required a concerted effort by a group representing a national perspective. As the result of a strong common interest, the Construction Management Association of America (CMAA) was formed and incorporated in 1982.

CMAA's membership includes CMs, Designers, Contractors, educators, vendors, public and private Owners, and attorneys representing a broad spectrum of the construction industry that share a common interest in construction management. There are regional chapters throughout the country as well as a number of student chapters on college campuses.

CMAA provides a unified voice for the construction management industry in those areas where collective representation and action as an association is the best method of achieving common goals. CMAA's goals include:

- Setting standards of practice and developing contract documents for construction management.
- Expanding the understanding of the construction management concept and its use in the marketplace.
- Research and education to assess and advance construction management performance.
- Providing a network of information resources and business contacts.
- Advocacy for construction management in the legislative, regulatory and judicial arenas of federal, state and local government.
- Certification of individual construction management practitioner knowledge and capabilities.
- Leadership and consensus-building on critical issues, such as safety, quality management, insurance and qualifications-based procurement of construction management as a professional service.

Standard Forms of Agreement

Over the past two decades, there are a number of Standard Form CM Agreements that have been developed and are currently offered as guides for establishing a contract between the Owner and a CM. Standard forms are now published and made available by CMAA, AGC and AIA. While these forms have similarities, each association takes a different approach to the CM's function and tends to reflect the perspective of their members. All three associations publish complete sets of ready-to-use companion documents.

The process of developing the CMAA contract documents began in 1983. These documents, after considerable review and public discussion, were finalized in 1990. The strategy in drafting the CMAA documents was to provide contractually specified duties and to avoid redundant or undefined responsibility. The objective of the CMAA

documents is to minimize conflicts between the CM, Designer, Contractor and Owner by treating each of the parties fairly and allocating specific risks to the party that is best able to manage that risk. The standard forms of agreement are reviewed and updated periodically to ensure adherence to this principle.

Notwithstanding the above, many Owners and CMs have developed their own contract documents, which are usually similar to the above, but may be more self protective. Public sector Owners tend to be the least flexible to changes to their standard contract documents since they may be bound by statutes reserving contracting authority, limiting any delegation of authority, and complying with the rules for open competition and conflict of interest.

When an Owner engages the services of a CM, it is essential that the contract documents are clearly understood by the parties in terms of the roles of each party, the responsibilities assumed by each party, and more importantly, the responsibilities and liabilities of other contracting parties.

Standards of Construction Management

The past lack of a definition for construction management, coupled with the variable services that CMs offer, has over the years created a need for acceptable standards of practice. As a professional association, CMAA took the initiative in 1983 to establish *Construction Management Standards of Practice* guidelines for construction management. The first edition was approved by the CMAA Board of Directors in 1986 and made available to the public in early 1987. Since then, these guidelines have been updated several times. CMAA believes that its current standards of practice and standard contract forms provide for the definition of construction management the construction industry needs.

The *Construction Management Standards of Practice* was developed by CMAA in response to what the Association believes to be a broad industry need for a unified document, which generally outlines the depth and breadth of services which may be required of a CM.

By definition, a standard establishes a criterion by which the performance of those who subscribe to it may be measured. The CMAA standards are intended as a guide to the range of services that constitute professional construction management. They seek to meet the documented need for the definition of what construction management services are, without unduly structuring the methodologies by which those services are provided by the CM for a particular project. The standard guidelines are not intended to include any hard fast rules of procedure, and they are not considered to be a detailed procedures manual. They do, however, establish the basis for the development of such a document for use on a particular project.

The *Construction Management Standards of Practice* provides standard definitions and addresses seven primary areas or functions including:

- Project Management
- Time Management
- Cost Management
- Quality Management
- Contract Administration
- Safety Management
- Program Management

Each function is further broken down into five phases: pre-design, design, procurement, construction and post construction. These phases are consistent with the CMAA suggested scope of services contained in the CMAA contract documents and with established usage in the construction industry.

Certification of a Construction Manager

The terms licensing, certification and accreditation have been discussed as having application to the practice of construction management for some time. These discussions generated questions such as: Would licensing or certification of a CM apply to an individual, corporation, or both? What would be the basis for qualification and examination? What standards would be used for measurement? Who would administer and control the process? What about long term compliance? Are there any legal ramifications?

What about the existing licensing or registration laws for architects, engineers, planners and general contractors? Are these laws adequate for CM qualification? The scope of services rendered by a CM encompasses a broad range of professional skills, management knowledge and experience. The fact that a CM is certified or licensed in any other profession does not per se establish it as a qualified CM. Practitioners in construction management may include all the named categories, but the individuals and firms practicing and rendering construction management services must be knowledgeable and experienced in the technical and management areas required.

To certify means "meeting a standard." With *Construction Management Standards of Practice*, standard contract forms, and a body of knowledge already established, CMAA took the next step. In late 1986, the CMAA Board of Directors authorized the development of a model certification program. A committee presented its recommendations and a certification program for individuals was given serious consideration. After much study,

the Board of Directors approved in June 1993, a program to certify the individual as a construction manager and thus clearing the way for implementation of the current CM Certification Program. This certification is recognition that an individual has voluntarily met the Certification Program's criteria with regard to experience and knowledge necessary to practice professional construction management at a minimum acceptable level. A practitioner who meets all of the certification requirements is designated a Certified Construction Manager (CCM).

Summary

John F. Kennedy made the statement that "success has many fathers." The same can certainly be said for construction management, but with more purpose, since its performance takes many forms. The theory and application is as old as construction itself and some have even likened construction management to being very much like "old wine in new bottles."

In 1973, an article entitled "How to Avoid Construction Headaches" appeared in the *Harvard Business Review* magazine. The article stated:

> *"The construction management concept has been touted by some of its more evangelical proponents as a major breakthrough in the history of building, but it is really not a single new discovery. Instead, it is a mixed bag of techniques and procedures, dating back to antiquity, which have been fused together under the pressure of the present building crisis. The catalyst for this fusion has been the owner's determination to force the construction industry to regard a highly fragmented series of discrete decisions and events as a single process. In other words, the owners have argued that the building process can be effectively managed.*
>
> *It now appears that they are correct. The construction management concept has been applied—and has worked—in many cases and under a wide variety of circumstances. The construction management approach is one of the more exciting and promising developments in the field of facilities construction, and it represents an alternative to traditional procedures of which all potential construction owners should have the right to be aware."*

Given how construction management has developed as a professional practice and demonstrated its ability to work successfully with any contract format and project delivery method, these comments appear to be quite prophetic.

1.3 ETHICS

The concept of professionalism has always been closely associated with ethics. Most professional associations have developed codes of ethics to guide the professional behavior of their members. Whereas ethical codes are important and serve as general

guides, they usually do not address all of the many facets of ethical concerns that are intimately woven into the fabric of everyday practice in our profession.

To establish a meaningful sense of ethical practice, it is important to first establish what we really mean by ethics. Is it law? Is it religion? Is it morality? Some states have seat belt laws; to not comply is illegal, but not unethical or immoral. If you do not go to church, it is not illegal or unethical, but based on your religion, it might be immoral. If you speak derogatorily about a client or employee, it is probably immoral. Is it ethical to review the work of other professionals? What happens when a client requests you to review the work of others? Is it ethical to wine and dine a client to obtain business? How much can you spend on a client before it becomes ethically questionable? Is it ethical to make political contributions to gain work? Is it ethical to try to take work away from others? Is it ethical to try to gain an advantage by trying to maliciously injure the competition? Is it ethical to low ball a fee? Many codes of ethics say you should not competitively bid professional services. How do you get work in the states and cities that bid their work? Ask yourself, "Is it ethical to do many of the things we do everyday?"

There are some simple guidelines you can follow in trying to gauge whether or not your decisions and actions move beyond the bounds of ethical practice:

- Don't do anything that will embarrass you if you read it on the front page of the newspaper tomorrow.
- If you have to think about it twice, it's probably wrong—normally your gut reaction is right.
- You cannot use the end to justify the means.

Ethics Start with Marketing Ethics

Ethics start with marketing of professional services. A good marketing program is essential to survival, but unfortunately, construction management services are susceptible to overselling. Overselling may appear at the time as a subtle transgression, but it becomes far less subtle when a disappointed Owner regrets its selection of a CM and begins to have misgivings about the construction management profession itself.

On projects where the scope is vague, it becomes important to clarify the scope up front and put this in your proposal. As one practitioner stated, "We frequently don't get the jobs we understand." This is particularly true when you do the first phase and know what it takes to finish the job. Give it your best price and deal with it fairly. Inadequate fees mean either a poor quality product or a financial loss. If you cannot do a quality job for the price then walk away. Integrity is one of your best marketing tools and much of your reputation boils down to doing what you say you will do. Overselling and accepting fees where you do not have enough money to do the job are clearly ethical questions. In short:

- Do not sell people you don't have.
- Do not bait and switch.
- Do not sell what you do not plan to deliver.
- Compete fairly with your competitors.

Failure to deliver what you have promised and attempting to sell your services by discrediting your competition are among the most unethical offenses that a professional can commit.

Project Delivery

Balancing fees with resources and quality of product to meet professional standards is probably the biggest challenge facing the construction manager. Project control becomes all important. Lack of adequate control can put you in a position of making the decision," Do I put what I need to into this project to finish and give a quality job and lose money, or do I cut back and minimize my costs to avoid a loss?" This becomes both a business and ethical issue and it presents a difficult dilemma. Most reputable firms will put reputation above loss, but then again the firm would have to have the ability to absorb the loss. The obvious answer is to not contract for inadequate fees, to maintain sufficient project control and to make the necessary decisions that keep you from getting in this situation in the first place.

A summary of the ethical aspects of project delivery might be:

- Deliver what you promise.
- Balance your fees against resources needed and quality of product.
- Implement project controls that will maintain that balance.
- Maintain your professional standards.
- Do not compromise quality for schedule.
- Do not assign responsibility where the training is not adequate.
- Be up front with your client.

Training and recruiting are also ethical issues. The two most common complaints of people leaving construction management firms are:

- Being turned loose on a job and not being adequately trained or directed as to what they are to do.
- Not doing what they were told they would be doing when hired.

Honesty

As construction managers, we all struggle to survive and prosper in a highly competitive and increasingly litigious society. We can find ourselves brought into litigation where we are not at fault and bear no responsibility. Frequently we find that the most advantageous decisions economically may not be compatible with ethical considerations. During periods of economic downturn it becomes even more difficult to keep ethics in the forefront of our daily practice.

As a professional, the CM provides many services, but aside from its technical expertise, the main thing it is selling is integrity... it is selling trust. When the CM fails to provide this, it damages it reputation, and it hurts the profession.

It is always easier to tell people what they want to hear. Doing what the client wants as opposed to what the facts show is an ethical issue. Do not compromise integrity and do not succumb to client pressure when what you are being asked to do is dishonest. Disclose to the client any circumstances that might compromise your judgment or prevent you from serving in the client's interest. Be willing to admit your mistakes.

The CM is usually in the role of "Team Leader" on projects, and as such, it has the responsibility to maintain the highest standards of ethical practice. The very foundation of successful partnering in construction is honesty and fair play. When asked to comment on ethics in professional services, one leading professional said "I can sum it up in three words... honesty, honesty, honesty!" If the CM does not view its professional services as being synonymous with honesty and integrity, then it is likely in the wrong business.

ATTACHMENT 6

contact us direct
703.356.2622
E-mail

privacy policy
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CMAA Mission and Vision

CMAA Mission & Vision

The Mission of CMAA is to promote and enhance leadership, professionalism, and excellence in managing the development and construction of projects and programs.

The Vision of CMAA is to be the recognized authority in managing the development and construction of projects and programs.

CMAA is leading the growth and acceptance of construction management as a professional discipline that can add significant value to the entire construction process, from conception to ongoing operation.

Membership in CMAA includes more than 6,000 firms and individuals. Owners, engineers, architects, contractors, educators, students...everyone with a stake in the construction industry's success.

All parties to a project are vitally interested in excellence of execution--including rapid completion, high fidelity to specifications, conscientious cost control, and optimum use of all resources. Professional construction management delivers these values.

What Do We Stand For?

The professional construction management services concept has grown out of a universal recognition throughout the design and construction community that quality-focused, cost-effective, dispute- and injury-free project delivery does not occur without a deliberate commitment and effort to manage the project delivery process. The cost and complexity of today's capital projects, the importance of time, and the need to deal with unanticipated events and unforeseen conditions all argue the need for an integrated and managed approach to planning, design, and construction of the built environment.

Owners are faced with an array of project delivery options, each of which involves costs and benefits matched against the needs of the owner and the specific project. The task of management is to ensure that the value of those various project delivery methodologies is realized in achieving the owner's objectives.

Professional construction management services are selected on the basis of qualifications and experience matched to the needs of the owner and the project and compensated on the basis of a negotiated fee for the scope of services rendered. This approach results in a cost-effective, dedicated representation of the owner's interests free from potential conflicts with regard to the cost of the project.

Ethics and Accountability

In 2006, the CMAA Board of Directors proved its commitment to good governance, accountability, and ethical integrity by establishing a new reporting system, which will allow CMAA members, non-members, vendors, and staff to submit questions, issues or concerns anonymously online or by phone. We respect and value your feedback, and hope that you will feel comfortable using the SilentWhistle website to communicate with us. Please **click here** to access the website.

ATTACHMENT 7

OTAYWATERDISTRICT

1296-3 2.0 Million Gallon Reservoir Project

CONSTRUCTION MANAGEMENT & FIELD INSPECTION MANUAL

February, 2009

CONSTRUCTION MANAGER

VALLEY
Construction Management

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INTRODUCTION

The purpose of this manual is to Project inspection and Construction Management Services for the CM Project. The booklet is intended as a guide to both the Valley CM Construction Management Team and representatives of the Owner.

The purpose of this manual is to establish standardized methods for contract administration and field inspection to be used during the construction of the **1296-3 Reservoir Project**. The procedures were established to facilitate the construction work and monitor that the work will be done in a manner consistent with the requirements of the Contract Documents. This manual provides an outline of procedures, delineates lines of authority and communication, and defines areas of responsibilities and includes copies of forms to be used during construction. The manual is intended as a guide to both the Valley CM Construction Management Team and the Owner.

This reference manual is not intended to supersede the Contract Documents. The Contractor shall be required to comply with all Federal, State and Local laws and ordinances applicable to the work.

PROJECT SUMMARY

DESCRIPTION

PROJECT:	Otay Water District 1296 Reservoir Project
CONTRACT NO.:	P2143-001103
CONTRACTOR:	Natgun Corporation
DESCRIPTION OF WORK:	2.0 Million Gallon Reservoir Construction
AWARD AMOUNT:	$2,373,220
NOTICE TO PROCEED:	2/10/09
ORIGINAL CONTRACT TIME:	365 Calendar Days

KEY CONTACTS

OWNER: Daniel Kay, PE 619-670-2247

CONSTRUCTION MANAGER: Paul Mochel, PE 858-444-6804

RESIDENT ENGINEER: N/A

CONSTRUCTION INSPECTOR: Jon Chambers 619-987-6371

CM FIELD OFFICE: N/A

CONSTRUCTION STAKING: Per Contractor

GEOTECHNICAL OBSERVATION & SOILS TESTING: Per Contractor

SPECIALTY INSPECTION: Per Contractor

CONTRACTOR: Mike Dufresne 949-585-5111

DESIGN ENGINEER: Otay Water District

OTHER: N/A

LINE OF COMMUNICATION

The Contractor's main point of contact for this project will be the Construction Manager or their designated representative. All correspondence and communication (Letters, RFI's, Submittals, etc.) shall be hand delivered, emailed or sent standard mail to the Construction Manager. Field Memoranda can be issued by the Construction Inspector upon approval by the Construction Manager.

In turn, the Construction Manager and their representatives will communicate only with the Contractor's designated representative and will not normally communicate with subcontractors or suppliers. If it becomes necessary to take direct action with a subcontractor or supplier, the Contractor will be immediately advised.

The Construction Manager and their representatives will be responsible for all communication with the Regulatory Agencies as well as the public unless required as a condition of a contractor obtained permit or the contract documents. Any communications to the Contractor by the Regulatory Agencies shall be directed through the Construction Manager.

Correspondence can be either hand delivered to the project field office or sent to the Construction Manager's Main Office at:

Attention: Paul Mochel
Valley Construction Management
3525 Del Mar Heights Road #192
San Diego, CA 92130
Phone: (866) 966-2720 (office)
(858) 444-6804 (mobile)
Fax: (858) 408-3414
Paul.mochel@Valley CM.com

RESPONSIBILITIES

1. **Owner – Otay Water District**

   The following are the main representatives of the Owner:

   - Daniel Kay, PE Project Manager

2. **Construction Management Firm – Valley Construction Management**

The Construction Management Firm acts as the Owner's representative and is responsible for the overall coordination, observation, and administration and completion of the project in accordance with the drawings, specifications and scope of work. The staff assigned to this project are directly responsible to the Construction Manager.

3. **Construction Manager – Paul Mochel, PE**

The Construction Manager is the Owner's representative and is responsible for overall coordination, observation, and administration of the project and completion of the project in accordance with the drawings, specifications and scope of work. The Construction Manager will typically be responsible to schedule, provide notification, chair, attend, and prepare minutes for the weekly job-site meetings, coordinate soils testing and construction staking, review construction schedule, monitor status of shop drawings, RFI's, field memorandums, field orders, proposed contract modifications, and coordinate the work with Regulatory Agencies (main point of contact with the office staff), and prepare and maintain all paper work. He will also fill in for the Construction Inspector, in case of illness, vacation, or emergency. All written communications on the project shall be processed through the Construction Manager.

4. **Resident Engineer – N/A**

The Resident Engineer is responsible for both Construction Management and Inspection duties outlined in this section (Responsibilities) and that are required by the contract.

4. **Construction Inspector- Jon Chambers (Otay Inspector)**

The Construction Inspector is directly responsible for observing the work of the Contractor to assure that the construction meets or exceeds project plans and specifications. The Construction Inspector will provide as-needed observation when construction activity is in progress. All field communications (written and verbal) on the project will be processed through the Construction Inspector. The Construction Inspector will be the main point of contact for regulatory agency inspectors. The construction inspector will also coordinate with SWPPP inspectors, specialty inspectors, geotechnical firms and surveyors as required by the contract.

5. **General Contractor – Natgun Corporation**

The Contractor is responsible for the performance of the work called for in the specifications and shown on the drawings in accordance with the Contract Documents.

SAFETY

In accordance with generally accepted construction practices, the Contractor shall at all times be solely and completely responsible for conditions of the jobsite, including safety and security of all persons and property on the jobsite during the performance of the work, and the Contractor shall fully comply with all state, federal and other laws, rules, regulations and orders relating to the safety of the public and workers.

Except in cases of imminent danger, Valley CM's staff should work through the contractor's on-site project

manager or superintendent to correct safety violations.
If Valley CM staff encounters an unsafe condition on the job-site that does not pose an imminent danger, including the discovery of asbestos or other toxic materials, the contractor's on-site representative will be notified immediately. Valley CM staff will explain that they have observed what they believe to be an unsafe condition which may require immediate attention. Valley CM staff will not stop the work or recommend corrective action. Valley CM staff will record the notification to the contractor in the Daily Report, but will not put it in writing to the contractor at this point in time. If the contractor's on-site representative does not take prompt action to correct the hazardous condition, the contractor will be notified in writing of the potential hazard and the situation will be monitored.

Valley CM has no responsibility to seek out hazardous conditions, and it is important that Valley CM staff does not voluntarily assume that responsibility. Valley CM staff will not attend the contractor's safety meetings, nor review, or otherwise provide detailed comments, of the contractor's safety program. (Note: Safety programs submitted by the contractor as part of the project should be looked at to verify that the contractor does, in fact, have a safety program in place and as required by applicable provisions of the contract. Such programs submitted as part of the work will be acknowledged by the Resident Engineer by letter. However, the Resident Engineer or staff will not return the program with comments or revisions or edits that could in any way have the effect of altering the contractor's safety program.)

Valley CM's staff will adhere to the requirements of the contractor's safety program while on the site. A hard hat and safety vest will be worn at all times, and advise your visitors to do so as well. If a visitor refuses, his or her refusal should be recorded in your daily report.

Nowhere is the need for caution in this area more evident than chance encounters with hazardous materials. A variety of substances may be discovered during construction, including asbestos, PCB, and abandoned chemicals of unknown properties. Valley CM has no particular expertise in dealing with hazardous substances, and the Construction Management staff should not attempt to instruct or assist the contractor in their removal or handling. Instead, follow the procedures established here for reporting observation of an unsafe or potentially hazardous condition. In the usual case, the owner, or his designated representative, will call in appropriate experts.

C. VALLEY CM ASSOCIATES EMPLOYEE SAFETY PROGRAM

While assigned to Field Projects, Employees are expected to follow the Valley CM Associates employee jobsite safety procedures at all times. Valley CM Associates has adopted the "Code of Safe Practices – Construction" as the guidelines for all employees to follow while assigned to field construction jobsites. All incoming or new personnel to the project should review and sign that they have read and understood the requirements of the "Code of Safe Practices."

PERMITS

Certain permits are required for construction of the project as described in the contract documents. These permits are a part of the specifications, and the Contractor shall obtain these permits and meet all requirements solely and fully. All costs incurred due to the permit requirements are to be included in the various bid items, and no additional allowance will be made therefore.

The following permits will be obtained by the Owner:

- N/A

PROJECT FILING SYSTEM

The Valley CM project filing system is outlined below. All project files are kept both in electronic and hard copy format. The electronic file will mirror the hard copy file. Correspondence, submittals, RFI's and other documents received will be scanned as a PDF file for electronic storage. Email is stored as a .PST file that requires Microsoft Outlook to open. Emails are not kept as a hard copy unless required or requested. Email attachments are filed in the appropriate file both electronically and as a hard copy.

<u>Valley CM Project Files</u>

1. Contract Documents
    a. Bids
    b. Drawings
    c. Specifications
2. CM Contract
    a. Change Orders
    b. Contract
    c. Proposal (Including scope & fee)
3. Emergency Contact List
4. Preliminary Notices and Stop Notices
5. Correspondence
    a. Correspondence Log
    b. E-mail (Electronic Only)
    c. Faxes
    d. FROM Other Agencies, Utilities
    e. FROM Contractor
    f. FROM Design
    g. FROM Owner
    h. FROM Sub-Consultants
    i. Field Memos
    j. Plan Clarifications
    k. Punch Lists
    l. TO Other Agencies, Utilities
    m. TO Contractor
    n. TO Design
    o. TO Owner
    p. TO Sub-Consultants
    q. Transmittals
6. Monthly Project Status Reports
7. Weekly Statement of Working Days
8. Requests For Information (RFI)
    a. RFI Log
    b. RFI's in Numerical Order
9. Submittals

    a. Submittal Log
    b. Submittals in Numerical Order
10. Daily Reports
    a. Contractor's Daily Construction Reports
    b. Valley CM's Daily Reports
    c. Other Daily Reports
11. Photographs
    a. Filed based on location
12. Survey
    a. Survey Data
    b. Survey Requests
13. Meeting Minutes
    a. Other Meetings
    b. Pre-construction Meeting
    c. Progress Meetings
14. Progress Payment Estimates
    a. PPE Log
    b. PPE's in Numerical Order
15. Contract Change Orders
    a. Change Orders
        i. CCO's in numerical order
    b. Potential Change Orders
        i. PCO's in numerical Order
    c. Change Order Log
16. Claims/Disputed Work
    a. Claims (w/backup documentation)
17. Progress Schedules
    a. Baseline
    b. Final
    c. Updates
18. Permits/Utility Agreements/Easements
19. Traffic Control Plans/Permits
20. Storm Water Pollution Prevention Plan (SWPPP)
    a. Inspection Reports (Filed by date)
    b. Photographs (Filed by inspection date)
21. Material Information
    a. Asphalt Concrete
        i. Load Tickets
        ii. Test Results
    b. Compaction Testing
    c. Factory Testing
    d. Masonary
    e. Other
    f. Pipe Testing
    g. Portland Cement Concrete
        i. Load Tickets
        ii. Test Results

    h. Rebar
    i. Welding
22. Labor Compliance
    a. Certified Payroll
    b. Interviews
    c. Applicable Wage Rates (link to state web site)
23. Public Relations
    a. Letters & Notices to Public (residences & businesses)
    b. Letters from Public
    c. Log
24. Safety
    a. Valley CM Code of Safe Practices
    b. Accidents
25. CM Manual, Forms & Logs
    a. CM Manual
    b. CM Forms
    c. CM Logs
    d. CM Filing System

CONSTRUCTION MANAGEMENT SERVICES

Valley CM's Construction Manager will provide the following services for the Owner on this project in addition to any additional service required by the contract. In addition, our team will be responsible for making daily decisions for the project to facilitate the timely construction in the best interest of the Owner. Valley CM will provide additional services as necessary to ensure the timely and accurate completion of this project.

