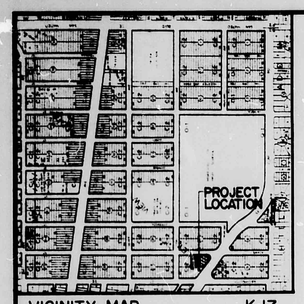
Hydrology K17/D28 Lead/Adams Apts.

K 17/D28

Lead/Adams Apts.

1 Plan



VICINITY MAP K-17

SCALE: 1" = 800'

·LEGEND·

- EXISTING SPOT ELEVATION
- PROPOSED SPOT ELEVATION
- 5236 EXISTING CONTOUR
- 36 PROPOSED CONTOUR
- PROPOSED CONCRETE
- PROPERTY LINE
- ROOF DRAINAGE DIVIDE
- DRAINAGE BASIN BOUNDARY
- SWALE

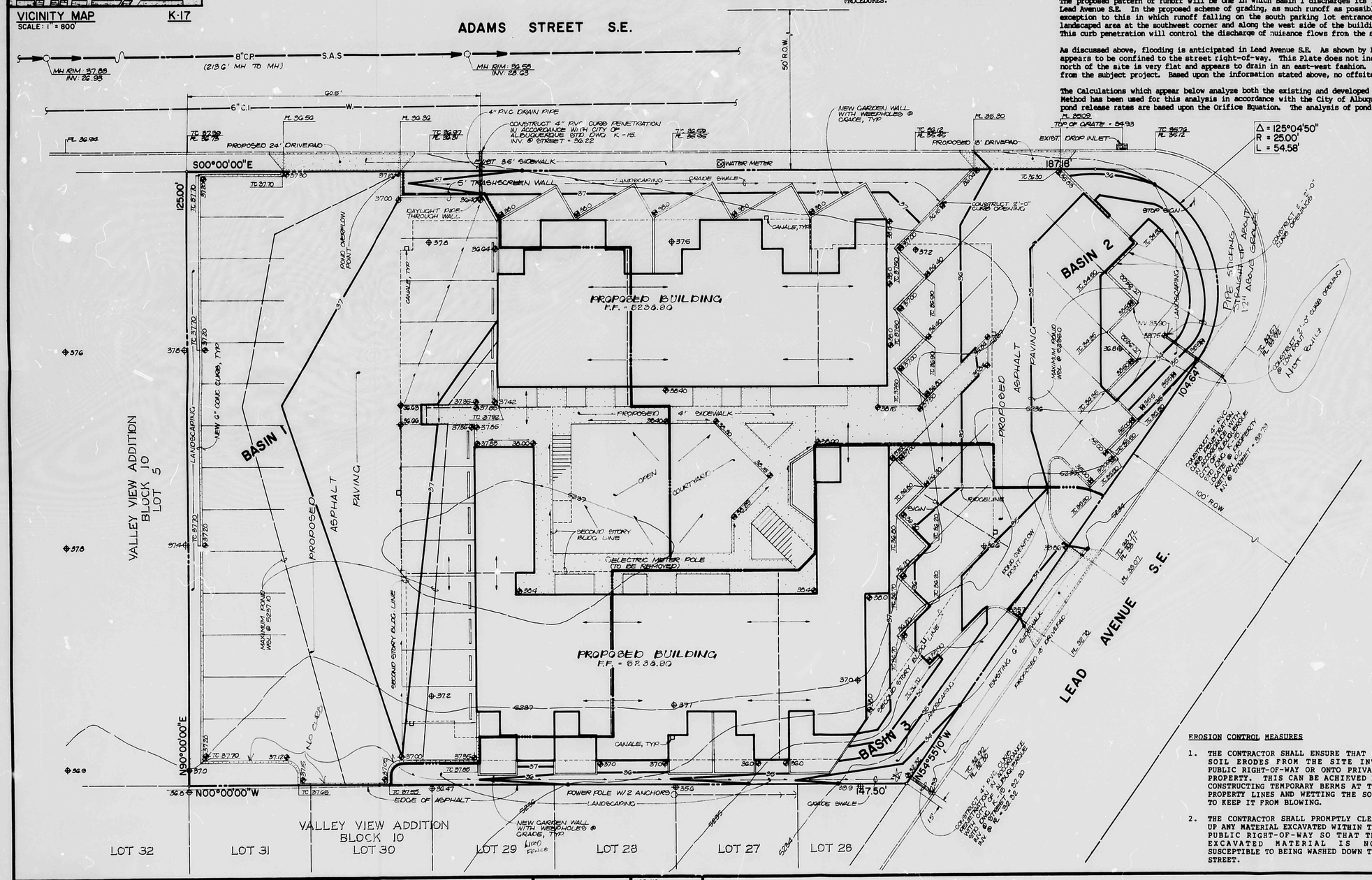
SCALE: 1" = 10'

PROJECT BENCHMARK:

A.C.S. BENCHMARK 10-L17. A SQUARE "Ø," CHISELED IN TOP OF CONCRETE CURB AT THE NW RETURN, LOCATED AT THE INTERSECTION OF MONROE ST. SE AND TRUMBULL AVE. SE. ELEVATION: 5260.929 FEET (M.S.L.D.)

