W.O. 0070

Cachuma Lake Surge Analysis
Preliminary Report

December 2000

Prepared for:

County of Santa Barbara
County Parks

FLOWERS & ASSOCIATES, INC.
CIVIL ENGINEERS

CSB #7

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W.O.0070

Ms. Coleen Lund, P.E.
County of Santa Barbara
Parks Department
610 Mission Canyon Road
Santa Barbara, CA 93105

Subject: Cachuma Lake Surcharge Analysis

Background

The Bureau of Reclamation is in the process of evaluating the impacts to raising Cachuma Lake water levels to capture and retain additional water. The surcharge will impact various existing improvements around the lake and in particular facilities and improvements at Cachuma Park. The Bureau of Reclamation is proposing three target still lake water levels. These levels are 1.8', 3.0' and 5.0' above the existing full lake level of 750.0'. The 1.8' surcharge is a near term intermediate lake level to obtain additional water storage. The ultimate target lake level of 3.0' above existing will require modifications to the existing dam gates to achieve. In addition to this, there is a storm surge allowance of two feet above the ultimate lake level that results in the 5.0' surcharge.

The proposed base lake water surface elevations are:

Table 1 – Proposed changes in Lake Elevation

Change in Stillwater Surface	Lake Surface Elevation	Description
None	750.0	Existing high lake still water surface elevation
1.8'	751.8	Proposed first raise of still water level
3.0'	753.0	Proposed ultimate raise of still water level
5.0'	755.0	Ultimate still water level with storm surcharge

Using this information as the basis for the evaluation, we were requested to evaluate the impacts to the existing park facilities. These facilities include a water treatment plant, several sewer lift stations, water distribution system, sewage collection system, roads, bridges, paths, parking lots, picnic and camping sites, boat ramps, boat docks and other facilities associated with the park.

Our charge was to identify what park facilities will be impacted by the change in the lake's water surface elevation and propose solutions to mitigate those impacts. Based on the surcharge evaluation and identification of proposed mitigation projects, an opinion of construction cost to implement the proposed mitigation projects was formulated to quantify the impact to the park.

Approach

Only four weeks was available to perform the evaluation of surcharge impacts and prepare an opinion of construction cost to mitigate the identified impacts. The approach was streamlined to accommodate the limited time-frame. This was accomplished by developing assumptions that would allow a generalized approach to the evaluation and performing conceptual level design of proposed mitigation improvements.

The evaluation was performed using available topographic mapping based on aerial photographs taken on March 11, 1993. Topographic mapping was prepared at 1" = 40' scale with 1 foot contour lines. Record information made available to us by the County illustrating water and sewer substructure location was plotted on the topographic mapping.

Next we met with Mitch Medeiros, Park Operations Supervisor and Joe Pueringer, Water and Wastewater Treatment Plant Superintendent. We identified critical and non-critical facilities, and performed a site review of the potentially impacted facilities. Corrections to the record information were made based on their recollection of the actual location of existing facilities. We field reviewed each identified facility or improvement that would be impacted by the change in lake level and possible mitigation methods and potential relocation sites for facilities requiring relocation.

This information was used to generate the concept level layouts of proposed mitigation projects. The proposed mitigation projects were reviewed and confirmed with Coleen Lund, P.E., County Parks' Senior Engineer. The layouts developed are intended to replace in-kind, or modify existing facilities to allow for the proposed lake surcharge. In several cases affected facilities will require upgrading when work is performed, to conform to current regulations. These layouts were the basis for preparing our engineer's opinion of construction cost for the proposed mitigation projects. This report summarizes the criteria developed and assumptions used for developing the proposed mitigation projects.

Maximum Water Inundation

The proposed raise in the lake stillwater surface does not account for the environmental reality of waves being present and the erosive impact they can have. Moffatt and Nichol Engineers recently prepared a design for proposed marina improvements at the lake that required development of a design storm for the proposed improvements. The design storm criteria was used in conjunction with the Army Corps of Engineers' *Shore Protection Manual* to estimate the potential water surface and wave run up due to storm and waves. The result of the analysis follows:

Estimate of wave set up	0.5'
Estimate of storm surge	0.1'
Estimate of wave run up	2.3'
Total	2.9'

For the purposes of this evaluation a value of 3.0' was used as the estimated maximum extent of water inundation above the stillwater surface elevation. Due to the limited time-frame and preliminary nature of this evaluation the 3.0' value was assumed to apply equally at all locations on the lake.

The surge, set up and run up due to storm conditions is added onto the stillwater surface elevations to determine the estimated inundation level for the various anticipated lake levels. Table 2 illustrates how the critical elevations were established using proposed stillwater elevations listed in Table 1, as determined by the Bureau of Reclamation, and adding to it the estimated impact of storm conditions summarized above.

Table 2 – Estimate of Maximum Inundation

Change in Stillwater Surface	Set up, surge and run up	Lake Surface Elevation	Description
None	N/A	750.0	Existing high still lake water surface elevation
1.8'	3.0'	750.0+1.8+3.0 = 754.8	Inundation level for first rise in lake level
3.0'	3.0'	750.0+3.0+3.0 = 756.0	Inundation level for ultimate rise in lake level
5.0'	3.0'	750.0+5.0+3.0 = 758.0	Inundation level for flood condition rise in lake level

These inundation elevations were used to evaluate the impact to existing facilities due to the proposed change in Cachuma Lake water surface elevation and determine how the identified impacts would be mitigated.

Assumptions

A number of assumptions were made to perform the analysis. These assumptions were developed based on experience with similar projects, anticipated requirements for a park setting and requirements for critical facilities. These assumptions follow:

A. Inundation Elevations

1. **Elevation 756.0** was used as the design elevation for proposed mitigation measures to existing non-critical facilities such as parking lots, trails, service buildings, camp and picnic sites, etc.

2. **Elevation 758.0** was used as the design elevation for proposed mitigation measures to existing critical facilities such as water treatment plant, sewage lift stations and manholes, etc.

B. Launch Ramp / Marina Area (non-critical facility)

1. The top of the existing launch ramp is at elevation 750.0, the existing lake maximum stillwater level. The proposed mitigation will raise the ramp to elevation 753.0, the proposed maximum stillwater level. To replace in-kind will require that the ramp extend to the depth of the existing ramp.

2. The existing launch ramp has experienced erosion at the back of the paved area. Higher lake levels will exacerbate this condition. A wall at the back of bank is proposed for erosion control and to protect existing oak trees.

3. Lakeside Business (Snack Shack and Bait Shop) need to remain in the same vicinity to be viable. Buildings are mobile, but will require service connections modifications.

4. Marina access needs to be maintained and marina steps raised to accommodate the proposed lake level.

5. Coffer dams will be required so that construction can be scheduled independent of lake level.

C. Water Treatment Plant / Water Intake Facility (critical facility)

1. The water treatment plant needs to be relocated. Based on discussions with Park Staff and consideration of current regulations a site next to the existing Sewage Lift Station No. 1 was selected. It is also desirable to move the facility out of the lake view shed, which is a typical permitting requirement.

2. It is anticipated that filter backwash will not be allowed to be discharged to the lake. Currently a site has not been identified for this process. We have included a cost for this portion of the facility assuming a nearby site is available and typical site improvements are all that is required.

3. The intake facility will need to be raised and a booster pump station added to pump water to the proposed water treatment plant site. As much of the existing facility will be reused as possible.

4. The proposed water treatment plant is located a minimum of 25' away and several feet above existing Sewage Lift Station No. 1.

D. Sewage Lift Stations (critical facility)

1. These facilities are to be relocated to have a setback of 50' (horizontally) from the location of the 758.0' contour as the lake is a potable water source

2. Due to the proximity to a potable water source, we recommend that this facility have a dedicated standby generator and sewage storage capacity for one to two hours of peak flow.

3. Pump facility is relatively low flow and is proposed to have two 100% capacity pumps in the lift station and one uninstalled backup pump.

4. This work is proposed for sewage lift stations Nos. 2 and 3.

E. Roads, Parking Lots and Trails (non-critical facility)

1. Locations that are currently experiencing erosion due to wind waves are proposed to be rip rapped to protect them as raising the lake water level will exacerbate the condition.

2. Proposed facilities are relocated based on observed site constraints and the recommendations of Park Staff.

3. Soft solutions (grading alternatives) are preferred to solutions requiring walls and retaining structures.

4. Roads and parking lots will be modified to result in a smooth transition between the existing portion to remain and the portion being modified as a result of the higher lake water levels.

F. Camp and Picnic Sites (non-critical facility)

1. Typically camp sites and picnic site relocation was evaluated by Park Staff. No costs have been included for relocating and replacing camping and picnic sites in this evaluation.

2. The handicapped accessible picnic / fishing site at Harvey's Cove, was evaluated with this report because the facilities are unique and can not be readily relocated. Proposed improvements need to conform to ADA requirements.

G. Miscellaneous

1. Replacement of oaks lost to the change in lake water surface elevation was not included in this evaluation. Current policy in the County is for replacement of oaks at a rate of 10 to 1 and with a minimum two years maintenance.

2. Proposed landscaping is limited to hydroseeding and facilities that will have landscaping removed.

Evaluation of Existing facilities

A list of impacted facilities was developed based on the estimated inundation elevations and site review of the affected areas. Site layouts were prepared for each proposed mitigation except for the water treatment plant backwash water / sludge facility which was unable to be sited due to time constraints associated with this phase of the project. Along with the site layouts, opinions of construction cost were developed for each facility. The location of each impacted facility is shown on the Key Map, Figure 1, by the number designation listed below.

1. Water Intake Facility
2. Water Treatment Plant
3. Sewer Lift Station No. 2
4. Sewer Lift Station No. 3
5. Marina / Launch Ramp
6. Marina Overflow Parking
7. Mohawk Road
8. Harvey's Cove Picnic Area
9. Barona Shores Trail
10. Tepee Island Access
11. Sweet Water Trail
12. Boat Works Shop
13. UCSB Crew / Overflow Area

For each impacted facility we have compiled a photograph of the existing facility (where available), a sketch illustrating the proposed improvements, a description of the proposed improvements, and a breakdown of the opinion of construction cost. This information is included in the Appendix.

Item	Description	Cost
1	Water Intake Facility	$998,000
2	Water Treatment Plant	$3,780,000
3	Sewer Lift Station No. 2	$490,000
4	Sewer Lift Station No. 3	$444,550
5	Marina / Launch Ramp	$3,049,315
6	Marina Overflow Parking	$190,490
7	Mohawk Road	$206,200
8	Harvey's Cove Picnic Area	$311,500
9	Barona Shores Trail	$116,700
10	Tepee Island Access	$268,200
11	Sweet Water Trail	$378,000
12	Boat Works Shop	$135,150
13	UCSB Crew / Overflow Area	$70,485
	TOTAL	$10,438,590

The opinion of cost included with this analysis is limited to estimated construction cost for each identified impacted facility, and assumes typical construction techniques are used, typical materials are used, and adequate time is available to perform the construction frame. **No provision has been made for items such as engineering design and construction services,**

EIR reports, permitting, work and requirements resulting from discretionary review bodies, environmental mitigations, cultural resource monitoring and protection, endangered and threatened specie protection, work sequencing for park operations or other sequencing requirements, construction of temporary facilities, and the like.

Sincerely,
FLOWERS & ASSOCIATES, INC.

By: _____

Eric L. Flavell, P.E.
Vice President
RCE 33,000

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APPENDIX

1. Water Intake Facility
   - Photographs
   - Sketch of Proposed Improvements
   - Description of Proposed improvements
   - Opinion of Construction Cost

2. Water Treatment Plant
   - Photographs
   - Sketch of Proposed Improvements
   - Description of Proposed improvements
   - Opinion of Construction Cost

3. Sewer Lift Station No. 2
   - Photographs
   - Sketch of Proposed Improvements
   - Description of Proposed improvements
   - Opinion of Construction Cost

4. Sewer Lift Station No. 3
   - Photographs
   - Sketch of Proposed Improvements
   - Description of Proposed improvements
   - Opinion of Construction Cost

5. Marina / Launch Ramp
   - Photographs
   - Sketch of Proposed Improvements
   - Description of Proposed improvements
   - Opinion of Construction Cost

6. Marina Overflow Parking
   - Photographs
   - Sketch of Proposed Improvements
   - Description of Proposed improvements
   - Opinion of Construction Cost

7. Mohawk Road
   - Photographs
   - Sketch of Proposed Improvements
   - Description of Proposed improvements
   - Opinion of Construction Cost

8. Harvey's Cove Picnic Area
   - Photographs
   - Sketch of Proposed Improvements
   - Description of Proposed improvements
   - Opinion of Construction Cost

9. Barona Shores Trail
   - Sketch of Proposed Improvements
   - Description of Proposed improvements
   - Opinion of Construction Cost

10. Tepee Island Access
   - Photographs
   - Sketch of Proposed Improvements
   - Description of Proposed improvements
   - Opinion of Construction Cost

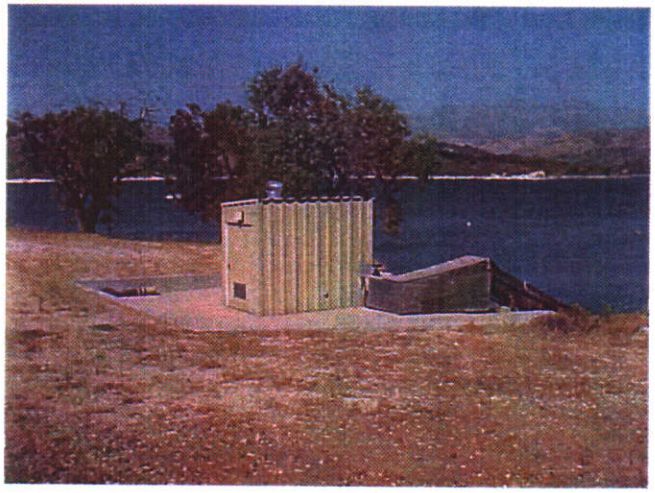
11. Sweet Water Trail
   - Sketch of Proposed Improvements
   - Description of Proposed improvements
   - Opinion of Construction Cost

12. Boat Works Shop
   - Photographs
   - Sketch of Proposed Improvements
   - Description of Proposed improvements
   - Opinion of Construction Cost

13. UCSB Crew / Overflow Area
   - Photographs
   - Sketch of Proposed Improvements
   - Description of Proposed improvements
   - Opinion of Construction Cost

