Reference DACW09-87-C-0043

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PROJECT CONTROL ESTIMATE

for

ARIZONA CANAL DIVERSION CHANNEL

DREAMY DRAW to CAVE CREEK

Maricopa County, Arizona

Authority: Public Law 89-298, Flood Control Act of 1965

Appropriation: Construction General

US Army Corps
of Engineers
Los Angeles District

A118.949

PROJECT CONTROL ESTIMATE

FOR

ARIZONA CANAL DIVERSION CHANNEL

DACW09-87-C-0043

DREAMY DRAW TO CAVE CREEK

MARICOPA COUNTY, ARIZONA

FLOOD CONTROL DISTRICT
RECEIVED
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ADMIN | LMGT
FINANCE | FILE
C & O
ENGR
REMARKS

JUNE 2, 1988

PREPARED BY:

MATHEWS KESSLER & ASSOCIATES, INC.
4045 E. MCDOWELL ROAD
PHOENIX, ARIZONA 85004

(602) 244-2664

Basis for Pre-Final Project Control Estimate

This is submitted in conformance with our contract on the above referenced project. The prices shown are those expected from a Contractor bidding on the work late this year.

Most unit prices were derived from a breakdown of plant, labor and material from Phoenix suppliers. Unit prices for the security fence and picket fence were quoted from local contractors that have bid on ACDC Reach 2B. The unit price for house demolition was from the Flood Control District of Maricopa County (FCDMC) office, for similar work in the area. MKA added a 12% contingency as per Page 6 of the instructions.

Quantities were estimated from the plan sheets and computer earthwork programs. Although many items are listed as Lump Sum (L.S.), they were treated as sub-estimates and the costs for individual items were determined separately before being combined.

MKA was given Construction Equipment Ownership and Operating Expense Schedule EP1110-1-8, Volume 7, June 1987 for determining costs, we also used Means Site Work Cost Data 1987, 6th Annual Edition as a guide for determining crew and equipment size and output capacities.

It is assumed the Contractor will be given the entire project area and construction easements, as shown on the plans, for his work site. It is also assumed that few restrictions will be placed on his ability to schedule the work.

The unit price costs (1987) were escalated to the estimated mid-point of construction, which is assumed to be January 1990, for an eighteen (18) months construction project. See Exhibit "A" which is an excerpt of Table 15 from D.M. No. 12.

Unit prices from local sources are shown on the attached Exhibit "B".

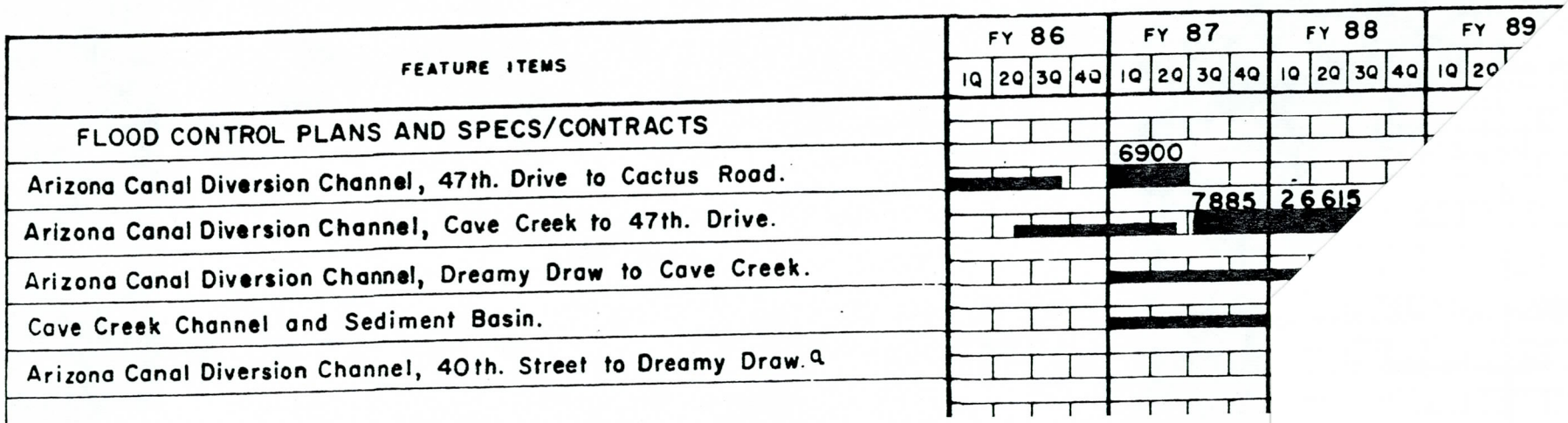
Distributed costs are shown on the attached Exhibit "C".