CONSTRUCTION NOTES:

1. TWO (2) WORKING DAYS PRIOR TO ANY EXCAVATION, CONTRACTOR MUST CONTACT LINE LOCATING SERVICE 765-1234, FOR LOCATION OF EXISTING UTILITIES.
2. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL EXCAVATE AND VERIFY THE HORIZONTAL AND VERTICAL LOCATION OF ALL POTENTIAL OBSTRUCTIONS. SHOULD A CONFLICT EXIST, THE CONTRACTOR SHALL NOTIFY THE ENGINEER SO THAT THE CONFLICT CAN BE RESOLVED WITH A MINIMUM AMOUNT OF DELAY.
3. ALL WORK ON THIS PROJECT SHALL BE PERFORMED IN ACCORDANCE WITH APPLICABLE FEDERAL, STATE AND LOCAL LAWS, RULES AND REGULATIONS CONCERNING CONSTRUCTION SAFETY AND HEALTH.
4. ALL CONSTRUCTION WITHIN PUBLIC RIGHT-OF-WAY SHALL BE PERFORMED IN ACCORDANCE WITH APPLICABLE CITY OF ALBUQUERQUE STANDARDS AND PROCEDURES.



DRAINAGE PLAN

The following items concerning the Lead/Adams Apartment Complex Drainage Plan are contained hereon:

1. Vicinity Map
2. Grading Plan
3. Calculations

The proposed improvements, as shown by the Vicinity Map, are located at the northwest corner of the intersection of Adams Street S.E. and Lead Avenue S.E. The site is more particularly described as Tract X, Block 10, Valley View Addition as filed in the Office of the County Clerk of Bernalillo County on January 5, 1984, Book C22, Page 189. The purpose of that platting was to eliminate all interior lot lines and form a single tract of land.

As shown by Plate K-17 of the Albuquerque Master Drainage Study, the site does not lie within a designated Flood Hazard Zone, however, there is adjacent flooding in Lead Avenue S.E. As indicated by the predesign conference recap for this project, the minimum finish floor elevation must be at least 5236.0. As shown by the grading plan, the finish floor elevation of the project is 5238.90. It is because of the present flooding in Lead Avenue S.E. that the majority of runoff from this site will be positively discharged to public right-of-way via controlled release ponds.

The Grading Plan shows 1) existing and proposed grades indicated by spot elevations and contours at 1' 0" intervals, 2) the limit and character of the proposed improvements, and 3) continuity between existing and proposed grades. As shown by this plan, the proposed improvements include the construction of an apartment complex along with adjacent asphalt paving, and landscaping. At present, the majority of the runoff from the site drains to the adjacent streets. Some minor runoff in the existing condition discharges onto the existing property to the west of the site. The proposed pattern of runoff will be one in which Basin 1 discharges its runoff to Adams Street S.E. and Basins 2 and 3 discharge runoff to Lead Avenue S.E. In the proposed scheme of grading, as much runoff as possible has been routed through positive discharge ponds. Basin 3 is an exception to this in which runoff falling on the south parking lot entrance will discharge through the new drivepad. Runoff falling on the landscaped area at the southwest corner and along the west side of the building will discharge via a 4-inch PVC curb penetration to the street. This curb penetration will control the discharge of nuisance flows from the site so that they do not cross the existing sidewalk.

As discussed above, flooding is anticipated in Lead Avenue S.E. As shown by Plate K-17 of the Albuquerque Master Drainage Study, this flooding appears to be confined to the street right-of-way. This Plate does not indicate any flooding within Adams Street S.E. The property to the north of the site is very flat and appears to drain in an east-west fashion. The property to the west of the site drains to the west and away from the subject project. Based upon the information stated above, no offsite flows will impact this site.

The Calculations which appear below analyze both 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 Average End-Area Method.