PRE-CONSTRUCTION CONFERENCE

Valley CM's Construction Manager will organize and hold the pre-construction meeting to discuss specific project items as outlined in the specifications. Valley CM will provide a written meeting agenda and minutes to the meeting. A list of required submittals for the project will be prepared and distributed at this meeting.

EMERGENCY CONTACT LIST

Valley CM's Construction Manager will organize and distribute an emergency contact list to all persons involved in the project. This list will contain 24 hour contact information for key personnel.

PROGRESS MEETINGS

Valley CM's Construction Manager and Resident Engineer/Inspector will hold bi-weekly progress meetings (or as required) with the contractor and their appropriate subcontractors to review construction progress. We will prepare and distribute minutes of the meetings, assigning action items, responsibilities, and documenting project trends. Meetings will include reviewing the contractor's three-week look ahead schedule (including shutdown and tie-in work), submittals and RFI/design clarification status, potential change orders and change orders, safety, SWPPP issues, delays and potential claims, construction problem resolution, interfaces/coordination with adjacent construction contracts, public outreach issues, partnering status, open discussion and in general coordinate and expedite the operation of all parties contributing to the project.

MONTHLY REPORT

Valley CM's Construction Manager will present a monthly progress report to the Owner. The report will outline in text, with supporting photo documentation, the progress of the project. This includes discussions of the work completed, progress payments, schedule, SWPPP, claims, submittals, RFI's and change orders. An electronic copy of the project file will also be included.

WEEKLY STATEMENT OF WORKING DAYS

Valley CM's Construction Manager will prepare and send to the contractor a weekly statement of working days that outlines the contract time expended and remaining. The contractor will have 15 days to dispute the

statement before it becomes official.

PRESENTATION TO OWNER'S MANAGEMENT

Valley CM's Construction Manager and staff will be available to assist the Owner in preparing presentation materials (photo boards, slides, schedules, spreadsheets, and other graphics), and will be available to make presentations to Owner's management.

TECHNICAL MEETINGS

In addition to discussing construction and technical issues during the construction progress meetings, Valley CM will conduct special technical meetings to address and resolve technical construction issues as needed. Valley CM will prepare and distribute minutes to these meetings.

CONTRACTOR'S SCHEDULE

Valley CM's Construction Manager and staff will review the construction contractor's critical path method (CPM), baseline schedule, and schedule updates. Analysis of the schedules will look for flaws and areas of special concern (including impacts of weather and change orders). We will check the Logic Network and the activity input durations and precedents for reasonableness of the sequence and the duration of the activities. Specified construction sequencing and schedule constraints, permit conditions, interfacing with adjacent contracts, as well as all submittals, procurement, construction, shutdowns and tie-ins, testing and startup, and closeout activities that are included for contract work will be confirmed.

Valley CM will meet with the contractor to review the baseline schedule and to expedite production of an approvable product.

Valley CM will perform detailed reviews of each contractor monthly schedule update to ensure that actual work progress based upon their records is properly incorporated, including the impacts of any change order work. Valley CM will also maintain an "as-built" schedule for verifying contractor's progress schedule. The contractor shall provide a written narrative report to define problems areas, anticipated delays and the impact on the schedule in addition to the proposed corrective action in sufficient detail to validate its effect on the schedule. The Construction Manager will not recommend Progress Payment without an approved, updated schedule.

PROGRESS PAYMENT ESTIMATES

Valley CM will compare the contractor's progress payment request to the cost loaded CPM (and schedule of values) and our daily inspection reports to confirm that the requested amounts are consistent. Approved contract change order work will also be confirmed and included. Any stop payment notices and/or other withholdings will also be confirmed and included. Valley CM will then provide a recommend progress payment to the Owner. The progress payment will not be processed without an updated schedule, proper lien releases

and updated as-built drawings.

SUBMITTALS

Valley CM will log in, track, process, and review submittals, including shop drawings, traffic control plans, operations and maintenance (O&M) submittals, samples, warranties, certifications, schedules, testing and startup plans, and other items. Each submittal will be reviewed by Valley CM's staff for completeness. Once Valley CM is satisfied with the submittals, it will be returned to the contractor. We will discuss submittal status at each bi-weekly construction meeting. Submittals becoming due or overdue will be identified and discussed. As appropriate, pre-submittal meetings with the contractor and supplier/manufacturer will be conducted to facilitate key equipment or material submittal preparation and approval. SWPPP review and approval is also included in this review. A list of submittals required for the project will be prepared by Valley CM and distributed at the pre-construction conference.

REQUEST'S FOR INFORMATION/PLAN CLARIFICATIONS

Valley CM will manage contractor requested design clarifications during construction. The status of RFI's will be accounted for in the RFI log and discussed at the bi-weekly progress meetings. Valley CM's staff will respond to RFI's not requiring the design engineer's interpretation of design intent, and will copy the response to the design engineer. Typical turn-around times will be 5 days.

Valley CM will also receive, log in, and transmit design clarifications originated by the design engineer or Owner. The RFI and design clarification process will be coordinated with the Valley CM's potential change order system. An individual potential change order number and file will be established so that each item involving extra work is properly tracked.

CHANGE ORDERS

Valley CM will manage the change order process to help obtain a fair and reasonable price for legitimate extra work items in accordance with the contract documents. Valley CM will request and log change order (extra work) quotations as requested by the Owner, and will coordinate the preparation of any revised specifications and/or sketches needed to define the scope of the extra work using in-house design staff. In each case, until a potential extra work item is confirmed and executed as a change order (or is dropped), it will be assigned a potential change order number to facilitate tracking and filing. In this manner, several potential change orders can subsequently be incorporated into a single contract change order.

Change order work performed on a time-and-materials basis will be verified daily. Valley CM will enter the change order work activities into the CPM schedule to verify requested time extensions impacts accompanying the change order. A detailed change order cost estimate with which to compare and negotiate the contractor's cost quotation will be prepared. Valley CM will then recommend acceptance or rejection of the terms of the change order to the Owner. If the change order is accepted, Valley CM will prepare the document for signature. If there is disputed extra work, Valley CM will work with the Owner and contractor until the item has been satisfactorily resolved. If it is not resolved, Valley CM will track the item as a potential claim. Change order

status will be included in the monthly status report.

CLAIMS

Valley CM will take the lead in the resolution of any contract claims for this project during the construction contract period. We will keep current logs of Notice of Potential Claims and will prepare documents and supporting evidence regarding claims. Information on each individual Notice of Potential Claim will be kept separately in the project files. Valley CM will provide complete documentation, a claims response strategy, and cost analysis for the Owner's review.

RECORD DRAWINGS

The construction management and inspection staff will maintain red-line markups of the contract drawings showing all change order items and RFI's/design clarifications, as well as other information regarding underground utilities and information useful to the Owner for future maintenance and construction. Each month before progress payment approval, Valley CM will review the contractor's set of marked up drawings to verify completeness. Valley CM will reconcile their markups with the contractor's at the end of the project and the project files electronically and provide the as-built drawings to the designer for review and signature.

UTILITY COORDINATION

Valley CM's Construction Manager will coordinate with affected utilities required for the completion of the project.

CERTIFIED PAYROLL

Valley CM's Construction Manager will review the contractor's certified payroll to ensure payment of the proper wage rates. In addition, Valley CM will periodically interview employees to ensure the proper payment of wages.

PROJECT CLOSEOUT

Valley CM will use the project closeout procedures required by the contract documents. A final walk through will be conducted which includes the Owner and contractor, to develop a final punch list. When the work is completed and all outstanding paperwork has been submitted (warranties, lien releases, equipment certifications, record drawings, interconnection diagrams, O&M manuals, etc.), Valley CM will process the final payment request, prepare the final project status report, recommend for project acceptance by the Owner and assist with the filing of the Notice of Completion with the County Recorder. Field office files, including submittals, correspondence, photographs, and other items, will be provided to the Owner. Electronic files will also be provided to the Owner on CD-ROM. Valley CM will also confirm that a warranty initiation date log and a

need for warranty work notification system is in place for Owner's use during the one-year warranty period.

INSPECTION SERVICES

CONSTRUCTION INSPECTION

Valley CM will provide the required inspection services to monitor the contractor's work for contract compliance during construction.

The on-site field inspection staff will document the contractor's daily work activities through preparation of daily construction reports and logs. Logs will include compaction results, concrete strength testing and hydraulic structure testing, equipment delivery, and installation and pipeline joint testing records. Equipment installation certifications will be completed for each electrical and mechanical item installed. The specified preliminary and final equipment and process tests will be documented. Digital photos and video records will be taken of work progress to document the contractor's work. All photos will be annotated and stored in electronic files in accordance with Valley CM's project filing system. Deficient work will be identified, tracked, and corrected using advisory notices and non-conformance reporting systems. Any damage to private or public property will be tracked, resolved, and reported in a timely manner. Compliance with all agency encroachment and other permits and environmental mitigation requirements will be monitored and reported. Valley CM's inspector will investigate changed conditions as notified by the contractor and assist the Construction Manager in the determination of the validity of the changed condition. Valley CM's inspector will also monitor and document extra work performed on a time and materials basis through a daily extra work report filled out and signed by both the contractor and Valley CM. Valley CM's inspector will monitor compliance with the approved Traffic Control Plan. The Inspector may at any time, with recommendation from the Construction Manager, further clarify or interpret the Contract Documents or make minor changes in the details of the work by issuing a Field Memorandum.

SPECIALTY INSPECTION

Valley CM's on-site team will handle the civil, structural, mechanical inspection for the project. Specialty inspection included welding, rebar, structural concrete or ICBO inspections will be handled by Valley CM's subcontractor. The subcontractor's daily report will be added to Valley CM's inspector's daily report.

PRE-CONSTRUCTION SITE INSPECTION

Valley CM will prepare a comprehensive digital video, with soundtrack, and digital photo preconstruction condition survey of existing structures and other facilities likely to be disturbed during construction. Upon completion of construction, a post construction survey will be similarly conducted and any outstanding damage added to the final punch list.

MATERIALS TESTING

Valley CM will provide or coordinate with the owner's geotechnical material testing firm as required for the successful completion of the project. This includes compaction testing and excavation observation.

SURVEYING

Valley CM will provide construction staking or coordinate with the owner's surveyor as required for the successful completion of the project.

STORM WATER POLLUTION PREVENTION PLAN (SWPPP)

Valley CM will maintain a proactive approach to SWPPP compliance and BMP inspection. Valley CM is very experienced in storm water management and will review the SWPPP for proper compliance with the appropriate regulations. Valley CM's SWPPP inspection team will provide periodic site inspections (including pictures) to ensure compliance with the approved SWPPP plans and that all required BMP's are in place and installed correctly. A memo will document each site inspection notifying the contractor of any deficiencies and recommended corrective action.

FINAL INSPECTION

To confirm the satisfactory completion of all contract and change order work, Valley CM will perform a final project walkthrough with the Owner and PM to prepare the final punch list. Any items remaining from preliminary punch lists and logs of nonconforming work will be added. Items from the post-construction conditions survey will be added. Each punch list item will be signed off by both Valley CM and the contractor as it is satisfactorily completed. Valley CM will prepare an estimate of the value of the punch list work so that any items the contractor does not complete can be deducted from the final payment due the contractor.

CM FORMS & LOGS

PROJECT FORMS AND LOGS

The following forms have been developed to support the complete documentation of communications and issues relating to the construction of the Project. Use of the forms is required to facilitate organization of the Project administration. Owner provided forms will be used in lieu of the listed forms and additional forms may be used as needed.

1. **Construction Forms**

   Change Order
   Potential Change Order Request
   Correspondence
   Daily & Monthly Report
   Emergency Contact List
   Labor Compliance
   Material Testing
   Meetings
   Progress Payment Estimates
   Request for Information (RFI)
   Safety
   Storm Water Pollution Prevention Plan Inspection (SWPPP)
   Submittal
   Survey
   Weekly Statement of Working Days

2. **Construction Logs**

   Change Order Log
   Correspondence Log
   Progress Payment Log
   Request for Information (RFI) Log
   Submittal Log
   Public Complaint Log

SAMPLE FORMS AND LOGS

ATTACHMENT 8

OTAYWATERDISTRICT

1485-1 Pump Station Replacement Project

CONSTRUCTION MANAGEMENT & FIELD INSPECTION MANUAL

January, 2009

CONSTRUCTION MANAGER

VALLEY
Construction Management

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INTRODUCTION

The purpose of this manual is to Project inspection and Construction Management Services for the CM Project. The booklet is intended as a guide to both the Valley CM Construction Management Team and representatives of the Owner.

The purpose of this manual is to establish standardized methods for contract administration and field inspection to be used during the construction of the **1485-1 Pump Station Replacement Project**. The procedures were established to facilitate the construction work and monitor that the work will be done in a manner consistent with the requirements of the Contract Documents. This manual provides an outline of procedures, delineates lines of authority and communication, and defines areas of responsibilities and includes copies of forms to be used during construction. The manual is intended as a guide to both the Valley CM Construction Management Team and the Owner.

This reference manual is not intended to supersede the Contract Documents. The Contractor shall be required to comply with all Federal, State and Local laws and ordinances applicable to the work.

PROJECT SUMMARY

DESCRIPTION

PROJECT:	Otay Water District 1485-1 Pump Station Replacement Project
CONTRACT NO.:	P2172
CONTRACTOR:	SCW Corporation
DESCRIPTION OF WORK:	Pump Station Replacement
AWARD AMOUNT:	$1,453,344
NOTICE TO PROCEED:	1/20/09
ORIGINAL CONTRACT TIME:	365 Calendar Days

KEY CONTACTS

OWNER: Daniel Kay, PE 619-670-2247

CONSTRUCTION MANAGER: Paul Mochel, PE 858-444-6804

RESIDENT ENGINEER: N/A

CONSTRUCTION INSPECTOR: Jon Chambers 619-987-6371

CM FIELD OFFICE: N/A

CONSTRUCTION STAKING: Per Contractor

GEOTECHNICAL OBSERVATION & SOILS TESTING: Per Contractor

SPECIALTY INSPECTION: Per Contractor

CONTRACTOR: Kirt Bijorn 760-728-1308 x18

DESIGN ENGINEER: Otay Water District

OTHER: N/A

LINE OF COMMUNICATION

The Contractor's main point of contact for this project will be the Construction Manager or their designated representative. All correspondence and communication (Letters, RFI's, Submittals, etc.) shall be hand delivered, emailed or sent standard mail to the Construction Manager. Field Memoranda can be issued by the Construction Inspector upon approval by the Construction Manager.

In turn, the Construction Manager and their representatives will communicate only with the Contractor's designated representative and will not normally communicate with subcontractors or suppliers. If it becomes necessary to take direct action with a subcontractor or supplier, the Contractor will be immediately advised.

The Construction Manager and their representatives will be responsible for all communication with the Regulatory Agencies as well as the public unless required as a condition of a contractor obtained permit or the contract documents. Any communications to the Contractor by the Regulatory Agencies shall be directed through the Construction Manager.

Correspondence can be either hand delivered to the project field office or sent to the Construction Manager's Main Office at:

Attention: Paul Mochel
Valley Construction Management
3525 Del Mar Heights Road #192
San Diego, CA 92130
Phone: (866) 966-2720 (office)
(858) 444-6804 (mobile)
Fax: (858) 408-3414
Paul.mochel@Valley CM.com

RESPONSIBILITIES

1. **<u>Owner</u> – Otay Water District**

   The following are the main representatives of the Owner:

   - Daniel Kay, PE Project Manager

2. **<u>Construction Management Firm</u> – Valley Construction Management**

The Construction Management Firm acts as the Owner's representative and is responsible for the overall coordination, observation, and administration and completion of the project in accordance with the drawings, specifications and scope of work. The staff assigned to this project are directly responsible to the Construction Manager.

3. **Construction Manager – Paul Mochel, PE**

The Construction Manager is the Owner's representative and is responsible for overall coordination, observation, and administration of the project and completion of the project in accordance with the drawings, specifications and scope of work. The Construction Manager will typically be responsible to schedule, provide notification, chair, attend, and prepare minutes for the weekly job-site meetings, coordinate soils testing and construction staking, review construction schedule, monitor status of shop drawings, RFI's, field memorandums, field orders, proposed contract modifications, and coordinate the work with Regulatory Agencies (main point of contact with the office staff), and prepare and maintain all paper work. He will also fill in for the Construction Inspector, in case of illness, vacation, or emergency. All written communications on the project shall be processed through the Construction Manager.

4. **Resident Engineer – N/A**

The Resident Engineer is responsible for both Construction Management and Inspection duties outlined in this section (Responsibilities) and that are required by the contract.

4. **Construction Inspector- Jon Chambers (Otay Inspector)**

The Construction Inspector is directly responsible for observing the work of the Contractor to assure that the construction meets or exceeds project plans and specifications. The Construction Inspector will provide as-needed observation when construction activity is in progress. All field communications (written and verbal) on the project will be processed through the Construction Inspector. The Construction Inspector will be the main point of contact for regulatory agency inspectors. The construction inspector will also coordinate with SWPPP inspectors, specialty inspectors, geotechnical firms and surveyors as required by the contract.

5. **General Contractor – SCW Corporation**

The Contractor is responsible for the performance of the work called for in the specifications and shown on the drawings in accordance with the Contract Documents.

SAFETY

In accordance with generally accepted construction practices, the Contractor shall at all times be solely and completely responsible for conditions of the jobsite, including safety and security of all persons and property on the jobsite during the performance of the work, and the Contractor shall fully comply with all state, federal and other laws, rules, regulations and orders relating to the safety of the public and workers.

Except in cases of imminent danger, Valley CM's staff should work through the contractor's on-site project

manager or superintendent to correct safety violations.
If Valley CM staff encounters an unsafe condition on the job-site that does not pose an imminent danger, including the discovery of asbestos or other toxic materials, the contractor's on-site representative will be notified immediately. Valley CM staff will explain that they have observed what they believe to be an unsafe condition which may require immediate attention. Valley CM staff will not stop the work or recommend corrective action. Valley CM staff will record the notification to the contractor in the Daily Report, but will not put it in writing to the contractor at this point in time. If the contractor's on-site representative does not take prompt action to correct the hazardous condition, the contractor will be notified in writing of the potential hazard and the situation will be monitored.

Valley CM has no responsibility to seek out hazardous conditions, and it is important that Valley CM staff does not voluntarily assume that responsibility. Valley CM staff will not attend the contractor's safety meetings, nor review, or otherwise provide detailed comments, of the contractor's safety program. (Note: Safety programs submitted by the contractor as part of the project should be looked at to verify that the contractor does, in fact, have a safety program in place and as required by applicable provisions of the contract. Such programs submitted as part of the work will be acknowledged by the Resident Engineer by letter. However, the Resident Engineer or staff will not return the program with comments or revisions or edits that could in any way have the effect of altering the contractor's safety program.)

Valley CM's staff will adhere to the requirements of the contractor's safety program while on the site. A hard hat and safety vest will be worn at all times, and advise your visitors to do so as well. If a visitor refuses, his or her refusal should be recorded in your daily report.

Nowhere is the need for caution in this area more evident than chance encounters with hazardous materials. A variety of substances may be discovered during construction, including asbestos, PCB, and abandoned chemicals of unknown properties. Valley CM has no particular expertise in dealing with hazardous substances, and the Construction Management staff should not attempt to instruct or assist the contractor in their removal or handling. Instead, follow the procedures established here for reporting observation of an unsafe or potentially hazardous condition. In the usual case, the owner, or his designated representative, will call in appropriate experts.

C. VALLEY CM ASSOCIATES EMPLOYEE SAFETY PROGRAM

While assigned to Field Projects, Employees are expected to follow the Valley CM Associates employee jobsite safety procedures at all times. Valley CM Associates has adopted the "Code of Safe Practices – Construction" as the guidelines for all employees to follow while assigned to field construction jobsites. All incoming or new personnel to the project should review and sign that they have read and understood the requirements of the "Code of Safe Practices."

PERMITS

Certain permits are required for construction of the project as described in the contract documents. These permits are a part of the specifications, and the Contractor shall obtain these permits and meet all requirements solely and fully. All costs incurred due to the permit requirements are to be included in the various bid items, and no additional allowance will be made therefore.

The following permits will be obtained by the Owner:

- N/A

PROJECT FILING SYSTEM

The Valley CM project filing system is outlined below. All project files are kept both in electronic and hard copy format. The electronic file will mirror the hard copy file. Correspondence, submittals, RFI's and other documents received will be scanned as a PDF file for electronic storage. Email is stored as a .PST file that requires Microsoft Outlook to open. Emails are not kept as a hard copy unless required or requested. Email attachments are filed in the appropriate file both electronically and as a hard copy.

<u>Valley CM Project Files</u>

1. Contract Documents
    a. Bids
    b. Drawings
    c. Specifications
2. CM Contract
    a. Change Orders
    b. Contract
    c. Proposal (Including scope & fee)
3. Emergency Contact List
4. Preliminary Notices and Stop Notices
5. Correspondence
    a. Correspondence Log
    b. E-mail (Electronic Only)
    c. Faxes
    d. FROM Other Agencies, Utilities
    e. FROM Contractor
    f. FROM Design
    g. FROM Owner
    h. FROM Sub-Consultants
    i. Field Memos
    j. Plan Clarifications
    k. Punch Lists
    l. TO Other Agencies, Utilities
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        i. CCO's in numerical order
    b. Potential Change Orders
        i. PCO's in numerical Order
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    a. Claims (w/backup documentation)
17. Progress Schedules
    a. Baseline
    b. Final
    c. Updates
18. Permits/Utility Agreements/Easements
19. Traffic Control Plans/Permits
20. Storm Water Pollution Prevention Plan (SWPPP)
    a. Inspection Reports (Filed by date)
    b. Photographs (Filed by inspection date)
21. Material Information
    a. Asphalt Concrete
        i. Load Tickets
        ii. Test Results
    b. Compaction Testing
    c. Factory Testing
    d. Masonary
    e. Other
    f. Pipe Testing
    g. Portland Cement Concrete
        i. Load Tickets
        ii. Test Results

    h. Rebar
    i. Welding
22. Labor Compliance
    a. Certified Payroll
    b. Interviews
    c. Applicable Wage Rates (link to state web site)
23. Public Relations
    a. Letters & Notices to Public (residences & businesses)
    b. Letters from Public
    c. Log
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    a. Valley CM Code of Safe Practices
    b. Accidents
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Valley CM's Construction Manager will organize and hold the pre-construction meeting to discuss specific project items as outlined in the specifications. Valley CM will provide a written meeting agenda and minutes to the meeting. A list of required submittals for the project will be prepared and distributed at this meeting.

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In addition to discussing construction and technical issues during the construction progress meetings, Valley CM will conduct special technical meetings to address and resolve technical construction issues as needed. Valley CM will prepare and distribute minutes to these meetings.

CONTRACTOR'S SCHEDULE

Valley CM's Construction Manager and staff will review the construction contractor's critical path method (CPM), baseline schedule, and schedule updates. Analysis of the schedules will look for flaws and areas of special concern (including impacts of weather and change orders). We will check the Logic Network and the activity input durations and precedents for reasonableness of the sequence and the duration of the activities. Specified construction sequencing and schedule constraints, permit conditions, interfacing with adjacent contracts, as well as all submittals, procurement, construction, shutdowns and tie-ins, testing and startup, and closeout activities that are included for contract work will be confirmed.

Valley CM will meet with the contractor to review the baseline schedule and to expedite production of an approvable product.

Valley CM will perform detailed reviews of each contractor monthly schedule update to ensure that actual work progress based upon their records is properly incorporated, including the impacts of any change order work. Valley CM will also maintain an "as-built" schedule for verifying contractor's progress schedule. The contractor shall provide a written narrative report to define problems areas, anticipated delays and the impact on the schedule in addition to the proposed corrective action in sufficient detail to validate its effect on the schedule. The Construction Manager will not recommend Progress Payment without an approved, updated schedule.

