RIVERSIDE COUNTY FLOOD CONTROL AND
WATER CONSERVATION DISTRICT
RIVERSIDE, CALIFORNIA

REPORT ON

MASTER DRAINAGE PLAN
FOR
PARAMOUNT ESTATES

ZONE ONE

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AND WATER CONSERVATION DISTRICT

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PURPOSE

The purpose of this report is to investigate and evaluate the drainage problems of the Paramount Estates area and to develop an economical drainage plan that considers flood protection of both existing development and potential future development.

The Paramount Estates watershed is located northwest of the community of Rubidoux. It is bounded on the south by Highway 60 and on its remaining perimeter by natural divides within the Jurupa Mountains.

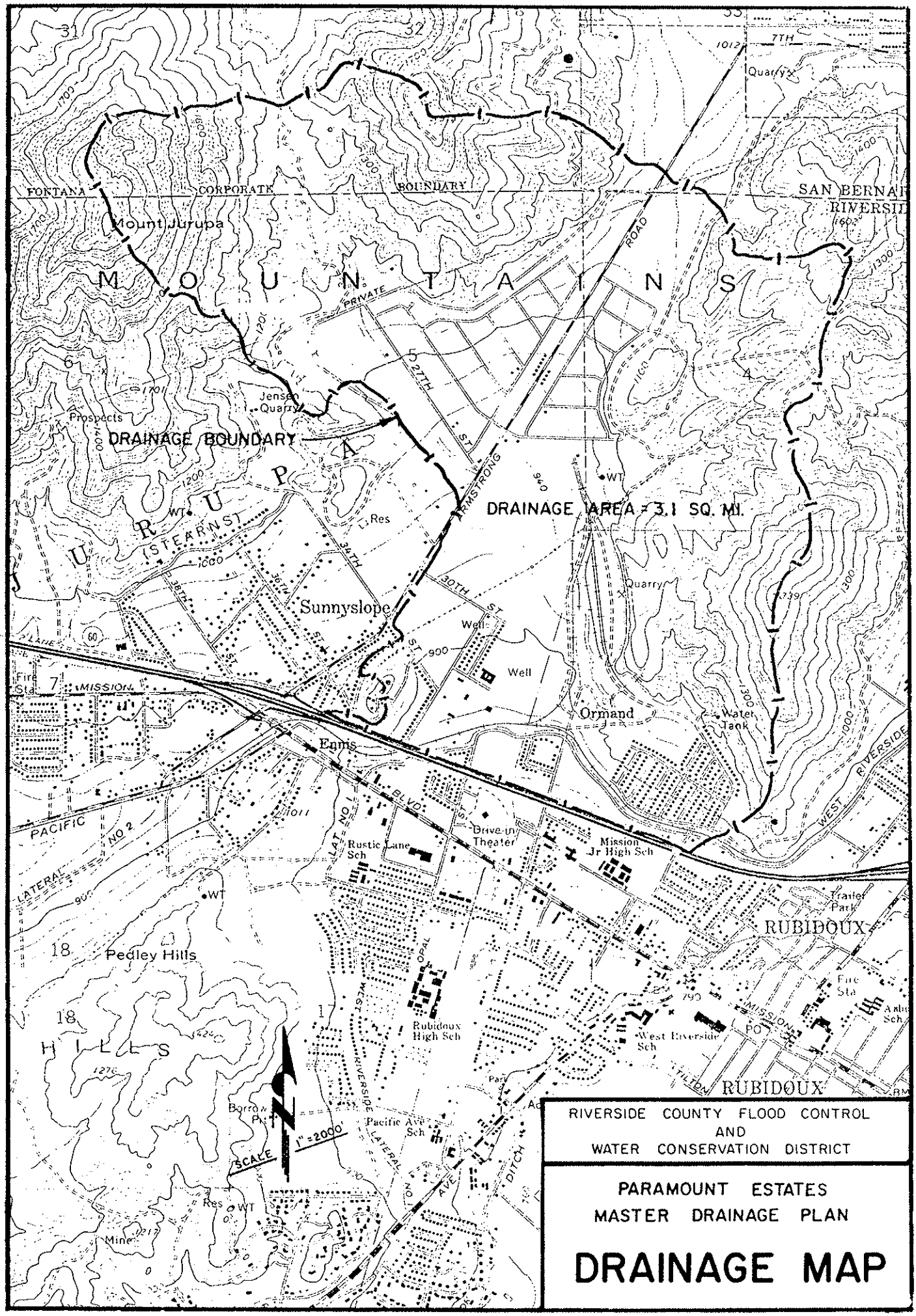
The plan presented herein, when implemented, will provide adequate flood protection to the community and will serve as a quide for the long term construction scheduling of the primary drainage facilities. The plan will also act as a guide for the location and sizing of local drainage facilities to be constructed by developers and others within the area.

It should be noted by the reader that the cover of this report clearly states it is a master plan and, therefore, it should be used with this in mind. Simply stated, this plan is an overview, a study of the drainage problems that exist in a specific geographical area, and a conceptual solution to those problems. As stated elsewhere in this report, the selection of the facilities presented in this plan is based on engineering and economic considerations and is by no means the only solution.

