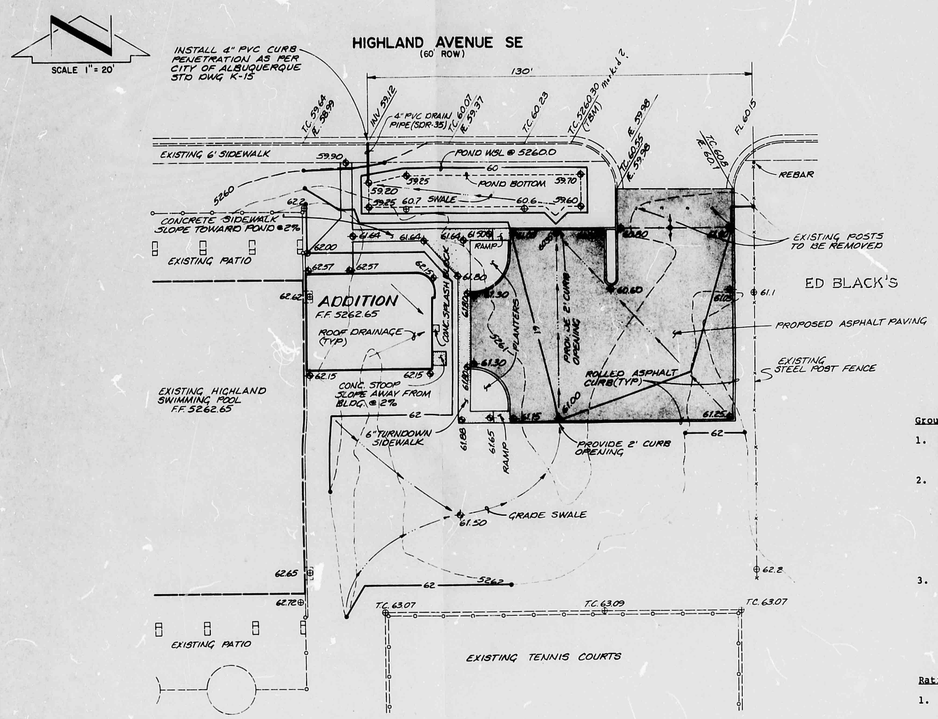
HYDROLOGY K17/D1a 1 PLAN

K17/D1a

1 Plan

CITY OF ALBUQUERQUE



MISCELLANEOUS INFORMATION

1. TOPOGRAPHIC SURVEY DATA PROVIDED BY CITY OF ALBUQUERQUE. PROJECT BENCHMARK NOT KNOWN.
2. TBM:
   TOP OF CURB ELEVATION WSW CURB RETURN AT ENTRANCE TO PROJECT.
   ELEVATION: 5260.30 FEET (MSLD)
3. ADDRESS:
   4700 COAL AVENUE S.E.
4. LEGAL ADDRESS:
   NOT KNOWN.

DRAINAGE PLAN

The following items concerning the Highland Pool Addition 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 south side of Highland Avenue S.E. between San Mateo Boulevard S.E. and Jackson Street S.E. At present, the site is developed as a High School campus.

Research has revealed that the site does lie within a designated flood hazard zone, however, downstream flooding exists. Because of this, the runoff generated by the proposed improvements will be routed through a positive discharge pond and discharged onto Highland Avenue. Highland Avenue drains from east to west.

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 elevations, 3) the limit and character of existing improvements, and 4) the limit and character of the proposed improvements. As shown by this plan, the proposed improvements include the construction of an addition to the existing Highland High School Swimming Pool along with adjacent asphalt parking and landscaping. At present, runoff flows from south to north onto Highland Avenue. As previously mentioned, Highland Avenue drains from east to west. The runoff generated by the proposed improvements will be routed through a positive discharge pond prior to entering Highland Avenue. In essence, the existing drainage pattern will not be altered by construction with the exception of the routing, which will tend to delay the runoff peak.

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 evaluation of pond release rates is based upon the orifice equation. The determination of pond volume is based upon the average-end area method. As shown by these calculations, only a minor increase in runoff is anticipated due to the proposed improvements. A positive discharge pond has been provided to attenuate the runoff peak discharging from the site. Although the pond volume provided is somewhat less than that which is required by hydrograph analysis, it will serve to control the discharge of runoff generated by the more frequent rainfall events. This is significant due to the fact that the increase in impervious area will lower the runoff threshold for the site.

Calculations

Ground Cover Information

1. From SCS Bernalillo County Soil Survey, Plate 31:
   NWA Madurez - Wink Association
   Hydrologic Soil Group B
2. Existing Condition
   A_{total} = 22,500 sf = 0.52 Ac
   A_{imp} = 0 sf
   % impervious = 0%
   'C' = 0.34 (DPM Plate 22.2C-1)
3. Developed Condition
   A_{total} = 22,500 sf = 0.52 Ac
   A_{imp} = 8200 sf
   % impervious = 8200/22,500 = 37%
   'C' = 0.51 (DPM Plate 22.2C-1)

Rational Method

1. Discharge: $Q = CiA$
   where C varies
   $i = P_6 (6.84) T_c^{-0.51} = 4.86$ in/hr
   P_6 = 2.3 in (DPM Plate 22.2D-1)
   T_c = 10 min (minimum)
   A = 0.52 Ac
2. Volume: $V = CP_6A(1/12)$
   where C varies
   P_6 = 2.3 in (DPM Plate 22.2D-1)
   A = 22,500 sf

Existing Condition

$Q_{100} = CiA = 0.34\ (4.86)(0.52) = 0.9$ cfs

$V_{100} = CP_6A = 0.34\ (2.3/12)(22{,}500) = 1466$ cf

Developed Condition

$Q_{100} = CiA = 0.51\ (4.86)(0.52) = 1.3$ cfs

$V_{100} = CP_6A = 0.51\ (2.3/12)(22{,}500) = 2199$ cf

$Q_{release} = CA\sqrt{2gh} = 0.4$ cfs

where C = 0.75

A = 0.0873 sf (4" dia pipe)

$g = 32.2$ ft/sec^2

h = 60 - 59.20 - 0.17 = 0.63'

By hydrograph analysis, $V_{required} = 1053$ cf

$V_{pond} = 1/2[(A_{59.2}+A_{59.6})(59.6-59.2) + (A_{59.6}+A_{60})(60-59.6)]$

$= 1/2[(0+720)(0.4) + (720+1160)(0.4) = 520$ cf

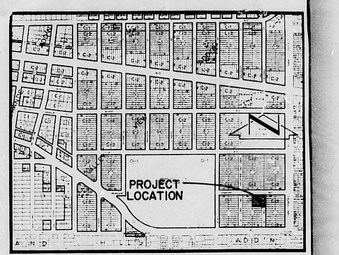
$V_{pond} < V_{required}$

Comparison

$\Delta Q_{100} = 0.9-1.3 = 0.4$ cfs (increase)

$\Delta V_{100} = 1466-2199 = 733$ cf (increase)

Job No. 90642



VICINITY MAP
SCALE 1" = 800'

K-17

• LEGEND •

- EXISTING SPOT ELEVATION
- PROPOSED SPOT ELEVATION
- 5551 — EXISTING CONTOUR
- 55 — PROPOSED CONTOUR
- SWALE
- T.C. 52.00 — EXISTING TOP OF CURB
- F.L. 52.00 — EXISTING FLOW LINE
- CONCRETE
- BASIN BOUNDARY
- HIGH POINT
- PROPOSED ASPHALT

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JUL 27 1983
ENGINEERING

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 LOCATIONS 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.

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CITY OF ALBUQUERQUE
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