1. Water Intake Facility

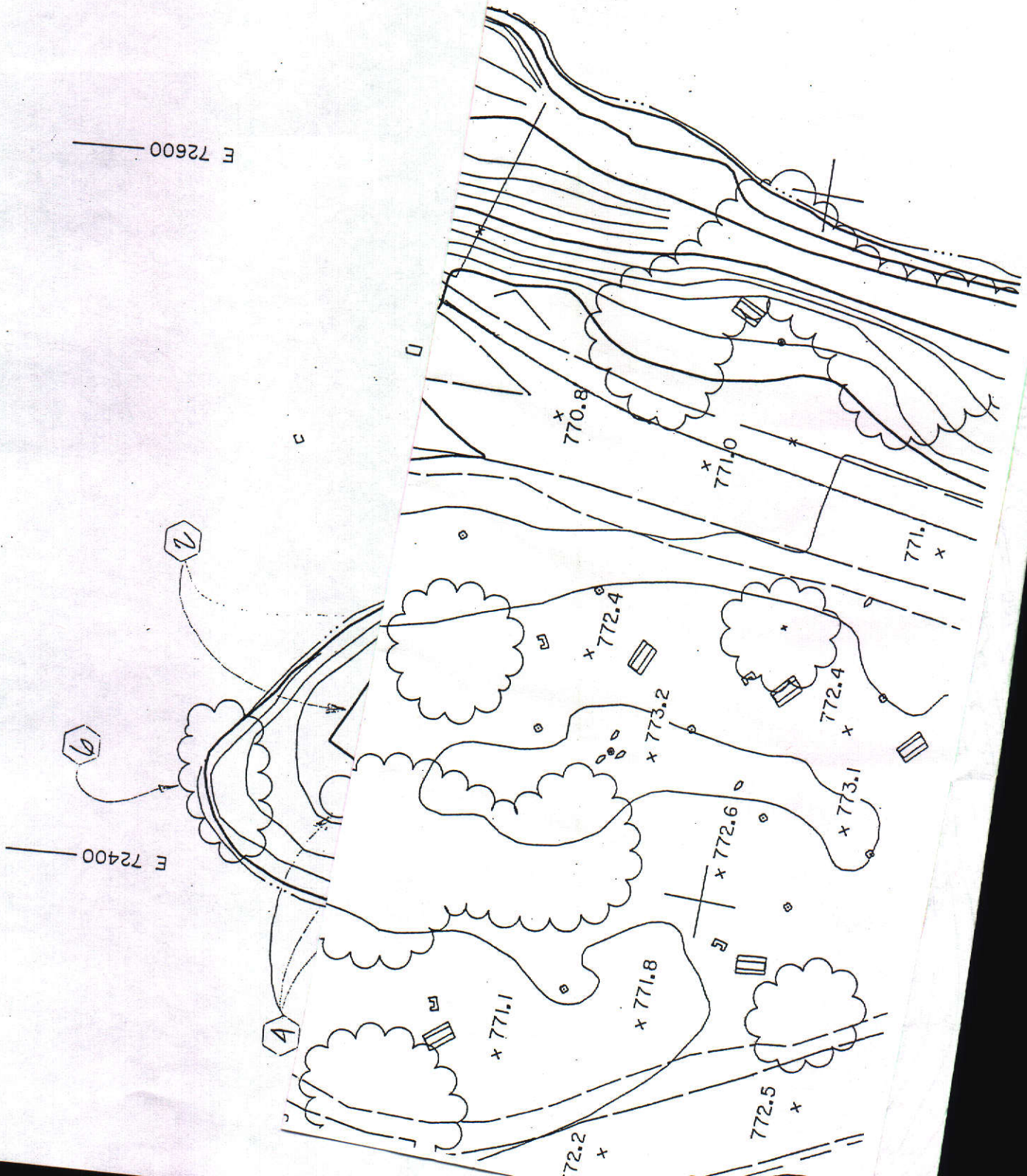
Water Intake Facility looking South



Water Intake Facility looking North

Water Intake Pipeline

PROPOSED MODIFICA
TO WATER INTAKE FA



Description of Proposed Work for Intake Structure

1 DEMOLISH AND REMOVE PIPING TO WATER TREATMENT PLANT. BACKFILL AND COMPACT VOIDS LEFT BY EXISTING STRUCTURES AND HYDROSEED WITH NATIVE SEED MIX.

2 DEMOLISH AND REMOVE EXISTING WATER TREATMENT BUILDINGS, PIPING, EQUIPMENT AND APPURTENANCES. BACKFILL AND COMPACT ANY VOID LEFT BY EXISTING STRUCTURES, CONTOUR GRADE, AND HYDROSEED WITH NATIVE SEED MIX.

3 REMOVE EXISTING CHLORINE CONTAINMENT STRUCTURE. DEMOLISH CONCRETE PAD AND PIPING. BACKFILL AND COMPACT VOIDS LEFT BY EXISTING STRUCTURE AND HYDROSEED WITH NATIVE SEED MIX.

4 DEMOLISH AND REMOVE EXISTING WATER TANKS, PIPING, CONCRETE IMPROVEMENT AND APPURTENANCES. BACKFILL AND COMPACT ANY VOID LEFT BY EXISTING STRUCTURES AND HYDROSEED WITH NATIVE SEED MIX.

5 ABANDON EXISTING BURIED PIPING IN-PLACE. CONSTRUCT CONCRETE CAP AT EXPOSED END PLACING CONCRETE 5' INTO PIPE. ROD CONCRETE TO REMOVE VOIDS. BACKFILL AND COMPACT ACCESS HOLE, HYDROSEED WITH NATIVE SEED MIX.

6 REMOVE EXISTING TREES BELOW 756.0 ELEVATION. REPLACE ANY REMOVED OAK TREES AT A 10:1 RATIO. REPLANT IN THE PARK AS DETERMINED BY THE COUNTY PARKS DEPARTMENT.

7 CONSTRUCT CMU WALL TO 758.5 ELEVATION.

8 ADJUST INTAKE STRUCTURE TO NEW ELEVATION.

9 CONSTRUCT PUMP STATION AND CONCRETE PAD TO 758.0 ELEVATION.

10 CONSTRUCT AC DRIVEWAY AND PARKING AREA FOR PUMP STATION.

11 CONSTRUCT TRANSMISSION LINE FROM PUMP STATION TO WATER TREATMENT PLANT.

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WATER INTAKE FACILITY

Engineer's Opinion of Estimated Construction Costs

Item No.	Description	Quantity	Unit	Unit Price	Item Cost
1	Project Safety/Shoring	...	LS	...	$2,500
2	Traffic Control	...	LS	...	$500
3	Demolition/Site Prep	...	LS	...	$5,000
4	Dewatering	...	LS	...	$5,000
5	CMU Retaining Wall w/Drainage Sys.	900	SF	$50	$45,000
6	1.0' Subgrade Prep	7,700	SF	$1	$7,700
7	.5' CL II Agg. Base	92	CY	$45	$4,140
8	.25' AC Pavement	90	Ton	$50	$4,500
9	Concrete Pavement	810	SF	$9	$7,290
10	Import Fill/Compact Contour Grade	850	CY	$15	$12,750
11	Rock Rip-Rap	...	LS	...	$4,000
12	Modify Intake Structure	...	LS	...	$40,000
13	Booster Pump Station	...	LS	...	$127,200
14	8" Waterline & Fittings	4,350	LF	$65	$282,750
15	Air Vac. Valve/Enclosure	3	Ea	$9,000	$27,000
16	Redwood Header	240	LF	$10	$2,400
17	Hydroseed	...	LS	...	$1,000
				Subtotal	$578,730
				Contingency 35%	$258,135
				Total	**$837,000**

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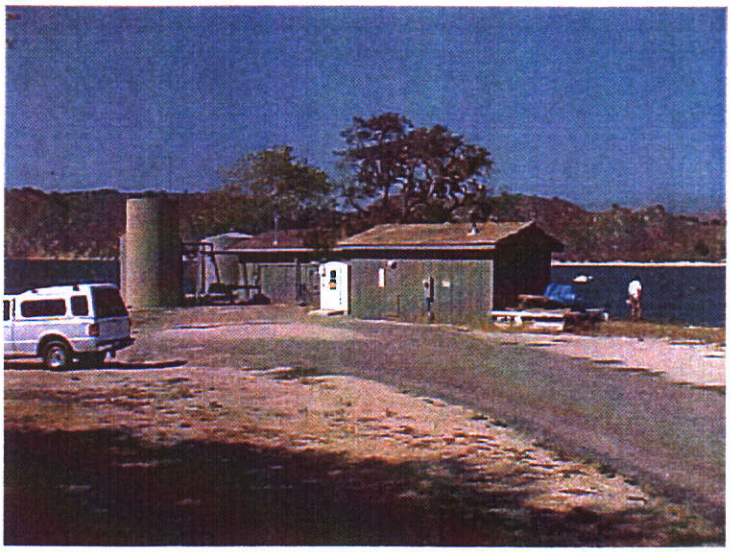
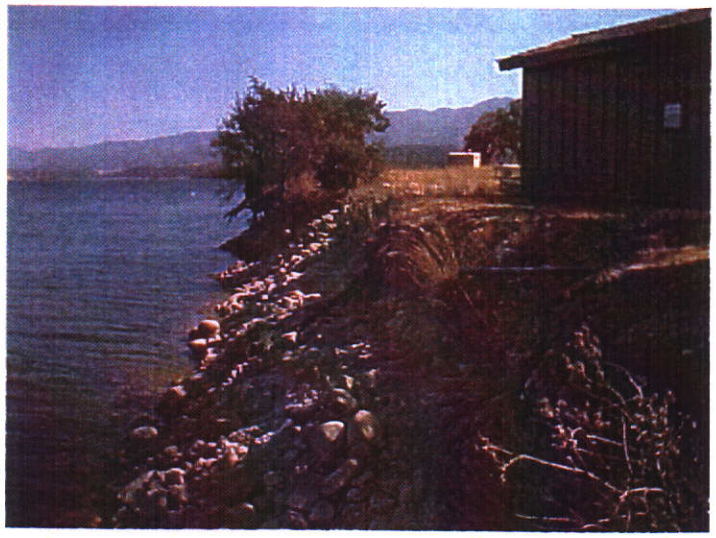
NOTE: This opinion of estimated cost is based on project drawings and cost factors derived from previous projects. Flowers & Associates, Inc. and the Engineer make no warranty, expressed or implied, as to the actual cost of Project improvements resulting from Contractor's bids based on approved Project plans and specifications.

2. Water Treatment Plant



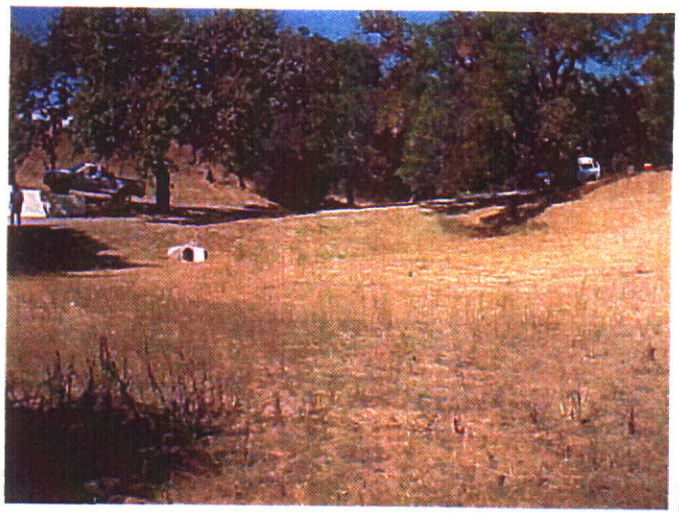
Water Treatment Plant looking North

Water Treatment Plant looking East



Water Treatment Plant looking South

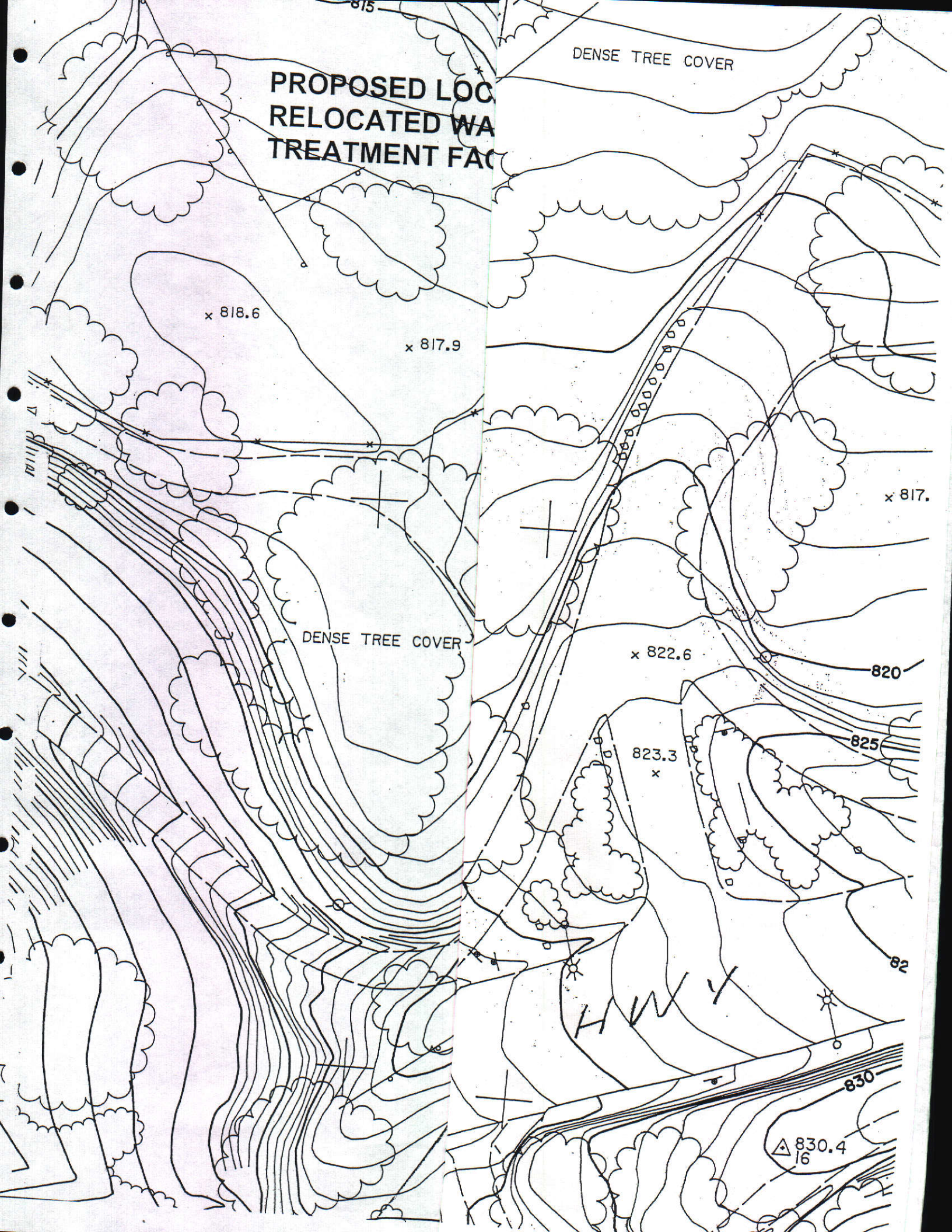
Water Treatment Plant
(cont.)



