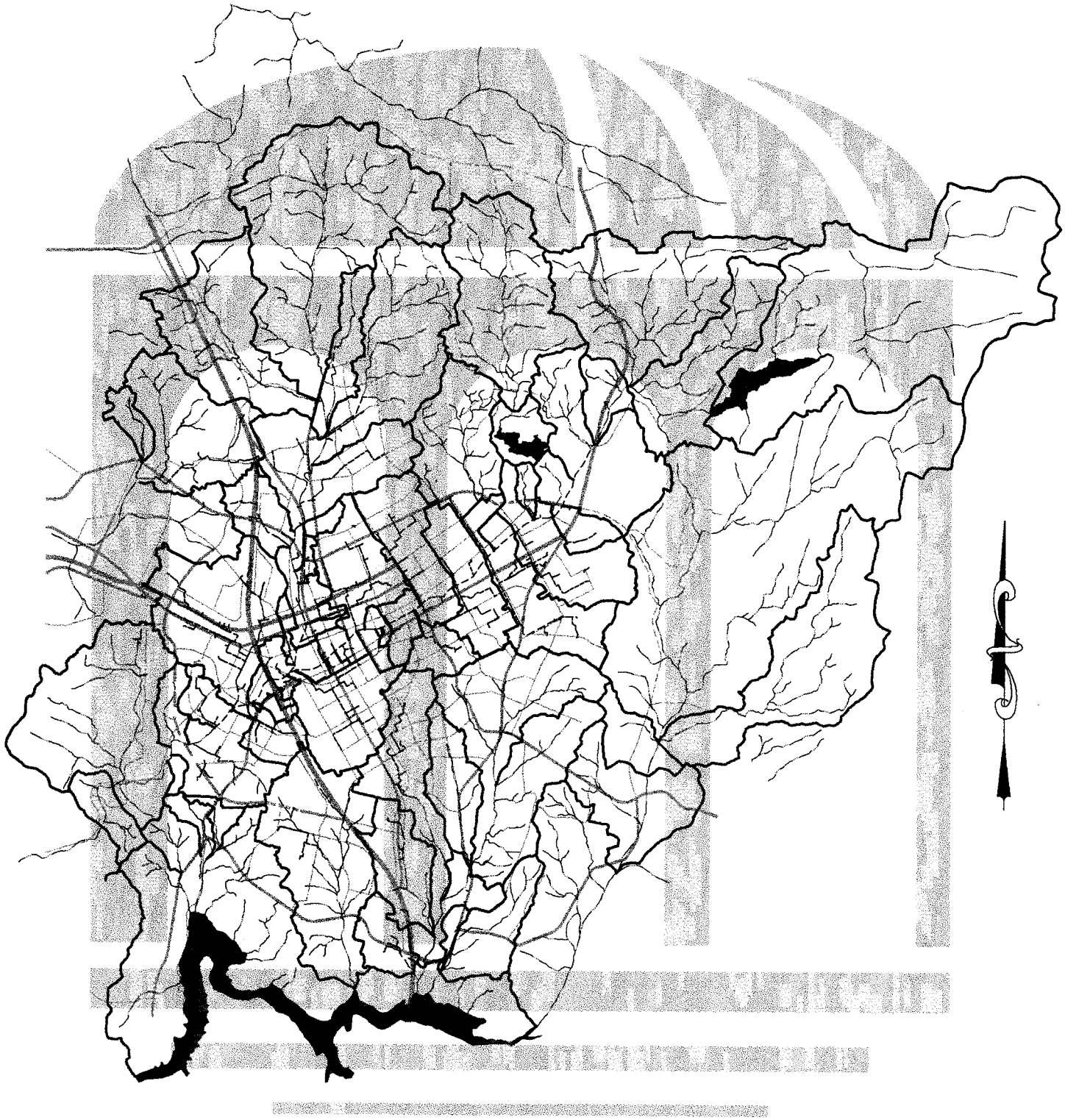
DRAINAGE MASTER PLAN
CITY OF ESCONDIDO, CALIFORNIA



MASSON & ASSOCIATES, INC.
PLANNING ▾ ENGINEERING ▾ SURVEYING

DRAINAGE MASTER PLAN

CITY OF ESCONDIDO

NOVEMBER 1995

CITY OF ESCONDIDO
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Escondido, California 92025
760.839.4651

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CHAPTER 1

EXECUTIVE SUMMARY

A. Goals and Objectives

In August 1993 the City of Escondido initiated the preparation of a Drainage Master Plan for Storm Water Facilities for ultimate development within the General Plan Sphere of Influence.

The purpose of the Drainage Master Plan (DMP) is to:

1. Catalogue and create an electronic data base for all existing storm drainage facilities with a capacity equal to or greater than a 36-inch diameter pipe. Enter the data base into the City G.I.S. database.

2. Study existing drainage facilities and identify any existing critical deficiencies and field review existing known problem areas.

3. Provide a master plan or ultimate facilities plan based on the goals and objectives of the General Plan adopted in June of 1990. Create an electronic database of proposed facilities and input into City G.I.S. database.

4. Incorporate drainage facility studies included in various subarea facility plans previously completed or processed at the time the DMP was initiated.

5. Establish a cost for upgrading the existing system to provide for ultimate development in accordance with the General Plan.

6. Develop a financing plan for construction of ultimate facilities.

7. Provide a brief overview of the FEMA Flood Plan Management Program and the NPDES Storm Water Quality Management Program.

During preparation of the DMP most of the Subarea Facility Plans throughout the city were canceled before completion. There were also many existing drainage fee basins (approximately 20) which during the study of adjacent basins it became apparent that there would be boundary conflicts and inconsistencies with the new study areas. These SFP areas and existing fee basin areas were then added to the scope of work in order to provide a comprehensive city-wide Drainage Master Plan.

Also during the course of the study it became obvious that in order to properly assess the needs of future development an analysis of the existing facilities capacity would be necessary. This analysis provided not only a cost to correct existing deficiencies but also provided a value of excess capacity which may be utilized by ultimate development. This analysis was also added to the scope of work of the Drainage Master Plan.

B. Background

The Drainage Master Plan was prepared based on the updated topographic mapping completed in December 1993. The parcel base used for property lines and street rights-of-way was compiled from Regional Urban Information System (RUIS) data provided through SANDAG.

Existing facilities compilation and proposed facilities sizing and cost estimates were determined through the joint efforts of Williamson Engineers and Masson & Associates, Inc. Existing and proposed facilities mapping was provided by Masson & Associates, Inc. Integration of the existing and proposed facilities data was accomplished through the combined efforts of Entranco Engineers, Inc., Masson & Associates, Inc. and the City of Escondido Engineering Department. The section on financing alternatives and recommendations was provided by Willdan Associates.

The study area covered by the Drainage Master Plan includes approximately 80 square miles covered by the General Plan of the City of Escondido. The DMP includes only those facilities conveying the equivalent capacity of a 36″ diameter pipe.

In accordance with the City's General Plan, natural drainage courses were used to the maximum extent practical. In all outlying rural areas natural channels were used with hard bottom facilities only at circulation element street crossings.

Existing and proposed drainage facilities shown on 1″ = 400′ scale mylar maps are on file with the Engineering Department. Reduced color copies of the 1″ = 400′ tiles are included as Appendix "C" in this report for easy reference.

These maps show all existing facility segments and proposed ultimate facility segments with a specific identification number which ties into the G.I.S. system.

The total cost of the proposed ultimate facilities is 54.7 million dollars. Of this total, approximately 10.3 million dollars is attributed to the needs of future development. The balance of 44.4 million dollars in ultimate facilities is attributed to existing facility deficiency due to existing development.

C. Recommendations

The following is a summary of the recommendations contained in this report:

1. Adopt this report as the 1995 Drainage Master Plan for the City of Escondido and to replace and supersede all previously adopted Storm Drainage Basin Plans within the City of Escondido.

2. Consolidate the 20+ existing fee basins and adopt a citywide drainage facilities fee.

3. Make findings that there are no surplus funds in the existing fee basin accounts and transfer the current fund balances into a newly formed Drainage Facilities Fund.

4. Make findings that the future drainage facilities identified in the DMP are required for the ultimate development of the city, that the facility costs are fair and accurate, and that the proposed fee has been fairly determined on the basis of benefits and on the need for such facilities created by future development.

5. Adopt the fee of $898.00 per dwelling unit for single-family residential, $359 per dwelling unit for multi-family residential and $0.57 per square foot for non-residential development (see Table 7-13).

6. Revise current applicable portions of the Municipal Code and/or ordinances to affect the changes proposed in recommendations 1 through 5 listed above.

CHAPTER 2

PLANNING AREA CHARACTERISTICS

A. Planning Area Boundaries

This study includes all land within the Planning Boundaries of the City of Escondido General Plan adopted June 1990. The planning area covers more than eighty (80) square miles and is bounded on the north, east and portions of the west by San Diego County. Along the northern portion of the westerly boundary it borders the City of San Marcos. To the south it adjoins the City of San Diego. Along the easterly boundary of the study area some basins extend beyond the Planning Area Boundary. Those portions of these basins draining into the City Planning Area are accounted for in this study.

New orthophoto mapping (1" = 100' and 1" = 200') dated January 1993 was utilized for this study. San Diego County topographic mapping was used for supplemental information in those areas extending beyond the Planning Area Boundary.

B. Physical Environment

1. Geography and Topography

Escondido is located in North San Diego County, thirty (30) miles from metropolitan San Diego and 10 miles from the coast. Land use in the City of Escondido includes undeveloped agricultural lands, various densities of residential development, commercial, and industrial lands.

The City of Escondido is comprised mainly of a gentle sloping valley from north east to south west. Weathered coastal mountains rise to over $\pm$2425 feet elevation and surround the city to the west, north and east.

2. Geology and Soils

Soil types range from alluvial deposits in the valley floor to weathered granite on the hillsides. The soil types that are most predominant within the study area are type B, C and D. These soil types exhibit moderate to slow to very slow rates of infiltration.

3. Seismicity

Southern California is a seismically active area. No known active faults exist within the study area; however, active faults in the area include the Elsinore Fault located approximately twenty (20) miles to the northwest and the Rose Canyon Fault located approximately fifteen (15) miles to the southwest.

4. Hydrologic Features

The study area includes portions of three major drainage basins. A small amount of the westerly portion of the study area drains to San Marcos Creek and approximately thirty-eight (38) percent of the southerly portion of the study area drains to Lake Hodges (San Dieguito Creek). The balance of the study area drains to Escondido Creek with a major tributary being the Reidy Creek Channel.

Most precipitation within the study area results from winter storms cyclonic in nature and of North Pacific origin. This type of storm normally results in precipitation over large areas with the greatest intensity in the mountains. Occasionally thunder storms of a South Pacific origin occur during summer months; These types of storms frequently exhibit higher rainfall intensities, but cover much smaller areas and are generally of much shorter duration.

C. General Plan Goals, Policies and Land Use

The City of Escondido General Plan has many goals and policies relating to natural drainage courses, flood hazards, open space preservation, water quality and sensitive habitat protection. The following two statements perhaps best summarize the numerous references to drainage:

- Drainage Policy G3.1

...the City shall plan drainage improvements adequate to handle runoff when the drainage basin is fully developed to the intensity proposed by the Land Use element of the General Plan.

- Drainage Policy G3.5

To the degree it is economically feasible and consistent with sound engineering practices, the City shall discourage disruption of the natural landform and encourage the maximum use of natural drainage ways in new development . . .

Based on the General Plan Goals and Policies, the natural channels identified in the open space element of the General Plan were identified and preserved as natural channels wherever possible. In basins within the outlying rural areas of the Planning Area, only circulation element street crossings have been identified for master plan improvements.

In concert with the General Plan, all basins within the Planning Area have been evaluated based on the ultimate buildout to the intensity set forth in the land use element of the general plan.

CHAPTER 3

PRIOR STUDIES & EXISTING FACILITIES

A. Prior Studies

The earliest study focusing on the Escondido Creek area was the Escondido Creek Watershed Work Plan completed in June 1961. This study was prepared under the authority of P.L. 566, the Watershed Protection and Flood Prevention Act administered by the Soil Conservation Service of the Department of Agriculture. This report formed the basis of the improvements to Escondido and Reidy Creek constructed in the 1960's. These major channel improvements were designed to carry a 100-year storm. The Soil Conservation Services' preference was to use unlined earth channels; however, on page 2-12 the report states that, "the gradients on Escondido Creek and Reidy Creek are too steep to permit the use of unlined earth channels." The channels were built as concrete lined trapezoidal and rectangular sections.

The construction of these major channels gave the City the opportunity to install tributary drainage facilities to carry local runoff into the newly constructed backbone system. The City, in 1966, retained the firm of Leeds Hill Associates to prepare a design report for local storm drain facilities to tie into the major channels. The City used this report as the basis for obtaining Federal funding available through the U.S. Department of Housing and Urban Development. It was also used as the basis for a General Obligation Bond Issue approved by the citizens of Escondido.

The facilities in the Leeds Hill study were designed to carry a 10-year storm. The report, on p.26, states that "a return period of ten (10) years is all that can be justified for the storm drains in Escondido." Subsequently, most of the facilities included in the Leeds Hill Report were constructed according to the preliminary designs contained therein. Current City criterion requires the use of a 50-year storm event for basins less than one (1) square mile and a 100-year event for larger basins. The report also provided the basis for the drainage plan Element of the City's original General Plan, adopted in 1969.

In 1981, the Federal Energy Management Agency, (FEMA), prepared a Flood Insurance Study to define various levels of flooding within the incorporated areas of the City. This study included maps identifying the flood plain areas of the City. Financial institutions regulated by the Federal government use the maps as the basis for requiring flood insurance for properties. FEMA revised this study in 1988 to incorporate a detailed analysis of the channel improvements on Reidy Creek between Lincoln Avenue and Centre City Parkway.

B. Existing Open Channel Facilities

Several existing open channel facilities exist within the study area. The largest is the Escondido Creek Channel that traverses the entire study area, from Lake Wohlford to the Elfin Forest area, and westerly to the Pacific Ocean via San Elijo Lagoon. Escondido Creek begins as a natural channel. Near Valley Center Road and Lake Wohlford Road, it becomes a concrete lined channel running southwesterly through the middle of the urban area to Harmony Grove Road.

Westerly of Harmony Grove Road, Escondido Creek again becomes a natural channel until it leaves the study area.

Reidy Creek is primarily a natural/environmental channel from its origin at the North end of the study area to the under crossing at Centre City Parkway. From Centre City Parkway South to El Norte Parkway, it continues in a rectangular concrete channel. Beyond El Norte Parkway it's an environmental channel consisting of a small pilot channel within a landscaped earth channel until Lincoln Avenue. From Lincoln Avenue to its junction with Escondido Creek near I-15 freeway it's a trapezoidal concrete lined facility.

An open channel known as Indian Springs Creek runs along the southerly side of State Highway 78 from a point approximately six hundred (600) feet east of Nordahl Road to Andreason Street. From Andreason Street the channel runs southwesterly through the industrial area to a junction with Escondido Creek westerly of Auto Park Way. This channel is a lined concrete ditch for its entire length, except at street crossings, which are either bridges or large culverts.

Kit Carson Creek is an open channel until it reaches North County Fair, where it enters a large box culvert that carries it under the shopping center to Lake Hodges.

The Midway South drainage is carried in an open channel along the north side of Glen Ridge Road adjoining Orange Glen High School. This is a concrete lined trapezoidal channel.

C. Existing Closed Conduits

Approximately 1,000 closed conduits equal to or larger than thirty-six (36) inches in diameter exist within the study area. Most are found in the developed urban area, although many culverts are crossing roads and highways in the rural areas. Each facility has been assigned a numeric identification that is reflected in Table 3.1 and on the Exhibit Maps, and Tables accompanying this report. Many of these facilities are inadequate to carry the 50-year design flows used in this study. Each of these systems was evaluated to determine the capacity. The use of the larger storm events for this Master Plan explains the large number of undersized facilities.

Table 3.1, which lists all existing facilities with a capacity greater than a thirty-six (36) inch diameter pipe, contains two reference identifiers. The ID# in the first column is the numeric identifier assigned to a specific segment or facility for G.I.S. reference. Tied to each ID# is an alpha numeric identifier (system) in the second column that has been assigned to identify the subbasin containing the specific segment. The alpha component of the subbasin identifier ties the subbasin to one of the major basins. The following is a list of the major basins and their corresponding alpha identifier:

Major Basin	Alpha Identifier
Escondido Creek	E
Reidy Creek	R
San Marcos	S.M.
Lake Hodges	L.H.
Kit Carson	KC
Felicita	FEL
North Broadway	N.B.

The third column and the seventh column describe the geometry and material of the existing facility. The fourth and fifth columns list the width (or diameter in case of a circular pipe) and height (not designated for circular pipes) of the facility. Column six is a ratio factor which indicates the number of parallel facilities in the case of pipes, boxes or vertical walled channels and the horizontal to vertical ratio of the side slopes of trapezoidal channels. Column eight contains the reference drawing number of the improvement plan for original construction of the facility on file in the City of Escondido Engineering Department. Columns nine thru eleven list the overall length, bottom slope and approximate capacity of the facility.

D. Evaluation of Excess Capacity in Existing Systems

During the evaluation of the existing systems, it became apparent that some of the existing conduits currently have excess capacity which may be utilized by ultimate development. An analysis of the systems with a significant excess capacity was required in order to determine the value of this existing excess capacity. The evaluation was based on a comparison of the ultimate flow (Qu) to be carried versus the flow based on current development (Qe). The value of the existing excess capacity was obtained by sizing an equivalent pipe to carry that portion of the ultimate flow which is in excess of the existing flow based on current development (Qu-Qe) that can be accompanied in the existing system. Based on this equivalent pipe size a cost was assigned using the same unit cost factors which are used for ultimate facility needs.

Table 3.2 lists those existing facilities which contain excess capacity along with a current value for the excess capacity. See Chapter 7 for utilization of this value in establishing the new drainage fees.

E. Special Study Areas

Several special studies have been prepared recently, mostly in conjunction with the preparation of Sub-Area Facility Plans. Included in this category are the following:

- *Felicita S.F.P. Drainage Study by Hunsaker & Associates, dated July 1990*
- *North Broadway S.F.P. Drainage Study by O'Day Consultants, dated March 1993*
- *Eastgrove S.F.P. Drainage Study by Entranco, dated March* 1993
- *Daley Ranch S.F.P Drainage Study by REC, dated May 1993*

In addition, the County of San Diego had a Comprehensive Plan for Flood Control and Drainage prepared by Koebig, Inc. in July 1976 that covers the unincorporated areas surrounding the City. The City of Escondido has adopted these county basins for areas within the City's sphere of influence.

CHAPTER 4

METHODOLOGY, CRITERIA, AND STANDARDS

A. Study Approach

The approach for this Drainage Master Plan was to utilize previous hydrology studies and established Q's for the major water courses (see Table 4-4) and to analyze tributary areas where storm drain deficiencies occur. Storm drain facilities are recommended where existing facilities are inadequate or where projected development will require additional drainage facilities.

B. Engineering Standards - Hydrologic Design Criteria

The design criteria, as found in the design standards for the design of Public Works improvements in the city of Escondido (herein after "Escondido design standards"), specifies that design runoff conditions are as follows:

1. Design for tributary areas over one (1) square mile will be based on the 100-year frequency storm.

2. Design for tributary areas under one (1) square mile will be based on the 50-year frequency storm.

3. The use of underground storm drain systems, in addition to standard curb and gutter, shall be required:

   (a). When flooding or street overflow will cause damage.

   (b). When existing drainage facilities discharge into the proposed development.

   (c). When a 100-year frequency storm cannot be contained within the public right-of-way less one inch.

   (d). When the water level in streets based on a "50-year storm" exceeds the top of the curb.

   (e). When the depth-velocity product of flow in the street (expressed in feet and feet per second) exceeds six (6).

4. When the above conditions require an underground storm drain, the combined street and storm drain design shall be based on a 50-year frequency storm.

5. Sump areas are to be designed for a sump capacity or outfall of a 100-year frequency storm.

For this study existing drainage systems were analyzed with respect to the above criteria and recommendations made accordingly. In undeveloped areas, where future street alignments and grades are unknown, the recommended storm drain lines are sized for design storm event flow capacity, based on the grades of existing flowlines. However, when these areas are developed smaller drainage systems may be allowable in some non-sump areas where the street and storm drainage systems combined may actually carry the 50-year frequency storm. Drains at sumps should always convey 100-year flows.

The design flows were computed based on the following assumptions and data:

1. The following coefficients were used:

Table 4 - 1
MANNING'S ROUGHNESS "N" VALUE

Pipes and Channels	"N" Value
Corrugated Metal Pipe, unlined (CMP)	0.024
Corrugated Metal Pipe, half lined	0.017
Corrugated Metal Pipe, lined	0.013
Reinforced Concrete Pipe (RCP)	0.013
Cast in Place Concrete Pipe (CIPP)	0.015
Asbestos Concrete Pipe (ACP)	0.011
Aluminum Spiral Pipe (ASP)	0.012
Natural Channels (use Open Channel Hydraulics, by V.T. Chow)	0.030-0.15
Concrete Lined Channel	0.014
Rip Rap Channel	0.040
Reinforced Concrete Box Culvert (RCB)	0.014
Air Blown Mortar (ABM) Ditch	0.018

Table 4 - 2
RATIONAL METHOD RUNOFF COEFFICIENTS

FIG. 1 Escondido Design Stds.	G.P. Designation	Runoff
O.S./Parks/Golf Courses/Cemeteries	Public Lands/Parks	0.25
Rural-over ½ Acre Lots	Rural I & II	0.45
Undeveloped Land	Not Applicable	0.45
Single Family	Suburban/ Urban I	0.55
Mobile Home	Urban II	0.65
Multiple Units	Urban III & IV	0.70
Commercial	Commercial(Planned/General/ Mixed)/ Office	0.85
Industrial	Industrial(Planned/General)	0.95

For specific planning areas (SPA's) called out within the Escondido General Plan, previously accepted hydrology reports were reviewed and used to evaluate existing/proposed storm drainage systems. Where no such reports were available, the runoff coefficients were established based on the land use designation in the General Plan. Existing and proposed drainage systems were then evaluated based on those runoff coefficients. The following table summarizes the criteria used for SPA's:

Table 4 - 3
SPA CRITERIA

SPA #	Description	Existing Reports Used ?	Runoff Coefficient
1	Palos Vistas	yes	0.32
2	Daley Ranch	yes	0.35
3	Cloverdale Ranch	yes	0.41
4	Valley View	no	0.35
5	Northeast Gateway	no	0.45
6	Lomas Del Lago	yes	0.45
7	Bernardo Mountain	yes	0.45
8	Harmony Grove (Quail Hills)	yes	0.85
9	Central Business District	no	0.85
10	Leisure Oaks Project	yes	0.55

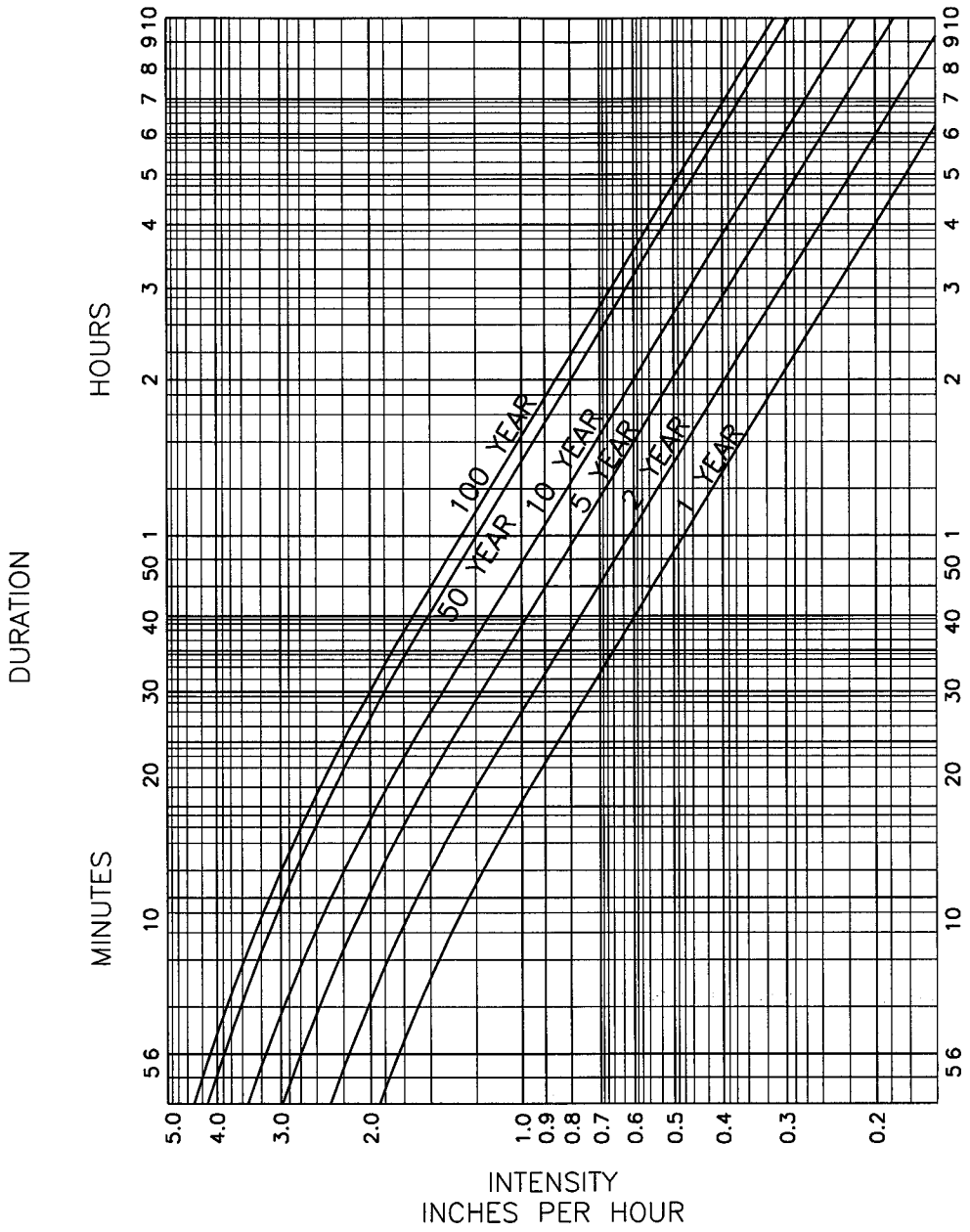
2. Rainfall intensities for the Rational Method hydrology computations were taken from Figure-1 of the Escondido Design Standards (see Figure 4-1).

3. Watershed boundaries and grades for proposed storm drains were derived from November 1992, 100 scale orthophoto maps with two (2) foot contour intervals and 200 scale orthophoto maps with five (5) foot contour intervals prepared by GEONEX North American Operations, Inc., Denver, Colorado.

4. The majority of the City of Escondido lies within the Escondido Creek watershed. Escondido Creek and Reidy Creek are the main creeks in the watershed. For the most part, these creeks are ephemeral, well-defined and have relatively flat slope in the valley. Design flows from these creeks and the other minor creeks in Escondido are based on the following previously accepted reports/studies which were reviewed as a part of this Drainage Master Plan:

   - Watershed Work Plan (Escondido Soil Conservation District, June 1961.)
   - Design Report. Storm Drainage Facilities (Leeds Hill Associates, June 1967)
   - Flood Insurance Study (FEMA, July 1988)
   - City Storm Drain Basin Reports (1975-1992)

Figure 4-1



ESCONDIDO RUNOFF COEFFICIENTS

OPEN SPACE, PARKS, GOLF COURSES, CEMETARIES	0.25
RURAL – OVER 1/2 ACRE LOTS	0.45
UNDEVELOPED LAND	0.45
SINGLE FAMILY	0.55
MOBILE HOME	0.65
MULTIPLE UNITS	0.70
COMMERCIAL	0.85
INDUSTRIAL	0.95

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DIRECTOR OF PUBLIC WORKS		DEPARTMENT OF PUBLIC WORKS	
REVISED	APPROVED	RUNOFF INTENSITY DURATION CURVE	FIGURE NO. 1

The 100-year flow rates used in this Drainage Master Plan for Escondido, as developed by the U.S. Army Corps of Engineers for FEMA Flood Insurance studies, are outlined in Table 4-4.

Table 4 - 4
SUMMARY OF DISCHARGES

Flooding Source and Location	Drainage Area (Sq. Mi)	Peak Discharge (cfs) 100-Year
Escondido Creek		
At Harmony Grove Road	48.3	18,000
Reidy Creek		
Upstream of Jesmond Dene Ave.	4.5	4,000
At Rincon Avenue	10.5	7,700
Above Confluence with Escondido Creek	15.1	7,700
Kit Carson Park Creek		
At Bear Valley Parkway	3.5	2,800
Shallow Flooding Area - South		
▪Citrus Wash at Escondido Creek, 500' downstream of the Rose Street Bridge	2.4	1,920
▪Citrus Wash at Reed Road, 600' west of Falconer Road	0.3	290
▪South Midway Wash at Midway Drive 400' northwest of Grand Avenue	2.0	1,570
Shallow Flooding Area - North		
▪Midway Wash at Midway Drive crossing of Escondido Creek	2.0	1,520
▪Midway Wash at intersection of East Lincoln Avenue and Midway Drive	1.7	1,310
▪Maywood Wash at intersection of East Lincoln Avenue and Nightingale Place	1.3	1,020
Shallow Flooding Area - West		
▪Country Club Creek at El Norte Pkwy, 1100' northwest of Bennett Avenue	2.1	1,700
▪Country Club Creek at Nutmeg Street, 1200' north of Golden Circle Drive	0.3	260
▪Unnamed Tributary at intersection of Golden Circle Drive and Country Club Lane	0.9	770

C. Design Runoff - Rational Method

The hydrologic analysis utilized for design of facilities recommended in this report is the Rational Method for watersheds less than one half (½) square mile and the Modified (by routing sub-watersheds) Rational Method for watersheds greater than one half (½) square mile and less than fifteen (15) square miles.

The Rational Formula is $Q_P = CiA$ where:

Q_P = The discharge in cubic feet/sec. (1 Acre in/hr. = 1.008 cubic feet/sec.)

C = Runoff Coefficient (dimensionless) expressed as that percentage of rainfall which becomes surface runoff.

I = Rainfall intensity (inches/hour) for a storm duration equal to the time of concentration of the contributing drainage area.

A = Tributary drainage area (Acres)

If rainfall is applied at a uniform rate to an impervious area, the runoff attributed to this area would eventually reach a rate equal to the rate of precipitation. The time required to reach this equilibrium is termed the time of concentration.

For small impervious areas one may assume that if precipitation persists at a uniform rate for at least as long as the time of concentration the peak discharge will equal the precipitation rate.

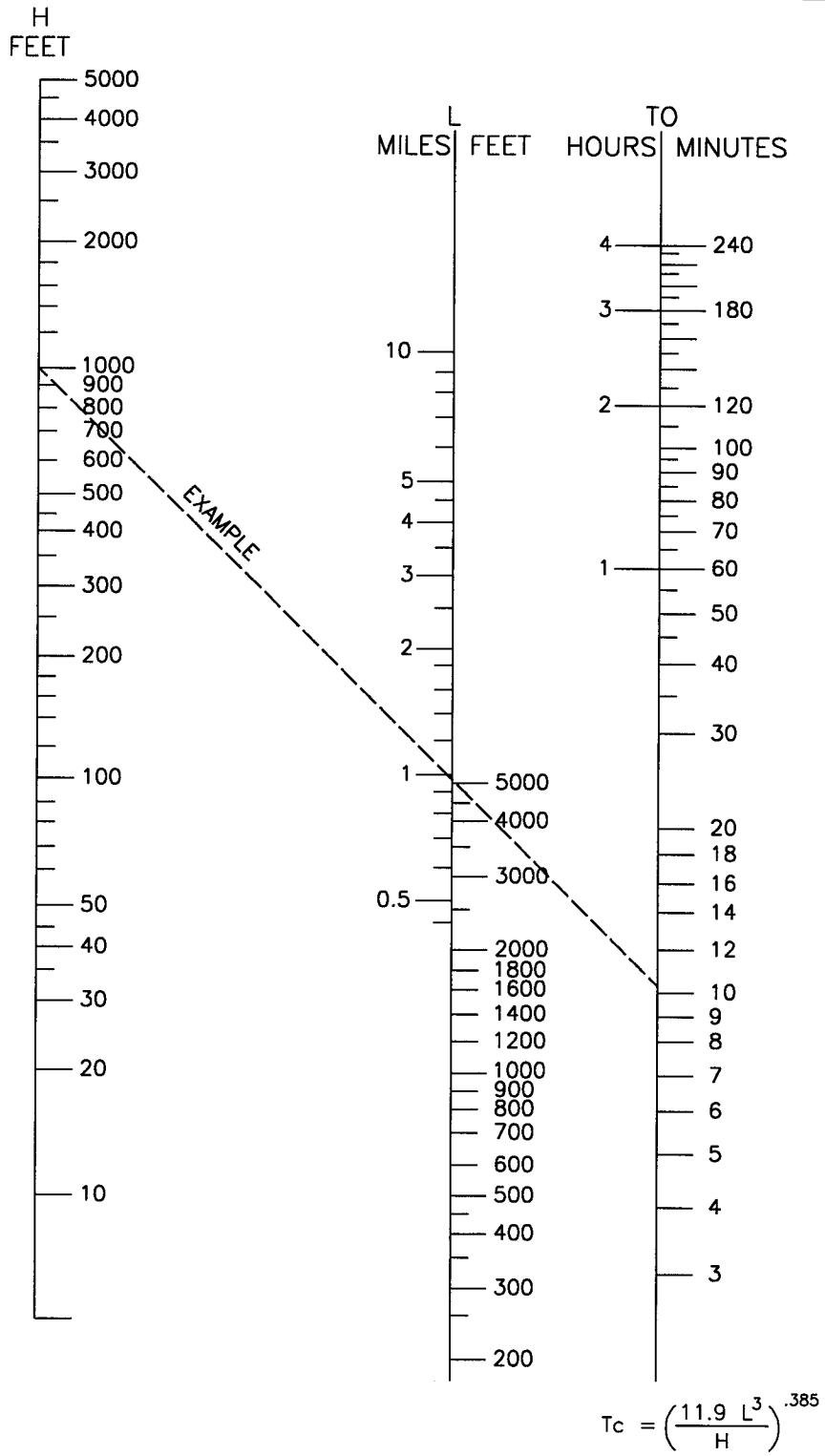
D. Design Procedure - Modified Rational Method

The following procedure was used to calculate the quantity of storm flow at various locations along the route of the proposed storm drains. The general procedure was developed by Los Angeles County Flood District and has been modified herein for use in San Diego County.

1. Generally, for Urbanized areas the initial area runoff was divided into subareas of up to twenty (20) acres for industrial and commercial uses and thirty (30) acres for all others. Assuming a minimum ten (10) minute time of concentration (Tc), these maximum areas will generate runoff that can be handled adequately by a storm drain system less than thirty-six (36) inches in diameter. These divisions were, if possible, based on the topography and land use. Systems identified in this Drainage Master Plan are thirty-six (36) inches in diameter and larger. In Rural areas, larger basins are utilized to promote the policy of the General Plan of maximizing the use of natural channels.

2. The quantity of runoff for the initial area was determined by estimating the initial time of concentration. For natural watersheds, this was obtained from Figure 2 of the Escondido Design Standards (see Figure 4.2). For urban areas overland time of flow was obtained from Appendix X-C of the "County of San Diego Department of Public Works Flood Control Division Hydrology manual, "dated 1985, (herein after "Manual" see Figure 4-3).

Figure 4-2



$$Tc = \left(\frac{11.9\ L^3}{H}\right)^{.385}$$

NOTE:

THIS CHART SHALL BE USED FOR ALL BASINS WITHIN THE CITY OF ESCONDIDO LESS 0.5 SQUARE MILE. THE MINIMUM Tc TO BE USED IS 10 MINUTES

Tc = TIME OF CONCENTRATION (HOURS)
L = LENGTH OF DRAINAGE COURSE (MILES)
H = DIFFERENCE IN ELEVATION FROM FURTHER MOST POINT OF DESIGN (FEET)

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REVISED	APPROVED	RUNOFF TIME CHART	FIGURE NO. 2

Engineering judgement was used to verify the validity of the computed initial times. A minimum time of concentration of 10 minutes was used for all initial basins. The ultimate land uses from the Escondido General Plan dictated the runoff coefficient "C" (see Table 4-2 and 4-3). The intensity (I) was obtained from Figure 1, Escondido Design Standards using the time of concentration derived from above. Then the quantity of water (Q) was calculated from the "Rational Equation", $Q = CiA$.

3. The quantity of runoff for subsequent subareas was determined by evaluating the runoff path from the point of concentration of the previous subarea to the point of concentration of the subarea in question. Then calculating the time necessary for the quantity of water arriving at this subarea to pass through to its point of concentration by the above route. The physical properties of this path were considered and the velocities obtained from the following:

   (a). If traveling in a street, the velocity was obtained from appendix X-D, "Gutter and Roadway Discharge Velocity Chart" of the "Manual" (see Figure 4-3).

   (b). If traveling in a ditch, pipe or other regular section, the velocity from the actual section was calculated.

   (c). If traveling in a natural watercourse, the velocity was derived from the approximation of the channel cross section.

   Using the length of flow to the point of inflow of the next subarea downstream, and the velocity, the time of flow was computed and added to the time for the first area to determine a new time of concentration (Tc). When determining the time of concentration (T_c), the expected future drainage facility and route was used to determine velocity and travel time (T_t). Wherever junctions, or changes in slope or drainage facilities occurred, it was necessary to calculate the velocity and travel time for the preceding reach. The slope of the Hydraulic Grade Line was generally assumed to be parallel to the ground slope.

   The Q for the second subarea was calculated using the new time of concentration. The evaluation was continued down stream in similar manner until a junction with a lateral drain was reached. The lateral was determined and the Q carried down to the junction with the main line.

4. The peak Q was computed at each junction. Let Q_a, T_a, I_a, correspond to the tributary area with the longer time of concentration. Let Q_b, T_b, I_b, correspond to the tributary area with the shorter time of concentration and Q_p, T_p correspond to the peak Q and time of concentration when the peak flow occurs.

   (a). If the tributary areas had the same time of concentration, the tributary Q's were added to obtain the Peak Q.

   $$Q_p = Q_a + Q_b$$

(b). If the tributary areas had different times of concentration, the tributary Q's were corrected as follows:

(1) The usual case was where the tributary area with the longer time of concentration had the larger Q. In this case, the smaller Q was corrected by a ratio of the intensities and added to the larger Q to obtain the peak Q. The tabling was then continued downstream using the longer time of concentration.

$$Q_p = Q_a + (Q_b)(I_a)/(I_b) \qquad T_p = T_a$$

(2) In some cases, the tributary area with the shorter time of concentration had the large Q. In this case, the smaller Q was corrected by a ratio of the times of concentration and added to the larger Q to obtain the peak Q. The tabling was then continued downstream using the shorter time of concentration.

$$Q_p = Q_b + (Q_a)(T_b)/(T_a) \qquad T_p = T_b$$

E. Computer Program

In this Master Plan the Rational Method Hydrology Program version 1.3A by Advanced Engineering Software was used to compute and design the drainage systems for the different watersheds. This program package enables the user to "master plan" or design a watershed drainage system interactively with a computer.

The designer splits the watershed into several sub-areas. The study proceeds in a sequential manner in the downstream direction. The designer selects from a menu of possible hydrologic processes that describe the watershed characteristics in each sub-area. The computer prompts the user for all the necessary information regarding watershed sub-area characteristics and computes all hydraulic and hydrologic information.

The designer then reviews the hydrologic results as to acceptability and decides whether to proceed with the design or investigate an alternate hydrologic process within the sub-area. This review is accomplished at each link and each nodal point and enables the designer to use the computer as a design tool interactively rather than in a "BATCH" mode. The watershed master planned system is stored in computer memory which can be easily changed, updated, or restudied with respect to other hydrologic criteria (e.g., 10, 25, 100-year return events).

CHAPTER 5

SUBAREA PLANNING AREAS

When the new General Plan was adopted in 1990, the Growth Management Element set up a tier system defining different geographic areas for facility planning purposes. Areas assigned to Tier 2 were subject to a moratorium on new development until a Subarea Facilities Plan (SFP) was prepared for that area. This concept was dropped in favor of a Citywide Facilities Plan in 1994, but in the interim, several subarea plans were initiated, each of which included a section on storm drains.

These studies were incorporated into the Master Plan wherever applicable. The following is a brief summary of each such study.

A. Felicita Subarea Facilities Plan

This plan was prepared by Hoffman Planning Associates in May 1992 and included a drainage element prepared by Hunsaker Associates.

The methodology used in the drainage section of the Felicita SFP was generally the same as that being used for this Master Plan. The only significant difference is that the Hunsaker & Associates analysis utilized the County Hydrology method. This resulted in a higher run-off than the City method, so these basins were reanalyzed using the same criteria as the remainder of the City.

The areas incorporated into the Felicita SFP include the following basins, as identified in the Storm Drain Master Plan:

- E-81, E-111, Felicita, KC-12, KC-22 (portion W. of I-15) and all the L.H. basins between Valley Parkway and KC-12.

B. North Broadway Subarea Facilities Plan (N.B.S.F.P.)

This plan was prepared by Hoffman Planning Associates in March 1993 and included a supporting drainage element documentation prepared by O'Day Consultants.

The methodology employed in the drainage section of the N.B.S.F.P. was similar to that being used for this Drainage Master Plan. Again, the only significant difference is that the County Hydrology method was utilized for the analysis of the SFP. This resulted in a higher run-off than the City method, so these basins were also reanalyzed using the same criteria as the remainder of the City.

The North Broadway Subarea is a portion of two major watersheds known as the Reidy Canyon Drainage Basin and the Jesmond Dene Drainage Basin. These two drainage basins have a combined watershed area of 13.15 square miles (8,400 acres) at the El Norte Parkway crossing.

Present and ultimate development is expected to be located within the North Broadway Subarea

boundary. Development outside of the subarea is expected to be light because of the steeper terrain and present rural and estate zoning.

Runoff generally flows north to south in natural streams. Overtopping of roads is common and some flooding is frequent during larger storm events.

The areas incorporated into the N.B.S.F.P. include the following basins, as identified in the Storm Drain Master Plan:

- R-20, R-51, R-71, R-81, R-83, & R-112

C. Eastgrove Subarea Facilities Plan

The Drainage Facilities element of this Subarea Facilities Plan was in the process of being prepared by Entranco in January 1993 and revised in March 1993 but was not completed. Their analysis was consistent with the criteria used in this Drainage Master Plan however, the scope of their plan was rather limited in that some of the basins were outside of the proposed development plan and therefore were not totally analyzed. This is revealed in the Corrective Action Notes on page 4 of the draft report, as follows:

> Note 1: No backbone Facilities identified in basin; further basin analysis may show requirements for additional storm drain facilities.
>
> Note 2: Basin has backbone facilities which have adequate capacity per City of Escondido Design Standards. Further basin analysis may show requirements for additional storm drain facilities.
>
> Note 3: Basin has backbone facilities in which we have discovered some capacity deficiencies per the City of Escondido Design Standards (Please refer to Storm Drain Adequacy Tables in Appendix). Further basin analysis may show a requirement for additional storm drain facilities.

During the time the Drainage Master Plan was being prepared, the processing of the Eastgrove SFP was terminated and ultimate drainage facilities requirements were not finalized. As a result, the Eastgrove Area was completely analyzed in the same manner as the other basins within the City.

D. Daley Ranch Subarea Facilities Plan

The Daley Ranch property is unique in that it occupies the entire upper watershed of Jack's Creek above Dixon Dam along with peripheral portions which drain to La Honda Drive, North Broadway and Valley Center Grade. As this project develops, it will be required to construct all of the drainage improvements needed to carry off the storm water and to treat it as necessary to protect the quality of the water in Lake Dixon.

If the project does not proceed, then the land will remain in its present natural state, which has functioned satisfactorily for the past 30 years since the lake was created by the construction of Dixon Dam.

Dixon Dam functions as both a water storage and a flood control facility, with capacity to absorb some storm water run-off and an adequate spillway in the case of overflow.

Previous development proposals for Daley Ranch have included storm water retention facilities which could reduce or eliminate any increase in runoff as a result of future development, as well as, drainage facilities which would divert flows around Dixon Lake and directly into the Escondido Creek Channel. therefore, this area was not analyzed for future facilities.

CHAPTER 6

COST ESTIMATE FOR MASTER PLAN FACILITIES

A. General

The cost estimates contained within this report were developed to provide a means of budgeting for ultimate construction of the proposed Master Plan drainage system. Within any individual reach, improvement costs may vary depending on current construction market conditions, size of project and specific unique site conditions.

B. Unit Costs

The unit costs for various facilities were developed in a general manner reflecting conditions which may vary from one site to another. The various components of unit prices include trenching, backfill, paving removal & replacement, cleanout structures, materials profit, and sales tax on materials. Unit costs developed also include contingencies such as utility conflicts, traffic control, engineering, surveying, contract administration, inspection and an overall contingency. No cost component was included for right-of-way purchase.

The unit costs for various materials are shown in Table 6.1 for reinforced concrete pipe and Table 6.2 for reinforced concrete box. Unit costs for concrete channel sections are based on cubic yards of concrete per lineal foot of channel, as calculated from channel dimensions, multiplied by the unit price of concrete per cubic yard. These unit construction costs should be reviewed and updated on an annual basis to reflect future increases in construction costs.

C. Estimated Construction Costs

A detailed listing of proposed master plan facilities is included in Table 6.4 along with a cost estimate for each segment. Each system segment has been assigned a unique identifier ID# within the G.I.S. Database. The ID# references a series of attributes describing the geometry, size, material, length, unit cost and ultimate Q. Additional attributes describe whether the proposed facility replaces or parallels an existing facility (reference ID# from Table 3.1 (Table 1)) and the node numbers at each end of the segment.

The master plan facilities do not include curb inlets and, generally, laterals smaller than an equivalent of a 36" diameter pipe. In some unique cases the identified master plan facility may consist of a pipe size less than a 36" diameter, this occurs where an existing facility is undersized and requires an additional parallel facility to carry a combined flow equivalent to a 36" or larger diameter pipe.

CHAPTER 7

FINANCING ALTERNATIVES

A. Purpose

The purpose of this chapter is to document the pre-existing financing programs used to fund storm drain improvements, review alternative financing techniques, and recommend drainage fees for the improvements identified in this Drainage Master Plan.

B. Existing Drainage Basins and Fees

The City of Escondido currently charges drainage fees in twenty (20) storm drain basins; twelve (12) basins which were formed by the City covering approximately 4,500 acres, and eight (8) basins which were formed by the County of San Diego and adopted by the City covering approximately 18,500 acres. The basins cover a total of approximately 30% of the land area within the Escondido General Plan boundary.

1. City Basins

The twelve plus city-formed basins were formed in accordance with Section 66483 of the California Government Code (Subdivision Map Act) of the State of California and Section 9250 of the subdivision ordinance of the City of Escondido and are summarized in Table 7-1. The information includes the City-assigned project number, basin name, the current fees in effect through July, 1994, and the revenue balance from fees on account within each basin.

Table 7-1
EXISTING CITY FORMED DRAINAGE BASINS

Project No.	Basin Name	Current Fee ($/Ac.)	Fund Balance 12/31/93
4901	Del Dios Ave - Zones I	$11,951.05	$111,612
4901	Del Dios Ave - Zone II	$2,960.02	$0.00
4902	North Broadway	$9,715.16	$0.00
4903	Citrus Avenue	$5,687.97	$77,223
4904	Fig-Gamble (Fig)	$6,502.94	$124,548
4904	Fig-Gamble (Gamble)	$6,427.70	$0.00
4905	Ash Street	$3,220.79	$194,407
4906	Midway Drive	$3,901.37	$319,889
4907	Harmony Grove	$2,314.00	$5,305
4917	San Pasqual/Oak Hill	$1,500.00	$23,268
4918	Lehner Avenue	$6,796.61	$208,564
4919	Mission Road	$11,291.00	$379,410

Project No.	Basin Name	Current Fee ($/Ac.)	Fund Balance 12/31/93
4919	Montiel Road	$5,532.00	$0.00
4920	South Midway Drive	$2,260.00	$10,694
4921	Meyers Avenue	$13,703.74	$0.00
4923	Hamilton Lane	$3,610.00	$0.00
		TOTAL	**$1,454,924**

The City collects the drainage fees at final map approval and deposits the funds into project accounts specifically established to track fees paid and withdrawals made to underwrite eligible improvement costs. The accounting of the fees and funds are the responsibility of the City's Finance Department. The City uses the funds from these accounts to construct or otherwise pay for improvements identified as needed as the result of development within the appropriate drainage basin.

2. County Basins

The County of San Diego maintains eight (8) special drainage areas (SDA's) throughout the county identified as follows:

1.	SDA 2	Valle De Oro
2.	SDA 3	Sweetwater
3.	SDA 4	Jamul
4.	SDA 5	Bostonia
5.	SDA 6	Lakeside
6.	SDA 7	Alpine
7.	SDA 9	San Dieguito
8.	SDA 10	North County Metro

Special Drainage Area 10, North County Metro, includes eight subbasins that lie partially within the General Plan boundary of the City of Escondido and were adopted by the City with approval of Ordinance No. 84-07. Table 7-2 identifies these eight basins.

