MONTEREY PENINSULA WATER SUPPLY PROJECT

NEW LOS PADRES AND NEW SAN CLEMENTE PROJECTS FISH COLLECTION FACILITIES

CONCEPTUAL DESIGNS AND COST ESTIMATES

PREPARED FOR
THE MONTEREY PENINSULA
WATER MANAGEMENT DISTRICT
MONTEREY, CALIFORNIA

BY

BECHTEL CORPORATION

JANUARY 1991

MONTEREY PENINSULA WATER SUPPLY PROJECT

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1.0 INTRODUCTION

This report has been prepared in accordance with the February 7, 1989 Agreement between Monterey Peninsula Water Management District (MPWMD) and Bechtel Civil, Inc., now known as Bechtel Corporation, in connection with the performance of certain analyses, studies, and planning services for the Monterey Peninsula Water Supply Project. The report is based on previously published information regarding the project and on data acquired and developed between February 1988 and April 1990. Its objectives are to provide conceptual designs and cost estimates for fish collection facilities that would be used to pass both upstream and downstream migrant steelhead trout around the New San Clemente and New Los Padres Reservoirs. The conceptual designs are supported by field reconnaissances of the sites and the cost estimates are based on construction plans and schedules as described in the report.

Two existing reservoirs on the Carmel River are owned and operated by California-American Water Company (Cal-Am) for domestic water supply in the Monterey Peninsula and Carmel Valley areas. The first reservoir, impounded by San

Clemente Dam which was completed in 1921, lies about three miles southeast of the town of Carmel Valley in T.17S, R.2E, MDB&M (See Figure 1-1). The second is Los Padres Reservoir located about seven miles southeast of Carmel Valley in T.18S, R.3E, MDB&M. Los Padres Dam was completed in 1949. The storage capacities of both reservoirs have been seriously depleted by sedimentation. At the last calibrations made in 1984, San Clemente Reservoir was reported to have about 800 acre-feet of storage capacity and Los Padres about 2,200 acre-feet. The combined capacity of the two reservoirs is insufficient to assure an adequate water supply for the Cal-Am service area. MPWMD has sought to obtain permitting for a larger reservoir that would not only assure an adequate domestic water supply but also provide continuity and improved flow conditions in the Carmel River in all but the driest foreseeable seasons.

To meet these needs, the District proposed to form a 29,000 acre-foot reservoir on the Carmel River. The height of dam required to impound a reservoir of that capacity is about 300 feet. The proposed location of the dam was about 3,600 feet downstream from the existing San Clemente Dam.

Opposition to this plan was voiced by fish and wildlife agencies and the Environmental Protection Agency on the grounds that such a dam and reservoir would threaten the existence of the steelhead fishery in the Carmel River and

would inundate more riparian habitat than other potential alternatives. As a result of that opposition to its proposed plan, the District renewed and expanded its studies of alternatives to the originally proposed project. Preliminary designs and estimates of costs for the following seven alternatives are set forth in the report entitled "New Los Padres, New San Clemente and San Clemente Creek Projects, Preliminary Designs and Cost Estimates" (Reference No. 1).

1. New San Clemente Dam at the site proposed for the 29,000 AF reservoir, but with reservoir capacity of approximately 23,000 AF.

2. New San Clemente Dam at the site proposed for the 29,000 AF reservoir, but with reservoir capacity of approximately 17,000 AF.

3. New Los Padres Dam downstream of the existing dam with reservoir capacity of approximately 24,000 AF.

4. New Los Padres Dam downstream of the existing dam with reservoir capacity of approximately 18,000 AF.

5. New Los Padres Dam downstream of the existing dam with reservoir capacity of approximately 9,000 AF.

6. San Clemente Creek Dam, with pumped storage, and reservoir capacity of approximately 12,000 AF.

7. San Clemente Creek Dam, with pumped storage, and reservoir capacity of 9,000 AF.

In earlier studies of the New San Clemente Project, (Reference No. 2), it had been proposed that upstream migrating adult fish would be collected at a facility to be located near Sleepy Hollow, downstream from the dam, and trucked to the reservoir impounded by the almost 300 ft. high dam. Downstream migrating juveniles would be collected by a fish horn arrangement located on the upstream side of the dam and passed by trucking to the downstream side.

During exploratory meetings in 1988 with representatives of the State and Federal fishery agencies and the Environmental Protection Agency, doubts that the fish horn concept would work satisfactorily were expressed because it was felt that the juveniles would become lost in the reservoir and would never find their way to the fish horn. The consensus reached was that a "trap and haul" type of operation would have the greatest chance of succeeding.

Efforts were therefore first directed towards developing a concept for a screening facility that would be located at the confluence of Pine Creek and the Carmel River, near the head of the proposed New San Clemente Reservoir. This facility would screen both juvenile and adult downstream migrants from the river and separate them for transportation to a release point downstream of the dam. The initial concept was modified and refined, then was transmitted to the agencies for review and comment whereupon it was again revised to reflect those comments. At the Agencies' request, an analysis of screening efficiency was performed (Reference No. 3), following which further revisions were made to the proposed arrangement. The final version is depicted in Figure 2-2 of this report.

A concept was also developed for the collection facility that would intercept upstream migrating adult steelhead during their spawning run. The concept in general terms follows the lines adopted by the U.S. Army Corps of Engineers for an upstream migrant collection facility completed during 1989 on the Toutle River in the State of Washington. The arrangement of that facility had been agreed to by the Federal and State fishery agencies and was therefore considered to be representative of the most recent thinking applied to this type of collection facility. The proposed concept, as modified to fit the site conditions and topography at Sleepy Hollow, is shown on Figure 2-1 in this report.

The concepts of the two collection facilities proposed for the New San Clemente Project were then modified and adapted to fit the site conditions and topography existing upstream and downstream from the New Los Padres Project. The proposed concepts are shown respectively on Figures 3-1 and 3-2 for the upstream and downstream migrant collection facilities. The locations of all facilities are identified on Figure 1-1.

A schedule of quantities and estimate of the cost of constructing each fish collection facility were prepared and are discussed in the report. The estimates are summarized in Table 1-1 immediately following. Details are included in Appendix A.

TABLE 1-1

UPSTREAM AND DOWNSTREAM MIGRANTS FISH COLLECTION FACILITIES

ESTIMATED COSTS OF CONSTRUCTION AND ANNUAL OPERATION

AND MAINTENANCE

	Estimated Costs in June 1989 Dollars			
	Upstream Migrants		Downstream Migrants	
Dam Site	Construction	Annual O&M	Construction	Annual O&M
New San Clemente	2,796,000	41,000	8,251,000	390,000
New Los Padres	2,785,000	39,000	11,925,000	383,000

2.0 NEW SAN CLEMENTE DAM

2.1 Downstream Migrant Screening Facility

The proposed site of the facility is immediately downstream from the confluence of Pine Creek and the Carmel River, just upstream of the head of the proposed New San Clemente Reservoir. In its initial configuration the main screening facility concept consisted of 16 drum screens each 12 feet in diameter and 12 feet long. They were aligned in a single row generally parallel to the left bank of the Carmel River. A drawing and description of the proposed facility were transmitted to the Agencies for review and comment. In response to the comments and more recently acquired data, the proposed arrangement of the screening facility was revised to an installation of twelve drum screens each 14 feet in diameter and length. The screens were arranged in three parallel banks with four screens per bank to provide a layout that would more effectively fit into the space available at the site. The screens would be capable of passing 600 cfs at 0.3 feet per second velocity through the gross screen area, assuming that the drum screens would be 75% submerged.