Proposed Water Treatment Plant Site looking North

Proposed Water Treatment Plant Site looking South (westerly portion)

Proposed Water Treatment Plant Site looking South (easterly portion)


PROPOSED LOC
RELOCATED WA
TREATMENT FAC
815
DENSE TREE COVER
× 818.6
× 817.9
× 817.
DENSE TREE COVER
× 822.6
820
825
823.3
82
HWY
830
830.4
16

Description of Proposed Work for Water Treatment Plant

1 CLEAR AND GRUB EXISTING SITE. PREPARE SOIL AS NECESSARY FOR IMPORTED SOIL. CONSTRUCT ELEVATED PAD AND GRADE AND COMPACT AS REQUIRED. CONSTRUCT WATER TREATMENT FACILITY, PIPING AND APPURTENANCES INCLUDING AC PAVEMENT AND CONCRETE IMPROVEMENTS AS REQUIRED.

2 CONSTRUCT 3'-0" WIDE CONCRETE "V" DITCH.

3 CONSTRUCT CAST-IN-PLACE CONCRETE CATCH BASIN WITH TRAFFIC WEIGHT GRATE.

4 CONSTRUCT RCP STORM DRAIN PIPE.

5 CONSTRUCT AC PAVEMENT DRIVEWAY.

6 CONSTRUCT WATER LINE AND VALVE BOX AND APPURTENANCES AS REQUIRED TO CONNECT TO EXISTING 6" WATER MAIN.

7 GRADE SLOPES AS NECESSARY. CONSTRUCT EARTHWORK AS REQUIRED SLOPES VARY, NOT TO EXCEED SLOPES OF 2:1. HYDROSEED WITH NATIVE SEED MIX.

8 CONSTRUCT CONCRETE "V" DITCH. CONNECT TO PROPOSED CATCH BASIN.

9 CONSTRUCT CONCRETE JUNCTION STRUCTURE WITH 24" MANHOLE COVER. WHERE APPLICABLE, CONNECT TO EXISTING CALTRANS CMP STORM DRAIN AS REQUIRED.

10 CONSTRUCT CONTOUR GRADING PER PLAN. HYDROSEED WITH NATIVE SEED MIX.

11 RELOCATE EXISTING UTILITY POLE AND SERVICES TO NEW LOCATION AS SHOWN ON PLAN. EXISTING PUMP STATION POWER SHALL BE CONTINUOUS. CONTRACTOR TO CONTACT PG&E TO COORDINATE RELOCATION AND CONTINUOUS POWER SUPPLY.

12 CONSTRUCT ROCK RIP-RAP AT STORM DRAIN OUTLET.

13 DEMOLISH AND REMOVE EXISTING 24" CMP STORM DRAIN. BACKFILL AND COMPACT TRENCH, RESTORE EXISTING ROADS AS REQUIRED.

14 RELOCATE 1" GALVANIZED WATER LINE AS REQUIRED FOR CONSTRUCTION OF WATER TREATMENT PLANT.

15 CONSTRUCT WATER LINE AND APPURTENANCES IN TRENCH. BACKFILL AND COMPACT TRENCH AND HYDROSEED AS REQUIRED WITH NATIVE SEED MIX. SAWCUT AND REPAVE WHERE WATER MAIN IS IN ROADWAY.

16 CONSTRUCT AIR RELIEF VALVE AND APPURTENANCES. CONSTRUCT COVER AND SECURE TO CONCRETE PAD.

17 INTAKE WATER LINE FROM PUMP STATION.

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WATER TREATMENT FACILITY

Engineer's Opinion of Estimated Construction Costs

Item No.	Description	Quantity	Unit	Unit Price	Item Cost
1	Project Safety/Shoring	...	LS	...	$3,000
2	Traffic Control	...	LS	...	$1,000
3	Demo Water Facility/Piping	...	LS	...	$30,000
4	Clear & Grub/Site Prep	...	LS	...	$15,000
5	.5' CL II Agg. Base	300	CY	$45	$13,500
6	.25' AC Pavement	295	TON	$50	$14,750
7	Import Fill/Compact	5,600	CY	$15	$84,000
8	Contour Grade	...	LS	...	$25,000
9	8" Waterline/Fittings	110	LF	$90	$9,900
10	Valves/Valve Vault	...	LS	...	$25,000
11	4' Conc. "V" Ditch	190	LF	$35	$6,650
12	Concrete Junction Structure	2	EA	$8,000	$16,000
13	Cast-In-Place Catch Basin	3	EA	$2,000	$6,000
14	RCP Storm Drain	410	LF	$150	$61,500
15	1" Waterline/Fittings	220	LF	$35	$7,700
16	Relocate Exist. Utility Pole & Svcs.	...	LS	...	$15,000
17	Exist. Access Road Work	...	LS	...	$5,000
18	Landscaping/Irrigation	...	LS	...	$20,000
19	Water Treatment Facility	...	LS	...	$2,288,800
20	Sludge Facility (Budget)	...	LS	...	$150,000
				Subtotal	$2,797,800
				Contingency 35%	$979,300
				Total	**$3,780,000**

NOTE: This opinion of estimated cost is based on project drawings and cost factors derived from previous projects. Flowers & Associates, Inc. and the Engineer make no warranty, expressed or implied, as to the actual cost of Project improvements resulting from Contractor's bids based on approved Project plans and specifications.

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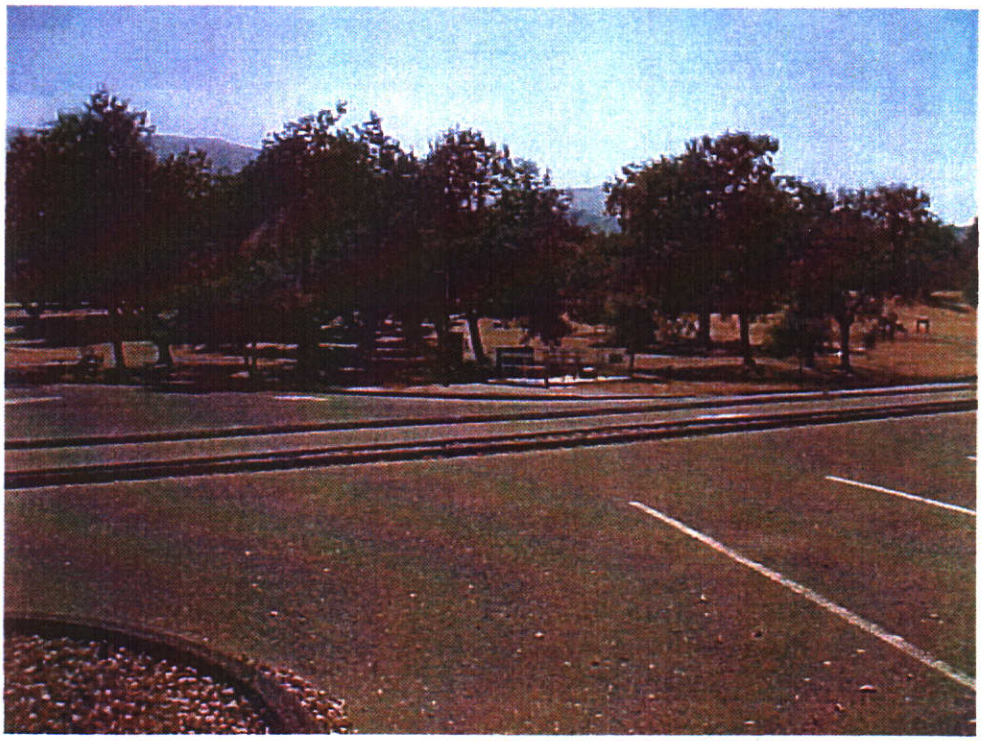
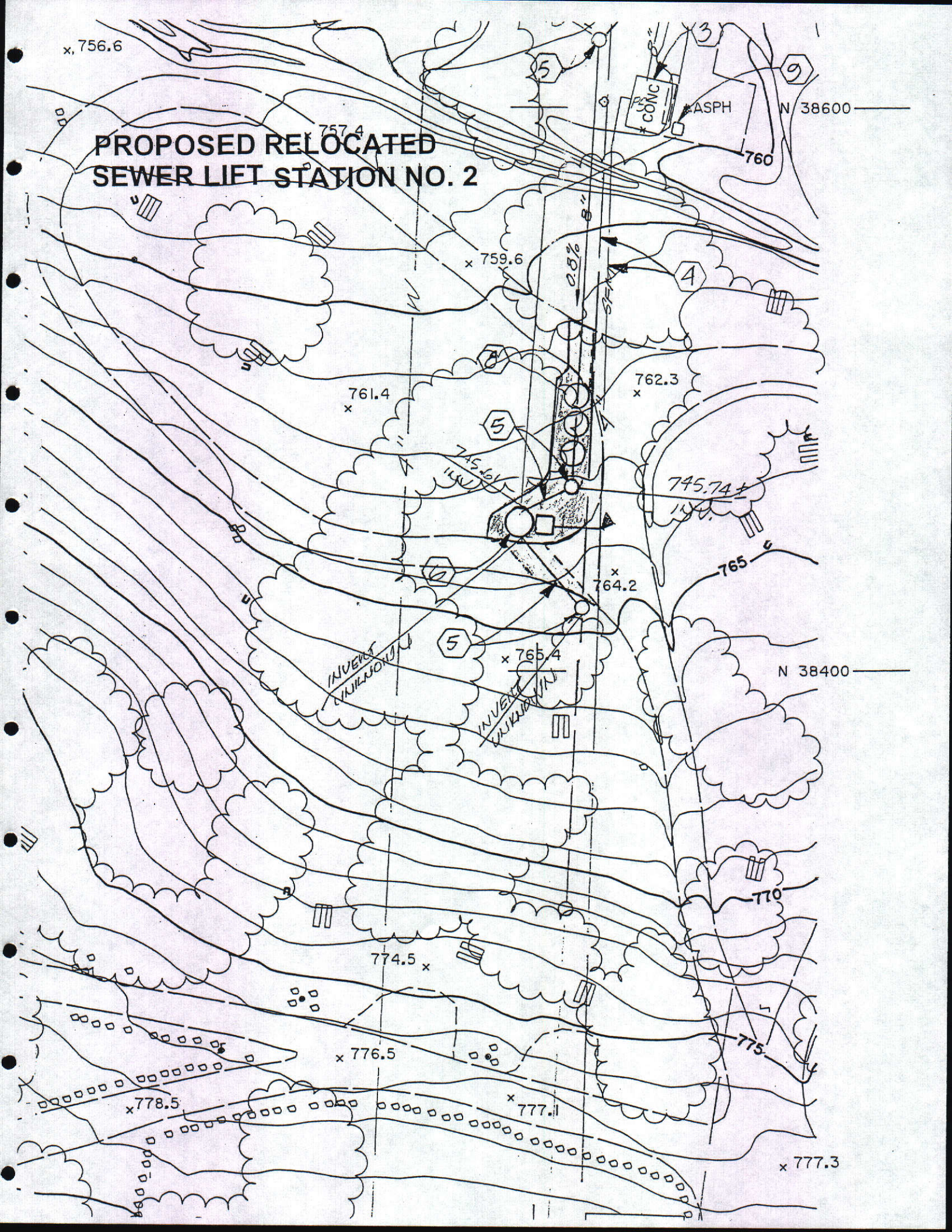
3. Sewer Lift Station No. 2



Sewage Lift Station No. 2
looking Southwest

Close Up looking Southwest


PROPOSED RELOCATED
SEWER LIFT STATION NO. 2
x 756.6
757.4
759.6
761.4
762.3
764.2
765.4
774.5
776.5
778.5
777.1
777.3
N 38600
N 38400
760
765
770
775
CONC
ASPH
0.8%
8"
745.74±
INVERT UNKNOWN

Description of Proposed Work for Sewage Lift Station No. 2

1 REMOVE EXISTING TREES BELOW 756.0 ELEVATION. REPLACE ANY REMOVED OAK TREES AT A RATIO OF 10:1. COUNTY PARKS DEPARTMENT TO DETERMINE LOCATIONS OF REPLACEMENT OAKS.

2 DEMOLISH AND REMOVE EXISTING PARKING LOT AND ISLANDS. PROTECT EXISTING DUMP STATION. RECONSTRUCT AC PARKING LOT WITH REDWOOD HEADERS AND ISLANDS, ADJUST EXISTING MANHOLE RIMS TO FINISH GRADE. CONTOUR GRADE WESTERLY END OF PARKING LOT. RE-LANDSCAPE AS REQUIRED.

3 ABANDON EXISTING PUMP STATION IN-PLACE. CUT AND CAP EXISTING 8" GRAVITY LINE FROM EXISTING SEWER MANHOLE. REMOVE PUMP STATION TO 5' BELOW GRADE AND FILL REMAINING PORTION WITH 2 SACK SAND-CEMENT SLURRY. CONTOUR GRADE AND HYDROSEED WITH NATIVE SEED MIX.

4 ABANDON EXISTING 8" GRAVITY SEWER MAIN AND 4" FORCE MAIN IN PLACE. CUT ENDS OF PIPES AND CONSTRUCT CONCRETE PLUG. CONCRETE PLUG SHALL BE A MINIMUM OF 5' LINEAL FEET AND RODDED TO REMOVE ANY VOIDS.

5 CONSTRUCT 48" DIAMETER SEWER MANHOLE AND 8" SDR 35 PVC GRAVITY SEWER MAIN. EXISTING SEWER SHALL REMAIN ACTIVE DURING SEWER MANHOLE CONSTRUCTION.

6 CONSTRUCT SEWER PUMP STATION AND VALVE VAULT. CONNECT TO EXISTING 4" SFM CONSTRUCT THRUST BLOCK AT 90° BEND.

7 RELOCATE EXISTING PICNIC AREAS BELOW 756.0 ELEVATION. COUNTY PARKS DEPARTMENT TO DETERMINE LOCATIONS.

8 CONSTRUCT 3- 8" DIAMETER EMERGENCY STORAGE SEWER MANHOLES AND APPURTENANT PIPING. MANHOLES SHALL PROVIDE 1 TO 2 HOURS OF DETENTION TIME AT PEAK FLOW.