Table 7-2
EXISTING COUNTY-FORMED DRAINAGE BASINS

Project No.	Basin Name	Current Fee ($/Ac.)	Fund Balance
4913	Elfin Forest	$1,609.00	$99,558
4914	Felicita	$2,681.00	$16,750
4910	Jesmond Dene	$2,098.00	
4916	Ninth Ave. & Valley Pkwy.	$3,720.00	
4912	Rees Road	$2,681.00	$7,647
4911	Reidy Canyon	$979.00	$35,451
4909	San Marcos North	$769.00	$42,030
4915	San Pasqual North	$1,609.00	$102,892
		TOTAL	**$304,329**

GRAND TOTAL ALL FUND BALANCES	**$1,759,254**

The County Board of Supervisors adopted County Ordinance No. 7 on June 11, 1991 which established the fee rate for each of the eight special drainage areas. The fees for the North County Metro (SDA 10) which includes portions of the City of Escondido was set at $0.34 per square foot of residential development and $0.48 per square foot of non-residential development[1]. The fees are to be paid as a condition of and prior to issuance of a building permit.

The San Diego County Flood Control Act establishes that drainage fees shall be based upon apportionment of potential fees to all developable properties[2] within each of the eight drainage areas under the following assumptions:

(a). A single family residence, on a one-half acre parcel of land is established as a basic unit of drainage fee development, or one equivalent dwelling unit (EDU).

(b). The average square footage of a single family residence is assumed to be 1,750 square feet.

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1 The county ordinance is based upon a report entitled *Development of Drainage Fee Rates for Eight Unincorporated Areas of San Diego County*, San Diego County Flood Control District, June 1991, by BSI Consultants, Inc.

2 The San Diego Association of Governments, *Series 7 Regional Growth Forecast 1986 - 2010*, was used to determine the developable property within the SDA.

(c). The following EDU's per land use classifications were used:

LAND USE	EDU's/ACRE
Low Density Single Family	1
Single Family	2
Multiple Family	8
Mixed Use	8
Commercial	5
Industrial	7.5

(d). The County determined that the non-residential fee rate shall be 33% higher than the residential fee rate.

(e). The calculation of EDU's for developed areas used the same proportions of land use types as the undeveloped areas per the Series 7 Regional Growth Forecast.

The San Diego County method of calculating the drainage fees uses the costs of the recommended facilities combined with the cost of the existing facilities divided by the total existing and potential square footage of buildings within each Special Drainage Area. The amount of the fee is limited to the cost necessary to install 100% of the remaining recommended improvements.

C. Citywide Land Uses

The City used the following listed sources of land use data to calculate the maximum buildout as well as the existing units of residential and existing acres of non-residential development.

1. City of Escondido Build Out Population Projections prepared by Hofman Planning Associates dated March 29, 1990.

From these sources, the information contained in Table 7-3 was calculated. The Maximum Buildout Units are the number of residential dwelling units and acres of non-residential development permitted in the City's General Plan. Existing Units consists of the development that is in place today. Finally, the Future Buildout Units are the number of residential dwelling units and acres of non-residential development that can be constructed in the future with buildout of the General Plan.

Table 7-3
RESIDENTIAL AND NON-RESIDENTIAL LAND USES

Land Use	Maximum Buildout Units	Existing Units	Future Buildout Units
Single Family	42,001	27,910	14,091
Multi-Family	17,007	16,633	374
RESIDENTIAL UNITS TOTAL	59,008	44,543	14,465
NON-RESIDENTIAL ACREAGE TOTAL	2,294	1,726	568

The units and acres identified in Table 7-3 are converted to percentages in Table 7-4 to facilitate a comparison between existing units and future buildout units and acres.

Table 7-4
PERCENTAGE COMPARISON BETWEEN EXISTING UNITS AND FUTURE BUILDOUT UNITS

Land Use	Maximum Buildout Units	% Existing Units	% Future Buildout Units
Single Family	42,001	66%	34%
Multi-Family	17,007	98%	2%
RESIDENTIAL UNIT TOTAL	59,008	75%	25%
NON-RESIDENTIAL ACREAGE TOTAL	2,294	75%	25%

D. Cost of Drainage Improvements

Chapter 6, Table 6.5, identifies the cost to construct ultimate storm drain facilities. In addition to the capital construction costs, the cost of the Drainage Master Plan has been added to the cost of construction and will be apportioned between existing and future development on the same basis as the existing-to-future units shown in Table 7-4, being 75 percent existing and 25 percent future.

Table 7-5
CONSTRUCTION AND INCIDENTAL COSTS

Construction Costs	Drainage Master Plan Costs	Total Costs
53,941,659	$275,000	$54,516,659

E. Storm Drain Facilities Needed to Serve Existing Development

The improvements needed to serve existing development have been identified and are listed in Table 6.4. These improvements total $46,153,727. The improvements were identified through a process of comparing the capacity of existing storm drain improvements to the improvements required to bring such systems up to current standards. Many of the deficiencies identified through this process are the result of changes in city design criteria using new rainfall intensity curves and runoff quantity (i.e. 10-year vs. 50 year storm). This additional calculation assumed hypothetically that no future development would take place and all improvements would be needed to satisfy existing runoff conditions. The resulting improvements and costs become the responsibility of existing development and cannot legally be assessed to future development in the form of a fee.

The drainage fees previously collected within established drainage basins and not already spent for drainage improvements are eligible to offset the cost of the unfunded share of costs because the developments which paid the fees have been included in the "existing" land use category. The Fund Balances identified in Table 7-1 are available for this purpose as shown in Table 7-6.

Table 7-6
CREDITING AVAILABLE FUND BALANCES TO UNFUNDED SHARE OF COSTS

Gross Unfunded Share of Costs	Less Available Fund Balances	Net Unfunded Share of Costs
$46,153,727	$1,759,254	$44,394,473

1. Accounting for Excess Capacity in Existing Facilities

Following the identification of storm drain facilities needed to serve existing development (Section E), calculations indicated that in some cases excess capacity in the existing system was available for use by future development. This is based on the concept that there are facilities which were constructed with capacity in excess of that which is necessary to carry runoff from existing development. This excess capacity and a component of the overall drainage facilities fee reflects use of this excess capacity by future development. The fee component for excess capacity includes existing Drainage Master Plan facilities along with a separate component for the Escondido Creek Flood Control Channel which currently has capacity for buildout of the City's General Plan.

An analysis was performed on all existing Drainage Master Plan facilities to determine the capacity and current runoff into each facility. The facilities that were identified to contain capacity in excess of that needed to carry runoff from existing development are available to provide this excess capacity to the benefit of future development in terms of reducing future development's need to construct new facilities. The list of existing facilities which may have excess capacity was generated by deleting all facilities which are proposed for upgrading or parallel from the existing facilities listing.

Due to the large number of existing facilities, only those designed to carry over 500 cfs, larger than 72" diameter, and over 500 feet in length were analyzed.

Table 7-7 is a summary of facilities with excess capacity. The value or cost of excess capacity has been determined to be the amount of capacity remaining in the system as a function of the Equivalent Dwelling Units remaining to be developed in the basin expressed as the total cost of the facility in current (1995) dollars. The cost per EDU is the amount recommended as the excess capacity component in the drainage facilities fee.

Table 7-7
EXCESS CAPACITY AVAILABLE FROM EXISTING FACILITIES

Cost of Excess Capacity[3]	Cost of Esc. Creek Channel[4]	Total EDU's	Cost Per EDU
$4,151,597	$2,644,200	17,876	380

F. Funding Future Storm Drain Improvements

There are traditionally two types of financing approaches that can be used to fund drainage improvements. One is a "pay-as-you-go" method that involves the collection of fees when development occurs. This approach establishes equity between developments within each basin but, unfortunately, does not collect enough funds to construct the improvements until most of the final maps have been approved or until most of the building permits have been issued and the fees have been collected.

The other approach involves the use of debt financing to generate capital in the early stages of construction with debt service spread over the life of the bond issue, commonly 15 to 20 years. This approach often uses such mechanisms as Mello-Roos Community Facility Districts or special assessment districts whereby the cost of the drainage improvements become a tax or assessment lien against the benefitting properties.

Due to the fact that approximately 25 percent of the total cost of the improvements are the responsibility of future development, it is appropriate to impose a fee on future development to pay for these facilities. Fees for drainage improvements can be established under either the Subdivision Map Act, Government Code Section 66483, or through Development Impact Fees, Government Code Section 66000. Of the two methods, the most preferred is the establishment of a fee using Government Code Section 66000. The code requires that a city establish a reasonable relationship, or "nexus", between a development project or class of development projects and the public improvement for which a developer fee is charged. The City must:

- Identify the purpose of the fee;
- Identify the use to which the fee will be put;
- Determine how there is a reasonable relationship between the fee's use and the type of development project on which the fee is imposed (a "type" nexus); and

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[3] From Table 3.2.

[4] The Escondido Creek Flood Control Channel was constructed in the 1960's as a cooperative project between several agencies. As a result, the total cost is based on 1965 dollars ($10,576,800) as the basis for the allocation of costs. As noted previously, 75% of the maximum residential units and 75% of the maximum non-residential acres are attributasble to existing development. Therefore, a total of 25% of the cost is attributable to future development resulting in an allocation of $2,644,200 to the Escondido Creek Basin.

- Determine how there is a reasonable relationship between the need for the public facility and the type of development project on which the fee is imposed (a "burden" nexus). In addition, when a city imposes a fee as a condition of development approval, it must determine how there is a reasonable relationship between the amount of the fee and the cost of the public facility or portion of that facility attributable to the development on which the fee is imposed.

Government Code Section 66000 also requires that the public agency segregate and account for the fees received separate from general funds. In addition, if a city has had possession of a developer fee for five years or more and has not committed or expended that money for a project, the city must make findings describing the continuing need for the fees each fiscal year after the five year period has expired. Fees excluded from the requirements of Section 66000 include:

- Fees charged in lieu of park land dedication under the Quimby Act;
- Regulatory and processing fees;
- Fees collected pursuant to a development agreement;
- Fees collected pursuant to a reimbursement agreement that exceed the developer's share of an improvement;
- Assessment district proceedings or taxes; and
- Service charges for utility services such as sewer, water, and electricity.

1. Calculating Future Development's Share of Costs

Future development's share of drainage improvement costs is determined by subtracting from the total improvement cost the gross unfunded share of costs as illustrated in Table 7-8. A five percent administration charge has been added to cover the cost of administering the Drainage Impact Fee program by the City. Administration includes the costs associated with managing, analyzing, auditing and overseeing the program within the City staff organization. This charge is a recognized cost of the program and is included in a similar manner by other jurisdictions.

Table 7-8
COSTS SUBJECT TO FUTURE DEVELOPMENT

Total Cost	Less Net Unfunded Share of Costs	Gross Cost to Future Buildout	Plus 5% for Program Admin.	Cost To Future Buildout
54,216,659	44,394,473	9,822,186	491,109	$10,313,295

2. Converting Improvement Costs To Fees

In the previous section we determined the cost of drainage improvements to serve future development. We have also determined in Table 7-3 the quantity of residential and non-residential land uses anticipated in the future to buildout of the General Plan. These future land uses have been replicated in Table 7-9. In order to equate dwelling units and acres of non-residential development, all land uses have been converted to Equivalent Dwelling Units or EDU's. Equivalent Dwelling Units are determined by applying the Coefficient of Runoff contained in Chapter 4 of this report and making an adjustment for density per acre. Density relationships were taken from the Hofman Planning Associates report previously referenced. One Single Family Dwelling Unit equals 1 EDU and other land uses are converted as follows:

Land Use	Runoff Coef.	Density Factor	EDU
SFDU	.55/unit	4/acre	1.00
MFDU	.70/unit	10/acre	.40
Non-Res.	.90/acre	1/acre[5]	6.40

Dwelling units and acres of non-residential land uses have been converted to Equivalent Dwelling Units in Table 7-10.

Table 7-9
SUMMARY OF FUTURE LAND USES

Future Single Family Units	Future Multi-Family Units	Future Non-Residential Acres
14,091	374	568

Table 7-10
CONVERSION OF FUTURE LAND USES TO EQUIVALENT DWELLING UNITS (EDU'S)

Future Single Family EDU's @ 1.0/DU	Future Multi-Family EDU's @ 0.4/DU	Future Non-Residential EDU's @ 6.4/AC	Total EDU's
14,091	150	3,635	17,876

[5] An average of 10,000 s.f. per acre of improvements was used for the conversion of all non-residential acres to square feet based on equivalent floor area factors contained within the SANDAG traffic generation rate table.

Next, the cost of improvements attributable to future buildout is divided by the total EDU's to calculate the cost per EDU as shown in Table 7-11.

Table 7-11
COST OF IMPROVEMENTS PER FUTURE EDU'S

Cost to Future Buildout[6]	Total EDU's	Cost Per EDU	Excess Capacity Cost Per EDU[7]	Total Net Cost Per EDU
$10,313,295	17,876	$577	$380	**$957**

Finally, the cost per EDU is converted to a fee per EDU by multiplying the EDU factor and the cost per EDU as shown in Table 7-12.

Table 7-12
FEES FOR FUTURE LAND USES

Per Future Single Family Unit	Per Future Multi-Family Unit	Per Future Non-Residential Square Foot
$957	$383	$0.61

G. Financing The Unfunded Share of Drainage Deficiencies

The Drainage Master Plan identified the need for ultimate drainage facilities with a total cost of $54,216,659. This was determined by analyzing approximately ninety (90) drainage basins covering the entire City with a land use equivalent to buildout of the General Plan. The drainage basins were again analyzed using existing development conditions. This analysis determined the need for a net cost of $44,394,473 in facilities to serve existing development. In establishing a development fee, it is required that only facilities required to serve future development be included in the fee. Therefore it is recommended that only the difference between the cost for ultimate drainage facilities and facilities to serve existing development be included in the drainage facilities fee.

When evaluating the need for drainage facilities to serve existing development, several factors should be considered. The need for a majority of the facilities is due to the fact that design standards for drainage facilities have been modified to include larger storm events which results in the need for larger facilities. A facility constructed in the 1970's may have been designed for a 10-year storm, whereas today's standards require the use of 50-year and 100-year storm events. The purpose for acknowledging these considerations is that

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[6] From Table 7-8.

[7] From Table 7-7.

although the Drainage Master Plan identified existing deficiencies in storm drain facilities, many recommended improvements are to parallel or replace existing facilities. The cost to construct the larger facility may outweigh the benefit of protection from larger storm events. It is recommended that a cost-benefit analysis and/or risk assessment be performed prior to consideration of replacement or parallel facilities.

It should also be noted that the design criteria used in the Drainage Master Plan required that all stormwater runoff be contained entirely within an underground storm drain pipe or open channel system. This is a conservative assumption since the City's drainage standards allow for the use of streets to convey stormwater runoff. If a facility is not adequate to convey the amount of runoff from a particular storm, and it is constructed within a public street right-of-way, it will overflow into the street. Based on its crossfall and slope, a street can convey a significant amount of runoff prior to flood waters reaching private property, homes and other structures.

It is proposed that staff prioritize the needed drainage facilities according to the following criteria:

a. Where no improved drainage facility currently exists

b. Where a drainage facility currently exists that was constructed prior to 1980

c. Where a drainage facility currently exists that was constructed after 1980

In most cases, the greatest flood threat exists where no improved drainage facility currently exists. The next greatest flood threat is assumed to exist where a facility was constructed prior to 1980 and was likely designed using a criteria that is less than current standards. Finally, the least flood threat is assumed to exist where a facility was constructed after 1980 using current drainage design standards. Staff will include personal knowledge of existing flooding problems in the priority ranking system. Also, drainage facilities or systems which have been partially constructed or constructed in phases with future phases remaining, will be considered in the priority rankings.

The cost of drainage facilities to serve existing development cannot be charged to future development and must be financed using other funding sources. The following is a list of alternatives used to account for the unfunded share of drainage deficiencies:

1. Increase Minimum Size Facility Included in Drainage Master Plan

   By increasing the minimum size facility included in the Drainage Master Plan, this will reduce the total cost of facilities included in the plan. Use of a larger minimum size facility in the Drainage Master Plan will require that more facilities be constructed as local improvements by future developers. As an example, if the minimum size facility included in the Drainage Master Plan is any facility designed to convey a minimum of 300 cubic feet per second (cfs), this requires that all smaller facilities be constructed by developers.

By increasing the minimum sized facility to that which conveys 300 cfs or greater (approximately equal to 60 inch diameter pipe), this results in a reduction in the cost of facilities required to serve existing development of approximately $14,000,000.

Increasing the minimum size facility also has the effect of reducing the total cost of facilities required to serve ultimate development. This results in a reduction in the cost of facilities which are the responsibility of future development. It is recommended that the Drainage Facilities Fee be reduced to the following amounts:

Table 7-13
FEES FOR FUTURE LAND USES
(using increased minimum facility size)

Per Future Single Family Unit	Per Future Multi-Family Unit	Per Future Non-Residential Square Foot
$898	$359	$0.57

2. Use of Detention/Retention Basins

Detention/retention basins can be used to reduce the peak rate of runoff from a storm and decrease the size of storm drain facilities required to convey the runoff. Future developers are encouraged to use detention/retention basins to maintain the rate of stormwater runoff at or below historic levels. This will not only reduce the size of local storm drain facilities, but may also reduce the size of downstream Drainage Master Plan facilities. If it can be shown that a detention/retention basin effects the need for a Master Plan facility, the developer may be eligible for credits against the Drainage Facilities Fee to be determined on a case by case basis.

Detention/retention basins also have a positive impact on the quality of stormwater runoff. The basins intercept the first flush of stormwater which typically has the highest load of pollutants. By using detention/retention basins, the amount of pollutants reaching receiving water bodies such as streams, rivers, lakes, coastal lagoons and the ocean is reduced.

The need for maintenance must also be considered when evaluating the use of detention/retention basins. Although they can be maintained in a natural state, it will likely be necessary to provide periodic removal of vegetation and control of siltation within the basins.

Since the use of detention/retention basins has not been studied in depth, it is assumed that this strategy will reduce the size of storm drain facilities by 33%. This will reduce the cost of existing deficiencies by approximately $15,000,000.

3. Construction with Street Improvement Projects

Currently, storm drain facilities which are integral to the construction of a street improvement project are installed with the street improvements and funded using Street Fund sources. This is justified by the fact that the drainage facilities are required to provide safe operation of the roadway during heavy rainfall and flooding conditions. It is estimated that approximately $5,000,000 is currently allocated in the Capital Improvement Program (CIP) for drainage improvements (including Reidy Creek) and that an additional $250,000 per year will be allocated over the next twenty (20) years. Therefore, it is assumed that the Street Fund will account for approximately $10,000,000 in storm drain facilities.

With adoption of the new Drainage Facilities Fee, it is recommended that drainage facilities be included in the City's Five Year Capital Improvement Program (CIP) budget based on the priority ranking system described above. Drainage facilities should be included in the Streets section of the CIP due to the need for coordination with street improvement projects.

4. Citywide Assessment District or Local Benefit District

It is possible for a group of residents or the City to petition for formation of Special Assessment District to finance the construction of storm drain facilities. This would involve issuance of bonds to generate revenue and an assessment placed on all properties which receive benefit from the improvements.

Since this method of financing has not been used extensively for storm drain improvements in the past, it is assumed that approximately ten (10) percent of the facilities required to serve existing development will be financed by Special Assessment Districts. This will reduce the cost of existing deficiencies by approximately be $4,000,000.

5. Stormwater Fee

The City currently includes a charge for stormwater quality (NPDES) on the bill to all utility customers. It may be feasible to increase this charge to include construction of storm drain facilities to provide for flood protection within the City. It is recommended that the existing stormwater fee be increased to generate a total of $1,000,000 for storm drain facilities to serve existing development. The stormwater fee should generate $50,000 per year over the next twenty (20) years, which will result in an increase of approximately $0.15 per month for each utility customer.

In summary, it is recommended that financing for the Drainage Master Plan be revised to include only facilities which convey 300 cfs or more (approximately equal to 60 inch diameter pipe). This results in a reduction in the cost of facilities required to serve existing development by $14,000,000. This also reduces the cost of facilities required to serve ultimate development and the recommended Drainage Facilities Fee to the amounts shown

in Table 7-13. It is estimated that the use of detention/retention basins can reduce the cost of facilities to serve existing development by approximately $15,000,000. Construction of drainage facilities with street improvement projects is estimated to account for approximately $10,000,000 in the cost of facilities to serve existing development. The use of Assessment Districts and the Stormwater Fee are estimated to account for approximately $4,000,000 and $1,000,000 respectively in the cost of facilities to serve existing development. The amounts described above account for $44,000,000 which is the total cost of the unfunded share of drainage deficiencies.

H. Reimbursement for Construction of Eligible Projects

A property owner/developer may be eligible for reimbursement for constructing one or more of the drainage improvements which are included in the Drainage Master Plan. Upon application by a property owner/developer for reimbursement the following information and requirements shall be considered:

(a). Detailed description of the project with a preliminary cost estimate.

(b). Requirements of property owner/developer:

- prepare plans and specifications for approval by the City;
- secure and dedicate any right-of-way required for the project;
- secure all required permits, environmental clearances necessary for construction of the project;
- provide performance bonds;
- pay all City fees and costs.

(c). The property owner/developer shall provide all necessary funds to construct the project. The City will not be responsible for any construction costs unless agreed to in advance.

(d). The property owner/developer shall secure at least three (3) qualified bids for the construction. Any extra work or charges during construction shall be justified and documented.

(e). When all work has been completed to the satisfaction of the City, the property owner/developer shall submit verification to the City of payments made for the construction. The Director of Public Works shall make the final determination on expenditures eligible for reimbursement.

(f). The City shall inspect all construction and verify quantities, in accordance with the City and State Code to ensure that the final improvement complies with all applicable standards and is constructed to the satisfaction of the City Engineer.

(g). A portion of Drainage Facilities Fees collected each fiscal year shall be used as reimbursement for eligible improvements constructed by developers. Initially, ten (10) percent of the fees collected during fiscal year

1995-96 shall be used to provide reimbursement for eligible drainage projects constructed during the year. Any remaining balance of the ten (10) percent shall be returned to the Drainage Facilities Fund to be used for City capital improvement drainage projects.

(h). The owner/developers name shall be placed on a list of all projects which are eligible for reimbursement on a year-to-year basis. The list shall be updated each year and the owner/developer shall be required to resubmit a request in the event they did not receive the maximum reimbursement during the previous year. The list shall be updated each year for new construction completed during the previous fiscal year.

(i). Reimbursement shall be distributed in direct proportion to the amount of eligible projects submitted. For example, if in a given fiscal year $100,000 is available for distribution and $1,000,000 in projects is eligible for reimbursement, each owner/developer is paid ten (10) percent of their respective amounts, and the balance can be carried over to the next fiscal year, upon resubmittal by the owner/developer.

(j). Reimbursement shall not be allowed in excess of the difference between the cost to construct the facility for existing development and ultimate development conditions as shown in Tables 6.4 and 6.5 or otherwise determined.

CHAPTER 8

FLOOD PLAIN MANAGEMENT PROGRAM

In order to be eligible for the National Flood Insurance Program (NFIP), the City adopted a Flood Plain Management Ordinance in December 1983. This was subsequently updated in 1987 and 1993 (current Flood Plain Management Ordinance No. 93-1). The NFIP was established by the federal government and is administered by the Federal Emergency Management Agency (FEMA). The intent of the program is to mitigate flood damage and provide protection for property against potential losses through a mechanism that allows a premium to be paid for flood insurance. The City's ordinance was based on the Flood insurance Study/Flood Insurance Rate Maps for the City of Escondido which were prepared by FEMA in 1983 and updated in 1988.

The Flood Insurance Study for the City of Escondido covers the incorporated areas of the City. Escondido Creek was studied in detail within the corporate limits. Reidy Creek was studied in detail from its confluence with Escondido Creek to the northern corporate limits at North Avenue. Kit Carson Park Creek was studied in detail from the southwest corporate limits to 2,450 feet upstream of Bear Valley Parkway. Detailed analyses were performed to evaluate hazards from shallow flooding in these three areas.

To provide a national standard, the 100 year flood (1 percent annual chance of occurrence) was adopted by FEMA as the base flood for flood plain management purposes. The area of the 100 year flood plain is divided into a floodway and a floodway fringe. The floodway is the channel of a stream plus any adjacent areas that must be kept free of encroachment so that the 100 year flood can be carried without substantial increase in flood heights. The floodway boundaries are shown on the Flood Boundary and Floodway Maps. According to the City's Flood Plain Management Ordinance, no development is permitted in a floodway area. The floodway fringe (area between the floodway and 100 year flood plain boundary) encompasses the portion of the flood plain that could be completely obstructed without increasing the water surface elevation of the 100 year flood by more than 1.0 foot at any point. This area can be developed, but will be required to obtain flood insurance.

To establish actuarial insurance rates, data from the engineering study was transformed into flood insurance criteria. This process included the determination of reaches, Flood Hazard Factors (FHF), and flood insurance zones and zone numbers were assigned based on the type of flood hazard and FHF. The Flood Insurance Rate Maps for the City of Escondido are the principal product for the Flood Insurance Study. These maps contain the official delineation of flood insurance zones and base flood elevations. The base flood elevations and zone numbers are used by insurance agents, in conjunction with structure elevations and characteristics, to assign actuarial insurance rates to structures and contents insured under the NFIP.

CHAPTER 9

STORM WATER QUALITY MANAGEMENT PROGRAM (NPDES)

The mandate to implement a storm water quality management program came about as a result of changes to the Water Quality Act adopted by the Environmental Protection Agency (EPA) in November, 1990. These regulations established the National Pollution Discharge Elimination System (NPDES) permit requirements for storm water. The act requires the issuance of NPDES permits for discharges from municipal separate storm sewer (storm water conveyance) systems serving a population of 100,000 or more.

The State Water Resources Control Board (SWRCB) and Regional Water Quality Control Boards (Regional Boards) are the state agencies responsible for protecting the quality of beneficial uses of water of the state and regulating the discharge of pollutants to such waters. The SWRCB and Regional Boards implement both state and federal water pollution control laws. On July 16, 1990, the San Diego Regional Board issued NPDES permit No. CA 0108758 and Order 90-42: "Water Discharge requirements for Storm Water and Urban Runoff from the County of San Diego, the City of San Diego, the Incorporated Cities of San Diego County and the San Diego Unified Port District."

The City of Escondido is named as a co-permittee in the permit for the San Diego region. As a co-permittee, the City is responsible for management of storm water and urban runoff management programs within its jurisdiction where it has ownership and maintenance responsibilities. The permit requires the development and implementation of programs to identify and eliminate illegal/illicit discharges to storm water conveyance systems, development and implementation of Best Management Practices (BMP's) to reduce pollutants in storm water and urban runoff, and development and implementation of a storm water monitoring program.

The City Council recently adopted Ordinance 93-30 pertaining to Storm Water Management and Discharge Control. Discharge of non-storm water to the storm water conveyance system is prohibited by the ordinance. Pollutants are defined and measures to reduce Pollutants in storm water are outlined. The ordinance does allow exemptions for waterline flushing and discharges from potable water sources, landscape irrigation and lawn watering, rising ground water or springs, passive foundation and footing drains, non-commercial washing of vehicles, flows from riparian habitats and wetlands, and other discharges of water not containing pollutants as defined in the California Water Code.

CHAPTER 10

REFERENCES

1. Master Plan of Drainage for the City of San Marcos, California; January 1990; Fraiser Engineering, Inc. and Cooper Engineering Associates.

2. City of Escondido Design Report, Storm Drainage Facilities, Project No. P-Calif.-3816; June 1, 1967; Leedshill Associates.

3. City of Escondido General Plan; June 6, 1990; City of Escondido.

4. Flood Insurance Study, City of Escondido, California, San Diego County; Revised July 4, 1988; Federal Emergency Management Agency.

5. Comprehensive Plan for Flood Control and Drainage, Zone 1, San Diego County Flood Control District; July 1976; Koebig, Inc.

6. Design Standards For The Design Of Public Works Improvements In The City Of Escondido; September 8, 1993; City of Escondido

7. Escondido Creek Watershed, Watershed Creek Plan; June 1961; Escondido Soil Conservation District.

APPENDIX A

TABLE 3.1

EXISTING FACILITIES

GEOMETRY: 1 = TRAP. OPEN CHANNEL, 2 = IRREGULAR CHANNEL, 3 = BOX CHANNEL, 4 = PIPE, 5 = RECT. OPEN CHANNEL
MATERIALS: 1 = R.C.P., 2 = C.I.P.P., 3 = R.C.B., 4 = C.M.P.A., 5 = C.M.P., 6 = NAT. CHNL., 7 = CONC. CHNL., 8 = SPIRAL RIBBED
Qc= EXISTING CAPACITY

ID #	SYSTEM	GEOMETRY	WIDTH (IN)	HEIGHT (IN)	RATIO	MATERIAL	DRAWING NO.	LENGTH (FEET)	SLOPE	Qc (CFS)
1	E-171	4	60			1	1018	320	0.50%	184
2	E-231	4	66			1	D-1036	1230	0.39%	210
3	E-231	4	66			1	D-1036	1136	0.13%	121
4	S.M.	3	48	96		3	D-1047	364	0.66%	438
5	NOT USED									
6	NOT USED									
7	KC-22A	3	96	96	2	3	D-1069-3	100	9.92%	8229
8	S.M.	1	96	72	2	7	P-1057-7	115	0.67%	1843
9	S.M.	3	84	48	3	3	P-1059-7	86	0.60%	1047
10	S.M.	4	48		2	1	P-1059-8	198	0.72%	244
11	S.M.	4	48			1	P-1059-8	278	1.19%	157
12	E-102	4	48			1	P-1061	713	1.00%	144
13	E-102	3	93	35	3	3	D-1062	89	0.30%	510
14	E-231	4	168	48		7	D-1063	223	0.42%	593
15	E-102	4	33			1	D-1065	656	0.50%	37
16	E-102	4	27			1	D-1065	249	0.50%	22
17	E-81	4	36			1	P-1066	50	3.10%	117
18	E-81	4	33			1	P-1066	110	3.50%	99
19	E-81	4	27			1	P-1066	125	3.50%	58
20	S.M.	4	36			1	P-1068	170	0.50%	47
21	KC-22A	3	144	96	3	3	D-1069-2	718	0.10%	2110
22	KC-22A	3	144	120	2	3	D-1069-3	812	0.10%	944
23	R-41	3	144	120	4	3	D-1072	790	0.40%	7535
24	R-41	5	480	144		7	D-1072	703	0.45%	12327
25	R-42	4	66		2	5	D-1076	331	0.93%	646
26	E-141	4	42			1	D-1077	126	2.00%	142
27	E-141	4	42			1	D-1077	207	2.00%	142
28	E-141	4	36			1	D-1077	136	1.78%	89
29	E-141	4	36			1	D-1077	304	1.78%	89
30	E-141	4	36			1	D-1077	106	1.20%	73
31	NOT USED									
32	E-231	4	84			1	P-1078	882	0.45%	429
33	E-231	4	42			1	P-1078	366	0.54%	74
34	E-231	4	36			1	P-1078	132	1.00%	67

TABLE 3.1

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MATERIALS: 1 = R.C.P., 2 = C.I.P.P., 3 = R.C.B., 4 = C.M.P.A., 5 = C.M.P., 6 = NAT. CHNL., 7 = CONC. CHNL., 8 = SPIRAL RIBBED
Qc= EXISTING CAPACITY

ID #	SYSTEM	GEOMETRY	WIDTH (IN)	HEIGHT (IN)	RATIO	MATERIAL	DRAWING NO.	LENGTH (FEET)	SLOPE	Qc (CFS)
35	E-222	4	54			1	P-1082	175	1.80%	264
36	E-171	4	60			1	D-1085	600	0.33%	150
37	E-221	4	60			1	P-1085	598	0.50%	160
38	KC-21	4	36			1	P-1086	700	2.00%	36
39	E-182	4	36			1	D-1088	2091	0.70%	56
40	E-181	4	60			1	D-1091	772	0.40%	165
41	E-181	4	54			1	D-1091	380	0.40%	124
42	E-181	4	58	36		4	D-1091	829	0.60%	121
43	NOT USED									
44	R-42	4	66		2	1	D-1092	184	0.98%	665
45	E-81	4	80			8	D-1093	489	0.50%	396
46	E-182	4	43	27		4	D-1094	273	0.40%	46
47	E-102	3	144	48		1	D-1096	437	0.53%	607
48	E-102	2	120	48	1.5	1	D-1096	595	0.64%	803
49	E-102	2	72	72	1.5	1	D-1096	324	0.64%	1395
50	E-102	4	60			1	D-1096	336	1.00%	260
51	E-102	4	60			1	D-1096	157	1.00%	260
52	E-111	4	48			1	D-1010	1242	1.60%	182
53	E-102	1	108	90	2	7	D-1011	340	0.25%	1004
54	E-102	1	240	54	1.5	7	P-1012-17	616	0.25%	538
55	E-102	5	216	60		3	P-1012-13	601	0.50%	1265
56	E-102	1	240	48	1.5	7	P-1012-13	281	0.50%	602
57	E-102	1	120	48	1.5	7	P-1012-15	621	0.50%	331
58	E-102	3	96	48	2	3	P-1012-15	393	0.50%	699
59	E-102	1	96	48	1.5	7	P-1012-14	410	0.40%	249
60	E-102	4	72	44		4	P-1012-6	680	0.50%	200
61	E-102	4	72	44		4	P-1012-7	751	1.50%	346
62	NOT USED									
63	E-231	4	84			1	D-1014	66	1.09%	667
64	E-231	4	72			2	D-1014	720	1.09%	383
65	E-231	4	72			2	D-1014	1642	0.72%	311
66	E-182	4	49	33		4	D-1015	325	0.50%	77
67	R-13	4	42			1	D-1016	361	1.08%	105
68	E-111	4	72			1	D-1023	603	0.74%	364

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GEOMETRY: 1 = TRAP. OPEN CHANNEL, 2 = IRREGULAR CHANNEL, 3 = BOX CHANNEL, 4 = PIPE, 5 = RECT. OPEN CHANNEL
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Qc= EXISTING CAPACITY

ID #	SYSTEM	GEOMETRY	WIDTH (IN)	HEIGHT (IN)	RATIO	MATERIAL	DRAWING NO.	LENGTH (FEET)	SLOPE	Qc (CFS)
69	E-111	4	72			1	D-1023	481	0.89%	399
70	E-102	4	42			1	P-1024	735	1.00%	100
71	E-102	4	39			1	P-1924	206	1.00%	83
72	E-211	4	57	38		4	P-1024	162	0.20%	70
73	R-12	4	36			1	D-1026	290	1.30%	76
74	E-102	3	120	42	2	3	D-1027	430	0.37%	659
75	S.M.	3	84	36	3	3	P-1033	70	1.00%	817
76	E-102	3	180	42		3	D-1034	140	1.21%	873
77	E-211	3	54	22		3	D-1035	605	0.23%	34
78	E-222	4	72			1	D-1035	370	0.50%	299
79	E-222	4	72			1	D-1035	500	1.00%	424
80	E-222	4	72			1	D-1035	311	0.50%	299
81	E-222	4	72			1	D-1035	235	0.70%	354
82	E-222	4	72			1	D-1035	348	1.00%	424
83	E-222	4	72			1	D-1035	453	0.80%	379
84	E-222	4	72			1	D-1035	219	1.04%	432
85	E-222	4	72			1	D-1035	536	0.85%	390
86	E-222	4	72			1	D-1035	320	0.85%	390
87	E-222	4	72			1	D-1035	698	0.30%	232
88	R-13	4	42			5	D-1041	545	0.62%	79
89	NOT USED									
90	E-222	4	60			1	D-1035	120	0.80%	233
91	E-222	4	72	44		4	D-1054	197	1.00%	282
92	E-222	4	72	44		4	D-1054	562	0.86%	262
93	E-222	4	72	44		4	D-1054	220	2.07%	406
94	E-222	4	72	44		4	D-1054	140	0.80%	252
95	E-81	4	54		4	5	D-1055	80	0.50%	301
96	E-81	1	120	60	1.5	7	D-1055	384	0.45%	506
97	E-81	1	96	48	1.5	7	D-1055	331	0.45%	265
98	E-81	1	72	52	1.5	7	D-1055	500	0.45%	254
99	E-81	1	48	44	1.5	7	D-1055	300	2.86%	351
100	E-81	3	60	42	2	3	D-1055	60	0.20%	194
101	E-81	4	54			1	P-1057	106	0.70%	165
102	E-102	1	78	54	1.5	7	D-1096	418	0.64%	759

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Qc= EXISTING CAPACITY

ID #	SYSTEM	GEOMETRY	WIDTH (IN)	HEIGHT (IN)	RATIO	MATERIAL	DRAWING NO.	LENGTH (FEET)	SLOPE	Qc (CFS)
103	E-102	1	54	72	1.5	7	D-1096	875	0.64%	1206
104	E-102	1	78	48	1.5	7	D-1096	330	0.64%	582
105	E-102	1	96	42	1.5	7	D-1096	500	0.64%	504
106	R-71	3	120	48		3	D-1097	275	0.86%	614
107	R-71	4	84			1	D-1097	539	0.72%	542
108	R-71	4	84			1	D-1097	676	0.75%	553
109	R-71	4	66			1	D-1097	750	0.35%	199
110	R-71	4	66			1	D-1097	497	2.49%	530
111	R-71	4	66			1	D-1097	698	1.58%	422
112	E-141	4	36			1	D-1099	186	1.00%	67
113	E-102	3	84	60		3	D-1100	486	0.50%	398
114	E-102	4	78			1	D-1100	520	0.25%	262
115	E-102	4	78			1	D-1100	504	0.73%	446
116	E-102	4	75			1	D-1100	524	0.50%	334
117	E-102	4	75			1	D-1100	674	0.48%	327
118	E-102	4	60			1	D-1100	378	0.55%	193
119	E-102	4	45			1	D-1100	318	1.26%	136
120	E-102	4	45			1	D-1100	525	1.49%	148
121	E-102	4	42			1	P-1555	380	2.00%	142
122	E-102	4	36			1	P-1555	176	1.73%	88
123	NOT USED									
124	E-222	3	96	60	2	3	P-1104	360	1.15%	1451
125	E-241	4	36			1	P-1112-5	500	0.30%	36
126	E-241	4	36			1	P-1112-4	155	0.20%	30
127	E-202	4	36			1	P-1148	280	0.50%	47
128	NOT USED									
129	NOT USED									
130	NOT USED									
131	NOT USED									
132	E-92	4	48			1	P-2009	81	1.00%	144
133	E-92	4	42			1	P-2009	85	0.65%	81
134	NOT USED									
135	NOT USED									
136	NOT USED									

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MATERIALS: 1 = R.C.P., 2 = C.I.P.P., 3 = R.C.B., 4 = C.M.P.A., 5 = C.M.P., 6 = NAT. CHNL., 7 = CONC. CHNL., 8 = SPIRAL RIBBED
Qc= EXISTING CAPACITY

ID #	SYSTEM	GEOMETRY	WIDTH (IN)	HEIGHT (IN)	RATIO	MATERIAL	DRAWING NO.	LENGTH (FEET)	SLOPE	Qc (CFS)
137	E-92	4	48			1	P-1772	103	1.60%	182
138	E-92	4	48			2	P-1775	182	9.26%	379
139	E-92	4	48			2	P-1775	155	5.79%	300
140	E-92	4	42			1	P-1800	277	5.31%	232
141	E-92	4	36			1	P-1800	298	1.90%	92
142	E-92	4	36			1	P-1800	96	1.50%	82
143	E-92	4	36			1	P-1800	193	7.11%	178
144	E-92	4	36			1	P-1800	364	1.90%	92
145	NOT USED									
146	NOT USED									
147	E-211	3	36	24		3	D-1000	70	0.23%	28
148	E-211	4	58	36		4	D-1000	609	0.32%	88
149	E-81	4	54			5	D-1002-2	163	1.02%	199
150	E-81	4	48			5	D-1002-2	350	3.29%	261
151	E-81	4	49	33	2	4	D-1002-2	124	1.04%	222
152	E-81	4	48			5	D-1002-2	96	1.02%	145
153	E-81	4	49	33		4	D-1002-2	227	2.43%	170
154	E-102	4	25	16	2	4	D-1004-2	110	0.17%	14
155	E-102	4	25	16	2	4	D-1004-3	450	0.17%	14
156	E-81	4	71	47		4	P-1004-A	70	1.00%	564
157	R-66	2	84	40	1.5	6	P-1007-11	1180	0.50%	141
158	R-66	4	76	52		4	P-1007-11	325	0.40%	230
159	R-66	4	54			1	P-1007-3	276	0.85%	181
160	R-66	4	48			1	P-1007-3	358	2.66%	234
161	NOT USED									
162	FEL	4	42			1	P-1154	41	1.17%	109
163	E-81	4	72			1	P-1165	337	0.30%	232
164	E-81	4	54			1	P-1165	125	1.00%	197
165	E-81	4	48			1	P-1165	386	0.86%	133
166	E-81	4	48			1	P-1165	568	1.14%	153
167	KC21	3	72	36	2	3	P-1168	60	2.00%	630
168	NOT USED									
169	E-202	4	48			1	P-1175	123	0.50%	102
170	E-202	4	48			1	P-1175	349	0.50%	102

TABLE 3.1

EXISTING FACILITIES

GEOMETRY: 1 = TRAP. OPEN CHANNEL, 2 = IRREGULAR CHANNEL, 3 = BOX CHANNEL, 4 = PIPE, 5 = RECT. OPEN CHANNEL
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Qc= EXISTING CAPACITY

ID #	SYSTEM	GEOMETRY	WIDTH (IN)	HEIGHT (IN)	RATIO	MATERIAL	DRAWING NO.	LENGTH (FEET)	SLOPE	Qc (CFS)
171	NOT USED									
172	E-102	4	72	44		4	P-1182	1563	0.50%	200
173	E-182	4	60			1	P-1191-10	298	0.40%	165
174	E-182	4	66			1	P-1191-5	465	0.28%	178
175	E-182	4	72			1	P-1191-4	409	0.36%	254
176	E-222	4	39			1	P-1221-2	64	0.50%	58
177	E-222	4	39			1	P-1221-2	258	3.36%	151
178	E-222	4	96			5	P-1221-10	73	6.19%	2269
179	R-71	3	120	48		3	P-1223-2	223	1.50%	886
180	S.M.	4	36			1	P-1228-3	300	0.50%	47
181	S.M.	4	42			1	P-1228-3	800	2.18%	149
182	E-202	3	120	60		3	P-1413-7	1127	1.18%	1061
183	E-202	4	65	40		4	P-1240-2	494	1.61%	270
184	E-202	4	36			1	P-1240-3	244	0.90%	63
185	E-202	4	42			1	P-1255-5	772	0.20%	45
186	E-202	4	29	18		4	P-1255-4	445	0.50%	17
187	E-102	3	60	36	3	3	P-1260-3	74	1.92%	814
188	E-222	4	60			1	P-1343-6	259	0.53%	190
189	E-151	4	21		2	1	P-1346-13	80	0.40%	20
190	R-54	4	36			5	P-1348-2	200	1.61%	85
191	NOT USED									
192	NOT USED									
193	KC-11	4	24		2	1	P-1349-8	110	1.10%	47
194	E-182	4	24		2	1	P-1350	135	0.19%	19
195	E-92	4	84			1	P-1355	210	0.50%	452
196	E-231	4	42			1	P-1373-10	597	0.27%	52
197	E-231	4	36			1	P-1373-10	284	0.24%	33
198	E-211	3	36	48		3	P-1378	657	0.50%	95
199	NOT USED									
200	S.M.	3	48	24		3	P-1413-8	169	1.50%	87
201	E-221	4	42			1	P-1433-8	310	0.50%	71
202	E-221	4	50	31		4	P-1433-8	306	0.50%	77
203	S.M.	4	43	27		4	P-1438	172	0.70%	60
204	S.M.	4	50	31		4	P-1438	59	0.70%	91

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Qc= EXISTING CAPACITY

ID #	SYSTEM	GEOMETRY	WIDTH (IN)	HEIGHT (IN)	RATIO	MATERIAL	DRAWING NO.	LENGTH (FEET)	SLOPE	Qc (CFS)
205	S.M.	3	72	33	2	3	P-1438	90	0.50%	315
206	E-102	4	42			1	P-1445-6	230	1.10%	106
207	E-102	4	48			1	P-1445-6	430	1.10%	151
208	E-102	4	48			1	P-1445-7	440	1.97%	202
209	E-102	4		48		1	D-1100	36	22.60%	683
210	E-102	4		48		1	D-1100	101	1.50%	176
211	KC-32	4	84			1	1454-9	138	8.00%	1807
212	R-13	4	72	44		4	1455-3	80	1.00%	282
213	E-231	4	51			1	P-1457-7	486	0.30%	92
214	NOT USED									
215	NOT USED									
216	NOT USED									
217	E-193	4	54			1	P-1778-3	488	0.50%	139
218	E-193	4	42			1	P-1778-3	154	1.94%	140
219	E-193	4	39			1	P-1778-5	289	1.20%	90
220	E-111	4	60			1	P-1788	348	0.50%	184
221	E-111	4	54			1	P-1788	328	0.50%	139
222	E-111	4	48			1	P-1788	222	0.50%	102
223	E-111	4	48			1	P-1788	110	2.00%	203
224	E-111	4	36	58		4	P-1788	40	7.90%	437
225	E-234	4	48			2	P-1791	230	0.57%	94
226	E-234	4	42			2	P-1791	700	0.60%	68
227	E-234	4	24		3	1	P-1791	70	2.00%	96
228	R-31	4	50	31		4	P-1797	206	1.32%	125
229	R-31	4	36	22		4	P-1797	175	0.60%	34
230	NOT USED									
231	NOT USED									
232	S.M.	4	49	33		4	P-1314	240	0.50%	77
233	S.M.	4	36			1	P-1314	640	0.50%	47
234	S.M.	4	57	38	2	4	P-1318	163	2.40%	482
235	KC-32	3	72	48		3	P-1327	474	1.10%	352
236	NOT USED									
237	KC-32	4	42			1	P-1346	880	0.48%	70
238	KC-32	4	72			1	P-1346	22	0.36%	254

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Qc= EXISTING CAPACITY

ID #	SYSTEM	GEOMETRY	WIDTH (IN)	HEIGHT (IN)	RATIO	MATERIAL	DRAWING NO.	LENGTH (FEET)	SLOPE	Qc (CFS)
239	E-222	4	54			1	P-1343	347	0.50%	139
240	S.M.	4	48			1	P-1458-15	641	2.50%	227
241	S.M.	4	48			4	P-1471-2	240	0.50%	55
242	E-92	4	36			1	P-1474	498	0.45%	45
243	S.M.	3	60	48	2	3	P-1475-8	214	0.90%	495
244	E-192	4	42			1	P-1480-4	478	0.28%	53
245	NOT USED									
246	NOT USED									
247	KC-21	4	36			5	P-1483-2	385	5.77%	160
248	E-102	4	36			1	P-1483-4	122	0.50%	47
249	E-102	4	48			1	P-1483-4	235	1.00%	144
250	E-81	4	36			1	P-1487-6	323	0.62%	53
251	NOT USED									
252	NOT USED									
253	NOT USED									
254	E-202	4	48			1	P-1501-15	18	0.41%	92
255	E-202	4	60			1	P-1501-15	78	0.83%	237
256	E-102	4	36			1	P-1504-23	417	0.50%	47
257	E-102	4	36			1	P-1504-23	315	0.68%	55
258	E-121	3	72	30		3	P-1504-8,16	105	0.50%	120
259	E-121	4	48			1	P-1504-8,16	309	0.48%	100
260	E-121	4	54			1	P-1504-8,16	249	0.25%	98
261	E-102	1	162	84	1.5	7	P-1504-18,19	1243	0.31%	2285
262	E-102	1	312	54	1.5	7	P-1504-18,19	326	0.31%	1631
263	E-231	4	42			1	P-1510-8	746	0.20%	45
264	E-231	4	66			1	P-1510-2	543	0.64%	269
265	E-231	4	48			1	P-1510-4	635	0.25%	72
266	E-231	4	24		3	1	P-1510-3	82	3.50%	127
267	NOT USED									
268	NOT USED									
269	NOT USED									
270	NOT USED									
271	E-241	4	42		2	1	1618	112	0.40%	127
272	E-241	5	96	48		7	1618	960	0.40%	285

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Qc= EXISTING CAPACITY

ID #	SYSTEM	GEOMETRY	WIDTH (IN)	HEIGHT (IN)	RATIO	MATERIAL	DRAWING NO.	LENGTH (FEET)	SLOPE	Qc (CFS)
273	E-241	4	60			1	1618	233	0.40%	175
274	E-241	4	39			2	1632-1	465	0.50%	54
275	E-241	4	39			2	1632-2	550	1.52%	102
276	E-241	4	36			1	1632-2	333	1.50%	82
277	E-241	4	36			1	1632-2	267	2.75%	111
278	NOT USED									
279	NOT USED									
280	NOT USED									
281	S.M.	4	42			1	P-1639-6	147	0.80%	90
282	S.M.	4	36			1	P-1639-6	171	8.00%	189
283	S.M.	4	36			1	P-1639-6	188	4.26%	138
284	S.M.	4	48			1	P-1639-6	323	8.00%	128
285	E-161	4	42			1	1641	589	0.50%	71
286	NOT USED									
287	E-161	4	43	27		4	1641	147	0.80%	65
288	E-161	4	25	16	2	4	1641	110	0.50%	24
289	R-66	3	144	33		3	P-1644	60	0.50%	378
290	E-111	4	36			1	P-1661-5	64	1.00%	67
291	E-111	4	42	27	2	4	P-1661-2	48	0.50%	102
292	E-111	4	48			1	P-1661-2	245	0.50%	102
293	E-182	4	50	31		4	P-1529-5	550	0.25%	55
294	E-211	4	48			1	1530	685	0.36%	86
295	L.H.	4	36			1	P-1533-45	130	1.00%	67
296	L.H.	4	36			1	P-1533-44	100	28.28%	355
297	L.H.	4	72	72	2	3	P-1533-41	100	1.00%	1152
298	NOT USED									
299	R-41	4	48			1	P-1551	500	0.40%	91
300	NOT USED									
301	NOT USED									
302	R-41	4	42			1	P-1551	76	0.50%	71
303	R-32	4	36			1	P-1551	289	1.00%	67
304	R-42	3	84	72		3	P-1551	239	0.40%	454
305	E-202	1	156	39		7	1566	566	1.00%	614
306	E-202	4	48			1	1566	360	0.80%	128

