HYDROLOGY

F21/D37A

ONE PLAN

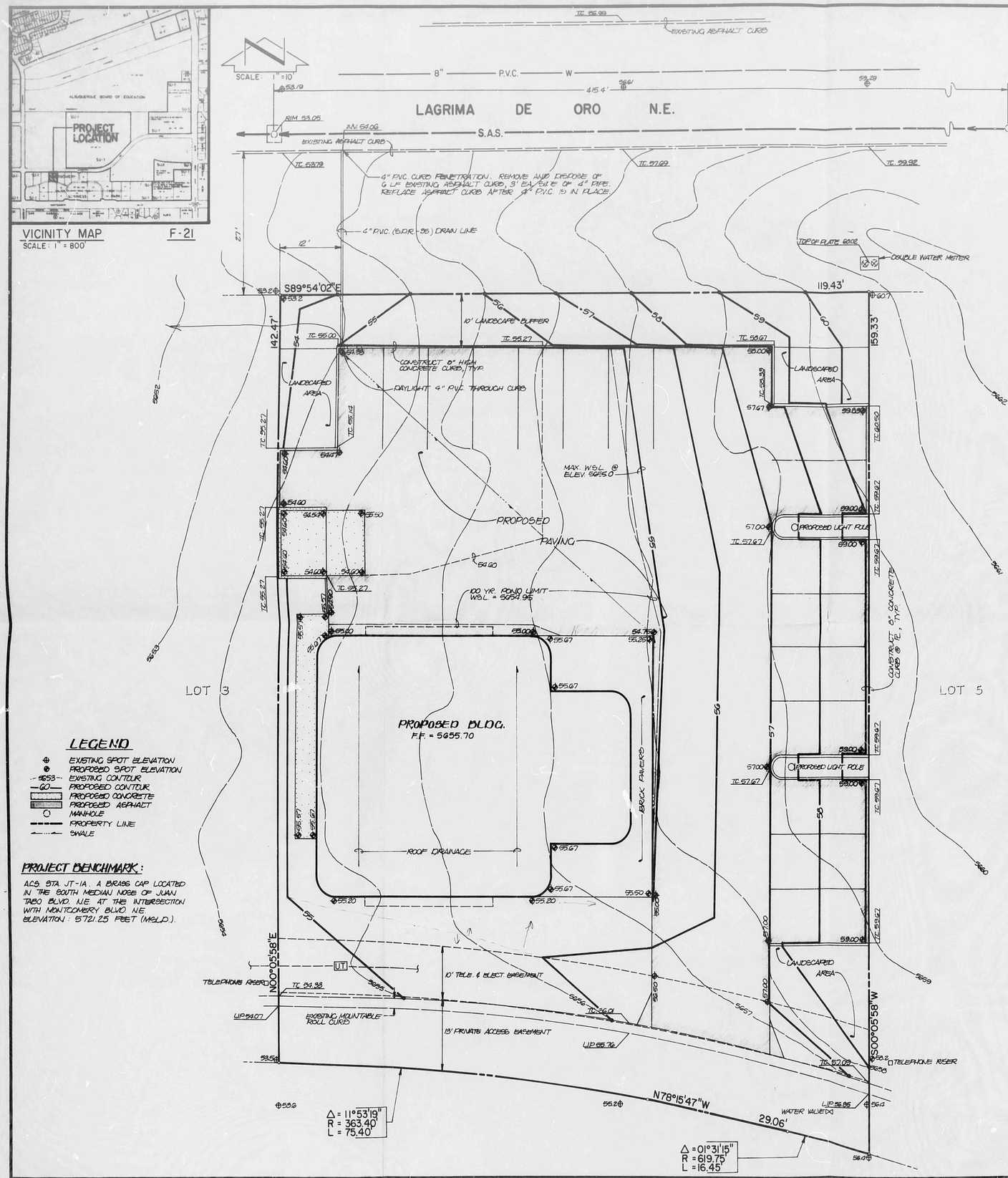
I PLAN FOR

MONTGOMERY

BUSINESS PARK

LOT 4

F 21 - D37A



DRAINAGE PLAN

The following items concerning the Lot 4, Montgomery Business Park 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 Lot 4 of the Montgomery Business Park. At present, the site is undeveloped. The surrounding area is currently undergoing development.