An analysis of screening efficiency was then made (Reference No. 3). This was based on daily flow duration curves at the screening facility site for the period

October 1, 1901 through September 30, 1987. These were developed from the District's Carmel Valley Simulation Model. The analysis was also based on an estimate of the number of downstream migrants that would pass New San Clemente Dam site that had been made by D.W. Kelley & Associates. That estimate, in turn, was based on the migratory pattern of juvenile steelhead in Waddell Creek and Lagunitas Creek, both in California. The screening efficiency analysis was made for varying rates of design flow capacity of the screening facility. Since the timing of the peak downstream migration does not coincide with the timing of the peak river flows, the analysis showed that the screening facility would have a very high collection efficiency for relatively low design flow capacities. On the basis of the results it was proposed that the normal design flow through the screens be 400 cfs which corresponds to 99% screening efficiency. Eight screens 14 ft. x 14 ft. would pass this flow at 0.3 feet per second velocity with the screens 75% submerged. The same screens could pass 600 cfs at 0.5 feet per second velocity. Above that rate of flow, the radial gates would be opened and the screening facility would be shut down until the flood peak had subsided.

Referring now to Figure 2-2, automatic water level controls would maintain the water level in the forebay of the facility within a range of about 3 feet. At low flows, the

first bay of four drum screens would be operated. With increasing flow and forebay water level, the second bay would come into operation. Most of the water (about 80%) would return to the river via drop box and conveyance conduits or diffusers located in the lower part of the fish ladder which is provided to allow upstream migrants to bypass the screening facility. The remaining flow would enter the bypass channels towards the downstream end of which, secondary screening would take place by vertical traveling screens to further concentrate the fish. They would then pass over a perforated plate and bar separator where the juveniles and adults would be separated before being discharged into their respective holding tanks. Trucks would then transport them to a point of release downstream from the main dam.

2.2 Upstream Migrant Collection Facility

The proposed site of the facility is about 1,200 feet downstream of the stilling basin at the base of the proposed New San Clemente Dam. Its purpose is to trap adult steelhead trout returning from the ocean to spawn in the Carmel River. The facility would provide for collecting, limited holding, and hauling of adult upstream migrants to the reservoir impounded by the proposed new dam. It would also be possible to release the fish upstream of the downstream migrant facility at the head of

the reservoir near Pine Creek but this would greatly increase transport time and would preclude returning adult fish from entering San Clemente Creek.

The facility consists of a fish barrier structure with a stilling basin, a water intake structure, a short fish ladder with entrance pool and fish collection pool weir box plus the mechanical equipment needed for a trap and haul operation (brails, crowder, water system, fish chute, etc.) and an electrical system for operation of the facility. It would provide for handling 4,000 adults per season provided that the Carmel River steelhead fishery can be restored to that level.

Referring now to Figure 2-1, the barrier dam would be a concrete structure spanning the present river channel and designed to prevent the upstream passage of adult fish beyond it. A screened intake structure would draw water from the pool upstream of the barrier dam and direct it through diffusers to the head of the fish ladder and to the entrance pool. Attraction water flow would lead the fish into the entrance pool at the base of the fish ladder which they would climb to reach the holding pool before being loaded into a tank truck for haulage to the reservoir upstream of the main dam. The walls of the collection facility would be carried up to an elevation that would prevent damage from floods up to the flood that has a

return frequency of once in a hundred years. The records indicate that this would be a peak flow of about 15,000 cfs. The collection facility would be designed to be operable in river flows up to 1,900 cfs.

Road access to the collection facility and between the collection facility and the main reservoir would be provided and would be coordinated with access road requirements to the dam during construction and after it has been completed.

2.3 Estimated Project Costs

Estimates of construction costs have been prepared for the upstream and downstream migrant collection facilities that would be associated with the New San Clemente Dam. The estimates are based on schedules of the principal quantities of materials and equipment measured from the drawings on Figures 2-1, and 2-2. Quantities not readily measurable at this stage were estimated on the basis of present knowledge of site conditions.

Materials prices are based on June 1989 mill rates adjusted for delivery to the site. Labor costs are based on Davis Bacon rates in effect in the Monterey area in June 1989. The cost of operating and maintaining construction equipment was obtained from the Bechtel data bank which includes first cost and the cost of fuel, parts and repair

labor. Allowances are included for temporary facilities such as field offices, warehousing, explosives magazine, repair shops, construction access and haul roads, and temporary utilities.

Provision is made in the estimates for construction services consisting of survey and cleanup crews, warehousing staff, electrical power supply, service vehicles, dust abatement and control, small tools and consumables, office expenses, equipment and furniture.

Engineering and construction management are included as an allowance at 10% of the construction cost.

A contingency allowance of 15% of the construction cost is included and an allowance for fee and profit has been added at 5% of the construction cost plus contingency.

The following items of cost are not presently included in the estimates:

- Project studies completed to date
- Land and land rights
- District's administration
- Escalation prior to construction
- Interest during construction
- Financing charges
- Taxes and insurance

The cost estimates are in terms of costs prevailing in June 1989. Cost summaries are set forth in Tables 2-1 and 2-2 respectively for the New San Clemente Dam downstream and upstream migrant collection facilities. Further details are set forth in Appendix A.

2.4 Construction Plan and Schedule

The cost estimates are based on a construction plan in which the upstream and downstream migrant collection facilities would be included in the same contract as construction of the main dam. At this time it appears that this would allow more efficient use of the Contractor's construction equipment and consequently less cost. For example, access roads will need to be constructed through the reservoir area to allow it to be cleared. These same roads could be used to haul concrete from the batch plant at the dam to the downstream migrant screening facility. The upstream migrant screening facility is located near the main dam and concrete needed for its construction could conveniently be supplied from the batch plant at the dam. The fixed costs of providing aggregate processing plant and concrete batch plant could thus be spread over the two screening facilities and the main dam.

TABLE 2-1

NEW SAN CLEMENTE DAM
DOWNSTREAM MIGRANT SCREENING FACILITY
CONCEPTUAL ESTIMATE OF COST
SUMMARY

Total Direct and Indirect Costs		$6,212,000
Engineering, C/M	10%	621,000
	Subtotal	6,833,000
Contingency	15%	1,025,000
	Subtotal	7,858,000
Fee	5%	393,000
	TOTAL	$8,251,000

TABLE 2-2

NEW SAN CLEMENTE DAM
UPSTREAM MIGRANT COLLECTION FACILITY
CONCEPTUAL ESTIMATE OF COST
SUMMARY

Total Direct & Indirect Costs		$2,105,000
Engineering, C/M	10%	211,000
	Subtotal	2,316,000
Contingency	15%	347,000
	Subtotal	2,663,000
Fee	5%	133,000
	TOTAL	$2,796,000

Each collection facility could conveniently be constructed in one season and could thus be readily coordinated with and merged into the twenty-two month schedule allowed for construction of the dam.

2.5 Estimated Annual Operation and Maintenance Costs

2.5.1 Downstream Migrant Screening Facility

Estimates of the number of downstream migrants that would pass the screening facility indicate that the principal downstream migration for yearling and older juveniles would occur during two periods: October through December and March through June (Reference No. 3, Figure 4). Downstream dispersal of age O+ migrants would occur primarily during the period from mid-May through September (Reference No. 3, Figure 2). Although there would be some fish movement during January and February, the numbers would be small, and that period would be the off-season. During the ten month on-season period (306 days) the downstream migrant screening facility would be in continuous operation and one attendant would be present seven days per week, twenty four hours per day.

2.5.2 Upstream Migrant Collection Facility

The principal upstream migration takes place December 1 through the end of February each year. During this period, one attendant would be needed to transport adult fish from the collection facility upstream past the dam during daylight hours seven days per week over the three month period (90 days).

The slack time thus lies during the months of July through September which would be the ideal time to schedule annual maintenance. This work does not require special skills and could be performed by the operating attendants for the fish passage facilities during the off-season.

2.5.3 Annual Operating and Maintenance Costs

The estimated annual O&M costs including 10% contingency allowance for each facility is as follows:

Downstream Migrant Screening Facility	$ 390,000
Upstream Migrant Collection Facility	$ 41,000
Annual Total	$ 431,000

Details are set forth in Appendix A.