PROGRESS PAYMENT ESTIMATES

Valley CM will compare the contractor's progress payment request to the cost loaded CPM (and schedule of values) and our daily inspection reports to confirm that the requested amounts are consistent. Approved contract change order work will also be confirmed and included. Any stop payment notices and/or other withholdings will also be confirmed and included. Valley CM will then provide a recommend progress payment to the Owner. The progress payment will not be processed without an updated schedule, proper lien releases

and updated as-built drawings.

SUBMITTALS

Valley CM will log in, track, process, and review submittals, including shop drawings, traffic control plans, operations and maintenance (O&M) submittals, samples, warranties, certifications, schedules, testing and startup plans, and other items. Each submittal will be reviewed by Valley CM's staff for completeness. Once Valley CM is satisfied with the submittals, it will be returned to the contractor. We will discuss submittal status at each bi-weekly construction meeting. Submittals becoming due or overdue will be identified and discussed. As appropriate, pre-submittal meetings with the contractor and supplier/manufacturer will be conducted to facilitate key equipment or material submittal preparation and approval. SWPPP review and approval is also included in this review. A list of submittals required for the project will be prepared by Valley CM and distributed at the pre-construction conference.

REQUEST'S FOR INFORMATION/PLAN CLARIFICATIONS

Valley CM will manage contractor requested design clarifications during construction. The status of RFI's will be accounted for in the RFI log and discussed at the bi-weekly progress meetings. Valley CM's staff will respond to RFI's not requiring the design engineer's interpretation of design intent, and will copy the response to the design engineer. Typical turn-around times will be 5 days.

Valley CM will also receive, log in, and transmit design clarifications originated by the design engineer or Owner. The RFI and design clarification process will be coordinated with the Valley CM's potential change order system. An individual potential change order number and file will be established so that each item involving extra work is properly tracked.

CHANGE ORDERS

Valley CM will manage the change order process to help obtain a fair and reasonable price for legitimate extra work items in accordance with the contract documents. Valley CM will request and log change order (extra work) quotations as requested by the Owner, and will coordinate the preparation of any revised specifications and/or sketches needed to define the scope of the extra work using in-house design staff. In each case, until a potential extra work item is confirmed and executed as a change order (or is dropped), it will be assigned a potential change order number to facilitate tracking and filing. In this manner, several potential change orders can subsequently be incorporated into a single contract change order.

Change order work performed on a time-and-materials basis will be verified daily. Valley CM will enter the change order work activities into the CPM schedule to verify requested time extensions impacts accompanying the change order. A detailed change order cost estimate with which to compare and negotiate the contractor's cost quotation will be prepared. Valley CM will then recommend acceptance or rejection of the terms of the change order to the Owner. If the change order is accepted, Valley CM will prepare the document for signature. If there is disputed extra work, Valley CM will work with the Owner and contractor until the item has been satisfactorily resolved. If it is not resolved, Valley CM will track the item as a potential claim. Change order

status will be included in the monthly status report.

CLAIMS

Valley CM will take the lead in the resolution of any contract claims for this project during the construction contract period. We will keep current logs of Notice of Potential Claims and will prepare documents and supporting evidence regarding claims. Information on each individual Notice of Potential Claim will be kept separately in the project files. Valley CM will provide complete documentation, a claims response strategy, and cost analysis for the Owner's review.

RECORD DRAWINGS

The construction management and inspection staff will maintain red-line markups of the contract drawings showing all change order items and RFI's/design clarifications, as well as other information regarding underground utilities and information useful to the Owner for future maintenance and construction. Each month before progress payment approval, Valley CM will review the contractor's set of marked up drawings to verify completeness. Valley CM will reconcile their markups with the contractor's at the end of the project and the project files electronically and provide the as-built drawings to the designer for review and signature.

UTILITY COORDINATION

Valley CM's Construction Manager will coordinate with affected utilities required for the completion of the project.

CERTIFIED PAYROLL

Valley CM's Construction Manager will review the contractor's certified payroll to ensure payment of the proper wage rates. In addition, Valley CM will periodically interview employees to ensure the proper payment of wages.

PROJECT CLOSEOUT

Valley CM will use the project closeout procedures required by the contract documents. A final walk through will be conducted which includes the Owner and contractor, to develop a final punch list. When the work is completed and all outstanding paperwork has been submitted (warranties, lien releases, equipment certifications, record drawings, interconnection diagrams, O&M manuals, etc.), Valley CM will process the final payment request, prepare the final project status report, recommend for project acceptance by the Owner and assist with the filing of the Notice of Completion with the County Recorder. Field office files, including submittals, correspondence, photographs, and other items, will be provided to the Owner. Electronic files will also be provided to the Owner on CD-ROM. Valley CM will also confirm that a warranty initiation date log and a

need for warranty work notification system is in place for Owner's use during the one-year warranty period.

INSPECTION SERVICES

CONSTRUCTION INSPECTION

Valley CM will provide the required inspection services to monitor the contractor's work for contract compliance during construction.

The on-site field inspection staff will document the contractor's daily work activities through preparation of daily construction reports and logs. Logs will include compaction results, concrete strength testing and hydraulic structure testing, equipment delivery, and installation and pipeline joint testing records. Equipment installation certifications will be completed for each electrical and mechanical item installed. The specified preliminary and final equipment and process tests will be documented. Digital photos and video records will be taken of work progress to document the contractor's work. All photos will be annotated and stored in electronic files in accordance with Valley CM's project filing system. Deficient work will be identified, tracked, and corrected using advisory notices and non-conformance reporting systems. Any damage to private or public property will be tracked, resolved, and reported in a timely manner. Compliance with all agency encroachment and other permits and environmental mitigation requirements will be monitored and reported. Valley CM's inspector will investigate changed conditions as notified by the contractor and assist the Construction Manager in the determination of the validity of the changed condition. Valley CM's inspector will also monitor and document extra work performed on a time and materials basis through a daily extra work report filled out and signed by both the contractor and Valley CM. Valley CM's inspector will monitor compliance with the approved Traffic Control Plan. The Inspector may at any time, with recommendation from the Construction Manager, further clarify or interpret the Contract Documents or make minor changes in the details of the work by issuing a Field Memorandum.

SPECIALTY INSPECTION

Valley CM's on-site team will handle the civil, structural, mechanical inspection for the project. Specialty inspection included welding, rebar, structural concrete or ICBO inspections will be handled by Valley CM's subcontractor. The subcontractor's daily report will be added to Valley CM's inspector's daily report.

PRE-CONSTRUCTION SITE INSPECTION

Valley CM will prepare a comprehensive digital video, with soundtrack, and digital photo preconstruction condition survey of existing structures and other facilities likely to be disturbed during construction. Upon completion of construction, a post construction survey will be similarly conducted and any outstanding damage added to the final punch list.

MATERIALS TESTING

Valley CM will provide or coordinate with the owner's geotechnical material testing firm as required for the successful completion of the project. This includes compaction testing and excavation observation.

SURVEYING

Valley CM will provide construction staking or coordinate with the owner's surveyor as required for the successful completion of the project.

STORM WATER POLLUTION PREVENTION PLAN (SWPPP)

Valley CM will maintain a proactive approach to SWPPP compliance and BMP inspection. Valley CM is very experienced in storm water management and will review the SWPPP for proper compliance with the appropriate regulations. Valley CM's SWPPP inspection team will provide periodic site inspections (including pictures) to ensure compliance with the approved SWPPP plans and that all required BMP's are in place and installed correctly. A memo will document each site inspection notifying the contractor of any deficiencies and recommended corrective action.

FINAL INSPECTION

To confirm the satisfactory completion of all contract and change order work, Valley CM will perform a final project walkthrough with the Owner and PM to prepare the final punch list. Any items remaining from preliminary punch lists and logs of nonconforming work will be added. Items from the post-construction conditions survey will be added. Each punch list item will be signed off by both Valley CM and the contractor as it is satisfactorily completed. Valley CM will prepare an estimate of the value of the punch list work so that any items the contractor does not complete can be deducted from the final payment due the contractor.

CM FORMS & LOGS

PROJECT FORMS AND LOGS

The following forms have been developed to support the complete documentation of communications and issues relating to the construction of the Project. Use of the forms is required to facilitate organization of the Project administration. Owner provided forms will be used in lieu of the listed forms and additional forms may be used as needed.

1. **Construction Forms**

   Change Order
   Potential Change Order Request
   Correspondence
   Daily & Monthly Report
   Emergency Contact List
   Labor Compliance
   Material Testing
   Meetings
   Progress Payment Estimates
   Request for Information (RFI)
   Safety
   Storm Water Pollution Prevention Plan Inspection (SWPPP)
   Submittal
   Survey
   Weekly Statement of Working Days

2. **Construction Logs**

   Change Order Log
   Correspondence Log
   Progress Payment Log
   Request for Information (RFI) Log
   Submittal Log
   Public Complaint Log

SAMPLE FORMS AND LOGS

ATTACHMENT 9

CONSTRUCTION MANAGEMENT PROJECT MANUAL

OTAY

Dedicated to Community Service

640-1 & 640-2 RESERVOIR

NOVEMBER 2006

RBF CONSULTING

640-1 & 640-2 RESERVOIR PROJECT
CONSTRUCTION MANAGEMENT PROJECT MANUAL
NOVEMBER 2006

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7. REQUEST FOR PROPOSAL
8. PROGRESS MEETING MINUTES
9. DAILY INSPECTION REPORT – GENERAL
10. MONTHLY PROJECT REPORT
11. CONSTRUCTION DISCREPANCY LIST
12. SPARE PARTS TRANSFER FORM
13. WARRANTY REPAIR ORDER
14. CERTIFICATE OF SUBSTANTIAL COMPLETION

1.0 PURPOSE AND SCOPE

The 640-1 & 640-2 Reservoir Project Construction Management Manual (CMM) provides construction management project personnel with the guidelines and information necessary to effectively interface and manage activities at the job site on a consistent basis of operation for all groups working under contract with the Otay Water District.

This CMM focuses on the RBF Consluting Construction Management Team, which is the focal point for all parties involved in this construction effort.

This CMM further provide orientation for new personnel on the project so that these individuals can become familiar with the procedures required to effectively work in conformance with site procedures. The instructions define specific construction inspection forms and quality control requirements that will be implemented by the Construction Management Team.

Copies of this CMM will be issued to key personnel involved in the construction effort. Each copy will be controlled and subsequent changes and additions to the manual will be issued with receipt acknowledgment submittals to assure that the manuals issued are being properly updated. This is meant to be a living document, in that changes and updates are expected to be necessary as the construction progresses. All changes to the CMM must be approved by the Project Manager (PM).

2.0 PROJECT OVERVIEW

2.1 Project

This project consists of two 10 million gallon (MG) pre-stressed post tensioned reservoirs, 42-inch inlet and outlest pipelines, site piping, access roads, valve vaults, PRV stations, and all other work and appurtenances in accordance with the contact documents. The Project has many challenges including movement of over 250,000 CY of hard rock and significant environmental restrictions in a confined site with limited access. These factors will make control and activity sequencing important.

2.2 RBF Consulting CM Team

The Construction Management Team is made up of personnel from RBF Consulting and various specialty subconsultant firms.

Project Manager	Wayne Papac	RBF Consulting
Resident Engineer	Douglas Cook	RBF Consulting
Lead Resident Inspector	James Bassett	RBF Consulting

SPECIALITY SUBCONTRACTORS

In-Plant Pipe Inspectors	James Walls	Walls Inspection Co.
Electrical Inspection	EPI	Matt Long
Coating Inspection	CSI Inc.	Patrick Sweeney

The roles and responsibilities of the Construction Management Team personnel include:

Project Manager (PM): Provides technical and construction management support to the CM Team on an as-needed basis. He will visit the site on a periodic basis during construction.

Resident Engineer (RE): Provides the lead of the overall CM effort and the day-to-day supervision of the inspection staff; reviews submittals, requests for information (RFI's), and shop drawings; verifies the Contractor's CPM schedule is correct and up-to-date to facilitate the processing of progress payments to the Contractor; oversees the Document Tracking System (DTS); prepares detailed reports; and coordinates the flow of information to and from the Contractor, Engineer, and the Otay Water Authority.

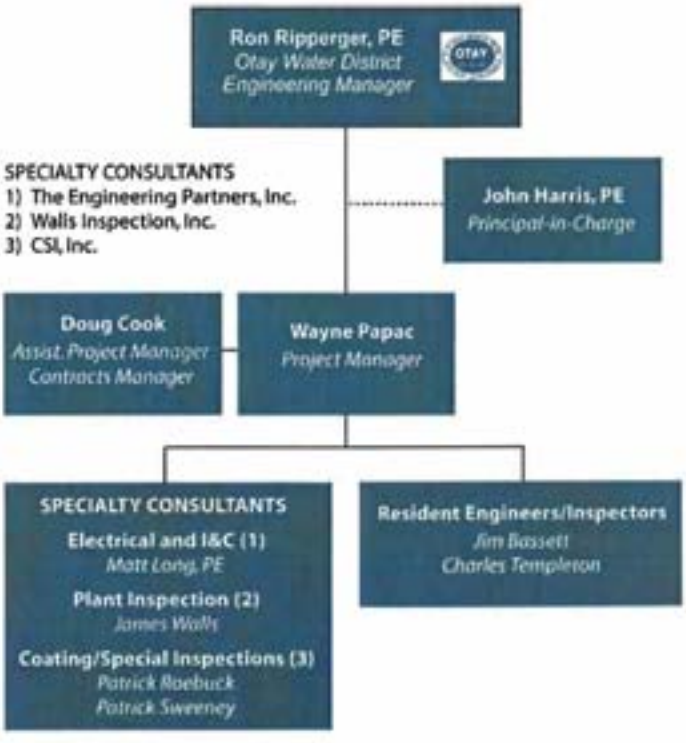
Resident Inspector (RI): Provides on-site Inspection. The RI documents and inspects the Contractors activities in accordance with the Contract and inspection document forms in this Construction Management Project Manual. Prepares deficiency notices based on construction field observation when required. Assists the Resident Engineer in reviewing any construction documents as needed. Acts as point of contact for any required specialty inspectors.

In-Plant Pipe Inspector: Responsible for verifying the manufacture of the pipe is done in accordance with the Contract Plans, Specifications and Submittals.

Electrical and Coating: Responsible for verifying that the installation of the electrical and coating systems are completed in accordance with the Contract Plans, Specifications and Submittals.

2.3 Project Organization Chart

Otay 640-1 & 640-2 Reservoir Project
Project Organizational Chart



3.0 QUALITY ASSURANCE AND QUALITY CONTROL

3.1 Construction Inspection Program

The purpose of a Construction Inspection Program is to attain a high level of quality for construction on the 640-1 & 640-2 Reservoir Project. Toward that stated purpose the Construction Management Team will prepare a Construction Inspection Plan (CI Plan) to comply with all provisions of this Contract as well as the orders, procedures, and instructions that may be issued from time to time by the PM or RE. The Construction Management Team is committed to attaining quality construction on the 640-1 & 640-2 Reservoir Project.

The CI Plan consists of the procedures and the organization necessary to provide inspection, testing, and verification of the following:

- All materials used on the project
- Equipment used
- Workmanship
- Certification of personnel
- On-site and Off-site fabrication by suppliers and manufacturers

All construction performed by the Contractor shall comply with the Plans and Specifications including those items of work performed by subcontractors.

The CI Plan will be managed by the RE to achieve maximum coordination with all Construction Management and Contractor personnel on all construction activities to ensure Quality Control (QC).

The RE and the RI shall examine specified areas of the project for QC performance by performing the following functions:

- Monitor the response time of RFI's, shop drawings, letters, and submittals.
- Ensure that the Contractor's record drawing are current and accurately reflect as-built conditions prior to monthly progress payment receipt.
- Review requested change orders and claims to determine if there is a recognizable pattern to the problems that can be minimized or avoided in the future.
- Conduct a monthly review of the Tracking System, files, and inspection reports and identify areas needing corrective action.
- Keep an electronic log of shop drawings, change orders, plan clarifications, RFI's, general correspondence and claims.

3.2 Project Site Rules

Good conduct on the job is essential to the common safety of all employees and the quality of the project. Therefore, conduct including but not limited to the following violations will subject the employee to appropriate administrative action or denial of access to the Owner's property or right-of-way. The CM Team has the responsibility for the administration of these rules. The Contractor is responsible for enforcement of these rules.

The following are prohibited:

- Unauthorized removal or theft of Owner's property.
- Violation of safety or security rules or procedures.
- Possession of firearms or lethal weapons on jobsite.
- Acts of sabotage.
- Destruction or defacing Owner's property or right-of-way.
- Failure to use sanitary facilities.
- Failure to report accidents or job related injury.
- Under the apparent influence of drugs, alcohol or other intoxicants or in procession of drugs, alcohol or other intoxicants on the property.
- Wearing shorts or tennis shoes on the jobsite while working.
- Failure to wear a hard hat and shirt with sleeves while working.
- Gambling at any time on the project.
- Fighting or engaging in horseplay on the project.
- Smoking in unauthorized areas on the project.
- Open fire cooking or making unauthorized fires on project property or right-of-way.
- Failure to use designated gates.

All employees of the Contractor, CM Team employees and some transiting visitors will have access to a copy of the above work site rules for their use and reference and they will be required to sign a receipt that acknowledge they have read and understand the rules and will abide by the rules while on the work site. They will also acknowledge that failure to abide with any rule is grounds for being denied access to the work site.

The RE will post copies of these rules on all bulletin boards and other places where notices of interest to our employees are generally displayed.

4.0 PROJECT COMMUNICATION

All formal communications with the Contractor shall be through the RE. This includes all written and oral direction. It includes communication with the Contractor or his Subcontractors, Subconsultants, and material suppliers of any tier. The RE should approve all requests for direct communication with the Contractor by other parties. Once permission to contact the Contractor directly is obtained, document that contact in the form of telephone conversation notes or memorandum to the RE. The RE will make all necessary supplemental distribution as required.

Only the RE shall address written correspondence, including telephone conversation notes or memorandum, to the Contractor. Other members of the CM team shall not contact the Contractor or his Subconsultants, Subcontractors and material suppliers of any tier without receiving the permission and/or direction of the RE.

In addition to hard copy filing, the RE will ensure all documents are scaned to Adobe Acrobat Portable Document Format (.pdf) each document (incoming and outgoing) related to the project. The electronic documents will be kept on a computer server in the same filing system as the paper documents and will facilitate electronic distribution of documents for instant delivery and ease of retrieval for all parties.

4.1 Project Directory

Prior to start of construction operations, the RE will create a Project Directory of all Project Team Members addresses for both local and home offices, telephone numbers, and emergency designated personnel and telephone numbers and those of subcontractors and major material suppliers. This information will be incorporated into the Project Directory and distributed to all Project Team Members.

4.2 Incoming Correspondence

The RE will work with the contractor to establish a numbering system for all correspondence. The RE will distribute copies of all incoming correspondence to the appropriate parties. Upon receipt of all letters and memorandums, the RE will ensure all correspondance receives a date stamp and is properly distributed.

4.2.1 Correspondence from Contractor

The RE will ensure all correspondence originating from the Contractor will be date stamped and logged in upon receipt and appropriately distributed. All communication by the Contractor with the RE will be entered into a Correspondence from Contractor log and tracked on a daily basis with copies available for all appropriate CM and project team personnel.

4.2.2 Letters from Third Parties, etc.

The RE will ensure all letters from outside agencies, government entities, third parties, etc. will be date stamped and logged in upon receipt. The RE will determine the action, if any required, and the routing of the letter.

4.3 Outgoing Correspondence

The RE will establish a numbering system for all outgoing correspondence. All outgoing correspondence must be signed by the RE. The distribution of copies shall be indicated on all outgoing correspondence and must include, at minimum, the PM.

4.3.1 Letters to the Contractor

Outgoing correspondence must be addressed to the Contractor's authorized site representative. The subject shall include the Project Title, Contract Number, and subject description. The RE shall assign a consecutive number to all outgoing letters. Correspondence should be confined to one subject as much as possible. Reference should be made to any applicable correspondence by date and subject.

The correspondence should be logged in the correspondence to contractor log. Copies of the outgoing correspondence should be filed.

When responding to a Contractors letter, all points raised by incoming correspondence shall be addressed, preferably in the order in which they appear. If complete answers cannot be provided, the correspondence should provide the best information available and indicate as acknowledgment to the incoming correspondence shall be made within five (5) working days.

4.3.2 Discrepancy and Deficiency Items

Any item, condition, or material which deviates from engineering drawings, specifications, or procedures is referred to as either a Quality Discrepancy Notice or Construction Deficiency Report (see Appendix A). A Discrepancy can be corrected within the scope of original drawings, specifications or procedures

for the project, whereas a Deficiency requires a disposition from the Engineer to be resolved.

The CM Team shall perform inspections to ensure the Contractor's compliance with all Contract Documents, and prevent nonconforming actions, methods, material, parts or components at the construction site. Upon observing an unacceptable condition, the RI shall notify the RE, who will determine, in conjunction with the PM and Contractor, whether the condition warrants a Discrepancy Notice (DN) or a Deficiency Report (DR).

If the condition is determined to be a discrepancy or deficiency of the plans and specifications, the RE shall complete the appropriate form, providing details of the issue, and forward the original to the Contractor for corrective action, with a copy to the PM. The Notice or Report shall be assigned a sequential number. The RE shall maintain a log of Notice and Reports, showing the appropriate number, item, open date, and closed date.

The Contractor shall sign and date the Notice or Report upon correction of the unsatisfactory condition and return it to the RI for verification. The RI shall verify that the rework is acceptable, initial the Notice or Report, and forward the original to the RE and copy to the Contractor.

When discrepancy items are found during the turnover and start-up phase of the project, the use of punch lists is an acceptable alternative to Notice's, provided punch list items are generated, controlled, and dispositioned in accordance with approved project procedures.

4.3.3 Safety Deficiency Reports

The RE will use the Safety Deficiency Report form (see Appendix A) to identify and report to the Contractor any health, safety and security plan violations observed in accordance with the Contract. The Contractor shall be responsible for correcting these conditions as the Contractor is solely responsible for the overall health and safety of the area where his work is performed. Failure of the CM Team to note any unsafe practice will not impose any duty or liability on the CM Team.

The Contractor will immediately stop reported unsafe practices and will respond to all Safety Deficiency Reports within two (2) working days of the report date.

The RE will monitor these deficiency reports in a Safety Deficiencies Log. Outstanding Safety Deficiency Reports will be discussed weekly at each Progress Meeting.

4.3.4 Letters of Transmittal

A letter of transmittal is to be used to transmit submittals, reports, drawings, etc., to the Contractor or other parties. Letters of transmittal shall be created and logged and assigned a consecutive (serial) number. Copies of the transmittal letter shall be distributed to the appropriate persons.

4.4 Submittals

4.4.1 Initiation

Submittals are defined as all items the Contractor is required, by Contract, to submit to the Engineer, Construction Manager or Owner for approval including procedures and documentation to support the procurement of equipment and materials. Submittals include but are not limited to: Certifications, Manufacturer's Literature, Shop Drawings, Project Schedules, As-built Drawings, Operation and

Maintenance Manuals, or other information as deemed necessary by the RE. See Appendix A for Submittal Cover format.

All submittals shall be delivered to the Project RE:

RBF Consulting
Attn: Douglas Cook
4499 Ruffin Road, Suite 100
San Diego, CA 92123

The Contractor shall maintain a submittal log and assign a sequential identification number to each submittal starting with S-001. Each submittal must also reference the proper specification section(s) identifier. Submittals will only be accepted from the Prime Contractor.

The Contractor shall provide six copies unless otherwise specified of each complete submittal including any attachments. One reproducible copy shall be included for each attached drawing. Submittal requirement dates are shown on the project schedule. The RE shall monitor the status of all submittals.

4.4.2 Review

The RE will ensure each submittal is date stamped and logged. The RE will then determine the distribution and routing of the submittal.

4.4.3 Response

The response to submittals shall be in one of the following forms:

- Accepted – without comments
- Accepted – make corrections noted
- Accepted – make corrections noted and re-submit
- Rejected – Make corrections noted and re-submit

Submittal responses from the Engineer to the Contractor via the RE shall be in writing, including a minimum of two sets of the submittal and will include all necessary comments and marked up reproducible drawings. Each response shall be in well defined and complete statements. The date of the response and the disposition noted.

The RE will retain a copy of the submittal, as returned to the Contractor, and will distribute other copies to appropriate parties as required.

4.5 Requests for Information

Requests for Information (RFI's) (see Appendix A) will be sent directly to the RE. The RE will ensure each RFI is date stamped and logged and properly distributed. All RFI's will be entered into and tracked by an RFI log.