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Qc= EXISTING CAPACITY

ID #	SYSTEM	GEOMETRY	WIDTH (IN)	HEIGHT (IN)	RATIO	MATERIAL	DRAWING NO.	LENGTH (FEET)	SLOPE	Qc (CFS)
307	KC-22	4	42			5	1574	310	2.40%	84
308	KC-22	4	42			5	1574	180	4.50%	116
309	KC-22	4	42			5	1574	450	4.50%	116
310	E-202	4	36			1	1594	350	0.50%	47
311	E-202	4	48			1	1594	146	0.50%	102
312	E-202	1	36	30	1.5	7	1594	756	1.38%	167
313	E-202	1	36	30	1.5	7	1594	382	1.98%	200
314	E-202	3	84	36		3	1594	90	1.32%	313
315	E-202	1	36	36	1.5	7	1594	361	1.85%	306
316	E-222	4	66			1	P-1619	942	1.40%	397
317	E-182	4	43	27		4	1626	615	0.40%	46
318	E-182	4	43	27		4	1626	115	0.50%	51
319	E-182	4	36	22	2	4	1626	208	0.50%	63
320	R-66	4	48			1	P-1654	900	1.83%	194
321	NOT USED									
322	E-202	4	48			1	P-1285	444	0.80%	128
323	E-193	4	54			1	P-1712	400	1.00%	197
324	R-42	4	48			1	P-1714	216	0.57%	108
325	R-42	4	48			1	P-1714	130	0.69%	119
326	R-42	4	42			2	P-1714	300	1.00%	93
327	R-42	4	36			2	P-1714	414	1.00%	58
328	R-42	4	36			2	P-1714	87	5.82%	139
329	E-231	4	42			1	P-1720	472	0.20%	45
330	R-81	4	54		10	5	P-1735	110	0.84%	976
331	E-92	4	72			1	P-1740	669	0.69%	352
332	L.H.	4	48			1	P-1746-8	170	8.14%	410
333	E-222	4	36			1	P-1747-12	224	3.33%	122
334	E-182	3	72	24		3	P-1753	121	0.25%	60
335	E-182	4	25	16	4	4	P-1753	32	0.20%	15
336	KC-32	3	96	36		3	P-1754	296	3.96%	644
337	KC-32	3	96	54		3	P-1754	127	1.00%	584
338	E-221	1	60	15	1	7	P-1763	133	1.00%	31
339	E-221	4	42			5	P-1763	396	0.66%	82
340	E-221	4	24		3	5	P-1763	82	0.35%	40

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Qc= EXISTING CAPACITY

ID #	SYSTEM	GEOMETRY	WIDTH (IN)	HEIGHT (IN)	RATIO	MATERIAL	DRAWING NO.	LENGTH (FEET)	SLOPE	Qc (CFS)
341	R-42	4	36			1	P-1764	60	1.00%	67
342	S.M.	4	36			1	P-1771	100	0.74%	57
343	NOT USED									
344	NOT USED									
345	E-92	4	54			2	P-1772	312	1.64%	252
346	E-92	4	54			2	P-1772	142	1.00%	170
347	KC-22	4	48			1	P-1667	131	1.00%	144
348	KC-22	4	45			1	P-1667	70	0.50%	86
349	KC-11	4	36			1	P-1667	90	0.40%	42
350	KC-11	4	50	31	2	4	P-1667	150	0.37%	133
351	KC-11	4	50	31	2	4	P-1667	60	2.57%	349
352	L.H.	4	48		2	1	P-1667-7/2098	220	2.83%	483
353	E-193	4	54			2	P-1669	612	0.50%	121
354	E-193	4	42		2	1	P-1669	68	0.50%	142
355	NOT USED									
356	E-236	4	36			1	P-1681	150	0.31%	37
357	E-111	4	36			1	P-1684-11	53	0.73%	57
358	E-111	4	36			1	P-1684-11	459	0.73%	57
359	NOT USED									
360	NOT USED									
361	FEL	4	54			1	P-1688	240	0.50%	139
362	R-71	5	120	48		7	P-1692	262	0.50%	425
363	R-71	4	10	3		3	P-1692	79	0.50%	342
364	E-202	4	36			1	P-1903	130	0.50%	47
365	E-193	4	36			1	P-1909	152	2.50%	105
366	E-231	4	36			1	P-1915-4	127	0.35%	39
367	S.M.	4	36			1	P-1917-4	278	2.15%	98
368	R-42	4	84			1	P-1927-3	455	0.60%	495
369	E-193	4	60			1	D-1002-2	318	0.43%	171
370	E-193	3	60	36	2	3	D-1002-2	95	0.43%	229
371	E-193	4	48		2	1	D-1002-2	327	0.43%	188
372	E-193	4	45		2	1	D-1002-2	1207	0.42%	157
373	E-193	4	45			1	D-1002-6	469	1.05%	124
374	E-193	4	42			1	D-1002-6	424	1.00%	101

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Qc= EXISTING CAPACITY

ID #	SYSTEM	GEOMETRY	WIDTH (IN)	HEIGHT (IN)	RATIO	MATERIAL	DRAWING NO.	LENGTH (FEET)	SLOPE	Qc (CFS)
375	NOT USED									
376	NOT USED									
377	NOT USED									
378	NOT USED									
379	NOT USED									
380	NOT USED									
381	NOT USED									
382	E-191	4	48			1	D-1002-8	217	0.50%	102
383	E-191	3	72	36		3	D-1002-8	247	0.10%	70
384	E-191	3	72	36		3	D-1002-8	138	0.38%	137
385	NOT USED									
386	E-191	4	39			1	D-1002-10	474	0.20%	37
387	NOT USED									
388	KC-32	4	72			1	D-1002-11	315	1.59%	534
389	KC-32	4	72			1	D-1002-11	406	0.37%	258
390	KC-32	4	66			1	D-1002-11	764	0.29%	181
391	KC-32	4	66			1	D-1002-12	587	0.20%	150
392	KC-32	4	66			1	D-1002-13	486	0.88%	315
393	NOT USED									
394	KC-32	4	60			1	D-1003-2	318	0.30%	143
395	KC-32	4	60			1	D-1003-2	542	0.28%	138
396	KC-32	4	57			1	D-1003-2	292	0.34%	132
397	KC-32	4	48			1	D-1003-3	648	0.89%	136
398	KC-32	4	36			1	D-1003-3	500	1.60%	84
399	NOT USED									
400	NOT USED									
401	NOT USED									
402	NOT USED									
403	NOT USED									
404	NOT USED									
405	NOT USED									
406	E-211	3	54	20		3	D-1005	882	0.25%	31
407	E-202	3	144	84		3	D-1009-2	1260	0.12%	644
408	E-202	3	144	84		3	D-1009-3	1323	0.14%	695

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Qc= EXISTING CAPACITY

ID #	SYSTEM	GEOMETRY	WIDTH (IN)	HEIGHT (IN)	RATIO	MATERIAL	DRAWING NO.	LENGTH (FEET)	SLOPE	Qc (CFS)
409	E-202	4	96			1	D-1009-B	960	0.40%	577
410	KC-32	4	72			1	S-1009	723	0.88%	397
411	E-214	3	72	36		3	1012	806	0.44%	166
412	E-214	3	72	36		3	1012	247	0.50%	158
413	E-214	4	36		2	1	1012	96	0.58%	102
414	KC-32	4	36			1	D-1013	750	1.09%	70
415	E-212	4	42			1	D-1013	819	0.36%	60
416	E-212	4	36			1	D-1013	1321	0.30%	37
417	R-31	4	50	31		4	D-1003-2	344	0.50%	77
418	E-211	3	72	48	2	3	1019	1068	0.20%	300
419	E-211	3	72	48	2	3	1019	427	0.16%	269
420	NOT USED									
421	E-211	4	58	36	2	4	1501	602	0.40%	197
422	E-182	4	78		2	1	1022	1619	0.28%	555
423	E-182	4	78		2	1	1022	1424	0.21%	481
424	E-182	4	84			1	1022	400	0.28%	338
425	NOT USED									
426	E-182	4	48			1	1022	859	0.20%	64
427	R-21	4	54			1	1022	524	0.60%	152
428	R-21	4	54			1	1022	427	0.65%	159
429	R-21	4	24		2	1	1022	85	0.34%	26
430	R-21	4	42			1	1022	328	0.83%	92
431	R-21	4	36			1	1022	205	0.30%	37
432	E-221	4	78		2	5	1023	1081	0.30%	574
433	E-221	4	60		3	1	1023	874	0.33%	449
434	E-221	4	65	40	2	4	1023	350	0.40%	269
435	E-182	4	36			5	1027	250	1.79%	89
436	E-182	4	36			5	1028	326	0.63%	53
437	E-81	4	36			5	S-1029	154	5.64%	158
438	NOT USED									
439	E-182	4	43	27		4	1031	445	1.37%	27
440	NOT USED									
441	R-72	4	36			2	P-1508	400	6.20%	144
442	NOT USED									

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Qc= EXISTING CAPACITY

ID #	SYSTEM	GEOMETRY	WIDTH (IN)	HEIGHT (IN)	RATIO	MATERIAL	DRAWING NO.	LENGTH (FEET)	SLOPE	Qc (CFS)
443	R-12	4	54			1	D-1108	950	0.50%	139
444	R-12	4	54			1	D-1108	87	0.42%	127
445	R-12	4	72	44		4	D-1108	212	3.12%	498
446	R-12	4	72	44		4	D-1108	254	0.30%	155
447	R-12	4	65	40		4	D-1108	750	0.30%	117
448	R-12	4	58	36		4	D-1108	128	0.62%	122
449	R-12	4	36			1	D-1108	253	0.60%	52
450	R-12	4	50	31		4	D-1108	40	0.96%	107
451	R-12	4	36			1	D-1158	40	10.00%	211
452	E-221	4	54			2	D-1153	656	0.50%	121
453	E-221	4	42			2	D-1153	348	0.50%	62
454	E-221	4	42			2	D-1153	288	1.04%	89
455	NOT USED									
456	E-231	3	120	30	2	3	P-1435	354	0.50%	527
457	E-231	5	192	41		7	P-1435	572	0.45%	547
458	NOT USED									
459	NOT USED									
460	NOT USED									
461	S.M.	4	48			1	1482-2	86	1.41%	234
462	E-221	4	65	40	2	4	1490	398	0.40%	269
463	E-211	1	72	36	1.5	7	1495	1375	0.33%	205
464	NOT USED									
465	E-211	4	36			1	1517	78	1.00%	67
466	E-211	4	36			1	1517	254	0.60%	52
467	E-222	4	54			1	1524	637	0.50%	139
468	E-222	4	48			1	1524	112	5.23%	329
469	E-222	4	36			1	1524	120	1.25%	75
470	E-102	4	60			2	P-1534	553	1.80%	303
471	E-102	2	120	60	3	6	P-1534	110	3.75%	1706
472	E-202	5	156	36		7	1578	625	1.00%	512
473	NOT USED									
474	NOT USED									
475	NOT USED									
476	NOT USED									

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Qc= EXISTING CAPACITY

ID #	SYSTEM	GEOMETRY	WIDTH (IN)	HEIGHT (IN)	RATIO	MATERIAL	DRAWING NO.	LENGTH (FEET)	SLOPE	Qc (CFS)
477	E-241	4	36			1	1669	870	2.75%	111
478	S.M.	4	72			1	P-1581	84	2.00%	599
479	S.M.	4	43	27		4	1678	124	0.70%	60
480	E-185	4	49	33		4	P-1813	230	0.30%	60
481	NOT USED									
482	R-81	4	36			1	P-1865	700	0.60%	52
483	E-222	4	36			1	P-1900	184	0.25%	33
484	E-222	4	36			1	P-1900	158	0.75%	58
485	E-222	4	36			1	P-1900	58	0.75%	58
486	E-222	4	36			1	P-1900	125	0.75%	58
487	E-185	4	36			1	P-1941	220	0.30%	37
488	S.M.	4	42			1	P-1949	58	1.80%	135
489	S.M.	4	42			1	P-1949	208	1.00%	101
490	R-21	4	36			1	P-2079	213	0.73%	57
491	NOT USED									
492	FEL	4	36			1	P-1988	35	0.62%	53
493	NOT USED									
494	NOT USED									
495	E-222	4	66			1	P-2003	185	1.00%	336
496	E-92	4	54			1	P-2009	503	1.66%	253
497	NOT USED									
498	NOT USED									
499	E-92	4	66			2	P-2009	201	0.91%	278
500	E-92	4	66			2	P-2009	457	1.98%	410
501	KC-12	4	60			1	P-2011	135	1.46%	315
502	KC-12	4	42			2	P-2011	360	1.10%	91
503	KC-12	4	36			2	P-2011	285	4.47%	122
504	KC-12	4	54			2	P-2011	285	17.40%	711
505	KC-12	4	54			2	P-2011	200	1.50%	209
506	KC-12	4	48			1	P-2011	330	2.75%	238
507	KC-12	4	48			2	P-2011	300	1.67%	161
508	E-221	4	60			1	P-2014	500	0.50%	184
509	E-221	4	36			1	P-2014	95	1.60%	84
510	E-221	4	72			1	P-2014	217	0.50%	299

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Qc= EXISTING CAPACITY

ID #	SYSTEM	GEOMETRY	WIDTH (IN)	HEIGHT (IN)	RATIO	MATERIAL	DRAWING NO.	LENGTH (FEET)	SLOPE	Qc (CFS)
511	E-221	4	60			1	P-2014	407	1.30%	297
512	E-221	4	48			1	P-2014	78	4.89%	318
513	E-221	4	36			1	P-2014	159	0.50%	47
514	E-221	4	48			1	P-2014	42	0.50%	102
515	E-221	4	36			1	P-2014	392	2.50%	105
516	KC-22	4	48			1	P-2015	233	1.00%	144
517	KC-32	4	48			5	P-2020	305	0.65%	63
518	KC-32	4	42			5	P-2020	337	1.25%	61
519	KC-32	4	36			5	P-2020	519	1.25%	40
520	E-222	3	72	30	2	3	P-2060	295	3.13%	600
521	E-222	4	49	33		4	P-2060	74	2.72%	180
522	E-222	4	49	33		4	P-2060	142	1.40%	129
523	NOT USED									
524	NOT USED									
525	R-112	4	42			1	11-156314-6	470	2.11%	146
526	R-112	4	48			1	11-156314-7	620	1.93%	200
527	R-112	4	48			1	11-156314-8	780	1.10%	151
528	R-112	4	54			1	11-156314-9	524	1.71%	257
529	KC-12	3	72	60		3	11-182554-14	415	1.81%	611
530	KC-12	4	36			1	11-182554-14	710	3.00%	116
531	E-102	4	72		2	1	11-095034-7	650	0.20%	379
532	E-102	1	144	60	1.5	7	11-095034-7	610	0.77%	1631
533	E-102	3	72	48	3	3	11-095034-5	112	0.20%	450
534	E-102	1	144	48	1.5	6	11-095034-5	600	2.00%	769
535	E-102	3	60	60	3	3	11-095034-5	528	0.47%	720
536	E-102	3	60	60	2	3	11-095034-9	560	0.45%	470
537	E-102	1	36	42	1.5	7	11-095034-10	800	2.17%	379
538	E-102	4	54			1	11-095034-10	450	0.29%	106
539	E-102	4	48			1	11-095034-10	622	0.46%	97
540	R-12	4	36			1	11-095034-6	230	1.00%	67
541	E-102	4	36			1	11-095034-5	124	3.33%	122
542	E-102	4	60			1	11-095034-2	400	1.50%	319
543	E-102	4	36			1	11-095034-3	250	0.85%	61
544	E-102	4	36		2	1	11-095034-3	300	0.38%	82

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Qc= EXISTING CAPACITY

ID #	SYSTEM	GEOMETRY	WIDTH (IN)	HEIGHT (IN)	RATIO	MATERIAL	DRAWING NO.	LENGTH (FEET)	SLOPE	Qc (CFS)
545	E-102	4	36			1	11-095034-3	400	0.50%	47
546	R-42	3	72	60	2	3	11-095034-12	270	0.51%	648
547	R-42	4	54			1	11-095034-13	424	0.94%	191
548	S.M.	4	48			1	11-095034-15	430	1.04%	146
549	S.M.	4	48			1	11-095034-16	256	2.80%	240
550	S.M.	4	36			1	11-095034-16	206	1.35%	78
551	E-151	1	72	60	2	6	1011	1020	0.14%	236
552	E-151	3	120	60		3	1011	444	0.20%	408
553	E-151	1	60	72	1.25	7	1011	564	0.20%	293
554	E-151	3	108	60		3	1011	609	0.20%	355
555	E-151	4	72			1	1011	745	0.35%	251
556	E-151	4	72			1	1011	758	0.35%	251
557	E-151	4	72			1	1011	380	0.35%	251
558	E-151	4	72			1	1011	380	0.35%	251
559	E-151	4	72			1	1011	395	0.35%	251
560	E-151	4	54			1	1011	517	0.45%	132
561	E-151	4	54			1	1011	499	0.45%	132
562	E-151	4	48			1	1011	466	0.40%	93
563	E-151	4	48			1	1011	329	0.40%	91
564	E-151	4	42			1	1011	759	0.72%	85
565	E-151	4	54			1	1011	612	0.20%	88
566	E-151	4	39			1	1011	339	0.20%	37
567	E-151	4	39			1	1011	359	0.20%	37
568	E-151	4	39			1	1011	475	0.25%	41
569	E-151	4	36			1	P-1103	374	0.20%	30
570	E-151	4	54			1	1011	380	0.20%	88
571	E-151	4	54			1	1011	337	0.20%	88
572	E-151	4	51			1	1011	445	0.25%	84
573	E-151	4	42			1	1011	479	0.50%	71
574	E-151	4	39			1	1011	523	0.50%	58
575	E-151	4	42			1	D-1037	574	0.50%	71
576	E-151	4	36			1	D-1037	381	0.45%	45
577	E-151	4	21		2	1	1305	450		22
578	E-151	4	36			1	1011	431	0.50%	47

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ID #	SYSTEM	GEOMETRY	WIDTH (IN)	HEIGHT (IN)	RATIO	MATERIAL	DRAWING NO.	LENGTH (FEET)	SLOPE	Qc (CFS)
579	E-151	4	48			1	D-1037	473	0.50%	102
580	E-151	4	39			1	D-1037	373	0.60%	64
581	E-151	4	36			1	D-1037	501	0.70%	56
582	NOT USED									
583	KC-22	4	48			1	11-095024-11	975	1.65%	184
584	KC-22	4	36			1	11-095024-13	290	0.92%	64
585	FEL	4	48			1	11-095024-24	670	0.54%	106
586	FEL	4	54			1	11-095024-29	780	1.08%	204
587	FEL	4	60			1	11-095024-30	2300	1.30%	297
588	FEL	2	24	24	VARIES	7	11-095024-31	1200	3.47%	87
589	E-111	4	36			1	11-095024-35	549	2.57%	107
590	E-131	4	36			1	11-095024-41	936	2.10%	97
591	E-131	1	12	24	1.5	7	11-095024-41	505	5.15%	91
592	E-132	4	48			1	11-095024-49	1500	0.50%	102
593	R-31	4	42			1	P-1551	192	1.00%	101
594	R-5	3	144	96	3	3	P-1602-5	61	1.15%	7155
595	R-5	4	156	61	4	4	P-1602-5	63	0.54%	2504
596	R-62	4	36			1	P-1602-6	200	2.36%	102
597	KC-22	3	6	36		3	P-1608-21	295	0.83%	203
598	KC-32	4	48			5	P-1608-13	200	0.40%	49
599	E-102	4	72	44		4	P-1012-10	699	0.50%	200
600	E-102	4	36			1	P-1555-8	32	0.50%	47
601	E-102	1	6		2	6	P-1555-8	260	1.00%	199
602	E-102	4	36			1	P-1555-8	108	2.00%	94
603	E-102	4	54			1	11-095034-2	240	1.04%	201
604	E-102	4	42			1	6411V13C5	1130	3.03%	175
605	KC-22	4	36			1	11-095024-8	500	2.08%	96
606	E-102	4	58	36		4	D-1100-5	290	0.69%	65
607	E-102	4	58	36		4	D-1100-5	222	0.40%	49
608	E-102	3	120	42	2	3	D-1062	67	0.30%	594
609	E-102	4	48			1	P-1070	65	2.50%	227
610	E-102	4	43	27		4	P-1182-3	160	0.50%	51
611	E-102	4	50	31		4	P-1182-4	224	0.23%	52
612	E-102	3	102	48	3	3	P-1012-17	60	0.50%	1136

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Qc= EXISTING CAPACITY

ID #	SYSTEM	GEOMETRY	WIDTH (IN)	HEIGHT (IN)	RATIO	MATERIAL	DRAWING NO.	LENGTH (FEET)	SLOPE	Qc (CFS)
613	E-102	3	102	48	3	3	P-1012-13	60	0.40%	1016
614	E-102	1	24	36	1.5	7	D-1096-2	715	1.50%	132
615	E-102	3	60	48	3	3	95034-1	70	0.20%	350
616	E-102	4	60			1	D-1534	82	0.50%	184
617	E-102	4	48			1	P-1024	61	1.00%	144
618	E-182	4	42			1	P-1191-10	174	2.00%	142
619	E-182	4	54			1	D-1046	1038	0.32%	111
620	E-182	4	54			5	D-1046	176	0.68%	88
621	E-182	4	48			5	D-1046A	420	1.15%	83
622	E-182	4	48			5	D-1046A	380	1.63%	99
623	E-182	4	36			5	D-1046A	251	2.00%	51
624	E-182	4	36			1	D-1088	700	0.57%	50
625	E-182	4	42			1	D-1088	247	1.10%	106
626	E-182	4	42			1	1022-5	80	2.35%	154
627	NOT USED									
628	FEL	3	60	48		3	N.A.	225	0.50%	200
629	FEL	4	48			5	N.A.	70	1.00%	144
630	FEL	4	60			5	R.S.1482	68	2.50%	412
631	FEL	4	36			5	N.A.	100	2.00%	94
632	L.H.	3	48	36		3	P-1746-15	110	2.64%	209
633	E-81	3	72	24		3	P-1165-7	100	2.60%	192
634	L.H.	4	42			5	TM 3805	100	7.60%	277
635	L.H.	4	48			5	TM 3805	90	8.40%	416
636	FEL	4	60			5	N.A.	140	2.00%	368
637	E-111	4	58	36		4	1514	700	0.70%	130
638	E-182	4	36			1	P-1501-13	272	1.13%	71
639	E-202	3	156	40		3	1578	156	1.92%	1092
640	E-202	3	75	36	2	3	1578	56	1.00%	148
641	E-202	1	74	38		2	1594-8	105	1.00%	279
642	E-202	3	36	72	2	3	1594-8	59	0.50%	354
643	E-202	1	36	36	1.5	7	1594-8	210	2.40%	348
644	E-202	4	39			1	P-1101-2	160	1.78%	110
645	E-202	1	36	36	1.5	7	1594-4	120	0.50%	159
646	E-202	3	96	30		3	1480-7	60	0.50%	145

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Qc= EXISTING CAPACITY

ID #	SYSTEM	GEOMETRY	WIDTH (IN)	HEIGHT (IN)	RATIO	MATERIAL	DRAWING NO.	LENGTH (FEET)	SLOPE	Qc (CFS)
647	E-202	4	69		2	1	1480-7	400	0.80%	676
648	E-202	4	60			1	P-1501-15	37	1.00%	260
649	E-202	1	108	42	1	7	1594-8	84	0.50%	536
650	NOT USED									
651	E-222	4	72			1	D-1035	80	1.15%	454
652	E-222	4	60			1	P-1343	251	0.92%	250
653	E-222	4	60			1	P-1343	55	0.50%	184
654	E-222	4	66			1	P-1619	118	1.94%	468
655	E-222	4	66			1	P-1619	206	1.90%	463
656	E-222	4	66			1	P-1619	300	2.37%	517
657	E-222	4	54			1	P-1343	91	1.74%	259
658	E-222	4	36			1	P-1900	3	0.75%	58
659	E-222	4	54			1	P-1082	266	4.00%	393
660	E-222	4	36			1	1524	253	5.40%	155
661	E-222	4	36			1	1524	130	3.25%	120
662	E-222	4	36			1	1524	198	4.00%	133
663	E-222	4	36			1	P-1747	139	12.11%	232
664	NOT USED									
665	E-222	4	36			1	P-1747	54	32.36%	379
666	E-102	4	60			2	1441	259	1.50%	276
667	E-102	4	60			2	1441	408	1.71%	295
668	E-102	4	60			2	1340	384	1.10%	237
669	E-102	4	60			2	P-1747	342	0.73%	193
670	E-102	4	54			1	200 scale	500	0.90%	187
671	E-102	4	48			1	200 scale	850	0.80%	128
672	KC-12	1	36	42	1.5	7	11-182554-13	1150	2.13%	482
673	E-211	3	72	48	2	3	1019-3	300	0.27%	349
674	E-211	1	72	36	1.5	7	1019-3	505	0.30%	91
675	E-211	1	72	36	1.5	7	1019-3	173	0.70%	140
676	E-211	4	36		2	1	1493-4	66	0.40%	84
677	E-211	4	36			5	D-1000	70	0.29%	19
678	E-201	3	72	36		3	1348-3	80	0.40%	141
679	E-201	4	42			5	1026	360	0.95%	53
680	E-221	4	65	40		4	D-1050	900	0.40%	135

TABLE 3.1

EXISTING FACILITIES

GEOMETRY: 1 = TRAP. OPEN CHANNEL, 2 = IRREGULAR CHANNEL, 3 = BOX CHANNEL, 4 = PIPE, 5 = RECT. OPEN CHANNEL
MATERIALS: 1 = R.C.P., 2 = C.I.P.P., 3 = R.C.B., 4 = C.M.P.A., 5 = C.M.P., 6 = NAT. CHNL., 7 = CONC. CHNL., 8 = SPIRAL RIBBED
Qc= EXISTING CAPACITY

ID #	SYSTEM	GEOMETRY	WIDTH (IN)	HEIGHT (IN)	RATIO	MATERIAL	DRAWING NO.	LENGTH (FEET)	SLOPE	Qc (CFS)
681	E-221	4	65	40		4	D-1050	147	1.11%	224
682	E-221	4	65	40	2	4	D-1050	165	1.11%	449
683	E-221	4	30			1	P-1433	135	0.50%	29
684	E-221	3	60	24		3	P-1724	418	0.38%	58
685	E-221	1	60	36	2	7	P-1763	146	1.00%	166
686	E-221	4	36			5	P-1860	258	2.55%	107
687	E-221	4	36			5	P-1860	297	3.09%	117
688	E-221	4	36			5	P-1860	300	2.91%	114
689	E-221	4	36			5	P-1860	229	7.03%	177
690	E-221	4	50	31	2	4	P-1860	74	1.00%	218
691	E-231	4	66			5	P-1892	397	0.30%	184
692	E-231	4	66			5	P-1892	471	0.40%	212
693	E-231	4	66			1	P-1510-2	170	0.93%	324
694	E-231	3	120	30	2	3	P-1510-2	50	0.50%	453
695	E-231	4	66		2	1	P-1510-2	180	0.01%	113
696	E-231	4	49	33		4	P-1078	39	1.37%	128
697	E-231	4	58	36		4	P-1457	125	0.30%	523
698	E-231	4	24		2	1	P-1915	316	1.10%	47
699	KC-32	3	72	48		3	P-1327	50	1.78%	487
700	KC-32	3	72	48		3	P-1327	156	3.80%	654
701	E-193	2	48	36	2	6	P-1778	250	0.50%	205
702	NOT USED									
703	E-81	4	48			1	P-1165-6	608	0.83%	131
704	E-81	1	180	18	4	6	P-1165-10	490	2.98%	142
705	E-81	4	36			1	P-1487-6	321	0.91%	64
706	E-221	1	109	42	1	7	N.A.	3100	0.50%	536
707	E-221	4	65	40	2	4	1023	1175	0.40%	269
708	E-81	4	49	33		4	S-1029	88	1.00%	109
709	E-81	4	36			5	S-1029	295	2.92%	114
710	E-81	4	36			5	P-1004	250	1.27%	75
711	E-81	4	36			5	P-1004	250	1.96%	93
712	E-81	4	36			5	P-1004	250	2.50%	105
713	E-81	4	36			5	P-1004	246	1.36%	78
714	E-111	4	48			1	P-1869-4	55	0.50%	102

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Qc= EXISTING CAPACITY

ID #	SYSTEM	GEOMETRY	WIDTH (IN)	HEIGHT (IN)	RATIO	MATERIAL	DRAWING NO.	LENGTH (FEET)	SLOPE	Qc (CFS)
715	E-111	4	57	38		4	P-1869-4	966	1.00%	156
716	E-111	4	36			1	P-1504-15	193	0.50%	47
717	E-111	4	48			1	D-1010	67	0.40%	91
718	E-111	4	48			1	P-1807-2	717	1.80%	193
719	E-111	4	36			1	11-095024-35	376	3.04%	116
720	E-111	4	36			1	11-095024-35	333	4.23%	137
721	E-111	4	36			1	11-095024-35	400	6.38%	168
722	R-42	4	43	27	3	4	N.A.	80	0.50%	141
723	NOT USED									
724	R-42	1	36	48	1.5	7	P-1764-3	1080	1.00%	462
725	R-42	2	12	48	2	6	P-1714-3	500	0.43%	129
726	R-42	4	48			1	11-095034-13	600	0.54%	106
727	R-12	4	33			1	P-1178-2	197	0.50%	37
728	NOT USED									
729	NOT USED									
730	R-21	4	36			1	P-2079-3	806	1.59%	84
731	R-21	4	33			1	1529-7	693	0.27%	27
732	R-21	4	27			1	1529-6	505	0.43%	20
733	R-31	4	48			1	P-1551-16	78	0.50%	102
734	R-31	4	50	31		4	P-1797-2	50	1.86%	149
735	R-31	4	48	36	2	6	P-1797-2	795	1.56%	181
736	R-31	4	43	27		4	P-1016-4	40	0.50%	51
737	R-31	4	25	16	3	4	P-1797-1	45	0.29%	28
738	R-13	4	72	44		4	F-359	40	1.25%	315
739	R-13	3	96	48		3	P-1604-23	142	0.50%	350
740	E-182	4	43	27		4	D-1056	87	0.14%	27
741	E-202	4	36			1	P-2080-3	315	0.89%	63
742	E-202	4	36			1	P-2080-3	320	2.64%	108
743	E-202	4	36		2	1	P-1501-15	35	1.68%	173
744	E-202	3	144	48		3	1566-5	42	1.00%	834
745	NOT USED									
746	E-182	4	42			5	P-1044-3	234	0.90%	95
747	E-201	4	48			1	1480-7	420	0.30%	79
748	L.H.	4	36			1	1895-7	345	2.39%	103

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Qc= EXISTING CAPACITY

ID #	SYSTEM	GEOMETRY	WIDTH (IN)	HEIGHT (IN)	RATIO	MATERIAL	DRAWING NO.	LENGTH (FEET)	SLOPE	Qc (CFS)
749	L.H.	4	42			1	1895-7	390	3.08%	174
750	NOT USED									
751	E-171	4	36			1	1018	236	0.80%	60
752	R-71	4	48			1	P-1899-2	703	0.20%	203
753	R-71	4	49	33		4	P-1899-4	71	0.85%	50
754	R-71	4	36			1	P-1899-4	702	2.84%	112
755	E-151	3	132	72		3	1011	72	0.14%	500
756	E-151	6	72	72	2	6	1011	587	0.14%	443
757	KC-23	4	42			1	P-1833-2	318	0.94%	98
758	KC-23	4	36			1	P-1833-2	180	1.44%	80
759	KC-23	4	48			1	P-1833-3	382	0.50%	102
760	KC-23	3	120	48	3	3	P-1833-3	102	1.00%	1985
761	KC-42	4	48			1	P-1857-3	252	1.00%	144
762	KC-42	4	57	38		4	P-1857-4	210	1.00%	156
763	KC-42	4	36			5	P-1857-4	460	1.40%	43
764	E-62	3	72	30		3	D-1090	33	0.22%	79
765	E-62	4	48			5	D-1834-10	255	1.30%	164
766	E-62	4	42			5	D-1834-10	204	0.76%	88
767	E-62	4	39			5	D-1834-9	630	0.40%	52
768	E-62	4	36			5	D-1834-10	294	4.63%	144
769	E-62	4	48			1	D-1090	33	0.34%	84
770	E-62	2	DETENTION BASIN			6	D-1090	0	0.50%	182878
771	R-71	4	36		2	1	P-1883-2	110	1.00%	133
772	R-71	3	96	36	2	3	P-1692-2	30	0.50%	457
773	R-81	4	288	120	4	4	SFP36	80	0.20%	3540
774	R-71	1	96	48	1.5	7	SFP12	650	0.65%	681
775	R-66	3	192	60		3	SFP25	30	0.50%	1181
776	R-81	4	57	38		4	P-1877-10	206	0.82%	141
777	R-81	4	60			1	SFP37	470	0.60%	202
778	R-81	4	83	57		4	SFP37	331	0.60%	340
779	R-81	4	95	67		4	SFP37	248	0.60%	467
780	R-81	4	36			5	SFP40	60	0.80%	32
781	R-81	1	96	36	2	6	SFP39	700	0.80%	205
782	R-81	1	96	36	2	6	SFP39	450	0.80%	205

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Qc= EXISTING CAPACITY

ID #	SYSTEM	GEOMETRY	WIDTH (IN)	HEIGHT (IN)	RATIO	MATERIAL	DRAWING NO.	LENGTH (FEET)	SLOPE	Qc (CFS)
783	R-81	4	42			1	SFP41	100	0.50%	71
784	R-81	4	36			1	SFP42	227	0.50%	47
785	R-81	5	240	38.4		7	SFP43	1600	0.50%	670
786	R-81	1	660	66	5	6	SFP45	1400	0.40%	3038
787	R-112	3	120	72		3	SFP49	110	0.50%	879
788	R-20	3	120	72	3	3	SFP52	110	0.50%	2495
789	S.M.	1	48	36	1.5	7	11-095034-16	400	7.25%	977
790	R-83	3	48	36	2	3	SFP55	63	0.50%	203
791	R-83	1	48	36		7	SFP56	1700	0.81%	102
792	R-83	4	65	40		4	SFP58	60	2.00%	301
793	R-83	4	48			1	SFP60	110	2.00%	203
794	R-83	4	42			1	SFP63	100	6.49%	256
795	R-81	4	93			2	SFP68	800	1.79%	972
796	R-81	1	120	72	2	7	SFP67	200	2.50%	4330
797	R-83	1	24	26.4	2	7	SFP62	550	4.00%	189
798	S.M.	4	43	27	3	4	1475-4	106	0.50%	153
799	S.M.	4	36			1	P-1033	110	1.00%	67
800	S.M.	4	72			1	P-1887-2	100	3.34%	774
801	S.M.	4	42			1	P-1639-5	116	2.00%	142
802	S.M.	1	60	60	4	6	P-1562-3	478	0.66%	759
803	E-234	4	49	33		4	P-1815-10	896	0.50%	77
804	KC-32	4	42			1	P-1367-6	55	1.30%	115
805	KC-32	4	42			1	P-1367-6	118	2.87%	170
806	E-242	4	58	36	2	4	P-1804	32	1.00%	311
807	KC-22	4	42			5	1603-1	43	1.00%	55
808	KC-22	3	30	30		3	1603-1	300	0.68%	48
809	KC-22	4	42			1	P-1405-9	157	1.58%	126
810	KC-23	3	120	60	4	3	P-2064-3	103	0.55%	2708
811	KC-23	4	36		2	1	P-1829-18	43	1.50%	163
812	KC-23	4	43	27	2	4	P-1829-17	45	0.50%	102
813	KC-42	4	60		2	1	P-1685-2	130	0.70%	436
814	KC-42	4	36			1	P-1685-2	80	18.10%	284
815	L.H.	4	48			1	P-1627-23	78	1.00%	144
816	L.H.	4	42			1	P-1627-23	23	15.00%	390

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Qc= EXISTING CAPACITY

ID #	SYSTEM	GEOMETRY	WIDTH (IN)	HEIGHT (IN)	RATIO	MATERIAL	DRAWING NO.	LENGTH (FEET)	SLOPE	Qc (CFS)
817	L.H.	4	36			1	P-1627-23	42	1.00%	67
818	L.H.	4	36			5	P-1627-24	124	3.50%	125
819	FEL	4	42			1	P-1806-5	268	0.90%	95
820	FEL	4	42			1	P-1806-5	65	2.62%	163
821	FEL	4	42			1	P-1806-7	214	10.00%	318
822	FEL	4	42			1	P-1806-7	268	12.58%	357
823	FEL	4	42			1	P-1806-7	32	1.02%	102
824	FEL	4	42			1	P-1806-7	106	7.69%	279
825	FEL	4	18		3	5	P-1806-7	30	2.00%	45
826	FEL	4	42			1	P-1803-2	260	5.31%	232
827	FEL	4	48			1	P-1803-2	260	1.88%	197
828	FEL	4	54			1	P-1803-2	250	2.84%	331
829	FEL	4	52	77		4	P-1803-2	321	2.40%	564
830	FEL	4	84			1	P-1803-3	175	2.48%	1006
831	FEL	4	71	47		4	P-1803-6	72	1.60%	357
832	FEL	4	36			1	P-1802-4	89	6.73%	173
833	FEL	4	36			1	P-1802-8	148	0.71%	56
834	FEL	4	36			1	P-1802-11	180	5.19%	152
835	FEL	4	36			1	P-1802-9	753	1.00%	67
836	FEL	4	36			1	P-1802-7	198	1.35%	78
837	FEL	4	84			2	P-1802-12	644	0.55%	411
838	FEL	4	72		2	2	P-1802-13	626	0.60%	569
839	FEL	3	84	48	2	3	P-1802-13	74	0.50%	585
840	L.H.	4	48			1	P-1988-15	130	4.00%	287
841	L.H.	4	36			1	P-1988-15	110	6.40%	169
842	L.H.	4	36			1	P-1988-2	192	0.80%	60
843	KC-22	4	60		2	1	P-1749-3	92	5.00%	1164
844	KC-12	3	60	30		3	P-1309-24	22	0.68%	110
845	KC-12	4	36			1	P-1309-24	100	2.80%	112
846	KC-12	4	36			1	P-1309-24	52	6.71%	173
847	KC-12	4	36			1	P-1309-24	106	1.73%	88
848	E-232	4	36			1	P-1534-1	130	0.60%	52
849	R-71	1	180	36	3	6	EUHSD	800	0.40%	263
850	L.H.	4	48			1	P-1623-4	624	1.30%	164

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Qc= EXISTING CAPACITY

ID #	SYSTEM	GEOMETRY	WIDTH (IN)	HEIGHT (IN)	RATIO	MATERIAL	DRAWING NO.	LENGTH (FEET)	SLOPE	Qc (CFS)
851	E-62	1	72	24	1.5	7	P-1636-10	300	1.30%	158
852	E-62	4	48			1	P-1636-2	56	1.30%	164
853	E-62	4	42			1	P-1636-2	33	2.93%	172
854	E-162	4	36			5	P-1604-13	156	1.00%	36
855	E-171	4	36			1	1003-8	366	0.25%	33
856	E-171	4	36			1	1003-8	546	0.25%	33
857	E-162	1	24	36	1.25	7	1365	460	0.12%	77
858	KC-22	1	12	24	1.5	7	11-095024-1	1050	2.40%	121
859	L.H.	4	42			1	P-1746-6	91	22.34%	476
860	NOT USED									
861	E-221	3	60	24		3	P-1724-2	332	0.12%	39
862	E-221	3	60	24		3	P-1724-2	393	0.38%	70
863	E-221	3	72	18		3	P-1724-2	72	0.50%	52
864	E-221	3	72	24		3	P-1724-2	40	0.50%	84
865	E-201	3	72	24		3	P-1348-2	570	0.20%	53
866	E-201	3	72	24		3	P-1348-6	70	0.20%	53
867	L.H.	4	36			4	1667	453	0.40%	42
868	R-81	4	66	36		5	SFP40	60	0.80%	145
869	R-12	4	65	40		4	P-1604-23	120	1.00%	213
870	E-242	4	48		2	1	P-1804-3	580	0.43%	188
871	E-242	4	48		2	1	P-1806	280	0.75%	249
872	E-132	4	58	36		4	P-1623/P-2145	650	0.76%	136
873	E-221	4	36	22	2	4	N.A.	260	0.90%	84
874	KC-42	4	228	76		4	P-2113	64	0.43%	1479
875	KC-42	4	48		3	5	P-2113	52	1.00%	233
876	L.H.	4	54			5	N.A.	100	1.00%	197
877	KC-21	4	48			1	N.A.	60	1.00%	144
878	L.H.	4	42			5	N.A.	140	10.00%	318
879	L.H.	4	48			5	N.A.	90	5.00%	321
880	KC-21	3	72	60		3	N.A.	80	5.00%	1015
881	KC-23	4	48		2	5	N.A.	90	2.00%	220
882	KC-23	4	54			5	N.A.	110	1.50%	130
883	KC-23	3	120	48		3	N.A.	160	1.00%	662
884	KC-23	4	36			5	N.A.	200	5.00%	81

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Qc= EXISTING CAPACITY

ID #	SYSTEM	GEOMETRY	WIDTH (IN)	HEIGHT (IN)	RATIO	MATERIAL	DRAWING NO.	LENGTH (FEET)	SLOPE	Qc (CFS)
885	E-62	4	54		2	1	N.A.	40	0.70%	329
886	E-72	4	42			1	N.A.	70	1.00%	101
887	FEL	4	48	32		4	N.A.	60	1.00%	109
888	KC-23	4	42			5	N.A.	75	1.00%	55
889	KC-23	4	54			1	N.A.	60	1.00%	197
890	KC-23	4	54			1	N.A.	50	1.00%	197
891	KC-23	4	42			1	N.A.	90	1.00%	101
892	E-252	4	42			5	R.S. 1838-2	74	8.10%	286
893	E-252	4	36			5	R.S. 1838-2	126	10.30%	214
894	E-252	4	36			5	R.S. 1838-2	90	17.87%	281
895	E-252	4	36			5	R.S. 1838-2	82	11.50%	226
896	E-252	4	60			5	R.S. 1838-2	80	9.00%	781
897	E-252	4	48			5	R.S. 1838-2	80	1.20%	157
898	E-252	4	36			5	R.S. 1838-2	200	12.50%	236
899	E-252	4	36			5	R.S. 1838-2	374	11.70%	228
900	L.H.	4	48			5	R.S 476	160	8.00%	406
901	L.H.	4	36			5	R.S 476	72	10.00%	211
902	L.H.	4	36			5	TM 3805	272	4.93%	148
903	L.H.	4	48			5	R.S. 1482	105	8.00%	406
904	L.H.	4	48			5	R.S. 1482	164	9.00%	431
905	L.H.	4	50	31		4	ROS 3814	52	8.00%	308
906	E-252	4	36			5	P-1454	50	6.00%	163
907	R-112	3	72	60		3	N.A.	42	2.00%	685
908	R-112	4	30		2	5	N.A.	60	1.50%	54
909	R-112	4	36			5	N.A.	60	2.00%	51
910	KC-42	4	60		2	5	R.S. 765	248	2.00%	200
911	KC-23	4	60			1	TM 3674	164	1.40%	308
912	NOT USED									
913	FEL	4	90			5	N.A.	120	6.00%	1881
914	KC-21	3	54	24		3	P-1731	40	1.00%	99
915	E-231	4	58	36		4	P-1457	45	11.28%	482
916	KC-42	4	36			1	P-1857	540	2.70%	110
917	E-111	4	48			1	P-1661-5	252	0.50%	102
918	NOT USED									

TABLE 3.1

EXISTING FACILITIES

GEOMETRY: 1 = TRAP. OPEN CHANNEL, 2 = IRREGULAR CHANNEL, 3 = BOX CHANNEL, 4 = PIPE, 5 = RECT. OPEN CHANNEL
MATERIALS: 1 = R.C.P., 2 = C.I.P.P., 3 = R.C.B., 4 = C.M.P.A., 5 = C.M.P., 6 = NAT. CHNL., 7 = CONC. CHNL., 8 = SPIRAL RIBBED
Qc= EXISTING CAPACITY

ID #	SYSTEM	GEOMETRY	WIDTH (IN)	HEIGHT (IN)	RATIO	MATERIAL	DRAWING NO.	LENGTH (FEET)	SLOPE	Qc (CFS)
919	R-71	4	54			1	D-1097-5	50	2.85%	332
920	R-71	4	66			1	D-1097-3	40	8.08%	954
921	NOT USED									
922	NOT USED									
923	KC-32	4	36			1	1454	110	1.50%	82
924	KC-32	4	84			1	S-1099	537	2.20%	947
925	NOT USED									
926	KC-21	4	42			1	P-1211-13	56	1.26%	113
927	E-132	4	50	31		4	P-1623	72	0.60%	78
928	E-132	4	42			1	P-2145	504	0.53%	73
929	R-42	4	36			1	P-1551	353	1.00%	67
930	R-42	4	48			1	P-1551	288	1.00%	144
931	NOT USED									
932	R-31	4	42			1	P-1551	90	0.50%	71
933	E-102	4	42			1	P-2125	609	1.09%	105
934	E-102	4	36			1	P-2125	235	1.60%	84
935	NOT USED									
936	R-12	3	72	42	3	3	1446	465	0.20%	411
937	NOT USED									
938	R-41	4	36			1	P-1551	223	0.50%	47
939	R-31	4	25	16	3	4	P-1797	40	0.50%	34
940	NOT USED									
941	NOT USED									
942	NOT USED									
943	NOT USED									
944	NOT USED									
945	NOT USED									
946	NOT USED									
947	NOT USED									
948	NOT USED									
949	NOT USED									
950	N-5	4	36			1	P-1971	55	1.09%	69
951	N-5	4	36			1	P-1971	180	1.94%	93
952	N-5	4	36			1	P-1971	132	40.15%	423

TABLE 3.1

EXISTING FACILITIES

GEOMETRY: 1 = TRAP. OPEN CHANNEL, 2 = IRREGULAR CHANNEL, 3 = BOX CHANNEL, 4 = PIPE, 5 = RECT. OPEN CHANNEL
MATERIALS: 1 = R.C.P., 2 = C.I.P.P., 3 = R.C.B., 4 = C.M.P.A., 5 = C.M.P., 6 = NAT. CHNL., 7 = CONC. CHNL., 8 = SPIRAL RIBBED
Qc= EXISTING CAPACITY

ID #	SYSTEM	GEOMETRY	WIDTH (IN)	HEIGHT (IN)	RATIO	MATERIAL	DRAWING NO.	LENGTH (FEET)	SLOPE	Qc (CFS)
953	N-5	4	36			1	P-1971	58	11.90%	230
954	N-5	4	36			1	P-1971	178	3.25%	120
955	N-5	4	36			1	P-1971	210	8.36%	193
956	N-5	4	36			1	P-1971	182	9.73%	208
957	N-5	4	36			1	P-1971	483	7.81%	186
958	N-5	4	42			1	P-1971	237	4.84%	221
959	N-5	4	42			1	P-1971	249	11.65%	343
960	N-5	4	42			1	P-1971	192	4.32%	209
961	N-5	4	42			1	P-1971	299	4.24%	207
962	N-5	4	42			1	P-1971	299	4.08%	203
963	N-5	4	42			1	P-1971	339	3.31%	183
964	N-5	4	42			1	P-1971	146	6.64%	259
965	N-5	4	42			1	P-1971	451	5.22%	230
966	N-5	4	48			1	P-1971	464	3.02%	250
967	N-5	4	48			1	P-1971	786	1.87%	196
968	NOT USED									
969	SM	4	168	60		1	SD-ATLAS	400	0.50%	694
970	SM	4	96	48		1	SD-ATLAS	240	0.50%	164
971	SM	4	96	48		1	SD-ATLAS	470	0.50%	164
972	KC-22	4	48			5	N.A.	650	1.00%	78
973	KC-22	3	48	48		3	P-1608-21	60	0.50%	145
974	E-202	4		72	2	1	D-1009-2	16	0.63%	672
975	NOT USED									
976	R-112	4	36			5	11-156314	388	9.40%	204
977	R-112	4	36			5	N.A.	100	2.00%	51
978	E-221	4	36			5	N.A.	75	2.00%	51
979	NOT USED									
980	NOT USED									
981	R-42	4	39			1	P-1551	321	1.00%	83
982	R-42	4	39			1	11-095034-13	236	1.02%	83
983	R-42	4	39			1	11-095034-13	78	6.15%	205

