HYDROLOGY

K19/D37

ONE PLAN

1 PLAN FOR
4 PLEXES
MARQUETTE + VERMONT
N.E.

K 19-D 37

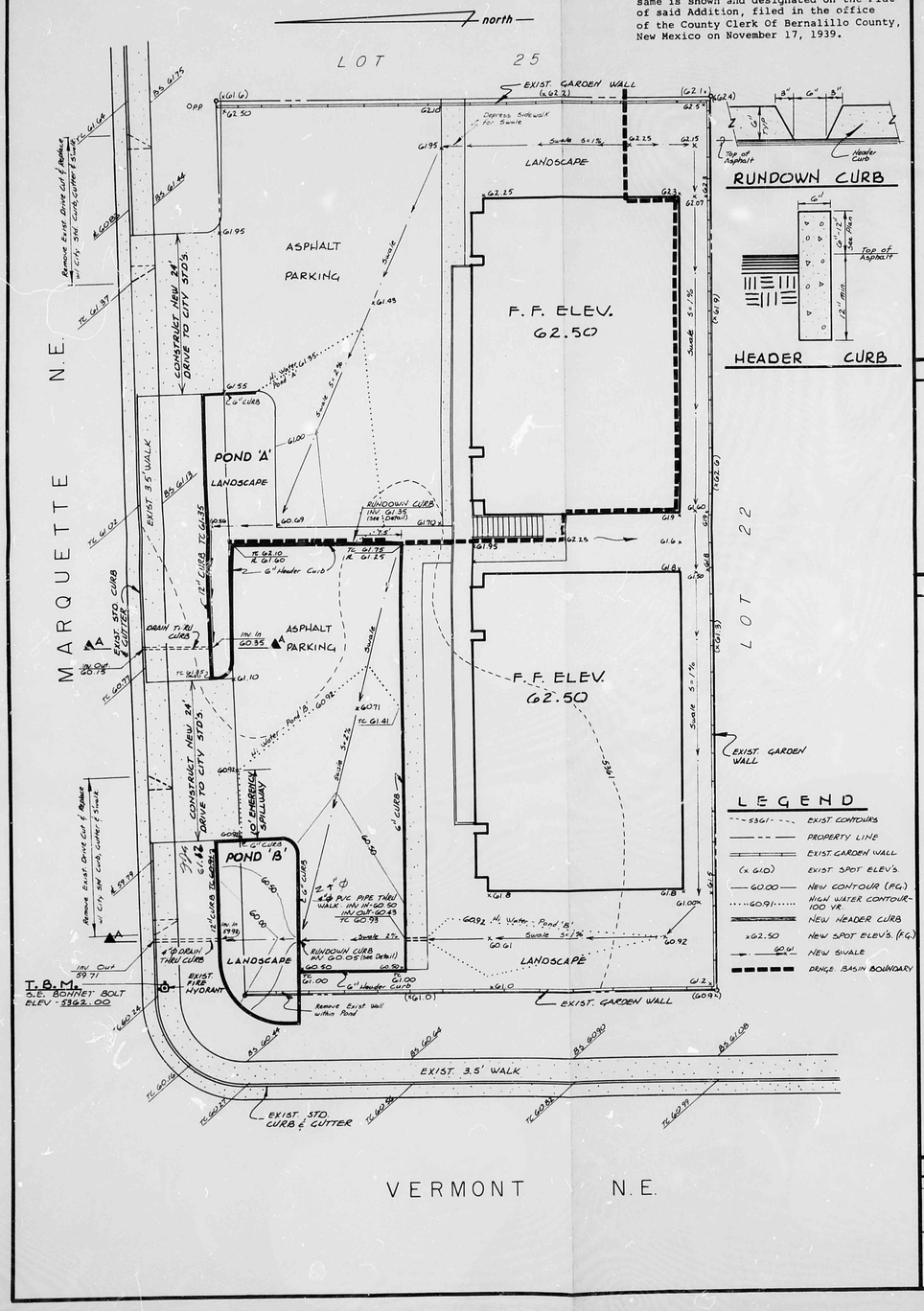
GRADING AND DRAINAGE PLAN

# FOUR-PLEXES S.E. CORNER OF MARQUETTE & SUMMER N.E.

JUNE 1983

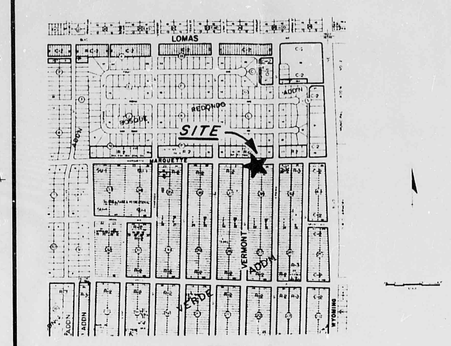
## PLAN 1" = 10'

LEGAL DESCRIPTION: Lots 23 & 24, Blk. 38 of the MESA VERDE ADDITION, an addition to the City of Albuquerque, New Mexico as the same is shown and designated on the Plat of said Addition, filed in the office of the County Clerk Of Bernalillo County, New Mexico on November 17, 1939.



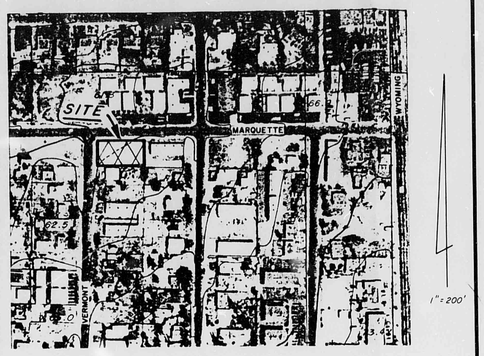

## VICINITY MAP

From ABQ. ZONE ATLAS




## FLOOD HAZARD MAP

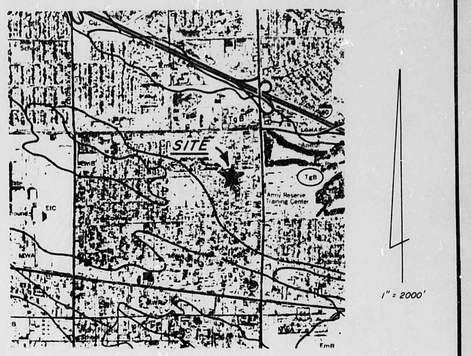
From ABQ. MASTER DRAINAGE PLAN Sht. K-19 Bohannan-Huston, Inc. 1981




NOTES:
- No Offsite flows to Property - Property is surrounded on 3 sides by garden walls.
- 100 yr. Storm water elev. in street is below top of curbs.

## SOILS MAP

From SOIL SURVEY OF BERNALILLO COUNTY AND PARTS OF SANDOVAL & VALENCIA COUNTIES, N.M. - USDA SCS, 1977, Sht. 31




## SOILS INFORMATION

### DESCRIPTION:

**TgB—Tijeras gravelly fine sandy loam, 1 to 5 percent slopes.** This nearly level to gently sloping soil is on old alluvial fans on the East Mesa. It has a profile similar to that described as representative of the series, but has a yellowish brown surface layer about 6 inches thick and has less gravel and more lime between depths of 10 and 30 inches.

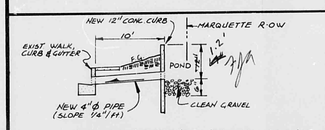
Included with this soil in mapping are areas of Embudo, Madurez, and Latene soils, which make up 20 percent of the unit.

Runoff is moderate, and the hazard of water erosion is moderate.

