HYDROLOGY

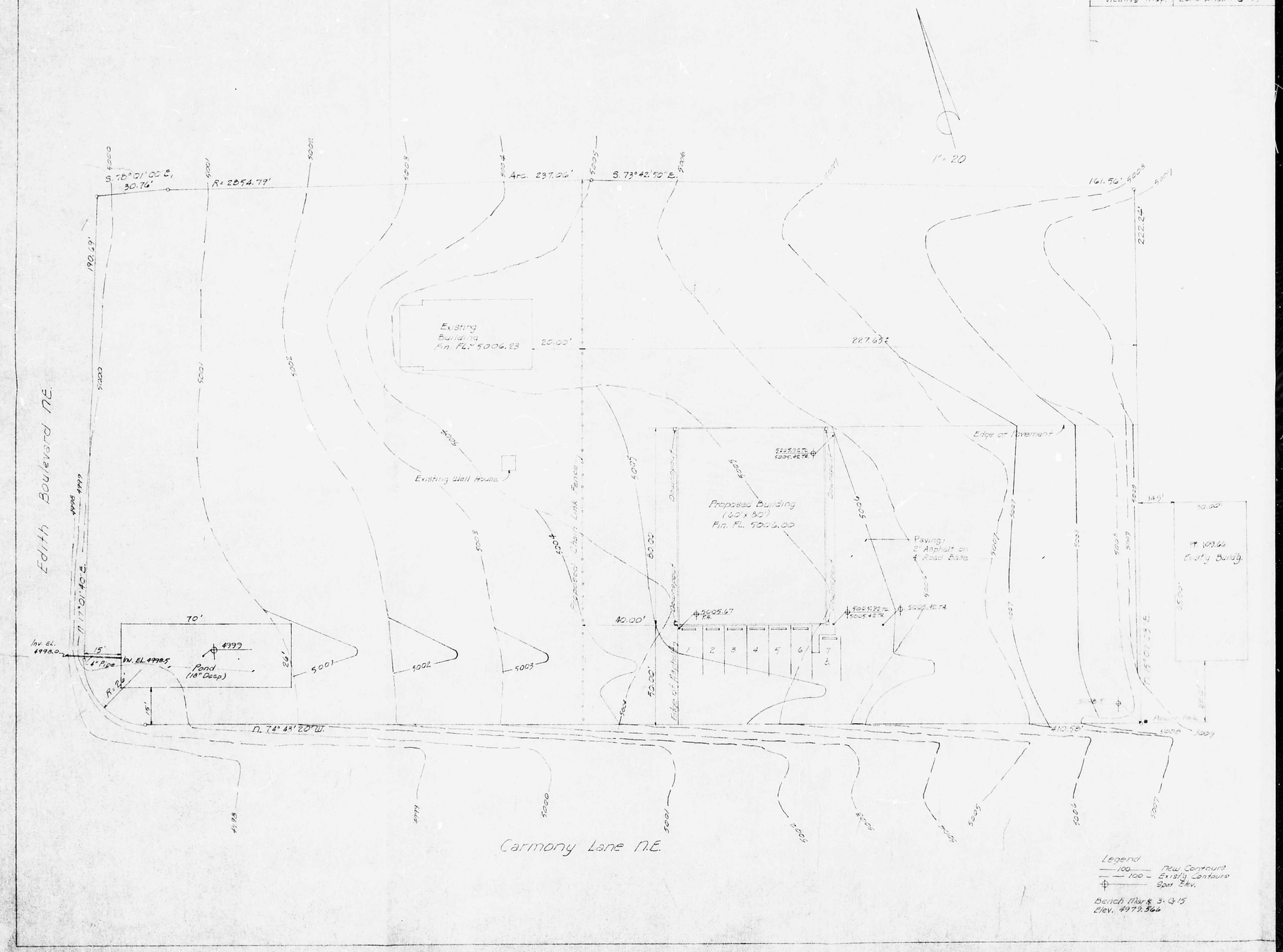
G15/D31
ONE PLAN

G 15/ D31

1 Plan

CITY OF ALBUQUERQUE
THIS MICROIMAGE IS THE BEST POSSIBLE REPRODUCTION DUE TO THE POOR QUALITY OF THE ORIGINAL DOCUMENT

DRAINAGE STUDY
NEW MEXICO CHEMICAL CO.