TABLE 3.2

EXISTING FACILITIES- EXCESS CAPACITY

GEOMETRY: 1=TRAP. OPEN CHANNEL, 2= IRREGULAR CHANNEL, 3= BOX CHANNEL, 4= PIPE 5= RECT. OPEN CHANNEL
MATERIALS: 1= R.C.P., 2= C.I.P.P., 3= R.C.B., 4= C.M.P.A., 5 =C.M.P., 6= NAT. CHANNEL, 7= CONCRETE CHANNEL
Qe= EXISTING DEVELOPMENT FLOW, Qu= ULTIMATE DEVELOPMENT FLOW, Qc= EXISTING CAPACITY FLOW

ID#	SYSTEM	GEOM	WIDTH (in)	HEIGHT (in)	RATIO	MATL	DWG. NO.	LENGTH (ft)	Qu (cfs)	Qe (cfs)	Qc (cfs)	EXCESS CAP. (Qc-Qe)	EQUIVALENT PIPE/ ULT FLOW Q (Qu-Qe)	SLOPE (%)	DIA (in)	COST $/LF	EXCESS CAPACITY VALUE
21	KC-22A	3	144	96	3	3	D-1069-2	718	4842	4327	4842	515	515	0.10%	2-96	$764	$548,552
22	KC-22A	3	144	120	2	3	D-1069-3	812	4842	4327	4842	515	515	0.10%	2-96	$764	$620,368
23	R-41	3	144	120	4	3	D-1072	790	5918	4666	7535	2869	1252	0.40%	2-102	$894	$706,260
24	R-41	5	480	144	1	7	D-1072	703	5918	4666	12327	7661	1252	0.45%	2-102	$894	$628,482
102	E-102	1	78	54	1.5	7	D-1096	418	730	611	759	148	119	0.64%	51	$139	$58,102
105	E-102	1	96	42	1.5	7	D-1096	500	565	473	504	31	92	0.64%	30	$83	$41,500
107	R-71	4	84			1	D-1097	539	482	401	542	141	81	0.72%	42	$106	$57,134
108	R-71	4	84			1	D-1097	676	445	370	553	183	75	0.75%	42	$106	$71,656
305	E-202	1	156	39		7	1566	566	413	387	614	227	26	1.00%	27	$83	$46,978
457	E-231	5	192	41	1	7	P-1435	572	600	525	547	22	75	0.45%	30	$83	$47,476
472	E-202	5	156	36		7	1578	625	389	366	512	146	23	1.00%	27	$83	$51,875
529	KC-12	3	72	60		3	11-182554	415	393	322	611	289	71	1.81%	33	$83	$34,445
532	E-102	1	144	60	1.5	7	11-095034	610	866	720	1631	911	146	0.77%	51	$139	$84,790
534	E-102	1	144	48	1.5	6	11-095034	600	820	682	769	87	138	2.00%	36	$83	$49,800
535	E-102	3	60	60	3	3	11-095034	528	851	707	720	13	144	0.47%	24	$83	$43,824
706	E-221	1	109	42	1	7	N.A.	3100	595	537	595	58	58	0.50%	39	$101	$313,100
774	R-71	1	96	48	1.5	7	SFP-12	650	549	457	681	224	92	0.65%	45	$116	$75,400
786	R-81	1	660	66	5	6	SFP-45	1400	1473	1144	3038	1894	329	0.40%	78	$270	$378,000
789	S.M.	1	48	36	1.5	7	11-095034	400	78	66	977	911	12	7.25%	18	$83	$33,200
795	R-81	4	93			2	SFP-68	800	720	576	972	396	144	1.79%	45	$116	$92,800
802	S.M.	1	60	60	4	6	P-1562-3	478	807	681	759	78	126	0.66%	42	$106	$50,668
838	FEL	4	72		2	2	P-1802-13	626	437	357	569	212	80	0.60%	45	$116	$72,616
924	KC-32	4	84			1	S-1099	537	1003	912	947	35	91	2.20%	27	$83	$44,571

TOTAL VALUE OF EXCESS CAPACITY $4,151,597

APPENDIX B

TABLE 6.1
UNIT PRICES- PIPE

PIPE SIZE		TRENCHING AND BACKFILL					PAVING	C.O.'s	PIPE	SALES	INSTAL-	UTILITY	TRAFFIC	OVRHD/	ENGR, ADMN	CONTIN-		
I.D.	O.D.	COVER	DEPTH	WIDTH	VOL	ESTM @	*	**	***	TAX****	LATION	CONFL	CNTRL	PROFIT	SURV & INSP	GENCY	TOTAL	USE
(in)	(ft)	(ft)	(ft)	(ft)	CY/LF	$5.00	$3.25	$/LF	$/LF	7.0%	5.0%	5.0%	2.5%	10.0%	15.0%	10.0%	$/LF	$/LF
<36	2.92	3	5.9	4.9	1.08	$5.40	$15.99	$10.00	$20.00	$1.40	$2.64	$2.77	$1.46	$5.97	$9.84	$7.55	$83.02	$83
36	3.50	3	6.5	5.5	1.32	$6.60	$17.88	$10.00	$24.00	$1.68	$3.01	$3.16	$1.66	$6.80	$11.22	$8.60	$94.61	$95
42	4.08	3	7.1	6.1	1.59	$7.95	$19.76	$10.00	$28.00	$1.96	$3.38	$3.55	$1.87	$7.65	$12.62	$9.67	$106.41	$106
48	4.67	3	7.7	6.7	1.89	$9.45	$21.68	$10.00	$36.00	$2.52	$3.98	$4.18	$2.20	$9.00	$14.85	$11.39	$125.25	$125
54	5.25	3	8.3	7.3	2.22	$11.10	$23.56	$15.00	$44.00	$3.08	$4.84	$5.08	$2.67	$10.93	$18.04	$13.83	$152.13	$152
60	5.83	3	8.8	7.8	2.56	$12.80	$25.45	$15.00	$51.00	$3.57	$5.39	$5.66	$2.97	$12.18	$20.10	$15.41	$169.53	$170
66	6.42	3	9.4	8.4	2.94	$14.70	$27.37	$15.00	$59.00	$4.13	$6.01	$6.31	$3.31	$13.58	$22.41	$17.18	$189.00	$189
72	7.00	3	10.0	9.0	3.33	$16.65	$29.25	$15.00	$77.00	$5.39	$7.16	$7.52	$3.95	$16.19	$26.72	$20.48	$225.31	$225
78	7.58	3	10.6	9.6	3.75	$18.75	$31.14	$20.00	$95.00	$6.65	$8.58	$9.01	$4.73	$19.39	$31.99	$24.52	$269.76	$270
84	8.17	3	11.2	10.2	4.21	$21.05	$33.05	$20.00	$105.00	$7.35	$9.32	$9.79	$5.14	$21.07	$34.77	$26.65	$293.19	$293
90	8.75	3	11.8	10.8	4.68	$23.40	$34.94	$20.00	$135.00	$9.45	$11.14	$11.70	$6.14	$25.18	$41.54	$31.85	$350.34	$350
96	9.33	3	12.3	11.3	5.17	$25.85	$36.82	$20.00	$150.00	$10.50	$12.16	$12.77	$6.70	$27.48	$45.34	$34.76	$382.38	$382
102	9.92	3	12.9	11.9	5.70	$28.50	$38.74	$30.00	$175.00	$12.25	$14.22	$14.94	$7.84	$32.15	$53.05	$40.67	$447.36	$447
108	10.50	3	13.5	12.5	6.25	$31.25	$40.63	$30.00	$185.00	$12.95	$14.99	$15.74	$8.26	$33.88	$55.91	$42.86	$471.47	$471
114	11.08	3	14.1	13.1	6.82	$34.10	$42.51	$30.00	$230.00	$16.10	$17.64	$18.52	$9.72	$39.86	$65.77	$50.42	$554.64	$555
120	11.67	3	14.7	13.7	7.43	$37.15	$44.43	$30.00	$260.00	$18.20	$19.49	$20.46	$10.74	$44.05	$72.68	$55.72	$612.92	$613

* SAWCUT, REMOVE & REPLACE - ASSUME 4" AC / 12" AB
** CLEANOUTS @ 250' SPACING
*** BASED ON CLASS III (1350D) & INCLUDES SHIPPING & HANDLING (RIALTO CONCRETE PRODUCTS 7/28/95)
**** SALES TAX COMPUTED ON PIPE COST ONLY

TABLE 6.2
UNIT PRICES - R.C.B.

RCB SIZE		RCB SIZE		TRENCHING AND BACKFILL					PAVING	C.O.'s	IN-PLACE	SALES	UTILITY	TRAFFIC	OVRHD	ENGR, ADM	CONTIN-		
SPAN	HT	SPAN	HT	COVER	DEPTH	WIDTH	VOL	ESTM @	*	**	CONCRETE	TAX ****	CONFL	CNTRL	& PROFIT	SURV, INSP	GENCY		USE
(ft)	(ft)	(in)	(in)	(ft)	(ft)	(ft)	CY/LF	$5.00	$2.25	$/LF	$/LF***	7.0%	5.0%	2.5%	10.0%	15.0%	10.0%	TOTAL	$/LF
2.0	4.0	24	48	2	7.5	7.0	1.94	$9.70	$17.75	$10.00	$78.00	$2.73	$5.91	$3.10	$12.72	$20.99	$16.09	$176.99	$177
2.5	5.0	30	60	2	8.5	8.0	2.52	$12.60	$20.00	$10.00	$96.00	$3.36	$7.10	$3.73	$15.28	$25.21	$19.33	$212.61	$213
3.0	4.0	36	48	2	7.5	7.0	1.94	$9.70	$17.75	$10.00	$90.00	$3.15	$6.53	$3.43	$14.06	$23.19	$17.78	$195.59	$196
4.0	2.5	48	30	2	6.0	5.5	1.22	$6.10	$14.38	$10.00	$93.00	$3.26	$6.34	$3.33	$13.64	$22.51	$17.26	$189.82	$190
4.0	3.0	48	36	2	6.5	6.0	1.44	$7.20	$15.50	$10.00	$99.00	$3.47	$6.76	$3.55	$14.55	$24.00	$18.40	$202.43	$202
5.0	3.0	60	36	2	6.5	6.0	1.44	$7.20	$15.50	$10.00	$108.00	$3.78	$7.22	$3.79	$15.55	$25.66	$19.67	$216.37	$216
5.0	4.0	60	48	2	7.5	7.0	1.94	$9.70	$17.75	$10.00	$120.00	$4.20	$8.08	$4.24	$17.40	$28.71	$22.01	$242.09	$242
5.0	5.0	60	60	2	8.5	8.0	2.52	$12.60	$20.00	$10.00	$132.00	$4.62	$8.96	$4.70	$19.29	$31.83	$24.40	$268.40	$268
5.5	5.0	66	60	2	8.5	8.0	2.52	$12.60	$20.00	$10.00	$150.00	$5.25	$9.89	$5.19	$21.29	$35.13	$26.94	$296.29	$296
6.0	3.0	72	36	2	6.5	6.0	1.44	$7.20	$15.50	$10.00	$132.00	$4.62	$8.47	$4.44	$18.22	$30.07	$23.05	$253.57	$254
6.0	4.0	72	48	2	7.5	7.0	1.94	$9.70	$17.75	$10.00	$141.00	$4.94	$9.17	$4.81	$19.74	$32.57	$24.97	$274.65	$275
6.0	5.0	72	60	2	8.5	8.0	2.52	$12.60	$20.00	$10.00	$156.00	$5.46	$10.20	$5.36	$21.96	$36.24	$27.78	$305.60	$306
7.0	3.0	84	36	2	6.5	6.0	1.44	$7.20	$15.50	$10.00	$144.00	$5.04	$9.09	$4.77	$19.56	$32.27	$24.74	$272.17	$272
7.0	3.5	84	42	2	7.0	6.5	1.69	$8.45	$16.63	$10.00	$147.00	$5.15	$9.36	$4.91	$20.15	$33.25	$25.49	$280.39	$280
7.0	4.0	84	48	2	7.5	7.0	1.94	$9.70	$17.75	$10.00	$153.00	$5.36	$9.79	$5.14	$21.07	$34.77	$26.66	$293.24	$293
7.0	4.5	84	54	2	8.0	7.5	2.22	$11.10	$18.88	$10.00	$159.00	$5.57	$10.23	$5.37	$22.02	$36.33	$27.85	$306.35	$306
7.0	5.0	84	60	2	8.5	8.0	2.52	$12.60	$20.00	$10.00	$165.00	$5.78	$10.67	$5.60	$22.97	$37.89	$29.05	$319.56	$320
7.0	5.5	84	66	2	9.0	8.5	2.83	$14.15	$21.13	$10.00	$171.00	$5.99	$11.11	$5.83	$23.92	$39.47	$30.26	$332.86	$333
7.5	5.0	90	60	2	8.5	8.0	2.52	$12.60	$20.00	$10.00	$174.00	$6.09	$11.13	$5.85	$23.97	$39.55	$30.32	$333.51	$334
7.5	5.5	90	66	2	9.0	8.5	2.83	$14.15	$21.13	$10.00	$183.00	$6.41	$11.73	$6.16	$25.26	$41.68	$31.95	$351.47	$351
7.5	6.0	90	72	2	9.5	9.0	3.17	$15.85	$22.25	$10.00	$189.00	$6.62	$12.19	$6.40	$26.23	$43.28	$33.18	$365.00	$365
8.0	4.0	96	48	2	7.5	7.0	1.94	$9.70	$17.75	$10.00	$171.00	$5.99	$10.72	$5.63	$23.08	$38.08	$29.20	$321.15	$321
8.0	4.5	96	54	2	8.0	7.5	2.22	$11.10	$18.88	$10.00	$177.00	$6.20	$11.16	$5.86	$24.02	$39.63	$30.39	$334.24	$334
8.0	5.0	96	60	2	8.5	8.0	2.52	$12.60	$20.00	$10.00	$183.00	$6.41	$11.60	$6.09	$24.97	$41.20	$31.59	$347.46	$347
8.0	5.5	96	66	2	9.0	8.5	2.83	$14.15	$21.13	$10.00	$189.00	$6.62	$12.05	$6.32	$25.93	$42.78	$32.80	$360.78	$361
8.0	6.0	96	72	2	9.5	9.0	3.17	$15.85	$22.25	$10.00	$195.00	$6.83	$12.50	$6.56	$26.90	$44.38	$34.03	$374.30	$374
8.0	8.0	96	96	2	11.5	11.0	4.69	$23.45	$26.75	$10.00	$219.00	$7.67	$14.34	$7.53	$30.87	$50.94	$39.06	$429.61	$430
8.5	4.0	102	48	2	7.5	7.0	1.94	$9.70	$17.75	$10.00	$204.00	$7.14	$12.43	$6.53	$26.76	$44.15	$33.85	$372.31	$372
8.5	5.0	102	60	2	8.5	8.0	2.52	$12.60	$20.00	$10.00	$222.00	$7.77	$13.62	$7.15	$29.31	$48.37	$37.08	$407.90	$408

* SAWCUT, REMOVE & REPLACE - ASSUME 4" AC / 12" AB
** CLEANOUTS ($ 5,000) @ 500' SPACING
*** $300 PER CUBIC YARD
**** SALES TAX COMPUTED ON 50% OF IN-PLACE CONCRETE COST

TABLE 6.2
UNIT PRICES - R.C.B.

RCB SIZE		RCB SIZE		TRENCHING AND BACKFILL					PAVING	C.O.'s	IN-PLACE	SALES	UTILITY	TRAFFIC	OVRHD	ENGR, ADM	CONTIN-		
SPAN (ft)	HT (ft)	SPAN (in)	HT (in)	COVER (ft)	DEPTH (ft)	WIDTH (ft)	VOL CY/LF	ESTM @ $5.00	* $2.25	** $/LF	CONCRETE $/LF***	TAX **** 7.0%	CONFL 5.0%	CNTRL 2.5%	& PROFIT 10.0%	SURV, INSP 15.0%	GENCY 10.0%	TOTAL	USE $/LF
8.5	5.5	102	66	2	9.0	8.5	2.83	$14.15	$21.13	$10.00	$228.00	$7.98	$14.06	$7.38	$30.27	$49.95	$38.29	$421.21	$421
8.5	6.0	102	72	2	9.5	9.0	3.17	$15.85	$22.25	$10.00	$237.00	$8.30	$14.67	$7.70	$31.58	$52.10	$39.95	$439.40	$439
9.0	4.0	108	48	2	7.5	7.0	1.94	$9.70	$17.75	$10.00	$213.00	$7.46	$12.90	$6.77	$27.76	$45.80	$35.11	$386.25	$386
9.0	5.0	108	60	2	8.5	8.0	2.52	$12.60	$20.00	$10.00	$231.00	$8.09	$14.08	$7.39	$30.32	$50.02	$38.35	$421.85	$422
9.0	6.0	108	72	2	9.5	9.0	3.17	$15.85	$22.25	$10.00	$243.00	$8.51	$14.98	$7.86	$32.25	$53.21	$40.79	$448.70	$449
9.5	3.0	114	36	2	6.5	6.0	1.44	$7.20	$15.50	$10.00	$207.00	$7.25	$12.35	$6.48	$26.58	$43.85	$33.62	$369.83	$370
9.5	5.0	114	60	2	8.5	8.0	2.52	$12.60	$20.00	$10.00	$237.00	$8.30	$14.40	$7.56	$30.99	$51.13	$39.20	$431.18	$431
9.5	5.5	114	66	2	9.0	8.5	2.83	$14.15	$21.13	$10.00	$246.00	$8.61	$14.99	$7.87	$32.28	$53.25	$40.83	$449.11	$449
10.0	3.0	120	36	2	6.5	6.0	1.44	$7.20	$15.50	$10.00	$213.00	$7.46	$12.66	$6.65	$27.25	$44.96	$34.47	$379.15	$379
10.0	3.5	120	42	2	7.0	6.5	1.69	$8.45	$16.63	$10.00	$222.00	$7.77	$13.24	$6.95	$28.50	$47.03	$36.06	$396.63	$397
10.0	4.0	120	48	2	7.5	7.0	1.94	$9.70	$17.75	$10.00	$228.00	$7.98	$13.67	$7.18	$29.43	$48.56	$37.23	$409.50	$410
10.0	5.0	120	60	2	8.5	8.0	2.52	$12.60	$20.00	$10.00	$246.00	$8.61	$14.86	$7.80	$31.99	$52.78	$40.46	$445.10	$445
10.0	6.0	120	72	2	9.5	9.0	3.17	$15.85	$22.25	$10.00	$261.00	$9.14	$15.91	$8.35	$34.25	$56.51	$43.33	$476.59	$477
10.0	6.5	120	78	2	10.0	9.5	3.52	$17.60	$23.38	$10.00	$270.00	$9.45	$16.52	$8.67	$35.56	$58.68	$44.99	$494.85	$495
10.0	8.0	120	96	2	11.5	11.0	4.69	$23.45	$26.75	$10.00	$291.00	$10.19	$18.07	$9.49	$38.90	$64.18	$49.20	$541.23	$541
10.5	3.0	126	36	2	6.5	6.0	1.44	$7.20	$15.50	$10.00	$231.00	$8.09	$13.59	$7.13	$29.25	$48.26	$37.00	$407.02	$407
10.5	4.0	126	48	2	7.5	7.0	1.94	$9.70	$17.75	$10.00	$246.00	$8.61	$14.60	$7.67	$31.43	$51.86	$39.76	$437.38	$437
11.0	4.0	132	48	2	7.5	7.0	1.94	$9.70	$17.75	$10.00	$255.00	$8.93	$15.07	$7.91	$32.44	$53.52	$41.03	$451.35	$451
11.0	5.0	132	60	2	8.5	8.0	2.52	$12.60	$20.00	$10.00	$267.00	$9.35	$15.95	$8.37	$34.33	$56.64	$43.42	$477.66	$478
11.0	5.5	132	66	2	9.0	8.5	2.83	$14.15	$21.13	$10.00	$276.00	$9.66	$16.55	$8.69	$35.62	$58.77	$45.06	$495.63	$496
11.0	6.0	132	72	2	9.5	9.0	3.17	$15.85	$22.25	$10.00	$282.00	$9.87	$17.00	$8.92	$36.59	$60.37	$46.29	$509.14	$509
12.0	3.0	144	36	2	6.5	6.0	1.44	$7.20	$15.50	$10.00	$255.00	$8.93	$14.83	$7.79	$31.93	$52.68	$40.39	$444.25	$444
12.0	3.5	144	42	2	7.0	6.5	1.69	$8.45	$16.63	$10.00	$264.00	$9.24	$15.42	$8.09	$33.18	$54.75	$41.98	$461.74	$462
12.0	5.0	144	60	2	8.5	8.0	2.52	$12.60	$20.00	$10.00	$285.00	$9.98	$16.88	$8.86	$36.33	$59.95	$45.96	$505.56	$506
12.0	6.0	144	72	2	9.5	9.0	3.17	$15.85	$22.25	$10.00	$297.00	$10.40	$17.78	$9.33	$38.26	$63.13	$48.40	$532.40	$532
12.0	7.0	144	84	2	10.5	10.0	3.89	$19.45	$24.50	$10.00	$312.00	$10.92	$18.84	$9.89	$40.56	$66.92	$51.31	$564.39	$564
12.0	8.0	144	96	2	11.5	11.0	4.69	$23.45	$26.75	$10.00	$327.00	$11.45	$19.93	$10.46	$42.90	$70.79	$54.27	$597.00	$597
12.0	10.0	144	120	2	13.5	13.0	6.50	$32.50	$31.25	$10.00	$393.00	$13.76	$24.03	$12.61	$51.72	$85.33	$65.42	$719.62	$720

* SAWCUT, REMOVE & REPLACE - ASSUME 4" AC / 12" AB
** CLEANOUTS ($ 5,000) @ 500' SPACING
*** $300 PER CUBIC YARD
**** SALES TAX COMPUTED ON 50% OF IN-PLACE CONCRETE COST

TABLE 6.3

UNIT PRICES - TRAPEZOIDAL CONCRETE CHANNEL

TRAP CONCRETE CHANNEL								EXCAVATION					FENCE *	UTILITY	TRAFFIC	OVRHD	ENGR, ADM	CONTIN-		
BTM (ft)	DEPTH (ft)	BTM (in)	DEPTH (in)	THK (in)	RATIO Z:1	VOL CY/LF	IN-PLACE $/LF**	DEPTH (ft)	BTM (ft)	TOP (ft)	VOL CY/LF	ESTM @ $5.00	$/LF $12	CONFL 5.0%	CNTRL 2.5%	& PROFIT 10.0%	SURV, INSP 15.0%	GENCY 10.0%	TOTAL	USE $/LF
8.0	5.0	96	60	6.0	1.0	0.48	$120.00	6	10.0	22.0	3.56	$17.80	$12.00	$7.49	$3.93	$16.12	$26.60	$20.39	$224.33	$224
12.0	5.0	144	60	6.0	1.0	0.56	$140.00	6	14.0	26.0	4.44	$22.20	$12.00	$8.71	$4.57	$18.75	$30.93	$23.72	$260.88	$261

* 6' CHAINLINK FENCING ON BOTH SIDES OF CHANNEL
** $250 PER CUBIC YARD OF CONCRETE

UNIT PRICES - TRAPEZOIDAL EARTH CHANNEL

TRAP EARTH CHANNEL BANK PROTECTION								EXCAVATION					FENCE *	LANTIN	ONITORIN	OVRHD	ENGR, ADM	CONTIN-		
BTM (ft)	DEPTH (ft)	BTM (in)	DEPTH (in)	THK (in)	RATIO Z:1	VOL CY/LF	IN-PLACE $/LF**	DEPTH (ft)	BTM (ft)	TOP (ft)	VOL CY/LF	ESTM @ $5.00	$/LF $12	$/Ac $35,000	$/Ac $15,000	& PROFIT 10.0%	SURV, INSP 15.0%	GENCY 10.0%	TOTAL	USE $/LF
142.0	6.0	1704	72	24.0	5.0	5.68	$341	8	146.0	226.0	55.11	$276	$12	$182	$78	$89	$146	$112	$1,235	$1,235
120.0	10.0	1440	120	24.0	5.0	9.44	$566	13	124.0	254.0	91.00	$455	$12	$204	$87	$133	$219	$168	$1,844	$1,844
128.0	6.0	1536	72	24.0	5.0	5.68	$341	8	132.0	212.0	50.96	$255	$12	$170	$73	$85	$140	$108	$1,184	$1,184
96.0	6.0	1152	72	24.0	5.0	5.68	$341	8	100.0	180.0	41.48	$207	$12	$145	$62	$77	$127	$97	$1,067	$1,067
90.0	6.0	1080	72	24.0	5.0	5.68	$341	8	94.0	174.0	39.70	$199	$12	$140	$60	$75	$124	$95	$1,045	$1,045
63.0	6.0	756	72	24.0	5.0	5.68	$341	8	67.0	147.0	31.70	$159	$12	$118	$51	$68	$112	$86	$946	$946
50.0	8.0	600	96	24.0	5.0	7.56	$454	10	54.0	154.0	38.52	$193	$12	$124	$53	$84	$138	$106	$1,162	$1,162
39.0	6.0	468	72	24.0	4.0	4.60	$276	8	43.0	107.0	22.22	$111	$12	$86	$37	$52	$86	$66	$726	$726
35.0	7.5	420	90	24.0	5.0	7.08	$425	9	39.0	129.0	28.00	$140	$12	$104	$44	$72	$120	$92	$1,009	$1,009
33.0	4.5	396	54	24.0	5.0	4.24	$254	6	37.0	97.0	14.89	$74	$12	$78	$33	$45	$75	$57	$629	$629
25.0	6.0	300	72	24.0	4.0	4.60	$276	8	29.0	93.0	18.07	$90	$12	$75	$32	$49	$80	$61	$675	$675
30.0	4.0	360	48	24.0	5.0	3.76	$226	5	34.0	84.0	10.93	$55	$12	$67	$29	$39	$64	$49	$541	$541
40.0	4.0	480	48	24.0	5.0	3.76	$226	5	44.0	94.0	12.78	$64	$12	$76	$32	$41	$68	$52	$570	$570
24.0	4.5	288	54	24.0	5.0	4.24	$254	6	28.0	88.0	12.89	$64	$12	$71	$30	$43	$71	$55	$601	$601
23.8	3.0	285	36	24.0	5.0	2.84	$170	4	27.8	67.8	7.08	$35	$12	$54	$23	$30	$49	$37	$411	$411
18.5	3.0	222	36	18.0	5.0	2.13	$128	4	21.5	61.5	6.15	$31	$12	$49	$21	$24	$40	$31	$336	$336
16.3	3.0	195	36	18.0	5.0	2.13	$128	4	19.3	59.3	5.82	$29	$12	$48	$20	$24	$39	$30	$330	$330
12.0	3.0	144	36	18.0	5.0	2.13	$128	4	15.0	55.0	5.19	$26	$12	$44	$19	$23	$38	$29	$318	$318
7.0	5.0	84	60	18.0	5.0	3.54	$212	6	10.0	70.0	8.89	$44	$12	$56	$24	$35	$58	$44	$486	$486
7.0	4.5	84	54	18.0	5.0	3.18	$191	6	10.0	70.0	8.89	$44	$12	$56	$24	$33	$54	$41	$456	$456
5.0	3.0	60	36	12.0	4.0	1.14	$68	4	7.0	39.0	3.41	$17	$12	$31	$13	$14	$23	$18	$198	$198
3.0	3.0	36	36	12.0	4.0	1.14	$68	4	5.0	37.0	3.11	$16	$12	$30	$13	$14	$23	$18	$193	$193

* 6' CHAINLINK FENCING ON BOTH SIDES OF CHANNEL
** $60 PER CUBIC YARD OF BANK PROTECTION

TABLE 6.3

UNIT PRICES - RECTANGULAR CONCRETE CHANNEL

RECTANGULAR CONCRETE CHANNEL								EXCAVATION				FENCE *	UTILITY	TRAFFIC	OVRHD	ENGR, ADM	CONTIN-		
				THICKNESS															
BTM (ft)	DEPTH (ft)	BTM (in)	DEPTH (in)	BTM (in)	WALL (in)	VOL CY/LF	IN-PLACE $/LF**	DEPTH (ft)	BTM (ft)	VOL CY/LF	ESTM @ $5.00	$/LF $12	CONFL 5.0%	CNTRL 2.5%	& PROFIT 10.0%	SURV, INSP 15.0%	GENCY 10.0%	TOTAL	USE $/LF
13.2	4.0	158	48	7.0	5.0	0.43	$122.55	7	16.0	4.15	$20.75	$12.00	$7.77	$4.08	$16.72	$27.58	$21.15	$232.60	$233
20.0	4.0	240	48	7.0	5.0	0.57	$162.45	7	23.0	5.96	$29.80	$12.00	$10.21	$5.36	$21.98	$36.27	$27.81	$305.88	$306
22.8	4.0	273	48	7.0	5.0	0.63	$179.55	7	26.0	6.74	$33.70	$12.00	$11.26	$5.91	$24.24	$40.00	$30.67	$337.33	$337
41.7	4.0	500	48	7.0	5.0	1.04	$296.40	7	45.0	11.67	$58.35	$12.00	$18.34	$9.63	$39.47	$65.13	$49.93	$549.25	$549
45.0	4.5	540	54	7.5	5.5	1.22	$347.70	7	48.0	12.44	$62.20	$12.00	$21.10	$11.08	$45.41	$74.92	$57.44	$631.85	$632
53.3	4.5	640	54	7.5	5.5	1.41	$401.85	7	56.0	14.52	$72.60	$12.00	$24.32	$12.77	$52.35	$86.38	$66.23	$728.50	$729
57.3	4.5	688	54	7.5	5.5	1.50	$427.50	7	60.0	15.56	$77.80	$12.00	$25.87	$13.58	$55.68	$91.86	$70.43	$774.72	$775
42.0	5.0	504	60	8.0	6.0	1.25	$356.25	8	45.0	13.33	$66.65	$12.00	$21.75	$11.42	$46.81	$77.23	$59.21	$651.32	$651
27.4	7.0	329	84	10.0	8.0	1.23	$350.55	11	31.0	12.63	$63.15	$12.00	$21.29	$11.17	$45.82	$75.60	$57.96	$637.54	$638
28.0	7.0	336	84	10.0	8.0	1.25	$356.25	11	31.0	12.63	$63.15	$12.00	$21.57	$11.32	$46.43	$76.61	$58.73	$646.06	$646

* 6' CHAINLINK FENCING ON BOTH SIDES OF CHANNEL

** $285 PER CUBIC YARD

TABLE 6.4

PROPOSED FACILITIES- EXISTING DEVELOPMENT

GEOMETRY: 1= TRAP. OPEN CHANNEL, 2= IRREGULAR CHANNEL, 3= BOX CHANNEL, 4= PIPE, 5= RECT. OPEN CHANNEL
MATERIALS: 1= R.C.P., 2= C.I.P.P., 3= R.C.B., 4= C.M.P.A., 5= C.M.P., 6= NATURAL CHANNEL, 7= CONC. CHANNEL, 8= SPIRAL RIBBED
Qe= EXISTING DEVELOPMENT FLOW * R=REPLACE, P=PARALLEL, N= NEW **NO I.D. ~EXIST < 36"

ID #	SYSTEM	GEOMETRY	WIDTH (in)	HEIGHT (in)	RATIO	MAT'L	EXISTING REF. ID #	R/P/N *	LENGTH (ft)	COST/ UNIT	Qe (cfs)	FREQ	FROM NODE	TO NODE	COST ESTIMATE
2001	SM	4	45		3	1	240	P	641	$116	654	100	130	132	$223,068
2002	SM	4	36		1	1		N	50	$95	90	100	410	412	$4,750
2003	SM	4	45		1	1		N	100	$116	100	100	506	508	$11,600
2004	SM	4	51		1	1	**	R	150	$139	236	100	418	420	$20,850
2468	SM	4	75		1	1	798	R	106	$248	404	100	422	424	$26,288
2005	SM	3	36	48	1	3	4	P	364	$196	646	100	436	438	$71,344
2006	SM	3	36	48	1	3	4	P	500	$196	646	100	438	140	$98,000
2007	SM	3	30	60	1	3	969	P	400	$213	1292	100	140	142	$85,200
2008	SM	3	66	60	2	3		N	40	$296	1317	100	144	146	$23,680
2009	KC 23	4	42		1	1	891	P	90	$106	173	100	208	210	$9,540
2010	KC 23	4	42		1	1		N	500	$106	97	100	204	206	$53,000
2011	KC 23	< 36"						N	50	$0	192	100	212	214	$0
2012	KC 23	4	54		1	1	889	P	60	$152	313	100	306	308	$9,120
2013	KC 23	4	39		1	1			1750	$101	98	100	403	404	$176,750
2014	KC 23	4	42		1	1		N	450	$106	134	100	404	310	$47,700
2469	KC 23	4	72		1	1	888	R	75	$225	451	100	310	312	$16,875
2470	KC 23	4	42		1	1	**	R	100	$106	65	100	215	217	$10,600
2471	KC 23	4	45		1	1	758	R	382	$116	74	100	221	220	$44,312
2015	KC 23	4	42		1	1	882	P	110	$106	208	100	610	612	$11,660
2016	KC 21	4	42		1	1		N	125	$106	116	100	704	706	$13,250
2017	KC 21	4	48		2	1	877	P	60	$125	376	100	718	720	$15,000
2018	KC 21	4	75		1	1		N	100	$248	451	100	722	226	$24,800
2019	KC 32B	4	108		1	1		N	100	$471	1212	100	164	166	$47,100
2020	KC 32	4	42		1	1	**	R	330	$106	122	100	112	114	$34,980
2021	KC 32	4	45		1	1	**	R	240	$116	151	100	114	116	$27,840
2022	KC 32	4	48		1	1	**	R	400	$125	161	100	116	118	$50,000
2023	KC 32	4	51		1	1	398	R	500	$139	204	100	118	120	$69,500
2024	KC 32	4	39		1	1	**	R	350	$101	58	100	218	220	$35,350
2025	KC 32	4	45		1	1	**	R	600	$116	74	100	220	120	$69,600
2026	KC 32	4	69		1	1	397	R	180	$207	315	100	120	122	$37,260
2027	KC 32	4	69		1	1	397	R	468	$207	337	100	122	124	$96,876
2028	KC 32	4	84		1	1	396	R	292	$293	348	100	124	126	$85,556
2029	KC 32	4	87		1	1	395	R	542	$322	353	100	126	128	$174,524

TABLE 6.4

PROPOSED FACILITIES- EXISTING DEVELOPMENT

GEOMETRY: 1= TRAP. OPEN CHANNEL, 2= IRREGULAR CHANNEL, 3= BOX CHANNEL, 4= PIPE, 5= RECT. OPEN CHANNEL
MATERIALS: 1= R.C.P., 2= C.I.P.P., 3= R.C.B., 4= C.M.P.A., 5= C.M.P., 6= NATURAL CHANNEL, 7= CONC. CHANNEL, 8= SPIRAL RIBBED
Qe= EXISTING DEVELOPMENT FLOW * R=REPLACE, P=PARALLEL, N= NEW **NO I.D. ~EXIST < 36"

ID #	SYSTEM	GEOMETRY	WIDTH (in)	HEIGHT (in)	RATIO	MAT'L	EXISTING REF. ID #	R/P/N *	LENGTH (ft)	COST/ UNIT	Qe (cfs)	FREQ	FROM NODE	TO NODE	COST ESTIMATE
2030	KC 32	3	132	60	1	3	394	R	318	$451	365	100	128	130	$143,418
2031	KC 32	4	48		1	1	392	P	499	$125	428	100	130	132	$62,375
2032	KC 32	3	120	60	1	3	391	R	587	$445	444	100	132	134	$261,215
2033	KC 32	3	120	60	1	3	390	R	736	$445	447	100	134	136	$327,520
2034	KC 32	3	120	60	1	3	390	R	50	$445	501	100	136	138	$22,250
2035	KC 32	3	120	60	1	3	388/389	R	719	$445	535	100	138	140	$319,955
2036	KC 32	3	120	60	1	3	410	R	723	$445	584	100	140	142	$321,735
2037	KC 32	4	39		1	1	700/235	P	630	$101	594	100	142	144	$63,630
2038	KC 32	4	42		1	1	699	P	50	$106	607	100	144	146	$5,300
2039	KC 32	4	39		1	1		N	250	$101	110	100	810	812	$25,250
2040	KC 32	4	36		1	1	804/923	P	450	$95	159	100	812	146	$42,750
2041	KC 32	4	36		1	1	336	P	296	$95	727	100	146	148	$28,120
2042	KC 32	4	42		1	1	337	P	126	$106	727	100	148	150	$13,356
2043	KC 32A	4	36		1	1		N	680	$95	64	100	910	912	$64,600
2044	KC 32A	4	36		1	1		N	380	$95	78	100	912	914	$36,100
2045	KC 42	4	42		1	1	**	R	62	$106	79	50	108	110	$6,572
2046	KC 42	4	39		1	1	761	P	550	$101	79	50	112	114	$55,550
2047	KC 42	4	39		1	1	763	R	380	$101	150	50	116	118	$38,380
2048	KC 42	4	45		2	1	875	P	100	$116	486	50	128	130	$23,200
2049	KC 22	< 36"									146	50	128	130	$0
2050	KC 22	4	18		1	1	**	P	50	$83	152	50	130	132	$4,150
2051	KC 22	< 36"									282	50	144	146	$0
2053	R 42	4	84		1	1	722	R	100	$293	465	50	138	140	$29,300
2054	R 42	4	39		1	1	304	P	239	$101	531	50	146	148	$24,139
2056	R 51	< 36"						N			47	50	106	108	$0
2057	R 51	< 36"									12	50	202	108	$0
2058	R 51	4	39		1	1	SFP-76/NB	R	190	$101	76	50	108	110	$19,190
2059	R 51	4	39		1	1	**	R	750	$101	78	50	110	112	$75,750
2061	R 71	< 36"						N			83	50	304	306	$0
2062	R 71	4	39		1	1		N	150	$101	100	50	306	120	$15,150
2063	R 71	< 36"						N			27	50	402	404	$0

TABLE 6.4

PROPOSED FACILITIES- EXISTING DEVELOPMENT

GEOMETRY: 1= TRAP. OPEN CHANNEL, 2= IRREGULAR CHANNEL, 3= BOX CHANNEL, 4= PIPE, 5= RECT. OPEN CHANNEL
MATERIALS: 1= R.C.P., 2= C.I.P.P., 3= R.C.B., 4= C.M.P.A., 5= C.M.P., 6= NATURAL CHANNEL, 7= CONC. CHANNEL, 8= SPIRAL RIBBED
Qe= EXISTING DEVELOPMENT FLOW *** R=REPLACE, P=PARALLEL, N= NEW** ****NO I.D. ~EXIST < 36"**

ID #	SYSTEM	GEOMETRY	WIDTH (in)	HEIGHT (in)	RATIO	MAT'L	EXISTING REF. ID #	R/P/N *	LENGTH (ft)	COST/ UNIT	Qe (cfs)	FREQ	FROM NODE	TO NODE	COST ESTIMATE
2064	R 71	4	39		1	1		N	300	$101	47	50	404	128	$30,300
2065	R 71	4	48		1	1	SFP-8/NB/362	P	260	$125	478	50	136	138	$32,500
2066	R 71	1	222	36	5	6	849	R	800	$336	504	50	138	140	$268,800
2069	E 222	4	54		1	1		N	60	$152	367	100	112	114	$9,120
2070	E 222	4	75		1	1	495	P	185	$248	699	100	126	128	$45,880
2071	E 222	4	75		1	1	495	P	828	$248	699	100	128	130	$205,344
2072	E 222	4	75		1	1	495	P	115	$248	719	100	130	132	$28,520
2073	E 222	4	75		1	1	495	P	506	$248	719	100	132	134	$125,488
2074	E 222	4	75		1	1	495	P	118	$248	728	100	134	136	$29,264
2075	E 222	4	93		1	1	653	P	55	$366	728	100	136	138	$20,130
2076	E 222	4	93		1	1	652	P	251	$366	728	100	138	140	$91,866
2077	E 222	4	93		1	1	188	P	259	$366	728	100	140	142	$94,794
2078	E 222	4	108		1	1	87	P	510	$471	844	100	142	144	$240,210
2079	E 222	4	102		1	1	86	P	505	$447	844	100	144	146	$225,735
2080	E 222	4	102		1	1	85	P	536	$447	844	100	146	148	$239,592
2081	E 222	4	93		1	1	84/83	P	672	$366	1025	100	148	150	$245,952
2082	E 222	4	93		1	1	82/81	P	583	$366	1025	100	150	152	$213,378
2083	E 222	4	84		1	1	81	P	80	$293	1025	100	152	154	$23,440
2085	E 232 A	< 36"						N	1000	$0	28	100	159	157	$0
2086	E 232 A	4	36		1	1		N	500	$95	64	100	157	155	$47,500
2087	E 232 A	4	42		1	1		N	600	$106	77	100	155	154	$63,600
2088	E 232 A	4	102		1	1	80/79	P	811	$447	1095	100	154	156	$362,517
2089	E 232 A	4	102		1	1	78	P	360	$447	1095	100	156	158	$160,920
2091	E 232 B	<36"						N	1300	$0	28	50	802	804	$0
2092	E 232 B	<36"						N	550	$0	21	50	807	805	$0
2093	E 232 B	4	36		1	1		N	450	$95	44	50	805	804	$42,750
2094	E 232 B	4	45		1	1	**	R	300	$116	87	50	804	806	$34,800
2095	E 232B	4	42		1	1	848	P	130	$106	122	50	806	808	$13,780
2097	E 232 C	4	36		1	1		N	650	$95	84	50	906	908	$61,750
2098	E 232 C	4	48		1	1		N	500	$125	95	50	908	910	$62,500
2099	E 232 C	4	51		1	1	**	R	600	$139	108	50	910	912	$83,400

TABLE 6.4

PROPOSED FACILITIES- EXISTING DEVELOPMENT

GEOMETRY: 1= TRAP. OPEN CHANNEL, 2= IRREGULAR CHANNEL, 3= BOX CHANNEL, 4= PIPE, 5= RECT. OPEN CHANNEL
MATERIALS: 1= R.C.P., 2= C.I.P.P., 3= R.C.B., 4= C.M.P.A., 5= C.M.P., 6= NATURAL CHANNEL, 7= CONC. CHANNEL, 8= SPIRAL RIBBED
Qe= EXISTING DEVELOPMENT FLOW * R=REPLACE, P=PARALLEL, N= NEW **NO I.D. ~EXIST < 36"

ID #	SYSTEM	GEOMETRY	WIDTH (in)	HEIGHT (in)	RATIO	MAT'L	EXISTING REF. ID #	R/P/N *	LENGTH (ft)	COST/ UNIT	Qe (cfs)	FREQ	FROM NODE	TO NODE	COST ESTIMATE
2100	E 51	4	42		1	1		N	100	$106	82	50	208	210	$10,600
2101	E 62	3	96	60	2	3	885	R	40	$347	1368	100	128	130	$27,760
2084	E 62	4	78		1	1		N	80	$270	384	100	506	508	$21,600
2102	E 72	4	63		1	1	886	R	70	$180	113	50	210	212	$12,600
2103	E 72	4	48		1	1		N	70	$125	127	50	214	216	$8,750
2104	E 102	4	30		1	1	933	P	51	$83	156	100	206	110	$4,233
2105	E 102	4	63		1	1	470	P	310	$180	402	100	116	118	$55,800
2106	E 102	4	30		1	1	71	P	206	$83	110	100	506	508	$17,098
2107	E 102	4	24		1	1	70	P	565	$83	110	100	508	510	$46,895
2108	E 102	4	30		1	1	70	P	183	$83	130	100	510	512	$15,189
2109	E 102	4	24		1	1	617	P	51	$83	139	100	512	514	$4,233
2110	E 102	< 36"						N			57	100	602	604	$0
2111	E 102	4	39		1	1		N	300	$101	95	100	604	514	$30,300
2112	E 102	4	39		1	1	616	P	81	$101	232	100	514	118	$8,181
2113	E 102	4	54		2	1	533	R	112	$152	719	100	132	134	$34,048
2114	E 102	4	93		1	1	531	P	454	$366	811	100	134	136	$166,164
2090	E 102	3	108	60	1	3	615	P	70	$422	865	100	136	138	$29,540
2115	E 102	4	72		1	1	59	P	410	$225	881	100	138	140	$92,250
2116	E 102	< 36"						N	500	$0	69	100	802	804	$0
2096	E 102	< 36"					670	P	410	$0	177	100	806	808	$0
2117	E 102	4	42		1	1	670	P	90	$106	248	100	808	810	$9,540
2118	E 102	4	45		1	1	669	P	342	$116	306	100	810	812	$39,672
2119	E 102	4	39		1	1	668	P	384	$101	315	100	812	814	$38,784
2120	E 102	4	30		1	1	667	P	408	$83	376	100	814	816	$33,864
2052	E 102	4	39		1	1	666	P	259	$101	398	100	816	818	$26,159
2121	E 102	4	51		1	1	542	P	350	$139	398	100	818	820	$48,650
2122	E 102	< 36"					104		330	$0	500	100	822	824	$0
2123	E 102	< 36"					103		875	$0	583	100	824	826	$0
2124	E 102	4	54		1	1	543	R	260	$152	161	100	2014	828	$39,520
2125	E 102	4	66		1	1	51	P	157	$189	767	100	828	830	$29,673
2126	E 102	4	66		1	1	50	P	336	$189	775	100	830	832	$63,504
2127	E 102	4	36		1	1	48	P	595	$95	792	100	834	836	$56,525
2128	E 102	4	66		1	1	47	P	511	$189	824	100	836	838	$96,579

TABLE 6.4

PROPOSED FACILITIES- EXISTING DEVELOPMENT

GEOMETRY: 1= TRAP. OPEN CHANNEL, 2= IRREGULAR CHANNEL, 3= BOX CHANNEL, 4= PIPE, 5= RECT. OPEN CHANNEL
MATERIALS: 1= R.C.P., 2= C.I.P.P., 3= R.C.B., 4= C.M.P.A., 5= C.M.P., 6= NATURAL CHANNEL, 7= CONC. CHANNEL, 8= SPIRAL RIBBED
Qe= EXISTING DEVELOPMENT FLOW *** R=REPLACE, P=PARALLEL, N= NEW** ****NO I.D. ~EXIST < 36"**

ID #	SYSTEM	GEOMETRY	WIDTH (in)	HEIGHT (in)	RATIO	MAT'L	EXISTING REF. ID #	R/P/N *	LENGTH (ft)	COST/ UNIT	Qe (cfs)	FREQ	FROM NODE	TO NODE	COST ESTIMATE
2129	E 102	< 36"					122		208	$0	97	100	3008	3012	$0
2271	E 102	4	33		1	1	119	P	318	$83	156	100	3016	3018	$26,394
2286	E 102	4	33				117		674	$83	327	100	3020	3022	$0
2391	E 102	4	33				116		524	$83	341	100	3022	3024	$0
2395	E 102	4	33				115/114		1024	$83	351	100	3024	3026	$0
2130	E 102	3	120	60	1	3	74/608	P	554	$445	1195	100	838	840	$246,530
2131	E 102	3	126	36	3	3	13	P	148	$407	1212	100	840	842	$180,708
2132	E 102	3	126	48	1	3	58	P	393	$437	1212	100	842	844	$171,741
2133	E 102	3	96	48	1	3	57	R	625	$321	1222	100	844	140	$200,625
2134	E 102	5	158	48	1	7	56	R	260	$233	2094	100	140	142	$60,580
2398	E 102	< 36"					611		224	$0	47	100	4013	4014	$0
2135	E 102	< 36"					60		708	$0	186	100	4020	4022	$0
2136	E 102	< 36"					60		197	$0	200	100	4022	142	$0
2137	E 102	3	144	60	2	3	613	P	60	$506	2303	100	142	144	$60,720
2138	E 102	3	84	60	2	3	55	P	300	$320	2303	100	144	146	$192,000
2139	E 102	3	84	60	2	3	55	P	300	$320	2312	100	146	148	$192,000
2140	E 102	4	42		1	1	**	R	400	$106	151	100	5006	5008	$42,400
2141	E 102	4	54		1	1	248	R	122	$152	161	100	5008	5010	$18,544
2400	E 102	< 36"					244		428	$0	164	100	5010	5012	$0
2142	E 102	4	33		1	1	12	P	350	$83	175	100	5012	5014	$29,050
2143	E 102	4	33		1	1	12	P	270	$83	191	100	5014	5016	$22,410
2144	E 102	4	45		1	1	55	P	699	$116	222	100	5016	150	$81,084
2145	E 102	5	504	60	1	7	54	R	616	$651	2557	100	150	152	$401,016
2146	E 102	5	540	54	1	7	262	R	326	$632	2585	100	152	154	$206,032
2147	E 102	4	63		1	1	261	P	600	$180	2625	100	154	156	$108,000
2148	E 102	4	69		1	1	261	P	500	$207	2666	100	156	158	$103,500
2149	E 102	4	72		1	1	262	P	143	$225	2693	100	158	160	$32,175
2150	E 111	4	33		1	1	220	P	350	$83	383	50	314	322	$29,050
2151	E 121	4	33		1	1	259	P	309	$83	118	50	126	128	$25,647
2152	E 121	4	36		1	1	260	P	162	$95	124	50	128	130	$15,390
2153	E 121	4	36		1	1	260	P	83	$95	127	50	130	132	$7,885
2154	E 151	< 36"					580		373	$0	84	50	108	110	$0
2155	E 151	4	33		1	1	579	P	330	$83	131	50	110	112	$27,390