9 CONSTRUCT STANDBY GENERATOR AND APPURTENANCES ON CONCRETE PAD AND ENCLOSURE.

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SEWER LIFT STATION NO. 2

Engineer's Opinion of Estimated Construction Costs

Item No.	Description	Quantity	Unit	Unit Price	Item Cost
1	Project Safety/Shoring	...	LS	...	$25,000
2	Traffic Control	...	LS	...	$500
3	Abandon Pump Station & Piping	...	LS	...	$25,000
4	Modify Exist. Sewer Manhole	1	Ea	$1,500	$1,500
5	8" SDR 35 Pipe	240	LF	$65	$15,600
6	48" Sewer Manhole	3	Ea	$3,000	$9,000
7	96" Sewer Manhole/Piping	3	Ea	$10,000	$30,000
8	Sewer Lift Station/Generator	...	LS	...	$225,000
9	1-B290' Subgrade Prep.	1,600	SF	$1	$1,600
10	.5' CL II Agg. Base	30	CY	$45	$1,350
11	.25' AC Pavement	28	Ton	$50	$1,400
12	Clear & Grub	...	LS	...	$2,500
13	Hydroseed	...	LS	...	$500
14	Standby Generator Enclosure	...	LS	...	$20,000
					$0
					$0
					$0
					$0
					$0
					$0
				Subtotal	$358,950
				Contingency 35%	$125,700
				Total	**$490,000**

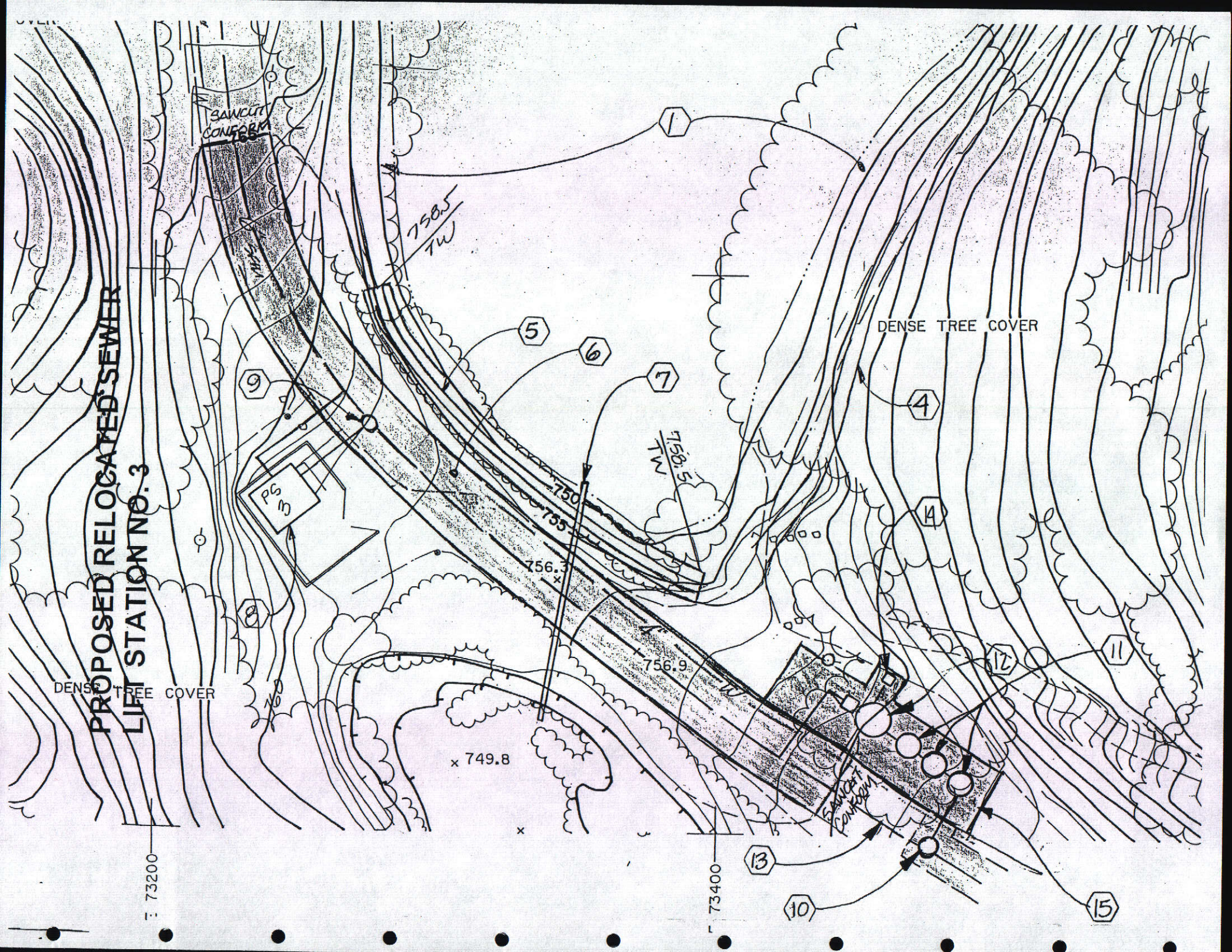
NOTE: This opinion of estimated cost is based on project drawings and cost factors derived from previous projects. Flowers & Associates, Inc. and the Engineer make no warranty, expressed or implied, as to the actual cost of Project improvements resulting from Contractor's bids based on approved Project plans and specifications.

0070Cost03_102000

4. Sewer Lift Station No. 3

Sewer Lift Station No. 3
looking South

Sewer Lift Station No. 3
looking West


PROPOSED RELOCATED SEWER
LIFT STATION NO. 3
DENSE TREE COVER
DENSE TREE COVER
SAWCUT CONFORM
SAWCUT CONFORM
758.5 TW
758.5 TW
PS 3
750
755
756.3
756.9
749.8
73200
73400
1
4
5
6
7
8
9
10
11
12
13
14
15

Description of Proposed Work for Sewage Lift Station No. 3

1 RELOCATE AND CONSTRUCT FOOT TRAIL.

5 ABANDON EXISTING PUMP STATION IN-PLACE. FILL WITH CONCRETE.

10 CONSTRUCT SEWER MANHOLE AND GRAVITY SDR 35 SEWER PIPE. CONNECT TO PROPOSED SEWER MANHOLE.

11 CONSTRUCT 3-8' DIAMETER EMERGENCY STORAGE SEWER MANHOLES AND APPURTENANT PIPING. MANHOLES SHALL PROVIDE 1 TO 2 HOURS FLOW CAPACITY AT PEAK FLOW.

12 CONSTRUCT SEWER PUMP STATION NO. 3 AND APPURTENANCES.

13 ABANDON EXISTING 6" SEWER FORCE MAIN IN-PLACE. CAP WITH CONCRETE MINIMUM 5' INTO PIPE. ROD CONCRETE TO REMOVE VOIDS.

14 CONSTRUCT STANDBY GENERATOR AND APPURTENANCES. CONNECT TO PUMP STATION.

15 CONSTRUCT AC PAVEMENT STRUCTURAL SECTION AND REDWOOD HEADER AROUND PUMP STATION AND SEWER MANHOLES TO LIMITS SHOWN ON PLAN.

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SEWER LIFT STATION NO. 3

Engineer's Opinion of Estimated Construction Costs

Item No.	Description	Quantity	Unit	Unit Price	Item Cost
1	Project Safety/Shoring	...	LS	...	$10,000
2	Traffic Control	...	LS	...	$500
3	Site Prep	...	LS	...	$3,000
4	Abandon Pump Station 3	...	LS	...	$25,000
5	1.0' Subgrade Prep	2,500	SF	$1	$2,500
6	.5' CL II Agg. Base	50	CY	$45	$2,250
7	.25' AC Pavement	48	Ton	$50	$2,400
8	48" S.M.H.	1	Ea	$3,000	$3,000
9	96" S.M.H. / PIPING	3	Ea	$10,000	$30,000
10	Modify Exist. S.M.H.	1	Ea	$1,500	$1,500
11	Abandon Exist. Piping	...	LS	...	$2,000
12	Sewer Lift Station/Generator	...	LS	...	$225,000
13	Standby Generator/Enclosure	...	LS	...	$20,000
14	Hydroseed	...	LS	...	$500
15	Redwood Header	160	LF	$10	$1,600
					$0
					$0
					$0
					$0
					$0
				Subtotal	$329,250
				Contingency 35%	$115,300
				Total	**$444,550**

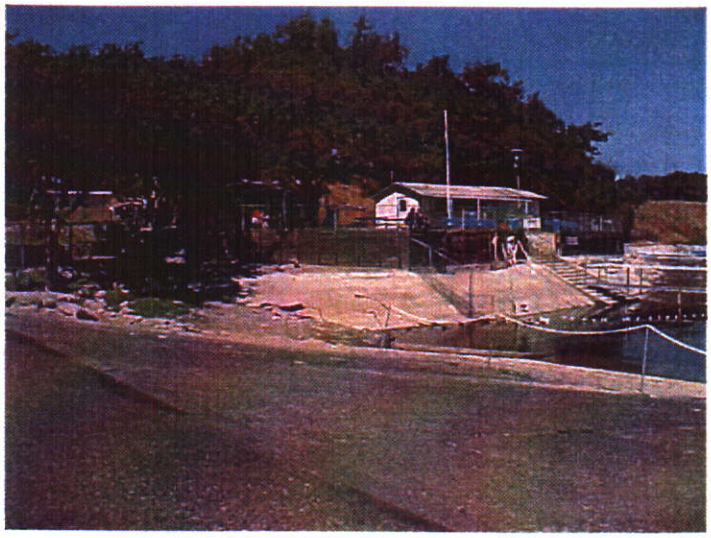
NOTE: This opinion of estimated cost is based on project drawings and cost factors derived from previous projects. Flowers & Associates, Inc. and the Engineer make no warranty, expressed or implied, as to the actual cost of Project improvements resulting from Contractor's bids based on approved Project plans and specifications.

0070Cost04_102000

5. Marina / Launch Ramp Area

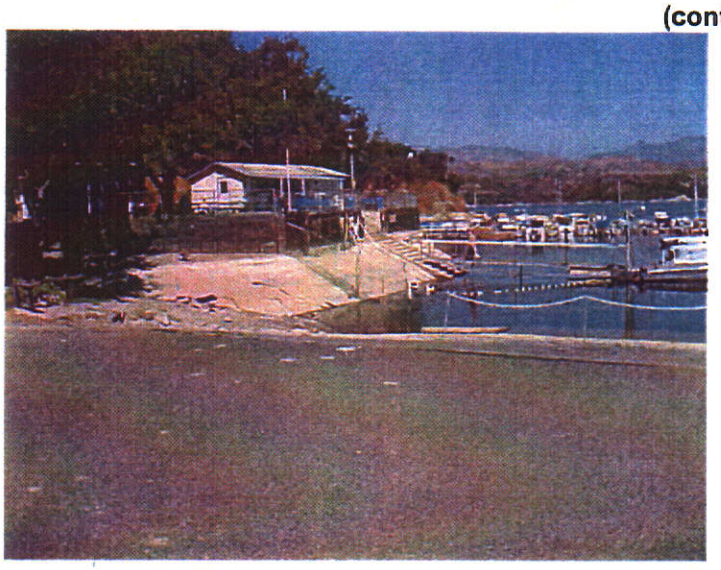
Launch Ramp looking South from Marina

Launch Ramp looking West from Shops



Launch Ramp looking North at Shops

Marina / Launch Ramp Area
(cont.)

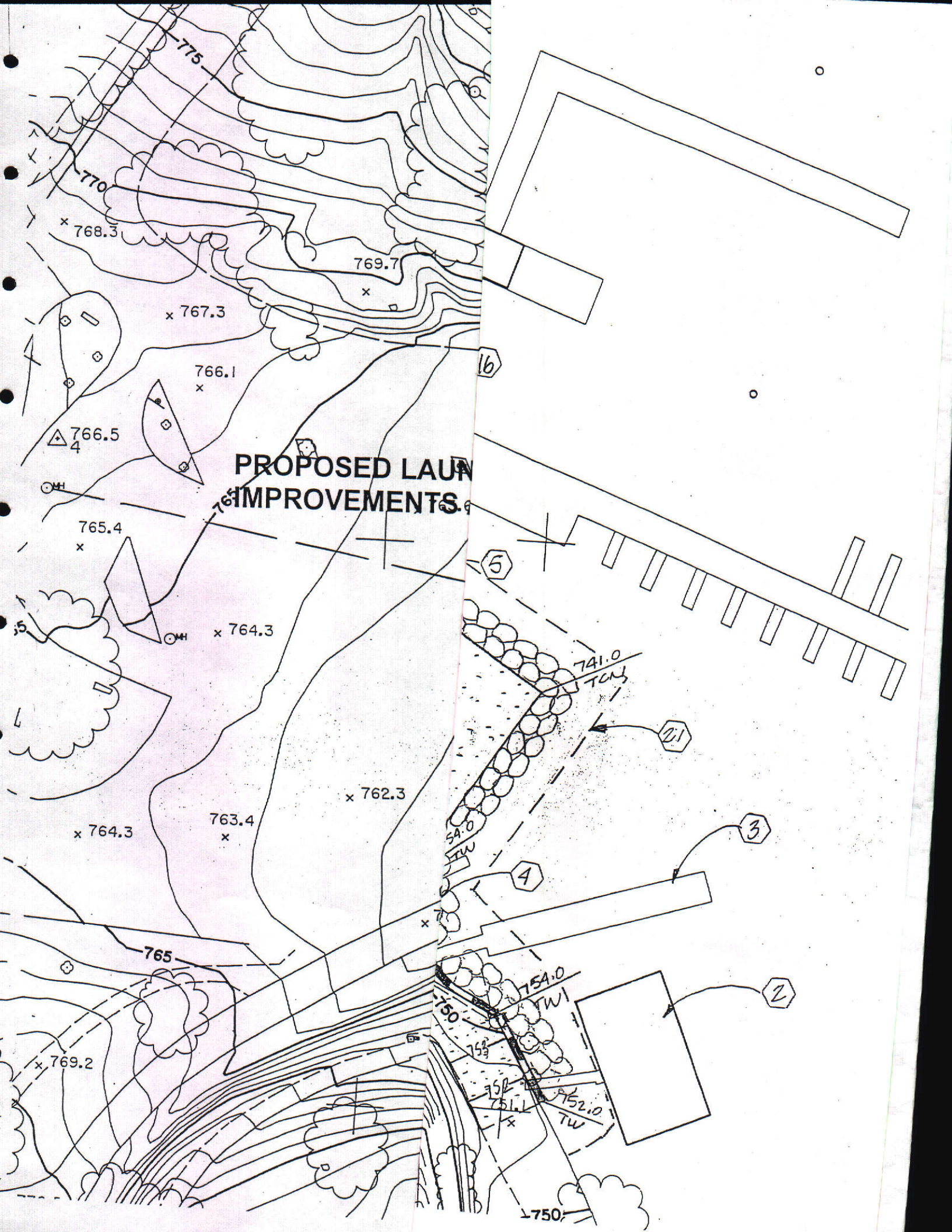


Marina looking North from Launch Ramp

Marina Access looking North from Shops

Concrete Lining Erosion control at Access

PROPOSED M
IMPROVEME
788.3
795.2
795.4
791.6
758.5
TW
600


PROPOSED LAUN
IMPROVEMENTS
775
770
768.3
769.7
767.3
766.1
766.5
4
765.4
764.3
762.3
763.4
764.3
765
769.2
750
741.0
TCN
754.0
TW
754.0
TW
752.0
TW
16
5
21
3
4
2

Description of Proposed Work for Marina Area

1 REMOVE EXISTING TREES BELOW 756.0 ELEVATION. REPLACE ANY REMOVED OAK TREES AT A RATIO OF 10:1. COUNTY PARKS DEPARTMENT TO DETERMINE LOCATIONS OF REPLACEMENT OAKS.

4 DEMOLISH AND REMOVE EXISTING IMPROVEMENTS. CONSTRUCT CMU RETAINING WALL "A" WITH DRAINAGE SYSTEM WITH A TOP OF WALL ELEVATION OF 758.5.

5 CONSTRUCT CONCRETE ABUTMENT WITH STAIRS FORMED IN. TOP STEP SHALL HAVE AN ELEVATION OF 758.0. BOTTOM STEP SHALL BE 755.5.