This soil is used for community development, range, watershed, and wildlife habitat. Dryland capability subclass VIIe; native plant community 4.

| Soil series and map symbols | Depth to— Bedrock | Depth to— Seasonal high water table | Depth from surface | USDA texture of representative profile | Classification— Unified | Classification— AASHTO | Coarse fraction greater than 3 inches | Percentage passing sieve— No. 4 (4.7 mm) | No. 10 (2.0 mm) | No. 40 (0.42 mm) | No. 200 (0.074 mm) | Liquid limit | Plasticity index | Permeability | Available water capacity | Reaction | Salinity | Shrink-swell potential | Risk of corrosion to— Uncoated steel | Concrete |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Tijeras: TgB | >5 | >5 | 0-19 | Gravelly fine sandy loam and sandy clay loam. | SM, CL-ML, or CL | A-4 | -------- | 80-100 | 60-90 | 50-80 | 35-65 | 20-30 | 0-10 | 0.6-2.0 | 0.10-0.16 | 7.9-8.4 | 0-1 | Low to moderate. | High | Low. |
| | | | 19-60 | Gravelly sandy loam and very gravelly loamy sand. | SM | A-1 or A-2 | 0-10% | 70-90 | 45-70 | 25-60 | 15-35 | NP | NP | 2.0-20.0 | 0.03-0.09 | 7.9-8.4 | 0-1 | Low | High | Low. |

## HYDROLOGIC DATA AND SAMPLE CALCULATIONS




NOTE: DRAIN PIPE THRU CURB SHALL BE BUILT TO CITY STD. K-15

SECTION A-A

1" = 10' HORIZ. 1" = 2' VERT.

### EXISTING CONDITIONS

OFF-SITE: The 0.23 acre site located at the southeast corner of Vermont and Marquette Streets N.E. is protected from off-site drainage by a 5.0 foot C.M.U. garden wall on the east, south, and west(partially). The 100-year storm run-off in Vermont N.E. and Marquette N.E. flows at less than curb depth according to sheet K-19 of the Abq. Master Drainage Plan, Vol. IV. Until the planned improvements to the downstream drainage system are constructed, additional downstream capacity is not available.

ON-SITE: The 0.23 acre site is currently undeveloped and is graded such that run-off will not exit the site except in extreme rainfall events.

CALCULATIONS:

$P_{100}$ = 2.4 in. $T_c \leq 10$ min. $I_{100}$ = 5.16 in./hr.
$P_{10}$ = 1.6 in. $I_{10}$ = 3.39 in./hr.

PEAK RATE:

C = 0.34(Type B soils, 0% impervious) A= 0.23 acres
$Q_{100}$ = (0.34)(5.16)(0.23)= 0.40 cfs
$Q_{10}$ = (0.34)(3.39)(0.23)= 0.27 cfs

RUN-OFF VOLUME: A = 10,000 $ft^2$

$Vol._{100}$ = (0.34)(2.4)=0.82 in. ⇒ 680 $ft^3$
$Vol._{10}$ = (0.34)(1.6)=0.54 in. ⇒ 453 $ft^3$

### DEVELOPED CONDITIONS

OFF-SITE: The eventual construction of several major storm drainage improvements in the area will significantly increase downstream system capacity. Subsequent to the construction, the planned on-site drainage facilities may be altered or eliminated at the owners convenience and with the City Engineer approval.

ON-SITE: The site development is configured such that two nearly equally sized sub-watersheds will be constructed. The east basin drains 4500 $ft^2$ and the west basin 5500 $ft^2$. The site is assumed to be fully impervious as the landscaping will largely be gravel underlain by a impervious plastic blanket. A 'c' factor of 1.0 is assumed. Except for minor flow permanent ponding below the outfall pipe invert, the ponds will be drained to Marqette Street through the back of curb with a 4 in. diameter pipe. The emergency spillway for both ponds is the western drive pad. The 4 in. diameter pipes can discharge the peak flow from the site without ponding. Pond volumes were therefore determined by routing triangular hydrographs through them and assuming a constant pipe discharge equal to ½ the actual pipe capacity.