TABLE 6.4

PROPOSED FACILITIES- EXISTING DEVELOPMENT

GEOMETRY: 1= TRAP. OPEN CHANNEL, 2= IRREGULAR CHANNEL, 3= BOX CHANNEL, 4= PIPE, 5= RECT. OPEN CHANNEL
MATERIALS: 1= R.C.P., 2= C.I.P.P., 3= R.C.B., 4= C.M.P.A., 5= C.M.P., 6= NATURAL CHANNEL, 7= CONC. CHANNEL, 8= SPIRAL RIBBED
Qe= EXISTING DEVELOPMENT FLOW * R=REPLACE, P=PARALLEL, N= NEW **NO I.D. ~EXIST < 36"

ID #	SYSTEM	GEOMETRY	WIDTH (in)	HEIGHT (in)	RATIO	MAT'L	EXISTING REF. ID #	R/P/N *	LENGTH (ft)	COST/ UNIT	Qe (cfs)	FREQ	FROM NODE	TO NODE	COST ESTIMATE
2156	E 151	4	45		1	1		N	750	$116	139	50	112	208	$87,000
2157	E 151	< 36"						N	419	$0	54	50	204	206	$0
2158	E 151	4	69		1	1		N	1100	$207	223	50	208	210	$227,700
2159	E 151	4	72		1	1		N	800	$225	252	50	210	316	$180,000
2160	E 151	4	36		1	1	**	R	366	$95	45	50	304	306	$34,770
2161	E 151	4	36		1	1	**	P	383	$95	82	50	306	308	$36,385
2162	E 151	4	42		1	1	**	P	483	$106	95	50	308	310	$51,198
2163	E 151	4	42		1	1	**	P	479	$106	119	50	310	312	$50,774
2164	E 151	4	63		1	1	568	R	475	$180	144	50	312	314	$85,500
2165	E 151	4	66		1	1	567	R	356	$189	150	50	314	315	$67,284
2055	E 151	4	36		1	1		N	427	$95	45	50	120	110	$40,565
2166	E 151	4	69		1	1	566	R	342	$207	158	50	315	316	$70,794
2167	E 151	4	96		1	1		N	400	$382	416	50	316	338	$152,800
2168	E 151	3	120	72	1	3		N	1420	$477	509	50	338	342	$677,340
2169	E151QUIN	4	36		1	1		N	750	$95	53	50	504	512	$71,250
2170	E151QUIN	4	45		1	1		N	430	$116	114	50	510	512	$49,880
2171	E151QUIN	4	66		1	1	564	R	759	$189	184	50	512	514	$143,451
2172	E151QUIN	4	69		1	1	563	R	329	$207	209	50	514	516	$68,103
2173	E151QUIN	4	75		1	1	562	R	459	$248	305	50	516	528	$113,832
2174	E151QUIN	4	78		1	1	561	R	478	$270	317	50	528	530	$129,060
2175	E151QUIN	3	84	60	1	3		N	760	$320	336	50	530	534	$243,200
2176	E151QUIN	3	84	60	1	3		N	380	$320	349	50	534	536	$121,600
2177	E151QUIN	3	84	60	1	3		N	380	$320	361	50	536	538	$121,600
2178	E151QUIN	3	108	60	1	3		N	860	$422	382	50	538	540	$362,920
2179	E151QUIN	3	108	60	1	3		N	380	$422	393	50	540	542	$160,360
2180	E151QUIN	3	108	60	1	3		N	380	$422	405	50	542	544	$160,360
2181	E151QUIN	4	36		1	1		N	800	$95	40	50	402	404	$76,000
2182	E151QUIN	4	36		1	1		N	374	$95	65	50	404	406	$35,530
2183	E151QUIN	4	48		1	1		N	401	$125	96	50	406	408	$50,125
2184	E151QUIN	4	54		1	1		N	378	$152	108	50	408	410	$57,456
2185	E151QUIN	4	54		1	1	578	R	431	$152	108	50	410	412	$65,512
2186	E151QUIN	3	72	60	1	3	554	R	50	$306	189	50	424	544	$15,300
2187	E151QUIN	3	96	60	2	3	554	R	559	$347	610	50	544	546	$387,946
2188	E151QUIN	4	36		1	1		N	150	$95	64	50	610	612	$14,250
2189	E151QUIN	4	36		1	1		N	479	$95	89	50	612	614	$45,505

TABLE 6.4

PROPOSED FACILITIES- EXISTING DEVELOPMENT

GEOMETRY: 1= TRAP. OPEN CHANNEL, 2= IRREGULAR CHANNEL, 3= BOX CHANNEL, 4= PIPE, 5= RECT. OPEN CHANNEL
MATERIALS: 1= R.C.P., 2= C.I.P.P., 3= R.C.B., 4= C.M.P.A., 5= C.M.P., 6= NATURAL CHANNEL, 7= CONC. CHANNEL, 8= SPIRAL RIBBED
Qe= EXISTING DEVELOPMENT FLOW * R=REPLACE, P=PARALLEL, N= NEW **NO I.D. ~EXIST < 36"

ID #	SYSTEM	GEOMETRY	WIDTH (in)	HEIGHT (in)	RATIO	MAT'L	EXISTING REF. ID #	R/P/N *	LENGTH (ft)	COST/ UNIT	Qe (cfs)	FREQ	FROM NODE	TO NODE	COST ESTIMATE
2190	E151QUIN	4	36		1	1		N	82	$95	110	50	614	616	$7,790
2191	E151QUIN	4	72		1	1	652	P	444	$225	678	50	616	618	$99,900
2192	E151QUIN	3	60	60	1	3	755	P	72	$268	739	50	620	622	$19,296
2193	E 191	4	36		1	1	**	R	384	$95	84	50	110	112	$36,480
2194	E 191	4	48		1	1	**	P	373	$125	96	50	112	114	$46,625
2195	E 191	4	39		1	1	**	P	476	$101	45	50	204	206	$48,076
2196	E 191	4	45		1	1	386	P	474	$116	77	50	206	114	$54,984
2197	E 191	3	48	36	1	3	383/384	P	387	$202	173	50	114	116	$78,174
2198	E 191	4	51		1	1	382	P	217	$139	201	50	116	118	$30,163
2199	E 192	4	36		1	1		N	900	$95	79	50	201	202	$85,500
2200	E 192	4	45		1	1	**	R	359	$116	79	50	202	203	$41,644
2201	E 193	4	45		1	1	701	R	350	$116	223	50	107	108	$40,600
2202	E 193	4	36		1	1	323	P	400	$95	224	50	111	112	$38,000
2203	E 193	4	60		1	1	374	R	424	$170	253	50	112	113	$72,080
2204	E 193	4	63		1	1	373	R	469	$180	270	50	113	114	$84,420
2205	E 193	4	36		1	1	**	R	300	$95	70	50	142	143	$28,500
2206	E 193	4	36		1	1	**	R	400	$95	77	50	143	144	$38,000
2207	E 193	< 36"					378		401	$0	83	50	144	145	$0
2208	E 193	4	42		1	1	377	R	316	$106	90	50	145	145.5	$33,496
2209	E 193	4	42		1	1	376	R	316	$106	90	50	145.5	146	$33,496
2210	E 193	4	42		1	1	375	R	420	$106	97	50	146	114	$44,520
2211	E 193	3	102	48	1	3	372	R	370	$372	373	50	114	115	$137,640
2212	E 193	3	108	48	1	3	372	R	120	$386	411	50	115	116	$46,320
2213	E 193	3	120	48	1	3	372	R	295	$410	419	50	116	117	$120,950
2214	E 193	3	120	48	1	3	372	R	420	$410	423	50	117	118	$172,200
2215	E 193	3	108	48	1	3	372	R	325	$386	427	50	118	119	$125,450
2216	E 193	3	120	48	1	3	370	R	95	$410	427	50	119	120	$38,950
2217	E 193	4	51		1	1	369	P	318	$139	427	50	120	121	$44,202
2218	E 201	4	30		1	1	866	P	70	$83	81	50	123	124	$5,810
2219	E 201	4	39		1	1	865	P	570	$101	100	50	124	125	$57,570
2220	E 201	4	45		1	1	747	P	420	$116	135	50	125	126	$48,720

TABLE 6.4

PROPOSED FACILITIES- EXISTING DEVELOPMENT

GEOMETRY: 1= TRAP. OPEN CHANNEL, 2= IRREGULAR CHANNEL, 3= BOX CHANNEL, 4= PIPE, 5= RECT. OPEN CHANNEL
MATERIALS: 1= R.C.P., 2= C.I.P.P., 3= R.C.B., 4= C.M.P.A., 5= C.M.P., 6= NATURAL CHANNEL, 7= CONC. CHANNEL, 8= SPIRAL RIBBED
Qe= EXISTING DEVELOPMENT FLOW * R=REPLACE, P=PARALLEL, N= NEW **NO I.D. ~EXIST < 36"

ID #	SYSTEM	GEOMETRY	WIDTH (in)	HEIGHT (in)	RATIO	MAT'L	EXISTING REF. ID #	R/P/N *	LENGTH (ft)	COST/ UNIT	Qe (cfs)	FREQ	FROM NODE	TO NODE	COST ESTIMATE
2221	E 211	3	48	30	1	3		N	450	$190	84	50	202	203	$85,500
2222	E 211	3	48	30	1	3		N	100	$190	105	50	203	204	$19,000
2223	E 211	3	72	36	1	3	466	R	254	$254	150	50	204	205	$64,516
2224	E 211	3	72	36	1	3	465	R	78	$254	185	50	205	206	$19,812
2225	E 211	3	84	48	1	3	294	R	725	$293	221	50	206	207	$212,425
2226	E 211	3	84	48	1	3	676/252	R	66	$293	261	50	207	208	$19,338
2227	E 211	3	72	36	2	3	463	R	1025	$254	287	50	208	209	$520,700
2228	E 211	3	72	36	2	3	463	R	350	$254	296	50	209	210	$177,800
2229	E 211	3	72	36	2	3	675	R	173	$254	305	50	210	211	$87,884
2230	E 211	3	84	36	2	3	674	R	505	$272	314	50	211	212	$274,720
2231	E 211	4	36		1	1		N	700	$95	34	50	241	212	$66,500
2232	E 211	3	84	36	2	3	421	R	601	$272	342	50	212	213	$326,944
2233	E 211	4	27		1	1	418	P	768	$83	456	50	214	215	$63,744
2234	E 211	4	18		1	1	77	P	410	$83	31	50	271	272	$34,030
2235	E 211	4	18		1	1	406	P	200	$83	31	50	272	273	$16,600
2236	E 211	4	30		1	1	406	P	660	$83	53	50	273	274	$54,780
2237	E 211	4	45		1	1	**	R	600	$116	78	50	274	275	$69,600
2238	E 211	3	60	36	1	3	72	R	162	$216	78	50	275	276	$34,992
2239	E 211	3	60	36	1	3	148	R	162	$216	114	50	276	277	$34,992
2240	E 211	3	60	36	1	3	677/147	R	70	$216	114	50	277	215	$15,120
2241	E 211	4	72		1	1	673	P	300	$225	591	50	215	216	$67,500
2242	E 211	3	120	48	1	3	419	P	200	$410	595	50	216	217	$82,000
2243	E 211	3	132	48	1	3	419	P	227	$451	617	50	217	218	$102,377
2244	E 212 A	4	36		1	1		N	1300	$95	63	50	304	306	$123,500
2245	E 212 A	4	57		1	1		N	1000	$161	92	50	306	308	$161,000
2246	E 212 A	4	54		1	1	416	P	1000	$152	150	50	308	310	$152,000
2247	E 212 A	4	57		1	1	416	P	321	$161	165	50	310	312	$51,681
2248	E 212 A	4	60		1	1	415	P	819	$170	205	50	312	314	$139,230
2249	E 212 B	4	42		1	1		N	500	$106	52	50	104	106	$53,000
2250	E 212 B	4	51		1	1		N	1300	$139	115	50	106	108	$180,700
2251	E 231	4	42		1	1		N	1340	$106	142	50	204	206	$142,040
2252	E 231	4	60		1	1		N	50	$170	245	50	206	208	$8,500
2253	E 231	4	63		1	1		N	50	$180	261	50	208	210	$9,000

TABLE 6.4

PROPOSED FACILITIES- EXISTING DEVELOPMENT

GEOMETRY: 1= TRAP. OPEN CHANNEL, 2= IRREGULAR CHANNEL, 3= BOX CHANNEL, 4= PIPE, 5= RECT. OPEN CHANNEL
MATERIALS: 1= R.C.P., 2= C.I.P.P., 3= R.C.B., 4= C.M.P.A., 5= C.M.P., 6= NATURAL CHANNEL, 7= CONC. CHANNEL, 8= SPIRAL RIBBED
Qe= EXISTING DEVELOPMENT FLOW * R=REPLACE, P=PARALLEL, N= NEW **NO I.D. ~EXIST < 36"

ID #	SYSTEM	GEOMETRY	WIDTH (in)	HEIGHT (in)	RATIO	MAT'L	EXISTING REF. ID #	R/P/N *	LENGTH (ft)	COST/ UNIT	Qe (cfs)	FREQ	FROM NODE	TO NODE	COST ESTIMATE
2254	E 231	4	42		1	1	65	P	427	$106	387	50	106	108	$45,262
2255	E 231	4	42		1	1	65	P	320	$106	395	50	108	110	$33,920
2256	E 231	4	42		1	1	65	P	480	$106	401	50	110	112	$50,880
2257	E 231	4	51		1	1	65	P	450	$139	439	50	112	114	$62,550
2258	E 231	4	42		1	1	64	P	317	$106	446	50	114	116	$33,602
2259	E 231	4	42		1	1	63	P	416	$106	457	50	116	118	$44,096
2260	E 231	4	45		1	1	32	P	673	$116	482	50	118	120	$78,068
2060	E 231	4	75		3	1	693	P	360	$248	646	50	138	140	$267,840
2261	E 231	4	45		1	1	32	P	191	$116	489	50	120	122	$22,156
2262	E 231	4	45		1	1	32	P	93	$116	517	50	122	124	$10,788
2263	E 231	4	57		2	1	693	P	252	$161	612	50	136	138	$81,144
2264	E 231	4	75		3	1	3	P	173	$248	653	50	140	142	$128,712
2265	E 231	4	75		3	1	3	P	138	$248	658	50	142	144	$102,672
2266	E 231	4	69		3	1	3	P	440	$207	665	50	144	146	$273,240
2267	E 231	4	75		2	1	3	P	189	$248	672	50	146	148	$93,744
2268	E 231	4	72		2	1	3	P	110	$225	698	50	148	150	$49,500
2269	E 231	4	75		1	1	2	P	318	$248	698	50	150	152	$78,864
2270	E 231	4	75		1	1	2	P	550	$248	713	50	152	154	$136,400
2272	R 41	4	30		1	1	938	P	222	$83	71	50	203	204	$18,426
2273	R 41	4	30		1	1	302	P	76	$83	84	50	204	205	$6,308
2274	R 41	4	30		1	1	299	P	387	$83	107	50	205	206	$32,121
2275	R 31	< 36"							168	$0	34	50	402	413	$0
2276	R 31	< 36"									25	50	422	423	$0
2277	R 31	4	36		1	1	737	R	45	$95	31	50	423	424	$4,275
2278	R 31	4	30		1	1	932	P	90	$83	95	50	407	408	$7,470
2279	R 31	4	30		1	1	593	P	124	$83	118	50	408	409	$10,292
2280	R 21	4	48		1	1	731	R	693	$125	69	50	203	204	$86,625
2281	R 21	4	48		1	1	429	R	85	$125	72	50	204	205	$10,625
2282	R 21	4	45		1	1	431	P	165	$116	92	50	214	215	$19,140
2283	R 21	4	30		1	1	430	P	328	$83	112	50	215	205	$27,224
2284	R 21	4	36		1	1	427	P	539	$95	186	50	206	207	$51,205
2285	R 21	4	48		1	1	427	P	100	$125	226	50	207	208	$12,500

TABLE 6.4

PROPOSED FACILITIES- EXISTING DEVELOPMENT

GEOMETRY: 1= TRAP. OPEN CHANNEL, 2= IRREGULAR CHANNEL, 3= BOX CHANNEL, 4= PIPE, 5= RECT. OPEN CHANNEL
MATERIALS: 1= R.C.P., 2= C.I.P.P., 3= R.C.B., 4= C.M.P.A., 5= C.M.P., 6= NATURAL CHANNEL, 7= CONC. CHANNEL, 8= SPIRAL RIBBED
Qe= EXISTING DEVELOPMENT FLOW * R=REPLACE, P=PARALLEL, N= NEW **NO I.D. ~EXIST < 36"

ID #	SYSTEM	GEOMETRY	WIDTH (in)	HEIGHT (in)	RATIO	MAT'L	EXISTING REF. ID #	R/P/N *	LENGTH (ft)	COST/ UNIT	Qe (cfs)	FREQ	FROM NODE	TO NODE	COST ESTIMATE
2287	LH 1D	4	30		1	1	901	P	72	$83	160	50	108	110	$5,976
2288	E 182	4	45		1	1	746	R	234	$116	95	50	102	103	$27,144
2289	E 182	4	36		1	1		N	1200	$95	119	50	103	104	$114,000
2290	E 182	4	42		1	1	623	R	246	$106	138	50	104	105	$26,076
2291	E 182	4	42		1	1	624	R	641	$106	61	50	122	105	$67,946
2292	E 182	4	42		2	1	622	R	380	$106	220	50	105	106	$80,560
2293	E 182	4	45		2	1	621	R	396	$116	220	50	106	107	$91,872
2294	E 182	4	54		2	1	620	R	176	$152	232	50	107	108	$53,504
2295	E 182	3	96	54	1	3	619	R	350	$334	295	50	108	109	$116,900
2296	E 182	3	96	54	1	3	619	R	300	$334	310	50	109	110	$100,200
2067	E 182	3	96	54	1	3	619	R	400	$334	326	50	110	111	$133,600
2297	E 182	3	96	54	1	3	619	R	298	$334	346	50	111	112	$99,532
2298	E 182	3	96	66	1	3	174	R	925	$361	410	50	112	113	$333,925
2299	E 182	3	96	72	1	3	175	R	409	$374	479	50	113	114	$152,966
2300	E 182	3	96	96	1	3	424	R	456	$430	560	50	114	115	$196,080
2301	E 182	4	33		1	1	39	P	1144	$83	88	50	154	155	$94,952
2302	E 182	4	54		1	1	39	R	947	$152	147	50	155	156	$143,944
2303	E 182	4	75		1	1	426	R	859	$248	191	50	156	115	$213,032
2304	E 182	4	78		1	1	423	P	826	$270	739	50	115	116	$223,020
2305	E 182	4	78		1	1	423	P	550	$270	762	50	116	117	$148,500
2306	E 182	4	39		1	1	439	R	445	$101	29	50	172	174	$44,945
2307	E 182	4	42		1	1	740	R	87	$106	29	50	174	175	$9,222
2308	E 182	4	45		1	1	627	R	286	$116	66	50	175	176	$33,176
2309	E 182	4	42		1	1	46	R	273	$106	66	50	176	177	$28,938
2310	E 182	4	45		1	1	335	R	64	$116	73	50	177	178	$7,424
2311	E 182	4	42		1	1	319	R	210	$106	73	50	179	179.5	$22,260
2312	E 182	4	48		1	1	318	R	118	$125	89	50	179.5	180	$14,750
2313	E 182	4	51		1	1	317	R	460	$139	89	50	180	181	$63,940
2314	E 182	4	48		1	1	66	R	325	$125	94	50	181	182	$40,625
2315	E 182	4	48		1	1	**	R	200	$125	94	50	182	183	$25,000
2316	E 182	4	51		1	1	436	R	326	$139	124	50	183	184	$45,314
2317	E 182	4	42		1	1	435	R	250	$106	124	50	184	185	$26,500
2318	E 182	4	36		1	1		N	900	$95	40	50	192	193	$85,500
2319	E 182	4	42		1	1		N	850	$106	61	50	193	194	$90,100
2320	E 182	4	48		1	1		N	450	$125	75	50	194	195	$56,250

TABLE 6.4

PROPOSED FACILITIES- EXISTING DEVELOPMENT

GEOMETRY: 1= TRAP. OPEN CHANNEL, 2= IRREGULAR CHANNEL, 3= BOX CHANNEL, 4= PIPE, 5= RECT. OPEN CHANNEL
MATERIALS: 1= R.C.P., 2= C.I.P.P., 3= R.C.B., 4= C.M.P.A., 5= C.M.P., 6= NATURAL CHANNEL, 7= CONC. CHANNEL, 8= SPIRAL RIBBED
Qe= EXISTING DEVELOPMENT FLOW * R=REPLACE, P=PARALLEL, N= NEW **NO I.D. ~EXIST < 36"

ID #	SYSTEM	GEOMETRY	WIDTH (in)	HEIGHT (in)	RATIO	MAT'L	EXISTING REF. ID #	R/P/N *	LENGTH (ft)	COST/ UNIT	Qe (cfs)	FREQ	FROM NODE	TO NODE	COST ESTIMATE
2321	E 182	4	48		1	1		N	60	$125	88	50	195	185	$7,500
2322	E 182	4	69		1	1	293	R	570	$207	210	50	185	186	$117,990
2323	E 182	4	69		1	1	626	R	80	$207	210	50	186	117	$16,560
2324	E 182	4	78		1	1	422	P	613	$270	981	50	117	117.5	$165,510
2325	E 182	4	78		1	1	422	P	640	$270	1000	50	117.5	118	$172,800
2326	E 182	3	144	84	1	3	422	R	300	$564	1034	50	118	119	$169,200
2327	LH 10A	4	54		1	1	876	P	100	$152	196	50	108	110	$15,200
2328	LH 10B	4	48		2	1	**	R	100	$125	126	50	208	210	$25,000
2329	LH 10C	4	45		2	1	**	R	90	$116	111	50	304	306	$20,880
2330	R 66	4	48		2	1	158	R	325	$125	171	50	105	106	$81,250
2331	R 66	4	63		1	1		N	60	$180	196	50	106	107	$10,800
2332	R 66	4	36		1	1		N	750	$95	60	50	122	123	$71,250
2333	R 66	4	39		1	1		N	550	$101	76	50	123	124	$55,550
2334	R 66	3	144	84	3	3	SFP-33/NB	R	116	$564	5040	100	134	108	$196,272
2336	R 11	4	42		1	1	**	R	450	$106	52	50	112	113	$47,700
2338	R 13	4	48		1	1	88	R	545	$125	100	50	103	104	$68,125
2339	R 13	4	36		1	1	67	P	361	$95	151	50	105	106	$34,295
2341	R 81	3	120	72	1	3		N	50	$477	1156	100	110.2	110.4	$23,850
2342	R 81	3	96	60	2	3	330	R	110	$347	1387	100	112	113	$76,340
2343	R 81	1	360	48	5	6	SFP-43/NB/78	R	1600	$541	1399	100	113	114	$865,600
2344	R 81	4	36		1	1	780	R	60	$95	57	100	173	174	$5,700
2346	R 83	4	45		1	1	792	R	60	$116	150	50	309	309.5	$6,960
2347	R 83	4	51		1	1	791	P	750	$139	154	50	309.5	310	$104,250
2348	R 83	4	54		1	1	791	P	1000	$152	154	50	310	311	$152,000
2349	R 83	4	63		1	1		N	50	$180	254	50	312.2	312.4	$9,000
2350	R 83	NOT USED													$0
2351	R 83	3	96	72	2	3	SFP-49/NB/78	R	110	$374	1247	100	217	330	$82,280
2353	R 112	4	54		1	1	**	R	60	$152	228	100	204	205	$9,120
2354	R 112	4	54		1	1	909	R	60	$152	235	100	206	207	$9,120

TABLE 6.4

PROPOSED FACILITIES- EXISTING DEVELOPMENT

GEOMETRY: 1= TRAP. OPEN CHANNEL, 2= IRREGULAR CHANNEL, 3= BOX CHANNEL, 4= PIPE, 5= RECT. OPEN CHANNEL
MATERIALS: 1= R.C.P., 2= C.I.P.P., 3= R.C.B., 4= C.M.P.A., 5= C.M.P., 6= NATURAL CHANNEL, 7= CONC. CHANNEL, 8= SPIRAL RIBBED
Qe= EXISTING DEVELOPMENT FLOW * R=REPLACE, P=PARALLEL, N= NEW **NO I.D. ~EXIST < 36"

ID #	SYSTEM	GEOMETRY	WIDTH (in)	HEIGHT (in)	RATIO	MAT'L	EXISTING REF. ID #	R/P/N *	LENGTH (ft)	COST/ UNIT	Qe (cfs)	FREQ	FROM NODE	TO NODE	COST ESTIMATE
2355	R 112	3	72	48	1	3	908	R	60	$275	432	100	208	209	$16,500
2356	R 112	4	33				907		50	$83	641	100	212	213	$0
2357	R 112	4	36		1	1	977	R	100	$95	89	100	292	293	$9,500
2399	R 112	< 36"							50	$0	43	100	296	216	$0
2358	R 112	3	108	72	1	3		N	50	$449	957	100	216	216.5	$22,450
2361	E 132	4	39		1	1	**	R	800	$101	30	50	204	206	$80,800
2362	E 132	4	51		1	1	**	R	100	$139	62	50	206	208	$13,900
2363	E 132	4	27		1	1	875	P	200	$83	69	50	208	210	$16,600
2364	E 132	4	33		1	1	875	P	250	$83	81	50	210	212	$20,750
2365	E 132	4	39		1	1	875	P	250	$101	102	50	212	214	$25,250
2366	E 132	4	24		1	1	592	P	800	$83	109	50	214	216	$66,400
2367	E 132	4	45		1	1	**	R	60	$116	132	50	216	218	$6,960
2368	E 132	< 36"						N	100	$0	16	50	302	304	$0
2370	E 162	4	36		1	1	15	R	200	$95	39	50	403	404	$19,000
2371	E 162	4	36		1	1	15	R	130	$95	44	50	404	405	$12,350
2372	E 162	4	39		1	1	15	R	326	$101	53	50	405	406	$32,926
2373	E 162	<36"								$0	40	50	412	413	$0
2375	E 164	4	42		1	1	**	R	500	$106	84	50	110	115	$53,000
2377	E 241	< 36"					477		457	$0	118	50	102	103	$0
2378	E 241	< 36"					277		267	$0	118	50	103	104	$0
2379	E 241	4	36		1	1	276	P	333	$95	127	50	104	105	$31,635
2380	E 241	4	36		1	1	275	P	550	$95	133	50	105	106	$52,250
2381	E 241	4	60		1	1	274	R	460	$170	164	50	106	107	$78,200
2382	E 241	4	39		1	1	273	P	225	$101	192	50	107	108	$22,725
2383	E 241	4	48		1	1	271	P	112	$125	211	50	110	111	$14,000
2384	E 241	< 36"							230	$0	46	50	122	123	$0
2385	E 241	< 36"							440	$0	49	50	123	124	$0
2386	E 241	< 36"							200	$0	59	50	124	125	$0
2387	EG A	< 36"						N	880	$0	95	50	104	106	$0
2388	EG A	4	48		1	1		N	1940	$125	168	50	106	110	$242,500
2389	EG A	4	51		2	1		N	100	$139	221	50	110	112	$27,800

TABLE 6.4

PROPOSED FACILITIES- EXISTING DEVELOPMENT

GEOMETRY: 1= TRAP. OPEN CHANNEL, 2= IRREGULAR CHANNEL, 3= BOX CHANNEL, 4= PIPE, 5= RECT. OPEN CHANNEL
MATERIALS: 1= R.C.P., 2= C.I.P.P., 3= R.C.B., 4= C.M.P.A., 5= C.M.P., 6= NATURAL CHANNEL, 7= CONC. CHANNEL, 8= SPIRAL RIBBED
Qe= EXISTING DEVELOPMENT FLOW *** R=REPLACE, P=PARALLEL, N= NEW** ****NO I.D. ~EXIST < 36"**

ID #	SYSTEM	GEOMETRY	WIDTH (in)	HEIGHT (in)	RATIO	MAT'L	EXISTING REF. ID #	R/P/N *	LENGTH (ft)	COST/ UNIT	Qe (cfs)	FREQ	FROM NODE	TO NODE	COST ESTIMATE
2390	EG A	4	66		2	1		N	970	$189	221	50	112	114	$366,660
2392	EG B	4	36		1	1		N	950	$95	75	50	206	208	$90,250
2393	EG B	4	48		1	1		N	100	$125	97	50	208	210	$12,500
2394	EG B	4	51		2	1		N	950	$139	97	50	210	212	$264,100
									100	$0					
2396	EG C	< 36"						N			51	50	308	310	$0
2397	EG C	4	36		1	1		N	725	$95	51	50	310	312	$68,875
2401	E 221	4	36		1	1	689	R	229	$95	141	100	402	403	$21,755
2402	E 221	4	42		1	1	688	R	300	$106	148	100	403	404	$31,800
2403	E 221	4	42		1	1	687	R	297	$106	148	100	404	405	$31,482
2404	E 221	4	45		1	1	686	R	258	$116	159	100	405	406	$29,928
2405	E 221	4	36		1	1	515	P	392	$95	162	100	406	407	$37,240
2068	E 221	< 36"					**		75	$0	68	100	434	431.5	$0
2406	E 221	4	33				511		407	$83	328	100	407	408	$0
2407	E 221	4	42		1	1	510	P	220	$106	357	100	408	409	$23,320
2408	E 221	4	48		1	1	509/37	P	100	$125	357	100	409	410	$12,500
2409	E 221	4	36		1	1	508/37	P	500	$95	431	100	410	411	$47,500
2410	E 221	4	45		1	1	339	R	200	$116	82	100	443	444	$23,200
2411	E 221	4	45		1	1	339	R	200	$116	87	100	444	445	$23,200
2412	E 221	4	51		1	1	340	R	85	$139	98	100	445	412	$11,815
2413	E 221	3	120	48	1	3	682	R	165	$410	665	100	413	414	$67,650
2414	E 221	3	120	42	1	3	681	R	147	$397	700	100	414	415	$58,359
2415	E 221	3	84	54	2	3	680	R	300	$306	700	100	415	416	$183,600
2416	E 221	3	90	60	2	3	680	R	350	$334	783	100	416	417	$233,800
2417	E 221	3	90	60	2	3	680	R	250	$334	786	100	417	418	$167,000
2418	E 221	3	90	60	2	3	707	R	350	$334	786	100	418	419	$233,800
2419	E 221	3	90	60	2	3	707	R	725	$334	818	100	419	420	$484,300
2420	E 221	3	90	60	2	3	707	R	100	$334	845	100	420	421	$66,800
2421	E 221	3	90	66	2	3	462	R	400	$351	891	100	421	422	$280,800
2422	E 221	3	90	66	2	3	434	R	150	$351	891	100	422	423	$105,300
2423	E 221	3	90	66	2	3	434	R	200	$351	900	100	423	424	$140,400
2424	E 221	3	102	66	2	3	433	R	325	$421	1005	100	424	425	$273,650
2425	E 221	3	102	66	2	3	433	R	450	$421	1006	100	425	426	$378,900
2426	E 221	3	102	66	2	3	433	R	100	$421	1019	100	426	427	$84,200

TABLE 6.4

PROPOSED FACILITIES- EXISTING DEVELOPMENT

GEOMETRY: 1= TRAP. OPEN CHANNEL, 2= IRREGULAR CHANNEL, 3= BOX CHANNEL, 4= PIPE, 5= RECT. OPEN CHANNEL
MATERIALS: 1= R.C.P., 2= C.I.P.P., 3= R.C.B., 4= C.M.P.A., 5= C.M.P., 6= NATURAL CHANNEL, 7= CONC. CHANNEL, 8= SPIRAL RIBBED
Qe= EXISTING DEVELOPMENT FLOW * R=REPLACE, P=PARALLEL, N= NEW **NO I.D. ~EXIST < 36"

ID #	SYSTEM	GEOMETRY	WIDTH (in)	HEIGHT (in)	RATIO	MAT'L	EXISTING REF. ID #	R/P/N *	LENGTH (ft)	COST/ UNIT	Qe (cfs)	FREQ	FROM NODE	TO NODE	COST ESTIMATE
2427	E 221	3	102	72	2	3	432	R	1080	$439	1044	100	427	428	$948,240
2428	LH 11 A	< 36"					**		140	$0	77	50	104	106	$0
2429	LH 11 A	4	51		1	1	**	R	140	$139	271	50	212	214	$19,460
2430	LH 12 A	< 36"						N	100	$0	89	50	104	106	$0
2431	LH 8	4	45		1	1		N	100	$116	155	50	112	114	$11,600
2432	R 12	4	36		1	1	450	R	40	$95	76	50	218	220	$3,800
2433	R 12	4	36		1	1	449	P	253	$95	76	50	222	224	$24,035
2434	R 12	4	57	36	1	4	448	P	128	$161	110	50	224	226	$20,608
2435	R 12	4	63	40	1	4	447	P	750	$180	117	50	226	228	$135,000
2436	R 12	4	63	40	1	4	446	P	253	$180	131	50	228	230	$45,540
2437	R 12	4	27		1	1	443	P	100	$83	145	50	234	236	$8,300
2438	R 12	4	27		1	1	443	P	944	$83	154	50	236	238	$78,352
2439	FEL	4	54		2	1	629	P	70	$152	457	100	416	418	$21,280
2556	FEL	< 36"								$0	39	100	125	126	$0
2441	FEL	< 36"							700	$0	74	100	137	129	$0
2557	FEL	4	51		1	1		N	50	$139	175	100	129	129	$6,950
2558	FEL	< 36"							60	$0	47	100	304	306	$0
2559	FEL	4	36		1	1	839	P	74	$95	381	100	130	132	$7,030
2446	FEL	4	36		1	1		N	500	$95	64	100	307	309	$47,500
2447	FEL	4	36		1	1	**	P	600	$95	94	100	309	314	$57,000
2550	FEL	4	42		1	1		N	400	$106	77	100	504	506	$42,400
2551	FEL	4	42		1	1	**	R	68	$106	87	100	506	508	$7,208
2552	FEL	4	63		2	5	636	P	140	$180	583	100	422	424	$50,400
2553	FEL	4	36		1	5	913	P	120	$95	1071	100	138	140	$11,400
2554	FEL	4	36		1	5	631	P	100	$95	84	100	904	906	$9,500
2555	FEL	4	93		2	5	630	P	132	$366	1427	100	146	148	$96,624
2448	E 81	4	54		1	1	165/166	P	923	$152		50	SFP-57		$140,296
2450	E 61	4	36		1	1		N	200	$95	56	50	206	208	$19,000
2451	E 61	4	39		1	1		N	100	$101	79	50	210	212	$10,100

TABLE 6.4

PROPOSED FACILITIES- EXISTING DEVELOPMENT

GEOMETRY: 1= TRAP. OPEN CHANNEL, 2= IRREGULAR CHANNEL, 3= BOX CHANNEL, 4= PIPE, 5= RECT. OPEN CHANNEL
MATERIALS: 1= R.C.P., 2= C.I.P.P., 3= R.C.B., 4= C.M.P.A., 5= C.M.P., 6= NATURAL CHANNEL, 7= CONC. CHANNEL, 8= SPIRAL RIBBED
Qe= EXISTING DEVELOPMENT FLOW *** R=REPLACE, P=PARALLEL, N= NEW** ****NO I.D. ~EXIST < 36"**

ID #	SYSTEM	GEOMETRY	WIDTH (in)	HEIGHT (in)	RATIO	MAT'L	EXISTING REF. ID #	R/P/N *	LENGTH (ft)	COST/ UNIT	Qe (cfs)	FREQ	FROM NODE	TO NODE	COST ESTIMATE
2473	N.B./R 66	3	144	36	1	3	595/594	P	90	$444	5683	100	112	114	$39,960
2065	N.B./R 71	SEE R 71									478	50	136	138	$0
2066	N.B./R 71	SEE R 71									504	50	138	140	$0
2474	N.B./R 71	3	72	48	2	3	363	R	105	$275	475	50	134	136	$57,750
2475	N.B./R 71	1	144	36	5	6		N	350	$318	463	50	132	134	$111,300
2476	N.B./R 71	4	48		1	1	109	P	150	$125	293	50	118	120	$18,750
2477	N.B.	RETENTION BASIN DELETED													$0
2478	N.B./R 66	1	1152	72	5	6		N	2000	$1,067	5327	100	109	111	$2,134,000
2479	N.B./R 66	NO NEW FACILITY REQUIRED							40	$0	215	50	156	157	$0
2480	N.B./R 66	4	48		1	1		N	2000	$125	172	50	154	156	$250,000
2481	N.B./R 66	4	57		1	1		N	700	$161	215	50	157	109	$112,700
2334	N.B./R 66	SEE R 66									5040	100	134	108	$0
2483	N.B./R 66	1	1080	72	5	6		N	1000	$1,045	5037	100	133	134	$1,045,000
2343	N.B./R 81	SEE R 81											113	114	$0
2485	N.B./R 81	1	288	54	5	6		R	1300	$601	1360	100	111	112	$781,300
2486	N.B./R 81	3	96	72	2	3		N	100	$374	1360	100	SFP-46		$74,800
2487	N.B./R 83	1	420	90	5	6			2400	$1,009	3871	100	321	314	$2,421,600
2351	N.B./R 83	SEE R 83									1247	10	217	330	$0
2489	N.B.	NOT USED											SFP-51		$0
2490	N.B.	3	120	96	2	3	788	P	110	$541	2627	100	412	320	$119,020
2491	N.B.	1	468	72	4	6		N	3100	$726	2627	100	411	412	$2,250,600
2492	N.B.	NOT USED											SFP-54		$0
2484	N.B./R 83	1	36	36	4	6		N	3000	$193	213	50	312	312.2	$579,000
2493	N.B./R 83	RETENTION BASIN DELETED													$0
2494	N.B./R 81	1	84	54	5	6		N	2000	$456	743	100	108	109	$912,000
2495	N.B./R 81	INLET STRUCTURE			1			N	1	$1,500	684	100	106	106	$1,500
2496	N.B.	RETENTION BASIN DELETED													$0
2058	N.B./R 51	SEE R 51									76	50	108	110	$0
2467	E 252	1	96	60	1	7		N	2800	$224	1822	100			$627,200
2449	E 202	4	39		1	1		N	430	$101	100	50	106	108	$43,430
2250	E 202	4	39		1	1	322	P	444	$101	182	50	114	115	$44,844
2251	E 202	4	39		1	1	306	P	360	$101	182	50	115	116	$36,360
2452	E 202	4	36		1	1	**	R	250	$95	75	50	406	408	$23,750
2453	E 202	NEW FACILITY NOT REQ'D FOR EXIST. COND.					182		296	$0	129	50	412	414	$0

TABLE 6.4

PROPOSED FACILITIES- EXISTING DEVELOPMENT

GEOMETRY: 1= TRAP. OPEN CHANNEL, 2= IRREGULAR CHANNEL, 3= BOX CHANNEL, 4= PIPE, 5= RECT. OPEN CHANNEL
MATERIALS: 1= R.C.P., 2= C.I.P.P., 3= R.C.B., 4= C.M.P.A., 5= C.M.P., 6= NATURAL CHANNEL, 7= CONC. CHANNEL, 8= SPIRAL RIBBED
Qe= EXISTING DEVELOPMENT FLOW *** R=REPLACE, P=PARALLEL, N= NEW** ****NO I.D. ~EXIST < 36"**

ID #	SYSTEM	GEOMETRY	WIDTH (in)	HEIGHT (in)	RATIO	MAT'L	EXISTING REF. ID #	R/P/N *	LENGTH (ft)	COST/ UNIT	Qe (cfs)	FREQ	FROM NODE	TO NODE	COST ESTIMATE
2454	E 202	4	36		1	1	**	R	100	$95	57	50	504	506	$9,500
2455	E 202	4	42		1	1	184	R	244	$106	89	50	514	414	$25,864
2457	E 202	4	90		1	1	409	P	225	$350	630	50	122	124	$78,750
2458	E 202	4	24		1	1	186	P	452	$83	51	50	906	908	$37,516
2459	E 202	4	57		1	1	407	P	1005	$161	282	50	130	132	$161,805
2460	E 202	4	63		1	1	407	P	245	$180	797	50	132	134	$44,100
2461	E 202	4	48		1	1	407	P	16	$125	797	50	134	136	$2,000
2462	E 202	4	54		1	1	647	P	40	$152	797	50	136	138	$6,080
2463	E 202	4	36		1	1		N	850	$95	57	50	1104	1106	$80,750
2464	E 202	4	30		1	1	**	P	100	$83	64	50	1106	138	$8,300
2465	E 202	4	60		1	1	647	P	40	$170	850	50	138	140	$6,800
2466	E 202	4	60		1	1	647	P	320	$170	873	50	140	142	$54,400

TOTAL FACILITIES COST ESTIMATE = $46,153,727

LAST UPDATE: 29-Sep-95

G:\123DATA\ESTM\93\ 329T6-4.WB2

TABLE 6.5

PROPOSED FACILITIES- ULTIMATE DEVELOPMENT

GEOMETRY: 1=TRAP. OPEN CHANNEL, 2= IRREGULAR CHANNEL, 3= BOX CHANNEL, 4= PIPE 5= RECT. OPEN CHANNEL
MATERIALS: 1= R.C.P., 2= C.IP.P., 3= R.C.B., 4= C.M.P.A., 5 =C.M.P., 6= NAT. CHANNEL, 7= CONCRETE CHANNEL
Qe= EXISTING DEVELOPMENT FLOW, Qu= ULTIMATE DEVELOPMENT FLOW * R=REPLACE, P=PARALLEL, N= NEW ** NO ID. ~ EXIST < 36"

ID #	SYSTEM	GEOMETRY	WIDTH (in)	HEIGHT (in)	RATIO	MAT'L	EXISTING REF ID #	R/P/N *	LENGTH (ft)	COST/ UNIT	Qu (cfs)	FREQ.	FROM NODE	TO NODE	COST ESTIMATE
2001	SM	4	48		3	1	240	P	641	$125	775	100	130	132	$240,375
2002	SM	4	39		1	1		N	50	$101	106	100	410	412	$5,025
2003	SM	4	48		1	1		N	100	$125	118	100	506	508	$12,500
2004	SM	4	54		1	1	**	R	150	$152	279	100	418	420	$22,800
2468	SM	4	78		1	1	798	R	106	$270	480	100	422	424	$28,620
2005	SM	3	60	48	1	3	4	P	364	$242	768	100	436	438	$88,088
2006	SM	3	60	48	1	3	4	P	500	$242	768	100	438	140	$121,000
2007	SM	3	66	60	1	3	969	P	400	$296	1537	100	140	142	$118,400
2008	SM	3	102	60	2	3		N	40	$408	1567	100	144	146	$32,640
2009	KC 23	4	45		1	1	891	P	90	$116	219	100	208	210	$10,440
2010	KC 23	4	45		1	1		N	500	$116	122	100	204	206	$58,000
2011	KC 23	4	36		1	1	890	P	50	$95	243	100	212	214	$4,750
2012	KC 23	4	60		1	1	889	P	60	$170	396	100	306	308	$10,200
2013	KC 23	4	42		1	1		N	1750	$106	124	100	403	404	$185,500
2014	KC 23	4	45		1	1		N	450	$116	168	100	404	310	$52,200
2469	KC 23	4	78		1	1	888	R	75	$270	570	100	310	312	$20,250
2470	KC 23	4	45		1	1	**	R	100	$116	82	100	215	217	$11,600
2471	KC 23	4	48		1	1	758	R	382	$125	93	100	221	220	$47,750
2015	KC 23	4	45		1	1	882	P	110	$116	261	100	610	612	$12,760
2016	KC 21	4	45		1	1		N	125	$116	145	100	704	706	$14,500
2017	KC 21	4	48		3	1	877	P	60	$125	476	100	718	720	$22,500
2018	KC 21	4	84		1	1		N	100	$293	573	100	722	226	$29,300
2019	KC 32B	4	114		1	1		N	100	$555	1334	100	164	166	$55,500
2020	KC 32	4	42		1	1	**	R	330	$106	134	100	112	114	$34,980
2021	KC 32	4	48		1	1	**	R	240	$125	166	100	114	116	$30,000
2022	KC 32	4	51		1	1	**	R	400	$139	177	100	116	118	$55,600
2023	KC 32	4	54		1	1	398	R	500	$152	223	100	118	120	$76,000
2024	KC 32	4	39		1	1	**	R	350	$101	64	100	218	220	$35,175
2025	KC 32	4	48		1	1	**	R	600	$125	82	100	220	120	$75,000
2026	KC 32	4	72		1	1	397	R	180	$225	345	100	120	122	$40,500
2027	KC 32	4	72		1	1	397	R	468	$225	370	100	122	124	$105,300
2028	KC 32	4	87		1	1	396	R	292	$322	381	100	124	126	$94,024
2029	KC 32	4	90		1	1	395	R	542	$350	387	100	126	128	$189,700

TABLE 6.5

PROPOSED FACILITIES- ULTIMATE DEVELOPMENT

GEOMETRY: 1=TRAP. OPEN CHANNEL, 2= IRREGULAR CHANNEL, 3= BOX CHANNEL, 4= PIPE 5= RECT. OPEN CHANNEL
MATERIALS: 1= R.C.P., 2= C.IP.P., 3= R.C.B., 4= C.M.P.A., 5 =C.M.P., 6= NAT. CHANNEL, 7= CONCRETE CHANNEL
Qe= EXISTING DEVELOPMENT FLOW, Qu= ULTIMATE DEVELOPMENT FLOW * R=REPLACE, P=PARALLEL, N= NEW ** NO ID. ~ EXIST < 36"

ID #	SYSTEM	GEOMETRY	WIDTH (in)	HEIGHT (in)	RATIO	MAT'L	EXISTING REF ID #	R/P/N *	LENGTH (ft)	COST/ UNIT	Qu (cfs)	FREQ.	FROM NODE	TO NODE	COST ESTIMATE
2030	KC 32	3	132	66	1	3	394	R	318	$496	401	100	128	130	$157,728
2031	KC 32	3	132	66	1	3	392	R	499	$496	471	100	130	132	$247,504
2032	KC 32	3	132	66	1	3	391	R	587	$496	488	100	132	134	$291,152
2033	KC 32	3	132	66	1	3	390	R	736	$496	491	100	134	136	$365,056
2034	KC 32	3	132	66	1	3	390	R	50	$496	551	100	136	138	$24,800
2035	KC 32	3	132	66	1	3	388/389	R	719	$496	588	100	138	140	$356,624
2036	KC 32	3	132	66	1	3	410	R	723	$496	643	100	140	142	$358,608
2037	KC 32	3	72	48	1	3	700/235	P	630	$275	654	100	142	144	$173,250
2038	KC 32	3	72	48	1	3	699	P	50	$275	669	100	144	146	$13,750
2039	KC 32	4	42		1	1		N	250	$106	120	100	810	812	$26,500
2040	KC 32	4	36		1	1	804/923	P	450	$95	175	100	812	146	$42,750
2041	KC 32	4	36		1	1	336	P	296	$95	800	100	146	148	$28,120
2042	KC 32	4	42		1	1	337	P	126	$106	800	100	148	150	$13,356
2043	KC 32A	4	39		1	1		N	680	$101	70	100	910	912	$68,340
2044	KC 32A	4	39		1	1		N	380	$101	86	100	912	914	$38,190
2045	KC 42	4	42		1	1	**	R	62	$106	96	50	108	110	$6,572
2046	KC 42	4	42		1	1	761	P	550	$106	96	50	112	114	$58,300
2047	KC 42	4	42		1	1	763	R	380	$106	182	50	116	118	$40,280
2048	KC 42	4	51		2	1	875	P	100	$139	595	50	128	130	$27,800
2049	KC 22	4	42		1	1	**	R	150	$106	159	50	128	130	$15,900
2050	KC 22	4	42		1	1	**	R	50	$106	166	50	130	132	$5,300
2051	KC 22	4	24		1	1		P	30	$83	308	50	144	146	$2,490
2053	R 42	4	84		1	1	722	R	100	$293	481	50	138	140	$29,300
2054	R 42	4	39		1	1	304	P	239	$101	550	50	146	148	$24,020
2056	R 51	4	36		1	1		N	200	$95	54	50	106	108	$19,000
2057	R 51	< 36"						N			14	50	202	108	$0
2058	R 51	4	42		1	1	SFP-76/NB	R	190	$106	89	50	108	110	$20,140
2059	R 51	4	42		1	1	**	R	750	$106	91	50	110	112	$79,500
2061	R 71	4	36		1	1		N	850	$95	99	50	304	306	$80,750
2062	R 71	4	39		1	1		N	150	$101	119	50	306	120	$15,075
2063	R 71	< 36"									33	50	402	404	$0

TABLE 6.5

PROPOSED FACILITIES- ULTIMATE DEVELOPMENT

GEOMETRY: 1=TRAP. OPEN CHANNEL, 2= IRREGULAR CHANNEL, 3= BOX CHANNEL, 4= PIPE 5= RECT. OPEN CHANNEL
MATERIALS: 1= R.C.P., 2= C.IP.P., 3= R.C.B., 4= C.M.P.A., 5 =C.M.P., 6= NAT. CHANNEL, 7= CONCRETE CHANNEL
Qe= EXISTING DEVELOPMENT FLOW, Qu= ULTIMATE DEVELOPMENT FLOW * R=REPLACE, P=PARALLEL, N= NEW ** NO ID. ~ EXIST < 36"