The RE shall be responsible for proper processing of the RFI. The RE shall determine a required completion date for response to the RFI and shall have that date entered into the log.

The Engineer shall respond to the RFI in writing on the copied RFI form in the space provided. Continuation sheets may be used as required. The completed form shall be reviewed and signed by the RE, logged on the RFI log and transmitted to the Contractor.

If additional distribution is required, the RE shall specify such on the RFI. If the RFI impacts other parties, the RE shall designate that copies be sent to the appropriate parties. If the RE believes that the response to the RFI may

lead to a Request for Change Order (RFC), the RE will note such on the original RFI form by stating a change order may/will follow.

4.6 Documentation Procedures

4.6.1 Responsibility for Documentation Procedures

The RE is responsible for suitable protection and storage of the official project records to preclude damage, deterioration, and loss, The RE is also responsible for collection, logging, and distribution of documents and maintenance of files, including Construction Inspection Plan (CI Plan) records; as well as implementation and enforcement of the project's documentation and control.

4.6.2 Drawings

The RE shall ensure all new drawings received on site shall be date stamped and logged in. The RE shall review all incoming drawings and ensure proper distribution. The RI will keep a jobsite file of all shop drawings, working drawings, submittal drawings, as-built drawings, and design drawings.

5.0 CONTRACT ADMINISTRATION

5.1 Contractor's Construction Schedule

A detailed construction schedule shall be developed and maintained by the Contractor as per the requirement of the Contract Documents. This schedule shall be used by the RE to monitor the Contractor's progress and initiate corrective action as necessary. The RE and the CM Team will review and monitor the Contractor's monthly schedule updates. Review shall include careful attention to the schedule's critical path. Any change in critical path logic shall be brought to the attention of the RE who will discuss the change with the Contractor. If an activity cannot be completed in the time frame mandated by the schedule, the Contractor should identify that activity (or activities) to the RE for resolution. A copy of the project CPM schedule shall be posted in the CM field office for use by the CM team.

Delay of the Contractor is a critical concern during the project. In many cases, the Contractor will delay himself through late material delivery, improper scheduling of subcontractors, equipment or material malfunctions and breakdowns. It is important to document each of these incidences on the daily inspection forms. This documentation will enable the CM Team to defend the Otay Water District against any potential claim or delay when addressed by the Contractor.

The RI shall document the contractors activities thoroughly. Equipment actively utilized in the construction work or staged on the project site should be noted to assess the impact of any delay claims filed by the Contractor. Finally, the RI will be especially alert to construction activities that could potentially affect critical path activities.

Also, every effort must be made by the CM Team, Engineer, and the Owner to expedite these activities, i.e., return of submittals, RFI's, inspection responses, etc., to avoid requests for time extension and Contractor claims.

5.2 Contract Payments

The Contractor shall review the progress monthly with the subcontractors and material suppliers. The Contractor will then forward the original agreed upon Request for Payment form (see Appendix A) with complete back-up as required

including change order work if appropriate. The RE will review the payment document for compliance to the contractual terms, and ensure that all of the necessary reviews and percentages of work completed have been performed and that all change orders completed or outstanding are properly included on the invoice. The payment requisition shall then be forwarded to the Owner for approval and further processing.

Prior to the first payment, the Contractor shall submit a cost breakdown for each Lump Sum bid item which will show elements and costs for progress payment purposes integrated into the Project Schedule. After review and approval by the RE, the breakdown will be used as the basis for monthly progress payments. Payment will be sent directly to the Contractor by the Owner. Payments for Change Orders will be limited to total amounts specified in the change.

The RE will alert the Contractor in writing to the liquidated damage potential when it appears imminent that work will be continuing after the current official contract completion date. Any payments processed after the current completion date will have liquidated damages deducted, at the rate specified in the contract. Such amounts can be restored only by processing a Change Order for a Contract time extension.

5.3 Contract Changes

A Change Order (CO) is issued when additions, revisions and/or deletions are made to the contract documents. CO's may cover scope of work, extensions of time, changes in design or specifications, substitution of material and equipment, unforeseen conditions, acceleration or suspension of the work and/or any other factors affecting the cost of time of performance.

5.3.1 Change Order Processing

A CO is processed in two to three steps.

Request For Change (RFC): An RFC is generated by the Contractor and informs the Construction Manager that the Contractor believes that the work defined in the RFC is out of the scope of the Contract, and a CO should be issued as compensation for the extra work. The Construction Manager must then determine whether or not the RFC has merit and either issues an RFP or rejects the RFC.

Request For Proposal (RFP): An RFP informs the Contractor that a change will be implemented and requests that the Contractor submit a time and cost estimate. The RFP does not authorize the Contractor to begin working on the CO unless it is so stated and the pricing is agreed to be on a time and materials basis. The RFP shall be subsequently issued as a CO.

Change Order (CO): A CO is the formal document that modifies the contract documents and is signed by the Contractor, CM and the Owner. Any schedule adjustments shall be made after the work is completed but will be negotiated with the Contractor prior to issuance of the Final Change Order. There are three possible pricing methods for CO's:

> **Negotiated Lump Sum:** A Negotiated Lump Sum CO would be used in the case where the RE and the Contractor reach an agreement regarding all cost and schedule adjustments before the change is implemented. The RE would first issue a RFP for negotiation purposes and then a CO after the negotiations are complete and prior to the start of the work.

Unit Price: A Unit Price CO would be used to increase or decrease contract bid quantities. The CO would be paid at the contract unit price, in accordance with the Standard Specifications. When actual quantities of unit price items will exceed or fall short of the contract bid quantities, the RE shall prepare a RFP adjusting the estimated quantities or unit price, if applicable. Pending approval of the CO, payment for overrun quantities will be made at the unit bid price.

Time and Material (Force Account): A Time and Material CO authorizes the contractor to proceed with work and informs him that payment will be based on documented direct cost and approved overhead and profit during the phase of the work. A CO shall be issued when the cost and time adjustments are finalized.

5.3.2 Evaluation of Contractor's Proposal

During preparation of the CO, the RE and PM will prepare an independent estimate covering all items involved with the change order.

There must be sufficient detail to enable another estimator or an auditor to track the specific cost to its source. All references to specific sections of estimating manuals, vendor quotations, equipment rental rate, etc, should be listed. If necessary, copies of reference material should be made, particularly if this material is periodically changed or updated.

Documentation of costs is as important as the accuracy of the estimate. Every change order estimate should be prepared with the possibility that it will end up as a claim or in litigation as a piece of evidence. Well documented costs are the best admissible evidence.

The RE shall compare the CM Team's estimate with the contractor's proposal. If both estimates are materially close, the RE may approve the contractor's proposal. If discrepancies exist, the RE (with the PM, and the Owner as necessary) will hold a CO negotiation meeting with the Contractor to resolve the differences.

5.3.3 Change Order Negotiations

When the Contractor's CO estimate differs substantially from the CM team's estimate, the Contractor and RE (with the PM and Owner as necessary) will meet to negotiate the CO cost. A written summary of the negotiations will be made part of the CO file and should include the following:

- Date of the meeting
- List of Attendees
- Explanation or documentation presented by the Contractor in support of his proposal
- Basis of RE's estimate
- Explanation of the key elements wherein differences exist between the Contractor's proposal and the RE's estimate
- New information disclosed during negotiation
- Agreements reached
- Explanation of the basis for the method of compensation

5.4 Record Keeping

The recognition and preservation of facts and events are essential to the achievement of the settlement of construction disputes, whether achieved through negotiation, mediation, or litigation. The first key to a successful

settlement of a construction dispute is an early recognition that a claim exists. A project documentation system must serve two functions: First, to ensure adequate control and monitoring of the project; and second, to begin building as the project begins, an accurate and complete record of construction conditions, problems, and their impact on the project.

Successful negotiation of construction claims depends primarily on preparation and persuasive presentation of facts. The minimum types of documentation which must exist on each project area as follows:

- Daily Inspection Reports
- All incoming and outgoing contract correspondence and memoranda
- Jobsite log or diary with detailed entries
- Conversation and telephone memos, preferably confirmed by letter
- Photographs and/or videos
- Cost accounting records with enough detail to demonstrate and allocate the cost impact of events on the project
- Baseline and montly project schedule updates

The RE must apprise the CM Team of all potential claim risks on the project on an ongoing basis. The best way to accomplish this is to conduct a weekly review of the actions and activities on the project and their potential for creating disputes. The appropriate remediation activities must be implemented promptly once an internal agreement is achieved.

5.4.1 Daily Inspection Report

The RI shall each keep a daily jobsite log to facilitate accurate completion of the Daily Inspection Report, see Appendix A. The ideal jobsite log is one which provides a daily record of work progress, together with periodic summaries of conditions of the site. Such contemporaneous written documentation of work progress, site conditions, and the contractors ability (or inability) to perform its work without interference can also provide a valuable factual evidentiary foundation.

The RI must record everything that may be pertinent to the most common types of problems and claims.

If anyone fails to record circumstance giving arise to claims for delay or extra work, the very fact that nothing was included in the daily report may raise a damaging inference that the facts as stated by the opposing party are correct. Contemporaneous memos or e-mails of project conferences and conversations with the other parties to the construction project (i.e., the Owner, Engineer, contractor, subcontractors, or suppliers) can be extremely valuable in reconstructing the substance of those meetings. Reference to such conferences should be made in the jobsite diaries or daily report. A confirming letter or e-mail sent to the other party which summarizes the substance of the conversation or meeting is to be encouraged.

5.4.2 Photographs

The ideal approach to picture taking, whether still or videos, is to consider the photographs as a periodic pictorial diary of the job. This encourages personnel to take photographs of site conditions on a routine and systematic basis, perhaps concentrating on problem areas and those areas with crucial construction procedures and scheduling. RBF Consulting's policy is to provide digital cameras to all field personnel and maintain an electronic image chronology of the project construction. Upon project completion a CD or DVD

will be created containing all images and software required to view the catalog with descriptions and timeframe information.

5.4.3 Correspondence

Communications between parties through memos, letters, and e-mails serve as valuable assets for future reference. Be careful prior to discarding anything. Something which seems unimportant at one state on the job may become more significant at a later date.

5.4.4 Monthly Report

The RE will prepare a monthly Construction Management Status Report. The report will outline schedule, submittal, monthly accomplishments, contract status and any key problems encountered during the reporting period. An example is attached in Appendix A.

5.5 Safety

The Contractor is responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with their work. He is also responsible for the safety of employees, visitors and other persons working in their assigned contract area and will provide the necessary protection to prevent injury to these persons

The Contractor is required to designate a qualified and experienced safety representative at the site whose duties and responsibility is the prevention of accidents and maintaining and supervising of safety precautions and programs. The person will conduct and document safety inspection of the work place (self inspection) and will participate in inspections, meetings and training conducted by the CM Team.

Before work is started, the Contractor is required to prepare and submit a safety plan that includes all applicable laws and regulation for the RE's review. Review of this safety plan will not impose any duty or responsibility upon the CM Team for the Contractor's performance of the work in a safe manner. Approval of this plan by the RE is required prior to the start of any work on the site by the Contractor. However, approval of the plan does not in any way relieve the Contractor of his safety responsibility and liability on the project. The Contractor is fully responsible for safety during the performance of the Work.

5.6 Claims Avoidance

Claims prevention and the early resolution of disputes regarding claims depend largely on knowledge of the contract, the quality of the contract, and the quality of records that have been kept for the duration of the project. Potential claims shall be brought to the attention of the PM and the RE by CM Team members at the earliest possible date so that appropriate documentation, analysis and remediation can be undertaken in a timely manner.

5.6.1 Meetings

The RE shall schedule and conduct a weekly job meeting with the Contractor to discuss construction of the project. Problems which arise will be discussed and resolved by the RE in a timely manner in order to prevent a claim situation. The minutes of these meetings shall be distributed to all appropriate parties, as determined by the RE, for review and to alert absent parties to discussions which took place.

5.6.2 Documentation

Good project documentation is essential for the mitigation and resolution of claims. Daily inspection reports, daily construction reports, job memos and other correspondence are important resources for establishing factual elements of a claim. The RE shall perform a periodic review of project documentation to ascertain that the records are consistent, complete, and understandable and factually represent the project work history. The RE shall inform the RE and Inspectors about claims and potential claim issues so that they may keep detailed records of the labor, equipment and materials used in the disputed portion of the work as it progresses.

5.7 Claim Documentation

When a claim is identified, the RE will coordinate all action taken. The RE is required to report the status of any outstanding claims on a monthly basis.

All observations, evaluations, estimates, and notes relevant to that claim shall be maintained in a file for that claim only.

5.7.1 Time-Impact Analysis

The existence of a delay on a project does not, in and of itself constitute an event which automatically yields relief for the Contractor. Relief is determined by the cause and impact of the delay. The RE will review all relevant information with the Owner and authorize such relief following examination.

To properly analyze the impact of a delay on a project, it is necessary to review not only the specifics of the situation, but also the entire context within which the delay occurred. The following steps should be followed to make a valid time-impact analysis:

- Review the delay and record the answers to the questions of when, why, and how the delay occurred.
- Perform document review of all project records relating to the delay (i.e., the contract documents, change orders, daily progress records, monthly reports, job correspondence, field directives, etc.).
- Determine which parties were affected by the delay, to what extent, and provide the proof.
- Determine the scheduled activities that were or will be affected or logically constrained by the delay.
- Determine the impact and duration computations for all affected activities, comparing the current schedule update against the original schedule.
- Schedule fragnets should be prepared to show any added activities or logic revisions and to compare schedule revisions due to the delay to the original project schedule. This comparison will aid the RE in determining the extent of the delay and the delay responsibility. In order to develop the most productive fragnet, it is important to extract the time prior to the delay to observe how the delay was caused, as well as time following the delay to observe which activities were impacted and by how much.
- Design changes during the performance of the work are frequently the subject of claims. The impact that such changes may have, such as damage to completed work and/or delay to project completion, is often not recognized at the time the change is considered. The possibility of such impact should be explored and provided for before the time the change is made. Impact costs are best resolved through forward pricing

and an appropriate time extension at the time of the change rather than at the end of the job. Proof of a causal connection between a given event and delay to ultimate completion of the work is difficult. Available CPM techniques are useful, but often not conclusive. The essential source of any such proof is detailed daily records of job performance.

6.0 MEETINGS

6.1 Weekly Progress Meeting

The RE will hold weekly formal meetings with the Contractor to allow early identification of critical issues and to facilitate resolution of potential problems.

6.1.1 Attendees

These meetings will be conducted by the RE, attended by the Owner, the Engineer, the Contractor, Contractor's subs as required, and any other third parties invited by the RE.

6.1.2 Agenda

The agenda for these meetings (example attached in Appendix A) should contain any unresolved items from the previous meeting(s) and any new items presented at this meeting for the first time. Items are numbered and carried continuously in the minutes until they are resolved.

Standard agenda items should include:

- Review of any Safety Issues
- Review of schedule, past, current, and following week
- Submittal status
- RFI status
- CO status
- Progress payments
- Old business
- New business

The RE will write-up the meeting minutes and have them reviewed by the PM before distribution. The minutes of each meeting should be completed and distributed for comment before the following meeting. The minutes will be stored by serial numbers and weekly dates.

6.2 Coordination Meetings with Contractor

Periodic meetings, aside from weekly meetings, may be held on an as-needed basis to ensure coordination of activities, allow informal status updates, and provide an opportunity for discussion of key issues.

6.2.1 Attendees

Attendees for informal additional meetings will depend on the topic of the meeting and will be led by the RE.

6.2.2 Agenda

Typical agenda items for coordination meetings include:

- Inspection/testing requirements
- Coordination required for multi-discipline activities
- Start-up activities
- Construction activities with environmental concerns

- New issues
- Third party involvement

6.3 Weekly CM Staff Meetings

The RE conducts weekly staff meetings with CM team personnel. Construction activities that are planned for the week are discussed. All employees are encouraged to discuss activities that they are currently working on and share them with the group. Any field problems that the RI encounters will also be discussed at the meeting The RE will also assign the RI's work schedule for the week and will discuss any safety issues with the CM Team.

6.4 Safety Meetings

In accordance with the Contractor's safety program as submitted, meetings must occur on the job site, a tool box meeting for all Contractor's field personnel on a weekly basis, and a supervisory meeting for all contractor supervisory personnel. A CM staff member will be represented at all of these meetings. These meetings will be documented and the notes distributed and filed appropriately.

6.5 Project Schedule Meetings

At a time established by the RE and prior to submittal of the monthly progress pay request, the Contractor will meet with the RE to discuss the project schedule. The Contractor shall be prepared to discuss the project as built condition, evaluate and agree upon actual construction progress, make recommendations for progress payment, review schedule changes, identify problem areas, address critical areas, and determine causes for any delays and make recommendations for corrective action. The RE will use the content of this meeting to evaluate the Contractor's request for payment and monthly schedule update.

7.0 ENVIRONMENTAL MONITORING

7.1 SWPPP Implementation

The Storm Water Pollution Prevention Plan (SWPPP) development and implementation is the responsibility of the Contractor. Its' implementation and maintenance will be reviewed and monitored by the CM Team for compliance. Written notice will be provided to the Contractor when the CM Team detects deficiencies in its' implementation or maintenance.

7.2 Archeological / Paleotological Monitoring

The RE will coordinate with the Contractor provided archeologist or paleontologist. This will include but not be limited to routing of correspondence, meeting invitations and interface with the Contractor should any item of significance be discovered.

7.3 Biological Monitoring

The RE will coordinate with the Contractor provided biologist. This will include but not be limited to routing of correspondence, meeting invitations and interface with the Contractor should any item of significance be discovered.

8.0 PROJECT COMPLETION

8.1 Final Record Documents

Final record documents include Contract Drawings and Specifications maintained by the Contractor to reflect as-built conditions. Final record documents include all changes, deviations, supplemental information, or concealed utilities that revise or supplement the original Contract Documents. This shall include information from RFI's, Field Orders and approved Change Orders.

Following substantial completion, the Contractor will submit record documents to the RE. The RE will review the submittal and forward it to the Design Consultant for incorporation onto the original electronic files.

8.2 Spare Parts

Spare parts, when required by the Contract Documents, are provided by the Contractor in accordance with the Contract specifications to enable the Owner to maintain and repair system equipment.

As part of the project closeout, when the Contractor is ready to transfer spare parts to the Owner, the RE will arrange a suitable time and place for this transfer, reviewing the items and documenting the components submitted.

The Contractor shall turn over spare parts to the Owner. The spare parts will be properly identified, protected, and boxed in accordance with the Contract Documents. All spare parts turned over to the Owner will be itemized on the Spare Parts Transfer form (see Appendix A).

The RE, Contractor, and Owner shall inventory each transfer of spare parts and will complete the Spare Parts Transfer form.

8.3 Warranty

The Contract Documents require that all warranties must be submitted prior to project completion and final payment. The warranty process will generally follow the steps presented below.

When equipment under warranty malfunctions, the Owner will initiate a Warranty Repair Order (WRO) (see appendix A), and forward it to the RE.

The RE receives and logs the WRO, and performs an independent investigation of the problem. If the RE verifies that the problem is a warranty item, the RE will issue the WRO to the Contractor.

The Contractor will make the necessary repairs or call in the manufacturer's service representative as required. When the repairs are complete, the Contractor will so note the WRO and return it to the Construction Manager.

The RE will verify that the repairs are complete, sign the WRO, log the repair date, and return the WRO to the Owner.

Special warranties, beyond the normal one year period, may be required on this project and would be specified in the Contract Documents

8.4 Pre-Final Inspection

The Pre-final inspection will be conducted by the RE prior to start-up and substantial completion to identify incomplete or unsatisfactory items of work in accordance with the Contract Documents. Incomplete or nonconforming work

will be itemized on the Discrepancy list. The paragraphs presented below identify the procedures that will be followed in performing the pre-final inspection and preparing the discrepancy list (pre-inspection punch list).

When the Contractor, notifies the RE that the work is ready for the pre-final inspection, the RE will arrange for inspection of the work by the Owner and Engineer and will develop a discrepancy list (pre-inspection punch list) that identifies the incomplete and nonconforming work.

The RE will issue the Construction Discrepancy List, contained in Appendix A, to the Contractor. The Contractor will correct all deficiencies and report completion to the RE.

The RE will monitor the satisfactory completion of the individual work items by the Contractor and will check off completed work items in preparation for the final inspection.

8.5 Final Inspection

The final inspection, in compliance with the Contract, includes both physical examination of the work and the examination of all contract provisions and requirements to ascertain whether the contract has been fully performed. This inspection is used to identify all outstanding contract requirements

When the Contractor has completed all work and contractual requirements, the Contractor can then request that the RE schedule a final inspection.

During the final inspection, the RE, Owner and Engineer will inspect the work and will examine applicable provisions of the Contract Documents. The RE will prepare a final punch list based on the results of this inspection.

8.6 Notice of Partial Utilization/Beneficial Occupancy

In compliance with the Contract, the Notice of Beneficial Occupancy and/or Partial Utilization of a portion of the work is prepared by the RE and is used to notify both the Contractor and the Owner that the portion of the work that the Owner wishes to occupy and/or utilize is substantially complete. This will establish the date when a portion of the Work that the Owner wishes to beneficially occupy and/or partially utilize is substantially complete and ready for the Owner's use. This notice will start the Contractor's warranty period for those portion(s) of the work and starts the Owner's maintenance and operational responsibility for the accepted portions of the work

8.7 Certificate of Substantial Completion

In compliance with the Contract, when the Contractor has successfully completed the operational demonstration and believes that the pre-final inspection punch list work items have been completed to the point that would allow the Owner to occupy and utilize the work while the few remaining punch list items are completed, the RE will issue a Certificate of Substantial Completion.

The Certificate of Substantial Completion (see Appendix A) is prepared and issued to the Owner and the Contractor by the RE giving the date that the work is sufficiently complete so that the Owner can occupy and utilize the entire work for the purpose for which it is intended. The issuance of the Certificate of Substantial Completion begins the Contractor's warranty period

8.8 Final Payment & Acceptance

Application for final payment by the Contractor indicates that the terms and conditions of the contract are fulfilled and provides a mutual waiver of all claims, except as provided in the Contract Documents.

After the final inspection, the Contractor will submit a final application for payment to the RE. The final application for payment will be reviewed by the RE during the final inspection and will include a waiver and release of all liens, claims, disputes, and a certification attesting that all the Contractor's obligations associated with this project have been discharged in full for all work covered by prior applications for payment.

If the RE determines that the final Application for Payment is acceptable, the RE after receiving all necessary documentation from the Contractor will recommend payment.

8.9 Notice of Completion and Retention Release

Upon conclusion of the final inspection and approval by the Owner, the RE will prepare the Notice of Completion and submit it to the Owner.

The Notice of Completion is filed with the County Recorder to start the 35 day Stop Notice period on the project. After successful completion of this 35 day period, the Owner will make payment of the retained funds in Compliance with Contract Documents

APPENDIX A
CONSTRUCTION MANAGEMENT FORMS

1. QUALITY DISCREPANCY NOTICE
2. CONSTRUCTION DEFICIENCY REPORT
3. SAFETY DEFICIENCY REPORT
4. SUBMITTAL TRANSMITTAL FORM
5. APPLICATION FOR PAYMENT
6. REQUEST FOR INFORMATION
7. REQUEST FOR PROPOSAL
8. PROGRESS MEETING MINUTES
9. DAILY INSPECTION REPORT – GENERAL
10. MONTHLY PROJECT REPORT
11. CONSTRUCTION DISCREPANCY LIST
12. SPARE PARTS TRANSFER FORM
13. WARRANTY REPAIR ORDER
14. CERTIFICATE OF SUBSTANTIAL COMPLETION

RBF CONSULTING

RBF Consulting
4499 Ruffin Road, Suite 100
San Diego, CA 92123
(858) 565-4545
Fax (858) 565-4547

QUALITY DISCREPANCY NOTICE #00

Date:		Project Name:	Otay 640-1 & 640-2 Reservoirs
To:	Pacific Hydrotech Corporation	C.I.P. No.:	P2185
	314 E 3rd Street Perris, CA 92570	Contractor:	Pacific Hydrotech Corporation
Attn:		W.O. No.:	30018
From:	Douglas Cook		
Subject:			

You are hereby notified that the following material or work in progress may result in a product that does not conform to the contract requirements:

We wish to resolve the above discrepancy prior to any impact to the progress of the work. If you disagree with our interpretation of the contract documents, please contact me immediately. If you agree, please take the necessary actions to ensure contract compliance, and have our inspector or R.E. sign below.