TABLE 15. PHOENIX, ARIZONA AND VICINITY (INCLUDING NEW

OPTIMUM DESIGN AND CONSTRUCTION SCH

FOR REMAINING WORK ON ARIZONA CANAL DIVE

(40TH. STREET TO CACTUS R



prices. Assuming the midpoint of construction to be January 1990, we used 2.5 years as the time frame for escalation.

AMERICAN CITY & COUNTY
CONST. COST INDEX = 2.4% (1987)
ENGINEERING NEWS RECORD = 2.3% (1987)

Using 2.4%/Year for 2.5 Years = 6.0%

We used 6.0% increase when escalating costs to mid-point of construction.

R.L.S.
6/2/88

PRE-FINAL PROJECT CONTROL ESTIMATE
"EXHIBIT B"

1. Security Fence rental 8′ high overall with 3 strand barb

   $\frac{\$6,500}{4,200}$ = $1.55 L.F. American Fence / Tom McMullen / (602) 272-2333

2. Grout Mix - 3/8" - 6 sack - 25% mix $48/CY
   Action Redi Mix Dan / 254-1921

3. a. WW mesh 7′* $\frac{1,400 \text{ S.F.}}{200 \text{ roll}}$ = $ 100′ = $ .0714/S.F.

   b. Access Ladder (galvanized) $635.00 Ea.

   c. 3" pipe @ $3.14/L.F.

   d. Pipe gate (bare) $295.00 Ea.

   Allfab 437-0497 Terry

4. Signs (gate, reflectorized) 24" X 16"

   Aluminum $19.00 Ea. (recommended by Safety Engineer & Supply)

   16 ga. per specifications Estimate $40.00

   Safety Engineer & Supply 968-0910 Karen

5. Guard Rail Installed $15-20′/L.F.

   Southwest Specialties 1-582-2385 Sue

6. Tanner Materials 262-1466 Jerry

   a. Gravel Base $ 8.25/C.Y.

   b. A.C. Paving $17.75/TON

   c. Rock 6" - 12" $11.25/C.Y.

7. Picket Fence (In Place) $29.00/L.F. Includes concrete and steel posts and picket gates.

8. Manhole - Frame & Cover 24" = $ 115.00 Ea.
   30" = $ 140.00 Ea.

   Concrete adjusting rings 0.5′ = $ 29.00 Ea.
   0.9′ = $ 44.00 Ea.

   D.I. Frame & Cover Key Lock = $ 345.00 Ea.

   Estimate aluminum locking ram type = $ 500.00 ±

EXHIBIT "C"

DACW09-87-C-0043

CONSTRUCTION COST ESTIMATE

DATE PREPARED 5/18/88

SHEET 1 OF 5

PROJECT: ARIZONA CANAL DIVERSION CHANNEL (REACH 3)

LOCATION: DREAMY DRAW TO CAVE CREEK, PHOENIX, ARIZONA

ARCHITECT ENGINEER: MATHEWS KESSLER & ASSOCIATES

BASIS FOR ESTIMATE:
- [ ] CODE A (No design completed)
- [ ] CODE B (Preliminary design)
- [ ] CODE C (Final design)
- [x] OTHER (Specify) PRE-FINAL

DRAWING NO.:

ESTIMATOR: RDM

CHECKED BY: SKS

General Conditions SUMMARY	QUANTITY NO. UNITS	QUANTITY UNIT MEAS.	LABOR PER UNIT	LABOR TOTAL	MATERIAL PER UNIT	MATERIAL TOTAL	TOTAL COST
Admin & Super							
Super	18	Mo	4,200	75,600			75,600
Assist. Super	"	Mo	3,400	61,200			61,200
Clerk	"	Mo	1,000	18,000			18,000
Time Keeper	"	Mo	2,200	39,600			39,600
Typist	"	Mo	1,600	28,800			28,800
Watchmen 2(ea)	"	Mo	1,200	43,200			43,200
Engineering							
Engineer	"	Mo	3,600	64,800			64,800
Estimator	"	Mo	2,500	45,000			45,000
Draftsman	"	Mo	1,400	25,200			25,200
Field Engr.	"	Mo	2,500	45,000			45,000
Instr. Man	"	Mo	1,800	32,400			32,400
Rod & Chain 2(ea)	"	Mo	1,400	50,400			50,400
Stakes, etc.	-	LS					2,000
Safety Engr.	"	Mo	3,000	54,000			54,000
Temporary Facilities							
Constr. Office	-	LS				10,000	10,000
Gov't Office	-	LS				10,000	10,000
Sheds	-	LS				10,000	10,000
Heat	"	Mo			200	3,600	3,600
Elec	"	Mo			200	3,600	3,600
Water	"	Mo			100	1,800	1,8--
Sanitary	"	Mo			100	1,800	1,800
Fence	-	LS					10,000
Barricades	-	LS					5,000

Exhibit "C"

DACW09-87-C-0043

CONSTRUCTION COST ESTIMATE

DATE PREPARED 5-18-88

PROJECT: ARIZONA CANAL DIVERSION CHANNEL

LOCATION: DREAMY DRAW TO CAVE CREEK, PHOENIX, ARIZONA

ARCHITECT ENGINEER: MATHEWS KESSLER & ASSOCIATES

DRAWING NO.:

ESTIMATOR: RDM

CHECKED BY: SKS

BASIS FOR ESTIMATE:
- [ ] CODE A (No design completed)
- [ ] CODE B (Preliminary design)
- [ ] CODE C (Final design)
- [x] OTHER (Specify) PRE-FINAL

General Conditions (con't) SUMMARY	QUANTITY NO. UNITS	QUANTITY UNIT MEAS.	LABOR PER UNIT	LABOR TOTAL	MATERIAL PER UNIT	MATERIAL TOTAL	TOTAL COST
Telephone	18	Mo			100	1,800	1,800
Furniture	"	Mo			100	1,800	1,800
Misc. Supplies	"	Mo			50	900	900
Tools & Equipment							
Air Compressor	"	Mo			500	9,000	9,000
Air Tools	"	Mo			150	2,700	2,700
Welding Tools	"	Mo			300	5,400	5,400
Concrete Tools	"	Mo			150	2,700	2,700
Generators	"	Mo			500	9,000	9,000
Pumps	"	Mo			1000	18,000	18,000
Towers & Hoists	"	Mo			2000	36,000	36,000
Trucks End Dump	"	Mo			1500	27,000	27,000
Trucks P.U.	"	Mo			500	9,000	9,000
Trucks Stake Body	"	Mo			1000	18,000	18,000
Tarps & Covers	-	LS			500	9,000	9,000
Fill & Lube	"	Mo	1000	18,000	2500	45,000	63,000
Mobilization &	-	LS		estimated			50,000
Clean-up							
General Job Clean-up	-	LS		estimated			50,000
Progress Photographs	-	LS		estimated			5,000
Travel Expense	-	LS		estimated			25,000

U.S. GOVERNMENT PRINTING OFFICE 1958 O—516148

EXHIBIT "C"

DACW09-87-C-0043

CONSTRUCTION COST ESTIMATE

DATE PREPARED 5/18/88

PROJECT: ARIZONA CANAL CIVERSION CHANNEL

LOCATION: DREAMY DRAW TO CAVE CREEK, PHOENIX, ARIZONA

ARCHITECT ENGINEER: MATHEWS KESSLER & ASSOCIATES

BASIS FOR ESTIMATE:
- [ ] CODE A (No design completed)
- [ ] CODE B (Preliminary design)
- [ ] CODE C (Final design)
- [x] OTHER (Specify) PRE-FINAL

DRAWING NO.:

ESTIMATOR: RDM

CHECKED BY: SKS

General Conditions (con't) SUMMARY	QUANTITY NO. UNITS	QUANTITY UNIT MEAS.	LABOR PER UNIT	LABOR TOTAL	MATERIAL PER UNIT	MATERIAL TOTAL	TOTAL COST
Permits							
City	-	LS					150,000
County	-	LS					
State	-	LS					
First-Aid Expense	-	LS		estimated			10,000
Project & Safety Signs	-	LS		estimated			25,000
Project Insurance							
Builder's Risk Insurance	-	LS					57,000
Extended Coverage	-	LS					150,000
Pulbic Liability	-	LS					246,000
Interest (on operating capital)	-	LS	(see attachment sheet 5)				139,000
Taxes							
State assume 4.25%	-	LS					347,000
Unemployment	-	LS	CO .0093%				76,000
and Social Security @7.15%							58,400
Bond							
Performance Bond							117,000

ENG FORM 150
1 AUG 59

(EM 1110-345-730) PREVIOUS EDITION MAY BE USED

U.S. GOVERNMENT PRINTING OFFICE: 1959 O—516146

EXHIBIT "C"

DACW09-87-C-0043

CONSTRUCTION COST ESTIMATE

DATE PREPARED: 5/18/88

SHEET 4 OF 5

PROJECT: ARIZONA CANAL DIVERSION CHANNEL

LOCATION: DREAMY DRAW TO CAVE CREEK, PHOENIX, ARIZONA

ARCHITECT ENGINEER: MATHEWS KESSLER & ASSOCIATES

BASIS FOR ESTIMATE:
- [ ] CODE A (No design completed)
- [ ] CODE B (Preliminary design)
- [ ] CODE C (Final design)
- [X] OTHER (Specify) PRE-FINAL

DRAWING NO.:

ESTIMATOR:

CHECKED BY:

SUMMARY	QUANTITY NO. UNITS	QUANTITY UNIT MEAS.	LABOR PER UNIT	LABOR TOTAL	MATERIAL PER UNIT	MATERIAL TOTAL	TOTAL COST
SUMMARY:							
ADMIN., SUPER & ENGINEERING							645,500
TOOLS & EQUIPMENT							208,800
INSURANCE							592,000
TAX & BOND							598,400
MOBILIZATION, CLEAN-UP							315,000
						TOTAL:	2,359,700

ENG FORM 150
1 AUG 59

(EM 1110-345-730)

PREVIOUS EDITION MAY BE USED

U.S. GOVERNMENT PRINTING OFFICE: 1959 O—516140

EXHIBIT "C"
DISTRIBUTED COSTS
INTEREST ON OPERATING CAPITAL

Amount of Capital = Sum of the average monthly payroll and 1/2 the cost of (listed items)*.

Listed Items:

215,800 - (1. Plant purchase
(2. Plant Mobilization

60,300 - 3. Construction of Facilities (Contractors Camp)

117,000 - 4. Bond
453,000 - 5. Insurance
846,000

@ Current Interest Rate part with no partial payment except for progress payments monthly.

a. Average monthly payroll = $\frac{43,200 + 585,200}{18}$ = 34,911

Payroll = $34,911 X 1% / mo. = $ 3,491/mo. X 18 months = $ 62,838

b. $\frac{846,100}{2}$ = 423,050

Listed Items = $ 423,050 X 12% X 1.5 years = $ 76,149

c. Interest @ 12% A.P.R. Total Interest: = $138,987

Call: $139,000

GOVERNMENT ESTIMATE WORK SHEET SUMMARY

SHEET 1 OF 3

PROJECT: ARIZONA CANAL DIVERSION CHANNEL (REACH 3)

DACW09-87-0043

SUBJECT: PRE-FINAL DESIGN ESTIMATE

QUANTITY

SUBITEM	PLANT	LABOR	MATERIALS	SUPPLIES	SUBTOTAL	REF. PG.
1. Diversion & Control of Water	109,016	57,342	-0-	-0-	166,358	
2. Clear & Grub	22,215	27,581	20,046	-0-	69,842	
3. Demolition	16,266	29,901	-0-	-0-	46,167	
4. Excavation (Blasting)	195,084	292,859	-0-	-0-	487,943	
5. Excavation (Common)	3,987,135	1,087,249	-0-	-0-	5,074,384	
6. Compacted Fill (Channel)	701,235	291,465	-0-	-0-	992,700	
7. Misc. - Fill	96,882	40,554	-0-	-0-	137,436	
8. Concrete, Invert	19,512	402,231	2,350,038	-0-	2,771,781	
9. Concrete, Walls	134,491	521,285	1,870,134	-0-	2,525,910	
10. Concrete, Top Slab	282,093	167,945	342,594	264,000	1,056,632	
11. Steel Reinforcement	284,090	1,231,274	3,363,255	-0-	4,878,619	
12. Aggregate Base Course	27,276	20,446	47,305	-0-	95,027	
13. Asphalt Concrete Paving	16,189	8,373	75,438	-0-	100,000	
TOTALS						