### DEVELOPED CONDITIONS (cont.)

CALCULATIONS:

$P_{100}$ = 2.4 in. $T_c \leq 10$ min. $I_{100}$ = 5.16 in./hr.
$P_{10}$ = 1.6 in. $I_{10}$ = 3.39 in./hr.

PEAK RATE:

East Basin: A = 4500 $ft^2$ = 0.10 ac. C = 1.0
$Q_{100}$ = (1.0)(0.10)(5.16)= .52 cfs
$Q_{10}$ = (1.0)(0.10)(3.39)= .34 cfs

West Basin: A = 5500 $ft^2$ = 0.13 ac.
$Q_{100}$ = (1.0)(0.13)(5.16)= .67 cfs
$Q_{10}$ = (1.0)(0.13)(3.39)= .44 cfs

RUN-OFF VOLUMES:

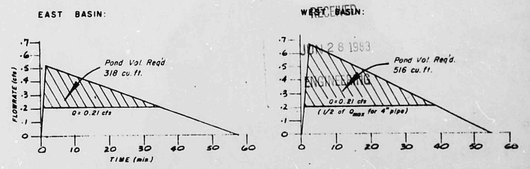
East Basin: A = 4500 $ft^2$
$Vol._{100}$ = (1.0)(2.4 in.)(4500 $ft^2$)/12 = 900 $ft^3$
$Vol._{10}$ = (1.0)(1.6 in.)(4500 $ft^2$)/12 = 600 $ft^3$

West Basin: A = 5500 $ft^2$
$Vol._{100}$ = (1.0)(2.4 in.)(5500 $ft^2$)/12 = 1100 $ft^3$
$Vol._{10}$ = (1.0)(1.6 in.)(5500 $ft^2$)/12 = 733 $ft^3$

POND CALCULATIONS:

PIPES: 4 in. diameter pipe Area = 0.087 $ft^2$ C = 0.60
$H_{max}$ = 1.0 ft. $Q_{max}$ = (0.60)(0.087)√(2)(32.2)(1) = 0.42 cfs

VOLUMES:




EMERGENCY SPILLWAY: $Q_{total}$ = 0.52 + 0.67 = 1.19 cfs

C = 2.7 (Broad Crested Weir) L = 10 ft.

$Q = C L H^{3/2} \Rightarrow H = \left(\frac{Q}{C \cdot L}\right)^{2/3} = \left(\frac{1.19}{(2.7)(10)}\right)^{2/3} = 0.13$ ft.

### POND VOLUME TABULATION

AS SHOWN ON PLAN

| POND | CONTOUR | AREA | Avg. | ΔH | Vol | Σ Vol $ft^3$ | |
|---|---|---|---|---|---|---|---|
| EAST (A) | 60.50 | 25 $ft^2$ | - | 0.15' | 4 $ft^3$ | 4 | |
| | 61.00 | 320 | 173 | 0.50 | 86 | 90 | |
| | 61.35 | 994 | 657 | 0.35 | 230 | 320 > 318 ok. | |
| WEST (B) | 60.00 | 90 | - | 0.08 | 7 | 7 | |
| | 60.50 | 490 | 290 | 0.50 | 145 | 152 | |
| | 60.92 | 1250 | 870 | 0.42 | 365 | 517 > 516 ok. | |

### EROSION CONTROL

The site will be fully developed immediately. Erosion problems generated by phased developement will not, therefore, be a problem.

CONSTRUCTION PHASE: The contractor shall excersize reasonable care during construction to prevent the movement of sediment from the site into the street. Loose soil stockpiled in the street during utility connection activities shall be protected from being carried downstream by flowing water in the street.

THE STATE OF NEW MEXICO — REGISTERED PROFESSIONAL ENGINEER — DATE: 6-28-83


LEVERTON - EASTERLING, INC.
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5629 PARADISE BLVD. NW • ABQ. NM 87114 • (505) 896-8021


K19/D37

SHEET 1 OF 1