HYDROLOGY K19/D44 1 PLAN

K19/D44

1 Plan

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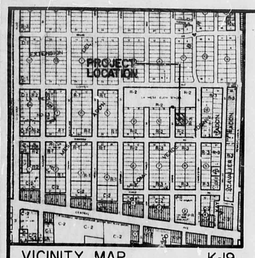


VICINITY MAP K-19

SCALE: 1" = 800'

SCALE: 1" = 10'

LEGEND

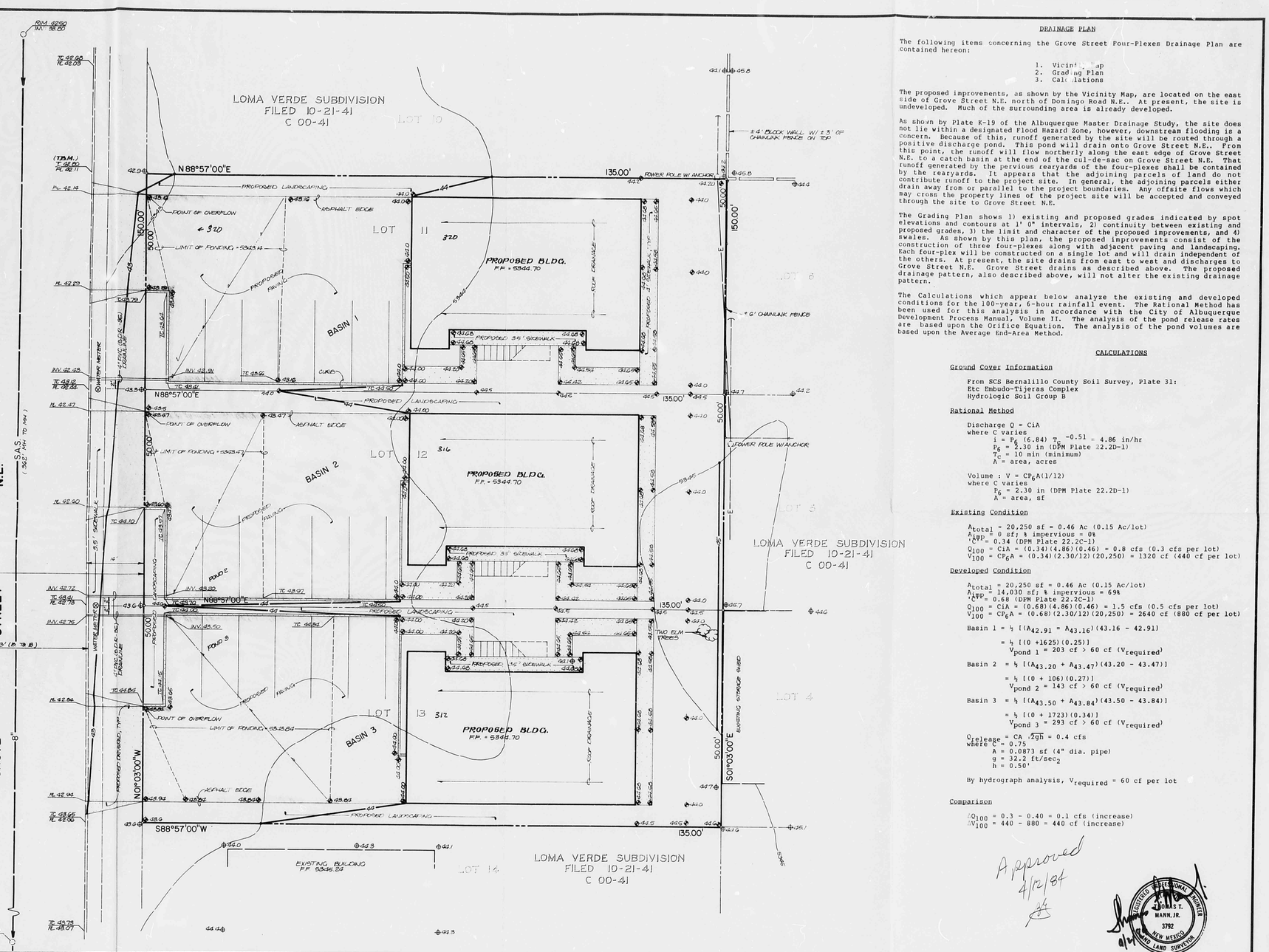
- EXISTING SPOT ELEVATION
- PROPOSED SPOT ELEVATION
- EXISTING CONTOUR
- PROPOSED CONTOUR
- PROPOSED CONCRETE
- PROPOSED ASPHALT PAVING
- EXISTING BLOCK WALL
- EXISTING CHAINLINK FENCE
- MANHOLE
- POWER POLE
- SWALE
- PROPERTY LINE

T.B.M.:

SCRATCH ON CURB AS SHOWN
ELEVATION = 5342.80 FEET (MSLD).

PROJECT BENCHMARK:

A STANDARD A.C.S. STATION MARK STAMPED ON TOP OF CONCRETE CURB AT THE BEND NORTHEAST OF THE INTERSECTION OF PENNSYLVANIA ST. N.E. AND COPPER AVE. N.E. ELEVATION = 5347.50 (MSLD).