EROSION CONTROL MEASURES

1. THE CONTRACTOR SHALL ENSURE THAT NO SOIL ERODES FROM THE SITE INTO PUBLIC RIGHT-OF-WAY OR ONTO PRIVATE PROPERTY. THIS CAN BE ACHIEVED BY CONSTRUCTING TEMPORARY BERMS AT THE PROPERTY LINES AND WETTING THE SOIL TO KEEP IT FROM BLOWING.
2. THE CONTRACTOR SHALL PROMPTLY CLEAN UP ANY MATERIAL EXCAVATED WITHIN THE PUBLIC RIGHT-OF-WAY SO THAT THE EXCAVATED MATERIAL IS NOT SUSCEPTIBLE TO BEING WASHED DOWN THE STREET.

CALCULATIONS

Ground Cover Information

From SCS Bernalillo County Soil Survey, Plate 31:
Cu - Cut and Fill Land
Hydrologic Soil Group A

Rational Method

Discharge: $Q = CiA$
where C varies
$i = P_6 (6.84)\ T_c^{-0.51} = 4.80$ in/hr
$P_6 = 2.27$ in (DPM Plate 22.2D-1)
$T_c = 10$ min (minimum)
A = area, acres

Volume: $V = CP_6A(1/12)$
where C varies
$P_6 = 2.27$ in (DPM Plate 22.2D-1)
A = area, sf

Existing Condition

$A_{total} = 23{,}400$ sf = 0.54 Ac
$A_{imp} = 0$ sf; % impervious = 0
$C^{100} = 0.16$ (DPM Plate 22.2C-1)
$Q_{100} = CiA = 0.16\ (4.80)(0.54) = 0.4$ cfs
$V_{100} = CP_6A = 0.16\ (2.27/12)(23{,}400) = 710$ cf

Basin 1

$A_{total} = 10{,}440$ sf = 0.24 Ac
$A_{imp} = 9800$ sf; % impervious = 94%
$C^{100} = 0.83$
$Q_{100} = 0.83\ (4.80)(0.24) = 1.0$ cfs
$V_{100} = 0.83\ (2.27/12)(10{,}440) = 1640$ cf

$Q_{release} = CA\sqrt{2gh} = 0.4$ cfs
where C = 0.8
A = 0.0873 sf (4" dia pipe)
g = 32.2 ft/sec²
h = 37.10 - 36.4 - 0.17 = 0.5'

By hydrograph analysis, $V_{required} = 600$ cf
$V_{pond} = 1/2\ [(A_{36.40} + A_{37.0})(0.8) + (A_{37.0} + A_{37.1})\ (0.1)]$
$= 1/2\ [(0 + 2410)(0.8) + (2410 + 3980)(0.1)]$
$= 1040$ cf $> V_{required}$

Basin 2

$A_{total} = 8460$ sf = 0.19 Ac.
$A_{imp} = 5820$ sf; % impervious 69%
$C^{100} = 0.55$
$Q_{100} = 0.55\ (4.80)(0.19) = 0.5$ cfs
$V_{100} = 0.55\ (2.27/12)(8460) = 880$ cf

$Q_{release} = CA\sqrt{2gh} = 0.5$ cfs
where C = 0.7
A = 0.0873 sf
g = 32.2 ft/sec²
h = 35.0 - 33.90 - 0.17 = 0.9'

$V_{pond} = 1/2\ [(A_{33.75} + A_{34})(0.25) + (A_{34} + A_{35})(1)]$
$= 1/2\ [(0 + 480)(0.25) + (480 + 1540)\ (1)]$
$= 1070$ cf $> V_{100}$

Basin 3 (Direct Discharge to Lead Avenue S.E.)

$A_{total} = 4500$ sf = 0.10 Ac
$A_{imp} = 2970$ sf; % impervious = 66%
$C^{100} = 0.53$
$Q_{100} = 0.53\ (4.80)(0.10) = 0.3$ cfs
$V_{100} = 0.53\ (2.27/12)(4500) = 450$ cf

Comparison

$\Delta Q_{100} = 0.4 - (0.4 + 0.5 + 0.3) = 0.8$ cfs (increase)
$\Delta V_{100} = 710 - (1640 + 880 + 450) = 2260$ cf (increase)

JOHN G. MORRIS NO. 8547 NEW MEXICO PROFESSIONAL ENGINEER

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ENGINEERS

NO.	DATE	BY	REVISIONS

DESIGNED BY J.G.M.
DRAWN BY L.B.D.
APPROVED J.G.M.

JOB NO. 31531
DATE 6·84

GRADING & DRAINAGE PLAN
LEAD/ADAMS APARTMENT COMPLEX

RECEIVED JUL 19 1984 HYDROLOGY SECTION

FILE NO.

SHEET 1 OF 1

K17/D28