3.0 NEW LOS PADRES DAM

3.1 Downstream Migrant Screening Facility

This facility, which is shown on Figure 3-2, is patterned after the one proposed for the New San Clemente Reservoir but it would be located on the right side of the river about 800 feet upstream from the head of the proposed New Los Padres Reservoir. Access would be via a 6-1/2 mile road to be constructed along the westerly side of the raised reservoir as shown on Figure 1-1. Such a road would provide a favorable starting point for hikers and horseback riders entering the Ventana National Wilderness Area. Being on the opposite side of the river, the arrangement would also be opposite face to that proposed at the New San Clemente downstream migrant screening facility. Operation would be essentially as described in Section 2.1 for the New San Clemente downstream migrant screening facility.

Based on flow records, the proposed design capacity would be 75% of that proposed for the New San Clemente installation, with six drum screens 14 feet in diameter and length, a design flow of 300 cfs, and maximum flow of 450 cfs.

3.2 Upstream Migrant Collection Facility

The proposed facility which is shown on Figure 3-1, is located about 400 feet downstream of the stilling basin lip of the proposed New Los Padres Dam. Its purpose and description are the same as those described in Section 2.2 of this Report for the corresponding New San Clemente facility. The topography of the site however favors locating the entrance pool, fish ladder, holding pool and loading facilities on the right bank of the river which also allows for more convenient access. Thus the arrangement would be opposite face to that proposed at the New San Clemente facility and its operation would be essentially the same as that described in Section 2.2 for the New San Clemente upstream migrant screening facility.

3.3 Estimated Project Costs

Summaries of the estimates are presented in Table 3-1 for the New Los Padres Dam downstream migrant facility and Table 3-2 for the upstream migrant facility. Further details are set forth in Appendix A. The basis of these estimates is the same as that described in Section 2.3 of this Report for the New San Clemente facilities.

TABLE 3-1

NEW LOS PADRES DAM
DOWNSTREAM MIGRANT COLLECTION FACILITY
CONCEPTUAL ESTIMATE OF COST
SUMMARY

Total Direct and Indirect Costs		$8,978,000
Engineering, C/M	10%	898,000
	Subtotal	9,876,000
Contingency	15%	1,481,000
	Subtotal	11,357,000
Fee	5%	568,000
	TOTAL	$11,925,000

TABLE 3-2

NEW LOS PADRES DAM
UPSTREAM MIGRANT COLLECTION FACILITY
CONCEPTUAL ESTIMATE OF COST
SUMMARY

Total Direct & Indirect Costs		$2,096,000
Engineering, C/M	10%	210,000
	Subtotal	2,306,000
Contingency	15%	346,000
	Subtotal	2,652,000
Fee	5%	133,000
	TOTAL	$2,785,000

3.4 Construction Plan and Schedule

In order to take advantage of the economy to be realized from sharing the use of common equipment in this fairly isolated location it is considered advantageous at this stage to include the construction of the fish collection facilities in the scope of work for the proposed new dam construction contract. Each of the two collection facilities could readily be built in one construction season and thus could conveniently be merged with the dam construction schedule which is spread over a 21 month period of time.

3.5 Estimated Annual Operation and Maintenance Costs

The basis for estimating the annual O&M costs are the same as those described in Sections 2.5.1 and 2.5.2 for the facilities that would be associated with the New San Clemente Dam.

The estimated annual O&M costs including 10% contingency allowance for each facility are as follows:

Downstream Migrant Screening Facility	$ 383,000
Upstream Migrant Collection Facility	$ 39,000
Annual Total	$ 422,000

Details are set forth in Appendix A.

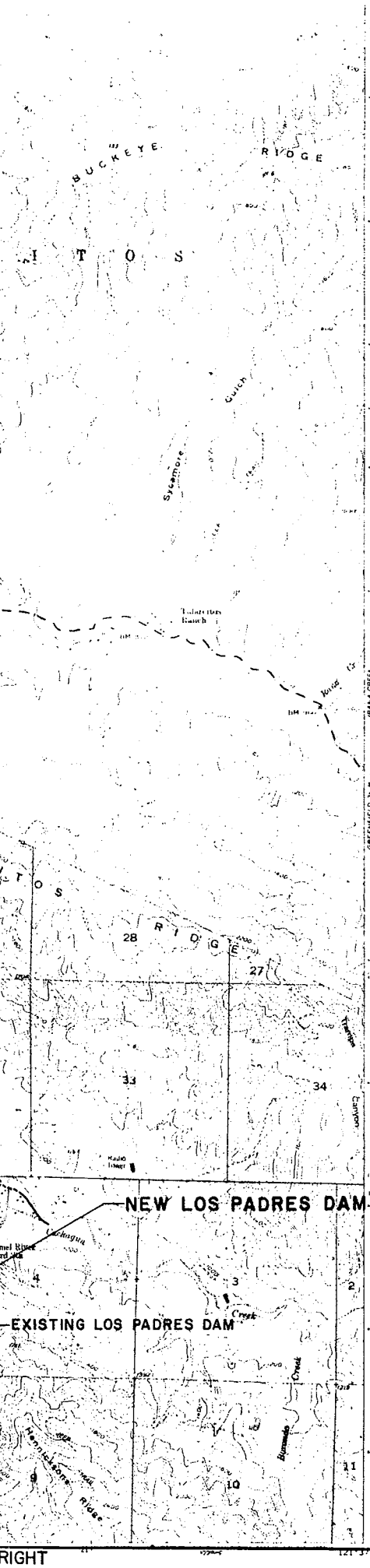
REFERENCES

1. New Los Padres, New San Clemente and San Clemente Creek Projects, Preliminary Designs and Cost Estimates, Bechtel Civil, Inc., June 1989.

2. New San Clemente Project, Preliminary Design and Cost Estimate, Converse Consultants Northern California, November 5, 1986.

3. New San Clemente Site, Downstream Migrant Screening Facility Collection Efficiency, Bechtel Civil, Inc., May 1989.

FIGURES

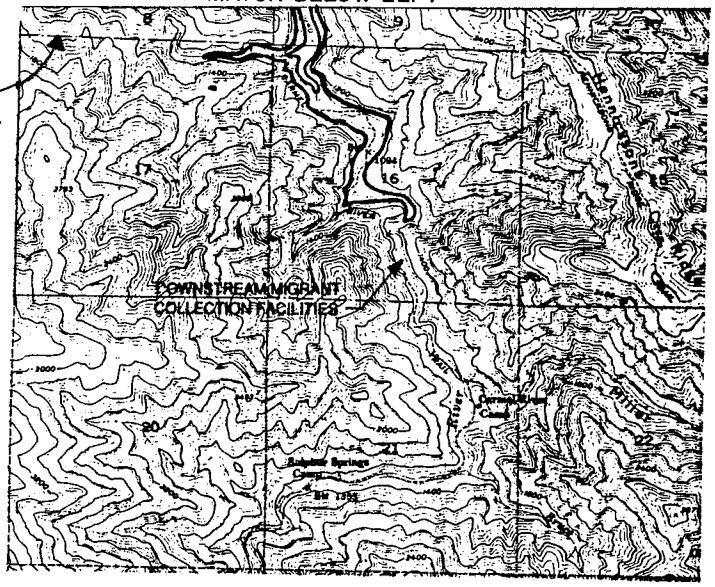


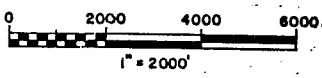
RESERVOIR DATA

DAM	STORAGE CAPACITY ACRE FEET	SPILLWAY CREST ELEVATION FT.
NEW SAN CLEMENTE	17,000	621
	23,000	643
	29,000	662
NEW LOS PADRES	9,000	1050
	18,000	1100
	24,000	1120
SAN CLEMENTE CREEK	9,000	866
	12,500	900