ENG FORM APR 1740 (Translucent) REPLACES EDITION OF 1 JAN 69 WHICH IS OBSOLETE (EM 1110-2-1302)

GOVERNMENT ESTIMATE WORK SHEET SUMMARY

SHEET 2 OF 3

PROJECT: ARIZONA CANAL DIVERSION CHANNEL (REACH 3)

DACW09-87-0043

SUBJECT: PRE-FINAL DESIGN ESTIMATE

QUANTITY

SUBITEM	PLANT	LABOR	MATERIALS	SUPPLIES	SUBTOTAL	REF. PG.
14. Side Drains	3,025	11,533	7,468	-0-	22,026	
15. Overflow Spillways	18,174	35,116	68,681	-0-	121,971	
16. Steel Picket Fence	---	---	---	---	751,680	
17. Manhole Adjustments	508	812	1,050	-0-	2,370	
18. Dunlap Detours	---	---	---	---	982,022	
19. Central Detours	---	---	---	---	235,685	
20. Misc. Hardware	1,997	3,242	11,431	6,000	22,670	
21. Landscaping	---	---	---	---	594,366	
22. Irrigation	---	---	---	---	59,916	
23. Misc. Utility Modification	---	---	---	---	2,500	
24. Station Marking	232	482	96	-0-	810	
25. Underpasses	---	---	---	---	653,375	
26. Road Work (Dunlap)	4,783	10,032	14,772	-0-	29,587	
TOTALS						

GOVERNMENT ESTIMATE WORK SHEET SUMMARY

SHEET 3 OF 3

PROJECT: ARIZONA CANAL DIVERSION CHANNEL (REACH 3)

DACW09-87-C-0043

SUBJECT: PRE FINAL DESIGN ESTIMATE

QUANTITY

SUBITEM	PLANT	LABOR	MATERIALS	SUPPLIES	SUBTOTAL	REF. PG.
27. Road Work (Central)	4,783	10,032	14,772	-0-	30,000	
				TOTAL:	21,911,777	
TOTALS						

ENG FORM 1 APR 61 1740 (Translucent) REPLACES EDITION OF 1 JAN 49 WHICH IS OBSOLETE (EM 1110-2-1302)

Prepared by: RDM
Checked by: SKS
Date: 6/01/88

DETAIL SUMMARY SHEET OF REASONABLE CONTRACT ESTIMATE

DACW09-87-C-0043 Sheet 1 of 3

Project: ARIZONA CANAL DIVERSION CHANNEL (REACH 3)

Bid Item No.	Designation	Unit	Quantity	Plant	Labor	Overtime, Ins., Soc. Sec., etc.	Materials and Supplies	Subcontracts	Subtotal	Distributed costs	Subtotal costs	Profit	Bond cost	Total cost	Unit cost	Adjusted Unit cost	Adjusted Amount
1.	DIVERSION & CONTROL OF WATER	L.S.	JOB						166,358	17,917	184,275	18,427	---	202,702	---	---	214,865
2.	CLEAR & GRUB	L.S.	JOB						69,842	7,522	77,364	7,736	---	85,100	---	---	90,200
3.	DEMOLITION	EA.	41						46,167	4,972	51,139	5,114	---	56,253	1,372	1,455	59,655
4.	EXCAVATION (BLASTING)	C.Y.	58,500						487,943	52,551	540,494	54,049	---	594,543	10.16	10.80	631,800
5.	EXCAVATION (COMMON)	C.Y.	1,420,000						5,074,384	546,511	5,620,895	562,090	---	6,182,985	4.35	4.60	6,532,000
6.	COMPACTED FILL (CHANNEL)	C.Y.	363,000						992,700	106,914	1,099,614	109,961	---	1,209,575	3.33	3.55	1,288,650
7.	MISCELLANEOUS FILL	C.Y.	68,000						137,436	14,802	152,238	15,224	---	167,462	2.46	2.60	176,800
8.	CONCRETE, INVERT	C.Y.	54,900						2,771,781	298,521	3,070,302	307,030	---	3,377,332	61.52	65.20	3,579,480
9.	CONCRETE, WALLS	C.Y.	42,600						2,525,910	272,040	2,797,950	279,795	---	3,077,745	72.25	76.60	3,263,160
10.	CONCRETE, TOP SLAB	C.Y.	7,900						1,056,632	113,799	1,170,431	117,043	---	1,287,474	162.97	172.75	1,364,725
11.	STEEL REINFORCEMENT	LBS.	15,453,000						4,878,619	525,427	5,404,046	540,405	---	5,944,451	0.38	0.41	6,335,730
12.	AGGREGATE BASE COURSE	C.Y.	4,100						95,027	10,234	105,261	10,526	---	115,789	28.24	29.95	122,795
13.	ASPHALT CONCRETE PAVING	TON	4,250						100,000	10,770	110,770	11,077	---	121,847	28.67	30.40	129,200