Project Manager's Signature

Resident Engineer's Signature

FOR INSPECTOR OR R.E. USE ONLY

☐ The discrepancy has been resolved.

Remarks:

Inspector / RE Signature

Date

cc:

RBF CONSULTING

RBF Consulting
4499 Ruffin Road, Suite 100
San Diego, CA 92123
(858) 565-4545
Fax (858) 565-4547

CONSTRUCTION DEFICIENCY REPORT #00

Date:		Project Name:	Otay 640-1 & 640-2 Reservoirs
To:	Pacific Hydrotech Corporation	C.I.P. No.:	P2185
	314 E 3rd Street Perris, CA 92570	Contractor:	Pacific Hydrotech Corporation
Attn:		W.O. No.:	30018
From:	Douglas Cook		
Subject:			

You are hereby notified that the following construction or work procedure does not conform to the contract requirements:

Noncomplying work may be required to be removed and replaced at no cost to the Owner.

It shall be your responsibility to determine the corrective action necessary.

Resident Engineer's Signature

Project Manager's Signature

Resolution:

Agree with finding ☐ We expect to take action by:

Description of Resolution:

Disagree with finding ☐

Reason for Disagreement:

Contractor's Signature

Date

cc:

RBF CONSULTING

RBF Consulting
4499 Ruffin Road, Suite 100
San Diego, CA 92123
(858) 565-4545
Fax (858) 565-4547

SAFETY DEFICIENCY REPORT #00

Date:		Project Name:	Otay 640-1 & 640-2 Reservoirs
To:	Pacific Hydrotech Corporation	C.I.P. No.:	P2185
	314 E 3rd Street Perris, CA 92570	Contractor:	Pacific Hydrotech Corporation
Attn:		Contract No.:	30018
From:	Douglas Cook		
Subject:			

Date of Inspection _____

Location/Contractor Inspected _____

Persons Conducting Inspection _____

The following Safety/Health/Security/Environmental Deficiencies have been identified and must be corrected IMMEDIATELY. If additional time is needed or if an item is disputed please note this accordingly on this form. This form must be returned to the Construction Manager within 48 hours.

DEFICIENCIES IDENTIFIED	RECOMMENDED / REQUIRED CORRECTIVE ACTION

All Deficiencies Corrected ___ More Time Requested of Items Checked above

Disputed Deficiencies Checked above ___ (Request meeting to discuss) check one

_____ _____

Contractors Safety Representative Date

RBF Consulting
4499 Ruffin Road, Suite 100
San Diego, CA 92123
(858) 565-4545
Fax (858) 565-4547

CONTRACTOR'S SHOP DRAWING/SUBMITTAL TRANSMITTAL FORM

Date:		Project Name:	Otay 640-1 & 640-2 Reservoirs
To:	RBF Consulting	C.I.P. No.:	P2185
	4499 Ruffin Road, Suite 300 San Diego, CA 92123	Contractor:	Pacific Hydrotech Corporation
Attn:	Douglas Cook	W.O. No.:	30018
From:		Spec. Sec.:	
Subject:		Dwg. No.:	

Specification Section: _____ This is an original submittal: _____

Submittal Prepared By: _____ A re-submittal: _____

Phone Number: _____ of submittal no.: _____

DRAWING NO.	DESCRIPTION	DATE	NO. OF COPIES	TYPE

We verify that the material or equipment contained in this submittal meets all the requirements specified or shown, except for the following deviations.

Remarks: _____

By: _____ Forwarded by: _____ Date: _____

Contractor's Signature — Contract Manager's Signature

Returned to RBF from: _____ Date: _____

NO EXCEPTIONS TAKEN ☐ MAKE CORRECTIONS NOTED ☐ REJECTED/RESUBMIT ☐

Remarks: _____

By: _____ _____ Forwarded By: _____ _____

Design Consultant's Signature — Date — Contract Manager's Signature — Date

cc:

OTAY WATER DISTRICT
PROGRESS PAYMENT

Project: Subproject: Date:

W.O. No.: CIP No.: P.O. No.:

Project Name:

Contractor's Name:

Contractor's Address:

Phone No.: Fax No.:

Progress Payment No.: For Period Ending:

SEE ATTACHED ITEMIZED BREAKDOWN

ORIGINAL CONTRACT AMOUNT:	$
TOTAL CONTRACT THROUGH C.O. No.	$
TOTAL EARNED TO DATE:	$
LESS 10% RETENTION:	- $
LESS PREVIOUS PAY:	- $
LESS STOP NOTICES AND OTHERS:	- $
TOTAL PAY THIS INVOICE:	$
PERCENT COMPLETE:	%

_____ Dated: ___ /___ /___
Contractor

_____ Dated: ___ /___ /___
Construction Manager/District Inspector

_____ Dated: ___ /___ /___
Project Manager

COPIES: ☐ ACCTS PAY.(Orig) ☐ FILE ☐ DIVISION MGR.

N:\PDATA\25102366\Admin\proposal\CM Manual Forms\Contractor Handbook\CTR 05 Pay Application Form Blank.doc

RBF Consulting
4499 Ruffin Road, Suite 100
San Diego, CA 92123
(858) 565-4545
Fax (858) 565-4547

REQUEST FOR INFORMATION # 000

Date:		Project Name:	Otay 640-1 & 640-2 Reservoirs
To:	RBF Consulting 4499 Ruffin Road, Suite 100 San Diego, CA 92123	C.I.P. No.:	P2185
		Contractor:	Pacific Hydrotech Corporation
Attn:	Douglas Cook	W.O. No.:	30018
From:		Spec. Sec.:	
Subject:		Dwg. No.:	
		Need Response By:	

Question/Problem

By: _____ Date: _____
Originator's Signature

Reply/Solution

Date:

By: _____ Date: _____
Design Consultant's Signature

This document is informational only. The above reply is intended as a clarification only and does not constitute a basis for change in contract price or time. If you do not concur do not proceed and notify the Construction Manager immediately.

Forwarded By: _____ Date: _____
Construction Manager's Signature

RBF CONSULTING

RBF Consulting
4499 Ruffin Road, Suite 100
San Diego, CA 92123
(858) 565-4545
Fax (858) 565-4547

REQUEST FOR PROPOSAL #01

Date:		Project Name:	Otay 640-1 & 640-2 Reservoirs
To:	Pacific Hydrotech Corporation	C.I.P. No.:	P2185
	314 E 3rd Street Perris, CA 92570	Contractor:	Pacific Hydrotech Corporation
Attn:	Bob Owens	W.O. No.:	30018
From:	Douglas Cook		
Subject:	RFP 001 –		

Reference Drawings: N/A
Ref. Spec. Section: N/A
Referenced RFI: N/A

Description:

Shop drawings required

X No Shop drawings required

Please prepare a lump sum proposal to furnish all required labor, material, and equipment necessary to implement the following items:

-

- Please submit a lump sum cost proposal for this adjustment to your construction contract by **????? ??, ????.** Your proposal should include a complete detailed breakdown of labor man-hours, materials, equipment, and all other related costs which would be basis for negotiation and agreement in an adjustment to the contract price.
- Please quantify the impact, if any, the above described scope of work will have upon your project completion date, by identifying the first critical path element of your schedule which is impacted and the duration of the impact.
- Other requirements to be included are: N/A

By: _____
Resident Engineer's Signature

cc:

R2022
WO 8875

30 Inch Recycled Water Pipeline Project
Progress Meeting No. 055
Ortiz Corporation
October 12, 2006

Attendees:

Ortiz	OWD	Hirsch	Lee & Ro	Sub-Contractors / Other
Marcelino Ortiz Jon Cady Lucy Ortiz	Manny Magana	Doug Cook Wayne Papac	John Stein	

Additional Copies to:

Victor Ortiz Obdulio Martinez	Rod Posada Richard Shackley Doug Marple	Jim Bassett	John Kearney Frank Biehl	Ted Lee – Mooney Korey Klutz – Mooney Cristina Gonzalez – Mooney Rob Case – Mooney Danny Lima – City of CV

NO.	TOPIC	ACTION
	OLD BUSINESS	
51.4	Archeological Artifacts – Otay to determine how to issue check to Natural History Museum for curation of artifacts recovered from the project site 09/21 Otay to issue check to Natural History Museum after directions received from Mooney on the process to be used 09/28 Check pending receipt of directions from Mooney 10/05 Continuing 10/12 Continuing	Mooney
52.4	Chula Vista Trench Repair Paving Limits – a meeting will be held in the field at 9am on Tuesday, 9/26/06 to determine limits of paving and cross-sections. Discussion in meeting today regarding use of fabric to minimize the limits of cold-plane and paving. 09/28 Discussion resulted in the following: Brandywine – 11 feet x 2.5 inches Main – 11 feet x 1.5 inches with sand and seal Sequoia – 20 feet x 2.5 inches West Point – 11 feet x 4 inches w/o sub-base and base compaction testing 10/05 Limits were revised by e-mail and additional site visit – see attached e-mail confirming revised limits of removal and replacement 10/12 City of CV reviewed Asphalt Paving submittal (No. 96) one comment related to desire to have a ½" wear course on top of a ¾" mix beneath (see attached e-mail)	Informational
54.4	Pipe flushing protocols – Jim B and Richard S to work on determining flushing protocols and water sources 10/12 Continuing	RBF / Otay
	NEW BUSINESS	
55.1	Safety – no accidents or incidents this week	None
55.2	Schedule – see attached lookahead schedule this week – tie in to San Diego is delayed pending receipt of ductile iron spool piece should be complete in approximately 5 weeks –	None

NO.	TOPIC	ACTION
	paving in City of SD to commenced this week - AVAR's 99% complete – project clean-up readying for punchlist – final cathodic testing pending connection at Diary Mart Road – Olympic Parkway scheduled for installation week of 10/24, schedule to be coordinated with Richard Shackley and Doug Marple. – City of CV paving scheduled to begin 10/29/06	
55.3	Pipe Installation Totals – as of end of shift PROJECT TOTAL* 31,039 LF 10/05/05 – 09/07/06 *including HDD footage & MTDB J&B LAST MONTH 1,394 LF 07/27/06 – 08/31/06 THIS MONTH 1,464 LF 09/01/06 – 10/12/06 THIS WEEK 0.0 LF 09/28/06 – 10/12/06 REMAINING 6.5 LF	None
	END OF MEETING	

Next Meeting - **9:00 am on Thursday, October 19, 2006**
Prepared by: Doug Cook, RBF Consulting

These minutes summarize the substantive items discussed or issues resolved at the meeting to the best of the writer's memory. If the recipients understand differently, please notify the writer as soon as possible so corrections can be made.

Douglas Cook - Fwd: Asphalt Mix

From: Douglas Cook
To: Dan Lima
Date: 10/9/2006 2:23 PM
Subject: Fwd: Asphalt Mix
CC: James Bassett; John Stein PE; Jon Cady

Dan,

From a discussion with Jon at Ortiz, it is my understanding that the only comment City of Chula Vista had on the Asphalt Paving submittal (Number 96 and attached) was the inclusion of a 3/4" mix for the base pavement on West Point to be followed by a ½" mix wear course.

The 3/4" mix design is attached in an e-mail from Jon Cady.

If this is correct or incorrect, please let me know as soon as possible.

Thank You,
Doug

OTAY PIPELINE 2 WEEK LOOK AHEAD

2006

October

12 13 16 17 18 19 20 21 22 23

Tie In – Dairy Mart Road Awaiting Pipe for Connection

Awaiting 16" BFV for Olympic Parkway - Due Oct. 24 →

Punch List Work Items →

All Paving Completed within City of San Diego – Striping to Commence Today →

Paving on Main St. – Brandywine – Sequoia – West Pt. \ City of Chula Vista

Week of Oct. 23

Cathodic System Certification – On Hold Until Connection @ Dairy Mart Road

Continuing to Complete Misc. Work Items (Pre-Punch List) Next 2 Weeks

All 30" Steel Pipe is Installed

RBF CONSULTING

RBF Consulting
4499 Ruffin Road, Suite 100
San Diego, CA 92123
(858) 565-4545
Fax (858) 565-4547

DAILY INSPECTION REPORT

Title:	Otay 640-1 & 640-2 Reservoirs Project	Report No.:	
Owner:	Otay Water District	Date:	Day:
Work Order No.:	30018	Shift Hour: Start:	Stop:
C.I.P. No.:	P2185	Weather:	
Contractor:	Pacific Hydrotech Corporation	Location:	

PROGRESS ON CONSTRUCTION ACTIVITIES SCHEDULED:

Activity No.	Area	Quantity	Description

OTHER ACTIVITIES OBSERVED:

Activity No.	Area	Quantity	Description

NONCONFORMING MATERIALS OR WORK (Describe reason for Non-conformance)

Activity No.	Description

SUBCONTRACTOR'S ON SITE

Active	Non-active

FIELD PROBLEMS

Activity No.	Problem

FOLLOW UP INSPECTIONS OF PREVIOUSLY REPORTED DISCREPANCIES:

Report No.	Discrepancy	Resolution

Name _____ **Signature** _____

Title Resident Inspector **Date** _____

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4499 Ruffin Road, Suite 100
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(858) 565-4545
Fax (858) 565-4547

DAILY INSPECTION REPORT

Title:	Otay 640-1 & 640-2 Reservoirs Project	Report No.:	
Owner:	Otay Water District	Date:	Day:
Work Order No.:	30018	Shift Hour: Start:	Stop:
C.I.P. No.:	P2185	Weather:	
Contractor:	Pacific Hydrotech Corporation	Location:	

CONTRACTOR'S / SUBCONTRACTOR LABOR FORCE

Name	Activity	Code	Hrs	Day / Night	Sub "S"

CONTRACTOR'S EQUIPMENT

Description	Activity	Code	Hrs	Day / Night	Sub "S"

MATERIALS DELIVERED THIS DATE:

Description	Activity	Activity	Activity

PUBLIC ISSUES ADDRESSED:

VISITORS:

Name _____ **Signature** _____

Title Resident Inspector **Date** _____

Otay Water District
Development Services Department
Construction Management Status Report

30" Recycled Water Pipeline Project
Dairy Mart Road to 450-1 Reservoir

San Diego / Chula Vista ~ Division 1 & 2

W.O. 8875 ~ **R2022 - 001103**

HDD – 30-inch pipe installation

Night Operations on Dennery Road

HDD – Beginning of pullback operation at Otay River

March 2006 **Issue 07**

All data contained in this report is as of last day of the month reporting.

Prepared by:
Douglas Cook
Hirsch & Co.

CONSTRUCTION MANAGEMENT STATUS REPORT

Project Team

Otay Water District: Rod Posada, P.E., Chief Development Services
Otay Water District: Pat Vaughan, P.E., Project Manager
Hirsch & Co.: Wayne Papac, Construction Manager
Ortiz Corporation: John Cady, Contractor Project Manager
Lee & Ro: John Stein, P.E., Design Engineer

1.0 Schedule Status

1.01 Contractor's current schedule indicates an on-schedule finish for November 21, 2006. Currently the Contractor is on-schedule.

1.02 Horizontal Direction Drill operation completed this month – Subcontractor has demobilized from Otay River Valley

1.03 63% complete with mainline pipe installation at end of month

1.04 Construction scheduled to begin in City of Chula Vista on April 10, 2006 in SBC Operations Yard

2.0 Accomplishments

2.01 HDD Operation – Completed Installation of 30-inch pipe this month

2.02 2,347 LF of 30-inch CMLC pipe installed this month

2.03 Continued installations of Air/Vac and Blow-off's

2.04 Began and nearly completed night operations on Dennery Road this month

3.0 Current Contract Status

3.01 **Contract Time**

Limited NTP Date	May 11, 2005
Full NTP Date	September 28, 2005
Original Allowed Calendar Days	565
Original Contract Completion Date	November 21, 2006
Additional Allowed Calendar Days Through C.O. 0	0
Total Revised Allowed Calendar Days	565
Days Completed	325
Revised Contract Completion Date	November 21, 2006
Elapsed Contract Time	58.0%
Allowed Construction Days	419
Construction Days Completed	184
Elapsed Construction Time	43.9%

CONSTRUCTION MANAGEMENT STATUS REPORT

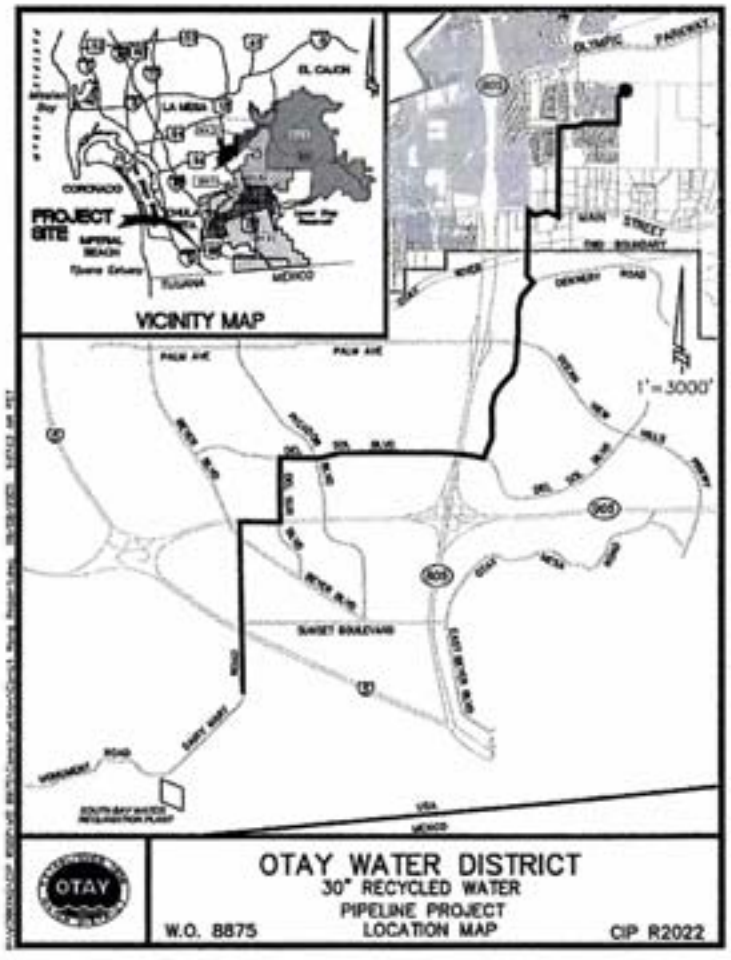
3.0 Current Contract Status

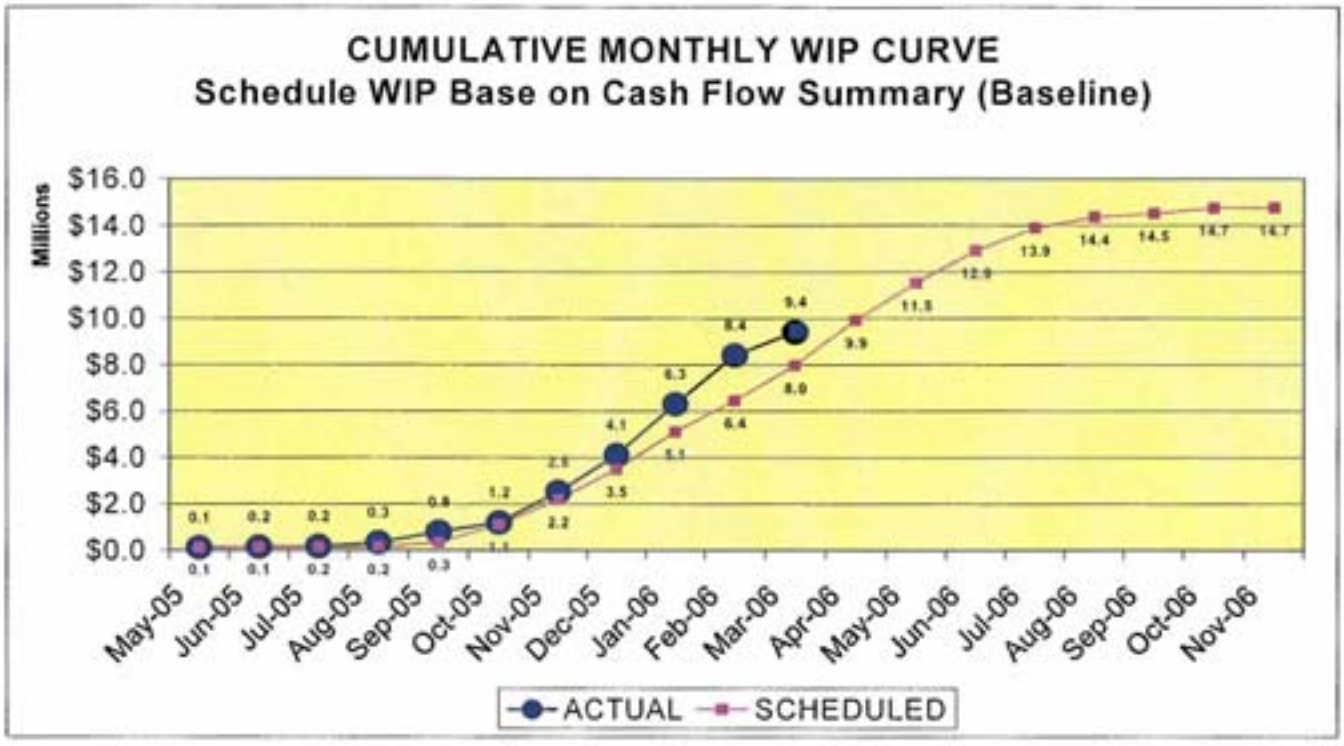
3.02 **Contract Price**

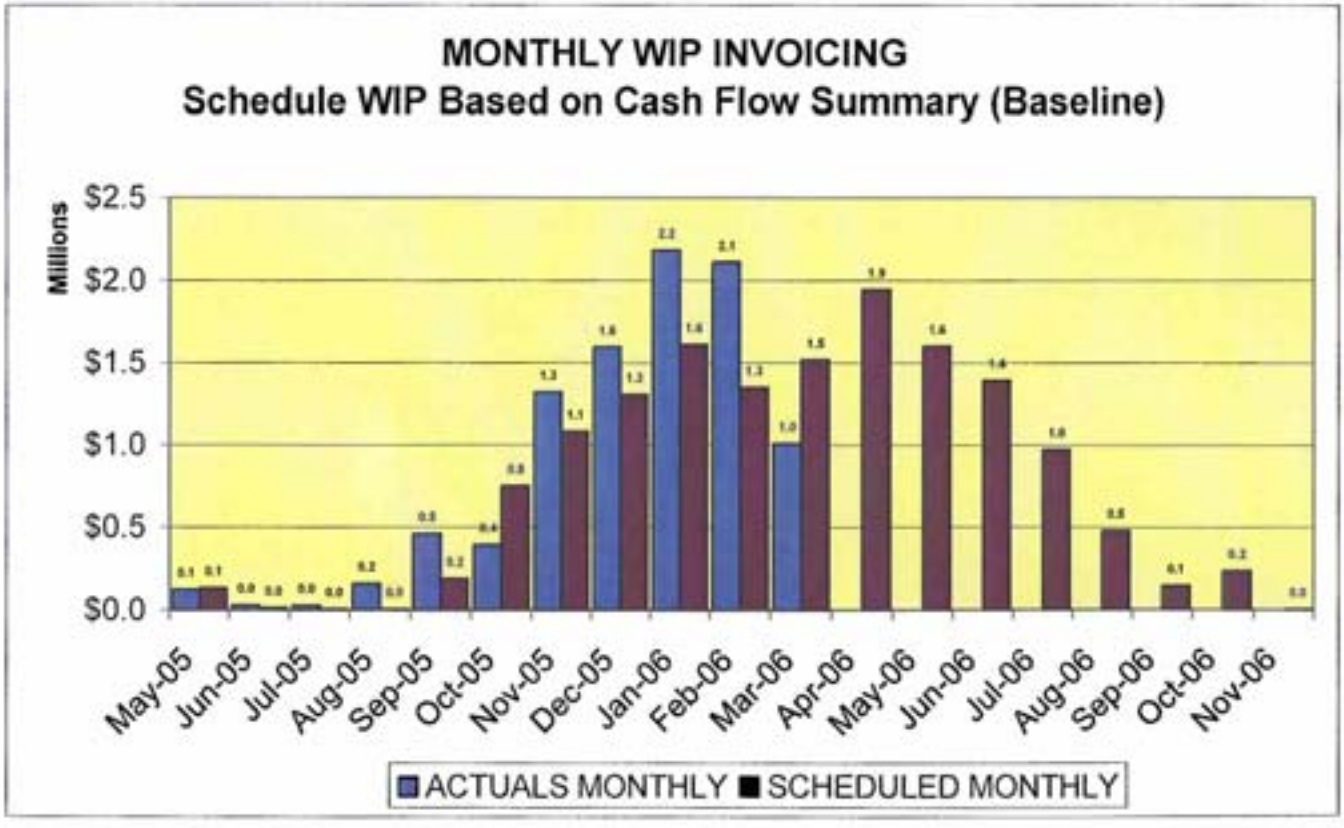
Original Contract Value	$	14,747,600.00
Approved Change Order Value Through #0	$	0.00
Revised Contract Amount	$	14,747,600.00
Payable To Date	$	9,417,154.35
Retention To Date	$	941,715.44
Total Invoiced To Date	$	8,475,438.92
Percent Invoiced To Date		**63.86%**

3.03 **Change Orders**

No C.O. were processed in March 2006. There are no C.O.'s on the project.