The alignment and location of the facilities proposed in this Master Drainage Plan are general; precise facility location will be dictated by conditions and other factors existing at the time of design. Similarly, the sizing information shown on the plates in this report as well as on the enclosed map is preliminary. A more detailed analysis performed at the design stage will determine final sizing.

SCOPE

The drainage area covered by this plan is approximately 3.1 square miles, and ranges from moderately flat valley terrain to foothills with relatively steep slopes (See Drainage Map Page 2).



RIVERSIDE COUNTY FLOOD CONTROL AND WATER CONSERVATION DISTRICT

PARAMOUNT ESTATES
MASTER DRAINAGE PLAN

DRAINAGE MAP

The scope of this master plan includes:

1. Determination of the quantity and points of concentration of storm runoff in the area.

2. Preparation of a drainage area map.

3. Determination of the location, size and capacity of the proposed drainage structures.

4. Investigation of alternate routes and methods as a basis for selecting the most economically and engineeringly sound plan.

5. Preparation of preliminary design plans and supporting cost estimates.

GENERAL DISCUSSION

This report provides a Master Drainage Plan for the Paramount Estates area. The proposed facilities in the plan include several open channels and underground storm drains. This proposed system will safely convey storm runoff through the community, ultimately outletting into the District's Sunnyslope Channel.

At present, during periods of runoff, the floodwaters, silt and other debris produced in the hills impact the community, causing property damage and leaving roads impassible.

The Master Drainage Plan presented herein provides an economical method of collecting and conveying storm runoff through the study area. The proposed drainage structures will also provide an outlet for local drainage facilities built by developers and others as growth occurs in the area. When completed, the facilities will provide the area with improved drainage and protection from the once in 100 year flood.

CRITERIA

The underground storm drain facilities shown in this plan are proposed when the construction of open channels is not feasible, either because of topographic constraints or existing development. Line A-1, Line A-4 and the underground portion of Line B are sized to convey the flow generated by a 10 year frequencey storm. During a 100 year event, the excess flow will be carried in the street section. All other underground drains within the plan are sized to convey the 100 year discharge. This is necessitated when the quantity of water tributary to the system is too large for the street to convey or when

containment of the entire 100 year flow is needed to protect existing structures. Where possible, storm drains proposed in this plan are located in existing street or future street rights of way.

Open channels are generally considered the only economically feasible means of transporting large flood flows for any appreciable distance and are used where possible. In addition to their role as flow transporters, the open channels provide an outlet for the underground facilities proposed in this plan as well as local drainage facilities built by developers and others. All open channels proposed in this plan are designed to carry the runoff from a 100 year frequency storm.

The alignments and locations of all channels and drains are based on hydraulic efficiency, the ability to drain tributary areas, and economics.

HYDROLOGY

Both the Synthetic Unit Hydrograph Method and the Modified Rational Method were used to determine all design discharges and storm volumes for the plan. Methodology and supportive data can be found in "The Riverside County Flood Control and Water Conservation District Hydrology Manual" dated April 1978.

EXISTING FACILITIES

Several drainage facilities currently exist within the study area. They include: (1) Sunnyslope Channel, Stage V, (2) Sunnyslope Freeway Lateral, (3) culverts at several locations under the Union Pacific Railway tracks and (4) an asphalt interceptor "V" ditch along the rear of the homes on Paramount Drive. With the exception of the "V" ditch, all existing facilities will be incorporated into the proposed plan. The "V" ditch is in very poor condition and nonfunctional. It is beyond the point of repair and will be replaced with the proposed Line E.

RECOMMENDED IMPROVEMENTS

The recommended improvements discussed below are shown on the enclosed map found at the back of this report. Supporting data for all proposed facilities is available for review at the Riverside County Flood Control and Water Conservation District office. Estimated construction costs shown in Table I and on the enclosed map include right of way costs and 30% for engineering and administration contingencies.

Lines A, A-1, A-2, A-3 and A-4

Line A is the upstream extension of the Sunnyslope Channel and is the primary outlet for the plan. The line begins at the intersection of Armstrong Road and Sierra Avenue and proceeds a short distance downstream to its confluence with Line A-2. At this point the discharge increases from 610 cfs (cubic feet per second) to 1300 cfs. The channel continues downstream as a concrete lined trapezoidal section on an alignment compatible with the layout of tentative Tract 11936. The bottom width of the channel is 5 feet with a depth varying from 6 to 7.5 feet.

Line A-1 begins at the intersection of 34th Street and Florine Avenue as a 30 inch RCP (reinforced concrete pipe) carrying a 10 year discharge of 30 cfs and then easterly in 33rd Street to its outlet at Line A. The maximum pipe size is 57 inches with a discharge rate of 74 cfs.