Form No. K-2

Prepared by: RDM
Checked by: SKS
Date: 6/01/88

DETAIL SUMMARY SHEET OF REASONABLE CONTRACT ESTIMATE

Project: ARIZONA CANAL DIVERSION CHANNEL

DACW09-87-C-0043 Sheet 2 of 3

Bid Item No.	Designation	Unit	Quantity	Plant	Labor	Overtime, Ins., Soc. Sec., etc.	Materials and Supplies	Subcontracts	Subtotal	Distributed costs	Subtotal costs	Profit	Bond cost	Total cost	Unit cost	Adjusted Unit cost	Adjusted Amount
14.	SIDE DRAINS	L.S.	JOB						22,026	2,372	24,398	2,440	---	26,838	---	---	28,450
15.	OVERFLOW SPILLWAYS	L.S.	JOB						121,971	13,136	135,107	13,511	---	148,618	---	---	157,535
16.	STEEL PICKET FENCE	L.S.	32,400						751,680	80,956	832,636	83,264	---	915,900	28.27	29.95	970,380
17.	MANHOLE ADJUSTMENTS	L.S.	JOB						2,370	255	2,625	262	---	2,887	---	---	3,060
18.	DUNLAP DETOUR	L.S.	JOB						982,022	105,764	1,087,786	108,778	---	1,196,564	---	---	1,268,360
19.	CENTRAL DETOUR	L.S.	JOB						235,685	25,383	261,068	26,107	---	287,175	---	---	304,405
20.	MISCELLANEOUS HARDWARE	L.S.	JOB						22,670	2,442	25,112	2,511	---	27,623	---	---	29,280
21.	LANDSCAPING	L.S.	JOB						594,366	64,013	658,379	65,838	---	724,217	---	---	767,670
22.	IRRIGATION	L.S.	JOB						59,916	6,453	66,369	6,637	---	73,006	---	---	77,390
23.	MISCELLANEOUS UTILITY MODIFICATION	L.S.	JOB						2,500	269	2,769	277	---	3,046	---	---	3,230
24.	STATION MARKING	L.S.	JOB						810	87	897	89	---	986	---	---	1,045
25.	UNDERPASSES	L.S.	JOB						653,375	70,368	723,743	72,374	---	796,117	---	---	843,885
26.	ROAD WORK (DUNLAP AVE.)	L.S.	JOB						29,587	3,186	32,773	3,277	---	36,050	---	---	38,215

Form No R-2

Prepared by: RDM
Checked by: SKS Date: 6/01/88

DACW09-87-0043 Sheet 3 of 3

DETAIL SUMMARY SHEET OF REASONABLE CONTRACT ESTIMATE

Project: ARIZONA CANAL DIVERSION CHANNEL (REACH 3)

Bid Item				Plant	Labor	Overtime, Ins., Soc. Sec., etc.	Materials and Supplies	Subcontracts	Subtotal	Distributed costs	Subtotal costs	Profit	Bond cost	Total cost	Unit cost	Adjusted	
No.	Designation	Unit	Quantity													Unit cost	Amount
27.	ROAD WORK (CENTRAL AVE.)	L.S.	JOB						30,000	3,060	33,060	3,306	---	4,508,790	---	---	38,750
																TOTAL:	28,320,715

Form No B-2