HIRSCH & COMPANY
CONSULTING ENGINEERS

RBF CONSULTING

RBF Consulting
4499 Ruffin Road, Suite 100
San Diego, CA 92123
(858) 565-4545
Fax (858) 565-4547

PRELIMINARY
CONSTRUCTION DISCREPANCY LIST

Date:		Project Name:	Otay 640-1 & 640-2 Reservoirs
To:	Pacific Hydrotech Corporation	C.I.P. No.:	P2185
	314 E 3rd Street Perris, CA 92570	Contractor:	Pacific Hydrotech Corporation
Attn:		W.O. No.:	30018
From:	Douglas Cook		
Subject:			

No.	Item	Corrected on:	Verified by:
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			
15			
16			
17			
18			
19			
20			
21			
22			
23			
24			
25			
26			
27			
28			
29			
30			

cc:

RBF Consulting
4499 Ruffin Road, Suite 100
San Diego, CA 92123
(858) 565-4545
Fax (858) 565-4547

SPARE PARTS TRANSFER FORM #00

Date:		Project Name:	Otay 640-1 & 640-2 Reservoirs
To:	RBF Consulting	C.I.P. No.:	P2185
	4499 Ruffin Road, Suite 100 San Diego, CA 92123	Contractor:	Pacific Hydrotech Corporation
Attn:	Douglas Cook	W.O.:	30018
From:			
Subject:			

	Spec. No.	Item Description	Quantity	Part No.
1.				
2.				
3.				
4.				
5.				
6.				
7.				
8.				
9.				
10.				
11.				
12.				
13.				
14.				
15.				

The above listed items have been assembled and are ready for transfer to the Owner

Delivered By: Received By:

Contractor's Signature Date Resident Engineer's Signature Date

The above listed spare parts have been inspected and inventoried and are hereby accepted, subject to all contract provisions by the Owner

Accepted By:

Owner's Signature Date

cc:

RBF Consulting
4499 Ruffin Road, Suite 100
San Diego, CA 92123
(858) 565-4545
Fax (858) 565-4547

WARRANTY REPAIR ORDER #00

Date:		Project Name:	Otay 640-1 & 640-2 Reservoirs
To:	Pacific Hydrotech Corporation	C.I.P. No.:	P2185
	314 E 3rd Street Perris, CA 92570	Contractor:	Pacific Hydrotech Corporation
Attn:		W.O. No.:	30018
From:	Douglas Cook		
Subject:			

Equipment I.D. #/Location:

Problem Description:

Comments:

Initiated and verified by:

Resident Inspector's Signature

Date

Forwarded to Contractor by:

Contract Manager's Signature

Date

RBF CONSULTING

RBF Consulting
4499 Ruffin Road, Suite 100
San Diego, CA 92123
(858) 565-4545
Fax (858) 565-4547

WARRANTY REPAIR ORDER #00

Description of Corrective Work Performed:

_____

_____

_____

_____

Identify any Spare Parts Supplied:

_____

_____

Comments:

_____

_____

_____

By: _____ Work Completed on: _____

Contractor's Signature

Repair Verified by Whom and When: _____

Comments:

_____

_____

_____

_____

_____

_____

This Work Order has been completed.

By: _____ _____

Contract Manager's Signature Date

cc:

RBF CONSULTING

RBF Consulting
4499 Ruffin Road, Suite 100
San Diego, CA 92123
(858) 565-4545
Fax (858) 565-4547

CERTIFICATE OF SUBSTANTIAL COMPLETION

Date:		Project Name:	Otay 640-1 & 640-2 Reservoirs
To:	Pacific Hydrotech Corporation	C.I.P. No.:	P2185
	314 E 3rd Street Perris, CA 92570	Contractor:	Pacific Hydrotech Corporation
Attn:		W.O. No.:	30018
From:	Douglas Cook		
Subject:	Project Substantial Completion		

DEFINITION

The date of Substantial Completion of the Work or designated portion thereof is the Date certified by the Construction Manager when construction is sufficiently complete, in accordance with the Contract Documents, so the Owner can occupy or utilize the Work or designated portion thereof for the use for which it is intended, as expressed in the Contract Documents.

PROJECT, OR DESIGNATED PORTION THEREOF, INCLUDED IN THIS CERTIFICATE:

Otay 640-1 & 640-2 Reservoirs Project

The Work performed under this Contract has been reviewed and found to be substantially complete. The date of Substantial Completion of the Project or portion thereof designated above is hereby established as ????? ???, 200?, which is also the date of commencement of applicable warranties required by the Contract Documents.

A list of items to be completed or corrected has been previously transmitted. The failure to include any items on such a list does not alter the responsibility of the Contractor to complete all work in accordance with the Contract Documents. The date of commencement of warranties of items will be the date of Notice of Completion unless otherwise agreed to in writing.

By: _____ _____
Contract Manager's Signature Date

By: _____ _____
Contractor's Signature Date

Acknowledged By: _____ _____
Owner's Representative's Signature Date

cc:

ATTACHMENT 10

CONSTRUCTION MANGAGEMENT

MANUAL

DECEMBER 2010

VERSION 1.0

OTAY WATER DISTRICT

ENGINEERING DEPARTMENT

DANIEL KAY, P.E.

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CONSTRUCTION FORMS

INTRODUCTION

The Otay Water District (District) Construction Management (CM) staff's primary purpose is to administer construction contracts for Capital Improvement Projects (CIP). Every construction project is different from the next however this manual shall be used to adopt standard operating procedures to promote uniformity and efficiency. The CM team shall use the methods and forms described herein to keep a consistent standard of practice.

CONSTRUCTION MANGAGEMENT METHODS

There are two basic components to the CM process: Construction Management and Inspection. Of these basic components there are three methods the District uses to deliver the Construction Management phase of the project:

	CM	Inspection
Method 1	District Staff	District Staff
Method 2	Consultant	District Staff
Method 3	Consultant	Consultant

Method 1: This method is used when District Staff has enough in-house resources to administer the construction phase with District personnel. The construction value for this method is typically less than $1,000,000

Method 2: This method is administered to the District's current As-Needed CM Consultant. The consultant will be selected using the District's Policy 21 for Selection of Professional Consultants as well as Engineering Guideline G1.17 for Consultant Selection. The contract is typically for $175,000 and for a period of two fiscal years (whichever comes first). This method shall only be used when District Inspection Staff has enough resources to administer the inspection portion of the project. The construction value for this method is typically less than $5,000,000.

Method 3: This method is most commonly used on larger and complex CIP projects with a construction value greater than $5,000,000. The consultant will be selected using the District's Policy 21 for Selection of Professional Consultants as well as Engineering Guideline G1.17 for Consultant Selection. The Consultant will typically be selected between the 60% and 90% design phase to become familiar with the project before the award of the construction project and to provide a constructability review before the design is completed.

CONSTRUCTION MANAGEMENT TEAM RESPONSIBLITIES

CM consists of providing construction engineering, inspection, and observation, during the construction phase of the project to ensure the conditions of the contract have been

met. A typical CM team consists of a Principal Construction Manager/Engineer, a Project Construction Manager/Engineer, and Inspection Staff.

The CM manual describes the duties involved in the CM of projects. The following descriptions cover the normal range of duties, however these descriptions are not a complete list of responsibilities and every CM team should recognize that every project will be different to some degree and will require flexibility in the procedures by adapting them to a particular project.

Project Manager (PM): The PM is the person responsible for the oversight and control of the entire project. The PM is responsible for budgeting, planning, scheduling, preparing contract documents and general oversight of the project from inception to completion. In some cases the PM, the Design Engineer, and the CM are the same.

Principal Construction Manager (PCM): The PCM oversees the Construction Manager and Inspection Staff. The PCM will guide the CM in controversial contract interpretations and keep District Staff aware of the overall project progress. The PCM and the Construction Manager will try to resolve any conflicts before a certified claim is filed. In some cased the PCM may be part of District Management Staff.

Construction Manager (CM): The CM is the primary contact with the Contractor. The CM is responsible for the administration of the construction contract to assure to the extent possible that the contract is completed according to the plans and specifications, to the required Water Agencies' Standards (WAS), within the contract time allowed for construction, and within the contract price authorized for the work.

The CM is responsible for monitoring the work of the Contractor to ensure that the work is installed in accordance with an agreed schedule and to ensure that support services from Inspection staff comply with the construction schedule. The CM will receive and resolve requests for information, clarification of the construction documents, and resolution of field conditions that may represent a change to the contract conditions. The CM shall process all requests for changes, including any changes in the contract price or time that result from changes.

Unless the project specifically states otherwise, the CM is responsible for responding professionally, timely, and courteously to concerns about the construction from the public. The CM is expected to take reasonable steps to minimize the impact of construction on the affected residents and businesses. The CM is responsible for reporting and documenting any visits by the media.

The CM is responsible for checking all monthly progress payments to ensure the quantities and payments reflect the work actually completed for each month.

The CM is responsible for monitoring the quality of the work installed to confirm that it meets the specifications and industry quality standards. This will include processing of shop drawings and other submittals, monitoring of all testing, observation of the work

being installed and gathering certifications, warranties, and guarantees. The CM shall record all non-conforming work and completion of corrective action.

The CM is responsible for monitoring the Contractor for conformance with District and contractual safety requirements and shall bring all observed violations to the attention of the Contractor. The CM is not responsible for the safety of the work, but shall require correction of serious situations observed and shall stop work that poses a serious and imminent danger to life or substantial property damage. All accidents requiring medical attention or property damage shall be immediately reported to District Management Staff and Operations.

The CM is responsible for monitoring the work of others assigned to assist the CM in the administration of construction contracts and shall ensure that they perform their duties as required. The CM shall provide assistance and guidance as necessary so as to promote a team environment and a positive work experience.

The CM is responsible for regular and timely reporting to the PCM. The CM shall promptly report any major deviations from the schedule, the contract price, or the quantity of the work.

The CM is responsible to set up and maintain the project files. The project files include but are not limited to submittal logs, RFI logs, change order logs, progress payments, schedules, progress meeting minutes, monthly reports, and all correspondence between the Contractor and the District.

Construction Inspector: The Inspector is responsible to perform inspection of the Contractor's work to assure the work is in compliance with approved contract plans and specifications. The Inspector observes the Contractor's work and recommends approval of the inspected work to the CM in accordance with the contract documents and WAS. The Inspector prepares daily inspection reports detailing the work performed by the Contractor and verifies with the CM the quantities for progress payments.

CONTRACT FORMS

December 7, 2007 Project: P2191-002103

Scott Coleman
Speiss Construction Co. Inc.
1110 East Clark Ave., Suite 210
Santa Maria, CA 93455

SUBJECT: 850-4 Reservoir Potable Water Storage Facility; Notice of Apparent Low Bidder

Dear Mr. Coleman:

This is to notify you that your firm is the "Apparent Low Bidder" for the subject project based on bids that were opened on December 6, 2007.

The Otay Water District (District) will finalize the evaluation of all bids received and verify the responsiveness of each bid. Assuming that there are no errors or discrepancies in the bids received, staff will recommend that the District's Board of Directors award a contract to your firm at the Board's scheduled meeting on January 2, 2008.

If you have any questions, please feel free to contact me at (619) 670-2247.

Sincerely,

Daniel Kay
Associate Civil Engineer

cc: Rod Posada
Ron Ripperger
Hossein Juybari

BID OPENING SUMMARY

OTAY WATER DISTRICT

PROJECT NAME: 850-4 Reservoir Potable Water Storage Facility — CIP P2191

DATE: December 6, 2007 TIME: 2:00 p.m. — LOCATION: Otay Water District Engineering Conference Room

BID NO.	CONTRACTOR NAME	TOTAL BID AMOUNT	BIDDER'S SURETY			REMARKS
			BIDDER'S BOND	CERTIFIED CHECK	CASH	
	ENGINEERS ESTIMATE	**$2,790,000.00**				
1	SPIESS CONSTRUCTION CO., INC	$2,566,300.00	x			Acknowledged Addendum 1 &2
2	PACIFIC TANK & CONSTRUCTION, INC.	$2,726,400.00	x			Acknowledged Addendum 1 &2
3	CASS CONSTRUCTION , INC	$3,098,950.00	x			Acknowledged Addendum 1 &2
4	PACIFIC HYDROTECH CORPORATION	$3,475,400.00	x			Acknowledged Addendum 1 &2
5	WIER CONSTRUCTION CORPORATION	$3,572,300.00	x			Acknowledged Addendum 1 &2
6	TC CONSTRUCTION CO., INC.	$3,607,000.00	x			Acknowledged Addendum 1 &2

Spiess Construction Co., Inc. incorrectly added the (2) Precast Concrete Vault total price. Spiess quoted a price of $34,525.00 each. The total for the vaults would be $69,050.00, but Spiess quoted $70,850.00. The final cost used for the vaults will be $69,050.00, which changes the Submitted Bid from $2,568,100.00 to $2,566,300.00.

ATTEST TO OPENING:

BIDS OPENED BY: Daniel Kay
Name (printed) and Signature

WITNESS: Ron Ripperger
Name (printed) and Signature

WITNESS: Bernardo Separa
Name (printed) and Signature

WITNESS: Hossein Juybari
Name (printed) and Signature

cc: Engineering Department Secretary

REFERENCE CHECK COMMENTS
850-4 RESERVOIR POTABLE WATER STORAGE FACILITY
CIP P2191-002103

CONTRACTOR: Spiess Construction Co., Inc. DATE: 12/7/2007
REFERENCE: Helix Water District CONTACT PERSON: Aleld Anub
PROJECT TITLE: Windsor Hills Tank Replacement PHONE NUMBER: (619) 466-0344

1. Was Spiess Construction Co., Inc. able to perform the contracted services in a timely fashion?

2. Where there delays caused by Spiess Construction Co., Inc.?

3. Were there any change orders? If so, what was the total percentage of change orders?

4. Did Spiess Construction Co., Inc. follow through on direction/change orders timely?

5. How well did Spiess Construction Co., Inc. interface and communicate with your project manager?

6. Would Spiess Construction Co., Inc. be a viable choice to receive a contract today?

7. On a scale of 1-10 how would you rate Spiess Construction Co., Inc. overall performance with 10 being excellent?

COMMENTS:

MEMORANDUM

TO:	Ron Ripperger	CIP #	CIP P2191
FROM:	Daniel Kay	Date:	December 17, 2007
SUBJ:	850-4 Reservoir Potable Water Storage Facility	**Charge Time To:**	P2191-002103

The above referenced project was advertised and bids opened on December 6, 2007. Six (6)contractors submitted bids with the following results. References were checked for the lowest bid.

1) SPIESS CONSTRUCTION CO., INC. $2,566,300.00

- Responsive bid.
- Contractor License is current and active.
- Total Bid amount of $2,568,100.00 was calculated incorrectly. Correct Bid amount is $2,566,300.00. Explaination below.

2) PACIFIC TANK & CONSTRUCTION, INC. $2,726,400.00

- No irregularities found. Responsive bid.
- Contractor License is current and active.

3) CASS CONSTRUCTION, INC. $3,098,950.00

- No irregularities found. Responsive bid.
- Contractor License is current and active.

4) PACIFIC HYDROTECH CORPORATION $3,475,400.00

- No irregularities found. Responsive bid.
- Contractor License is current and active.

5) WIER CONSTRUCTION CORPORATION $3,572,300.00

- No irregularities found. Responsive bid.
- Contractor License is current and active.

6) TC CONSTRUCTION CO., INC. $3,607,000.00

- No irregularities found. Responsive bid.
- Contractor License is current and active.

Spiess Construction Co., Inc. incorrectly added the (2) Precast Concrete Vault total price. Spiess quoted a price of $34,525.00 each. The total for the vaults would be $69,050.00, but Spiess quoted $70,850.00. The final cost used for the vaults will be $69,050.00, which changes the Submitted Bid from $2,568,100.00 to $2,566,300.00.

Enclosures: Bid Evaluation Sheet
Bid Opening Summary
California Contractors' License Information
Reference Checks

CC: Rod Posada

OTAY WATER DISTRICT
PROJECT NAME

PRECONSTRUCTION MEETING AGENDA
W.O. NO. _____
DATE AND TIME

I. SIGN-UP SHEET

Attendees:

A. Owner: *Otay Water District*
- District Project Manager: _____
- District Inspectors: _____
- District Environmental Specialist: _____
- District Public Information Officer: _____
- District Surveyor: _____
- District Systems Operator: _____

B. Owner's Representative: _____
- Construction Manager: _____

C. Contractor: _____
- Project Manager: _____
- Project Superintendent: _____
- Project Safety Representative: _____

D. Material Testing/ Specialty Inspection: _____
- Contact:

E. Design Engineers: _____
- Contact: _____

F. Emergency Contacts: *Otay Water District*, 619-670-2222

Contractor: _____

Furnish These Emergency Numbers to California Highway Patrol, County Sheriff, or City Police

II. TIME

A.	Notice to Proceed:	*(date) to be determined at pre-con*
B.	Time of Completion:	*(Calendar days) to be determined from contract or at preconstruction meeting*
C.	Scheduled Completion:	*(date) to be determined*
D.	Site Move-In:	*(date) to be determined*
E.	Time Extensions:	*48-hours notice of potential delays. Request extension with seven (7) days of delay. (Section 01020, Paragraph 1.6G)*
F.	Hours of Work:	*Limited to between 7:00 AM - 6:00 PM Monday through Friday, except legal holidays.(Section 01030, Paragraph 1.8) Saturday work will require special advance notice and approval.*
G.	Subcontractors	*District will need a list and their representatives.*

III. PERMITS

A. Trenching - Division of Industrial Safety.

- Submittal of trench design for deep excavations.

B. NPDES Stormwater Discharge permit (Section 01030, Paragraph 1.28) (NPDES Permit is not required)

C. Temporary Power - SDG&E.

- District to inspect installation prior to Contractor energizing facilities. *Dave Duff, 619-670-2827*

D. County Encroachment & Sewer Connection Permits

E. Copies of all permits to be maintained on-site and furnished to Owner prior to beginning work.

IV. PAYMENT

A. Schedule of Values - Contractor submitted Schedule of Values for establishment of progress payments. Breakdown material and labor/equipment.

B. Cash Flow - Projection over life of contract of anticipated progress payments to be updated monthly.

C. Progress Payment Form - To be provided to Contractor.

- Contractor to submit updated construction schedule monthly (with progress payment request).
- Discuss Board requirements for monthly invoice. Board Meets 1st and 3rd Wednesday of the Month. Request must be completed two weeks in advance. ***Contractor will pick 1st or 2nd Board Meeting and will stay with this meeting for the duration of the contract, cutoff date will be three (3) weeks prior to the Board meeting.***

E. Retention - 10 percent retention.

F. Escrow Account.

G. Change Order Request Forms.

H. Certified Payroll - Contractor to submit to Owner with each progress payment.

I. Lien Releases.

J. Stop Notices.

V. SAFETY

A. Safety Plan - Contractor to submit safety plan for general information to Owner's Representative. ***Any trench over five foot deep will have shoring.***

B. Trench shoring plan to be submitted for deep excavations.

C. Site Fencing/Security.

- General Contractor to lock gate after entering or leaving site.
- Site is not entirely fenced: Contractor may provide additional fencing.

D. Visitors shall:

- Check in with Owner/Contractor.

E. Traffic Control:

- Hard hats, safety shoes, high visibility vests.
- Fire safe areas.

VI. SITE ACCESS

A. Access is provided to site from _____.

- Limited Parking for Contractor Employees.

B. Alternative Access:

- Contractor is responsible to maintain alternative access, if utilized.

C. Contractor shall install his own lock on all gates.

D. Field office telephone numbers.

VII. MEETINGS

A. Weekly Progress Meetings - Contractor, Construction Administration Staff, Inspectors and Subcontractors, as necessary.

- Statement of working days.

B. Monthly Progress Meetings - (if required)

- Contractor
- Subcontractors, as necessary
- Construction Administration Staff
- Inspectors
- Owner
- Engineers, as necessary
- Testing firm, as necessary

C. Safety Meetings - To be conducted by Contractor weekly. Owner's Representative and Inspectors may attend.

VIII. CONSTRUCTION OBSERVATION, TESTING AND INSPECTION

A. Daily Construction Observation/Administration - Owner

B. Daily Inspection - Owner

C. Material Testing/Specialty Inspection - *(To be coordinated by Contractor)*

Services, as required:

- Compaction Testing
- Concrete Sampling/Testing
- Masonry Sampling/Testing
- Structural Steel Sampling/Testing
- Welding Inspection
- Electrical Inspection

Tests, as required:

- Soil Proctor (Max. Density)
- Sand Equivalent
- Soil Sieve Analysis
- Soil Expansion
- Concrete Compression
- Trial Batch
- Rebar Tensile
- Mortar Compression
- Grout Compression
- Masonry Prism
- Block Compression
- Asphalt Extraction/Sieve
- Asphalt HVEM
- Asphalt Mix Design/Max Density

D. Daily Report from Contractor

E. Lead Abatement, as required:

- Site soils testing at start of the job

IX. COMMUNICATIONS/INTERPRETATIONS OF DOCUMENTS

A. Correspondence: Owner

B. RFI's/Interpretations: Owner

C. Submittals: Contractor. Not required if on approved materials list.

D. Communications:

Mail: Otay Water District
2554 Sweetwater Springs Blvd.
Spring Valley, CA 91977-7299
Attn:

Deliveries: Address above.

E. Changes in Work: Written notification to Owner. Approval from Owner prior to beginning of work.

X. RECORD DRAWINGS

Record drawings to be maintained by Contractor on site and updated daily.

- Will be marked up with red ball point pen

XI. UTILITIES

A. SDG&E

B. Temporary power to be provided by Contractor. District to review temporary power facilities prior to energizing.

C. Temporary construction water to be provided by the District from off-site hydrant

- Contractor to obtain water through District provided meter (complete request form for temporary meter at preconstruction meeting. Identify as District project with CIP and W.O. numbers.). Obtained at the District's Engineering Public Service Counter
- Contractor to provide District approved backflow prevention device.
- Contractor to boost pressure, if desired.

D. Sanitary facilities to be provided by Contractor.

E. Drinking water to be provided by Contractor.

XII. PUBLIC RELEASE OF INFORMATION

A. All project information to be approved by Owner, Charley Cassens, 619-670-2254.

XIII. SURVEY

A. Survey to be provided by:

B. Request survey three (3) days in advance if by Owner, in writing, through Owner's Representative. Forms to be provided to Contractor.

XIV. START-UP/TESTING

A. Soil compaction and acceptance prior to pipe hydrostatic testing.

B. Hydrostatic pressure testing 50 PSI above pipe class.

C. Chlorine residual testing and Turbidity Testing by Owner.

D. Bacteria testing by Owner. Testing on Tuesday, Wednesday, and Thursday; 48 hours for results.

E. Request chlorine residual and bacteria testing through Owner in writing, a minimum of 72 hours in advance.

F. New Pressure gages calibrated and certified prior to final acceptance by independent lab.

G. Pumps and Motors require Factory Witness Tests.

H. Instrumentation and Controls Testing, will be approved by Otay Operations Department.

I. Operational Testing, will be approved by Otay Operations Department.

J. Welding certifications.

XV. ACCEPTANCE

A. Prior to final acceptance, Contractor shall furnish Owner with As-built Drawings.

B. Unconditional lien releases shall be furnished to Owner by the Contractor, prior to final acceptance. Unconditional releases shall be obtained by Contractor on a monthly basis.