MATCH BELOW LEFT

BOUNDARY
LOS PADRES NATIONAL FOREST
AND VENTANA NATIONAL
WILDERNESS AREA





MONTEREY PENINSULA WATER MANAGEMENT DISTRICT

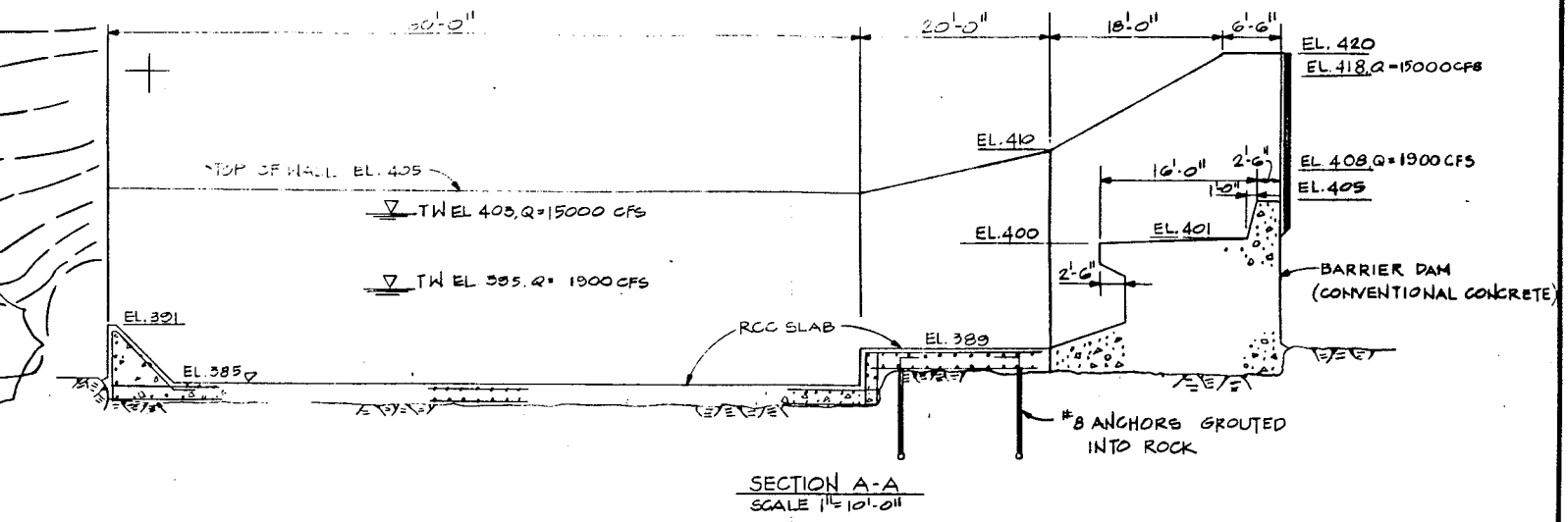
MONTEREY PENINSULA WATER SUPPLY PROJECT

LOCATION MAP FOR NEW SAN CLEMENTE
NEW LOS PADRES AND SAN CLEMENTE CREEK PROJECTS

JANUARY 1991

Bechtel Corporation
San Francisco, California

FIGURE 1-1



SECTION A-A
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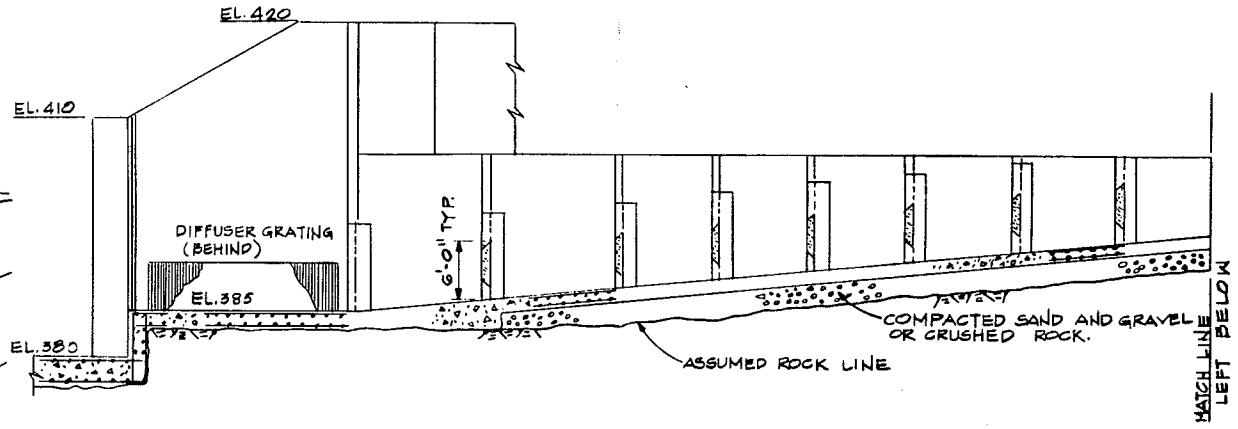
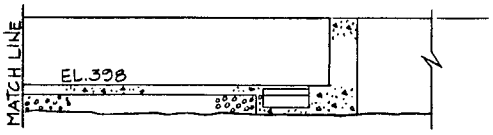
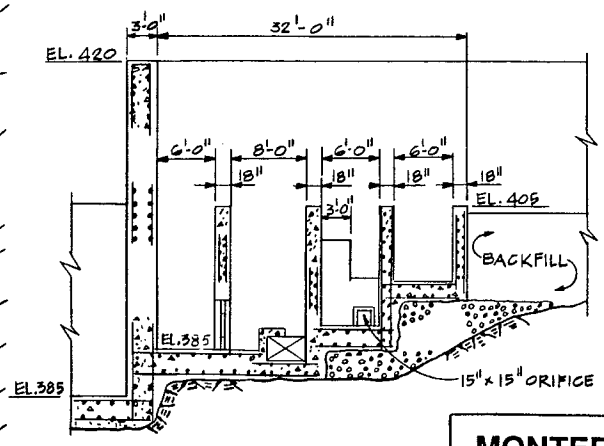




SECTION B-B DEVELOPMENT ON & FISH LADDER
SCALE 1" = 10'-0"

NOTE:
1. ELEVATIONS SHOWN ARE APPROXIMATE.



SECTION C-C
SCALE 1" = 10'-0"

