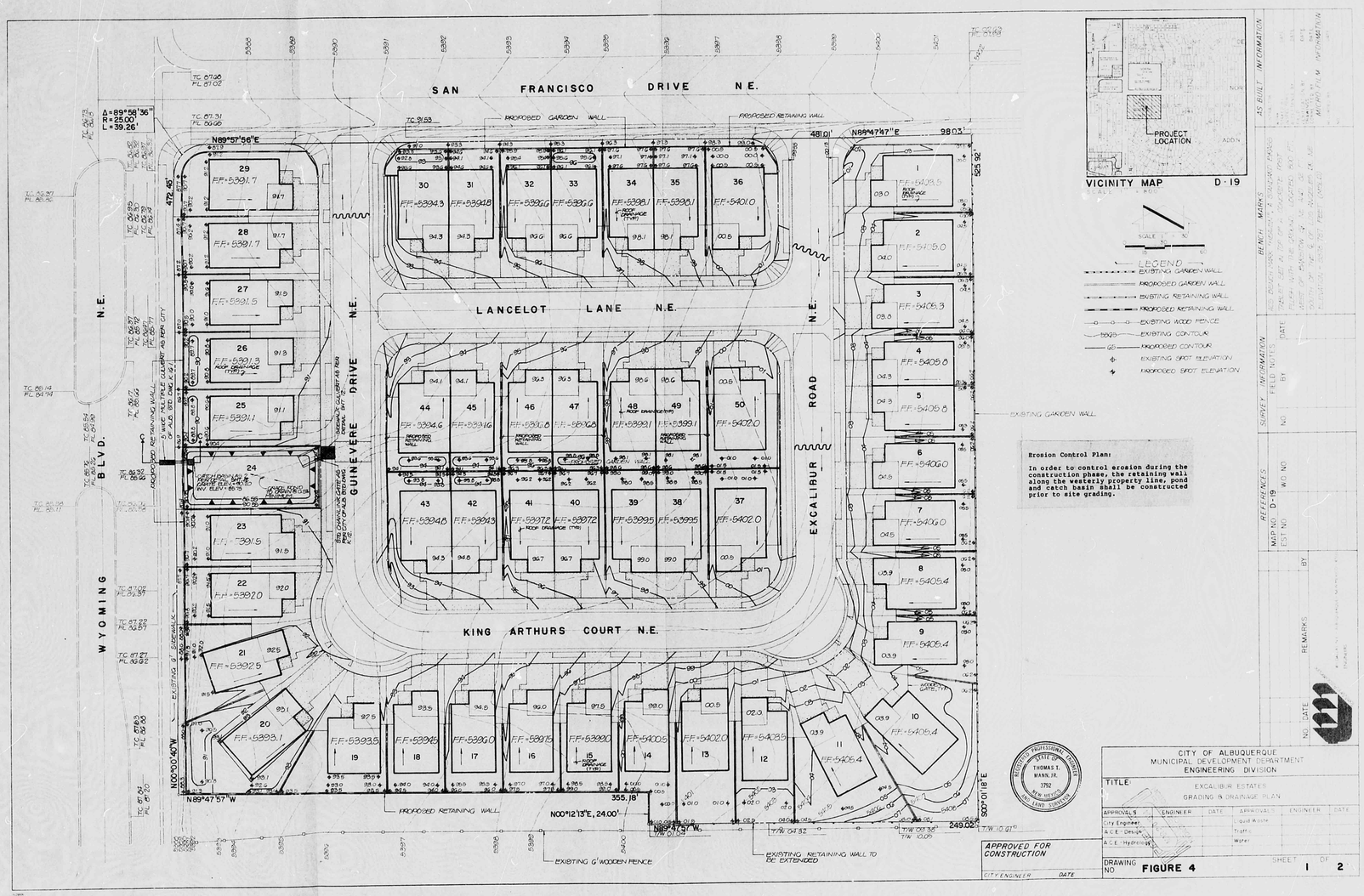
PUBLIC WORKS/HYDROLOGY

D19/D16



REL 24 DATE 3-15-02 OP ESP

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Roberta Duran
NOTARY PUBLIC
07/07/02