ID #	SYSTEM	GEOMETRY	WIDTH (in)	HEIGHT (in)	RATIO	MAT'L	EXISTING REF ID #	R/P/N *	LENGTH (ft)	COST/ UNIT	Qu (cfs)	FREQ.	FROM NODE	TO NODE	COST ESTIMATE
2064	R 71	4	39		1	1		N	300	$101	57	50	404	128	$30,150
2065	R 71	4	51		1	1	SFP-8/NB/362	P	260	$139	575	50	136	138	$36,140
2066	R 71	1	285	36	5	6	849	R	800	$411	606	50	138	140	$328,800
2069	E 222	4	60		1	1		N	60	$170	461	100	112	114	$10,200
2070	E 222	4	78		1	1	495	P	185	$270	881	100	126	128	$49,950
2071	E 222	4	78		1	1	495	P	828	$270	881	100	128	130	$223,560
2072	E 222	4	78		1	1	495	P	115	$270	905	100	130	132	$31,050
2073	E 222	4	78		1	1	495	P	506	$270	905	100	132	134	$136,620
2074	E 222	4	78		1	1	495	P	118	$270	916	100	134	136	$31,860
2075	E 222	4	102		1	1	653	P	55	$447	916	100	136	138	$24,585
2076	E 222	4	102		1	1	652	P	251	$447	916	100	138	140	$112,197
2077	E 222	4	102		1	1	188	P	259	$447	916	100	140	142	$115,773
2078	E 222	4	108		1	1	87	P	510	$471	1063	100	142	144	$240,210
2079	E 222	4	108		1	1	86	P	505	$471	1063	100	144	146	$237,855
2080	E 222	4	108		1	1	85	P	536	$471	1063	100	146	148	$252,456
2081	E 222	4	93		1	1	84/83	P	672	$366	1291	100	148	150	$245,952
2082	E 222	4	93		1	1	82/81	P	583	$366	1291	100	150	152	$213,378
2083	E 222	4	93		1	1	81	P	80	$366	1291	100	152	154	$29,280
2085	E 232 A	4	30		1	1		N	1000	$83	35	100	159	157	$83,000
2086	E 232 A	4	42		1	1		N	500	$106	79	100	157	155	$53,000
2087	E 232 A	4	45		1	1		N	600	$116	96	100	155	154	$69,600
2088	E 232 A	4	108		1	1	80/79	P	811	$471	1379	100	154	156	$381,981
2089	E 232 A	4	108		1	1	78	P	360	$471	1379	100	156	158	$169,560
2091	E 232 B	<36"	33		1	1		N	1300	$0	28	50	802	804	$0
2092	E 232 B	<36"	27		1	1		N	550	$0	21	50	807	805	$0
2093	E 232 B	4	36		1	1		N	450	$95	44	50	805	804	$42,750
2094	E 232 B	4	45		1	1	**	R	300	$116	87	50	804	806	$34,800
2095	E 232B	4	42		1	1	848	P	130	$106	122	50	806	808	$13,780
2097	E 232 C	4	36		1	1		N	650	$95	84	50	906	908	$61,750
2098	E 232 C	4	48		1	1		N	500	$125	95	50	908	910	$62,500
2099	E 232 C	4	51		1	1	**	R	600	$139	108	50	910	912	$83,400

TABLE 6.5

PROPOSED FACILITIES- ULTIMATE DEVELOPMENT

GEOMETRY: 1=TRAP. OPEN CHANNEL, 2= IRREGULAR CHANNEL, 3= BOX CHANNEL, 4= PIPE 5= RECT. OPEN CHANNEL
MATERIALS: 1= R.C.P., 2= C.IP.P., 3= R.C.B., 4= C.M.P.A., 5 =C.M.P., 6= NAT. CHANNEL, 7= CONCRETE CHANNEL
Qe= EXISTING DEVELOPMENT FLOW, Qu= ULTIMATE DEVELOPMENT FLOW * R=REPLACE, P=PARALLEL, N= NEW ** NO ID. ~ EXIST < 36"

ID #	SYSTEM	GEOMETRY	WIDTH (in)	HEIGHT (in)	RATIO	MAT'L	EXISTING REF ID #	R/P/N *	LENGTH (ft)	COST/ UNIT	Qu (cfs)	FREQ.	FROM NODE	TO NODE	COST ESTIMATE
2100	E 51	4	48		1	1		N	100	$125	124	50	208	210	$12,500
2101	E 62	3	84	60	3	3	885	R	40	$320	2064	100	128	130	$38,400
2084	E 62	4	78		1	1		N	80	$270	566	100	506	508	$21,600
2102	E 72	4	63		1	1	886	R	70	$180	289	50	210	212	$12,600
2103	E 72	4	66		1	1		N	70	$189	327	50	214	216	$13,230
2104	E 102	4	36		1	1	933	P	51	$95	187	100	206	110	$4,845
2105	E 102	4	69		1	1	470	P	310	$207	483	100	116	118	$64,170
2106	E 102	4	36		1	1	71	P	206	$95	131	100	506	508	$19,570
2107	E 102	4	30		1	1	70	P	565	$83	131	100	508	510	$46,895
2108	E 102	4	36		1	1	70	P	183	$95	155	100	510	512	$17,385
2109	E 102	4	27		1	1	617	P	51	$83	165	100	512	514	$4,233
2110	E 102	< 36"									68	100	602	604	$0
2111	E 102	4	39		1	1		N	300	$101	113	100	604	514	$30,150
2112	E 102	4	45		1	1	616	P	81	$116	277	100	514	118	$9,396
2113	E 102	4	96		2	1	533	R	112	$382	866	100	132	134	$85,568
2114	E 102	4	102		1	1	531	P	454	$447	976	100	134	136	$202,938
2090	E 102	3	144	60	1	3	615	P	70	$506	1042	100	136	138	$35,420
2115	E 102	5	240	48	1	7	59	R	410	$306	1060	100	138	140	$125,460
2116	E 102	4	36		1	1		N	500	$95	82	100	802	804	$47,500
2096	E 102	4	36		1	1	670	P	410	$95	210	100	806	808	$38,950
2117	E 102	4	45		1	1	670	P	90	$116	296	100	808	810	$10,440
2118	E 102	4	57		1	1	669	P	342	$161	365	100	810	812	$55,062
2119	E 102	4	45		1	1	668	P	384	$116	376	100	812	814	$44,544
2120	E 102	4	45		1	1	667	P	408	$116	448	100	814	816	$47,328
2052	E 102	4	51		1	1	666	P	259	$139	475	100	816	818	$36,001
2121	E 102	4	57		1	1	542	P	350	$161	475	100	818	820	$56,350
2122	E 102	4	30		1	1	104	P	330	$83	597	100	822	824	$27,390
2123	E 102	4	33		1	1	103	P	875	$83	696	100	824	826	$72,625
2124	E 102	4	60		1	1	543	R	260	$170	192	100	2014	828	$44,200
2125	E 102	4	78		1	1	51	P	157	$270	917	100	828	830	$42,390
2126	E 102	4	78		1	1	50	P	336	$270	926	100	830	832	$90,720
2127	E 102	4	48		1	1	48	P	595	$125	948	100	834	836	$74,375
2128	E 102	3	72	48	1	3	47	P	511	$275	986	100	836	838	$140,525

TABLE 6.5

PROPOSED FACILITIES- ULTIMATE DEVELOPMENT

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MATERIALS: 1= R.C.P., 2= C.IP.P., 3= R.C.B., 4= C.M.P.A., 5 =C.M.P., 6= NAT. CHANNEL, 7= CONCRETE CHANNEL
Qe= EXISTING DEVELOPMENT FLOW, Qu= ULTIMATE DEVELOPMENT FLOW * R=REPLACE, P=PARALLEL, N= NEW ** NO ID. ~ EXIST < 36"

ID #	SYSTEM	GEOMETRY	WIDTH (in)	HEIGHT (in)	RATIO	MAT'L	EXISTING REF ID #	R/P/N *	LENGTH (ft)	COST/ UNIT	Qu (cfs)	FREQ.	FROM NODE	TO NODE	COST ESTIMATE
2129	E 102	4	42		1	1	122	R	208	$106	117	100	3008	3012	$22,048
2271	E 102	4	42		1	1	119	P	318	$106	187	100	3016	3018	$33,708
2286	E 102	4	42		1	1	117	P	674	$106	393	100	3020	3022	$71,444
2391	E 102	4	42		1	1	116	P	524	$106	408	100	3022	3024	$55,544
2395	E 102	4	45		1	1	115/114	P	1024	$116	420	100	3024	3026	$118,784
2130	E 102	3	120	48	2	3	74/608	P	554	$410	1431	100	838	840	$454,280
2131	E 102	3	120	36	4	3	13	P	148	$379	1453	100	840	842	$224,368
2132	E 102	3	96	48	2	3	58	P	393	$321	1453	100	842	844	$252,306
2133	E 102	5	273	48	1	7	57	R	625	$337	1465	100	844	140	$210,625
2134	E 102	5	500	48	1	7	56	R	260	$549	2510	100	140	142	$142,740
2398	E 102	4	48		1	1	611	R	224	$125	56	100	4013	4014	$28,000
2135	E 102	4	39		1	1	60	P	708	$101	224	100	4020	4022	$71,154
2136	E 102	4	45		1	1	60	P	197	$116	239	100	4022	142	$22,852
2137	E 102	3	120	48	4	3	613	P	60	$410	2763	100	142	144	$98,400
2138	E 102	3	114	60	2	3	55	P	300	$431	2763	100	144	146	$258,600
2139	E 102	3	114	60	2	3	55	P	300	$431	2774	100	146	148	$258,600
2140	E 102	4	45		1	1	**	R	400	$116	180	100	5006	5008	$46,400
2141	E 102	4	54		1	1	248	R	122	$152	196	100	5008	5010	$18,544
2400	E 102	4	33		1	1	244	P	428	$83	196	100	5010	5012	$35,524
2142	E 102	4	39		1	1	12	P	350	$101	210	100	5012	5014	$35,175
2143	E 102	4	45		1	1	12	P	270	$116	229	100	5014	5016	$31,320
2144	E 102	4	51		1	1	55	P	699	$139	266	100	5016	150	$97,161
2145	E 102	5	640	54	1	7	54	R	616	$729	3064	100	150	152	$449,064
2146	E 102	5	688	54	1	7	262	R	326	$775	3105	100	152	154	$252,650
2147	E 102	5	329	84	1	7	261	R	600	$638	3153	100	154	156	$382,800
2148	E 102	5	336	84	1	7	261	R	500	$638	3204	100	156	158	$319,000
2149	E 102	5	336	84	1	7	262	R	143	$638	3236	100	158	160	$91,234
2150	E 111	4	48		1	1	220	P	350	$125	421	50	314	322	$43,750
2151	E 121	4	33		1	1	259	P	309	$83	128	50	126	128	$25,647
2152	E 121	4	42		1	1	260	P	162	$106	134	50	128	130	$17,172
2153	E 121	4	42		1	1	260	P	83	$106	137	50	130	132	$8,798
2154	E 151	4	24		1	1	580	P	373	$83	90	50	108	110	$30,959
2155	E 151	4	39		1	1	579	P	330	$101	142	50	110	112	$33,165

TABLE 6.5

PROPOSED FACILITIES- ULTIMATE DEVELOPMENT

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Qe= EXISTING DEVELOPMENT FLOW, Qu= ULTIMATE DEVELOPMENT FLOW * R=REPLACE, P=PARALLEL, N= NEW ** NO ID. ~ EXIST < 36"

ID #	SYSTEM	GEOMETRY	WIDTH (in)	HEIGHT (in)	RATIO	MAT'L	EXISTING REF ID #	R/P/N *	LENGTH (ft)	COST/ UNIT	Qu (cfs)	FREQ.	FROM NODE	TO NODE	COST ESTIMATE
2156	E 151	4	48		1	1		N	750	$125	148	50	112	208	$93,750
2157	E 151	4	36		1	1		N	419	$95	57	50	204	206	$39,805
2158	E 151	4	72		1	1		N	1100	$225	238	50	208	210	$247,500
2159	E 151	4	72		1	1		N	800	$225	270	50	210	316	$180,000
2160	E 151	4	36		1	1	**	R	366	$95	48	50	304	306	$34,770
2161	E 151	4	36		1	1	**	P	383	$95	87	50	306	308	$36,385
2162	E 151	4	42		1	1	**	P	483	$106	101	50	308	310	$51,198
2163	E 151	4	42		1	1	**	P	479	$106	126	50	310	312	$50,774
2164	E 151	4	66		1	1	568	R	475	$189	152	50	312	314	$89,775
2165	E 151	4	66		1	1	567	R	356	$189	159	50	314	315	$67,284
2055	E 151	4	36		1	1		N	427	$95	48	50	120	110	$40,565
2166	E 151	4	72		1	1	566	R	342	$225	167	50	315	316	$76,950
2167	E 151	4	102		1	1		N	400	$447	441	50	316	338	$178,800
2168	E 151	3	120	72	1	3		N	1420	$477	541	50	338	342	$677,340
2169	E151QUIN	4	36		1	1		N	750	$95	57	50	504	512	$71,250
2170	E151QUIN	4	45		1	1		N	430	$116	121	50	510	512	$49,880
2171	E151QUIN	4	69		1	1	564	R	759	$207	196	50	512	514	$157,113
2172	E151QUIN	4	69		1	1	563	R	329	$207	223	50	514	516	$68,103
2173	E151QUIN	4	75		1	1	562	R	459	$248	327	50	516	528	$113,832
2174	E151QUIN	4	78		1	1	561	R	478	$270	340	50	528	530	$129,060
2175	E151QUIN	3	96	60	1	3		N	760	$347	360	50	530	534	$263,720
2176	E151QUIN	3	96	60	1	3		N	380	$347	373	50	534	536	$131,860
2177	E151QUIN	3	96	60	1	3		N	380	$347	387	50	536	538	$131,860
2178	E151QUIN	3	120	60	1	3		N	860	$445	409	50	538	540	$382,700
2179	E151QUIN	3	120	60	1	3		N	380	$445	421	50	540	542	$169,100
2180	E151QUIN	3	120	60	1	3		N	380	$445	434	50	542	544	$169,100
2181	E151QUIN	4	36		1	1		N	800	$95	43	50	402	404	$76,000
2182	E151QUIN	4	36		1	1		N	374	$95	69	50	404	406	$35,530
2183	E151QUIN	4	48		1	1		N	401	$125	102	50	406	408	$50,125
2184	E151QUIN	4	54		1	1		N	378	$152	115	50	408	410	$57,456
2185	E151QUIN	4	54		1	1	578	R	431	$152	115	50	410	412	$65,512
2186	E151QUIN	3	108	60	1	3	554	R	50	$422	201	50	424	544	$21,100
2187	E151QUIN	3	96	60	2	3	554	R	559	$347	610	50	544	546	$387,946
2188	E151QUIN	4	36		1	1		N	150	$95	68	50	610	612	$14,250
2189	E151QUIN	4	36		1	1		N	479	$95	95	50	612	614	$45,505

TABLE 6.5

PROPOSED FACILITIES- ULTIMATE DEVELOPMENT

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MATERIALS: 1= R.C.P., 2= C.IP.P., 3= R.C.B., 4= C.M.P.A., 5 =C.M.P., 6= NAT. CHANNEL, 7= CONCRETE CHANNEL
Qe= EXISTING DEVELOPMENT FLOW, Qu= ULTIMATE DEVELOPMENT FLOW * R=REPLACE, P=PARALLEL, N= NEW ** NO ID. ~ EXIST < 36"

ID #	SYSTEM	GEOMETRY	WIDTH (in)	HEIGHT (in)	RATIO	MAT'L	EXISTING REF ID #	R/P/N *	LENGTH (ft)	COST/ UNIT	Qu (cfs)	FREQ.	FROM NODE	TO NODE	COST ESTIMATE
2190	E151QUIN	4	36		1	1		N	82	$95	117	50	614	616	$7,790
2191	E151QUIN	3	60	60	1	3	552	P	444	$268	724	50	616	618	$118,992
2192	E151QUIN	3	60	60	1	3	755	P	72	$268	789	50	620	622	$19,296
2193	E 191	4	36		1	1	**	R	384	$95	89	50	110	112	$36,480
2194	E 191	4	48		1	1	**	P	373	$125	102	50	112	114	$46,625
2195	E 191	4	39		1	1	**	P	476	$101	48	50	204	206	$47,838
2196	E 191	4	45		1	1	386	P	474	$116	81	50	206	114	$54,984
2197	E 191	3	48	36	1	3	383/384	P	387	$202	184	50	114	116	$78,174
2198	E 191	4	54		1	1	382	P	217	$152	213	50	116	118	$32,984
2199	E 192	4	36		1	1		N	900	$95	79	50	201	202	$85,500
2200	E 192	4	45		1	1	**	R	359	$116	79	50	202	203	$41,644
2201	E 193	4	54		1	1	701	R	350	$152	108	50	107	108	$53,200
2202	E 193	4	42		1	1	323	P	400	$106	242	50	111	112	$42,400
2203	E 193	4	63		1	1	374	R	424	$180	273	50	112	113	$76,320
2204	E 193	4	63		1	1	373	R	469	$180	292	50	113	114	$84,420
2205	E 193	4	36		1	1	**	R	300	$95	75	50	142	143	$28,500
2206	E 193	4	36		1	1	**	R	400	$95	83	50	143	144	$38,000
2207	E 193	4	36		1	1	378	R	401	$95	89	50	144	145	$38,095
2208	E 193	4	42		1	1	377	R	316	$106	97	50	145	145.5	$33,496
2209	E 193	4	45		1	1	376	R	316	$116	97	50	145.5	146	$36,656
2210	E 193	4	42		1	1	375	R	420	$106	104	50	146	114	$44,520
2211	E 193	3	120	48	1	3	372	R	370	$410	402	50	114	115	$151,700
2212	E 193	3	120	48	1	3	372	R	120	$410	443	50	115	116	$49,200
2213	E 193	3	120	48	1	3	372	R	295	$410	452	50	116	117	$120,950
2214	E 193	3	120	48	1	3	372	R	420	$410	456	50	117	118	$172,200
2215	E 193	3	120	48	1	3	372	R	325	$410	461	50	118	119	$133,250
2216	E 193	3	120	48	1	3	370	R	95	$410	461	50	119	120	$38,950
2217	E 193	3	120	48	1	3	369	R	318	$410	461	50	120	121	$130,380
2218	E 201	4	30		1	1	866	P	70	$83	81	50	123	124	$5,810
2219	E 201	4	39		1	1	865	P	570	$101	100	50	124	125	$57,285
2220	E 201	4	45		1	1	747	P	420	$116	135	50	125	126	$48,720

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Qe= EXISTING DEVELOPMENT FLOW, Qu= ULTIMATE DEVELOPMENT FLOW * R=REPLACE, P=PARALLEL, N= NEW ** NO ID. ~ EXIST < 36"

ID #	SYSTEM	GEOMETRY	WIDTH (in)	HEIGHT (in)	RATIO	MAT'L	EXISTING REF ID #	R/P/N *	LENGTH (ft)	COST/ UNIT	Qu (cfs)	FREQ.	FROM NODE	TO NODE	COST ESTIMATE
2221	E 211	3	48	30	1	3		N	450	$190	85	50	202	203	$85,500
2222	E 211	3	48	30	1	3		N	100	$190	107	50	203	204	$19,000
2223	E 211	3	72	36	1	3	466	R	254	$254	153	50	204	205	$64,516
2224	E 211	3	72	36	1	3	465	R	78	$254	187	50	205	206	$19,812
2225	E 211	3	84	48	1	3	294	R	725	$293	225	50	206	207	$212,425
2226	E 211	3	84	48	1	3	676/252	R	66	$293	265	50	207	208	$19,338
2227	E 211	3	72	36	2	3	463	R	1025	$254	292	50	208	209	$520,700
2228	E 211	3	72	36	2	3	463	R	350	$254	301	50	209	210	$177,800
2229	E 211	3	72	36	2	3	675	R	173	$254	310	50	210	211	$87,884
2230	E 211	3	84	36	2	3	674	R	505	$272	320	50	211	212	$274,720
2231	E 211	4	36		1	1			700	$95	35	50	241	212	$66,500
2232	E 211	3	84	36	2	3	421	R	601	$272	348	50	212	213	$326,944
2233	E 211	4	27		1	1	418	P	768	$83	465	50	214	215	$63,744
2234	E 211	4	18		1	1	77	P	410	$83	32	50	271	272	$34,030
2235	E 211	4	18		1	1	406	P	200	$83	32	50	272	273	$16,600
2236	E 211	4	30		1	1	406	P	660	$83	54	50	273	274	$54,780
2237	E 211	4	45		1	1	**	R	600	$116	79	50	274	275	$69,600
2238	E 211	3	60	36	1	3	72	R	162	$216	79	50	275	276	$34,992
2239	E 211	3	60	36	1	3	148	R	162	$216	116	50	276	277	$34,992
2240	E 211	3	60	36	1	3	677/147	R	70	$216	116	50	277	215	$15,120
2241	E 211	4	75		1	1	673	P	300	$248	601	50	215	216	$74,400
2242	E 211	3	120	48	1	3	419	P	200	$410	605	50	216	217	$82,000
2243	E 211	3	132	48	1	3	419	P	227	$451	627	50	217	218	$102,377
2244	E 212 A	4	36		1	1		N	1300	$95	64	50	304	306	$123,500
2245	E 212 A	4	57		1	1		N	1000	$161	94	50	306	308	$161,000
2246	E 212 A	4	57		1	1	416	P	1000	$161	152	50	308	310	$161,000
2247	E 212 A	4	57		1	1	416	P	321	$161	168	50	310	312	$51,681
2248	E 212 A	4	60		1	1	415	P	819	$170	209	50	312	314	$139,230
2249	E 212 B	4	45		1	1		N	500	$116	53	50	104	106	$58,000
2250	E 212 B	4	51		1	1		N	1300	$139	118	50	106	108	$180,700
2251	E 231	4	45		1	1		N	1340	$116	158	50	204	206	$155,440
2252	E 231	4	63		1	1		N	50	$180	274	50	206	208	$9,000
2253	E 231	4	66		1	1		N	50	$189	293	50	208	210	$9,450

TABLE 6.5

PROPOSED FACILITIES- ULTIMATE DEVELOPMENT

GEOMETRY: 1=TRAP. OPEN CHANNEL, 2= IRREGULAR CHANNEL, 3= BOX CHANNEL, 4= PIPE 5= RECT. OPEN CHANNEL
MATERIALS: 1= R.C.P., 2= C.IP.P., 3= R.C.B., 4= C.M.P.A., 5 =C.M.P., 6= NAT. CHANNEL, 7= CONCRETE CHANNEL
Qe= EXISTING DEVELOPMENT FLOW, Qu= ULTIMATE DEVELOPMENT FLOW * R=REPLACE, P=PARALLEL, N= NEW ** NO ID. ~ EXIST < 36"

ID #	SYSTEM	GEOMETRY	WIDTH (in)	HEIGHT (in)	RATIO	MAT'L	EXISTING REF ID #	R/P/N *	LENGTH (ft)	COST/ UNIT	Qu (cfs)	FREQ.	FROM NODE	TO NODE	COST ESTIMATE
2254	E 231	4	48		1	1	65	P	427	$125	438	50	106	108	$53,375
2255	E 231	4	48		1	1	65	P	320	$125	446	50	108	110	$40,000
2256	E 231	4	48		1	1	65	P	480	$125	454	50	110	112	$60,000
2257	E 231	4	57		1	1	65	P	450	$161	500	50	112	114	$72,450
2258	E 231	4	42		1	1	64	P	317	$106	508	50	114	116	$33,602
2259	E 231	4	54		1	1	63	P	416	$152	521	50	116	118	$63,232
2260	E 231	4	54		1	1	32	P	673	$152	549	50	118	120	$102,296
2060	E 231	4	84		3	1	693	R	360	$293	744	50	138	140	$316,440
2261	E 231	4	63		1	1	32	P	191	$180	557	50	120	122	$34,380
2262	E 231	4	63		1	1	32	P	93	$180	591	50	122	124	$16,740
2263	E 231	4	66		2	1	693	P	252	$189	706	50	136	138	$95,256
2264	E 231	4	84		3	1	3	R	173	$293	752	50	140	142	$152,067
2265	E 231	4	84		3	1	3	R	138	$293	758	50	142	144	$121,302
2266	E 231	4	84		3	1	3	R	440	$293	765	50	144	146	$386,760
2267	E 231	4	84		3	1	3	R	189	$293	773	50	146	148	$166,131
2268	E 231	4	84		3	1	3	R	110	$293	806	50	148	150	$96,690
2269	E 231	4	81		1	1	2	P	318	$282	806	50	150	152	$89,676
2270	E 231	4	81		1	1	2	P	550	$282	823	50	152	154	$155,100
2272	R 41	4	36		1	1	938	P	222	$95	76	50	203	204	$21,090
2273	R 41	4	39		1	1	302	P	76	$101	89	50	204	205	$7,638
2274	R 41	4	33		1	1	299	P	387	$83	114	50	205	206	$32,121
2275	R 31	4	36		1	1	**	R	168	$95	36	50	402	413	$15,960
2276	R 31	< 36"									26	50	422	423	$0
2277	R 31	4	39		1	1	737	R	45	$101	33	50	423	424	$4,523
2278	R 31	4	30		1	1	932	P	90	$83	100	50	407	408	$7,470
2279	R 31	4	30		1	1	593	P	124	$83	192	50	408	409	$10,292
2280	R 21	4	48		1	1	731	R	693	$125	69	50	203	204	$86,625
2281	R 21	4	48		1	1	429	R	85	$125	72	50	204	205	$10,625
2282	R 21	4	45		1	1	431	P	165	$116	92	50	214	215	$19,140
2283	R 21	4	30		1	1	430	P	328	$83	112	50	215	205	$27,224
2284	R 21	4	36		1	1	427	P	539	$95	186	50	206	207	$51,205
2285	R 21	4	48		1	1	427	P	100	$125	226	50	207	208	$12,500

TABLE 6.5

PROPOSED FACILITIES- ULTIMATE DEVELOPMENT

GEOMETRY: 1=TRAP. OPEN CHANNEL, 2= IRREGULAR CHANNEL, 3= BOX CHANNEL, 4= PIPE 5= RECT. OPEN CHANNEL
MATERIALS: 1= R.C.P., 2= C.IP.P., 3= R.C.B., 4= C.M.P.A., 5 =C.M.P., 6= NAT. CHANNEL, 7= CONCRETE CHANNEL
Qe= EXISTING DEVELOPMENT FLOW, Qu= ULTIMATE DEVELOPMENT FLOW * R=REPLACE, P=PARALLEL, N= NEW ** NO ID. ~ EXIST < 36"

ID #	SYSTEM	GEOMETRY	WIDTH (in)	HEIGHT (in)	RATIO	MAT'L	EXISTING REF ID #	R/P/N *	LENGTH (ft)	COST/ UNIT	Qu (cfs)	FREQ.	FROM NODE	TO NODE	COST ESTIMATE
2287	LH 1D	4	30		1	1	901	P	72	$83	251	50	108	110	$5,976
2288	E 182	4	45		1	1	746	R	234	$116	98	50	102	103	$27,144
2289	E 182	4	36		1	1		N	1200	$95	123	50	103	104	$114,000
2290	E 182	4	45		1	1	623	R	246	$116	142	50	104	105	$28,536
2291	E 182	4	42		1	1	624	R	641	$106	63	50	122	105	$67,946
2292	E 182	4	42		2	1	622	R	380	$106	227	50	105	106	$80,560
2293	E 182	4	45		2	1	621	R	396	$116	227	50	106	107	$91,872
2294	E 182	4	54		2	1	620	R	176	$152	240	50	107	108	$53,504
2295	E 182	3	96	54	1	3	619	R	350	$334	305	50	108	109	$116,900
2296	E 182	3	96	54	1	3	619	R	300	$334	320	50	109	110	$100,200
2067	E 182	3	96	54	1	3	619	R	400	$334	337	50	110	111	$133,600
2297	E 182	3	96	54	1	3	619	R	298	$334	357	50	111	112	$99,532
2298	E 182	3	96	66	1	3	174	R	925	$361	423	50	112	113	$333,925
2299	E 182	3	96	72	1	3	175	R	409	$374	495	50	113	114	$152,966
2300	E 182	3	96	96	1	3	424	R	456	$430	579	50	114	115	$196,080
2301	E 182	4	33		1	1	39	P	1144	$83	90	50	154	155	$94,952
2302	E 182	4	54		1	1	39	R	947	$152	151	50	155	156	$143,944
2303	E 182	4	75		1	1	426	R	859	$248	196	50	156	115	$213,032
2304	E 182	4	78		1	1	423	P	826	$270	762	50	115	116	$223,020
2305	E 182	4	78		1	1	423	P	550	$270	785	50	116	117	$148,500
2306	E 182	4	42		1	1	439	R	445	$106	30	50	172	174	$47,170
2307	E 182	4	42		1	1	740	R	87	$106	30	50	174	175	$9,222
2308	E 182	4	45		1	1	627	R	286	$116	69	50	175	176	$33,176
2309	E 182	4	45		1	1	46	R	273	$116	69	50	176	177	$31,668
2310	E 182	4	45		1	1	335	R	64	$116	76	50	177	178	$7,424
2311	E 182	4	45		1	1	319	R	210	$116	76	50	179	179.5	$24,360
2312	E 182	4	48		1	1	318	R	118	$125	92	50	179.5	180	$14,750
2313	E 182	4	51		1	1	317	R	460	$139	92	50	180	181	$63,940
2314	E 182	4	48		1	1	66	R	325	$125	97	50	181	182	$40,625
2315	E 182	4	48		1	1	**	R	200	$125	97	50	182	183	$25,000
2316	E 182	4	51		1	1	436	R	326	$139	128	50	183	184	$45,314
2317	E 182	4	42		1	1	435	R	250	$106	128	50	184	185	$26,500
2318	E 182	4	39		1	1		N	900	$101	42	50	192	193	$90,450
2319	E 182	4	45		1	1		N	850	$116	63	50	193	194	$98,600
2320	E 182	4	48		1	1		N	450	$125	78	50	194	195	$56,250

TABLE 6.5

PROPOSED FACILITIES- ULTIMATE DEVELOPMENT

GEOMETRY: 1=TRAP. OPEN CHANNEL, 2= IRREGULAR CHANNEL, 3= BOX CHANNEL, 4= PIPE 5= RECT. OPEN CHANNEL
MATERIALS: 1= R.C.P., 2= C.IP.P., 3= R.C.B., 4= C.M.P.A., 5 =C.M.P., 6= NAT. CHANNEL, 7= CONCRETE CHANNEL
Qe= EXISTING DEVELOPMENT FLOW, Qu= ULTIMATE DEVELOPMENT FLOW * R=REPLACE, P=PARALLEL, N= NEW ** NO ID. ~ EXIST < 36"

ID #	SYSTEM	GEOMETRY	WIDTH (in)	HEIGHT (in)	RATIO	MAT'L	EXISTING REF ID #	R/P/N *	LENGTH (ft)	COST/ UNIT	Qu (cfs)	FREQ.	FROM NODE	TO NODE	COST ESTIMATE
2321	E 182	4	48		1	1		N	60	$125	91	50	195	185	$7,500
2322	E 182	4	69		1	1	293	R	570	$207	218	50	185	186	$117,990
2323	E 182	4	69		1	1	626	R	80	$207	218	50	186	117	$16,560
2324	E 182	4	78		1	1	422	P	613	$270	1011	50	117	117.5	$165,510
2325	E 182	4	78		1	1	422	P	640	$270	1032	50	117.5	118	$172,800
2326	E 182	3	144	84	1	3	422	R	300	$564	1067	50	118	119	$169,200
2327	LH 10A	4	54		1	1	876	P	100	$152	280	50	108	110	$15,200
2328	LH 10B	4	54		2	1	**	R	100	$152	179	50	208	210	$30,400
2329	LH 10C	4	48		2	1	**	R	90	$125	156	50	304	306	$22,500
2330	R 66	4	51		2	1	158	R	325	$139	188	50	105	106	$90,350
2331	R 66	4	66		1	1		N	60	$189	216	50	106	107	$11,340
2332	R 66	4	36		1	1		N	750	$95	66	50	122	123	$71,250
2333	R 66	4	39		1	1		N	550	$101	83	50	123	124	$55,275
2334	R 66	3	144	84	4	3	SFP-33/NB	R	116	$564	6906	100	134	108	$261,696
2336	R 11	4	48		1	1	**	R	450	$125	71	50	112	113	$56,250
2338	R 13	4	48		1	1	88	R	545	$125	109	50	103	104	$68,125
2339	R 13	4	36		1	1	67	P	361	$95	166	50	105	106	$34,295
2341	R 81	3	120	78	1	3		N	50	$495	1431	100	110.2	110.4	$24,750
2342	R 81	3	108	60	2	3	330	R	110	$422	1719	100	112	113	$92,840
2343	R 81	1	480	48	5	6	SFP-43/NB/78	R	1600	$570	1733	100	113	114	$912,226
2344	R 81	4	39		1	1	780	R	60	$101	69	100	173	174	$6,030
2346	R 83	4	48		1	1	792	R	60	$125	181	50	309	309.5	$7,500
2347	R 83	4	54		1	1	791	P	750	$152	186	50	309.5	310	$114,000
2348	R 83	4	57		1	1	791	P	1000	$161	186	50	310	311	$161,000
2349	R 83	4	66		1	1		N	50	$189	309	50	312.2	312.4	$9,450
2350	R 83	NOT USED													$0
2351	R 83	3	120	72	2	3	SFP-49/NB/78	R	110	$477	1757	100	217	330	$104,940
2353	R 112	4	60		1	1	**	R	60	$170	319	100	204	205	$10,200
2354	R 112	4	63		1	1	909	R	60	$180	328	100	206	207	$10,800

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PROPOSED FACILITIES- ULTIMATE DEVELOPMENT

GEOMETRY: 1=TRAP. OPEN CHANNEL, 2= IRREGULAR CHANNEL, 3= BOX CHANNEL, 4= PIPE 5= RECT. OPEN CHANNEL
MATERIALS: 1= R.C.P., 2= C.IP.P., 3= R.C.B., 4= C.M.P.A., 5 =C.M.P., 6= NAT. CHANNEL, 7= CONCRETE CHANNEL
Qe= EXISTING DEVELOPMENT FLOW, Qu= ULTIMATE DEVELOPMENT FLOW * R=REPLACE, P=PARALLEL, N= NEW ** NO ID. ~ EXIST < 36"

ID #	SYSTEM	GEOMETRY	WIDTH (in)	HEIGHT (in)	RATIO	MAT'L	EXISTING REF ID #	R/P/N *	LENGTH (ft)	COST/ UNIT	Qu (cfs)	FREQ.	FROM NODE	TO NODE	COST ESTIMATE
2355	R 112	3	96	48	1	3	908	R	60	$321	602	100	208	209	$19,260
2356	R 112	4	48		1	1	907	P	50	$125	897	100	212	213	$6,250
2357	R 112	4	42		1	1	977	R	100	$106	123	100	292	293	$10,600
2399	R 112	4	36		1	1	**	R	50	$95	60	100	296	216	$4,750
2358	R 112	3	120	78	1	3		N	50	$495	1344	100	216	216.5	$24,750
2361	E 132	4	45		1	1	**	R	800	$116	43	50	204	206	$92,800
2362	E 132	4	60		1	1	**	R	100	$170	88	50	206	208	$17,000
2363	E 132	4	39		1	1	875	P	200	$101	98	50	208	210	$20,100
2364	E 132	4	45		1	1	875	P	250	$116	116	50	210	212	$29,000
2365	E 132	4	54		1	1	875	P	250	$152	147	50	212	214	$38,000
2366	E 132	4	60		1	1	592	R	800	$170	157	50	214	216	$136,000
2367	E 132	4	51		1	1	**	R	60	$139	190	50	216	218	$8,340
2368	E 132	4	36		1	1		N	100	$95	22	50	302	304	$9,500
2370	E 162	4	36		1	1	15	R	200	$95	41	50	403	404	$19,000
2371	E 162	4	36		1	1	15	R	130	$95	46	50	404	405	$12,350
2372	E 162	4	39		1	1	15	R	326	$101	56	50	405	406	$32,763
2373	E 162	< 36"									40	50	412	413	$0
2375	E 164	4	42		1	1	**	R	500	$106	84	50	110	115	$53,000
2377	E 241	4	30		1	1	477	P	457	$83	133	50	102	103	$37,931
2378	E 241	4	30		1	1	277	P	267	$83	133	50	103	104	$22,161
2379	E 241	4	36		1	1	276	P	333	$95	143	50	104	105	$31,635
2380	E 241	4	36		1	1	275	P	550	$95	150	50	105	106	$52,250
2381	E 241	4	63		1	1	274	R	460	$180	184	50	106	107	$82,800
2382	E 241	4	45		1	1	273	P	225	$116	216	50	107	108	$26,100
2383	E 241	3	96	48	1	3	271	R	112	$321	238	50	110	111	$35,952
2384	E 241	4	36		1	1	**	R	230	$95	52	50	122	123	$21,850
2385	E 241	4	36		1	1	**	R	440	$95	55	50	123	124	$41,800
2386	E 241	4	36		1	1	**	R	200	$95	66	50	124	125	$19,000
2387	EG A	4	39		1	1		N	880	$101	148	50	104	106	$88,440
2388	EG A	4	57		1	1		N	1940	$161	260	50	106	110	$312,340
2389	EG A	3	96	48	1	3		N	100	$321	343	50	110	112	$32,100

TABLE 6.5

PROPOSED FACILITIES- ULTIMATE DEVELOPMENT

GEOMETRY: 1=TRAP. OPEN CHANNEL, 2= IRREGULAR CHANNEL, 3= BOX CHANNEL, 4= PIPE 5= RECT. OPEN CHANNEL
MATERIALS: 1= R.C.P., 2= C.IP.P., 3= R.C.B., 4= C.M.P.A., 5 =C.M.P., 6= NAT. CHANNEL, 7= CONCRETE CHANNEL
Qe= EXISTING DEVELOPMENT FLOW, Qu= ULTIMATE DEVELOPMENT FLOW * R=REPLACE, P=PARALLEL, N= NEW ** NO ID. ~ EXIST < 36"

ID #	SYSTEM	GEOMETRY	WIDTH (in)	HEIGHT (in)	RATIO	MAT'L	EXISTING REF ID #	R/P/N *	LENGTH (ft)	COST/ UNIT	Qu (cfs)	FREQ.	FROM NODE	TO NODE	COST ESTIMATE
2390	EG A	4	72		2	1		N	970	$225	343	50	112	114	$436,500
2392	EG B	4	45		1	1		N	950	$116	117	50	206	208	$110,200
2393	EG B	3	84	36	1	3		N	100	$272	150	50	208	210	$27,200
2394	EG B	4	60		2	1		N	950	$170	150	50	210	212	$323,000
2396	EG C	4	39		1	1		N	100	$101	79	50	308	310	$10,050
2397	EG C	4	48		1	1		N	725	$125	79	50	310	312	$90,625
2401	E 221	4	36		1	1	689	R	229	$95	156	100	402	403	$21,755
2402	E 221	4	42		1	1	688	R	300	$106	163	100	403	404	$31,800
2403	E 221	4	42		1	1	687	R	297	$106	163	100	404	405	$31,482
2404	E 221	4	45		1	1	686	R	258	$116	175	100	405	406	$29,928
2405	E 221	4	36		1	1	515	P	392	$95	179	100	406	407	$37,240
2068	E 221	4	36		1	1	**	R	75	$95	75	100	434	431.5	$7,125
2406	E 221	4	39		1	1	511	P	407	$101	363	100	407	408	$40,904
2407	E 221	4	51		1	1	510	P	220	$139	395	100	408	409	$30,580
2408	E 221	4	66		1	1	509/37	P	100	$189	395	100	409	410	$18,900
2409	E 221	4	54		1	1	508/37	P	500	$152	476	100	410	411	$76,000
2410	E 221	4	45		1	1	339	R	200	$116	90	100	443	444	$23,200
2411	E 221	4	48		1	1	339	R	200	$125	96	100	444	445	$25,000
2412	E 221	4	51		1	1	340	R	85	$139	108	100	445	412	$11,815
2413	E 221	3	144	42	2	3	682	R	165	$462	735	100	413	414	$152,460
2414	E 221	3	144	42	2	3	681	R	147	$462	775	100	414	415	$135,828
2415	E 221	3	96	48	2	3	680	R	300	$321	775	100	415	416	$192,600
2416	E 221	3	96	60	2	3	680	R	350	$347	867	100	416	417	$242,900
2417	E 221	3	96	60	2	3	680	R	250	$347	871	100	417	418	$173,500
2418	E 221	3	96	60	2	3	707	R	350	$347	871	100	418	419	$242,900
2419	E 221	3	96	60	2	3	707	R	725	$347	906	100	419	420	$503,150
2420	E 221	3	96	60	2	3	707	R	100	$347	935	100	420	421	$69,400
2421	E 221	3	96	66	2	3	462	R	400	$361	987	100	421	422	$288,800
2422	E 221	3	96	66	2	3	434	R	150	$361	987	100	422	423	$108,300
2423	E 221	3	96	66	2	3	434	R	200	$361	997	100	423	424	$144,400
2424	E 221	3	114	66	2	3	433	R	325	$449	1112	100	424	425	$291,850
2425	E 221	3	114	66	2	3	433	R	450	$449	1114	100	425	426	$404,100
2426	E 221	3	114	66	2	3	433	R	100	$449	1129	100	426	427	$89,800

TABLE 6.5

PROPOSED FACILITIES- ULTIMATE DEVELOPMENT

GEOMETRY: 1=TRAP. OPEN CHANNEL, 2= IRREGULAR CHANNEL, 3= BOX CHANNEL, 4= PIPE 5= RECT. OPEN CHANNEL
MATERIALS: 1= R.C.P., 2= C.IP.P., 3= R.C.B., 4= C.M.P.A., 5 =C.M.P., 6= NAT. CHANNEL, 7= CONCRETE CHANNEL
Qe= EXISTING DEVELOPMENT FLOW, Qu= ULTIMATE DEVELOPMENT FLOW * R=REPLACE, P=PARALLEL, N= NEW ** NO ID. ~ EXIST < 36"

ID #	SYSTEM	GEOMETRY	WIDTH (in)	HEIGHT (in)	RATIO	MAT'L	EXISTING REF ID #	R/P/N *	LENGTH (ft)	COST/ UNIT	Qu (cfs)	FREQ.	FROM NODE	TO NODE	COST ESTIMATE
2427	E 221	3	108	72	2	3	432	R	1080	$449	1157	100	427	428	$969,840
2428	LH 11 A	4	36		1	1	**	R	140	$95	108	50	104	106	$13,300
2429	LH 11 A	4	57		1	1	**	R	140	$161	388	50	212	214	$22,540
2430	LH 12 A	4	36		1	1		N	100	$95	126	50	104	106	$9,500
2431	LH 8	4	51		1	1		N	100	$139	221	50	112	114	$13,900
2432	R 12	4	36		1	1	450	R	40	$95	88	50	218	220	$3,800
2433	R 12	4	36		1	1	449	P	253	$95	88	50	222	224	$24,035
2434	R 12	4	42		1	1	448	P	128	$106	128	50	224	226	$13,568
2435	R 12	4	51		1	1	447	P	750	$139	137	50	226	228	$104,250
2436	R 12	4	48		1	1	446	P	253	$125	153	50	228	230	$31,625
2437	R 12	4	36		1	1	443	P	100	$95	170	50	234	236	$9,500
2438	R 12	4	36		1	1	443	P	944	$95	180	50	236	238	$89,680
2439	FEL	4	60		2	1	629	P	70	$170	558	100	416	418	$23,800
2556	FEL	< 36"								$0	39	100	125	126	$0
2441	FEL	4	36		1	1	887	R	700	$95	90	100	137	129	$66,500
2557	FEL	4	54		1	1		N	50	$152	214	100	129	129	$7,600
2558	FEL	4	36		1	1		N	60	$95	57	100	304	306	$5,700
2559	FEL	3	24	48	1	3	839	P	74	$177	465	100	130	132	$13,098
2446	FEL	4	36		1	1		N	500	$95	78	100	307	309	$47,500
2447	FEL	4	36		1	1	**	P	600	$95	115	100	309	314	$57,000
2550	FEL	4	45		1	1		N	400	$116	94	100	504	506	$46,400
2551	FEL	4	45		1	1	**	R	68	$116	106	100	506	508	$7,888
2552	FEL	4	72		2	1	636	P	140	$225	713	100	422	424	$63,000
2553	FEL	4	63		1	5	913	P	120	$180	1319	100	138	140	$21,600
2554	FEL	4	39		1	5	631	P	100	$101	103	100	904	906	$10,050
2555	FEL	4	96		2	5	630	P	132	$382	1751	100	146	148	$100,848
2448	E 81	4	54		1	1	165/166	P	923	$152		50	SFP-57		$140,296
2450	E 61	4	42		1	1		N	200	$106	85	50	206	208	$21,200
2451	E 61	4	48		1	1		N	100	$125	119	50	210	212	$12,500

TABLE 6.5

PROPOSED FACILITIES- ULTIMATE DEVELOPMENT

GEOMETRY: 1=TRAP. OPEN CHANNEL, 2= IRREGULAR CHANNEL, 3= BOX CHANNEL, 4= PIPE 5= RECT. OPEN CHANNEL
MATERIALS: 1= R.C.P., 2= C.IP.P., 3= R.C.B., 4= C.M.P.A., 5 =C.M.P., 6= NAT. CHANNEL, 7= CONCRETE CHANNEL
Qe= EXISTING DEVELOPMENT FLOW, Qu= ULTIMATE DEVELOPMENT FLOW * R=REPLACE, P=PARALLEL, N= NEW ** NO ID. ~ EXIST < 36"

ID #	SYSTEM	GEOMETRY	WIDTH (in)	HEIGHT (in)	RATIO	MAT'L	EXISTING REF ID #	R/P/N *	LENGTH (ft)	COST/ UNIT	Qu (cfs)	FREQ.	FROM NODE	TO NODE	COST ESTIMATE
2473	N.B./R 66	3	144	120	1	3	595/594	P	90	$720	7596	100	112	114	$64,800
2065	N.B./R 71	SEE R 71									575	50	136	138	$0
2066	N.B./R 71	SEE R 71									606	50	138	140	$0
2474	N.B./R 71	3	72	36	3	3	363	R	105	$254	570	50	134	136	$80,010
2475	N.B./R 71	1	195	36	5	6		N	700	$330	556	50	132	134	$231,000
2476	N.B./R 71	4	60		1	1	109	P	150	$170	353	50	118	120	$25,500
2477	N.B.	RETENTION BASIN DELETED													$0
2478	N.B./R 66	1	1704	72	5	6		N	2000	$1,235	7528	100	109	111	$2,470,000
2479	N.B./R 66	3	144	36	1	3	289	P	40	$444	238	50	156	157	$17,760
2480	N.B./R 66	4	48		1	1		N	2000	$125	190	50	154	156	$250,000
2481	N.B./R 66	4	60		1	1		N	700	$170	238	50	157	109	$119,000
2334	N.B./R 66	SEE R-66									6906	100	134	108	$0
2483	N.B./R 66	1	1536	72	5	6		N	1000	$1,184	6904	100	133	134	$1,184,000
2343	N.B./R 81	SEE R-81									1733	100	113	114	$0
2485	N.B./R 81	1	396	54	5	6		R	1300	$629	1684	100	111	112	$817,700
2486	N.B./R 81	3	120	72	2	3		N	100	$477	1684	100	SFP-46		$95,400
2487	N.B./R 83	1	600	96	5	6		N	2400	$1,162	5483	100	321	314	$2,788,800
2351	N.B./R 83	SEE R-83									1757	100	217	330	$0
2489	N.B.	NOT USED													$0
2490	N.B.	3	96	96	4	3	788	N	110	$430	3771	100	412	320	$189,200
2491	N.B.	1	756	72	5	6		N	3100	$946	3771	100	411	412	$2,932,600
2492	N.B.	NOT USED													$0
2484	N.B./R 83	1	60	36	4	6		N	3000	$198	258	50	312	312.2	$594,000
2493	N.B.	RETENTION BASIN DELETED													$0
2494	N.B./R 81	1	84	60	5	6		N	2000	$486	920	100	108	109	$972,000
2495	N.B./R 81	INLET STRUCTURE			1			R	1	$2,200	846	100	106	106	$2,200
2496	N.B.	RETENTION BASIN DELETED													$0
2058	N.B./R 51	SEE R 51									105	50	108	110	$0
2467	E 252	1	96	60	1	7		N	2800	$224	1822	100			$627,200
2449	E 202	4	39		1	1		N	430	$101	106	50	106	108	$43,215
2250	E 202	4	39		1	1	322	P	444	$101	193	50	114	115	$44,622
2251	E 202	4	39		1	1	306	P	360	$101	193	50	115	116	$36,180
2452	E 202	4	42		1	1	**	R	250	$106	80	50	406	408	$26,500
2453	E 202	4	30		1	1	182	P	296	$83	137	50	412	414	$24,568

TABLE 6.5

PROPOSED FACILITIES- ULTIMATE DEVELOPMENT

GEOMETRY: 1=TRAP. OPEN CHANNEL, 2= IRREGULAR CHANNEL, 3= BOX CHANNEL, 4= PIPE 5= RECT. OPEN CHANNEL
MATERIALS: 1= R.C.P., 2= C.IP.P., 3= R.C.B., 4= C.M.P.A., 5 =C.M.P., 6= NAT. CHANNEL, 7= CONCRETE CHANNEL
Qe= EXISTING DEVELOPMENT FLOW, Qu= ULTIMATE DEVELOPMENT FLOW * R=REPLACE, P=PARALLEL, N= NEW ** NO ID. ~ EXIST < 36"

ID #	SYSTEM	GEOMETRY	WIDTH (in)	HEIGHT (in)	RATIO	MAT'L	EXISTING REF ID #	R/P/N *	LENGTH (ft)	COST/ UNIT	Qu (cfs)	FREQ.	FROM NODE	TO NODE	COST ESTIMATE
2454	E 202	4	36		1	1	**	R	100	$95	61	50	504	506	$9,500
2455	E 202	4	45		1	1	184	R	244	$116	95	50	514	414	$28,304
2457	E 202	4	90		1	1	409	P	225	$350	669	50	122	124	$78,750
2458	E 202	4	24		1	1	186	P	452	$83	55	50	906	908	$37,516
2459	E 202	3	84	36	1	3	407	P	1005	$272	832	50	130	132	$273,360
2460	E 202	3	84	36	1	3	407	P	245	$272	847	50	132	134	$66,640
2461	E 202	4	57		1	1	407	P	16	$161	847	50	134	136	$2,576
2462	E 202	4	63		1	1	647	P	40	$180	849	50	136	138	$7,200
2463	E 202	4	39		1	1		N	850	$101	61	50	1104	1106	$85,425
2464	E 202	4	30		1	1	**	P	100	$83	67	50	1106	138	$8,300
2465	E 202	4	63		1	1	647	P	40	$180	904	50	138	140	$7,200
2466	E 202	4	63		1	1	647	P	320	$180	929	50	140	142	$57,600

TOTAL FACILITIES COST ESTIMATE = $53,941,659

LAST UPDATE: 29-Sep-95

G:\123DATA\ESTM\9 329T6-5.WB2

APPENDIX C

DRAINAGE MASTER PLAN FOR THE CITY OF ESCONDIDO, CALIFORNIA

PARCEL LINE INFORMATION PROVIDED BY:
SAN DIEGO DATA PROCESSING CORPORATION
ACCORDING TO THE BASE MAP SUB LICENSE
AGREEMENT WITH THE CITY OF ESCONDIDO

TOPOGRAPHY COMPILED BY:
GEONEX NORTH AMERICAN OPERATIONS, INC.
DATED NOVEMBER, 1992

LEGEND

- EXISTING CONTOUR ELEVATION
- EXISTING NATURAL FLOW
- EXISTING IMPROVED CHANNEL
- EXISTING STORM DRAIN
- PROPOSED FACILITY
- EXISTING LAKES

LEGEND

- MAJOR BASIN BOUNDARY
- MINOR BASIN BOUNDARY
- GENERAL PLAN BOUNDARY
- BASIN DESIGNATION
- EXIST. / PROP. DESILT BASIN
- FACILITY IDENTIFIER

2056

N

SCALE IN FEET
9000 6000 3000 0 3000

Date	App'd	REVISIONS	By	Date

Checked By	Drawn by	Designed By
DWM-END	DAM	JAW-LBR-END

Plans Prepared Under Supervision Of: For Masson & Assoc. Inc.