C. Final acceptance will occur at Otay Water District's Board meeting.

D. Notice of Completion filed within ten (10) days of Board meeting.

E. Thirty-five (35) days following filing of Notice of Completion, final payment will be made.

F. All warranties are from date of final acceptance.

G. Substantial Completion:

- Owner may establish by written notice.
- Owner assumes responsibility for operation.
- Guarantees/warranties for specific equipment, covered in the Substantial Completion Notice, begin at Substantial Completion date specified in written notice.

H. Eleventh Month Inspection.

XVI. CONSTRUCTION ASPECTS

A. Project Specifications to be noted.

B. Pipe Installation.

- Furnish calculations for precast vaults.
- Pothole prior to submittal of shop drawings.
- All thrust blocks require inspection.
- All fittings and valves to be coated with Henry's Lap Cement 208 and wrapped in 8 mil plastic.
- District to operate existing facilities.
- After connection to District facilities, access to all valves shall be maintained.
- All copper piping to be sleeved.
- Set valve boxes to grade immediately after paving.
- DG backfill in pipe zone.
- Double slung on joints in excess of 30 feet.
- Steel chains on cables allowed if adequately covered to protect pipe coating.

C. Tie-Ins/Shutdowns

- Minimum seven (7) days notice for proposed shutdowns.
- District will operate/shutdown existing system.

D. Draining/filling/flushing of new system.

E. Electrical, Telemetry and Telephone.

F. Irrigation.

XVII. OTHER ISSUES

OTAY WATER DISTRICT
REQUEST FOR INFORMATION (RFI) FORM

RFI No. _____

Otay Construction Manager/Project Manager:_____ Date: ____ /____ /____

CIP No. _____ Project Name:_____

Contractor's Name: _____

(For Contractor's Use)

Date:

Subject:

Description:

Contractor's Authorized Representative:_____Signature:_____

Date:

Response:

District's Authorized Representative: _____Singature:_____

SHOP DRAWING TRANSMITTAL FORM

FROM: _____ DATE: _____

_____ PROJECT NAME: _____

TO: _____ OWD CIP No.: _____

_____ OWNER: Otay Water District
2554 Sweetwater Springs Blvd.
Spring Valley, CA 91978-2096

☐ THIS IS AN ORIGINAL ☐ THIS IS A REVISION

SUBMITTAL NO.: _____

SUBJECT OF SUBMITTAL: _____

SPECIFICATION SECTION(S): _____

PLAN SHEET NUMBER(S): _____

CONTRACTOR'S CERTIFICATION: Check & Complete either (A) or (B) below:

(Check One)

_____ (A) We have reviewed in detail and certify that the material, equipment or construction procedure(s) contained in this submittal meet all the requirements specified in or shown on the Contract Documents, Construction Specifications and Construction Plans with no exceptions.

_____ (B) We have reviewed in detail and certify that the material, equipment or construction procedure(s) contained in this submittal meet all the requirements specified in or shown on the Contract Documents, Construction Specifications and Construction Plans **except for the following deviations:**

_____

_____

_____

REQUIREMENT:

Contractor shall use this transmittal form for submittal of shop drawings to the District's representative. The procedure governing shop drawings submittal is contained in the Specifications. Failure to comply wiht all requirements specified therein will constitute grounds for return of the shop drawings for proper re-submittal.

_____ _____ _____

CONTRACTOR'S AUTHORIZED SIGNATURE TITLE DATE

SUBMITTAL LOG
850-4 RESERVOIR - 2.2MG
P2191-001103

Submittal Number	Date Sent	Description	Date Returned	ACTION
001	2/11/08	Welded Steel Reservoir Shop Drawings	3/24/08	Returned Approved. Comment to replace set screw w/ allen head screw on anode access ports
002	2/11/08	Welded Steel Reservoir Structural Calculations	4/22/08	Returned Approved. Comment to have a minimum anchorage spacing per D100-05
003	2/11/08	Concrete	2/26/08	Returned Approved
004	2/25/08	Painting & Coatings	3/24/08	Returned Approved
005	3/26/08	Pre Cast Vaults	4/22/08	Returned Approved
006	4/02/08	Piping & Valves	5/07/08	Returned Approved. Comment added to have all flanges classes called out on all the details. There was not a valve submittal in this package.
007	5/20/08	Altitude Valve	6/02/08	Returned Approved
008	5/20/08	Flange Insulating Kit	6/02/08	Returned Approved
009	5/20/08	Flap Valve	6/02/08	Returned Approved
010	5/20/08	Flange Bolts & Nuts	6/02/08	Returned Approved
011	5/20/08	Flange Gaskets	6/02/08	Returned Approved
012	5/20/08	Flanged Coupling	6/02/08	Returned Approved
013	5/20/08	Swing Check Valve	6/02/08	Returned Approved
014	5/20/08	Combo Air Release & Vacuum Valve	6/02/08	Returned Approved
015	5/20/08	Butterfly Valve	6/02/08	Returned Approved. Comment to use class 250 Valves
016	5/20/08	Resilient Wedge Gate Valve	6/02/08	Returned Approved
017	5/20/08	PVC Pipe	6/02/08	Returned Approved
018	5/20/08	Ductile Iron Fittings	6/02/08	Returned Approved
019	5/20/08	Ductile Iron Flanged Spools	6/02/08	Returned Approved
020	5/20/08	Corp Stops	6/02/08	Returned Approved
021	5/20/08	Weir Boxes	6/02/08	Rejected – Weir Boxes were not included in the plans
006A	6/11/08	Fabricated Steel Pipe	6/13/08	Returned Approved. States that flange classes are called out on each sheet.
022	8/26/08	Basic Electric Materials	9/15/08	Returned Approved
023	8/26/08	General Order	9/15/08	Returned Approved

SUBMITTAL LOG
850-4 RESERVOIR - 2.2MG
P2191-001103

Submittal Number	Date Sent	Description	Date Returned	ACTION
024	8/26/08	Light Fixtures	9/15/08	Returned Approved
025	8/29/08	Rebar for Catch Basin & Curb Inlet	9/11/08	Returned Approved
026	9/03/08	Cathodic Protection System	9/15/08	Returned Approved
027	9/22/08	Existing Soil Testing	9/22/08	Returned Approved
028	9/23/08	NEMA 3R SS Cabinets	10/08/08	Returned Approved
029	10/29/08	Photovoltaic System	11/04/08	Returned Approved
030	11/07/08	Welder Certification	11/17/08	Rejected – Welder Certs were not for the welder on site
031	11/14/08	Ringwall Rebar	11/17/08	Rejected – Rebar Sizes and dimensions are incorrect
032	12/23/08	Electrical Instrumentation & Controls	1/27/09	Returned Approved w/ Corrections
033	1/19/09	Welder Certifications	1/23/09	Returned Approved
034	2/13/09	Davit Crane	3/02/09	Returned Approved
035	3/10/09	Soils Reports	4/16/09	Returned Approved
036	3/27/09	Irrigation Pump	4/16/09	Returned Approved. Comment to install pump before backflow prevention device
037	6/12/09	Chain Link Fencing	6/18/09	Returned Approved
038	6/12/09	Automated Slide Gate	6/25/09	Returned Approved. Comment to provide card reader compatible with District System
039	6/17/09	Irrigation System	6/24/09	Returned Approved
040	6/17/09	Landscaping	6/24/09	Returned Approved
041	8/14/09	Landscaping Soil Analysis	8/19/09	Returned Approved

Otay Water District
850-4 Reservoir
Progress Meeting #01
Agenda
P2191-001103
July 16, 2008, at 1:30 PM

Attendees:
Daniel Kay, Otay Water District
Damon Braden, Otay Water District
Doug Marple, Otay Water District
Brandon DiPietro, Otay Water District
Bob Hamilton, RSH, President
Heath Chehey, RSH, Estimator

cc:
Rod Posada, Otay Water District

NO.	TOPIC	ACTION
1	**STATUS OF SUBMITTALS:** All submittals approved and up to date. Discussion of anchor bolts on reservoir. Outstanding Submittals to be submitted: Disinfection, Fencing, Irrigation, Electircal/Telemetry. Otay decided not to use anchor bolts on the reservoir to avoid a change order request.	
2	**STATUS OF RFIs:** All RFIs are up to date.	
3	**PROGRESS PAYMENT:** Progress payments are up to date.	
4	**LOOK-AHEAD SCHEDULE:** Storm Drain and Inlet/Outlet Piping to begin installation on Aug 4th.	
5	**DAILY REPORTS:** Submit at progress meetings, w/ updated schedule, or progress payments	
6	**PIPELINE CONTRACTOR:** Material delivery delay. No problems with pipeline contractor.	
7	**CONCERNS/QUESTIONS/OTHER ISSUES:** None	
	END OF MEETING	

Next Meeting: Aug 13, 1:30 PM
Prepared by: Daniel Kay, OWD

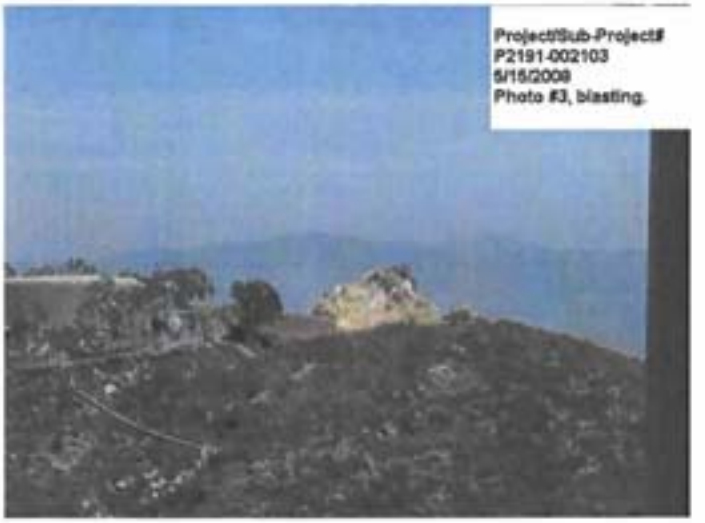
Otay Water District
Engineering Department
Construction Management
Status Report

850-4 Reservoir 2.2 MG

Spring Valley ~ Division 3

CIP P2191

Project/Sub-Project#
P2191-002103
5/15/2008
Photo #1.
Baxter Drilling, loading holes for phase 1, perparing to blast.



Project/Sub-Project#
P2191-002103
5/15/2008
Photo #3, blasting.

Project/Sub-Project#
P2191-002103
5/15/2008
Photo #11, blasting.

May 2008

All data contained in this report is as of last day of the month reporting.

Issue 1

Prepared by:
Damon Braden

CONSTRUCTION MANAGEMENT STATUS REPORT

Project Team

Otay Water District: Rod Posada, P.E., Chief, Engineering
Otay Water District: Damon Braden, P.E., Construction Manager
Otay Water District: Daniel Kay, P.E., Project Manager
Otay Water District: Doug Marple, Inspector
Spiess Construction Co.: Scott Coleman, Contractor Project Manager

1.0 Schedule Status

1.01 Complete blasting next month.

1.02 Begin excavation for piping next month.

1.03 Complete exporting of materials next month.

2.0 Accomplishments

2.01 Completed clear and grub of site.

2.02 Completed site preparation for blasting.

2.03 Began blasting this month.

3.0 Current Contract Status

3.01 **Contract Time**

NTP Date	February 12, 2008
Original Allowed Calendar Days	455
Original Contract Completion Date	May 12, 2009
Additional Allowed Calendar Days through C.O.	0
Total Revised Allowed Calendar Days	455
Days Completed	109
Revised Contract Completion Date	May 12, 2009
Elapsed Contract Time	24.0%

CONSTRUCTION MANAGEMENT STATUS REPORT

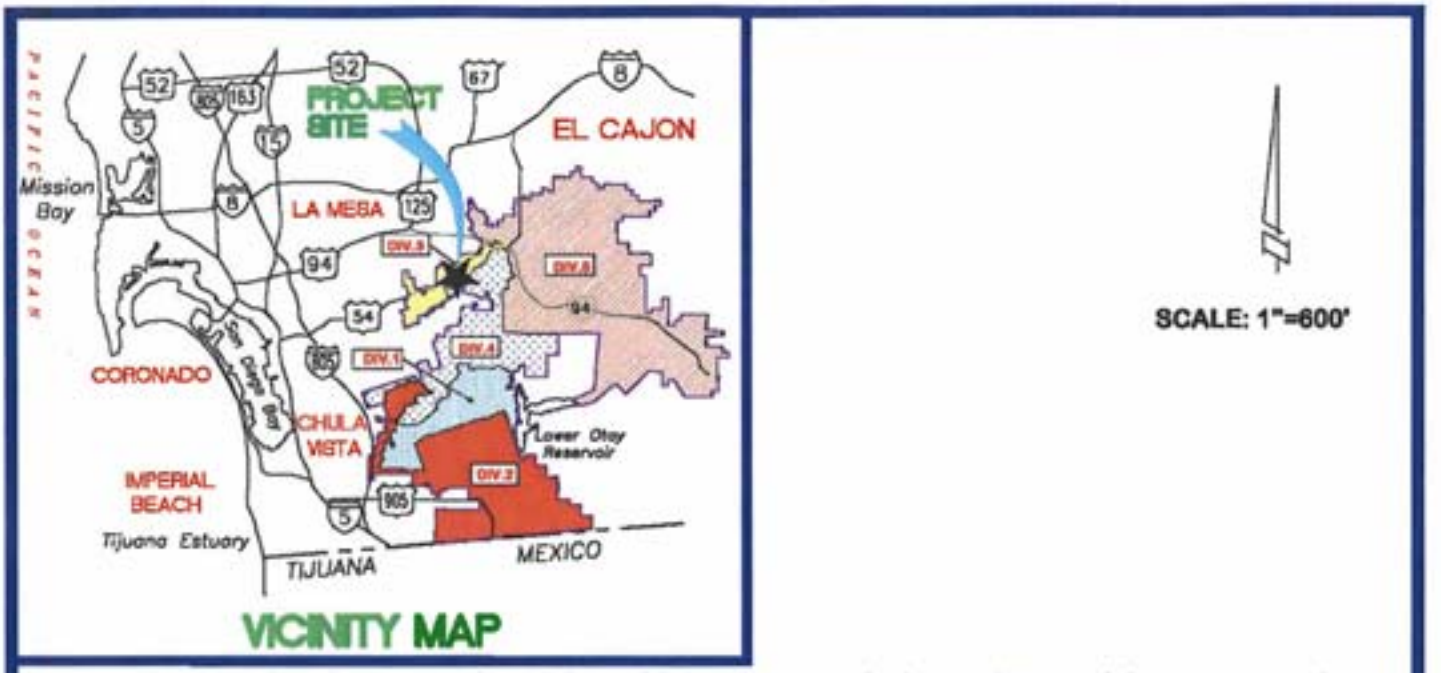
3.0 Current Contract Status

3.02 **Contract Price**

Original Contract Value	$	2,566,300.00
Payable To Date	$	49,575.00
Retention To Date (10.0%)	$	4,957.50
Total Invoiced To Date	$	44,617.50
Percent Invoiced To Date	$	**1.9%**

3.03 **Change Orders**

None



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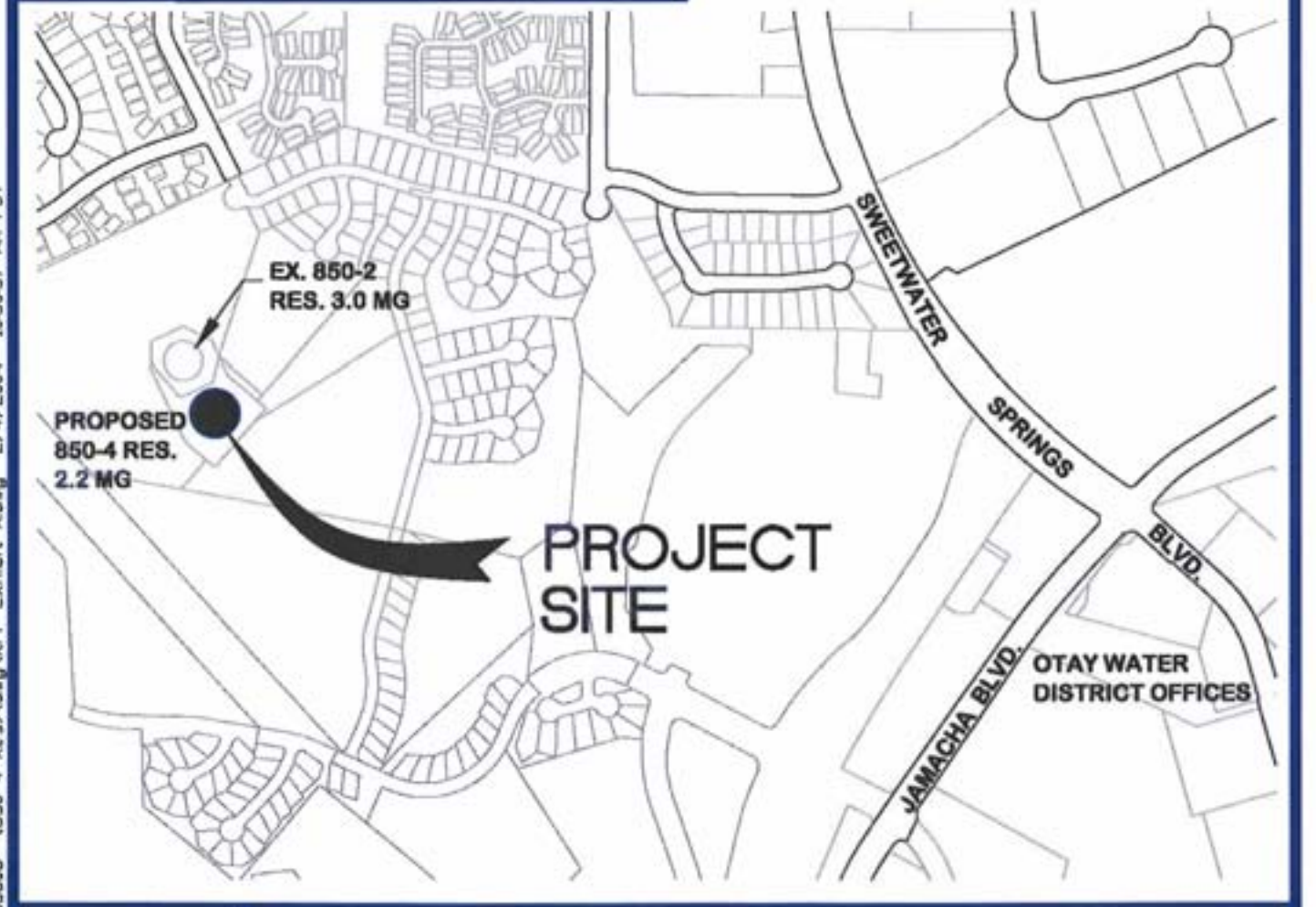
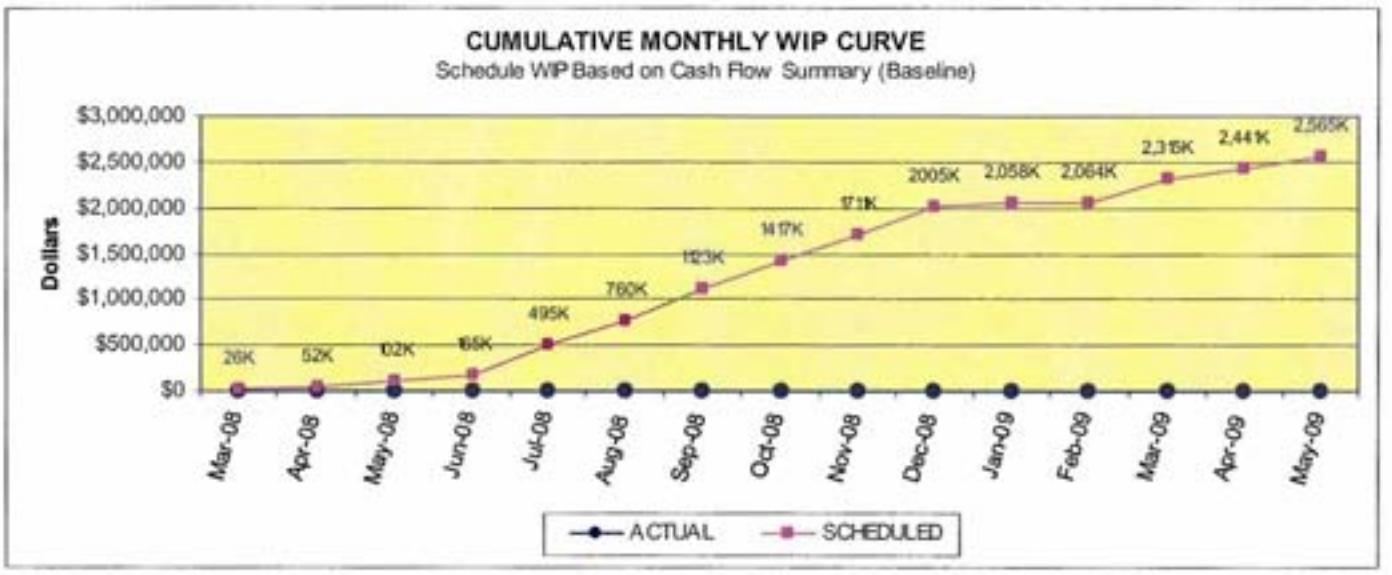


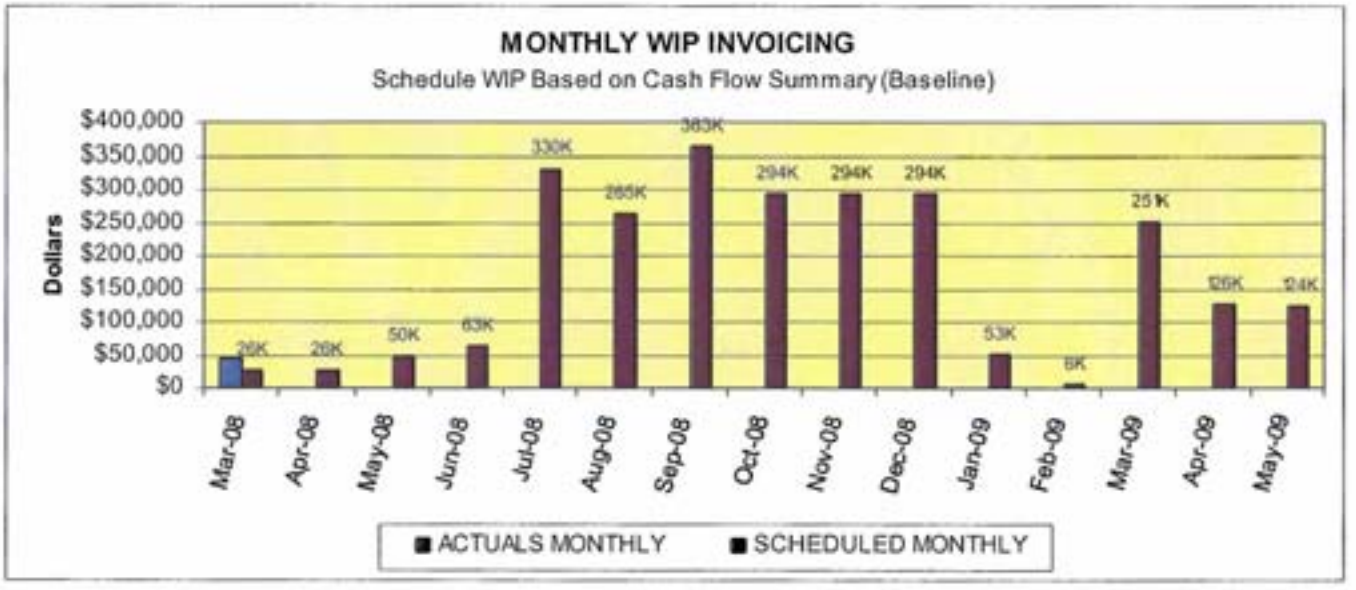
OTAY WATER DISTRICT

850-4 RESERVOIR

LOCATION MAP **CIP P2191**

EXHIBIT A


CUMULATIVE MONTHLY WIP CURVE
Schedule WIP Based on Cash Flow Summary (Baseline)
Dollars
$3,000,000
$2,500,000
$2,000,000
$1,500,000
$1,000,000
$500,000
$0
26K
52K
102K
495K
760K
1417K
2005K
2,058K
2,064K
2,315K
2,441K
2,565K
Mar-08
Apr-08
May-08
Jun-08
Jul-08
Aug-08
Sep-08
Oct-08
Nov-08
Dec-08
Jan-09
Feb-09
Mar-09
Apr-09
May-09
ACTUAL
SCHEDULED


MONTHLY WIP INVOICING
Schedule WIP Based on Cash Flow Summary (Baseline)
Dollars
$400,000
$350,000
$300,000
$250,000
$200,000
$150,000
$100,000
$50,000
$0
26K
26K
50K
63K
330K
265K
363K
294K
294K
294K
53K
6K
251K
126K
124K
Mar-08
Apr-08
May-08
Jun-08
Jul-08
Aug-08
Sep-08
Oct-08
Nov-08
Dec-08
Jan-09
Feb-09
Mar-09
Apr-09
May-09
ACTUALS MONTHLY
SCHEDULED MONTHLY

OTAY WATER DISTRICT
PROGRESS PAYMENT

Project Name:_____ Date: ___/___/____

CIP No._____ P.O. No. _____

Contractor's Name: _____

Contractor's Address: _____

Phone No. _____ Fax No. _____

Progress Payment No. _____ for Period Ending: ___/___/___

SEE ATTACHED ITEMIZED BREAKDOWN

ORIGINAL CONTRACT AMOUNT:	$_____
TOTAL CONTRACT THROUGH C.O. No. ___:	$_____
TOTAL EARNED TO DATE:	$_____
LESS 10% RETENTION:	- $_____
LESS PREVIOUS PAY:	- $_____
LESS STOP NOTICES AND OTHERS:	- $_____
TOTAL PAY THIS INVOICE:	$_____
PERCENT COMPLETE:	_____

_____ Dated: ___/___/___
Contractor

_____ Dated: ___/___/___
Construction Manager/District Inspector

_____ Dated: ___/___/___
Project Manager

COPIES: ☐ ACCTS PAY.(Orig) ☐ FILE ☐ DIVISION MGR.