As shown by Plate F-21 of the Albuquerque Master Drainage Study, the site does not lie within a designated Flood Hazard Zone. The Drainage Report for Montgomery Business Park, prepared by Bohannan-Huston Inc., does, however, identify downstream flooding at the intersection of Morris and Montgomery. It is based upon this, and the recommendations of the previously mentioned report, that the developed runoff generated by each site within the Montgomery Business Park be discharged in a controlled fashion. The Bohannan-Huston report goes further and recommends that 4-inch diameter pipes, one per lot, be used to control the discharge of runoff. These recommendations have been followed in the development of the subject parcel. The proposed plan does, however, deviate from the Bohannan-Huston report with respect to the point of controlled discharge. The Bohannan-Huston report recommends that Lot 4 drain to the south and discharge its runoff to the private access easement along the south boundary of the site. Review of the existing topography reveals that such a scheme is not practical due to the fact that the northwest corner of the site is topographically lower than the southwest corner. In addition, La Grima de Oro N.E., the public street situated to the north of the site, is a paved street whereas the private access easement along the south boundary of the site is currently unpaved. The private access easement appears to be in the process of construction as evidenced by the presence of the mountable roll curb. It is also understood that the paving of the access easement will be undertaken in conjunction with this project.

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, and 3) the limit and character of the proposed improvements. As shown by this plan, the proposed improvements include the construction of an office building along with adjacent paving and landscaping. At present, this site drains from east to west and discharges its runoff onto the private property to the west of the site. The proposed scheme of grading will route that runoff generated onsite plus the offsite flows accepted by the site and discharge them to La Grima de Oro N.E.

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. As shown by these calculations, the proposed improvements will result in an overall decrease in the peak runoff from the site. This decrease is due to the fact that the site will be developed with a controlled discharge. The pond volume has been determined based upon the average end-area method. The pond release rate has been determined based upon the Orifice Equation. Offsite flows have been determined based upon the Bohannan-Huston report. It should be noted that the offsite flows will be diverted in the future in accordance with the Bohannan-Huston report when those lots to the east develop.

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.

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 22:
EtC Embudo-Tijeras Complex
Hydrologic Soil Group B

Rational Method

Discharge: $Q = CiA$

where C varies

$i = P_6(6.84)T_c^{-0.51} = 5.28$ in/hr
$P_6 = 2.5$ in (DPM Plate 22.2 D-1)
$T_c = 10$ min (minimum)
A = area, acres

Volume: $V = CP_6A(1/12)$

where C varies

$P_6 = 2.5$ in (DPM Plate 22.2 D-1)
A = area, sf

Existing Condition

$A_{total} = 17{,}730$ sf $= 0.41$ Ac
$A_{imp} = 0$ sf; % impervious = 0%
$C = 0.34$ (DPM Plate 22.2 C-1)
$Q_{100} = CiA = 0.34(5.28)(0.41) = 0.7$ cfs
$V_{100} = CP_6A = 0.34(2.5/12)(17{,}730) = 1260$ cf

Developed Information

$A_{total} = 17{,}730$ sf $= 0.41$ Ac
$A_{imp} = 13{,}040$ sf; % impervious = 74%
$C = 0.72$ (DPM Plate 22.2 C-1)
$Q_{100} = CiA = 0.72(5.28)(0.41) = 1.6$ cfs
$V_{100} = CP_6A = 0.72(2.5/12)(17{,}730) = 2660$ cf

Required Pond Volume = RPV
RPV = 1193 cf (Bohannan-Huston Report)
Let RPV = 1200 cf

Pond Volume = 1400 cf

$$V_{pond} = \tfrac{1}{4}[(A_{54.33} + A_{54.6})(54.6 - 54.33) + (A_{54.6} + A_{55.0})(55.0 - 54.6)]$$

$$= \tfrac{1}{4}[(0 + 1960)(0.27) + (1960 + 3760)(0.40)]$$

$$= 1400 \text{ cf} > \text{RPV}$$

$Q_{release} = CA\sqrt{2gh}$ (Orifice Equation)
where $C = 0.80$
$A = 0.0873$ sf (4" pipe)
$g = 32.2$ ft/sec^2
$h = 55 - 54.33 - 0.17 = 0.5'$
$Q_{release} = 0.4$ cfs

Comparison

$\Delta Q_{100} = 0.7 - 0.4 = 0.3$ cfs (decrease)
$\Delta V_{100} = 1260 - 2660 = 1400$ cf (increase)

Offsite Flows

Site lies within Basin 7 (Bohannan-Huston)
$Q_{100} = 3.1$ cfs, undeveloped (Bohannan-Huston)
Offsite contributing area is 0.0432 x area of Basin 7.
$Q_{100,offsite} = 0.0432(3.1) = 0.1$ cfs (sheetflow)

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Jeffrey Morton Associates, Inc. ENGINEERS, 811 DALLAS N.E. · ALBUQUERQUE · NEW MEXICO · 87110	NO. / DATE / BY / REVISIONS	DESIGNED BY: J.G.M.	JOB NO. 40381	GRADING & DRAINAGE PLAN	FILE NO. F21/D37A
		DRAWN BY: L.B.D.	DATE 3-84	LOT 4, MONTGOMERY BUSINESS PARK	SHEET 1 OF 1
		APPROVED: J.G.M.			