EDWARD N. DOMINGUE R.C.E. 34131 DATE:

SCALE
Horizontal
1" = 3000'
DATE: 02-06-95
Drawn By: DAM

Submitted _____ Approved _____

By _____ Asst. City Engineer

By _____ Asst. Director of Public Works

MASSON & ASSOCIATES, INC.
PLANNING ▾ ENGINEERING ▾ SURVEYING
200 E. WASHINGTON AVE. ▾ SUITE 200 ▾ ESCONDIDO ▾ CA 92025-1818
TEL (619) 741-3570 ▾ FAX (619) 741-1788

CITY OF ESCONDIDO DEPT. OF PUBLIC WORKS

DRAINAGE MASTER PLAN FOR THE CITY OF ESCONDIDO:

INDEX MAP FOR: TILES, 8-14, 16-40

Drawing No.
D- 1114
Sheet 1 of 33

SEE TILE 13 (SHEET 7)

SEE TILE 9 (SHEET 3)

PARCEL LINE INFORMATION PROVIDED BY:
SAN DIEGO DATA PROCESSING CORPORATION
ACCORDING TO THE BASE MAP SUB LICENSE
AGREEMENT WITH THE CITY OF ESCONDIDO

TOPOGRAPHY COMPILED BY:
GEONEX NORTH AMERICAN OPERATIONS, INC.
DATED NOVEMBER, 1992

LEGEND

- EXISTING CONTOUR ELEVATION
- EXISTING NATURAL FLOW
- EXISTING IMPROVED CHANNEL
- EXISTING STORM DRAIN
- PROPOSED FACILITY
- EXISTING LAKES

LEGEND

- MAJOR BASIN BOUNDARY
- MINOR BASIN BOUNDARY
- GENERAL PLAN BOUNDARY
- BASIN DESIGNATION — LR-5
- EXIST. / PROP. DESILT BASIN — D / O
- FACILITY IDENTIFIER — 2056

KC-32 · KC-22 · KC-11 · KC-12 · L.H.-7 · L.H.-8 · L.H.-9 · L.H.-10 · N-6

MARY · SUNSET · HILLES · VALLEY PKY · SAN PASQUAL · RYAN RD · BEAR · SIERRA LINDA DR · LANE · RD

193 · 167 · 349 · 350 · 351 · 868 · 867 · 352 · 2431 · 2328 · 2329 · 22 · 21 · 530 · 529 · 295 · 296

SCALE IN FEET: 400 200 0 400 800 1200

N

MASSON & ASSOCIATES, INC.	Date	App'd	REVISIONS	By	Date
PLANNING • ENGINEERING • SURVEYING					
200 E. WASHINGTON AVE. • SUITE 200 • ESCONDIDO • CA 92025-1516					
TEL (619) 741-3570 • FAX (619) 741-1786					

Checked By	Drawn by	Designed By
DWM-END	DAM	JAW-LBR-END

Plans Prepared Under Supervision Of: For Masson & Assoc. Inc.

EDWARD N. DOMINGUE R.C.E. 34131 DATE:

SCALE: Horizontal 1" = 400'

DATE: 02-06-95 Drawn By: DAM

Submitted _____ Approved _____

By _____ Asst. City Engineer

By _____ Asst. Director of Public Works

CITY OF ESCONDIDO DEPT. OF PUBLIC WORKS

DRAINAGE MASTER PLAN FOR THE CITY OF ESCONDIDO:

EXISTING / PROPOSED STORM DRAINS TILE 8

Drawing No. D-1114

Sheet 2 of 33

SEE TILE 12 (SHEET 6)

SEE TILE 10 (SHEET 4)

SEE TILE 8 (SHEET 2)

LEGEND

EXISTING CONTOUR ELEVATION	
EXISTING NATURAL FLOW	
EXISTING IMPROVED CHANNEL	
EXISTING STORM DRAIN	
PROPOSED FACILITY	
EXISTING LAKES	

PARCEL LINE INFORMATION PROVIDED BY:
SAN DIEGO DATA PROCESSING CORPORATION
ACCORDING TO THE BASE MAP SUB LICENSE
AGREEMENT WITH THE CITY OF ESCONDIDO

TOPOGRAPHY COMPILED BY:
GEONEX NORTH AMERICAN OPERATIONS, INC.
DATED NOVEMBER, 1992

LEGEND

MAJOR BASIN BOUNDARY	
MINOR BASIN BOUNDARY	
GENERAL PLAN BOUNDARY	
BASIN DESIGNATION	E-6
EXIST. / PROP. DESILT BASIN	⊃ / ○
FACILITY IDENTIFIER	2056

N

SCALE IN FEET
400 200 0 400 800 1200

MASSON & ASSOCIATES, INC.
PLANNING ▼ ENGINEERING ▼ SURVEYING
200 E. WASHINGTON AVE. ▼ SUITE 200 ▼ ESCONDIDO ▼ CA 92025-1818
TEL (619) 741-3570 ▼ FAX (619) 741-1788

Date	App'd	REVISIONS	By	Date

Checked By	Drawn by	Designed By
DWM-END	DAM	JAW-LBR-END

Plans Prepared Under Supervision Of: For Masson & Assoc. Inc.

EDWARD N. DOMINGUE R.C.E. 34131 DATE:

SCALE
Horizontal
1" = 400'
DATE: 02-06-95
Drawn By: DAM

Submitted _____ Approved _____

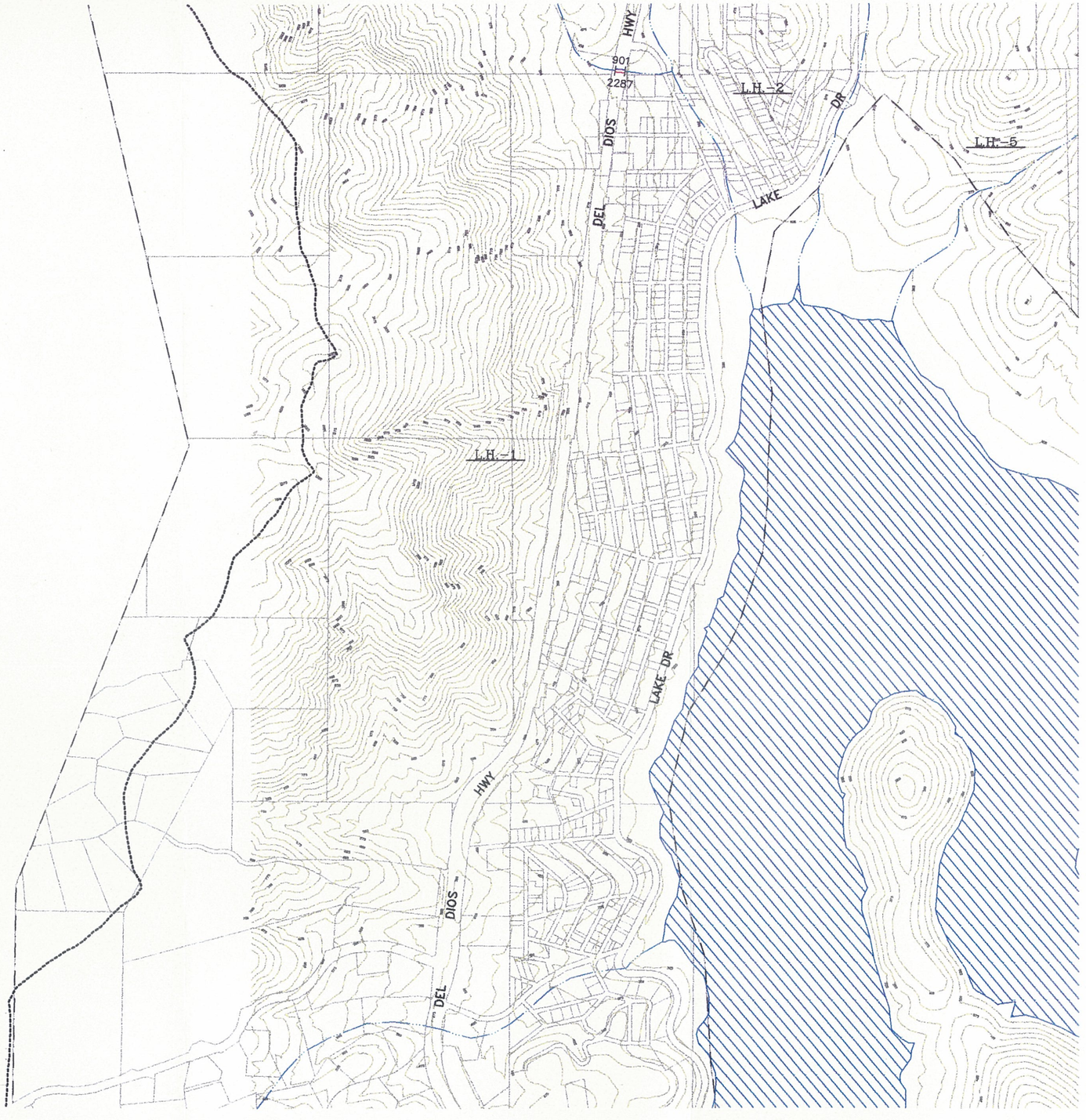
By _____ By _____
Asst. City Engineer Asst. Director of Public Works

CITY OF ESCONDIDO DEPT. OF PUBLIC WORKS

DRAINAGE MASTER PLAN FOR THE CITY OF ESCONDIDO:
EXISTING / PROPOSED STORM DRAINS TILE 9

Drawing No.
D- 1114
Sheet 3 of 33

SEE TILE 11 (SHEET 5)



SEE TILE 9 (SHEET 3)

LEGEND

- EXISTING CONTOUR ELEVATION
- EXISTING NATURAL FLOW
- EXISTING IMPROVED CHANNEL
- EXISTING STORM DRAIN
- PROPOSED FACILITY
- EXISTING LAKES

PARCEL LINE INFORMATION PROVIDED BY:
SAN DIEGO DATA PROCESSING CORPORATION
ACCORDING TO THE BASE MAP SUB LICENSE
AGREEMENT WITH THE CITY OF ESCONDIDO

TOPOGRAPHY COMPILED BY:
GEONEX NORTH AMERICAN OPERATIONS, INC.
DATED NOVEMBER, 1992

LEGEND

- MAJOR BASIN BOUNDARY
- MINOR BASIN BOUNDARY
- GENERAL PLAN BOUNDARY
- BASIN DESIGNATION — 1E-S
- EXIST. / PROP. DESILT BASIN — C / O
- FACILITY IDENTIFIER — 2056

N

400 200 0 400 800 1200
SCALE IN FEET

MASSON & ASSOCIATES, INC.
PLANNING ▾ ENGINEERING ▾ SURVEYING
200 E. WASHINGTON AVE. ▾ SUITE 200 ▾ ESCONDIDO ▾ CA 92025-1816
TEL (619) 741-3570 ▾ FAX (619) 741-1788

Date	App'd	REVISIONS	By	Date

Checked By	Drawn by	Designed By
DWM-END	DAM	JAW-LBR-END

Plans Prepared Under Supervision Of: For Masson & Assoc. Inc.
EDWARD N. DOMINGUE R.C.E. 34131 DATE:

SCALE
Horizontal
1" = 400'
DATE: 02-06-95
Drawn By: DAM

Submitted _____ Approved _____
By _____ Asst. City Engineer
By _____ Asst. Director of Public Works

CITY OF ESCONDIDO DEPT. OF PUBLIC WORKS
DRAINAGE MASTER PLAN FOR THE CITY OF ESCONDIDO:
EXISTING / PROPOSED STORM DRAINS TILE 10

Drawing No.
D- 1114
Sheet 4 of 33

SEE TILE 20 (SHEET 13)

PARCEL LINE INFORMATION PROVIDED BY:
SAN DIEGO DATA PROCESSING CORPORATION
ACCORDING TO THE BASE MAP SUB LICENSE
AGREEMENT WITH THE CITY OF ESCONDIDO

TOPOGRAPHY COMPILED BY:
GEONEX NORTH AMERICAN OPERATIONS, INC.
DATED NOVEMBER, 1992

LEGEND

- EXISTING CONTOUR ELEVATION
- EXISTING NATURAL FLOW
- EXISTING IMPROVED CHANNEL
- EXISTING STORM DRAIN
- PROPOSED FACILITY
- EXISTING LAKES

LEGEND

- MAJOR BASIN BOUNDARY
- MINOR BASIN BOUNDARY
- GENERAL PLAN BOUNDARY
- BASIN DESIGNATION — Ufs
- EXIST. / PROP. DESILT BASIN — E / D
- FACILITY IDENTIFIER — 2056

N

SCALE IN FEET
400 200 0 400 800 1200

SEE TILE 12 (SHEET 6)

SEE TILE 10 (SHEET 4)

MASSON & ASSOCIATES, INC.
PLANNING ▾ ENGINEERING ▾ SURVEYING
200 E. WASHINGTON AVE. ▾ SUITE 200 ▾ ESCONDIDO ▾ CA 92025-1815
TEL (619) 741-357D ▾ FAX (619) 741-1786

Date	App'd	REVISIONS	By	Date

Checked By	Drawn by	Designed By
DWM-END	DAM	JAW-LBR-END

Plans Prepared Under Supervision Of: For Masson & Assoc. Inc.
EDWARD N. DOMINGUE R.C.E. 34131 DATE:

SCALE
Horizontal
1" = 400'
DATE: 02-06-95
Drawn By: DAM

Submitted _____ Approved _____
By _____ Asst. City Engineer
By _____ Asst. Director of Public Works

CITY OF ESCONDIDO DEPT. OF PUBLIC WORKS
DRAINAGE MASTER PLAN FOR THE CITY OF ESCONDIDO:
EXISTING / PROPOSED STORM DRAINS TILE 11

Drawing No.
D- 1114
Sheet 5 of 33

SEE TILE 19 (SHEET 12)

SEE TILE 11 (SHEET 5)

SEE TILE 13 (SHEET 7)

SEE TILE 9 (SHEET 3)

PARCEL LINE INFORMATION PROVIDED BY:
SAN DIEGO DATA PROCESSING CORPORATION
ACCORDING TO THE BASE MAP SUB LICENSE
AGREEMENT WITH THE CITY OF ESCONDIDO

TOPOGRAPHY COMPILED BY:
GEONEX NORTH AMERICAN OPERATIONS, INC.
DATED NOVEMBER, 1992

LEGEND

- EXISTING CONTOUR ELEVATION
- EXISTING NATURAL FLOW
- EXISTING IMPROVED CHANNEL
- EXISTING STORM DRAIN
- PROPOSED FACILITY
- EXISTING LAKES

LEGEND

- MAJOR BASIN BOUNDARY
- MINOR BASIN BOUNDARY
- GENERAL PLAN BOUNDARY
- BASIN DESIGNATION — JE-L
- EXIST. / PROP. DESILT BASIN — C / O
- FACILITY IDENTIFIER — 2056

N

SCALE IN FEET
400 200 0 400 800 1200

MASSON & ASSOCIATES, INC.
PLANNING ▾ ENGINEERING ▾ SURVEYING
200 E. WASHINGTON AVE. ▾ SUITE 200 ▾ ESCONDIDO ▾ CA 92025-1516
TEL (619) 741-3570 ▾ FAX (619) 741-1788

Date	App'd	REVISIONS	By	Date

Checked By	Drawn by	Designed By
DWM-END	DAM	JAW-LBR-END

Plans Prepared Under Supervision Of: For Masson & Assoc. Inc.
EDWARD N. DOMINGUE R.C.E. 34131 DATE:

SCALE Horizontal 1" = 400'
DATE: 02-06-95
Drawn By: DAM

Submitted _____ Approved _____
By _____ Asst. City Engineer
By _____ Asst. Director of Public Works

CITY OF ESCONDIDO DEPT. OF PUBLIC WORKS
DRAINAGE MASTER PLAN FOR THE CITY OF ESCONDIDO:
EXISTING / PROPOSED STORM DRAINS TILE 12

Drawing No. D-1114
Sheet 6 of 33

SEE TILE 18 (SHEET 11)

SEE TILE 12 (SHEET 6)

SEE TILE 14 (SHEET 8)

SEE TILE 8 (SHEET 2)

PARCEL LINE INFORMATION PROVIDED BY:
SAN DIEGO DATA PROCESSING CORPORATION
ACCORDING TO THE BASE MAP SUB LICENSE
AGREEMENT WITH THE CITY OF ESCONDIDO

TOPOGRAPHY COMPILED BY:
GEONEX NORTH AMERICAN OPERATIONS, INC.
DATED NOVEMBER, 1992

LEGEND

- EXISTING CONTOUR ELEVATION
- EXISTING NATURAL FLOW
- EXISTING IMPROVED CHANNEL
- EXISTING STORM DRAIN
- PROPOSED FACILITY
- EXISTING LAKES

LEGEND

- MAJOR BASIN BOUNDARY
- MINOR BASIN BOUNDARY
- GENERAL PLAN BOUNDARY
- BASIN DESIGNATION
- EXIST. / PROP. DESILT BASIN FACILITY IDENTIFIER

N

SCALE IN FEET: 400 200 0 400 800 1200

MASSON & ASSOCIATES, INC.
PLANNING ▾ ENGINEERING ▾ SURVEYING
200 E. WASHINGTON AVE. ▾ SUITE 200 ▾ ESCONDIDO ▾ CA 92025-1815
TEL (619) 741-3570 ▾ FAX (619) 741-1786

Date	App'd	REVISIONS	By	Date

Checked By	Drawn by	Designed By
DWM-END	DAM	JAW-LBR-END

Plans Prepared Under Supervision Of: For Masson & Assoc. Inc.

EDWARD N. DOMINGUE R.C.E. 34131 DATE:

SCALE
Horizontal
1" = 400'
DATE: 02-06-95
Drawn By: DAM

Submitted _____ Approved _____

By _____ Asst. City Engineer

By _____ Asst. Director of Public Works

CITY OF ESCONDIDO DEPT. OF PUBLIC WORKS

DRAINAGE MASTER PLAN FOR THE CITY OF ESCONDIDO:

EXISTING / PROPOSED STORM DRAINS TILE 13

Drawing No.
D- 1114
Sheet 7 of 33

SEE TILE 17 (SHEET 10)

SEE TILE 13 (SHEET 7)

PARCEL LINE INFORMATION PROVIDED BY:
SAN DIEGO DATA PROCESSING CORPORATION
ACCORDING TO THE BASE MAP SUB LICENSE
AGREEMENT WITH THE CITY OF ESCONDIDO

TOPOGRAPHY COMPILED BY:
GEONEX NORTH AMERICAN OPERATIONS, INC.
DATED NOVEMBER, 1992

LEGEND

- EXISTING CONTOUR ELEVATION
- EXISTING NATURAL FLOW
- EXISTING IMPROVED CHANNEL
- EXISTING STORM DRAIN
- PROPOSED FACILITY
- EXISTING LAKES

LEGEND

- MAJOR BASIN BOUNDARY
- MINOR BASIN BOUNDARY
- GENERAL PLAN BOUNDARY
- BASIN DESIGNATION — EXIST. / PROP. DESILT BASIN FACILITY IDENTIFIER

SCALE IN FEET: 400 200 0 400 800 1200

N

MASSON & ASSOCIATES, INC.	Date	App'd	REVISIONS	By	Date	Checked By	Drawn by	Designed By	SCALE	Submitted	Approved	CITY OF ESCONDIDO DEPT. OF PUBLIC WORKS	Drawing No.
PLANNING • ENGINEERING • SURVEYING						DWM–END	DAM	JAW–LBR–END	Horizontal 1" = 400'			DRAINAGE MASTER PLAN FOR THE CITY OF ESCONDIDO:	D– 1114
200 E. WASHINGTON AVE. • SUITE 200 • ESCONDIDO • CA 92025–1815						Plans Prepared Under Supervision Of: For Masson & Assoc. Inc.			DATE: 02–06–95	By Asst. City Engineer	By Asst. Director of Public Works	EXISTING / PROPOSED STORM DRAINS TILE 14	Sheet 8 of 33
TEL (619) 741–3570 • FAX (619) 741–1786						EDWARD N. DOMINGUE R.C.E. 34131 DATE:			Drawn By: DAM				

SEE TILE 25 (SHEET 18)

SEE TILE 17 (SHEET 10)

PARCEL LINE INFORMATION PROVIDED BY:
SAN DIEGO DATA PROCESSING CORPORATION
ACCORDING TO THE BASE MAP SUB LICENSE
AGREEMENT WITH THE CITY OF ESCONDIDO

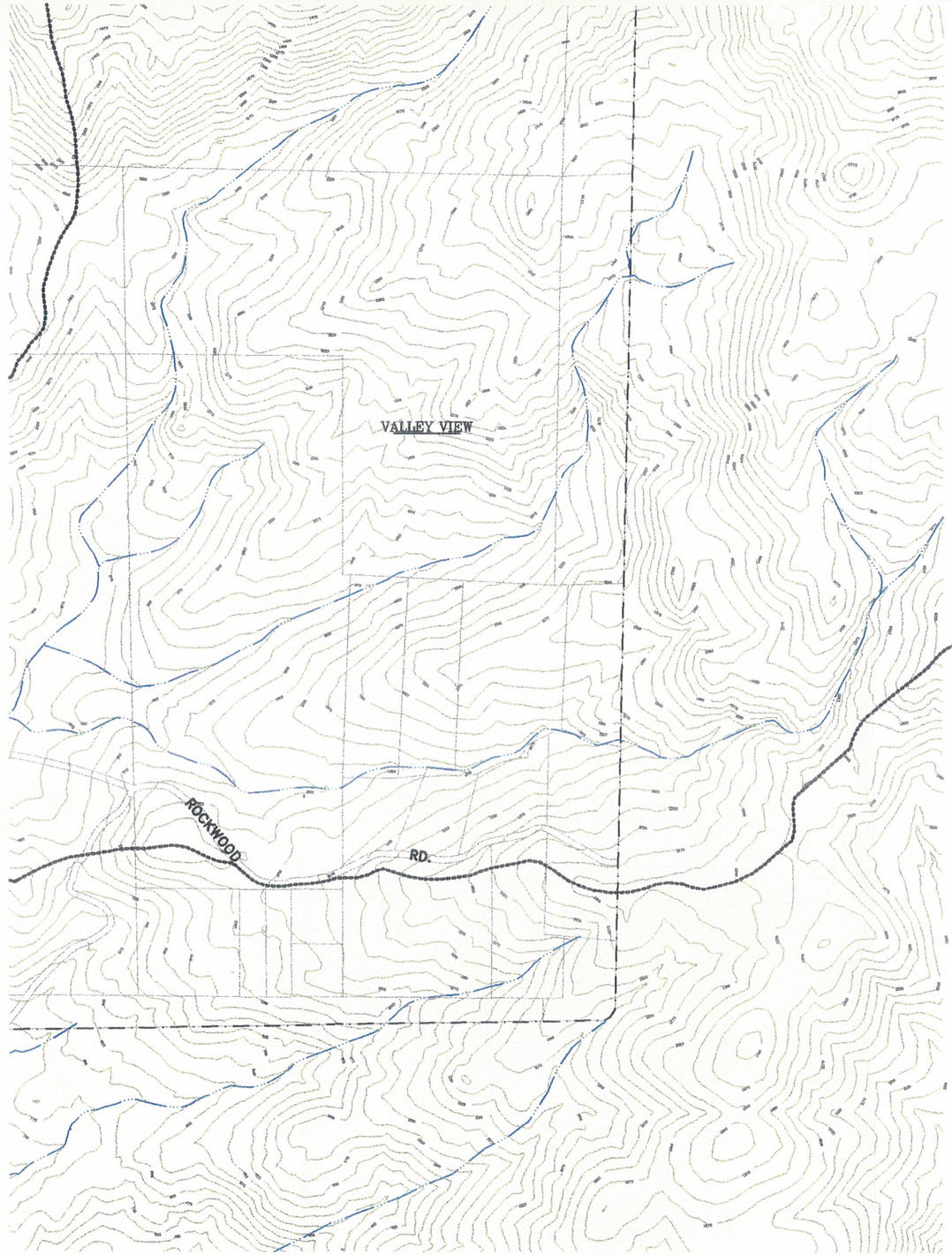
TOPOGRAPHY COMPILED BY:
GEONEX NORTH AMERICAN OPERATIONS, INC.
DATED NOVEMBER, 1992

LEGEND

- EXISTING CONTOUR ELEVATION
- EXISTING NATURAL FLOW
- EXISTING IMPROVED CHANNEL
- EXISTING STORM DRAIN
- PROPOSED FACILITY
- EXISTING LAKES

LEGEND

- MAJOR BASIN BOUNDARY
- MINOR BASIN BOUNDARY
- GENERAL PLAN BOUNDARY
- BASIN DESIGNATION
- EXIST. / PROP. DESILT BASIN FACILITY IDENTIFIER



N

SCALE IN FEET
400 200 0 400 800 1200

MASSON & ASSOCIATES, INC.
PLANNING ▾ ENGINEERING ▾ SURVEYING
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Date	App'd	REVISIONS	By	Date

Checked By	Drawn by	Designed By
DWM-END	DAM	JAW-LBR-END

Plans Prepared Under Supervision Of: For Masson & Assoc. Inc.

EDWARD N. DOMINGUE R.C.E. 34131 DATE:

SCALE
Horizontal
1" = 400'
DATE: 02-06-95
Drawn By: DAM

Submitted _____ Approved _____

By _____ By _____
Asst. City Engineer Asst. Director of Public Works

CITY OF ESCONDIDO DEPT. OF PUBLIC WORKS

DRAINAGE MASTER PLAN FOR THE CITY OF ESCONDIDO:

EXISTING / PROPOSED STORM DRAINS TILE 16

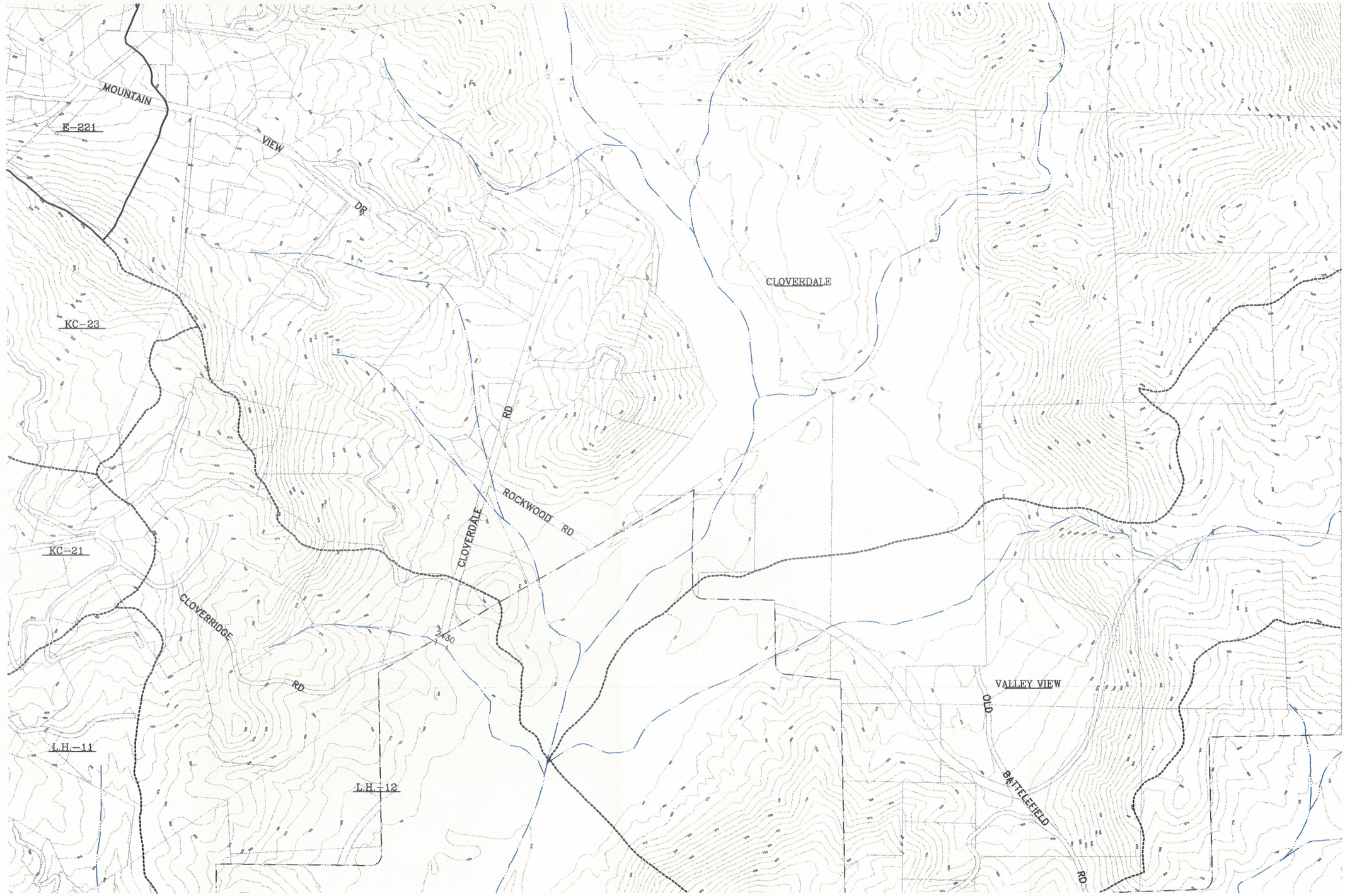
Drawing No.
D- 1114
Sheet 9 of 33

SEE TILE 24 (SHEET 17)

SEE TILE 18 (SHEET 11)

SEE TILE 16 (SHEET 9)

SEE TILE 14 (SHEET 8)



LEGEND

- EXISTING CONTOUR ELEVATION
- EXISTING NATURAL FLOW
- EXISTING IMPROVED CHANNEL
- EXISTING STORM DRAIN
- PROPOSED FACILITY
- EXISTING LAKES

LEGEND

- MAJOR BASIN BOUNDARY
- MINOR BASIN BOUNDARY
- GENERAL PLAN BOUNDARY
- BASIN DESIGNATION
- EXIST. / PROP. DESILT BASIN FACILITY IDENTIFIER

PARCEL LINE INFORMATION PROVIDED BY:
SAN DIEGO DATA PROCESSING CORPORATION
ACCORDING TO THE BASE MAP SUB LICENSE
AGREEMENT WITH THE CITY OF ESCONDIDO

TOPOGRAPHY COMPILED BY:
GEONEX NORTH AMERICAN OPERATIONS, INC.
DATED NOVEMBER, 1992

MASSON & ASSOCIATES, INC.
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200 E. WASHINGTON AVE. ▾ SUITE 200 ▾ ESCONDIDO ▾ CA 92025-1815
TEL (619) 741-3570 ▾ FAX (619) 741-1786

Date	App'd	REVISIONS	By	Date

Checked By	Drawn by	Designed By
DWM-END	DAM	JAW-LBR-END

Plans Prepared Under Supervision Of: For Masson & Assoc. Inc.
EDWARD N. DOMINGUE R.C.E. 34131 DATE:

SCALE
Horizontal
1" = 400'
DATE: 02-06-95
Drawn By: DAM

Submitted _____ Approved _____
By _____ Asst. City Engineer
By _____ Asst. Director of Public Works

CITY OF ESCONDIDO DEPT. OF PUBLIC WORKS
DRAINAGE MASTER PLAN FOR THE CITY OF ESCONDIDO:
EXISTING / PROPOSED STORM DRAINS TILE 17

Drawing No.
D- 1114
Sheet 10 of 33

SEE TILE 23 (SHEET 16)

SEE TILE 19 (SHEET 12)

SEE TILE 17 (SHEET 10)

SEE TILE 13 (SHEET 7)

LEGEND
MAJOR BASIN BOUNDARY
MINOR BASIN BOUNDARY
GENERAL PLAN BOUNDARY
BASIN DESIGNATION
EXIST. / PROP. DESILT BASIN
FACILITY IDENTIFIER 2056

LEGEND
EXISTING CONTOUR ELEVATION
EXISTING NATURAL FLOW
EXISTING IMPROVED CHANNEL
EXISTING STORM DRAIN
PROPOSED FACILITY
EXISTING LAKES

PARCEL LINE INFORMATION PROVIDED BY: SAN DIEGO DATA PROCESSING CORPORATION ACCORDING TO THE BASE MAP SUB LICENSE AGREEMENT WITH THE CITY OF ESCONDIDO

TOPOGRAPHY COMPILED BY: GEONEX NORTH AMERICAN OPERATIONS, INC. DATED NOVEMBER, 1992

SCALE IN FEET: 400 200 0 400 800 1200

N

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TEL (619) 741-3570 • FAX (619) 741-1786

Date	App'd	REVISIONS	By	Date

Checked By	Drawn by	Designed By	SCALE
DWM-END	DAM	JAW-LBR-END	Horizontal 1" = 400'
Plans Prepared Under Supervision Of: For Masson & Assoc. Inc.			DATE: 02-06-95
EDWARD N. DOMINGUE R.C.E. 34131	DATE:		Drawn By: DAM

Submitted ________ Approved ________
By ________ Asst. City Engineer
By ________ Asst. Director of Public Works

CITY OF ESCONDIDO — DEPT. OF PUBLIC WORKS
DRAINAGE MASTER PLAN FOR THE CITY OF ESCONDIDO:
EXISTING / PROPOSED STORM DRAINS TILE 18

Drawing No. D-1114

Sheet 11 of 33

SEE TILE 22 (SHEET 15)

SEE TILE 20 (SHEET 13)

SEE TILE 18 (SHEET 11)

SEE TILE 12 (SHEET 6)

PARCEL LINE INFORMATION PROVIDED BY:
SAN DIEGO DATA PROCESSING CORPORATION
ACCORDING TO THE BASE MAP SUB LICENSE
AGREEMENT WITH THE CITY OF ESCONDIDO

TOPOGRAPHY COMPILED BY:
GEONEX NORTH AMERICAN OPERATIONS, INC.
DATED NOVEMBER, 1992

LEGEND

- EXISTING CONTOUR ELEVATION
- EXISTING NATURAL FLOW
- EXISTING IMPROVED CHANNEL
- EXISTING STORM DRAIN
- PROPOSED FACILITY
- EXISTING LAKES

LEGEND

- MAJOR BASIN BOUNDARY
- MINOR BASIN BOUNDARY
- GENERAL PLAN BOUNDARY
- BASIN DESIGNATION (DE-4)
- EXIST. / PROP. DESILT BASIN (= / O)
- FACILITY IDENTIFIER (2056)

N

SCALE IN FEET: 400 200 0 400 800 1200

MASSON & ASSOCIATES, INC.
PLANNING ▾ ENGINEERING ▾ SURVEYING
200 E. WASHINGTON AVE. ▾ SUITE 200 ▾ ESCONDIDO ▾ CA 92025-1815
TEL (619) 741-3570 ▾ FAX (619) 741-1786

Date	App'd	REVISIONS	By	Date

Checked By	Drawn by	Designed By
DWM-END	DAM	JAW-LBR-END

Plans Prepared Under Supervision Of: For Masson & Assoc. Inc.
EDWARD N. DOMINGUE R.C.E. 34131 DATE:

SCALE
Horizontal
1" = 400'
DATE: 02-06-95
Drawn By: DAM

Submitted _____ Approved _____
By _____ Asst. City Engineer
By _____ Asst. Director of Public Works

CITY OF ESCONDIDO DEPT. OF PUBLIC WORKS
DRAINAGE MASTER PLAN FOR THE CITY OF ESCONDIDO:
EXISTING / PROPOSED STORM DRAINS TILE 19

Drawing No.
D- 1114
Sheet 12 of 33

SEE TILE 21 (SHEET 14)

SEE TILE 19 (SHEET 12)

PARCEL LINE INFORMATION PROVIDED BY:
SAN DIEGO DATA PROCESSING CORPORATION
ACCORDING TO THE BASE MAP SUB LICENSE
AGREEMENT WITH THE CITY OF ESCONDIDO

TOPOGRAPHY COMPILED BY:
GEONEX NORTH AMERICAN OPERATIONS, INC.
DATED NOVEMBER, 1992

LEGEND

- EXISTING CONTOUR ELEVATION
- EXISTING NATURAL FLOW
- EXISTING IMPROVED CHANNEL
- EXISTING STORM DRAIN
- PROPOSED FACILITY
- EXISTING LAKES

LEGEND

- MAJOR BASIN BOUNDARY
- MINOR BASIN BOUNDARY
- GENERAL PLAN BOUNDARY
- BASIN DESIGNATION
- EXIST. / PROP. DESILT BASIN
- FACILITY IDENTIFIER

SCALE IN FEET: 400 200 0 400 800 1200

N

SAN MARCOS

VINEYARD

DRIVE

KAUNA

LOA

CLUB

COUNTRY

ROAD

GROVE

HARMONY

AVE

DR

ANDREASEN

HALF

E-62

E-72

E-82

E-81

E-92

E-102

SEE TILE 11 (SHEET 5)

MASSON & ASSOCIATES, INC.
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200 E. WASHINGTON AVE. ▾ SUITE 200 ▾ ESCONDIDO ▾ CA 92025-1818
TEL (619) 741-3570 ▾ FAX (619) 741-1786

Date	App'd	REVISIONS	By	Date

Checked By	Drawn by	Designed By
DWM-END	DAM	JAW-LBR-END

Plans Prepared Under Supervision Of: For Masson & Assoc. Inc.

EDWARD N. DOMINGUE R.C.E. 34131 DATE:

SCALE Horizontal 1" = 400'

DATE: 02-06-95 Drawn By: DAM

Submitted _____ Approved _____

By _____ Asst. City Engineer

By _____ Asst. Director of Public Works

CITY OF ESCONDIDO DEPT. OF PUBLIC WORKS

DRAINAGE MASTER PLAN FOR THE CITY OF ESCONDIDO:

EXISTING / PROPOSED STORM DRAINS TILE 20

Drawing No. D- 1114

Sheet 13 of 33

SEE TILE 30 (SHEET 23)

PARCEL LINE INFORMATION PROVIDED BY:
SAN DIEGO DATA PROCESSING CORPORATION
ACCORDING TO THE BASE MAP SUB LICENSE
AGREEMENT WITH THE CITY OF ESCONDIDO

TOPOGRAPHY COMPILED BY:
GEONEX NORTH AMERICAN OPERATIONS, INC.
DATED NOVEMBER, 1992

LEGEND

- EXISTING CONTOUR ELEVATION
- EXISTING NATURAL FLOW
- EXISTING IMPROVED CHANNEL
- EXISTING STORM DRAIN
- PROPOSED FACILITY
- EXISTING LAKES

LEGEND

- MAJOR BASIN BOUNDARY
- MINOR BASIN BOUNDARY
- GENERAL PLAN BOUNDARY
- BASIN DESIGNATION
- EXIST. / PROP. DESILT BASIN FACILITY IDENTIFIER

SCALE IN FEET: 400 200 0 400 800 1200

N

SAN MARCOS

BENNETT AVE

ROCK SPRINGS RD

NORDAHL RD

MISSION AVE

DEODAR RD

HWY 78

E-102

E-62

SEE TILE 22 (SHEET 15)

SEE TILE 20 (SHEET 13)

MASSON & ASSOCIATES, INC.
PLANNING ▾ ENGINEERING ▾ SURVEYING
200 E. WASHINGTON AVE. ▾ SUITE 200 ▾ ESCONDIDO ▾ CA 92025-1818
TEL (619) 741-3570 ▾ FAX (619) 741-1786

Date	App'd	REVISIONS	By	Date

Checked By	Drawn by	Designed By
DWM-END	DAM	JAW-LBR-END

Plans Prepared Under Supervision Of: For Masson & Assoc. Inc.

EDWARD N. DOMINGUE R.C.E. 34131 DATE:

SCALE: Horizontal 1" = 400'

DATE: 02-06-95
Drawn By: DAM

Submitted _____ Approved _____

By _____ Asst. City Engineer

By _____ Asst. Director of Public Works

CITY OF ESCONDIDO DEPT. OF PUBLIC WORKS

DRAINAGE MASTER PLAN FOR THE CITY OF ESCONDIDO:

EXISTING / PROPOSED STORM DRAINS TILE 21

Drawing No. D-1114

Sheet 14 of 33

SEE TILE 29 (SHEET 22)

SEE TILE 21 (SHEET 14)

SEE TILE 23 (SHEET 16)

SEE TILE 19 (SHEET 12)

PARCEL LINE INFORMATION PROVIDED BY:
SAN DIEGO DATA PROCESSING CORPORATION
ACCORDING TO THE BASE MAP SUB LICENSE
AGREEMENT WITH THE CITY OF ESCONDIDO

TOPOGRAPHY COMPILED BY:
GEONEX NORTH AMERICAN OPERATIONS, INC.
DATED NOVEMBER, 1992

LEGEND

- EXISTING CONTOUR ELEVATION
- EXISTING NATURAL FLOW
- EXISTING IMPROVED CHANNEL
- EXISTING STORM DRAIN
- PROPOSED FACILITY
- EXISTING LAKES

LEGEND

- MAJOR BASIN BOUNDARY
- MINOR BASIN BOUNDARY
- GENERAL PLAN BOUNDARY
- BASIN DESIGNATION
- EXIST. / PROP. DESILT BASIN
- FACILITY IDENTIFIER

SCALE IN FEET: 400 200 0 400 800 1200

N

SEE TILE 19 (SHEET 12)

MASSON & ASSOCIATES, INC.	Date	App'd	REVISIONS	By	Date
PLANNING ▾ ENGINEERING ▾ SURVEYING					
200 E. WASHINGTON AVE. ▾ SUITE 200 ▾ ESCONDIDO ▾ CA 92025-1818					
TEL (619) 741-3570 ▾ FAX (619) 741-1786					

Checked By	Drawn by	Designed By
DWM-END	DAM	JAW-LBR-END

Plans Prepared Under Supervision Of: For Masson & Assoc. Inc.

EDWARD N. DOMINGUE R.C.E. 34131 DATE:

SCALE: Horizontal 1" = 400'

DATE: 02-06-95 Drawn By: DAM

Submitted _____ Approved _____

By _____ Asst. City Engineer

By _____ Asst. Director of Public Works

CITY OF ESCONDIDO DEPT. OF PUBLIC WORKS

DRAINAGE MASTER PLAN FOR THE CITY OF ESCONDIDO:

EXISTING / PROPOSED STORM DRAINS TILE 22

Drawing No. D-1114

Sheet 15 of 33

SEE TILE 28 (SHEET 21)

SEE TILE 22 (SHEET 15)

SEE TILE 24 (SHEET 17)

PARCEL LINE INFORMATION PROVIDED BY:
SAN DIEGO DATA PROCESSING CORPORATION
ACCORDING TO THE BASE MAP SUB LICENSE
AGREEMENT WITH THE CITY OF ESCONDIDO

TOPOGRAPHY COMPILED BY:
GEONEX NORTH AMERICAN OPERATIONS, INC.
DATED NOVEMBER, 1992

LEGEND

- EXISTING CONTOUR ELEVATION
- EXISTING NATURAL FLOW
- EXISTING IMPROVED CHANNEL
- EXISTING STORM DRAIN
- PROPOSED FACILITY
- EXISTING LAKES

LEGEND

- MAJOR BASIN BOUNDARY
- MINOR BASIN BOUNDARY
- GENERAL PLAN BOUNDARY
- BASIN DESIGNATION
- EXIST. / PROP. DESILT BASIN
- FACILITY IDENTIFIER

SCALE IN FEET: 400 200 0 400 800 1200

N

SEE TILE 18 (SHEET 11)

MASSON & ASSOCIATES, INC.	PLANNING ▼ ENGINEERING ▼ SURVEYING
200 E. WASHINGTON AVE. ▼ SUITE 200 ▼ ESCONDIDO ▼ CA 92025-1816	TEL (619) 741-3570 ▼ FAX (619) 741-1786

Date	App'd	REVISIONS	By	Date

Checked By	Drawn by	Designed By
DWM-END	DAM	JAW-LBR-END

Plans Prepared Under Supervision Of: For Masson & Assoc. Inc.

