SAN MATEO COUNTY
GUIDELINES FOR DRAINAGE REVIEW

The following is intended to summarize the San Mateo County Policy on Storm Drainage to guide the applicant and the civil engineer when preparing a drainage analysis as a required "Condition of Approval" for proposed development.

SAN MATEO COUNTY DRAINAGE POLICY:

1. Post-development peak flow (runoff) and velocity must be less than or equal to pre-development peak flow and velocity in areas where there are no existing down stream storm drain systems. No additional runoff, caused by development, can cross property lines. In areas where there are existing storm drain systems, those systems must be of adequate size to accept the increased runoff, or, mitigation procedures must be taken. Mitigation procedures may include on-site storm drain detention or off-site storm drain improvements.

2. If permanent structures are to be built over existing drainage courses or drainage facilities courses or drainage facilities.

    a. adequate drainage facilities must be provided to protect the proposed development and existing downstream development.

    b. A means of adequate access must be provided for maintenance

    c. An alternate system for drainage must be provided in the event the primary system becomes plugged or otherwise inoperable.

3. The use of dry wells to dispose of surface runoff may be allowed.

4. Drainage systems that are designed to rely on pumps may not be allowed.

To comply with County Policy, the applicant's civil engineer must submit a drainage report, hydrologic study, hydraulic calculations, and drainage improvement plans. The following sections present general guidelines for these items.

DRAINAGE REPORT:

A drainage report (written narrative) must be submitted to the County for review and include the following:

1. Delineation of drainage basins and subbasins.
2. Description of proposed drainage system.
3. Discussion of rationale used to design system
4. Discussion of methods and/or calculations.
5. Description of how excess drainage will be detained.
6. Description of how discharge will be controlled to comply with County Policy.

HYDROLOGIC ANALYSIS:

The hydrologic calculations must be based on an appropriate design storm for the specific site conditions and project. For projects located within a floodplain or bounding an existing drainage course located on or adjacent to the property, the design shall be based upon a design storm of no less than a 100 year recurrence interval may be used.

The hydrologic analysis must include the following:

1. ANALYSIS/CALCULATIONS MUST BE SIGNED AND STAMPED BY A REGISTERED CIVIL ENGINEER. WITHOUT THIS REQUIREMENT BEING MET, NO FURTHER REVIEW OF THE DRAINAGE ANALYSIS WILL BE PEFORMED.

2. All drainage basins and/or subbasins clearly shown on a map plan.

3. A clear description of the method used to determine peak flows.

4. If the rational method (Q = C I A) is used;

   a. provide a clear statement of the basis for the runoff coefficient, (C) rainfall intensity (I), time of concentration (T), and duration, etc., and

   b. a clear description showing the areas used in the formula.

5. If another method is used, provide a statement of method, a clear description of the basis for all assumptions and the source of all information used in the particular method.

6. Calculations for pre-development peak flow AND velocity.

7. Calculations for post-development peak flow AND velocity.

8. Calculations for detention basin design and a determination of the required volume of storage to comply with a County Policy.

HYRAULIC ANALYSIS:

ANALYSIS/CALCULATIONS MUST BE SIGNED AND STAMPED BY A REGISTERED CIVIL ENGINEER. WITHOUT THIS REQUIREMENT BEING MET, NO FURTHER REVIEW OF THE DRAINAGE ANALYSIS WILL BE PERFORMED.

The hydraulic analysis must include calculations that clearly demonstrate:

1. that the post-development discharge will be controlled, and peak flow and velocity will not exceed pre-development values

2. that all storm drainage facilities have sufficient capacity to carry the anticipated peak flows. These facilities include, but are not necessarily limited to:
   a. pipes
   b. culverts
   c. swales
   d. ditches
   e. valley gutters, etc.

PLANS:

The plans must incorporate the following items:

1. PLANS MUST BE SIGNED AND STAMPED BY A REGISTERED CIVIL ENGINEER. WITHOUT THIS REQUIREMENT BEING MET, NO FURTHER REVIEW OF THE DRAINAGE ANALYSIS WILL BE PERFORMED.

2. All proposed storm drainage contours and/or spot elevations clearly indicated.

3. Existing and proposed contours and/or spot elevations clearly indicated.

4. All flow patterns clearly shown.

5. Profiles of all storm drain lines including all crossings of other utilities. A minimum one (1) foot clearance between utility lines is required.

6. Construction details must be shown, including but not necessarily limited to:

   a. specific locations of all storm drainage facilities specified (i.e. stations, dimensions from property lines, etc.),

   b. dimensions of all storm drainage facilities, including Standard County Drawings where applicable,

   c. pipe/swale slopes, pipe sizes, etc.,

   d. invert elevations, and

   e. construction materials must be specified (i.e. RCP, PVC, DIP, etc.).

SUMMARY:

The above is intended only to provide the applicant and the applicant's civil engineer with minimum guidelines when preparing a drainage analysis. The County does not specify the design method that the applicant's engineer uses to prepare the drainage analysis. It is incumbent on the engineer to select a design method that is appropriate for the specific project and site accepting responsibility for the design. The County reviews the design as to concept and to see that the design adequately reflects County policy. The County's review does not include checking the calculations for accuracy nor making assumptions regarding the analysis.

