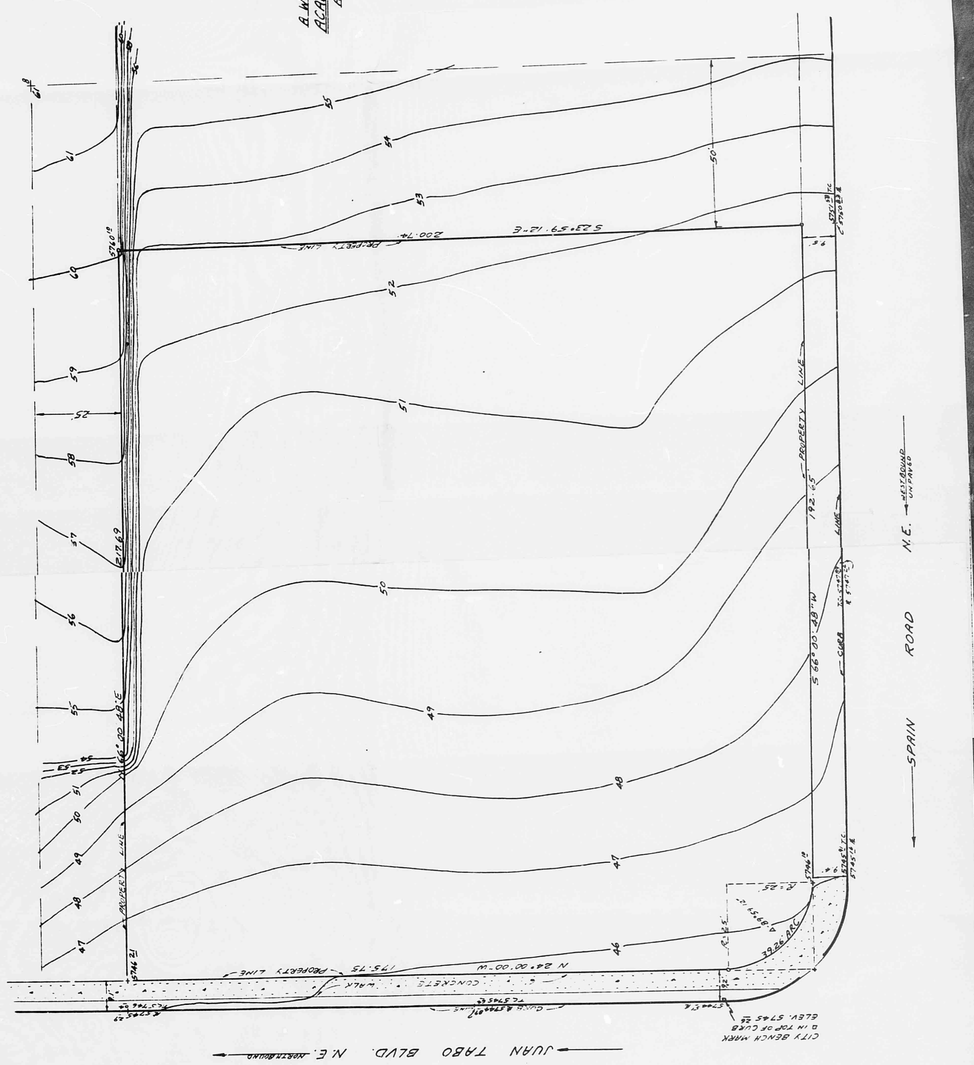
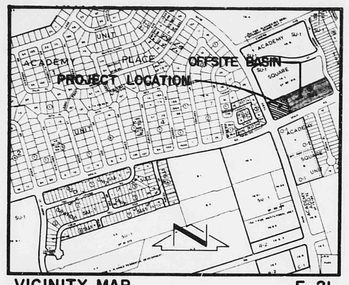
HYDROLOGY

F21/D10B
2 PLANS

F 21/D10B

2 Plans


SCALE: 1" = 20'
SUPPLEMENTAL MAP OF A
TOPOGRAPHIC SURVEY OF
A WESTERLY PORTION OF TRACT "D"
ACADEMY SQUARE, UNIT NO. 1
ALBUQUERQUE, NEW MEXICO.
FEBRUARY 6, 1966
JUAN TABO BLVD. N.E.
SPAIN ROAD N.E.
PROPERTY LINE
CONCRETE WALK
CITY BENCH MARK
TOP OF CURB
ELEV. 5745.52