Line A-2 is a lateral extending from near the upstream terminus of Line A to the area of Armstrong Road and Karen Lane. Its lower reach, designed for a 100 year discharge of 810 cfs, is a rectangular channel 12 feet wide and 6 feet deep. As the line proceeds upstream and enters Armstrong Road, a 12 foot wide by 6 foot high box culvert is used. At Karen Lane the drain forks, with Line A-2 proceeding east in Karen Lane to Rorimer Drive and Line A-3 proceeding westerly in Karen to Gail Drive. Both lines are box culverts with 100 year discharge carrying capacity.

Line A-4 is a 10 year storm drain in 30th Street extending from Line A to a proposed street within tentative Tract 11936. It receives its design discharge of 57 cfs exclusively from the proposed tract.

Line B

Line B has its upstream beginning within tentative Tract 15047. The proposed underground storm drain in combination with the street capacity is capable of conveying the 100 year discharge from the surrounding steep hills to the westerly edge of the tract. (Should the tract not materialize, an open channel along with an inlet at its upstream terminus, would replace the storm drain.) Line B, westerly of Tract 15,047, is a concrete lined trapezoidal channel, capable of conveying its 100 year discharge of 290 cfs to Line A.

Lines C and C-1

At the upstream terminus of both lines C and C-1 there exist culverts under the Union Pacific's tracks. These culverts accept drainage from the lumber yard and discharge it directly into the West Riverside Canal, which is seen as an undesirable situation. Lines C and C-1 will connect to the culverts, pass under the canal and deliver the flows via a storm drain and open channel to the Sunnyslope Channel at Highway 60.

Line D

Line D is very similar in concept to Lines C and C-1. Line D will extend a culvert that now outlets into the canal, downstream to the Sunnyslope Freeway Lateral.

Line E

When the Paramount Estates tract was developed (mid-1950's), an asphalt "V" ditch was constructed along the top of the cut slope at the rear of the lots on Paramount Drive to intercept runoff from the hills. The easement in which the ditch is located was offered for dedication to the County but never accepted, and therefore, maintenance of the ditch remains with the individual property owners. At this point in time the ditch has been washed away in certain areas and filled in and blocked by fences in other areas. The ditch is no longer serving its original purpose and it is not feasible to repair.

The proposed Line E will replace the "V" ditch. It consists of a block wall and collector channel, as well as two outlet channels that convey the flow out to Paramount Drive. One other outlet channel and a gunited inlet are also proposed. A small diversion ditch is also a part of the Line E proposal and will minimize the length of collector channel needed.

ALTERNATIVE STUDIES

In developing this Master Drainage Plan, several alternates were developed and studied for their feasibility, both hydraulically and economically.

Several alternates for Line B were studied. One was a retention dam just north of tentative Tract 15047. The intent of the dam was to temporarily store storm runoff and then release it at a controlled, very low rate, thus eliminating the need for downstream facilities. The proposed Line B is slightly more expensive than the dam proposal. However, the dam would have higher maintenance costs and would be difficult to lay out compatibly with Tract 15047. An alternate alignment for Line B, down Pacific Avenue, was also investigated, however, it proved to be more costly than the proposed line.

One alternative investigated for Line C was a more northerly alignment of the channel, just south of Canal Street. There were some grade difficulties encountered with this alignment and it was discarded as a feasible alternate.

The Paramount Estates Master Drainage Plan, as presented herein, is the coalescence of the best alternatives explored.

CONCLUSIONS

Based on the studies and investigations made for this report, it is concluded that:

1. The Paramount Estates area has experienced serious flooding problems in the past. As growth in the area continues to increase so will these problems. A more orderly pattern of development can safely occur with the construction of the proposed facilities.

2. A drainage system is required to safely convey storm runoff through the area with the least interruption to public services. The Master Drainage Plan presented in this report is such a system and is the most economical of the alternatives studied.

3. The proposed plan lends itself to stage construction as funds become available.

4. The total cost of the recommended improvements, including right of way, engineering, contingencies and administration is estimated to be $2,403,000 (See Table I).

RECOMMENDATIONS

It is recommended that:

1. The Master Drainage Plan as set forth herein be approved by the Board of Supervisors of the Riverside County Flood Control and Water Conservation District as part of the overall master plan for the County.

2. The Master Drainage Plan as set forth herein be used as a guide for all future developments in the study area and that such developments be required to conform to the plan insofar as possible.

3. The right of way required for the plan be protected from encroachment.

TABLE I

PARAMOUNT ESTATES MASTER DRAINAGE PLAN

COST SUMMARY

FACILITY	CONSTRUCTION COST	30% ENGINEERING & ADMINISTRATION	RIGHT OF WAY	TOTAL
Line A	$ 597,000	$ 179,000	$ 216,000	$ 993,000
Line A-1	200,000	60,000	-0-	260,000
Line A-2	275,000	83,000	8,000	366,000
Line A-3	57,000	17,000	-0-	74,000
Line A-4	57,000	17,000	-0-	74,000
Line B	249,000	75,000	36,000	360,000
Line C	91,000	27,000	16,000	134,000
Line C-1	12,000	3,000	-0-	15,000
Line D	16,000	5,000	-0-	21,000
Line E	57,000	17,000	32,000	106,000
TOTAL	$1,611,000	$ 483,000	$ 308,000	$2,403,000