OTAY WATER DISTRICT
2554 SWEETWATER SPRINGS BLVD., SPRING VALLEY, CA. 91978, (619) 670-2222

CONTRACT/P.O. CHANGE ORDER No. 01

PROJECT/ITEM: 850-4 Reservoir
CONTRACTOR/VENDOR: Spiess Construction **REF.CIP No.:** P2191
APPROVED BY: Board **REF. P.O. No:** 707937 **REF. W.O. No.:** N/A **DATE:** 5-Mar-09

DESCRIPTION:
Six separate items are part of this change order:

1. Upgraded Solar Equipment
2. New Inlet Tie In Location
3. Tank Overflow & Drain
4. Electrical Credit
5. Oil Sand Credit
6. Bid Items 12 & 12A Credit

See attached Change Order Proposals for items 1 through 5 from Spiess Construction.

REASON:

1. The inverter specified was not compatible with the solar panels specified. An upgraded inverter needed to be purchased in order for it to be compatible. The amount of this change is $752.40.

2. The proposed location of the inlet tie in could not be constructed per plan due to the steep terrain and accessibility issues. The tie in was moved closer to the existing inlet vault for the 850-2 Reservoir. The new location required extra material and labor. The amount of this change is $1,925.00.

3. The reservoir overflow and drain needed field modifications to enter into a catch basin perpendicularly. For the flapper valve to work properly the drain has to come into the catch basin perpendicularly. The amount of this change is $1,524.15.

4. The installation of a 3" conduit for electrical, telemetry, and control lines along the access road was not installed because it was discovered that there was an existing 2" conduit in good condition that could carry the same wires. The amount of this deductive change is <$16,260.00>.

5. The contractor installed cold mix in lieu of oil sand under the reservoir floor and reduced the thickness from 6 inches to 4 inches. According to the AWWA Standard for Welded Reservoirs cold mix is an acceptable substitute and the minimum thickness for soil under the reservoir floor is 3 inches. The amount of this deductive change is <$8,620.00>.

6. The District will not be using bid items No. 12 & 12A of the contract. These items are coating the exterior of the existing reservoir and handling of hazardous material respectively. There is not sufficient funds in the operating budget to cover the cost to re-coat the existing reservoir.

CHANGE P.O. TO READ:
Revise contract to deduct $250,778.45 for a total contract amount of $2,315,521.55.

ORIGINAL CONTRACT/P.O. AMOUNT:	$	2,566,300.00
ADJUSTED AMOUNT FROM PREVIOUS CHANGE:	$	0.00
TOTAL COST OF THIS CHANGE ORDER:	$	(250,778.45)
NEW CONTRACT/P.O. AMOUNT IS:	$	2,315,521.55

ORIGINAL CONTRACT COMPLETION DATE:	5/12/09
CONTRACT/P.O. TIME AFFECTED BY THIS CHANGE:	No
REVISED CONTRACT COMPLETION DATE:	N/A

IT IS UNDERSTOOD WITH THE FOLLOWING APPROVALS, THAT THE CONTRACTOR/VENDOR IS AUTHORIZED AND DIRECTED TO MAKE THE HEREIN DESCRIBED CHANGES. IT IS ALSO AGREED THAT THE TOTAL COST FOR THIS CHANGE ORDER CONSTITUTES FULL AND COMPLETE COMPENSATION FOR OBLIGATIONS REQUIRED BY THE CONTRACT/P.O. ALL OTHER PROVISIONS AND REQUIREMENTS OF THE CONTRACT/P.O. REMAIN IN FULL FORCE AND EFFECT.

CONTRACTOR/VENDOR:

SIGNATURE: _____

NAME : _____

TITLE: _____ DATE : _____

ADDRESS: _____

_____

STAFF APPROVALS:

PROJ. MGR : _____ Sr Eng (Int)____ DATE: _____

DIV. MGR : _____ DATE: _____

CHIEF: _____ DATE: _____

ASST. GM : _____ DATE: _____

DISTRICT APPROVAL:

GEN. MANAGER: _____ DATE: _____

COPIES: ☐ FILE (Orig.), ☐ CONTRACTOR/VENDOR, ☐ CHIEF-ENGINEERING, ☐ CHIEF-FINANCE, ☐ ENGR. MGR.
☐ ACCTS PAYABLE, ☐ INSPECTION, ☐ PROJ. MGR., ☐ ENGR. SECRETARY, ☐ PURCHASING, ☐ PROJECT BINDER

CHANGE ORDER LOG

850-4 Reservoir 2.2MG

P2191-001103

C.O.	AMOUNT	APPROVED BY	APPROVED DATE	DESCRIPTION	TYPE C.O.
1	($250,778.45)	Board	3/4/2009	Six items: Solar Equipment, Tie In Location, Tank Overflow & Drain, Electrical Credit, Oil Sand Credit, and Bid Items 12 & 12A credit.	Owner Initiated
2	$2,345.24	Project Mgr.	5/12/2009	Additional Tank Penetration and Enclosures	Owner Initiated
3	($2,354.10)	Project Mgr.	6/23/2009	Planting & Irrigation Modifications	Owner Initiated
4	$2,596.12	Project Mgr.	7/21/2009	Additional Fence Gate for Solar and Landscape	Owner Initiated
5	$3,234.85	Eng. Mgr.	8/5/2009	Larger Roof Vent and Deletion & Coating Repairs	Owner Initiated
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Total C.O.'s To Date:	($244,956.34)	-9.5%
Original Contract Amount:	$2,566,300.00	
Current Contract Amount:	$2,321,343.66	

Change Order Breakdown for the Month:

Month	Net C.O.$	Limit	Authorization	Absolute C.O.$	Absolute C.O. %
8/09	($244,956.34)	$5,000	PM/Supervisor	$0.00	0.0%
		$10,000	Manager	$0.00	0.0%
		$15,000	Chief	$0.00	0.0%
		$25,000	Assist. GM	$0.00	0.0%
		$50,000	GM	$0.00	0.0%
		>$50,000	Board	($244,956.34)	-9.5%

Otay Water District
2554 Sweetwater Springs Blvd.
Spring Valley, CA 91978
(619) 670-2222
Fax (619) 670-8920

REQUEST FOR PROPOSAL #01

Date:	3/6/09	Project Name:	850-4 Reservoir
To:	Spiess Construction	C.I.P. No.:	P2191
		Contractor:	Spiess Construction
Attn:	Jamie Jones		
From:	Daniel Kay		
Subject:	Electrical and Tank Modifications		

Reference Drawings: M-1,E-4
Ref. Spec. Section: 17000, 17120, 17200, 17150
Referenced RFI: #028

☑ Shop drawings required

☐ No Shop drawings required

Please prepare a lump sum proposal to furnish all required labor, material, and equipment necessary to implement the following items:

- Furnish and install a new PLC enclosure sized appropriately for the telemetry equipment as shown on Detail 4 Sheet E-4
- Furnish and install all telemetry equipment as shown on sheet E-4. District will assist as necessary.
- Furnish and install HART Protocol upgrade to the pressure transducer
- Furnish and install NEMA rated enclosures for all tank penetrations in lieu of the "metal locking box" as shown on details 2 and 3 on sheet M-1. Enclosures shall be sized appropriately for each penetration.
- Furnish and install an additional tank penetration per Detail 3 Sheet M-1, located above the inlet piping approximately 24" above the tank floor.

- Please submit a lump sum cost proposal for this adjustment to your construction contract by **March 26th, 2009.** Your proposal should include a complete detailed breakdown of labor man-hours, materials, equipment, and all other related costs which would be basis for negotiation and agreement in an adjustment to the contract price.

- Please quantify the impact, if any, the above described scope of work will have upon your project completion date, by identifying the first critical path element of your schedule which is impacted and the duration of the impact.

- Other requirements to be included are: N/A

By: Daniel Kay, P.E.

Project Mangager's Signature

cc: Ron Ripperger

PRELIMINARY AND STOP NOTICES

850-4 Reservoir

P2191

TYPE OF NOTICE	COMPANY	ADDRESS	DATE	AMOUNT	WORK FURNISHED	RELEASED
Prelim	Olson Precast	2239 W. Stonehurst Dr Rialto, CA 92377	3-26-08	$46,200	Vaults	7/2/09
Prelim	*Canyon Springs Enterprises	3001 E. Tahquitz Cyn Ste 205 Palm Springs, CA 92262	3-27-08	$1,214,400	Complete work per plan	*10/14/09
Prelim	West Coast Pipe	2180 N. Locust Ave. Rialto, CA 92377	4-1-08	$76,000	Building Structure	
Prelim	B&B Heavy Equipment Sales & Rental	10108 Riverford Road Lakeside, CA 92040	5/12/08	$13,000	Heavy Equipment Rental	7/1/09
Prelim	Kissenger Trucking and Equipment	P.O. Box 11227 Spring Valley, CA 91979	5/13/08	$350,000	Trucking & Material	7/1/09
Prelim	M.J. Baxter Drilling Co.	PO Box 245 El Cajon, CA 92022	5/21/08	$85,000	Drilling, Blasting, Materials & Service	2/19/09
Prelim	Realto Concrete Products	PO Box 398 Rialto, CA 92377	7/02/08	$5071.01	Reinforced Concrete Pipe	2/18/09
Prelim	Groeniger & Company Inc.	PO Box 3269 Hayward, CA 94540	7/28/08	$55,000	Valves, Pipes and Fittings	7/1/09
Prelim	Neal Electric	13250 Kirkham Way Poway, CA 92064	8/15/08	$133,155	Electrical Materials & Labor	10/16/09
Prelim	Superior Ready Mix	1508 W Mission Rd Escondido, CA 92029	10/24/08	$3,000	Ready mix concrete, sand and/or rock	
Prelim	Superior Ready	1508 W Mission Rd	11/6/08	$2,000	Ready mix	7/1/09

***CONDITIONAL WAIVER**

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PRELIMINARY AND STOP NOTICES

850-4 Reservoir

P2191

TYPE OF NOTICE	COMPANY	ADDRESS	DATE	AMOUNT	WORK FURNISHED	RELEASED
	Mix	Escondido, CA 92029			concrete, sand and/or rock	
Prelim	White Cap	P.O. Box 1770 Costa Mesa, CA 92626	11/11/08	$2,500	Construction Supplies	7/2/09
Prelim	Hub Construction Specialties, Inc.	379 S "I" St. P.O. Box 1269 San Bernardino, CA 92402-1269	12/8/08	$6,500	Misc Concrete Accessories Fasterners, Rentals, Ect.	7/2/09
Prelim	Superior Ready Mix Concrete	1508 W Mission Rd Escondido, CA 92029	12/23/08	$30,000	Ready Mix Concrete, Sand, and/or Rock	
Prelim	Conco Pumping	5141 Commercial Circle, Concord, CA 94520	12/31/08	$10,000	Pumping Services	7/1/09
Prelim	Palomar Grading & Paving	2150 Centre City Pkwy, Ste. C, Escondido, CA 92026	1/6/09	$57,000	Street Improvements	10/21/09
Prelim	DIII Transport Corp	12700 Stowe Dr. Suite 130 Poway, CA 92064	1/19/09	$25,000	Transportation of Materials	5/1/09
Prelim	West Coast Sand & Gravel	7351 Walnut Ave. Buena Park, CA 90621	1/27/09	$30,000	Building Materials & Related Product, Delivery	7/2/09
Prelim	Vulcan Materials Company	3200 San Fernando Rd. Los Angeles, CA 90065	1/28/2009	$14,000	Concrete, Aggregate, Asphalt and/or related items	

***CONDITIONAL WAIVER**

PRELIMINARY AND STOP NOTICES

850-4 Reservoir

P2191

TYPE OF NOTICE	COMPANY	ADDRESS	DATE	AMOUNT	WORK FURNISHED	RELEASED
Prelim	*American Construction and Supply Inc	45 San Clemente Dr Suite A-100 Corte Madera, CA 94925	3/18/2009	$8,250	Galvorod Cathodic Protection System	*10/22/09
Prelim	State Pipe & Supply Inc	9615 S Norwalk Blvd Santa Fe Springs Ca 90670	3/31/09	$7,475.00	Pipe Supplies	10/12/09
Prelim	Brickman	6218 Fairmount Ave San Diego, CA 92120	6/15/09	52,674.00	Provide & Install Irrigation	
Prelim	John Deere Landscapes	1425 N. McDowell Blvd Suite 125 Petaluma CA 94954	6/19/09	50,000.00	Landscape & Irrigation Materials	
Prelim	Ferguson Enterprises	11909 Tech Center Ct Poway CA 92064	7/6/09	3,000.00	Plumbing, HVAC, Waterworks, Appliances, Installation Svcs, Lighting, Constr Materials	
Prelim	Area West Fence Co	12566 Vigilante Rd Lakeside CA 92040	7/22/09	42,500.00	Materials & Labor	
Prelim	*RPI Coating, Inc	10114 Shoemaker Ave Santa Fe Springs CA 90670	10/22/08	$625,855.00	Painting & Coating	*10/26/09
Prelim	Rohr Steel Inc	1281 E. Third St. Pomona CA 91766	10/2/08	$1,490.00	Rebar	1/6/09
Prelim	C.W. McGrath, Inc	13080 Hwy 80 El Cajon CA 92021	9/18/08	$10,000.00	Trucking and/or Materials	6/30/09
Prelim	R. Dugan	6157 Marlatt St	10/6/08	$12,000.00	Storm Drains and	2/17/09

***CONDITIONAL WAIVER**

PRELIMINARY AND STOP NOTICES

850-4 Reservoir

P2191

TYPE OF NOTICE	COMPANY	ADDRESS	DATE	AMOUNT	WORK FURNISHED	RELEASED
	Construction	Mira Loma, CA 91752			Concrete Structures	
Prelim	Corrpro Companies Inc	13011 Florence Ave Santa Fe Springs CA 90670	9/30/08	$6,087.66	Furnish cathodic protection engineering testing services	
Prelim	Cresent Supply Co	2580 Progress St. Vista, CA 92081	9/28/09	$20,000	Electrical	

*

***CONDITIONAL WAIVER**

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Please complete this information..

RECORDING REQUESTED BY:

AND WHEN RECORDED MAIL TO:

Otay Water District
2554 Sweetwater Springs Blvd.
Spring Valley, CA 91978

DOC # 2009-0724856

DEC 31, 2009 11:04 AM

OFFICIAL RECORDS
SAN DIEGO COUNTY RECORDER'S OFFICE
DAVID L. BUTLER, COUNTY RECORDER
FEES: 0.00

PAGES: 3

12856

Space above this line reserved for Recorder's Use Only.
Govt. Code 27361.6

NOTICE OF COMPLETION

850-4 Reservoir (Project No. P2191)
Govt Code 27324

THIS PAGE ADDED TO PROVIDE ADEQUATE SPACE FOR RECORDING INFORMATION
Govt. Code 27361.6
(Additional recording fee applies)

12857

RECORDING REQUESTED BY
AND AFTER RECORDING MAIL TO

Otay Water District
2554 Sweetwater Springs Boulevard
Spring Valley, CA 91978

NOTICE OF COMPLETION

NOTICE IS HEREBY GIVEN THAT:

1. The following work of improvements to facilities at the Otay Water District 850-4 Reservoir Project was accepted as complete by the District on November 5, 2009.

2. The name of the project is "Res - 850-4 Reservoir 2.2 MG (Project No. P2191)."

3. The nature and location of the work is for the construction of a 2.2 million gallon steel reservoir to meet ultimate demand in the 850 pressure zone of the Otay Water District.

The location of the improved facilities is: 2105 Ledge Avenue, Spring Valley CA, 91978, Thomas Brothers Reference 1291-D1.

4. The name and address of the Contractor is:
Spiess Construction
P.O. Box 2849
Santa Maria, CA 93457

5. The property on which said work of improvement was completed is in the Otay Water District, located in the County of San Diego, State of California.

6. The undersigned Otay Water District (whose office and mailing address is: 2554 Sweetwater Springs Boulevard, Spring Valley, CA 91978) is Owner in fee of the said Work and Improvement, all of which is in areas dedicated to a public use of the type engaged in by said District.

OTAY WATER DISTRICT

German Alvarez
Assistant General Manager

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12858

STATE OF CALIFORNIA)
) ss.
COUNTY OF SAN DIEGO)

Susan Cruz, being first duly sworn, deposes and says that she is the District Secretary of the Otay Water District and is familiar with the facts stated in the foregoing Notice of Completion executed for and on behalf of said agency, that she has read the foregoing Notice of Completion and knows the contents thereof and that the same are true and correct.

OTAY WATER DISTRICT

District Secretary

STATE OF CALIFORNIA)
) ss.
COUNTY OF SAN DIEGO)

Subscribed and sworn to before me on this 17TH day of November 2009, by Susan Cruz, proved to me on the basis of satisfactory evidence to be the person who appeared before me.

Notary Public in and for said County and State

TITA JACQUELINE CAYETANO
Commission # 1864137
Notary Public - California
San Diego County
My Comm. Expires Sep 6, 2013

Date: November 3, 2009
Project No.: P2191
Subproject No.: NA

DISTRICT CIP PROJECT ACCEPTANCE FORM

Acceptance of: 850-4 Reservoir (P2191)
Project Manager: Daniel Kay
Contractor: Spiess Construction
Board Member Division: 3

To: Ron Ripperger
From: Daniel Kay

The subject project has been completed in accordance with the District standards and specifications, including all items on the Final Inspection/Operations Punch List. The project consisted of constructing a 2.2 million gallon steel reservoir, with a new perimeter fence, gate, SCADA system, solar array, and site improvements.

To: Routing Below
From: Daniel Kay

The Redline Drawings, Soils Test Results, Request for Final Payment, and Unconditional Waiver and Release forms have been received for this project and it can now be presented to the Assistant General Manager of Engineering and Water Operations for acceptance. Please sign the approval routing below.

Final Contract Amount: $2,324,843.66 Bond Amount During Warranty: $2,324,843.66
Warranty Period in Months: 12 Bond Number: 105037172
Bond Company: Travelers Casualty and Surety Company of America
Contractor's Address: P.O. Box 2849, Santa Maria, CA 93457

ATTACHMENT: Map marked with Project locations (Exhibits A)

Project Manager: _____ **Eng. Mgr. (Int)** _____ **Date:** 11/3/09

Inspection Supervisor: _____ **Date:** 11/4/09

Chief, Engineering: _____ **Date:** 11/4/09

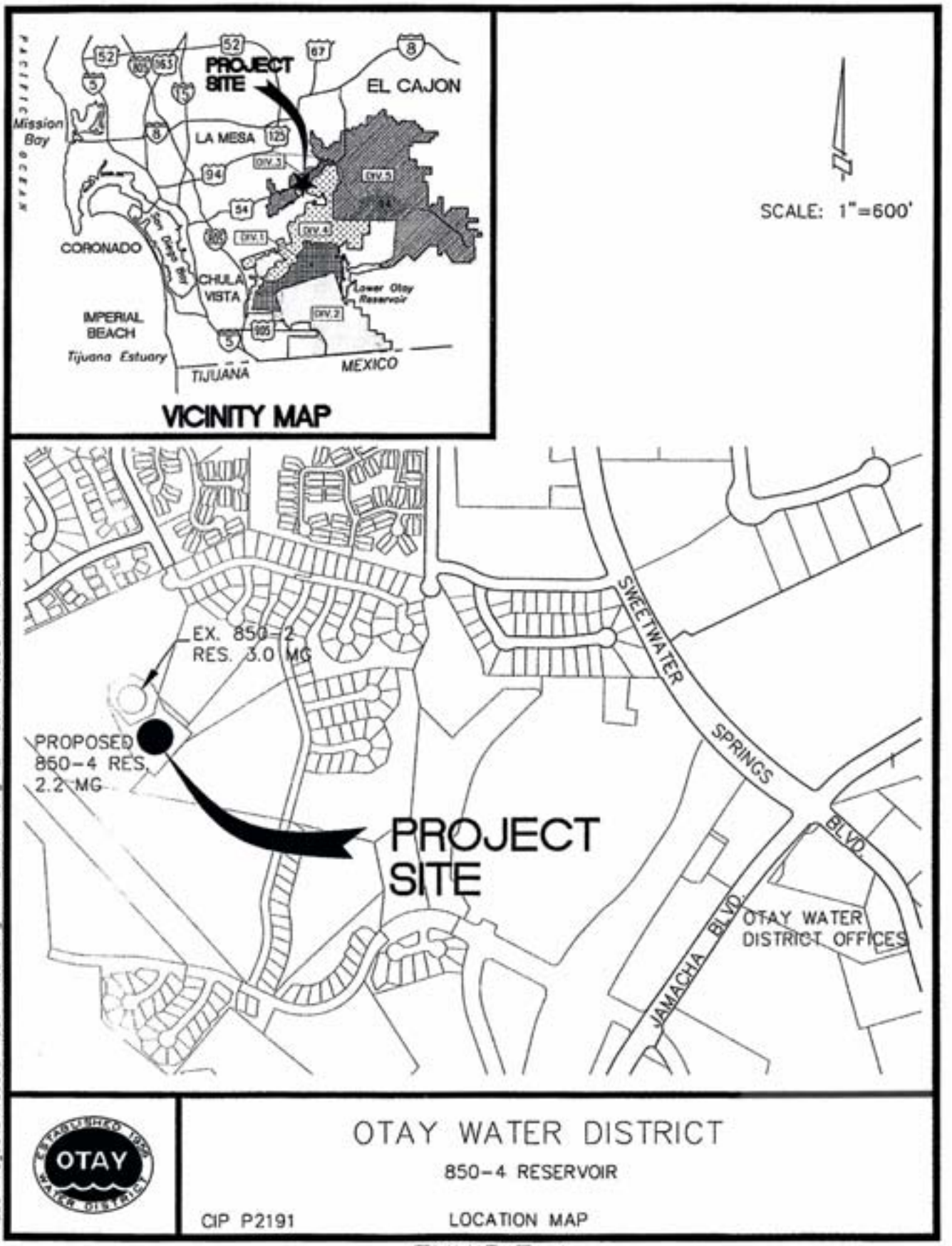
Assistant General Manager, Eng/Ops: _____ **Date:** 11/5/09

Assistant District Secretary: _____ Please file a Notice of Completion with the County Recorder's office for this project and notify the contractor. When complete, please initial and return to the Project Manager for final distribution to those listed below.

To: Finance Manager & Accounting
From: Daniel Kay

Please take the following action on the Project listed above:
CLOSE (X) SUSPEND ( )

cc: Chief, Water Operations
GIS Manager
Survey Supervisor
Inspection Supervisor
Project Manager



OTAY WATER DISTRICT

850-4 RESERVOIR

CIP P2191

LOCATION MAP

EXHIBIT A

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