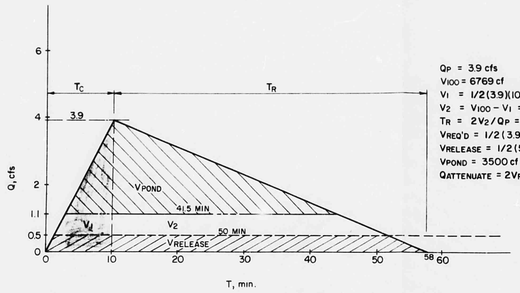


VICINITY MAP F-21

SCALE 1" = 800'

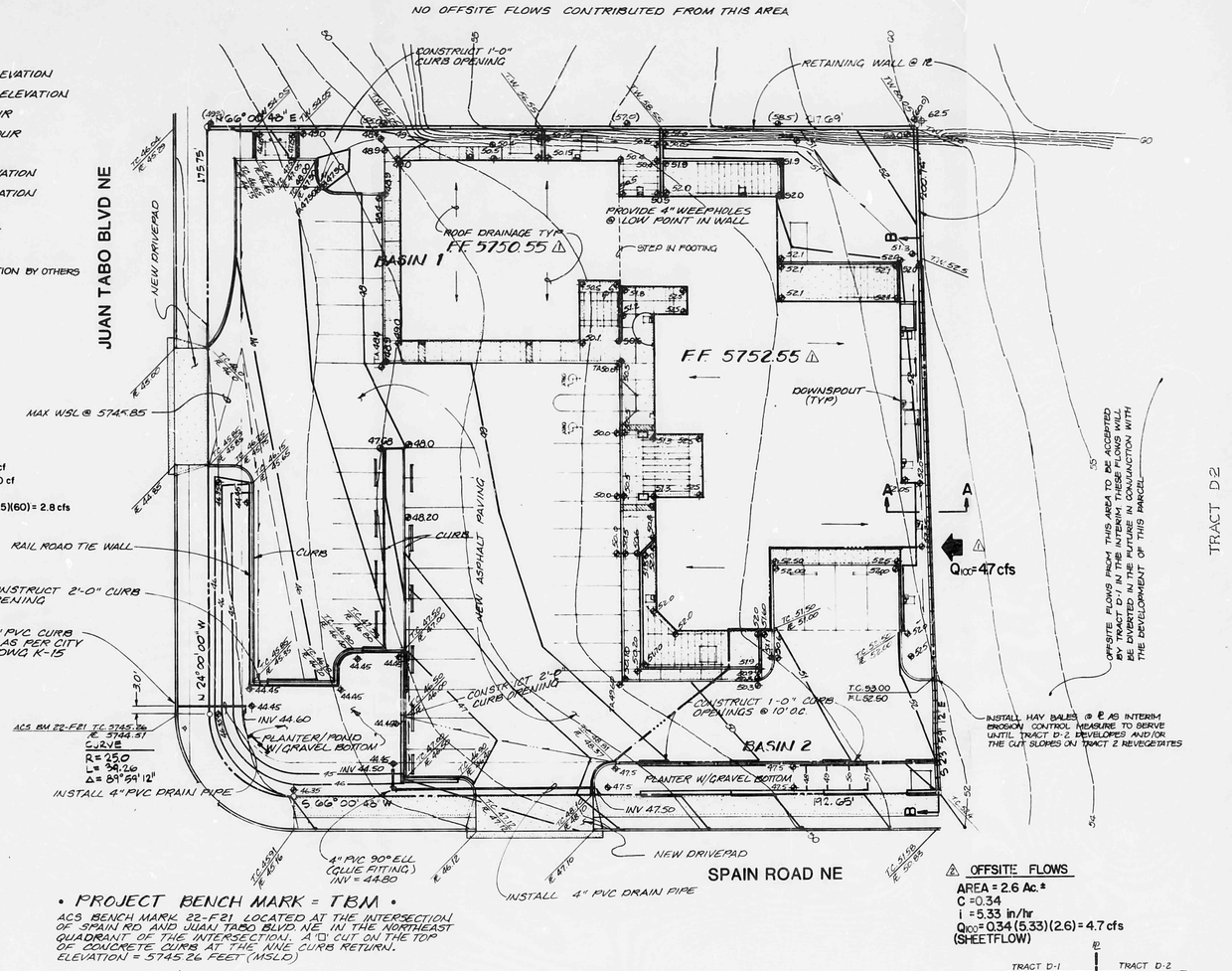
• LEGEND •

80.1	EXISTING SPOT ELEVATION
83.2	PROPOSED SPOT ELEVATION
5280	EXISTING CONTOUR
82	PROPOSED CONTOUR
	SWALE
T.C. 82.51	TOP OF CURB ELEVATION
F.E. 81.52	FLOW LINE ELEVATION
	CONCRETE
	BASIN BOUNDARY
	PROPERTY LINE
(80)	FUTURE SPOT ELEVATION BY OTHERS



Q_P = 3.9 cfs
V_{100} = 6769 cf
V_1 = 1/2(3.9)(10)(60) = 1170 cf
V_2 = $V_{100} - V_1$ = 5599 cf
T_R = $2V_2/Q_P$ = 2871 sec = 48 min
$V_{REQ'D}$ = 1/2(3.9 − 0.5)(50)(60) = 5100 cf
$V_{RELEASE}$ = 1/2(50 + 58)(0.5)(60) = 1620 cf
V_{POND} = 3500 cf
$Q_{ATTENUATE}$ = $2V_{POND}/T$ = 2(3500)/(41.5)(60) = 2.8 cfs

100-YEAR HYDROGRAPH – DEVELOPED CONDITION



• PROJECT BENCH MARK = TBM •

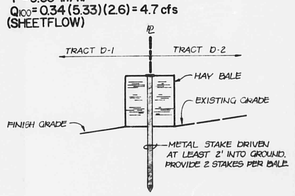
ACS BENCH MARK 22-F21 LOCATED AT THE INTERSECTION OF SPAIN RD AND JUAN TABO BLVD NE IN THE NORTHEAST QUADRANT OF THE INTERSECTION. A 'D' CUT ON THE TOP OF CONCRETE CURB AT THE NNE CURB RETURN. ELEVATION = 5745.26 FEET (MSLD)

SITE PLAN – GRADING

SCALE: 1" : 20'-0"

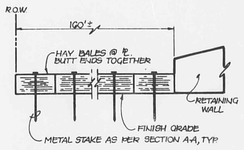
OFFSITE FLOWS

AREA = 2.6 Ac.±
C = 0.34
i = 5.33 in/hr
Q_{100} = 0.34 (5.33)(2.6) = 4.7 cfs
(SHEETFLOW)



SECTION A-A

SCALE: 1" = 2'



SECTION B-B

SCALE: 1" = 5'

Drainage Plan

The following items concerning the Campbell-Dillon Office building Drainage Plan are contained hereon:

1. Vicinity Map
2. Grading Plan
3. Calculations
4. Developed Condition Hydrograph