6 EXISTING FLOATING DOCK TO BE MODIFIED TO ACCEPT A MAXIMUM ELEVATION OF 756.0.

7 CONSTRUCT NEW ACCESS RAMPS. RAMPS SHALL BE ANCHORED TO CONCRETE ABUTMENTS AND ADJUST TO LAKE LEVEL FLUCTUATIONS PER COUNTY PARKS DEPARTMENT.

8 CONSTRUCT 10' WIDE CONCRETE ACCESS WALKWAY WITH A 2% MAXIMUM CROSS-SLOPE. MINIMUM ELEVATION SHALL BE 758.0.

9 CONSTRUCT CMU RETAINING WALL "B" WITH DRAINAGE SYSTEM. TOP OF WALL ELEVATION SHALL VARY BUT IN NO CASE BE LESS THAN 6" ABOVE BACK OF WALL EXISTING GROUND ELEVATION.

10 CONSTRUCT ROCK RIP-RAP SLOPE PROTECTION.

Description of Proposed Work for Launch Ramp Area

1 REMOVE EXISTING TREES BELOW 756.0 ELEVATION. REPLACE ANY REMOVED OAK TREES AT A RATIO OF 10:1. COUNTY PARKS DEPARTMENT TO DETERMINE LOCATIONS OF REPLACEMENT OAKS.

2 RELOCATE AND ADJUST ACCESS RAMP TO EXISTING BUILDING.

3 ADJUST EXISTING FLOATING DOCK TO MINIMUM 753.0 ELEVATION AS NECESSARY.

4 CONSTRUCT CMU RETAINING WALL "C" WITH A TOP OF WALL ELEVATION OF 754.0.

5 DEMOLISH AND REMOVE EXISTING CONCRETE BOAT ACCESS RAMP. CONSTRUCT PANELIZED CONCRETE BOAT ACCESS RAMP AT 15% MINIMUM SLOPE PER D-BAW REQUIREMENTS.

6 DEMOLISH AND REMOVE EXISTING AC PAVEMENT AND APPURTENANT IMPROVEMENTS. CONSTRUCT CONCRETE STAGING AREA AND RAMP CONFORM.

7 CONSTRUCT CMU RETAINING WALL "B" AND DRAINAGE SYSTEM. TOP OF WALL ELEVATION = 756.0.

8 DEMOLISH AND REMOVE EXISTING IMPROVEMENTS AND CONSTRUCT CMU RETAINING WALL "A" AND DRAINAGE SYSTEM WITH A TOP OF WALL ELEVATION OF 758.5.

9 DOWEL INTO EXISTING STAIRS AND CONSTRUCT CONCRETE STAIR EXTENSION WITH EXPANSION JOINT. TOP STEP ELEVATION SHALL BE 758.04. STAIRS SHALL HAVE TREADS AND RISERS TO MATCH EXISTING.

10 CONSTRUCT 5' WIDE CONCRETE WALKWAY TO EXISTING RESTROOMS.

11 RELOCATE EXISTING BAIT AND TACKLE SHOP TO PROPOSED LOCATION AS REQUIRED. PROVIDE ELECTRICAL AND WATER SERVICES.

12 DEMOLISH AND REMOVE EXISTING AC PAVEMENT, FENCING AND APPURTENANT IMPROVEMENTS AS REQUIRED FOR IMPROVEMENTS. CONSTRUCT CONTOUR GRADING AND AC PAVEMENT STRUCTURAL SECTION PER PLAN. CONSTRUCT REDWOOD HEADER AT PAVEMENT EDGE.

13 REMOVE AND REPLACE WITH PVC LINED MANHOLE, ADJUST TO FINISH GRADE.

14 FILL, COMPACT AND CONTOUR GRADE PER PLAN.

15 FILL, COMPACT AND CONTOUR GRADE PICNIC/SERVICE AREA PER PLAN.

16 ADJUST EXISTING FLOATING DOCK AS NECESSARY.

19 CONSTRUCT 10' WIDE CONCRETE PAVEMENT ACCESS PATH. CONSTRUCT AT A MINIMUM 2% CROSS-SLOPE.

20 CONSTRUCT CMU RETAINING WALL "B" AND DRAINAGE SYSTEM WITH TOP OF WALL ELEVATION OF 761.0. CONSTRUCT WALL DRAINAGE SYSTEM.

21 CONSTRUCT COFFER DAM AND DEWATER AREA FOR CONSTRUCTION ACCORDINGLY.

22 CONSTRUCT ROCK RIP-RAP REVETMENT.

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MARINA / LAUNCH RAMP

Engineer's Opinion of Estimated Construction Costs

Item No.	Description	Quantity	Unit	Unit Price	Item Cost
1	Project Safety/Shoring	...	LS	...	$5,000
2	Traffic Control	...	LS	...	$1,000
3	Demolition	...	LS	...	$80,000
4	Dewatering	...	LS	...	$45,000
5	Coffer Dam	10,000	SF	$45	$450,000
6	Import Fill/Compact	1,670	CY	$15	$25,050
7	Contour Grading	...	LS	...	$10,000
8	10' Concrete Walkway	4,200	SF	$10	$42,000
9	5' Concrete Walkway	125	SF	$7	$875
10	Concrete Abutment/Stairs	4	Ea	$10,000	$40,000
11	Concrete Launch Ramp	8,400	SF	$35	$294,000
12	Concrete Staging Area	11,200	SF	$15	$168,000
13	Retaining Wall "A"	6,800	SF	$80	$544,000
14	Retaining Wall "B"	2,120	SF	$50	$106,000
15	Retaining Wall "C"	660	SF	$60	$39,600
16	Dock Ramps	4	Ea	$20,000	$80,000
17	Modify Floating Docks	3	Ea	$15,000	$45,000
18	Rock Rip-Rap	9,600	SF	$20	$192,000
19	Relocate Buildings/Adjust Svcs/ Appurtenances	...	LS	...	$30,000

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20	1.0' Subgrade Prep	9,200	SF	$1	$9,200
21	.5' CL II Agg. Base	172	CY	$45	$7,740
22	.25' AC Pavement	170	TON	$50	$8,500
23	AC Dike	150	LF	$15	$2,250
24	Redwood Header	250	LF	$10	$2,500
25	PVC Lined Manhole	1	EA	$5,000	$5,000
26	Landscaping/Irrigation	...	LS	...	$10,000
27	Striping	...	LS	...	$1,000
28	Adjust Misc. Services	...	LS	...	$15,000

Subtotal	$2,258,715
Contingency 35%	$790,600
Total	**$3,049,315**

NOTE: This opinion of estimated cost is based on project drawings and cost factors derived from previous projects. Flowers & Associates, Inc. and the Engineer make no warranty, expressed or implied, as to the actual cost of Project improvements resulting from Contractor's bids based on approved Project plans and specifications.

0070Cost05_102000

6. Marina Overflow Parking Lot

West End of Lot looking East

East End of Lot looking East

East End of Lot looking West

PROPOSED MARINA OVERFLOW PARKING LOT MODIFICATIONS

Description of Proposed Work for Marina Overflow Parking Lot

1 REMOVE EXISTING TREES BELOW 756.0 ELEVATION. REPLACE ANY REMOVED OAK TREES AT A RATIO OF 10:1. COUNTY PARKS DEPARTMENT TO DETERMINE LOCATIONS OF REPLACEMENT OAKS.

2 DEMOLISH AND REMOVE EXISTING PARKING LOT AND ISLANDS. PROTECT EXISTING DUMP STATION. RECONSTRUCT AC PARKING LOT WITH REDWOOD HEADERS AND ISLANDS, ADJUST EXISTING MANHOLE RIMS TO FINISH GRADE. CONTOUR GRADE WESTERLY END OF PARKING LOT. RE-LANDSCAPE AS REQUIRED.

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MARINA OVERFLOW PARKING

Engineer's Opinion of Estimated Construction Costs

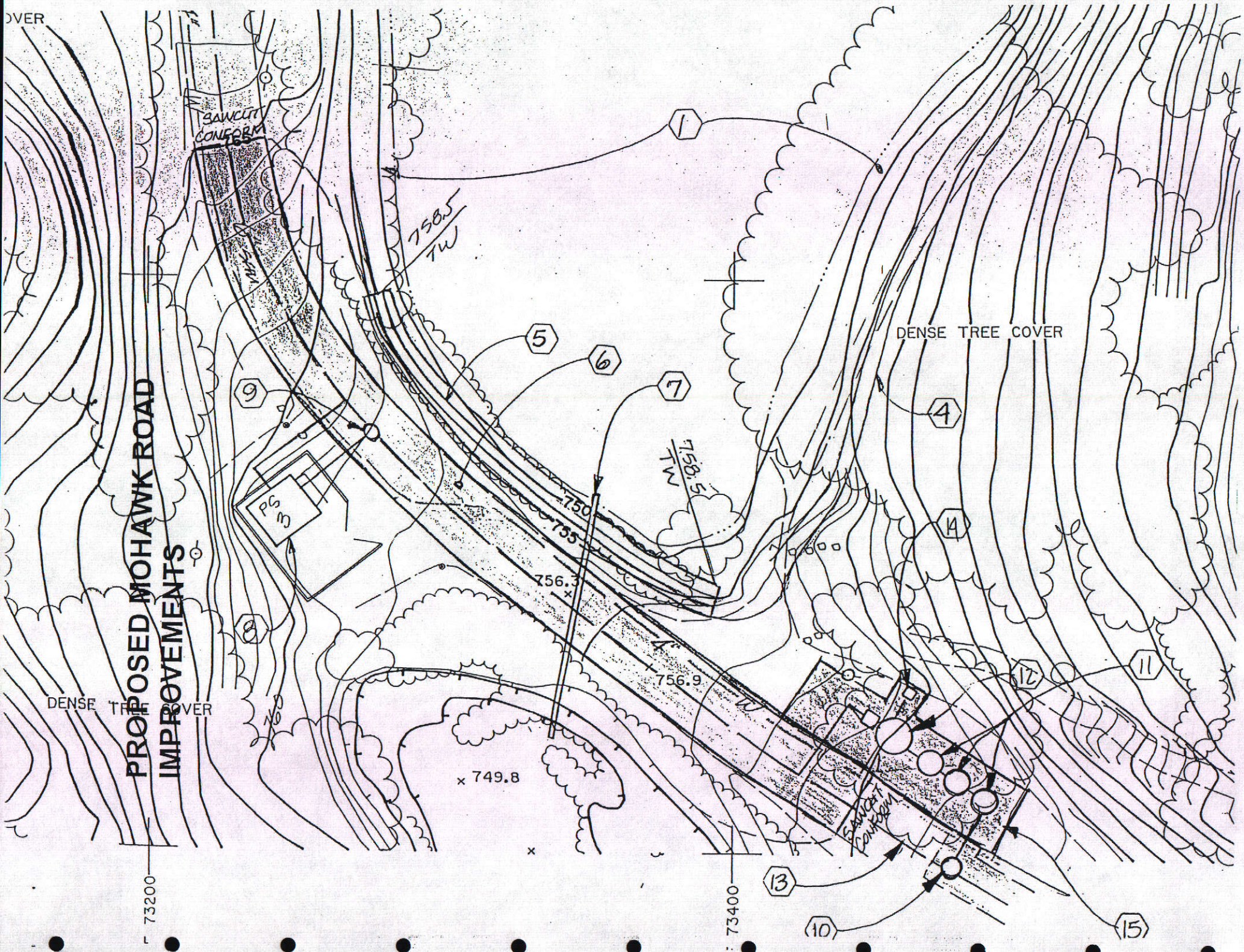
Item No.	Description	Quantity	Unit	Unit Price	Item Cost
1	Project Safety/Shoring	...	LS	...	$1,000
2	Traffic Control	...	LS	...	$500
3	Demolition	...	LS	...	$15,000
4	1.0' Subgrade	27,500	SF	$1	$27,500
5	.5' CL II Agg. Base	512	CY	$45	$23,040
6	.25' AC Pavement	505	Ton	$50	$25,250
7	AC Dike	1,400	LF	$15	$21,000
8	Import Fill/Compact	1,180	CY	$15	$17,700
9	Contour Grading	...	LS	...	$2,000
10	Adjust M.H. Rim	2	Ea	$500	$2,000
11	Access Trail	40	LF	$40	$1,600
12	Landscape	...	LS	...	$4,000
13	Hydroseed	...	LS	...	$500
					$0
					$0
					$0
					$0
					$0
					$0
				Subtotal	$141,090
				Contingency 35%	$49,400
				Total	**$190,490**

NOTE: This opinion of estimated cost is based on project drawings and cost factors derived from previous projects. Flowers & Associates, Inc. and the Engineer make no warranty, expressed or implied, as to the actual cost of Project improvements resulting from Contractor's bids based on approved Project plans and specifications.

0070Cost06_102000

3 Mohawk Road

Portion of Mohawk Road needing to be raised looking West.


PROPOSED MOHAWK ROAD IMPROVEMENTS
DENSE TREE COVER
DENSE TREE COVER
SAWCUT CONFORM
SAWCUT CONFORM
758.5 TW
758.5 TW
750
755
756.3
756.9
749.8
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73200
73400
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Description of Proposed Work for Mohawk Road

1 REMOVE EXISTING TREES BELOW 756.0 ELEVATION. REPLACE ANY REMOVED OAK TREES AT A RATIO OF 10:1. COUNTY PARKS DEPARTMENT TO DETERMINE LOCATIONS OF REPLACEMENT OAKS.

2 CONSTRUCT GABION ROCK WALL. TOP OF WALL ELEVATION SHALL BE 758.0.

6 DEMOLISH AND REMOVE EXISTING ROAD. CONSTRUCT FILL AND AC PAVEMENT ROAD PER PLAN.

7 REMOVE EXISTING CULVERT AND CONSTRUCT NEW RCP CULVERT PER PLAN.

9 MODIFY EXISTING MANHOLE TO ACCEPT 6" SEWER FORCE MAIN THROUGH IN A CONTINUOUS LAYOUT. ADJUST RIM OF MANHOLE TO FINISH GRADE AND SEAL LID TO PROVIDE A WATERTIGHT SEAL.

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MOHAWK ROAD

Engineer's Opinion of Estimated Construction Costs

Item No.	Description	Quantity	Unit	Unit Price	Item Cost
1	Project Safety/Shoring	...	LS	...	$3,000
2	Traffic Control	...	LS	...	$1,000
3	Demolition	...	LS	...	$15,000
4	Dewatering	...	LS	...	$10,000
5	Gabion Wall	340	CY	$200	$68,000
6	Import Fill/Compact	750	CY	$15	$11,250
7	Contour Grade	...	LS	...	$5,000
8	Storm Drain Pipe	90	LF	$150	$13,500
9	Access Trail	400	LF	$25	$10,000
10	.5' CL II Agg. Base	160	CY	$45	$7,200
11	.25' AC Pavement	155	Ton	$50	$7,750
12	Adjust S.M.H. Rim	1	Ea	$500	$500
13	Hydroseed	...	LS	...	$500
					$0
					$0
					$0
					$0
					$0
					$0
					$0
				Subtotal	$152,700
				Contingency 35%	$53,500
				Total	**$206,200**

NOTE: This opinion of estimated cost is based on project drawings and cost factors derived from previous projects. Flowers & Associates, Inc. and the Engineer make no warranty, expressed or implied, as to the actual cost of Project improvements resulting from Contractor's bids based on approved Project plans and specifications.