MONTEREY PENINSULA WATER MANAGEMENT DISTRICT

MONTEREY PENINSULA WATER SUPPLY PROJECT

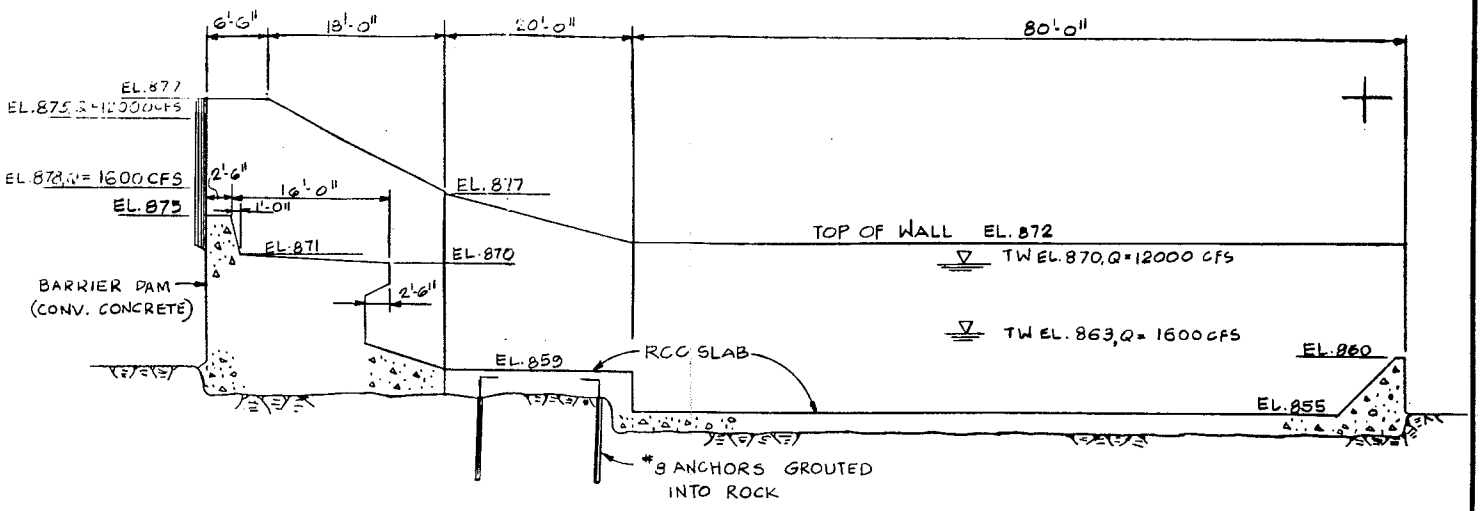
NEW SAN CLEMENTE DAM
UPSTREAM MIGRANT COLLECTION FACILITIES
PLAN AND SECTIONS

JANUARY 1991

Bechtel Corporation
San Francisco, California

FIGURE 2-1

E88800



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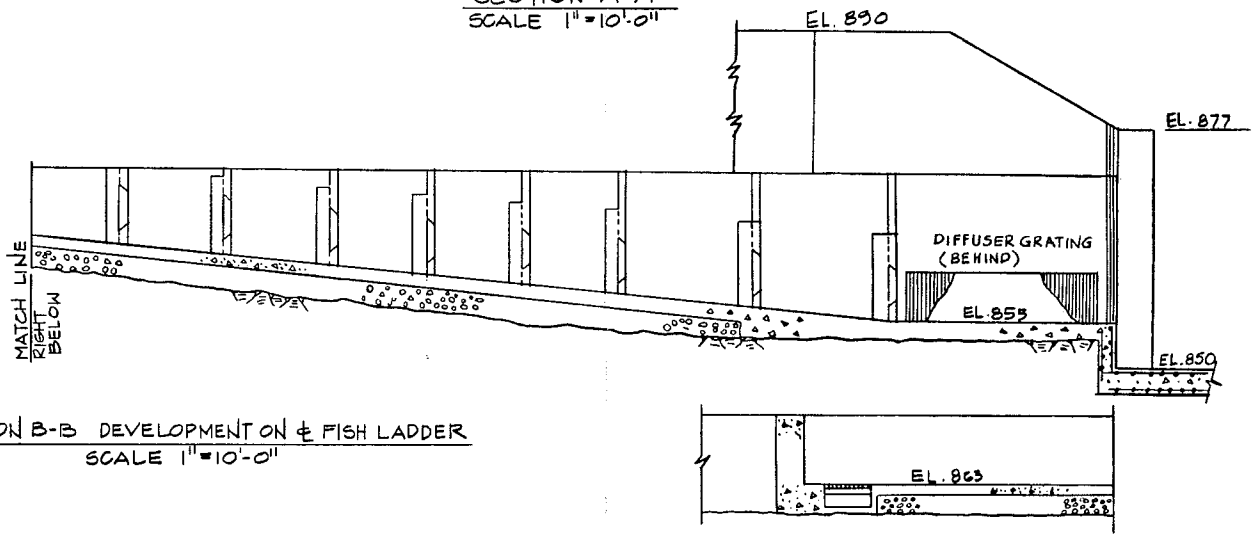
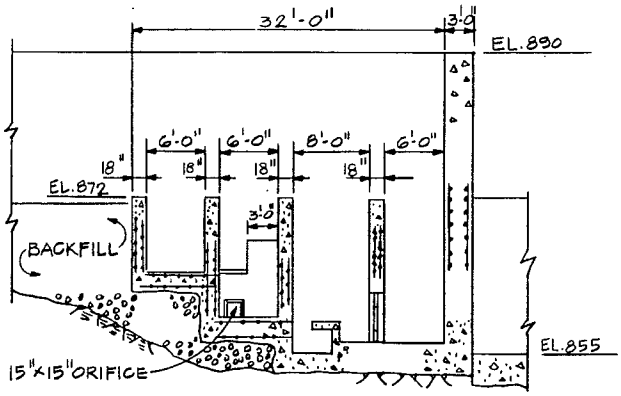


SECTION B-B DEVELOPMENT ON & FISH LADDER
SCALE 1" = 10'-0"



SECTION C-C
SCALE 1" = 10'-0"

NOTE:
1. ELEVATIONS SHOWN ARE APPROXIMATE.

MONTEREY PENINSULA WATER MANAGEMENT DISTRICT

MONTEREY PENINSULA WATER SUPPLY PROJECT

NEW LOS PADRES DAM
UPSTREAM MIGRANT COLLECTION FACILITIES
PLAN AND SECTIONS

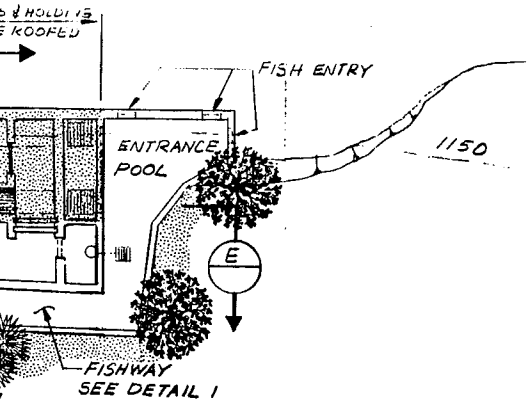
JANUARY 1991

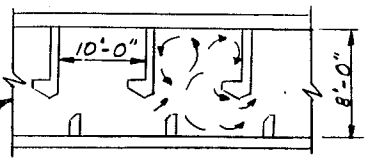
Bechtel Corporation
San Francisco, California

FIGURE 3-1

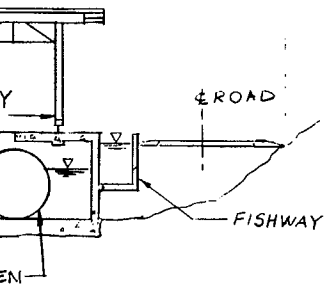
NOTES

1. ELEVATIONS SHOWN ARE APPROXIMATE.
2. ELEVATIONS ARE BASED ON THE RIVERBED GRADE AT THE HEAD OF THE CENTER PIER BETWEEN THE RADIAL GATES (POINT 'A') BEING EL. 1140, WHICH IS ESTIMATED FROM USGS 1:24,000 VENTANA CONES QUAD SHEET.





DETAIL 1 - PLAN
NTS



ON C
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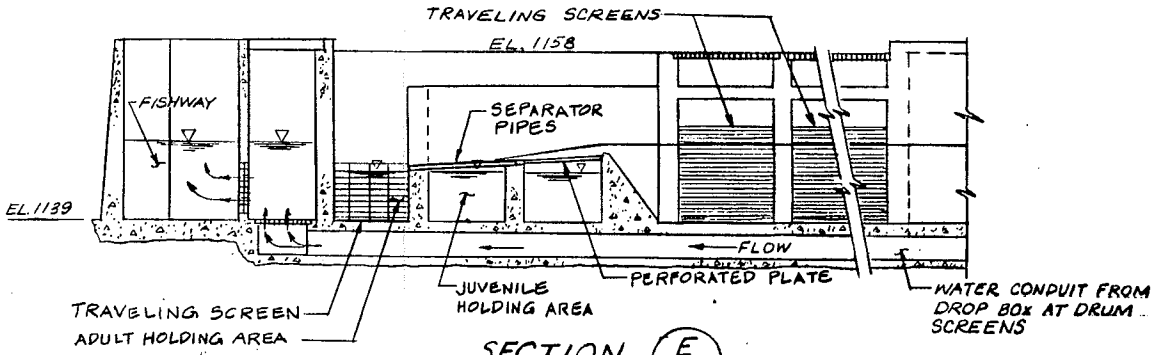