The proposed improvements, as shown by the Vicinity Map, are located at the northeast corner of the intersection of Juan Tabo Boulevard N.E. and Spain Road N.E. At present, the site is undeveloped.

It has been determined during the predesign conference with Mr. Fred J. Aguirre that downstream flooding conditions do exist. Because of this, the runoff generated by the developed site will be routed through a positive discharge pond and discharged onto Juan Tabo Blvd. N.E. From this point runoff will flow to Spain Road where it will be conveyed to the 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, and 3) the limit and character of the proposed improvements. As shown by this plan, the proposed improvements include the constructionof an office building along with adjacent paving and landscaping as required by the EPC. At present, runoff flows from east to west across the site and ultimately discharges to Spain Road N.E. This pattern of runoff will not be altered by development. Runoff generated by Basins 1 and 2 will be routed through the ponding areas shown below. These ponds are interconnected by a 4" PVC drain pipe. This scheme of ponding has been designed such that only one 4" PVC pipe drains onto the street.

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. Pond volumes have been determined based upon the average end-area method. These calculations are supplemented by the 100-year hydrograph for the developed condition. The analysis of this hydrograph demonstrates that due to development, the 100-year peak discharge rate will be 1.1 cfs which is less than the existing discharge rate for the same storm (i.e. 1.8 cfs).