EDWARD N. DOMINGUE R.C.E. 34131 DATE:

SCALE Horizontal 1" = 400'

DATE: 02-06-95 Drawn By: DAM

Submitted _____ Approved _____

By _____ Asst. City Engineer

By _____ Asst. Director of Public Works

CITY OF ESCONDIDO DEPT. OF PUBLIC WORKS

DRAINAGE MASTER PLAN FOR THE CITY OF ESCONDIDO:

EXISTING / PROPOSED STORM DRAINS TILE 23

Drawing No. D- 1114

Sheet 16 of 33

SEE TILE 27 (SHEET 20)

SEE TILE 23 (SHEET 16)

SEE TILE 25 (SHEET 18)

SEE: TILE 17 (SHEET 10)

PARCEL LINE INFORMATION PROVIDED BY:
SAN DIEGO DATA PROCESSING CORPORATION
ACCORDING TO THE BASE MAP SUB LICENSE
AGREEMENT WITH THE CITY OF ESCONDIDO

TOPOGRAPHY COMPILED BY:
GEONEX NORTH AMERICAN OPERATIONS, INC.
DATED NOVEMBER, 1992

LEGEND

- EXISTING CONTOUR ELEVATION
- EXISTING NATURAL FLOW
- EXISTING IMPROVED CHANNEL
- EXISTING STORM DRAIN
- PROPOSED FACILITY
- EXISTING LAKES

LEGEND

- MAJOR BASIN BOUNDARY
- MINOR BASIN BOUNDARY
- GENERAL PLAN BOUNDARY
- BASIN DESIGNATION
- EXIST. / PROP. DESILT BASIN
- FACILITY IDENTIFIER

N

SCALE IN FEET: 400 200 0 400 800 1200

OLD GUEJITO GRADE
EAST GROVE
E-241
377
477
E-231
2252
2251
REED RD
E-221
RD
STONEBRIDGE
STONEBRIDGE RD.
CLOVERDALE

MASSON & ASSOCIATES, INC.
PLANNING ▾ ENGINEERING ▾ SURVEYING
200 E. WASHINGTON AVE. ▾ SUITE 200 ▾ ESCONDIDO ▾ CA 92025-1815
TEL (619) 741-3570 ▾ FAX (619) 741-1786

Date	App'd	REVISIONS	By	Date

Checked By	Drawn by	Designed By
DWM-END	DAM	JAW-LBR-END

Plans Prepared Under Supervision Of: For Masson & Assoc. Inc.
EDWARD N. DOMINGUE R.C.E. 34131 DATE:

SCALE
Horizontal
1" = 400'
DATE: 02-06-95
Drawn By: DAM

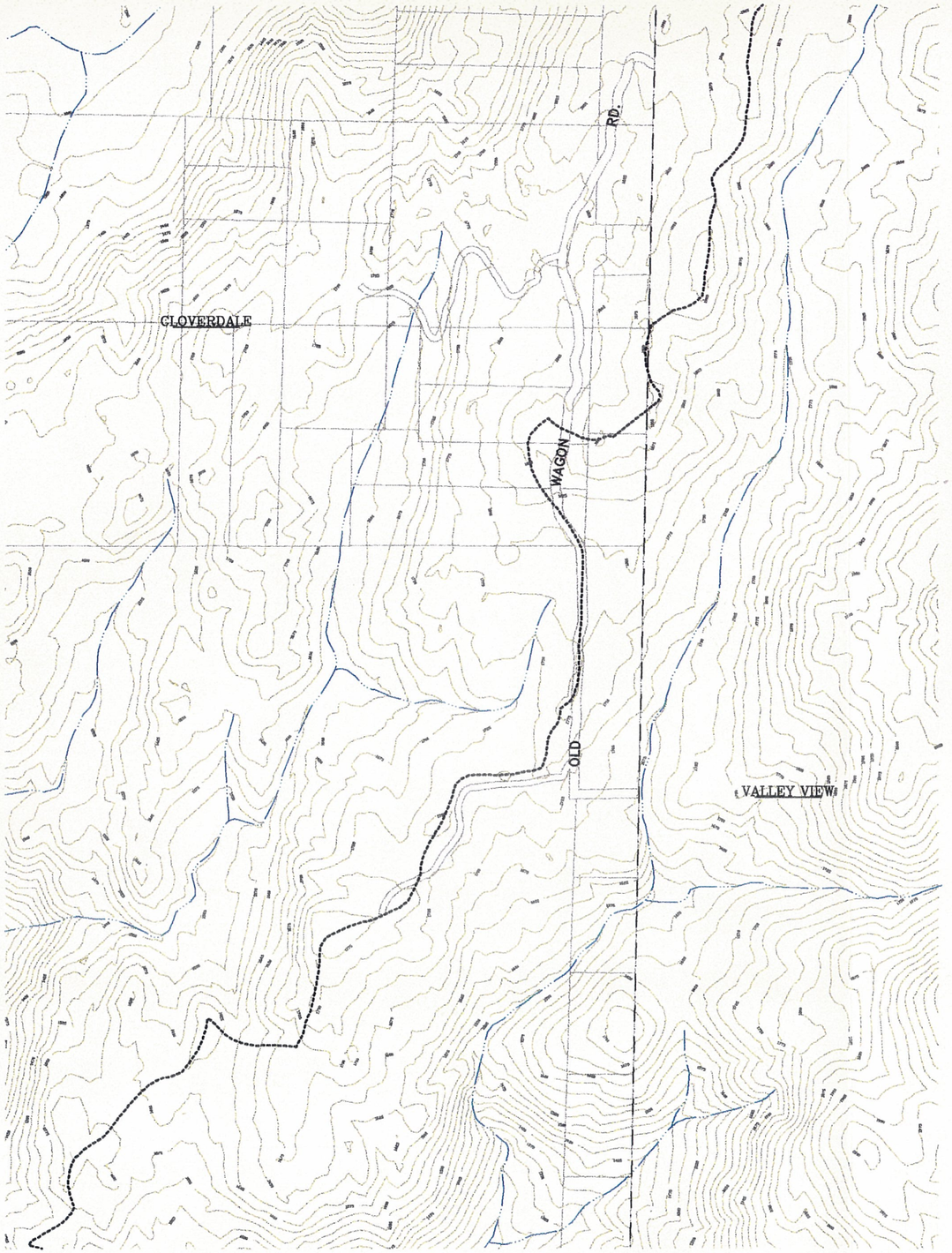
Submitted _____ Approved _____
By _____ Asst. City Engineer
By _____ Asst. Director of Public Works

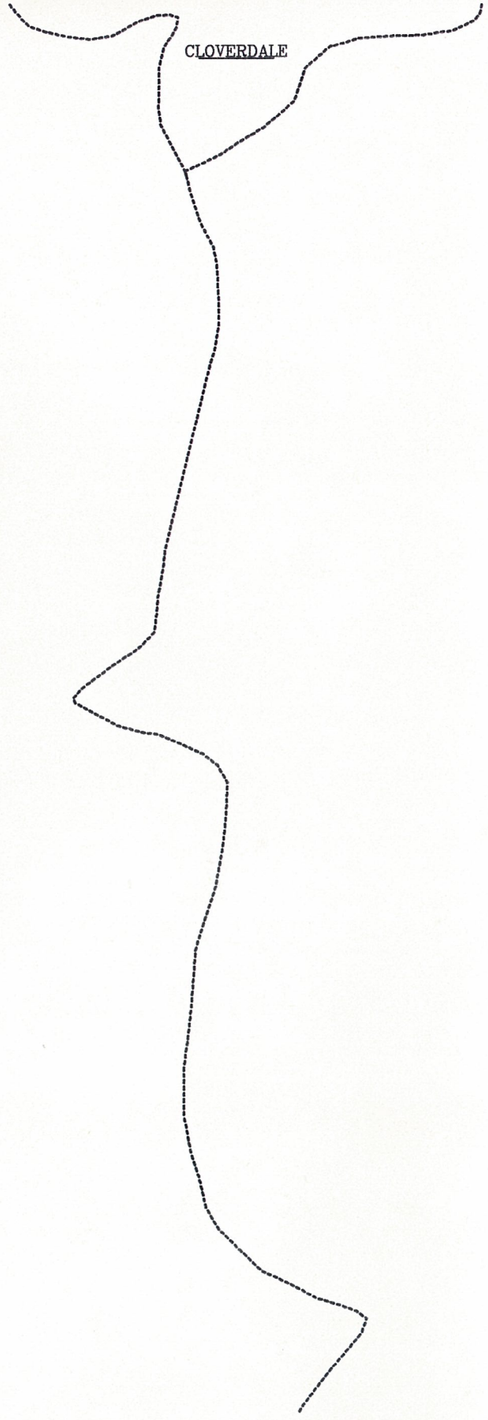
CITY OF ESCONDIDO DEPT. OF PUBLIC WORKS
DRAINAGE MASTER PLAN FOR THE CITY OF ESCONDIDO:
EXISTING / PROPOSED STORM DRAINS TILE 24

Drawing No.
D- 1114
Sheet 17 of 33

SEE TILE 26 (SHEET 19)

SEE TILE 24 (SHEET 17)





LEGEND

MAJOR BASIN BOUNDARY	EXISTING CONTOUR ELEVATION
MINOR BASIN BOUNDARY	EXISTING NATURAL FLOW
GENERAL PLAN BOUNDARY	EXISTING IMPROVED CHANNEL
BASIN DESIGNATION	EXISTING STORM DRAIN
EXIST. / PROP. DESILT BASIN	PROPOSED FACILITY
FACILITY IDENTIFIER	EXISTING LAKES

PARCEL LINE INFORMATION PROVIDED BY:
SAN DIEGO DATA PROCESSING CORPORATION
ACCORDING TO THE BASE MAP SUB LICENSE
AGREEMENT WITH THE CITY OF ESCONDIDO

TOPOGRAPHY COMPILED BY:
GEONEX NORTH AMERICAN OPERATIONS, INC.
DATED NOVEMBER, 1992

N

400 200 0 400 800 1200
SCALE IN FEET

SEE TILE 16 (SHEET 9)

MASSON & ASSOCIATES, INC.
PLANNING ▾ ENGINEERING ▾ SURVEYING
200 E. WASHINGTON AVE. ▾ SUITE 200 ▾ ESCONDIDO ▾ CA 92025-1816
TEL (619) 741-3570 ▾ FAX (619) 741-1786

Date	App'd	REVISIONS	By	Date

Checked By	Drawn by	Designed By
DWM-END	DAM	JAW-LBR-END

Plans Prepared Under Supervision Of: For Masson & Assoc. Inc.
EDWARD N. DOMINGUE R.C.E. 34131 DATE:

SCALE
Horizontal
1" = 400'
DATE: 02-06-95
Drawn By: DAM

Submitted _____ Approved _____
By _____ Asst. City Engineer
By _____ Asst. Director of Public Works

CITY OF ESCONDIDO DEPT. OF PUBLIC WORKS
DRAINAGE MASTER PLAN FOR THE CITY OF ESCONDIDO:
EXISTING / PROPOSED STORM DRAINS TILE 25

Drawing No.
D-1114
Sheet 18 of 33

SEE TILE 35 (SHEET 28)

SEE TILE 27 (SHEET 20)

SEE TILE 25 (SHEET 18)

PARCEL LINE INFORMATION PROVIDED BY:
SAN DIEGO DATA PROCESSING CORPORATION
ACCORDING TO THE BASE MAP SUB LICENSE
AGREEMENT WITH THE CITY OF ESCONDIDO

TOPOGRAPHY COMPILED BY:
GEONEX NORTH AMERICAN OPERATIONS, INC.
DATED NOVEMBER, 1992

LEGEND

- EXISTING CONTOUR ELEVATION
- EXISTING NATURAL FLOW
- EXISTING IMPROVED CHANNEL
- EXISTING STORM DRAIN
- PROPOSED FACILITY
- EXISTING LAKES

LEGEND

- MAJOR BASIN BOUNDARY
- MINOR BASIN BOUNDARY
- GENERAL PLAN BOUNDARY
- BASIN DESIGNATION — 2056
- EXIST. / PROP. DESILT BASIN FACILITY IDENTIFIER — E / 0

N

SCALE IN FEET: 400 200 0 400 800 1200

ESC. CREEK

ESC. CREEK

GUEJITO RD

CLOVERDALE

GUEJITO GRADE RD

OLD

VALLEY VIEW

MASSON & ASSOCIATES, INC.
PLANNING ▼ ENGINEERING ▼ SURVEYING
200 E. WASHINGTON AVE. ▼ SUITE 200 ▼ ESCONDIDO ▼ CA 92025–1516
TEL (619) 741–3570 ▼ FAX (619) 741–1786

Date	App'd	REVISIONS	By	Date

Checked By	Drawn by	Designed By
DWM–END	DAM	JAW–LBR–END

Plans Prepared Under Supervision Of: For Masson & Assoc. Inc.

EDWARD N. DOMINGUE R.C.E. 34131 DATE:

SCALE Horizontal 1" = 400'

DATE: 02–06–95 Drawn By DAM

Submitted _____ Approved _____

By _____ Asst. City Engineer

By _____ Asst. Director of Public Works

CITY OF ESCONDIDO DEPT. OF PUBLIC WORKS

DRAINAGE MASTER PLAN FOR THE CITY OF ESCONDIDO:

EXISTING / PROPOSED STORM DRAINS TILE 26

Drawing No. D– 1114

Sheet 19 of 33

SEE TILE 34 (SHEET 27)

SEE TILE 28 (SHEET 21)

SEE TILE 26 (SHEET 19)

SEE TILE 24 (SHEET 17)

PARCEL LINE INFORMATION PROVIDED BY:
SAN DIEGO DATA PROCESSING CORPORATION
ACCORDING TO THE BASE MAP SUB LICENSE
AGREEMENT WITH THE CITY OF ESCONDIDO

TOPOGRAPHY COMPILED BY:
GEONEX NORTH AMERICAN OPERATIONS, INC.
DATED NOVEMBER, 1992

LEGEND

- EXISTING CONTOUR ELEVATION
- EXISTING NATURAL FLOW
- EXISTING IMPROVED CHANNEL
- EXISTING STORM DRAIN
- PROPOSED FACILITY
- EXISTING LAKES

LEGEND

- MAJOR BASIN BOUNDARY
- MINOR BASIN BOUNDARY
- GENERAL PLAN BOUNDARY
- BASIN DESIGNATION
- EXIST. / PROP. DESILT BASIN FACILITY IDENTIFIER

SCALE IN FEET: 400 200 0 400 800 1200

N

N-3 N-2 N-1

BOTTS CANYON RD

CENTER

WOHLFORD RD

LAKE

WOHLFORD

OAKVALE RD

ESC. CREEK

E-252

VALLEY

2396

EAST GROVE

2392

2388

2387

CLOVERDALE

GUEJITO

GRADE

OLD RD

MASSON & ASSOCIATES, INC.
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TEL (619) 741-3570 ▾ FAX (619) 741-1786

Date	App'd	REVISIONS	By	Date

Checked By	Drawn by	Designed By
DWM-END	DAM	JAW-LBR-END

Plans Prepared Under Supervision Of: For Masson & Assoc. Inc.

EDWARD N. DOMINGUE R.C.E. 34131 DATE:

SCALE
Horizontal
1" = 400'
DATE: 02-06-95
Drawn By: DAM

Submitted _____ Approved _____

By _____ By _____
Asst. City Engineer Asst. Director of Public Works

CITY OF ESCONDIDO DEPT. OF PUBLIC WORKS

DRAINAGE MASTER PLAN FOR THE CITY OF ESCONDIDO:

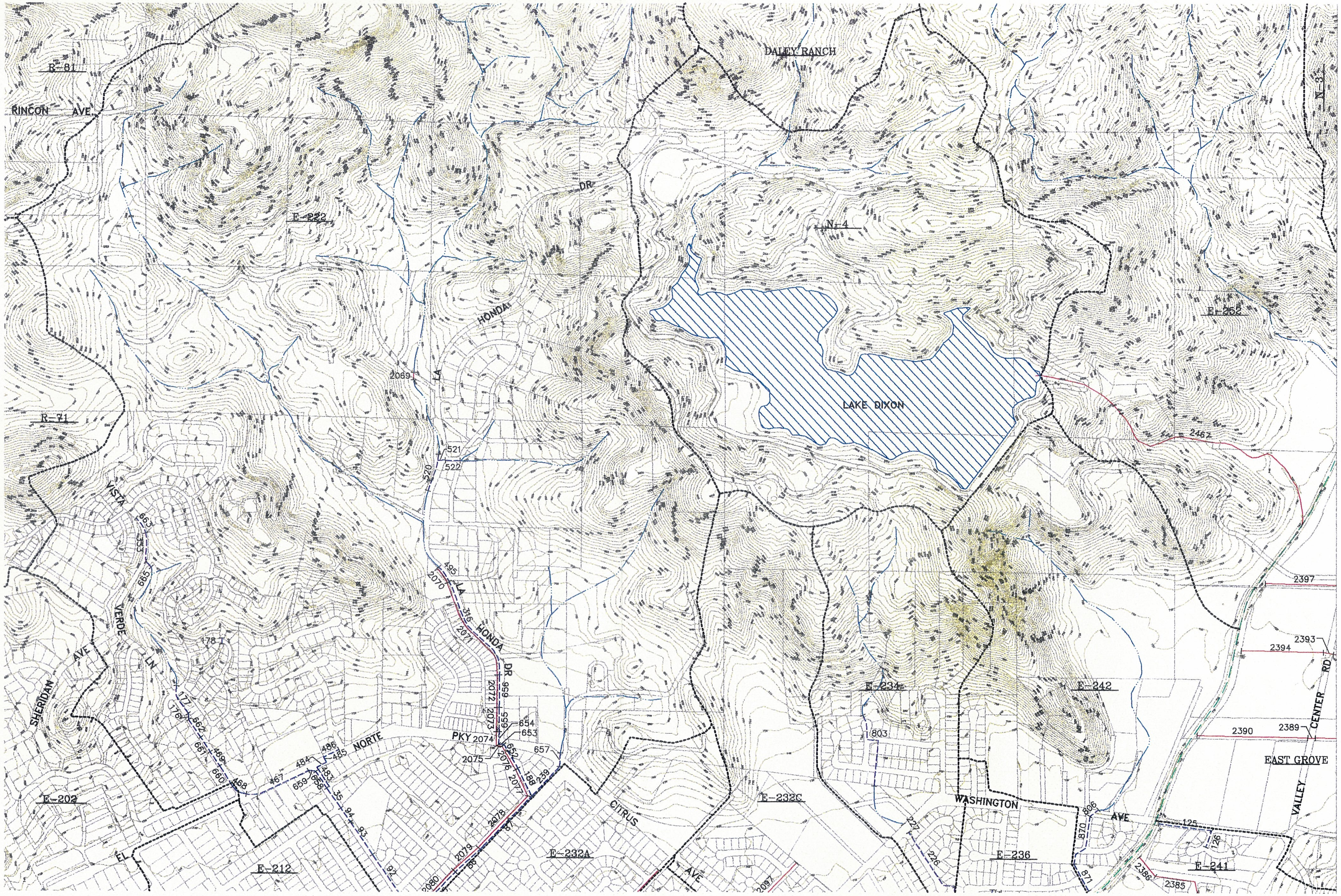
EXISTING / PROPOSED STORM DRAINS TILE 27

Drawing No. D-1114

Sheet 20 of 33

SEE TILE 33 (SHEET 26)

SEE TILE 29 (SHEET 22)



SEE TILE 27 (SHEET 20)

SEE TILE 23 (SHEET 16)

LEGEND

MAJOR BASIN BOUNDARY
MINOR BASIN BOUNDARY
GENERAL PLAN BOUNDARY
BASIN DESIGNATION
EXIST. / PROP. DESILT BASIN
FACILITY IDENTIFIER 2056

LEGEND

EXISTING CONTOUR ELEVATION
EXISTING NATURAL FLOW
EXISTING IMPROVED CHANNEL
EXISTING STORM DRAIN
PROPOSED FACILITY
EXISTING LAKES

PARCEL LINE INFORMATION PROVIDED BY:
SAN DIEGO DATA PROCESSING CORPORATION
ACCORDING TO THE BASE MAP SUB LICENSE
AGREEMENT WITH THE CITY OF ESCONDIDO

TOPOGRAPHY COMPILED BY:
GEONEX NORTH AMERICAN OPERATIONS, INC.
DATED NOVEMBER, 1992

N

400 200 0 400 800 1200
SCALE IN FEET

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Date	App'd	REVISIONS	By	Date

Checked By	Drawn by	Designed By	SCALE
DWM-END	DAM	JAW-LBR-END	Horizontal 1" = 400'
Plans Prepared Under Supervision Of: For Masson & Assoc. Inc.			DATE: 02-06-95 Drawn By: DAM
EDWARD N. DOMINGUE R.C.E. 34131		DATE:	

Submitted ____ Approved ____

By ____ Asst. City Engineer By ____ Asst. Director of Public Works

CITY OF ESCONDIDO DEPT. OF PUBLIC WORKS

DRAINAGE MASTER PLAN FOR THE CITY OF ESCONDIDO:

EXISTING / PROPOSED STORM DRAINS TILE 28

Drawing No. D-1114

SEE TILE 32 (SHEET 25)

SEE TILE 30 (SHEET 23)

SEE TILE 28 (SHEET 21)

SEE TILE 22 (SHEET 15)

PARCEL LINE INFORMATION PROVIDED BY:
SAN DIEGO DATA PROCESSING CORPORATION
ACCORDING TO THE BASE MAP SUB LICENSE
AGREEMENT WITH THE CITY OF ESCONDIDO

TOPOGRAPHY COMPILED BY:
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DATED NOVEMBER, 1992

LEGEND

- EXISTING CONTOUR ELEVATION
- EXISTING NATURAL FLOW
- EXISTING IMPROVED CHANNEL
- EXISTING STORM DRAIN
- PROPOSED FACILITY
- EXISTING LAKES

LEGEND

- MAJOR BASIN BOUNDARY
- MINOR BASIN BOUNDARY
- GENERAL PLAN BOUNDARY
- BASIN DESIGNATION
- EXIST. / PROP. DESILT BASIN FACILITY IDENTIFIER

N

SCALE IN FEET: 400 200 0 400 800 1200

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Date	App'd	REVISIONS	By	Date

Checked By	Drawn by	Designed By
DWM-END	DAM	JAW-LBR-END

Plans Prepared Under Supervision Of: For Masson & Assoc. Inc.

EDWARD N. DOMINGUE R.C.E. 34131 DATE:

SCALE
Horizontal
1" = 400'
DATE: 02-06-95
Drawn By: DAM

Submitted _____ Approved _____

By _____ Asst. City Engineer

By _____ Asst. Director of Public Works

CITY OF ESCONDIDO DEPT. OF PUBLIC WORKS

DRAINAGE MASTER PLAN FOR THE CITY OF ESCONDIDO:
EXISTING / PROPOSED STORM DRAINS TILE 29

Drawing No.
D- 1114
Sheet 22 of 33

SEE TILE 31 (SHEET 24)

SEE TILE 29 (SHEET 22)

PARCEL LINE INFORMATION PROVIDED BY:
SAN DIEGO DATA PROCESSING CORPORATION
ACCORDING TO THE BASE MAP SUB LICENSE
AGREEMENT WITH THE CITY OF ESCONDIDO

TOPOGRAPHY COMPILED BY:
GEONEX NORTH AMERICAN OPERATIONS, INC.
DATED NOVEMBER, 1992

LEGEND

- EXISTING CONTOUR ELEVATION
- EXISTING NATURAL FLOW
- EXISTING IMPROVED CHANNEL
- EXISTING STORM DRAIN
- PROPOSED FACILITY
- EXISTING LAKES

LEGEND

- MAJOR BASIN BOUNDARY
- MINOR BASIN BOUNDARY
- GENERAL PLAN BOUNDARY
- BASIN DESIGNATION
- EXIST. / PROP. DESILT BASIN FACILITY IDENTIFIER

SCALE IN FEET: 400 200 0 400 800 1200

N

SAN MARCOS

N-5

COUNTRY CLUB

EL NORTE PKY.

BENNETT AVE

DR

R-112

R-42

SEE TILE 21 (SHEET 14)

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Date	App'd	REVISIONS	By	Date

Checked By	Drawn by	Designed By
DWM-END	DAM	JAW-LBR-END

Plans Prepared Under Supervision Of: For Masson & Assoc. Inc.

EDWARD N. DOMINGUE R.C.E. 34131 DATE:

SCALE: Horizontal 1" = 400'

DATE: 02-06-95
Drawn By: DAM

Submitted _____ Approved _____

By _____ Asst. City Engineer

By _____ Asst. Director of Public Works

CITY OF ESCONDIDO DEPT. OF PUBLIC WORKS

DRAINAGE MASTER PLAN FOR THE CITY OF ESCONDIDO:

EXISTING / PROPOSED STORM DRAINS TILE 30

Drawing No. D- 1114

Sheet 23 of 33

SEE TILE 40 (SHEET 33)

SEE TILE 32 (SHEET 25)

SEE TILE 30 (SHEET 23)

PARCEL LINE INFORMATION PROVIDED BY:
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ACCORDING TO THE BASE MAP SUB LICENSE
AGREEMENT WITH THE CITY OF ESCONDIDO

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DATED NOVEMBER, 1992

LEGEND

- EXISTING CONTOUR ELEVATION
- EXISTING NATURAL FLOW
- EXISTING IMPROVED CHANNEL
- EXISTING STORM DRAIN
- PROPOSED FACILITY
- EXISTING LAKES

LEGEND

- MAJOR BASIN BOUNDARY
- MINOR BASIN BOUNDARY
- GENERAL PLAN BOUNDARY
- BASIN DESIGNATION
- EXIST. / PROP. DESILT BASIN FACILITY IDENTIFIER

SCALE IN FEET: 400 200 0 400 800 1200

N

SAN MARCOS

CENTRE CITY PKY

JESMOND DENE RD

R-112

T-15

N-5

528 527 526 525 976 908 2353 2354 2355

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Plans Prepared Under Supervision Of: For Masson & Assoc. Inc.

EDWARD N. DOMINGUE R.C.E. 34131 DATE:

SCALE Horizontal 1" = 400'

DATE: 02-06-95 Drawn By: DAM

Submitted _____ Approved _____

By _____ Asst. City Engineer

By _____ Asst. Director of Public Works

CITY OF ESCONDIDO DEPT. OF PUBLIC WORKS

DRAINAGE MASTER PLAN FOR THE CITY OF ESCONDIDO:

EXISTING / PROPOSED STORM DRAINS TILE 31

Drawing No. D-1114

Sheet 24 of 33

SEE TILE 39 (SHEET 32)

SEE TILE 31 (SHEET 24)

SEE TILE 33 (SHEET 26)

SEE TILE 29 (SHEET 22)

PARCEL LINE INFORMATION PROVIDED BY:
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ACCORDING TO THE BASE MAP SUB LICENSE
AGREEMENT WITH THE CITY OF ESCONDIDO

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DATED NOVEMBER, 1992

LEGEND

- EXISTING CONTOUR ELEVATION
- EXISTING NATURAL FLOW
- EXISTING IMPROVED CHANNEL
- EXISTING STORM DRAIN
- PROPOSED FACILITY
- EXISTING LAKES

LEGEND

- MAJOR BASIN BOUNDARY
- MINOR BASIN BOUNDARY
- GENERAL PLAN BOUNDARY
- BASIN DESIGNATION — JE-4
- EXIST. / PROP. DESILT BASIN — ○ / ○
- FACILITY IDENTIFIER — 2056

N

SCALE IN FEET
1200 800 400 0 400 200

N. BROADWAY
LAURASHAWN LN
KAYWOOD DR
NORTH AVE
CENTRE CITY PKWY
JESMOND DENE RD
R-20
R-112
R-83
R-81
794
797
795
796
793
792
2495
2346
2347
2348
2349
2356
2358
2359
2341
2491
2484

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DWM-END	DAM	JAW-LBR-END

Plans Prepared Under Supervision Of: For Masson & Assoc. Inc.
EDWARD N. DOMINGUE R.C.E. 34131 DATE:

SCALE Horizontal 1" = 400'
DATE: 02-06-95
Drawn By: DAM

Submitted _____ Approved _____
By _____ Asst. City Engineer
By _____ Asst. Director of Public Works

CITY OF ESCONDIDO DEPT. OF PUBLIC WORKS
DRAINAGE MASTER PLAN FOR THE CITY OF ESCONDIDO:
EXISTING / PROPOSED STORM DRAINS TILE 32

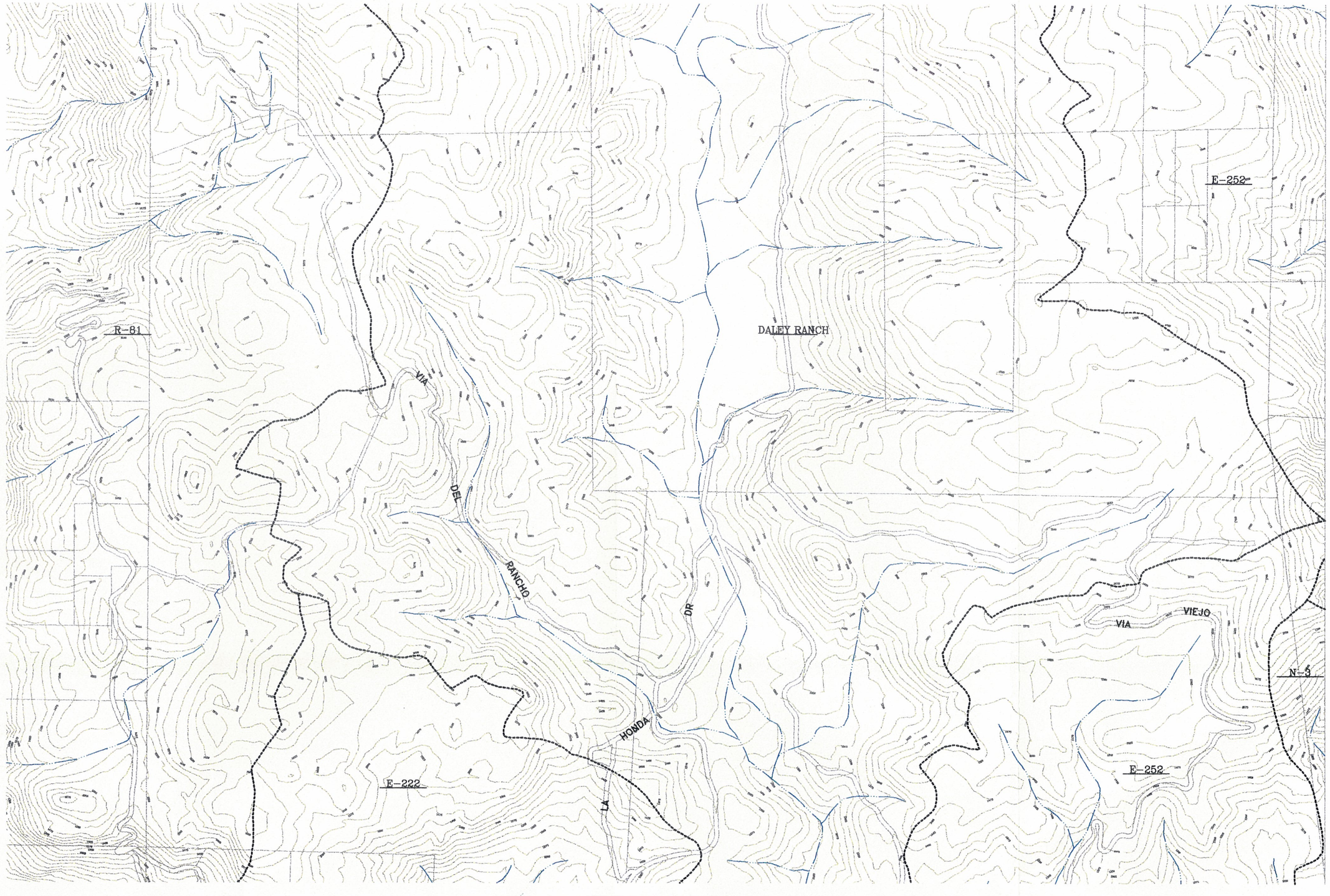
Drawing No. D- 1114
Sheet 25 of 33

SEE TILE 38 (SHEET 31)

SEE TILE 32 (SHEET 25)

SEE TILE 34 (SHEET 27)

SEE TILE 28 (SHEET 21)



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ACCORDING TO THE BASE MAP SUB LICENSE
AGREEMENT WITH THE CITY OF ESCONDIDO

TOPOGRAPHY COMPILED BY:
GEONEX NORTH AMERICAN OPERATIONS, INC.
DATED NOVEMBER, 1992

LEGEND

- EXISTING CONTOUR ELEVATION
- EXISTING NATURAL FLOW
- EXISTING IMPROVED CHANNEL
- EXISTING STORM DRAIN
- PROPOSED FACILITY
- EXISTING LAKES

LEGEND

- MAJOR BASIN BOUNDARY
- MINOR BASIN BOUNDARY
- GENERAL PLAN BOUNDARY
- BASIN DESIGNATION
- EXIST. / PROP. DESILT BASIN
- FACILITY IDENTIFIER

N

SCALE IN FEET: 400 200 0 400 800 1200

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Plans Prepared Under Supervision Of: For Masson & Assoc. Inc.

EDWARD N. DOMINGUE R.C.E. 34131 DATE:

SCALE
Horizontal
1" = 400'

DATE: 02-06-95
Drawn By: DAM

Submitted _____ Approved _____

By _____ Asst. City Engineer

By _____ Asst. Director of Public Works

CITY OF ESCONDIDO DEPT. OF PUBLIC WORKS

DRAINAGE MASTER PLAN FOR THE CITY OF ESCONDIDO:
EXISTING / PROPOSED STORM DRAINS TILE 33

Drawing No.
D- 1114
Sheet 26 of 33

SEE TILE 37 (SHEET 30)

SEE TILE 33 (SHEET 26)

SEE TILE 35 (SHEET 28)

SEE TILE 27 (SHEET 20)

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AGREEMENT WITH THE CITY OF ESCONDIDO

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DATED NOVEMBER, 1992

LEGEND

- EXISTING CONTOUR ELEVATION
- EXISTING NATURAL FLOW
- EXISTING IMPROVED CHANNEL
- EXISTING STORM DRAIN
- PROPOSED FACILITY
- EXISTING LAKES

LEGEND

- MAJOR BASIN BOUNDARY
- MINOR BASIN BOUNDARY
- GENERAL PLAN BOUNDARY
- BASIN DESIGNATION — 1E-5
- EXIST. / PROP. DESILT BASIN — E / D
- FACILITY IDENTIFIER — 2056

N

SCALE IN FEET
400 200 0 400 800 1200

E-252
N-1
N-2
N-3
CENTER
VALLEY
RD
ESC. CREEK
WOHLFORD
LAKE
WOHLFORD
LAKE
OAKVALE RD
898
897
896
895

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DWM-END	DAM	JAW-LBR-END

Plans Prepared Under Supervision Of: For Masson & Assoc. Inc.

EDWARD N. DOMINGUE R.C.E. 34131 DATE:

SCALE
Horizontal
1" = 400'
DATE: 02-06-95
Drawn By: DAM

Submitted _____ Approved _____

By _____ Asst. City Engineer

By _____ Asst. Director of Public Works

CITY OF ESCONDIDO DEPT. OF PUBLIC WORKS

DRAINAGE MASTER PLAN FOR THE CITY OF ESCONDIDO:

EXISTING / PROPOSED STORM DRAINS TILE 34

Drawing No. D- 1114

Sheet 27 of 33

SEE TILE 36 (SHEET 29)

SEE TILE 34 (SHEET 27)

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DATED NOVEMBER, 1992

LEGEND

- EXISTING CONTOUR ELEVATION
- EXISTING NATURAL FLOW
- EXISTING IMPROVED CHANNEL
- EXISTING STORM DRAIN
- PROPOSED FACILITY
- EXISTING LAKES

LEGEND

- MAJOR BASIN BOUNDARY
- MINOR BASIN BOUNDARY
- GENERAL PLAN BOUNDARY
- BASIN DESIGNATION — 15-5
- EXIST. / PROP. DESILT BASIN — ⊃ / ○
- FACILITY IDENTIFIER — 2056

N

SCALE IN FEET
400 200 0 400 800 1200

N-1

WOHLFORD RD

LAKE

ESC. CREEK

GUEJITO

RD.

OAKVALE RD

CLOVERDALE

SEE TILE 26 (SHEET 19)

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Date	App'd	REVISIONS	By	Date

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DWM-END	DAM	JAW-LBR-END

Plans Prepared Under Supervision Of: For Masson & Assoc. Inc.

EDWARD N. DOMINGUE R.C.E. 34131 DATE:

SCALE
Horizontal
1" = 400'
DATE: 02-06-95
Drawn By: DAM

Submitted _____ Approved _____

By _____ By _____
Asst. City Engineer Asst. Director of Public Works

CITY OF ESCONDIDO DEPT. OF PUBLIC WORKS

DRAINAGE MASTER PLAN FOR THE CITY OF ESCONDIDO:
EXISTING / PROPOSED STORM DRAINS TILE 35

Drawing No.
D- 1114
Sheet 28 of 33

PARCEL LINE INFORMATION PROVIDED BY:
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AGREEMENT WITH THE CITY OF ESCONDIDO

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DATED NOVEMBER, 1992

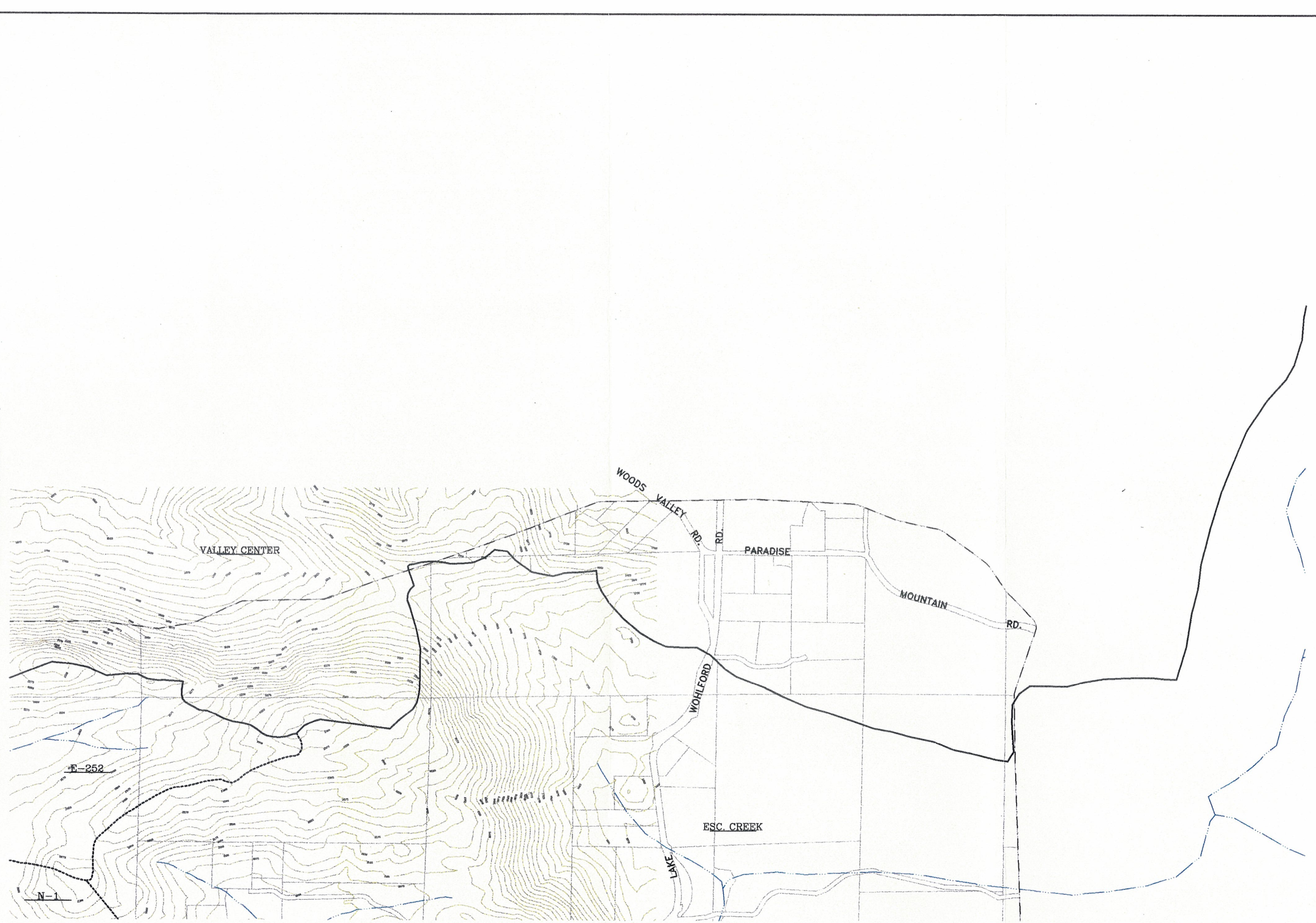
LEGEND

- EXISTING CONTOUR ELEVATION
- EXISTING NATURAL FLOW
- EXISTING IMPROVED CHANNEL
- EXISTING STORM DRAIN
- PROPOSED FACILITY
- EXISTING LAKES

LEGEND

- MAJOR BASIN BOUNDARY
- MINOR BASIN BOUNDARY
- GENERAL PLAN BOUNDARY
- BASIN DESIGNATION — Uf=5
- EXIST. / PROP. DESILT BASIN — ≈ / 0
- FACILITY IDENTIFIER — 2056

SEE TILE 37 (SHEET 30)



SEE TILE 35 (SHEET 28)

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Date	App'd	REVISIONS	By	Date

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DWM-END	DAM	JAW-LBR-END

Plans Prepared Under Supervision Of: For Masson & Assoc. Inc.
EDWARD N. DOMINGUE R.C.E. 34131 DATE:

SCALE Horizontal 1" = 400'
DATE: 02-05-95
Drawn By: DAM

Submitted _____ Approved _____
By _____ Asst. City Engineer
By _____ Asst. Director of Public Works

CITY OF ESCONDIDO DEPT. OF PUBLIC WORKS
DRAINAGE MASTER PLAN FOR THE CITY OF ESCONDIDO:
EXISTING / PROPOSED STORM DRAINS TILE 36

Drawing No. D-1114
Sheet 29 of 33

SEE TILE 38 (SHEET 31)

SEE TILE 36 (SHEET 29)

LEGEND

EXISTING CONTOUR ELEVATION
EXISTING NATURAL FLOW
EXISTING IMPROVED CHANNEL
EXISTING STORM DRAIN
PROPOSED FACILITY
EXISTING LAKES

PARCEL LINE INFORMATION PROVIDED BY:
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TOPOGRAPHY COMPILED BY:
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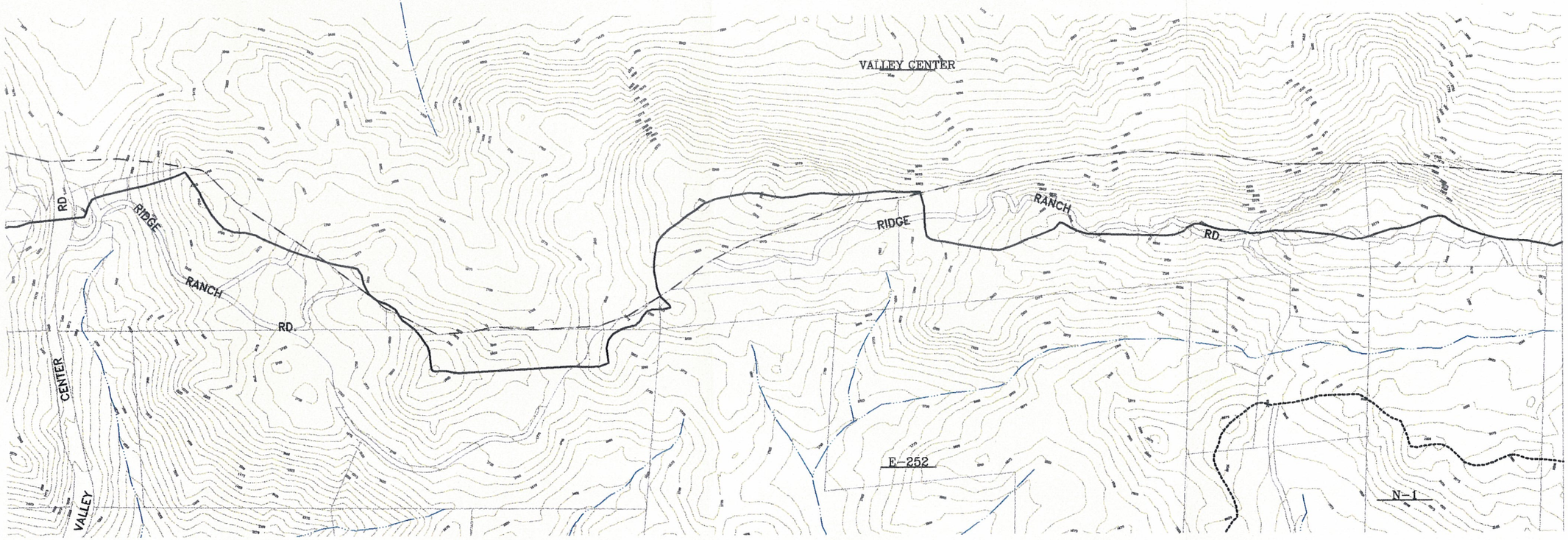
DATED NOVEMBER, 1992

LEGEND

MAJOR BASIN BOUNDARY
MINOR BASIN BOUNDARY
GENERAL PLAN BOUNDARY
BASIN DESIGNATION — HF-6
EXIST. / PROP. DESILT BASIN — ⊃ / O
FACILITY IDENTIFIER — 2056



N

1200 800 400 0 200 400 SCALE IN FEET

SEE TILE 34 (SHEET 27)

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DWM-END	DAM	JAW-LBR-END

Plans Prepared Under Supervision Of: For Masson & Assoc. Inc.

EDWARD N. DOMINGUE R.C.E. 34131 DATE:

SCALE
Horizontal
1" = 400'
DATE: 02-06-95
Drawn By: DAM

Submitted _____ Approved _____

By _____ Asst. City Engineer

By _____ Asst. Director of Public Works

CITY OF ESCONDIDO DEPT. OF PUBLIC WORKS

DRAINAGE MASTER PLAN FOR THE CITY OF ESCONDIDO:
EXISTING / PROPOSED STORM DRAINS TILE 37

Drawing No.
D- 1114
Sheet 30 of 33

PARCEL LINE INFORMATION PROVIDED BY:
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AGREEMENT WITH THE CITY OF ESCONDIDO

TOPOGRAPHY COMPILED BY:
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DATED NOVEMBER, 1992

LEGEND

EXISTING CONTOUR ELEVATION	165
EXISTING NATURAL FLOW	
EXISTING IMPROVED CHANNEL	
EXISTING STORM DRAIN	
PROPOSED FACILITY	
EXISTING LAKES	

LEGEND

MAJOR BASIN BOUNDARY	
MINOR BASIN BOUNDARY	
GENERAL PLAN BOUNDARY	
BASIN DESIGNATION	DP-6
EXIST. / PROP. DESILT BASIN	E / D
FACILITY IDENTIFIER	2056

SEE TILE 39 (SHEET 32)

SEE TILE 37 (SHEET 30)

VALLEY CENTER

R-20

DALEY RANCH

BANBURY DR.

LA HONDA DR.

R-61

E-252

N

SCALE IN FEET
400 200 0 400 800 1200

SEE TILE 33 (SHEET 26)

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1" = 400'

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Drawn By: DAM

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By _____ Asst. City Engineer

By _____ Asst. Director of Public Works

CITY OF ESCONDIDO DEPT. OF PUBLIC WORKS

DRAINAGE MASTER PLAN FOR THE CITY OF ESCONDIDO:
EXISTING / PROPOSED STORM DRAINS TILE 38

Drawing No.
D- 1114
Sheet 31 of 33

SEE TILE 40 (SHEET 33)

SEE TILE 38 (SHEET 31)

SEE TILE 32 (SHEET 25)

PARCEL LINE INFORMATION PROVIDED BY:
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ACCORDING TO THE BASE MAP SUB LICENSE
AGREEMENT WITH THE CITY OF ESCONDIDO

TOPOGRAPHY COMPILED BY:
GEONEX NORTH AMERICAN OPERATIONS, INC.
DATED NOVEMBER, 1992

LEGEND

- EXISTING CONTOUR ELEVATION
- EXISTING NATURAL FLOW
- EXISTING IMPROVED CHANNEL
- EXISTING STORM DRAIN
- PROPOSED FACILITY
- EXISTING LAKES

LEGEND

- MAJOR BASIN BOUNDARY
- MINOR BASIN BOUNDARY
- GENERAL PLAN BOUNDARY
- BASIN DESIGNATION — UF=6
- EXIST. / PROP. DESILT BASIN — C / O
- FACILITY IDENTIFIER — 2056

SCALE IN FEET: 400 200 0 400 800 1200

N

SAN MARCOS

MOUNTAIN MEADOW RD

SAN MARCOS

N. BROADWAY

R-112

R-20

R-81

R-83

MASSON & ASSOCIATES, INC.
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Plans Prepared Under Supervision Of: For Masson & Assoc. Inc.

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1" = 400'
DATE: 02-06-95
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Submitted _____ Approved _____

By _____ By _____
Asst. City Engineer Asst. Director of Public Works

CITY OF ESCONDIDO DEPT. OF PUBLIC WORKS

DRAINAGE MASTER PLAN FOR THE CITY OF ESCONDIDO:
EXISTING / PROPOSED STORM DRAINS TILE 39

Drawing No.
D- 1114
Sheet 32 of 33

LEGEND

- EXISTING CONTOUR ELEVATION
- EXISTING NATURAL FLOW
- EXISTING IMPROVED CHANNEL
- EXISTING STORM DRAIN
- PROPOSED FACILITY
- EXISTING LAKES

PARCEL LINE INFORMATION PROVIDED BY:
SAN DIEGO DATA PROCESSING CORPORATION
ACCORDING TO THE BASE MAP SUB LICENSE
AGREEMENT WITH THE CITY OF ESCONDIDO

TOPOGRAPHY COMPILED BY:
GEONEX NORTH AMERICAN OPERATIONS, INC.
DATED NOVEMBER, 1992

LEGEND

- MAJOR BASIN BOUNDARY
- MINOR BASIN BOUNDARY
- GENERAL PLAN BOUNDARY
- BASIN DESIGNATION
- EXIST. / PROP. DESILT BASIN FACILITY IDENTIFIER

1F=5
2 / 0
2056

N

SCALE IN FEET
400 200 0 400 800 1200

MASSON & ASSOCIATES, INC.
PLANNING ▾ ENGINEERING ▾ SURVEYING
200 E. WASHINGTON AVE. ▾ SUITE 200 ▾ ESCONDIDO ▾ CA 92025-1818
TEL (619) 741-3570 ▾ FAX (619) 741-1786

Date	App'd	REVISIONS	By	Date

Checked By	Drawn by	Designed By
DWM-END	DAM	JAW-LER-END

Plans Prepared Under Supervision Of: For Masson & Assoc. Inc.
EDWARD N. DOMINGUE R.C.E. 34131 DATE:

SCALE
Horizontal
1" = 400'
DATE: 02-06-95
Drawn By: DAM

Submitted _____ Approved _____
By _____ Asst. City Engineer
By _____ Asst. Director of Public Works

CITY OF ESCONDIDO DEPT. OF PUBLIC WORKS
DRAINAGE MASTER PLAN FOR THE CITY OF ESCONDIDO:
EXISTING / PROPOSED STORM DRAINS TILE 40

Drawing No.
D- 1114
Sheet 33 of 33