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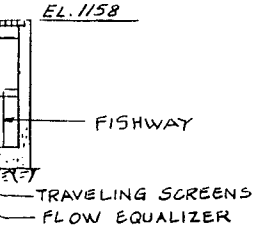

MONTEREY PENINSULA WATER MANAGEMENT DISTRICT

MONTEREY PENINSULA WATER SUPPLY PROJECT

NEW LOS PADRES DAM
DOWNSTREAM MIGRANT SCREENING FACILITIES
PLAN AND SECTIONS

JANUARY 1991

Bechtel Corporation
San Francisco, California

FIGURE 3-2

APPENDIX A

COST ESTIMATES - JUNE 1989

New San Clemente Dam Fish Passage

Downstream Migrants Screening Facility

Upstream Migrants Collection Facility

Annual Operation and Maintenance

New Los Padres Dam Fish Passage

Downstream Migrants Screening Facility

Upstream Migrants Collection Facility

Annual Operation and Maintenance

NEW SAN CLEMENTE DAM
DOWNSTREAM MIGRANT SCREENING FACILITY
CONCEPTUAL ESTIMATE OF COST
SUMMARY

Total Direct and Indirect Costs		$6,212,000
Engineering, C/M	10%	621,000
	Subtotal	6,833,000
Contingency	15%	1,025,000
	Subtotal	7,858,000
Fee	5%	393,000
	TOTAL	$8,251,000

LOCATION : CARMEL VALLEY, CA.
REPORT : COMMODITY SUMMARY BY FACILITY - PROJECT
CLIENT : MONTEREY PENINSULAR WATER MGT. DISTRICT
REMARKS :

NEW SAN CLEMENTE DAM

JOB 19523-000

RUN TIME : 13:51:38
RUN DATE : 07/03/90
RUN NUM :
PAGE NUM : 1

COMMOD	DESCRIPTION	QUANTITY	UNIT	KEY =	TOTAL MANHOURS	U S DOLLARS: DIRECT LABOR COST	REPAIR LABOR COST	CONSTUCT EQUIPMENT	EXPENDABLE COST	MATERIALS	SUB-CONTRACTS	TOTAL DIRECT COST	UNIT-COST
0100	INDIRECTS	1.0	LS		0	0	0	0	0	0	1,038,309	1,038,309	1,038,309
0101	BONDS & INSURANCE	1.0	LS		0	0	0	0	0	0	0	0	0.00
0102	ESCALATION	1.0	LS		0	0	0	0	0	0	0	0	0.00
0104	CONTINGENCY	1.0	LS		0	0	0	0	0	0	1,024,938	1,024,938	1,024,938
0105	FEE	1.0	LS		0	0	0	0	0	0	392,893	392,893	392,893.00
0120	ENGINEERING	1.0	LS		0	0	0	0	0	0	621,175	621,175	621,175.00
0211	CLEARING	5.0	AC		324	11,193	888	1,298	1,699	0	0	15,078	3,015.60
0214	DEWATERING	1.0	LS		487	16,972	4,063	5,364	5,070	0	0	31,469	31,469.00
0222	EXCAVATION	35600.0	CY		3,548	118,417	15,795	20,316	35,847	23,040	0	213,415	5.99
0223	BACKFILL	3400.0	CY		720	26,060	1,810	2,527	2,682	0	0	33,079	9.73
0251	PAVING	4670.0	SY		0	0	0	0	0	0	62,200	62,200	13.32
0261	WATER PIPING SYSTEMS	2.0	EA		184	6,269	69	88	92	2,000	0	8,518	4,259.00
0283	FENCES & GATES	1.0	LOT		60	2,084	42	54	73	16,200	0	18,453	18,453.00
0301	FOUNDATION PREPARATION	20000.0	SF		1,512	46,479	647	270	559	0	0	47,955	2.40
0302	CONCRETE - CONSTRUCTION JOINTS	8000.0	SF		200	6,148	21	15	71	0	0	6,255	0.78
0303	9" WATERSTOPS - PVC	620.0	LF		99	3,228	0	0	0	1,080	0	4,308	6.95
0312	FORMWORK - SHOP FABRICATION	16516.0	SF		2,976	98,814	1,307	1,030	17,103	0	0	118,254	7.16
0314	FORMWORK - SET & STRIP	78726.0	SF		23,142	774,196	24,616	18,133	43,245	0	0	860,190	10.93
0321	REINFORCING STEEL	450000.0	LB		3,465	123,837	1,855	1,366	1,807	126,840	0	255,705	0.57
0331	CONCRETE PLACING	4500.0	CY		3,378	112,946	5,504	7,064	5,459	296,400	0	427,373	94.97
0335	CONCRETE FINISHING	92790.0	SF		1,905	58,998	0	0	0	1,981	0	60,979	0.66
0551	MISC METAL FABRICATIONS	43400.0	SF		886	31,459	839	1,080	992	110,000	0	144,370	3.33
1120	GATES & EQUALIZERS	1.0	LOT		8,160	288,641	3,840	4,946	4,998	1,095,000	0	1,397,425	1,397,425
1130	RACKS & SCREENS	1.0	LOT		2,695	95,161	1,419	1,828	1,920	970,000	0	1,070,328	1,070,328
1131	FISH HANDLING EQUIPMENT	1.0	LOT		400	14,256	303	390	328	69,700	0	84,977	84,977.00
1330	LOG BOOM	1.0	EA		72	2,582	122	156	131	10,000	0	12,991	12,991.00
1351	INSTRUMENTATION	1.0	EA		0	0	0	0	0	0	15,000	15,000	15,000.00
1420	HOISTS	2.0	EA		640	22,840	606	780	656	143,000	0	167,882	83,941.00
1611	RACEWAY	1840.0	LF		710	21,837	78	102	272	4,999	0	27,288	14.83
1612	WIRE & CABLE	13360.0	LF		354	10,864	0	0	0	22,458	0	33,322	2.49
1613	GROUNDING SYSTEM	1.0	LOT		40	1,228	0	0	0	500	0	1,728	1,728.00
1631	EQUIPMENT	1.0	LOT		249	7,642	0	0	0	35,500	0	43,142	43,142.00
1641	LIGHTING	18.0	EA		106	3,253	0	0	0	8,500	0	11,753	652.94
800	DOWNSTREAM MIGRANT SCREENING FACILITIES				56,312	1,905,404	63,824	66,807	123,004	2,937,198	3,154,515	8,250,752	
	TOTAL				56,312	1,905,404	63,824	66,807	123,004	2,937,198	3,154,515	8,250,752	

NEW SAN CLEMENTE DAM
UPSTREAM MIGRANT COLLECTION FACILITY
CONCEPTUAL ESTIMATE OF COST
SUMMARY

Total Direct & Indirect Costs		$2,105,000
Engineering, C/M	10%	211,000
	Subtotal	2,316,000
Contingency	15%	347,000
	Subtotal	2,663,000
Fee	5%	133,000
	TOTAL	$2,796,000