Calculations

Ground Cover Information

1. From SCS Bernalillo County Soil Survey, Plate 22: Etc Embudo-Tijeras Complex Hydrologic Soil Group B
2. Existing Condition

   A_{total} = 1.00 Ac

   A_{imp} = 0 sf

   % impervious = 0%

   'C' = 0.34 (DPM Plate 22.2C-1)
3. Developed Condition

   A_{total} = 1.00 Ac = 43,560 sf

   A_{imp} = 33,600 sf = 0.77 Ac

   % impervious = 77%

   'C' = 0.74 (DPM Plate 22.2C-1)

Rational Method

1. Discharge: Q = CiA

   where C varies

   $i = P_6 (6.84) T_c^{-0.51} = 5.33$ in/hr

   P_6 = 2.52 in (DPM Plate 22.2D-1)

   T_c = 10 min (minimum)

   A = area, acres
2. Volume: $V = CP_6A(1/12)$

   where C varies

   P_6 = 2.52 in (DPM Plate 22.2D-1)

   A = area, sf

Existing Condition

Q_{100} = CiA = 0.34 (5.33)(1.00) = 1.8 cfs

$V_{100} = CP_6A$ = 0.34(2.52/12)(43,560) = 3110 cf

Developed Condition

Q_{100} = CiA = 0.74(5.33)(1.00) = 3.9 cfs

$V_{100} = CP_6A$ = 0.74(2.52/12)(43,560) = 6769 cf

$Q_{release} = CA\sqrt{2gh}$ (Orifice Equation)

where C = 0.70

A = 0.0873 sf (4" pipe)

g = 32.2 ft/sec^2

h = 45.85 − 44.45 − 0.17 = 1.23'

$Q_{release}$ = 0.5 cfs

By hydrograph analysis, $V_{req'd}$ = 5100 cf.

By proportion, $V_{req'd}$ = 4520 cf for Basin 1 and

$V_{req'd}$ = 580 cf for Basin 2

By average end-area method, V_{pond} = 2920 cf for Basin 1

and V_{pond} = 600 cf for basin 2

Total available ponding = 2920 + 580 = 3500 cf
Total volume by controlled release = 1620 cf (hydrograph analysis)
Total volume prior to overflow = 1620 + 3500 = 5120 cf
$F_r = V/C(1/P_6)(1/A)$ = 5120/0.74 (12/2.52)(1/43,560) = 0.756

$F_{r(10)}$ = 0.657 (DPM Plate 22.2D-1)

Pond can handle the 10-year frequency storm without overflowing. Subtracting the total available ponding from the top of the hydrograph leaves a 100-year peak discharge of 1.1 leaving the site (i.e. an attenuation of 2.8 cfs).

Pond Volumes:

1. Basin 1

Elev	Area, sf	Vol, cf	Vol, cf
44.45	1630		
		943	943
45.0	1800		
		658	1601
45.35	1960		
		1320	2921
45.85	3320		

2. Basin 2

   V_{pond} = (10)(60)(48.60 − 47.50) = 660 cf
   By proportion, $V_{100,2}$ = 580 cf
3. Total available ponding = 2921 + 580 = 3500 cf

THE BURNS PETERS GROUP
ARCHITECTS PLANNERS

NOTES

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.

△2 EROSION CONTROL PLAN

1. HAY BALES SHALL BE PLACED ON THE COMMON LOT LINE BETWEEN TRACTS D-1 AND D-2. INSTALL BALES AS PER DETAILS.
2. 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.
3. 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.

△2 03/19/84	EROSION CONTROL & ADDITIONAL CALCULATIONS
△1 02/08/84	LOWER FINISH FLOOR ELEVATIONS & ADJUST GRADES ACCORDINGLY; UPDATE EXISTING TOPO

REVISIONS

REGISTERED PROFESSIONAL ENGINEER — STATE OF NEW MEXICO — THOMAS MANN — ENGINEER

STATE OF NEW MEXICO — RONALD L. PETERS NO. 785 — REGISTERED ARCHITECT — ARCHITECT

A PROFESSIONAL OFFICE BUILDING

11001 - 11005 SPAIN ROAD NE
ALBUQUERQUE, NM 87111

PROJECT NO. 83-7

DATE 21 FEB. 84

C2

SHEET OF