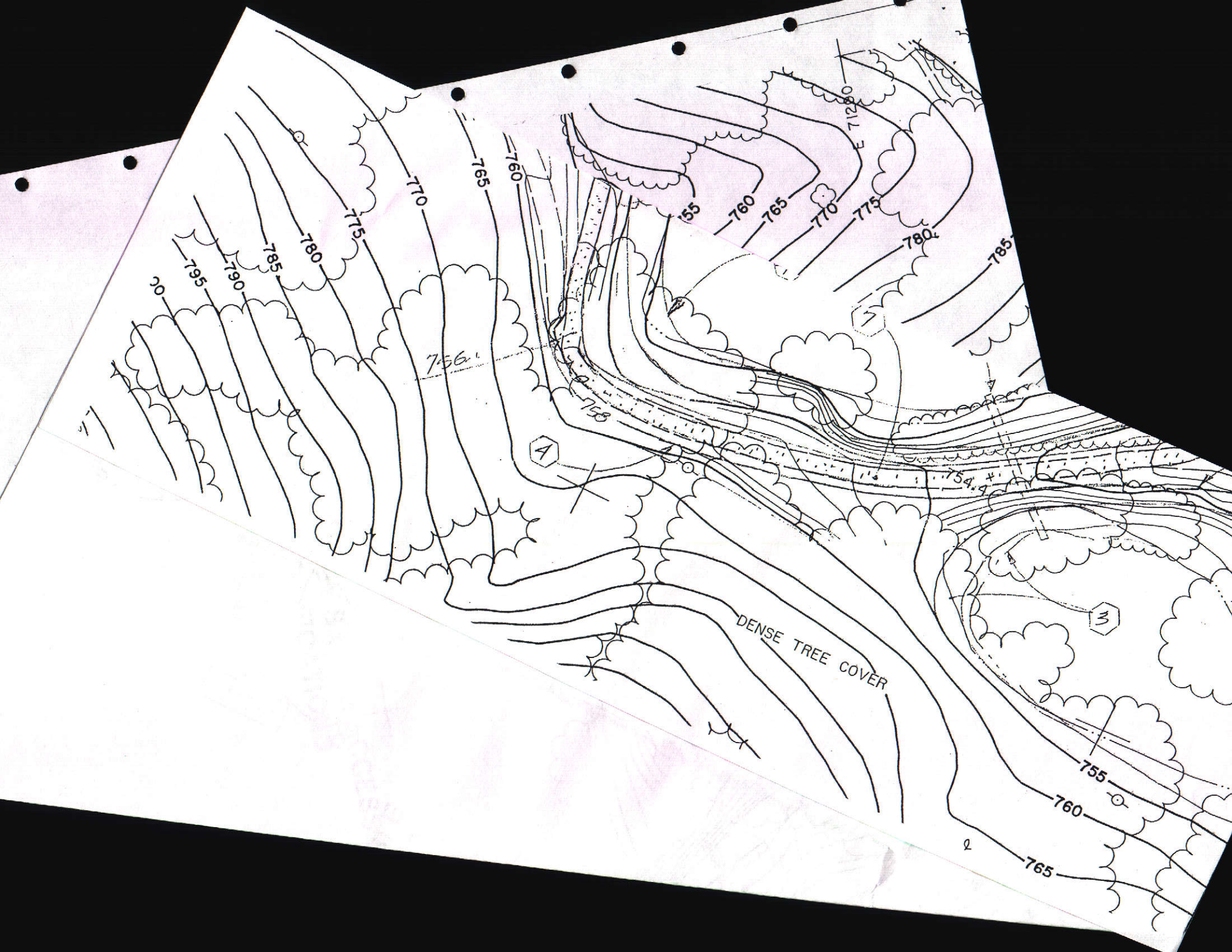
0070Cost07_102000

8. Harvey's Cove Picnic Area

(Handicapped Accessible)

Harvey's Cove Picnic Area and Fishing Pier looking west

Access Walkway to Harvey's Cove Picnic and Fishing Pier


DENSE TREE COVER
755
760
765
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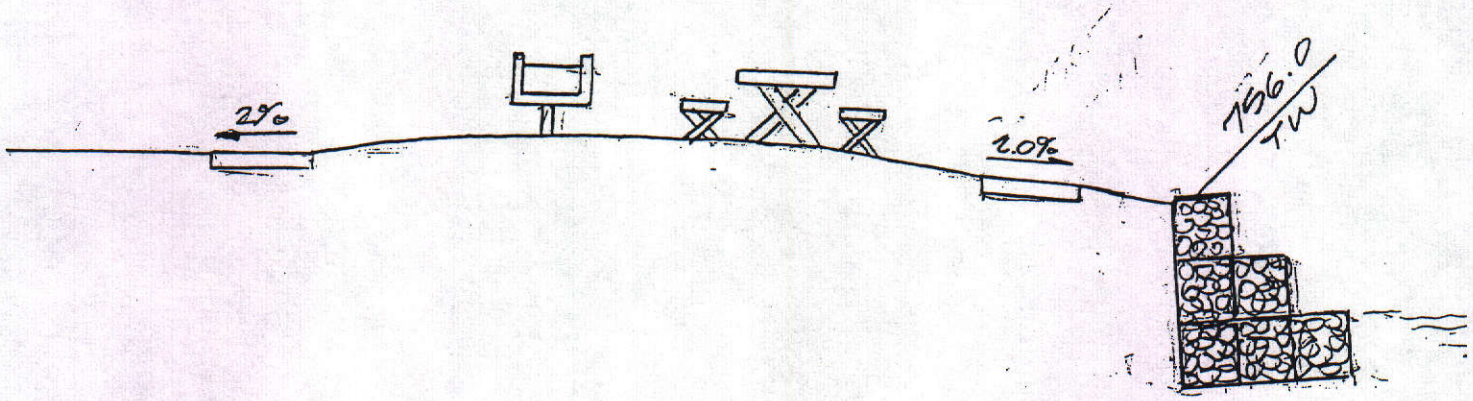
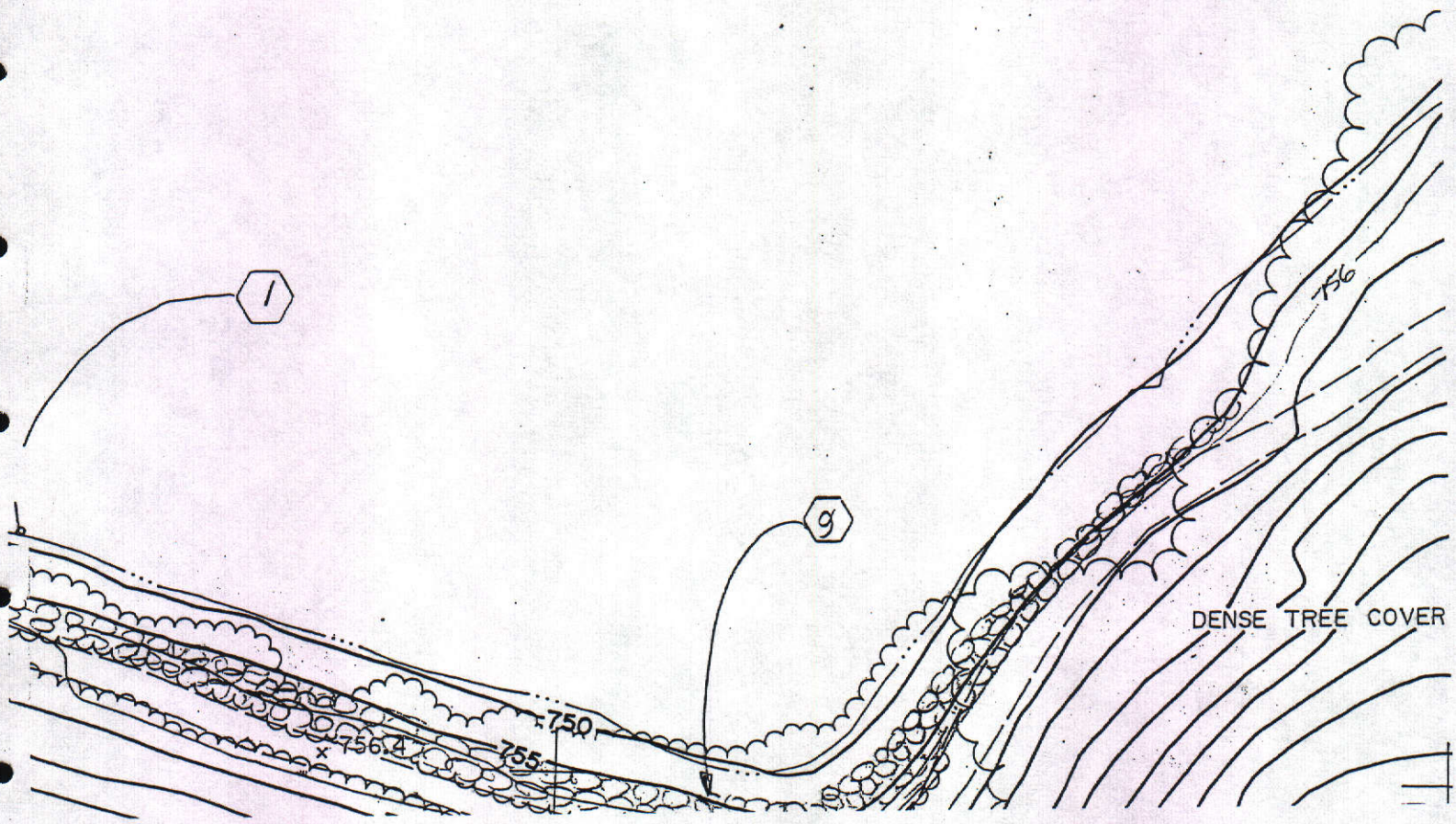
4
3

TYPICAL DETAIL, PROPOSED GABION WALL AT HARVEY'S COVE





Description of Proposed Work for Harvey's Cove Picnic Area

1 REMOVE EXISTING CULVERT AND CONSTRUCT NEW CULVERT. MATCH EXISTING CULVERT SIZE AND TYPE.

2 FILL AND CONTOUR GRADE EXISTING DEBRIS BASIN. DAYLIGHT CULVERT, TYPICAL.

3 CONTOUR GRADE, CUT OR FILL AS NECESSARY.

4 CONSTRUCT GABION ROCK WALL SIZE AND DEPTH TO BE DETERMINED IN FIELD. TOP OF WALL HEIGHT SHALL BE 756.0.

6 CONSTRUCT RAMP LANDING AND RAMP ATTACHMENT TO ADJUST TO FLUCTUATING LAKE LEVEL BUT IN NO CASE SHALL RAMP EXCEED 8.33 % SLOPE.

7 DEMOLISH AND REMOVE EXISTING CONCRETE WALKWAY. CONSTRUCT 6'-0" CONCRETE WALKWAY PER PLAN.

8 MODIFY EXISTING DOCK TO ACCOMMODATE A WATER SURFACE ELEVATION OF 756.0.

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HARVEY'S COVE PICNIC AREA

Engineer's Opinion of Estimated Construction Costs

Item No.	Description	Quantity	Unit	Unit Price	Item Cost
1	Project Safety/Shoring	...	LS	...	$2,000
2	Traffic Control	...	LS	...	$500
3	Dewatering	...	LS	...	$15,000
4	Demolition	...	LS	...	$15,000
5	Import Fill/Compact	560	CY	$15	$8,400
6	Contour Grade	...	LS	...	$4,000
7	Storm Drain Pipe	60	LF	$80	$4,800
8	Gabion Wall	560	CY	$200	$112,000
9	Fishing Pier Abutment	...	LS	...	$10,000
10	Modify Pier	...	LS	...	$5,000
11	6' Conc. Sidewalk	155	SF	$10	$38,500
12	Modify Picnic Area	...	LS	...	$12,000
13	Landscaping	...	LS	...	$3,000
14	Hyroseed	...	LS	...	$500
					$0
					$0
					$0
					$0
					$0
					$0
				Subtotal	$230,700
				Contingency 35%	$80,800
				Total	**$311,500**

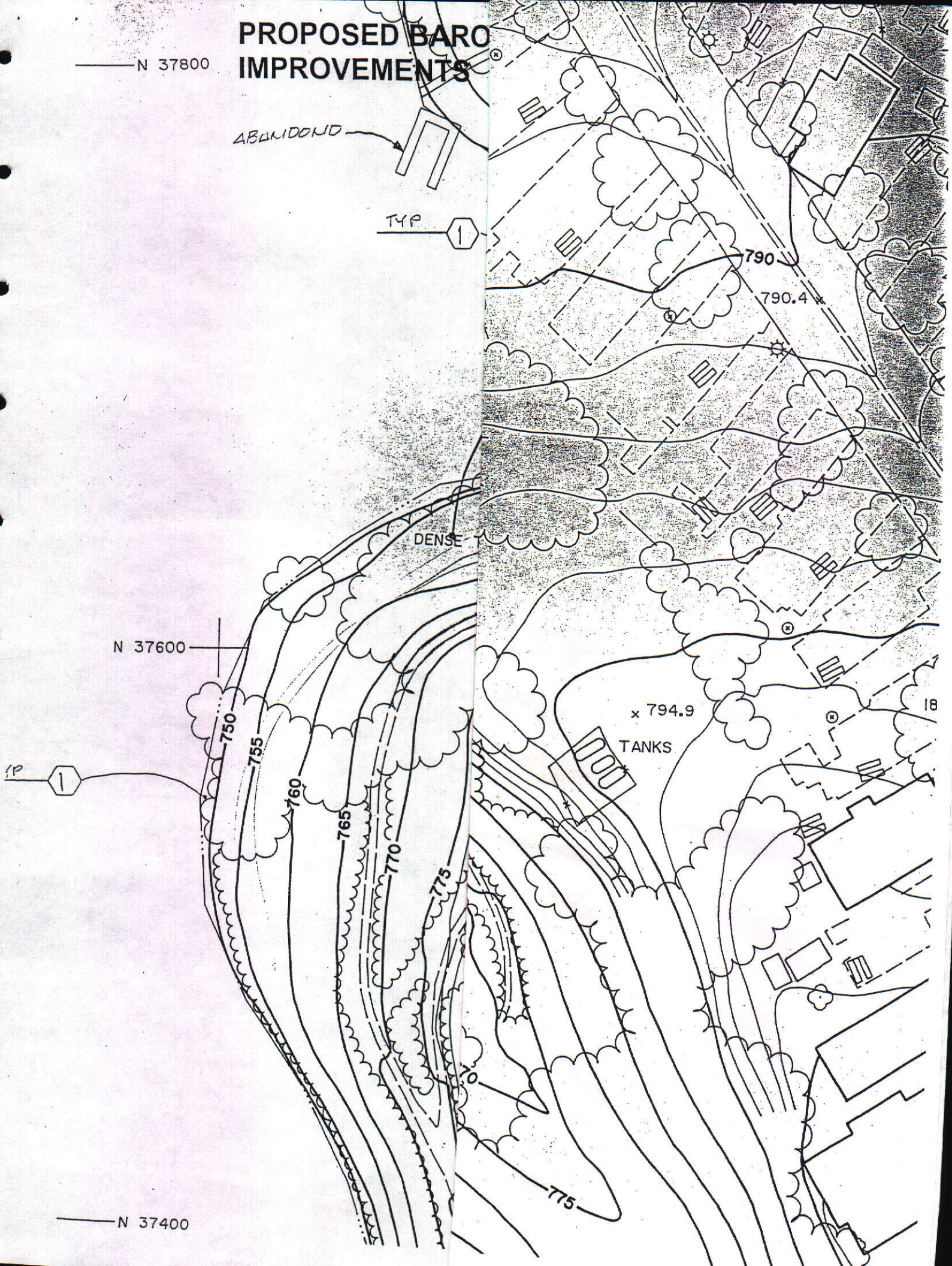
NOTE: This opinion of estimated cost is based on project drawings and cost factors derived from previous projects. Flowers & Associates, Inc. and the Engineer make no warranty, expressed or implied, as to the actual cost of Project improvements resulting from Contractor's bids based on approved Project plans and specifications.