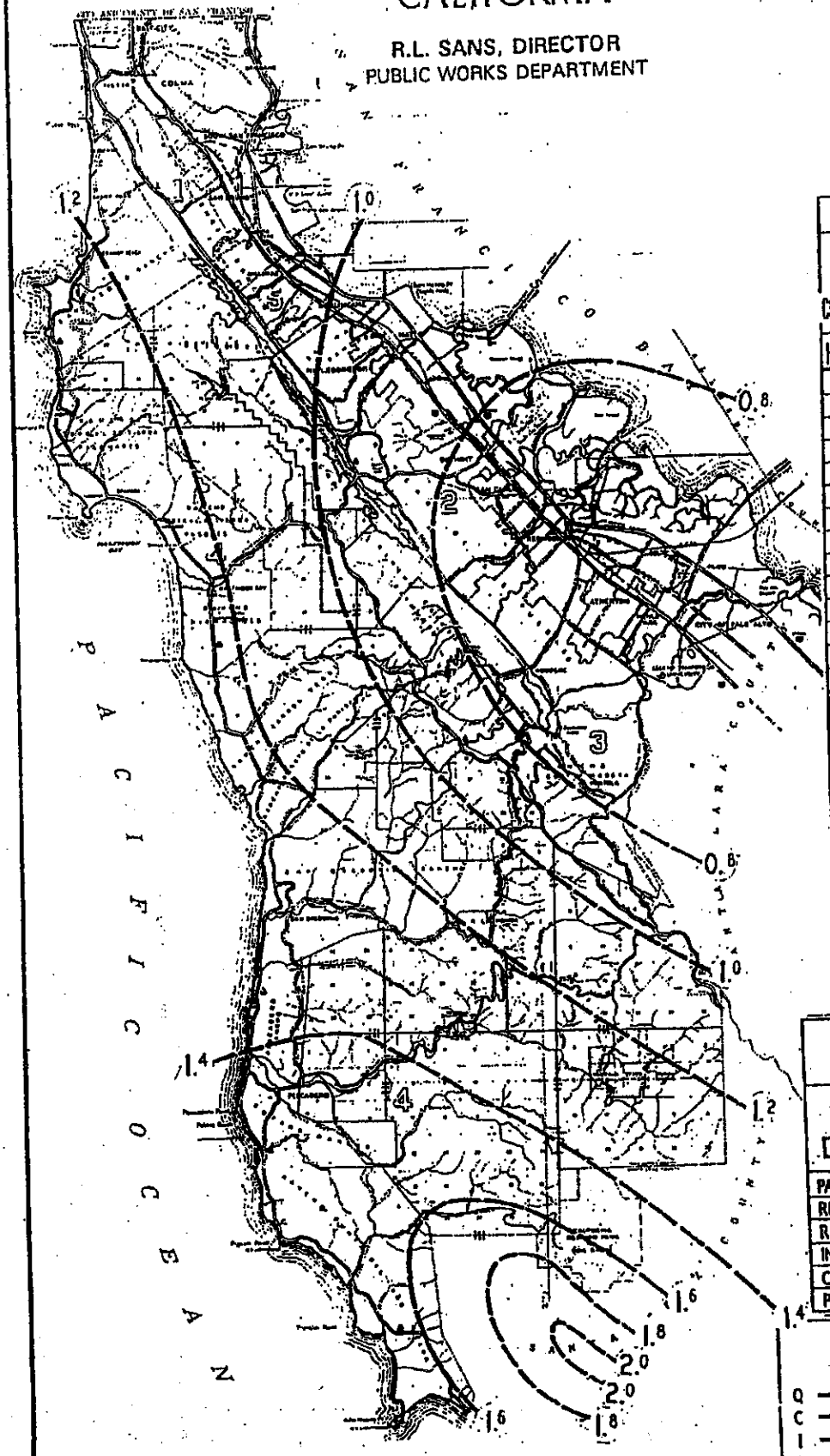
It is to the applicant's advantage to clearly show what is being recommended for construction. Mistakes, ambiguities, incomplete information, and poor preparation of the analysis only serve to delay the review and approval process.

RAINFALL RUNOFF DATA

SAN MATEO COUNTY

CALIFORNIA

R.L. SANS, DIRECTOR
PUBLIC WORKS DEPARTMENT



RAINFALL		
TIME OF CONCENTRATION	INTENSITY INCHES PER HOUR	
HRS. MIN.	10 YR.	100 YR.
0 — 10	2.45	3.60
0 — 15	2.05	3.00
0 — 20	1.73	2.55
0 — 25	1.50	2.22
0 — 30	1.33	1.95
0 — 35	1.20	1.75
0 — 40	1.10	1.61
0 — 45	1.02	1.49
0 — 50	0.95	1.37
0 — 55	0.90	1.28
1 — 00	0.86	1.21
1 — 15	0.75	1.07
1 — 30	0.67	0.95
1 — 45	0.61	0.87
2 — 00	0.56	0.80
2 — 30	0.49	0.70
3 — 00	0.44	0.63
3 — 30	0.40	0.57
4 — 00	0.37	0.53
4 — 30	0.34	0.49
5 — 00	0.32	0.45
6 — 00	0.29	0.41
7 — 00	0.26	0.38
8 — 00	0.24	0.35
9 — 00	0.23	0.33
10 — 00	0.21	0.30
12 — 00	0.19	0.27
24 — 00	0.13	0.18

RUNOFF COEFFICIENTS	
TYPE OF DEVELOPMENT	COEF.
PARKS AND CEMETERIES	0.30
RESIDENTIAL - ACRES	0.40
RESIDENTIAL - REGULAR	0.50
INDUSTRIAL	0.65
COMMERCIAL	0.75
PAVED AREAS	0.85

RATIONAL FORMULA

Q = C. I. A. F.

Q — RUNOFF - CUBIC FEET PER SECOND
C — RUNOFF COEFFICIENT - PER CENT
I — RAINFALL INTENSITY - INCHES PER HOUR
A — DRAINAGE AREA - ACRES
F — INTENSITY FACTOR (FROM MAP)

Dr. 22-1846