

**RIVERSIDE COUNTY FLOOD CONTROL AND
WATER CONSERVATION DISTRICT
RIVERSIDE, CALIFORNIA**

**MASTER DRAINAGE PLAN
FOR
THE NORTHWEST HEMET AREA**

ZONE FOUR

JAN. 1985

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PURPOSE

The purpose of this report is to investigate and evaluate the drainage problems of the Northwest Hemet area and to develop an economical drainage plan which provides flood protection for both existing and future development.

The Northwest Hemet area is located generally north of the city of Hemet and west of the city of San Jacinto. The area is bounded roughly by Lyon Avenue, Menlo Avenue, Cawston Avenue, and the Ramona Expressway. Two other District master drainage plans share portions of their boundaries with this plan. They are the West Hemet and San Jacinto Master Drainage Plans which border on the south and east respectively.

The plan presented herein will provide adequate flood protection to the area when implemented and will serve as a guide for the long term construction scheduling of the primary drainage facilities. The plan will also act as a planning guide for locating 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, should be read and 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 locations will be dictated by conditions and other factors existing at the time of design. Similarly, the sizing information shown 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 6.5 square miles in size. For the most part, it consists of flat valley terrain sloping gently to the northwest. The extent of the studies establishing 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 facilities.

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 Northwest Hemet area. The plan consists of a system of open channels and underground storm drains. The proposed facilities will carry storm runoff through this area to outlet in the San Jacinto River flood plain.

At present, during periods of runoff, floodwaters, silt and other debris impact a wide area of prime agricultural land and the developing community, causing property damage and leaving roads and streets impassable.

As development continues to increase in the southern portion of the watershed, these problems are expected to become worse, thus requiring a greater need for flood protection.

The master drainage plan presented herein provides an economical method of collecting and conveying storm runoff through the study area. The proposed drainage system 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

All underground storm drains proposed in this plan are intended to collect local urban runoff and most are sized for the 10 year frequency storm. They are intended to be located in either existing or anticipated future street rights of way.

Open channels are proposed when the discharge is large and the construction and right of way costs for a channel prove to be less than the cost of an underground storm drain. Where open channels are provided, they are designed to carry the runoff from a 100 year frequency storm.

In a few instances, circumstances have dictated that an underground drain be sized for the full 100 year flow instead of only the 10 year capacity.

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

HYDROLOGY

Two methods of hydrology were used in this plan to determine design discharges. For smaller tributary areas, up to 500 acres in size, the Modified Rational Hydrology Method was used. The Synthetic Unit Hydrograph Method was used for larger areas. The design discharges used in sizing all future appurtenant facilities in the study area should be determined by one of these two methods.

Methodology and supportive data for the rational and synthetic hydrology can be found in the "Riverside County Flood Control and Water Conservation District Hydrology Manual" dated April 1978.

Future land use assumptions used throughout the plan were generally based on the Riverside County "Comprehensive General Plan" dated 1984.

EXISTING FACILITIES

With the exception of some minor road culverts, there are no existing flood control facilities within the study area.

The San Jacinto Master Drainage Plan, approved in 1982 does propose the construction of a facility within the boundaries of this plan. That facility, however, is proposed as a small earthen channel, whose purpose it is to outlet flows back into the existing flood plain adjacent to the San Jacinto Reservoir. Line E of this plan is intended to eliminate this outletting channel. Instead, flows exiting the San Jacinto area will be fully contained and transported through the Northwest Hemet area via Line E.

RECOMMENDED IMPROVEMENTS

The recommended improvements discussed briefly below are shown on the enclosed map found at the back of this report. Supporting data for all proposed facilities is available at the Riverside County Flood Control and Water Conservation District office. Costs shown on the enclosed map include rights of way and 31% for engineering, administration and contingencies (see Table I, Cost Summary). This map not only shows proposed alignments, but pertinent preliminary size information as well as design flow rates.