0070Cost08_102000

9. Barona Shores Trail

No photographs available

PROPOSED BARO IMPROVEMENTS



Description of Proposed Work for Barona Shores Trail

1 REMOVE EXISTING TREES BELOW 756.0 ELEVATION. REPLACE ANY REMOVED OAK TREES AT A RATIO OF 10:1. COUNTY PARKS DEPARTMENT TO DETERMINE LOCATIONS OF REPLACEMENT OAKS.

2 CONSTRUCT ACCESS TRAIL PER DETAIL THIS SHEET.

3 CONSTRUCT FOOT BRIDGE AND CONCRETE ABUTMENTS. CONSTRUCT ROCK RIP-RAP SLOPE PROTECTION AROUND ABUTMENTS.

*4 RELOCATE PICNIC AREAS AT THE DIRECTION OF THE COUNTY PARKS DEPARTMENT.

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10/20/00

BARONA SHORES TRAIL

Engineer's Opinion of Estimated Construction Costs

Item No.	Description	Quantity	Unit	Unit Price	Item Cost
1	Project Safety/Shoring	...	LS	...	$2,000
2	Demolition	...	LS	...	$5,000
3	Access Trail	610	LF	$40	$24,400
4	Foot Bridge/Abutments	...	LS	...	$80,000
5	Rock Rip-Rap	...	CY	...	$4,000
6	Hydroseed	...	LS	...	$1,000
					$0
					$0
					$0
					$0
					$0
					$0
					$0
					$0
					$0
					$0
					$0
					$0
					$0
					$0
				Subtotal	$116,400
				Contingency 35%	$40,800
				Total	**$157,200**

NOTE: This opinion of estimated cost is based on project drawings and cost factors derived from previous projects. Flowers & Associates, Inc. and the Engineer make no warranty, expressed or implied, as to the actual cost of Project improvements resulting from Contractor's bids based on approved Project plans and specifications.

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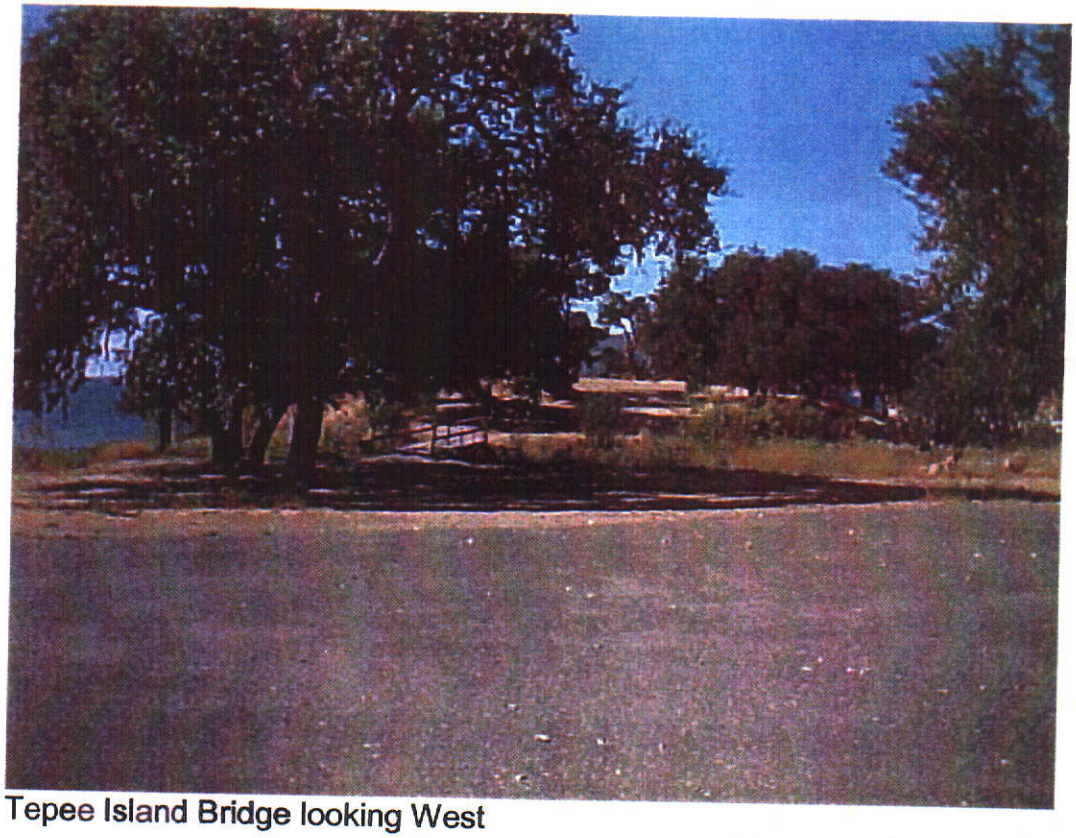
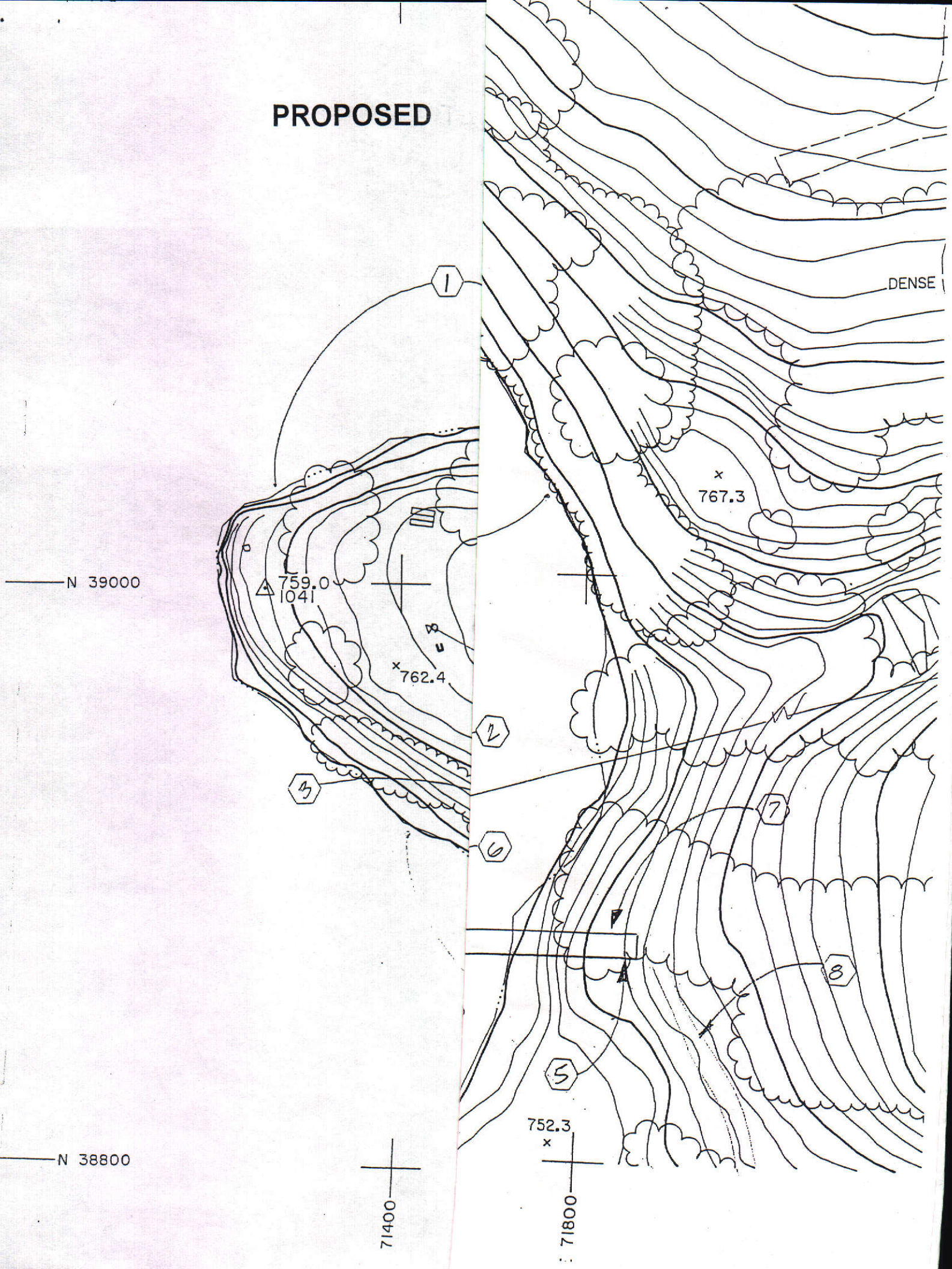
10. Tepee Island Access



Tepee Island Bridge looking West

Tepee Island Bridge looking South

PROPOSED


DENSE
767.3
759.0
1041
762.4
N 39000
N 38800
752.3
71400
71800
1
2
3
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6
7
8

Description of Proposed Work for Tepee Island Access

1 REMOVE EXISTING TREES BELOW 756.0 ELEVATION. REPLACE ANY REMOVED OAK TREE AT 10:1 RATIO. COUNTY PARKS DEPARTMENT TO DETERMINE LOCATIONS FOR REPLACEMENT OAKS.

2 EXISTING WATER LINE TO REMAIN IN APPROXIMATE LOCATION.

3 RELOCATE EXISTING PICNIC TABLES BELOW 756.0 ELEVATION TO HIGHER GROUND AT THE DIRECTION OF THE COUNTY PARKS DEPARTMENT.

4 REMOVE EXISTING FOOT BRIDGE, CONTACT COUNTY PARKS DEPARTMENT FOR DIRECTION. DEMOLISH AND REMOVE CONCRETE ABUTMENTS. FILL AND COMPACT VOIDS AND HYDROSEED WITH NATIVE SEED MIX.

5 STABILIZE EXISTING SOIL AND CONSTRUCT CONCRETE ABUTMENT FOR FOOT BRIDGE. CONSTRUCT ROCK RIP RAP FOR SLOPE PROTECTION FROM ABUTMENT TO SHORELINE.

6 CONSTRUCT FOOT BRIDGE. DESIGN AND TYPE TO BE DETERMINED BY COUNTY PARKS DEPARTMENT AND STRUCTURAL ENGINEER.

7 REMOVE EXISTING TREES ENCROACHING IN BRIDGE AND ABUTMENT LOCATION AND CONSTRUCTION. ANY OAK TREE REMOVED SHALL BE REPLACED AT A RATIO OF 10:1. COUNTY PARKS DEPARTMENT TO DETERMINE LOCATION OF REPLACEMENT OAKS.

8 CONSTRUCT ACCESS TO EXISTING PARKING AREA.

Flowers& Associates, Inc.
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10/20/00

TEPEE ISLAND ACCESS

Engineer's Opinion of Estimated Construction Costs

Item No.	Description	Quantity	Unit	Unit Price	Item Cost
1	Project Safety/Shoring	...	LS	...	$2,000
2	Demolition	...	LS	...	$10,000
3	Footbridge/Abutments	...	LS	...	$175,000
4	Rock Rip-Rap	...	LS	...	$5,000
5	Access Path - 5'	140	LF	$40	$5,600
6	Hydroseed	...	LS	...	$1,000
					$0
					$0
					$0
					$0
					$0
					$0
					$0
					$0
					$0
					$0
				Subtotal	$198,600
				Contingency 35%	$69,600
				Total	**$268,200**

NOTE: This opinion of estimated cost is based on project drawings and cost factors derived from previous projects. Flowers & Associates, Inc. and the Engineer make no warranty, expressed or implied, as to the actual cost of Project improvements resulting from Contractor's bids based on approved Project plans and specifications.

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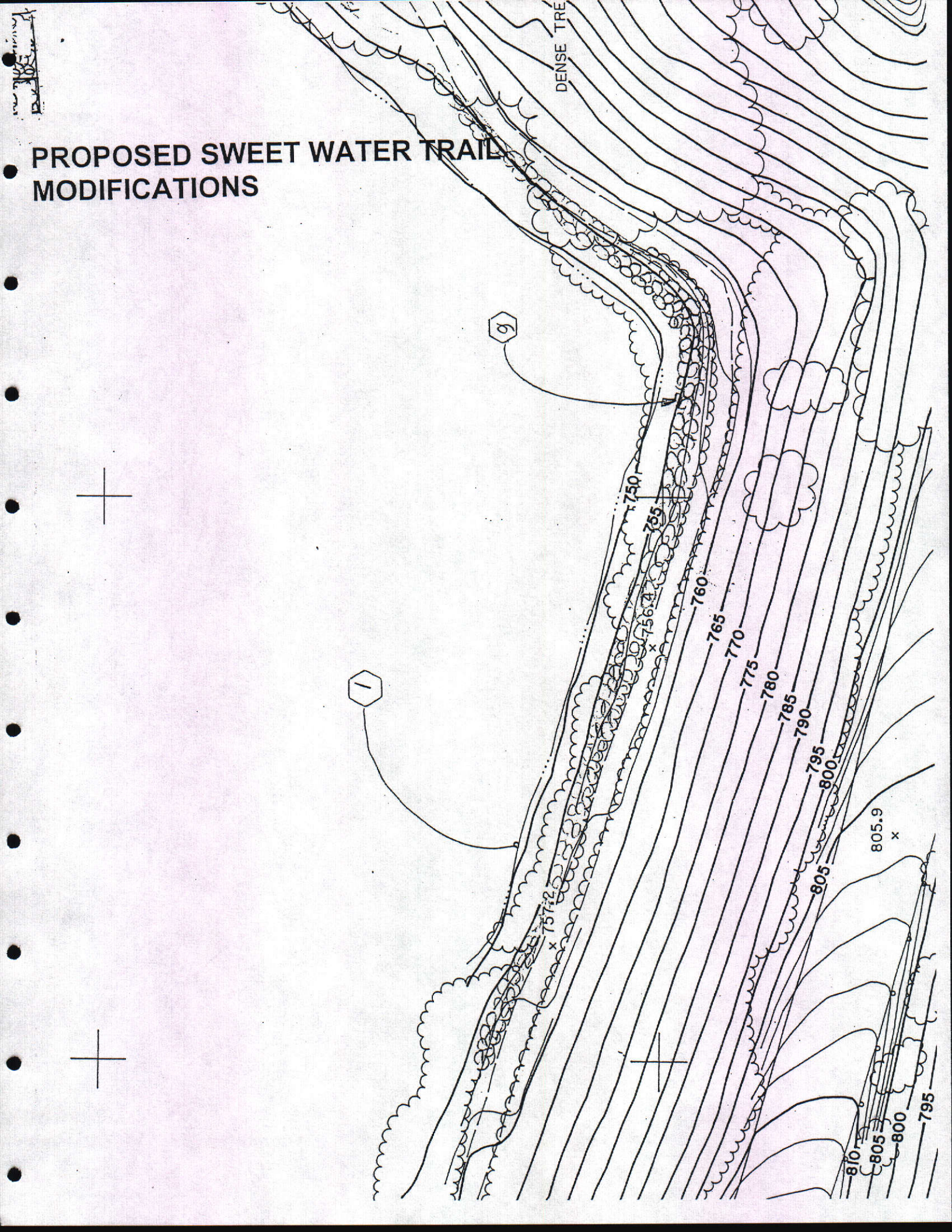
11. Sweet Water Trail

No photographs available

PROPOSED SWEET WATER TRAIL MODIFICATIONS



Description of Proposed Work for Sweet Water Trail

1 REMOVE EXISTING TREES BELOW 756.0 ELEVATION. REPLACE ANY REMOVED OAK TREES AT A RATIO OF 10:1. COUNTY PARKS DEPARTMENT TO DETERMINE LOCATIONS OF REPLACEMENT OAKS.