OFFICE & SHOP FACILITY
NEW MEXICO CHEMICAL
-DRAINAGE CALCULATIONS-

I. References

A. City of Albuquerque Development Process Manual (DPM), Volume 2, Design Criteria
B. Soil Survey of Bernalillo County and Parts of Sandoval and Valencia Counties, New Mexico, U.S. Soil Conservation Service

II. General Information

A. Soil Type. Reference B. (GF) Gila complex, moderately alkali (Hydrologic Soil Group B)
B. 6-hour, 100-year rain, R_6 = 2.2 inches (Ref. A, Plate 22.2 D-1)
C. Runoff coefficient ("C" Factor) (See Reference A, Plate 22.2 C-1). The "C" Factor for zero percent impervious, curve B is 0.34. (Undeveloped)

Proposed Impervious surfaces:

Building	= 4,800	SF
Concrete sidewalk	= 377	SF
Asphalt paving	=17,883	SF
Total site acreage	= 2.2 acres or 95,832	SF
Existing building	= 1,485	SF

Weighted "C" Factor:

$$C = \frac{(4800 + 377 + 1485)\ 1.0 + (17883)\ 0.9 + (95832 - 24545)\ 0.34}{95832} = 0.49 \text{ (Developed)}$$

D. Time of Concentration.

Length		= 466 feet
Elevation difference = 5008-4998		= 10 feet
Slope = 10/466		= 0.0215 (Ref. A, Plate 22.2 B-1, lower curve)
Velocity on undeveloped surface		= 0.90 fps
T_c = 466/(0.9 x 60)		= 8.62 Use 10 minutes.

E. Intensity. (Reference A, Plate 22.2 D-2)

$$I = R_6 \times 6.84 \times T_c^{-0.51} = 2.2 \times 6.84 \times 10^{-0.51} = 4.65 \text{ inches per hour.}$$

III. Off-Site Drainage

A. Peak Discharge. By rational Equation, Q = CIA
Area = 0.76 acres (From Floodway Map)
C = 0.34
I = 4.65

Q = 0.34 x 4.65 x 0.76 = 1.2 cfs
B. Volume. V = 0.34 (2.2/12) 0.76 x 43560 = 2063 cu ft
C. Although contours on the Floodway Map show the above off-site drainage area, field review revealed that nearly all of this area drains directly to Carmony Lane. Therefore, there is essentially no off-site drainage.

IV. On-Site Drainage

A. Undeveloped Conditions
1. Peak Discharged, by rational equation, Q = CIA
C = 0.34
I = 4.65 in/hr
A = 2.2 acres

Q = 0.34 x 4.65 x 2.2 = 3.48 cfs
2. Volume. V = 0.34 (2.2/12) 2.2 x 43560 = 5974 cu ft
B. Developed Conditions
1. Peak Discharge
Q = 0.49 (4.65) 2.2 = 5.0 cfs
2. Volume
V = 0.49 (2.2/12) 2.2 x 43560 = 8,609 cf
C. Ponding = Developed Volume - Undeveloped Volume
8609 - 5974 = 2635 cu ft
Use 26 x 70 x 1.5' deep pond V = 2730 cu ft

V. Conclusions

By limiting discharge from the site to the undeveloped rate, the proposed development will not adversely affect downstream conditions.

RICHARD V. HALL
NEW MEXICO
No. 7918
REGISTERED PROFESSIONAL ENGINEER

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HALL ENGINEERING COMPANY INC.
337 EUBANK N.E., SUITE 103
ALBUQUERQUE, NEW MEXICO 87123
Phones: (505) 292-1115 & 292-1116