CLIENT : MONTEREY PENINSULAR WATER MGT. DISTRICT

LOCATION: CARMEL VALLEY, CA.
REPORT : TOTAL FACILITY DETAIL
FACILITY: 800 - UPSTREAM MIGRANT FISH COLLECTION FACILITY

NEW SAN CLEMENTE DAM
JOB 19523-000

RUN TIME: 11:06 AM
RUN DATE: 03-May-90

Item	Description	Quantity	Unit	Unit Price	Amount	Totals	Remarks
1.	Clearing & Site Preparation	7	Ac	3,000.00	21,000		"Dense Trees".
2.	Care & Diversion Of Water	1	Job	50,000.00	50,000		
3.	Common Excavation	9,000	CY	10.00	90,000		Alluvial & weathered rock.
4.	Foundation Preparation	3,500	SY	10.00	35,000		For concrete palcement.
5.	Compacted Sand & Gravel or Rockfill	120	CY	25.00	3,000		Where rock may be low under the fish ladder.
6.	Common Backfill	1,500	CY	16.00	24,000		To create yard & tank truck turn around.
7.	Riprap	500	CY	50.00	25,000		On right bank, includes bedding.
8.	24" CMP	200	LF	50.00	10,000		
9.	Chain Link Fence	300	LF	30.00	9,000		Perimeter, includes 1 - 12' gate and 1 - 4' gate, 8' high
10.	Underdrain System	1	Job	25,000.00	25,000		
11.	Barrier Dam & Gravity Wall Concrete	2,700	CY	150.00	405,000		Conventional,3" max aggre-
12.	Stilling Basin Concrete Slab	2,000	CY	150.00	300,000		gate. Form factor 3 SF/CY.
13.	Training Wall Concrete	1,000	CY	310.00	310,000		
14.	Fish Facility Concrete	300	CY	650.00	195,000		Left side & Right side, Form factor 11 SF/CY
15.	Reinforcing Steel	275,000	LB	0.60	165,000		Slabs on grade & walls about 12' high, Form factor 36 SF/ Grade 60.
16.	Waterstops	700	LF	10.00	7,000		6" PVC
17.	Tiedown Anchors	3,000	LF	15.00	45,000		#8 bars x 20' long, grouted into rock under stilling basin
18.	Fish Crowders & Transfer Equipment	1	Job	50,000.00	50,000		
19.	Sluice Gates, Valves, Pumps & Piping	1	Job	45,000.00	45,000		
20.	Electrical work	1	Job	42,000.00	42,000		
21.	Structural Steel	40,000	LB	1.00	40,000		Diffusers, gratings & frames embedded guides, etc.
22.	Miscellaneous Metal Work	1	Job	26,000.00	26,000		Ladders, stairs and handrail.
23.	Architectural Painting	1	Job	20,000.00	20,000		
24.	Seeding & Mulching	1	Job	13,000.00	13,000		
25.	Access Road	0.5	Mi.	300,000.00	150,000		
TOTAL ESTIMATED CONSTRUCTION COST					2,105,000		

NEW SAN CLEMENTE DAM

FISH COLLECTION FACILITIES

CONCEPTUAL ESTIMATE

ANNUAL O&M COSTS

A. DOWNSTREAM MIGRANT SCREENING FACILITY

		Est. Annual Cost$
1.	Facility attendants:	
	Peak migration period Mar. 1 - Dec. 31, 7 days/week	
	1 attendant 24 hrs x 306 days = 7344 hrs	
	Off-season Jan. 1 - Feb. 28, 5 days/week,	
	Annual maintenance, 2 attendants 8 hrs x 42 days = 672 hrs	
	Off-season Jan. 1 - Feb. 28, once per week inspection	
	1 attendant, 8 hrs x 8 weeks = 64 hrs	
	Total time 8080 hours at $40.00/hr	323,200
2.	Tank truck, 500 galls.	
	Truck ownership, 350 days @ $48/day	16,800
	Truck travel 17,000 F.O.L&M @ $0.28/mi	4,800
3.	Consumables	
	Electric power 39,000 kWh	3,600
	Lubricants, paint, wire mesh etc.	500
4.	Forebay cleanout	
	Allowance	5,000
	Subtotal	$353,900
	Contingency 10%	35,400
		389,300
	Say	$390,000

Plus: District's Administrative Cost
Taxes
Insurance

B. UPSTREAM MIGRANT COLLECTION FACILITY

		Est. Annual Cost$
1.	Facility attendants:	
	Migration period Dec. 1 - Feb. 28, 7 days/week	
	1 attendant 8 hrs x 90 days = 720 hrs	
	Annual maintenance, 2 attendants for 5 days at 8hr/day = 80 hrs	
	Total time 800 hrs at $40.00/hr.	32,000
2.	Tank truck, 500 galls.	
	Truck ownership, 90 days, @ $48 per day	4,400
	Truck travel 1,000 F.O.L&M @ $0.28/mi.	300
3.	Consumables	
	Electric power 2,000 kWh	200
	Lubricants, paint, etc.	200
	Subtotal	$37,100
	Contingency 10%	3,700
		40,800
	Say	$41,000

Plus: District's Administrative Cost
Taxes
Insurance

NEW LOS PADRES DAM
DOWNSTREAM MIGRANT COLLECTION FACILITY
CONCEPTUAL ESTIMATE OF COST
SUMMARY

Total Direct and Indirect Costs		$8,978,000
Engineering, C/M	10%	898,000
	Subtotal	9,876,000
Contingency	15%	1,481,000
	Subtotal	11,357,000
Fee	5%	568,000
	TOTAL	$11,925,000

LOCATION : CARMEL VALLEY, CA.
REPORT : COMMODITY SUMMARY BY FACILITY - PROJECT
CLIENT : MONTEREY PENINSULAR WATER MGT. DISTRICT
REMARKS :

NEW LOS PADRES DAM

JOB 20126-000

RUN TIME : 13:43:42
RUN DATE : 07/03/90
RUN NUM :
PAGE NUM : 1

COMMOD	D E S C R I P T I O N	QUANTITY	UNIT	KEY =	TOTAL MANHOURS	DIRECT LABOR COST	REPAIR LABOR COST	CONSTUCT EQUIPMENT	EXPENDABLE COST	MATERIALS	SUB-CONTRACTS	TOTAL DIRECT COST	UNIT-COST
						<---------- U S DOLLARS ---------->							
0100	INDIRECTS	1.0	LS		0	0	0	0	0	0	1,500,709	1,500,709	1,500,709
0101	BONDS & INSURANCE	1.0	LS		0	0	0	0	0	0	0	0	0.00
0102	ESCALATION	1.0	LS		0	0	0	0	0	0	0	0	0.00
0104	CONTINGENCY	1.0	LS		0	0	0	0	0	0	1,481,384	1,481,384	1,481,384
0105	FEE	1.0	LS		0	0	0	0	0	0	567,864	567,864	567,864.00
0120	ENGINEERING	1.0	LS		0	0	0	0	0	0	897,809	897,809	897,809.00
0211	CLEARING	2.0	AC		130	4,488	363	531	702	0	0	6,084	3,042.00
0212	CLEARING - FISH HAUL ROAD	39.0	AC		1,365	47,144	3,717	5,433	7,075	0	0	63,369	1,624.85
0214	DEWATERING	1.0	LS		487	16,972	4,063	5,364	5,070	0	0	31,469	31,469.00
0222	EXCAVATION	25000.0	CY		2,492	83,177	11,102	14,274	25,190	16,200	0	149,943	6.00
0223	BACKFILL	3400.0	CY		720	26,060	1,810	2,527	2,682	0	0	33,079	9.73
0228	EXCAVATION, FISH HAUL ROAD	213000.0	CY		20,000	732,594	97,751	124,695	241,364	324,000	0	1,520,404	7.14
0229	FINISH GRADE - FISH HAUL ROAD	46000.0	SY		3,000	105,804	18,336	18,282	21,984	0	0	164,406	3.57
0251	PAVING	500.0	SY		0	0	0	0	0	0	6,680	6,680	13.36
0261	WATER PIPING SYSTEMS	2.0	EA		184	6,269	69	88	92	2,000	0	8,518	4,259.00
0271	DRAIN CULVERT, FISH HAUL ROAD	280.0	LF		425	14,253	758	446	804	6,580	0	22,841	81.58
0281	GUARD RAILS & SIGNS	1600.0	LF		649	21,700	84	9,714	218	18,216	0	49,932	31.21
0283	FENCES & GATES	1.0	LOT		60	2,084	42	54	73	16,200	0	18,453	18,453.00
0301	FOUNDATION PREPARATION	16000.0	SF		1,210	37,195	518	216	447	0	0	38,376	2.40
0302	CONCRETE - CONSTRUCTION JOINTS	7500.0	SF		200	6,148	20	14	68	0	0	6,250	0.83
0303	9" WATERSTOPS - PVC	560.0	LF		90	2,935	0	0	0	975	0	3,910	6.98
0312	FORMWORK - SHOP FABRICATION	15000.0	SF		2,703	89,750	1,188	936	15,535	0	0	107,409	7.16
0314	FORMWORK - SET & STRIP	70650.0	SF		20,765	694,674	22,098	16,278	38,833	0	0	771,883	10.93
0321	REINFORCING STEEL	404000.0	LB		3,108	111,078	1,664	1,225	1,621	113,680	0	229,268	0.57
0331	CONCRETE PLACING	4040.0	CY		2,953	98,091	4,950	6,353	4,909	266,100	0	380,403	94.16
0335	CONCRETE FINISHING	83300.0	SF		1,710	52,959	0	0	0	1,794	0	54,753	0.66
0551	MISC METAL FABRICATIONS	39000.0	SF		800	28,409	759	977	896	100,000	0	131,041	3.36
1120	GATES & EQUALIZERS	1.0	LOT		8,160	288,641	3,840	4,946	4,998	1,086,750	0	1,389,175	1,389,175
1130	RACKS & SCREENS	1.0	LOT		2,695	95,161	1,419	1,828	1,920	970,000	0	1,070,328	1,070,328
1131	FISH HANDLING EQUIPMENT	1.0	LOT		400	14,256	303	390	328	69,700	0	84,977	84,977.00
1330	LOG BOOM	1.0	EA		72	2,582	122	156	131	10,000	0	12,991	12,991.00
1351	INSTRUMENTATION	1.0	EA		0	0	0	0	0	0	15,000	15,000	15,000.00
1420	HOISTS	2.0	EA		640	22,840	606	780	656	143,000	0	167,882	83,941.00
1611	RACEWAY	1610.0	LF		652	20,068	98	128	340	4,780	0	25,414	15.79
1612	WIRE & CABLE	11800.0	LF		310	9,514	0	0	0	18,162	0	27,676	2.35
1613	GROUNDING SYSTEM	1.0	LOT		40	1,228	0	0	0	500	0	1,728	1,728.00
1631	EQUIPMENT	1.0	LOT		249	7,642	0	0	0	35,500	0	43,142	43,142.00
1641	LIGHTING	18.0	EA		106	3,253	0	0	0	8,500	0	11,753	652.94
1672	OVERHEAD POWER LINE	7.0	MI		17,731	544,164	0	92,660	0	192,015	0	828,839	118,405.57
800	DOWNSTREAM MIGRANT SCREENING FACILITIES				94,106	3,191,133	175,680	308,295	375,936	3,404,652	4,469,446	11,925,142	
	TOTAL				94,106	3,191,133	175,680	308,295	375,936	3,404,652	4,469,446	11,925,142	