9 CONSTRUCT ROCK RIP-RAP REVETMENT.

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SWEET WATER TRAIL

Engineer's Opinion of Estimated Construction Costs

Item No.	Description	Quantity	Unit	Unit Price	Item Cost
1	Project Safety/Shoring	...	LS	...	$5,000
2	Rock Rip-Rap	13,200	SF	$20	$264,000
3	Hydroseed	...	LS	...	$1,000
4	Trail Repair	...	LS	...	$10,000
					$0
					$0
					$0
					$0
					$0
					$0
					$0
					$0
					$0
					$0
				Subtotal	$280,000
				Contingency 35%	$98,000
				Total	**$378,000**

NOTE: This opinion of estimated cost is based on project drawings and cost factors derived from previous projects. Flowers & Associates, Inc. and the Engineer make no warranty, expressed or implied, as to the actual cost of Project improvements resulting from Contractor's bids based on approved Project plans and specifications.

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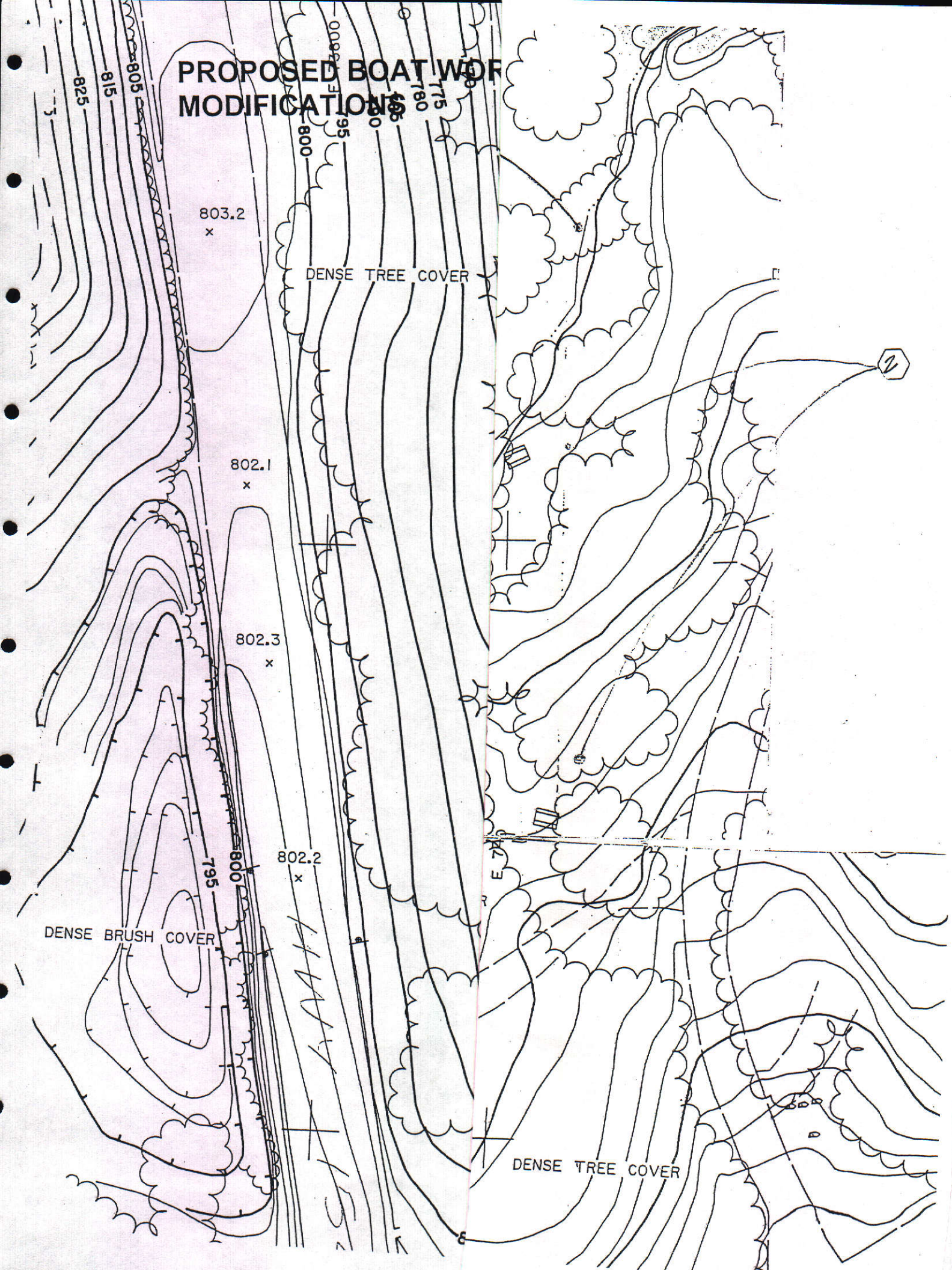
12. Boat Works Shop

Boat Works Shop looking North

Boat Works Shop looking West

PROPOSED BOAT WOR
MODIFICATIONS



Description for Proposed Work for Boat Works Shop

1 REMOVE EXISTING TREES BELOW 756.0 ELEVATION. REPLACE ANY REMOVED OAK TREES AT A RATIO OF 10:1. COUNTY PARKS DEPARTMENT TO DETERMINE LOCATIONS OF REPLACEMENT OAKS.

2 RELOCATE EXISTING PICNIC AREA LOCATED BELOW 756.0 ELEVATION. COUNTY PARKS DEPARTMENT TO DETERMINE LOCATIONS.

3 CONSTRUCT GABION WALL WITH A TOP WALL ELEVATION OF 758.5. CONSTRUCT EARTHEN ACCESS RAMP CONTOUR GRADE IN FRONT OF GABION WALL. REGRADE PARKING AREAS AS SHOWN ON PLANS. REPLACE ANY REMOVED OAK TREES AT A 10:1 RATIO. COUNTY PARK DEPARTMENT TO DETERMINE LOCATIONS FOR REPLACEMENT OAKS.

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BOATWORKS SHOP

Engineer's Opinion of Estimated Construction Costs

Item No.	Description	Quantity	Unit	Unit Price	Item Cost
1	Project Safety/Shoring	...	LS	...	$2,000
2	Demolition	...	LS	...	$10,000
3	Import Fill/Compact	1,070	CY	$15	$16,050
4	Contour Grading	...	LS	...	$3,000
5	Earth Ramp	...	LS	...	$3,000
6	Gabion Rock Wall	280	CY	$200	$56,000
7	Dewatering	...	LS	...	$5,000
8	Hydroseed	...	LS	...	$5,000
					$0
					$0
					$0
					$0
					$0
					$0
					$0
					$0
					$0
				Subtotal	$100,050
				Contingency 35%	$35,100
				Total	**$135,150**

NOTE: This opinion of estimated cost is based on project drawings and cost factors derived from previous projects. Flowers & Associates, Inc. and the Engineer make no warranty, expressed or implied, as to the actual cost of Project improvements resulting from Contractor's bids based on approved Project plans and specifications.

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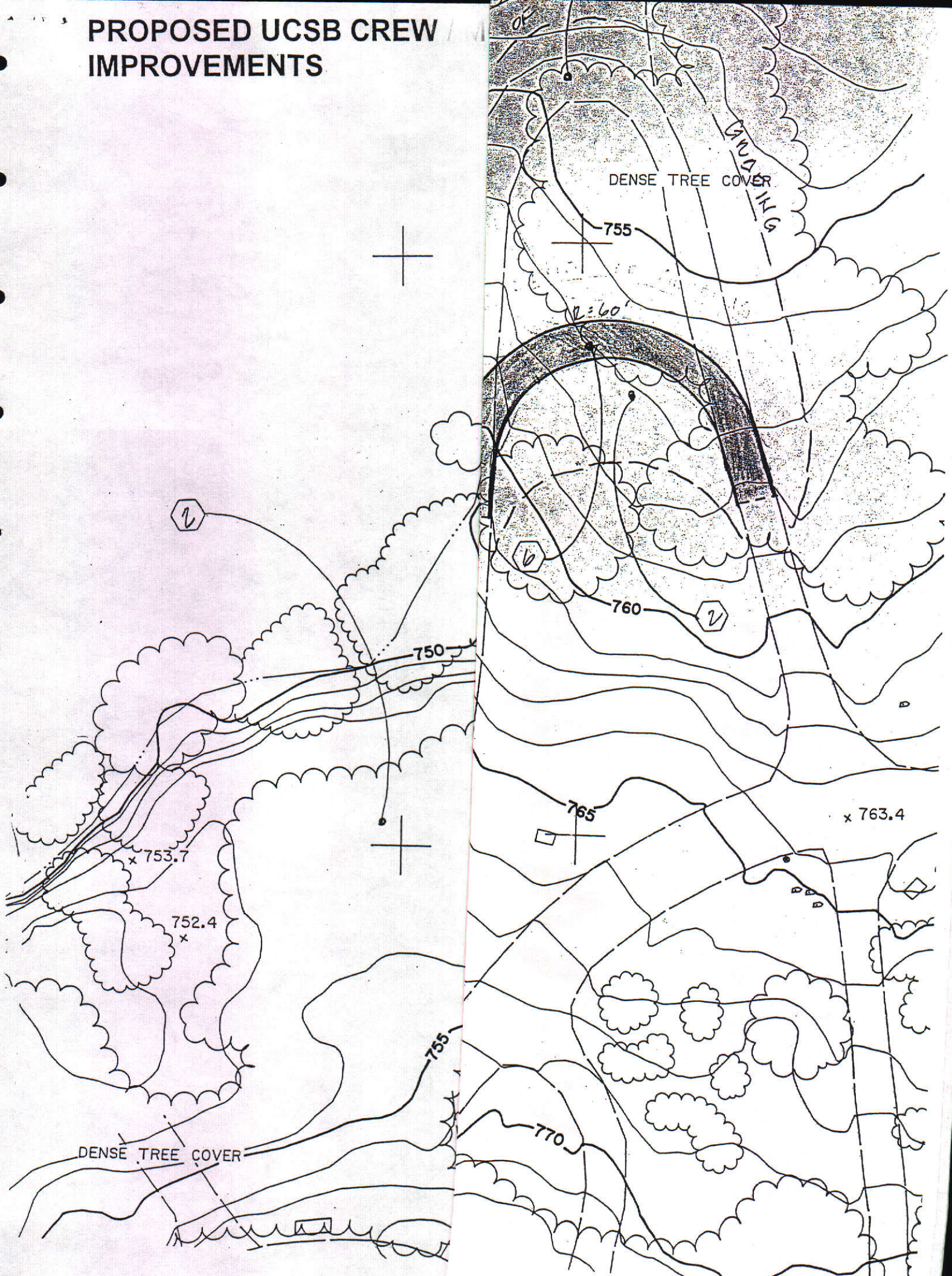
13. UCSB Crew / Overflow Area

UCSB Crew Facilities looking South

Typical Picnic Area in Overflow Area

PROPOSED UCSB CREW IMPROVEMENTS



Description of Proposed Work for UCSB Crew / Overflow Area

1 REMOVE EXISTING TREES BELOW 756.0 ELEVATION. REPLACE ANY REMOVED OAK TREES AT A RATIO OF 10:1. COUNTY PARKS DEPARTMENT TO DETERMINE LOCATIONS OF REPLACEMENT OAKS.

2 RELOCATE EXISTING PICNIC TABLES AND BBQ PITS PER COUNTY PARKS DEPARTMENT.

3 REGRADE AREA AS SHOWN ON PLAN TO PROVIDE UCSB CREW ACCESS TO FLOATING DOCK FACILITIES.

4 MODIFY EXISTING FLOATING DOCK TO FLOAT AT A MAXIMUM ELEVATION OF 756.0. PROVIDE FOR LAKE LEVEL FLUCTUATION.

5 DEMOLISH AND REMOVE EXISTING ACCESS ROAD TO LIMITS SHOWN ON PLAN. REGRADE AREA AND HYDROSEED WITH NATIVE SEED MIX.

6 CONSTRUCT AC PAVEMENT ROAD. REGRADE AS NECESSARY. HYDROSEED WITH NATIVE SEED MIX. REPLACE ANY REMOVED OAK TREES AT A 10:1 RATIO.

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10/20/00

UCSB CREW / OVERFLOW AREA

Engineer's Opinion of Estimated Construction Costs

Item No.	Description	Quantity	Unit	Unit Price	Item Cost
1	Project Safety/Shoring	...	LS	...	$1,000
2	Traffic Control	...	LS	...	$500
3	Demolition	...	LS	...	$10,000
4	Import Fill/Compact	320	CY	$15	$4,800
5	Contour Grading	...	LS	...	$4,000
6	1.0 Subgrade Prep	2,800	SF	$1	$2,800
7	.5' CL II Agg. Base	53	CY	$45	$2,835
8	.25' AC Pavement	51	Ton	$50	$2,550
9	Redwood Header	370	LF	$10	$3,700
10	Modify Exist. Dock	2	EA	$5,000	$10,000
11	Landscape/Irrigation	...	LS	...	$10,000
					$0
					$0
					$0
					$0
					$0
				Subtotal	$52,185
				Contingency 35%	$18,300
				Total	**$70,485**

NOTE: This opinion of estimated cost is based on project drawings and cost factors derived from previous projects. Flowers & Associates, Inc. and the Engineer make no warranty, expressed or implied, as to the actual cost of Project improvements resulting from Contractor's bids based on approved Project plans and specifications.

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