The design engineer should be aware that during preparation of preliminary plan and profile drawings, a detailed utility search was not completed. This means that, while major known facilities were dealt with, a more thorough search may reveal utilities that will necessitate minor alignment or size changes, or utility relocations.

OPEN CHANNELS

The open channels proposed in this plan are trapezoidal shaped facilities with concrete paving on the sides and bottom. The sides slope upward from the bottom at a rate of one foot vertically for every 1.5 feet horizontally. The channels in this plan range in size from a bottom width of 3 feet to 12 feet and in depth from 4 feet to 11 feet. In most cases, where open channels are proposed, the right of way required will accommodate the channel as well as one or two maintenance roads.

UNDERGROUND STORM DRAINS

The underground drains proposed in the plan consist of reinforced concrete pipe (RCP). The cost of the drains shown in Table I includes manholes and catch basins in addition to the in place cost of the pipe. Manholes are located as necessary with a maximum spacing of 500 feet. Catch basins are not specifically located but the total number of lineal feet is computed and costed.

ALTERNATIVE STUDIES

In developing this Master Drainage Plan a number of alternatives were developed and studied for their hydraulic and economic feasibility.

For the most part, the alternatives studied dealt with the southern portions of the plan area. The alignment and facility choices in the northern portion of the area are very limited because of topographical constraints. The Metropolitan Water District of Southern California (M.W.D.) has several aqueduct facilities traversing the area. These facilities are in the form of either buried pipes or leveed channels. The location of the siphons across these facilities in conjunction with only minimal ground slope has limited the alternatives available in the northern section of the plan.

Probably the major alternative considered for this plan was the incorporation of a retention basin. Because of the flatness of the area and the accompanying outlet problems, the necessary volume of the basin could only be achieved by using a relatively large (30 acre) site. The lack of any feasible undeveloped properties on which to locate the basin forced its dismissal as a viable facility.

Several alternative channel alignments were explored during the preparation of this plan. Alignments studied involved mainly east-west or north-south routes. In virtually all of the alignments studied, the channel construction costs were the same. However, when right of way and severance damage costs were compared, the more desirable alignments became obvious. They are the ones proposed in this report.

In addition to those discussed above, a number of other alternatives were studied and eventually disregarded as either being too costly or not providing adequate protection.

In short, the Northwest Hemet 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 Northwest Hemet area has experienced serious flooding problems in the past. As this area converts from primarily agricultural uses to more urban uses, these damages are expected to increase. A more orderly growth pattern can safely occur with the construction of these 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 feasible 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 rights of way, engineering, contingencies, and administration is estimated to be \$12,594,000.

RECOMMENDATIONS

It is recommended that:

1. The Master Drainage Plan as set forth herein be adopted by the Hemet City Council as part of the overall master plan for the City and be approved by the Riverside County Flood Control and Water Conservation District's Board of Supervisors 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 rights of way required for the plan be protected from encroachment.

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TABLE I
NORTHWEST HEMET MASTER DRAINAGE PLAN

COST SUMMARY

<u>FACILITY</u>	<u>CONSTRUCTION * COST</u>	<u>RIGHT OF WAY</u>	<u>TOTAL</u>
LINE A-1	1,515,000		1,515,000
LINE A-2	323,000		323,000
LINE A-3	163,000		163,000
LINE A-4	176,000		176,000
LINE A-5	224,000		224,000
LINE B-1	1,004,000		1,004,000
LINE B-2	390,000		390,000
LINE B-3	367,000		367,000
LINE B-4	166,000		166,000
LINE B-5	165,000		165,000
LINE C	1,088,000	186,000	1,274,000
LINE D	2,873,000	504,000	3,377,000
LINE E	2,366,000	492,000	2,858,000
LINE E-1	121,000	21,000	142,000
LINE E-2	379,000	71,000	450,000
TOTAL	<u>\$11,320,000</u>	<u>\$1,274,000</u>	<u>\$12,594,000</u>

* includes 31% for Engineering, Administration and Contingencies