NEW LOS PADRES DAM
UPSTREAM MIGRANT COLLECTION FACILITY
CONCEPTUAL ESTIMATE OF COST
SUMMARY

Total Direct & Indirect Costs		$2,096,000
Engineering, C/M	10%	210,000
	Subtotal	2,306,000
Contingency	15%	346,000
	Subtotal	2,652,000
Fee	5%	133,000
	TOTAL	$2,785,000

LOCATION: CARMEL VALLEY, CA.
REPORT : TOTAL FACILITY DETAIL
FACILITY: 800 - UPSTREAM MIGRANT FISH COLLECTION FACILITY

NEW LOS PADRES DAM
JOB 20126-000

RUN TIME: 11:00 AM
RUN DATE: 03-May-90

Item	Description	Quantity	Unit	Unit Price	Amount	Totals	Remarks
1.	Clearing & Site Preparation	4	Ac	3,000.00	12,000		Dscribed on topo map as "Dense Trees".
2.	Care & Diversion Of Water	1	Job	50,000.00	50,000		
3.	Common Excavation	9,000	CY	10.00	90,000		Alluvial & weathered rock.
4.	Foundation Preparation	3,500	SY	10.00	35,000		For concrete palcement.
5.	Compacted Sand & Gravel or Rockfill	120	CY	25.00	3,000		Where rock may be low under the fish ladder.
6.	Common Backfill	1,500	CY	16.00	24,000		To create yard 7 tank truck turn around.
7.	Riprap	500	CY	50.00	25,000		On left bank, includes bedding.
8.	24" CMP	200	LF	50.00	10,000		
9.	Chain Link Fence	300	LF	30.00	9,000		Perimeter, includes 1 - 12' gate and 1 - 4' gate, 8' high
10.	Underdrain System	1	Job	25,000.00	25,000		
11.	Barrier Dam & Gravity Wall Concrete	2,700	CY	150.00	405,000		Conventional,3" max aggregate. Form factor 3 SF/CY.
12.	Stilling Basin Concrete Slab	2,000	CY	150.00	300,000		RCC optional.
13.	Training Wall Concrete	1,000	CY	310.00	310,000		Left side & Right side, Form factor 11 SF/CY
14.	Fish Facility Concrete	300	CY	650.00	195,000		Slabs on grade & walls about 12' high, Form factor 36 SF/
15.	Reinforcing Steel	275,000	LB	0.60	165,000		Grade 60.
16.	Waterstops	700	LF	10.00	7,000		6" PVC
17.	Tiedown Anchors	3,000	LF	15.00	45,000		#8 bars x 20' long, grouted into rock under stilling basin
18.	Fish Crowders & Transfer Equipment	1	Job	50,000.00	50,000		
19.	Sluice Gates, Valves, Pumps & Piping	1	Job	45,000.00	45,000		
20.	Electrical work	1	Job	42,000.00	42,000		
21.	Structural Steel	40,000	LB	1.00	40,000		Diffusers, gratings & frames embedded guides, etc.
22.	Miscellaneous Metal Work	1	Job	26,000.00	26,000		Ladders, stairs and handrail.
23.	Architectural Painting	1	Job	20,000.00	20,000		
24.	Seeding & Mulching	1	Job	13,000.00	13,000		
25.	Access Road	0.5	Mi.	300,000.00	150,000		
TOTAL ESTIMATED CONSTRUCTION COST					2,096,000		

NEW LOS PADRES DAM

FISH COLLECTION FACILITIES

CONCEPTUAL ESTIMATE

ANNUAL O&M COSTS

A. DOWNSTREAM MIGRANT SCREENING FACILITY

		Est. Annual Cost$
1.	Facility attendants: Same requirements as for New San Clemente Site - fully attended during peak migration period, partly attended or inspected remainder of year	$323,200
2.	Tank truck, 500 galls. Truck ownership, 90 days @ $24/day* Truck ownership, 260 days @ $48/day Truck travel 1,500 F.O.L&M @ $0.28/mi	2,200 12,500 400
3.	Consumables Electric power Lubricants, paint, wire mesh etc.	3,500 500
4.	Forebay cleanout Allowance	5,000
	Subtotal	$347,300
	Contingency 10%	35,000
		382,300
	Say	$383,000

Plus: District's Administrative Cost
Taxes
Insurance

* Ownership shared 50% with upstream collection facility while it operates Dec. 1 through Feb. 28.

(6370W)

NEW LOS PADRES DAM

FISH COLLECTION FACILITIES

CONCEPTUAL ESTIMATE

ANNUAL O&M COSTS

B. UPSTREAM MIGRANT COLLECTION FACILITY

		Est. Annual Cost$
1.	Facility attendants:	
	Similiar to New San Clemente	32,000
2.	Tank truck, 500 galls.	
	Truck ownership, 90 days, @ $24 per day*	2,200
	Truck travel 1,500 F.O.L&M @ $0.28/mi	500
3.	Consumables	
	Electric power 2000 kwh	200
	Lubricants, paint, etc.	200
	Subtotal	$35,100
	Contingency 10%	3,500
		38,600
	Say	$39,000

Plus: District's Administrative Cost
Taxes
Insurance

* Ownership shared 50% with downstream collection facility.