DRAINAGE PLAN

The following items concerning the Grove Street Four-Plexes Drainage Plan are contained hereon:

1. Vicinity Map
2. Grading Plan
3. Calculations

The proposed improvements, as shown by the Vicinity Map, are located on the east side of Grove Street N.E. north of Domingo Road N.E.. At present, the site is undeveloped. Much of the surrounding area is already developed.

As shown by Plate K-19 of the Albuquerque Master Drainage Study, the site does not lie within a designated Flood Hazard Zone, however, downstream flooding is a concern. Because of this, runoff generated by the site will be routed through a positive discharge pond. This pond will drain onto Grove Street N.E.. From this point, the runoff will flow northerly along the east edge of Grove Street N.E. to a catch basin at the end of the cul-de-sac on Grove Street N.E. That runoff generated by the pervious rearyards of the four-plexes shall be contained by the rearyards. It appears that the adjoining parcels of land do not contribute runoff to the project site. In general, the adjoining parcels either drain away from or parallel to the project boundaries. Any offsite flows which may cross the property lines of the project site will be accepted and conveyed through the site to Grove Street N.E.

The Grading Plan shows 1) existing and proposed grades indicated by spot elevations and contours at 1' 0" intervals, 2) continuity between existing and proposed grades, 3) the limit and character of the proposed improvements, and 4) swales. As shown by this plan, the proposed improvements consist of the construction of three four-plexes along with adjacent paving and landscaping. Each four-plex will be constructed on a single lot and will drain independent of the others. At present, the site drains from east to west and discharges to Grove Street N.E. Grove Street drains as described above. The proposed drainage pattern, also described above, will not alter the existing drainage pattern.

The Calculations which appear below analyze the existing and developed conditions for the 100-year, 6-hour rainfall event. The Rational Method has been used for this analysis in accordance with the City of Albuquerque Development Process Manual, Volume II. The analysis of the pond release rates are based upon the Orifice Equation. The analysis of the pond volumes are based upon the Average End-Area Method.

CALCULATIONS

Ground Cover Information

From SCS Bernalillo County Soil Survey, Plate 31:
Etc Embudo-Tijeras Complex
Hydrologic Soil Group B

Rational Method

Discharge $Q = CiA$
where C varies
$i = P_6 (6.84)\ T_c^{-0.51} = 4.86$ in/hr
$P_6 = 2.30$ in (DPM Plate 22.2D-1)
$T_c = 10$ min (minimum)
A = area, acres

Volume : $V = CP_6A(1/12)$
where C varies
$P_6 = 2.30$ in (DPM Plate 22.2D-1)
A = area, sf

Existing Condition

$A_{total} = 20{,}250$ sf = 0.46 Ac (0.15 Ac/lot)
$A_{IMP} = 0$ sf; % impervious = 0%
'C' = 0.34 (DPM Plate 22.2C-1)
$Q_{100} = CiA = (0.34)(4.86)(0.46) = 0.8$ cfs (0.3 cfs per lot)
$V_{100} = CP_6A = (0.34)(2.30/12)(20{,}250) = 1320$ cf (440 cf per lot)

Developed Condition

$A_{total} = 20{,}250$ sf = 0.46 Ac (0.15 Ac/lot)
$A_{IMP} = 14{,}030$ sf; % impervious = 69%
'C' = 0.68 (DPM Plate 22.2C-1)
$Q_{100} = CiA = (0.68)(4.86)(0.46) = 1.5$ cfs (0.5 cfs per lot)
$V_{100} = CP_6A = (0.68)(2.30/12)(20{,}250) = 2640$ cf (880 cf per lot)

Basin 1 = $\frac{1}{3}[(A_{42.91} = A_{43.16})(43.16 - 42.91)]$

$= \frac{1}{3}[(0 + 1625)(0.25)]$

$V_{pond\ 1} = 203$ cf > 60 cf ($V_{required}$)

Basin 2 = $\frac{1}{3}[(A_{43.20} + A_{43.47})(43.20 - 43.47)]$

$= \frac{1}{3}[(0 + 106)(0.27)]$

$V_{pond\ 2} = 143$ cf > 60 cf ($V_{required}$)

Basin 3 = $\frac{1}{3}[(A_{43.50} + A_{43.84})(43.50 - 43.84)]$

$= \frac{1}{3}[(0 + 1723)(0.34)]$

$V_{pond\ 3} = 293$ cf > 60 cf ($V_{required}$)

$Q_{release} = CA\sqrt{2gh} = 0.4$ cfs
where C = 0.75
A = 0.0873 sf (4" dia. pipe)
g = 32.2 ft/sec^2
h = 0.50'

By hydrograph analysis, $V_{required} = 60$ cf per lot

Comparison

$\Delta Q_{100} = 0.3 - 0.40 = 0.1$ cfs (increase)
$\Delta V_{100} = 440 - 880 = 440$ cf (increase)

Approved
4/12/84

REGISTERED PROFESSIONAL ENGINEER
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NO.	DATE	BY	REVISIONS

DESIGNED BY L.P.U., J.G.M.
DRAWN BY L.B.D.
APPROVED T.T.M.

JOB NO. 40421
DATE 3-84

GRADING & DRAINAGE PLAN
GROVE STREET FOUR-PLEXES

FILE NO.
SHEET 1 OF 1

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