PLAN SHOT TWICE
ONCE ON LIGHT
ONCE ON DARK

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PLANS/PLATS ON FILE

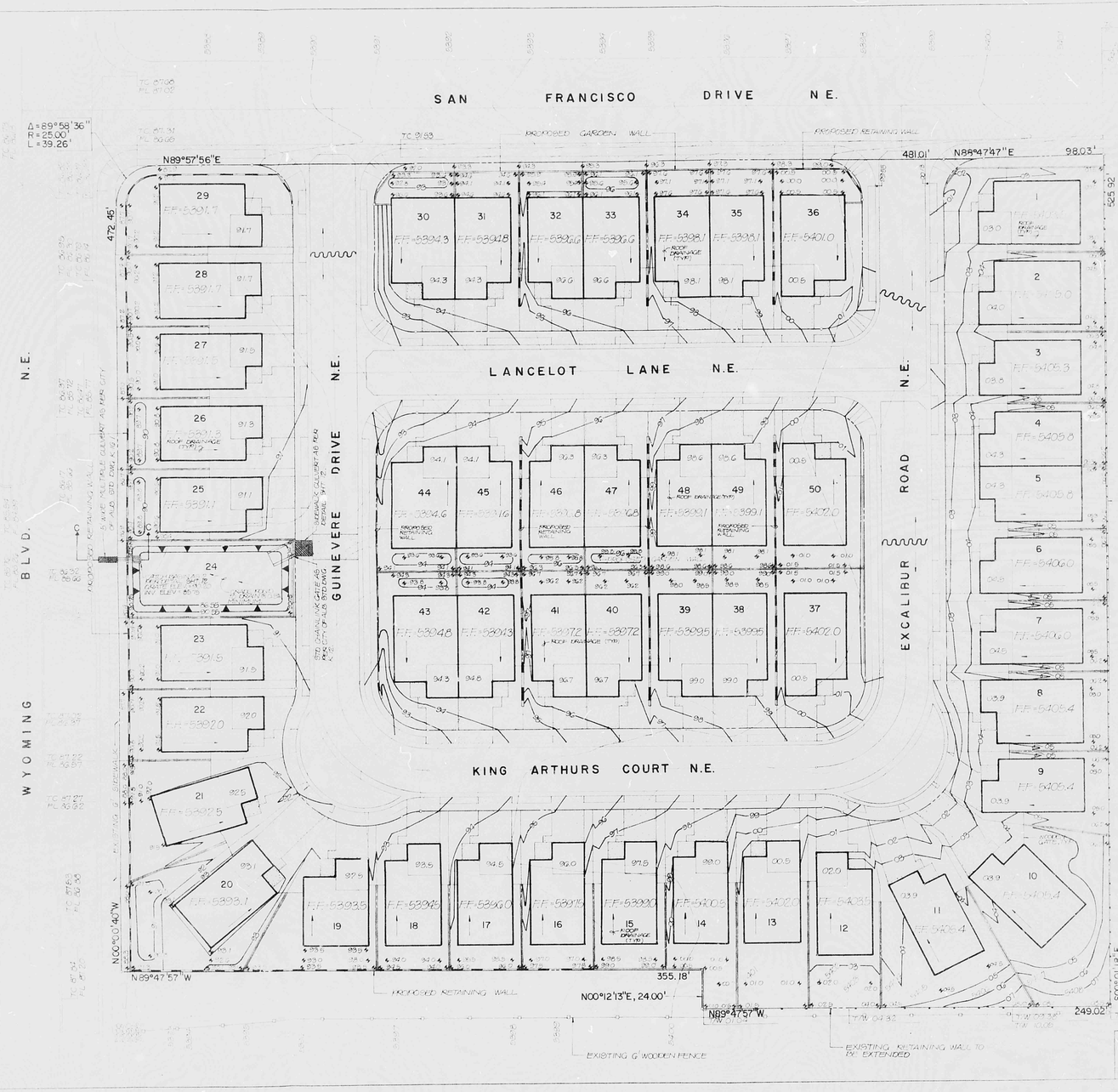
FILE DESC: D19/D16

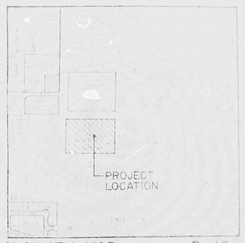
PLANS/PLATS 3

E 30 D 24 C 20 B 16 A 12

CITY OF ALBUQERQUE

C D F





VICINITY MAP D-19

LEGEND
EXISTING GARDEN WALL
PROPOSED GARDEN WALL
EXISTING RETAINING WALL
PROPOSED RETAINING WALL
EXISTING WOOD FENCE
EXISTING CONTOUR
PROPOSED CONTOUR
EXISTING SPOT ELEVATION
PROPOSED SPOT ELEVATION

Erosion Control Plan:

In order to control erosion during the construction phase, the retaining wall along the westerly property line, pond and catch basin shall be constructed prior to site grading.

FIGURE 4

1 2

PLAN SHOT TWICE
ONCE ON LIGHT
ONCE ON DARK

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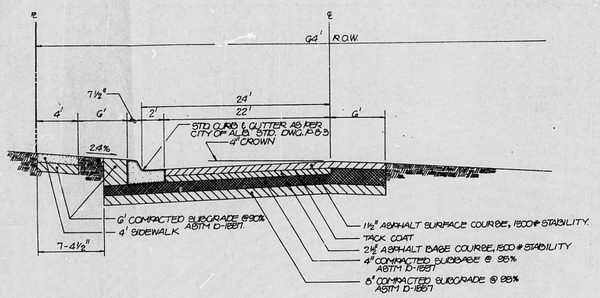
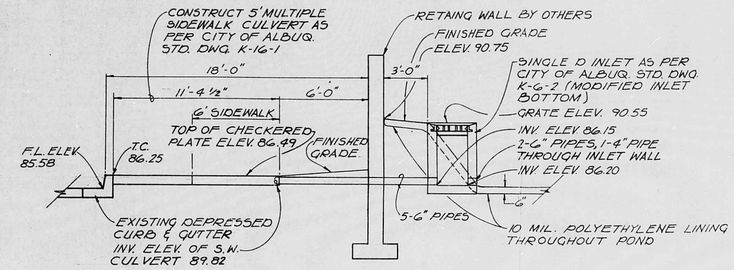
D24 C20 B16 A12

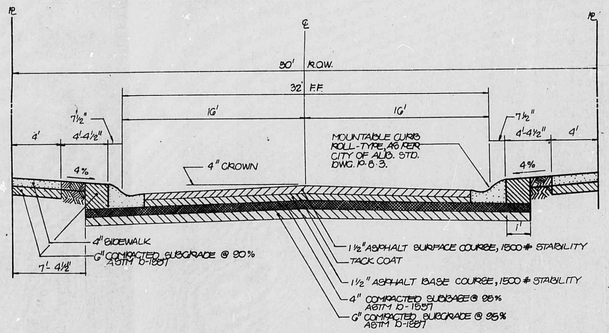
CITY OF ALBUQUERQUE C D



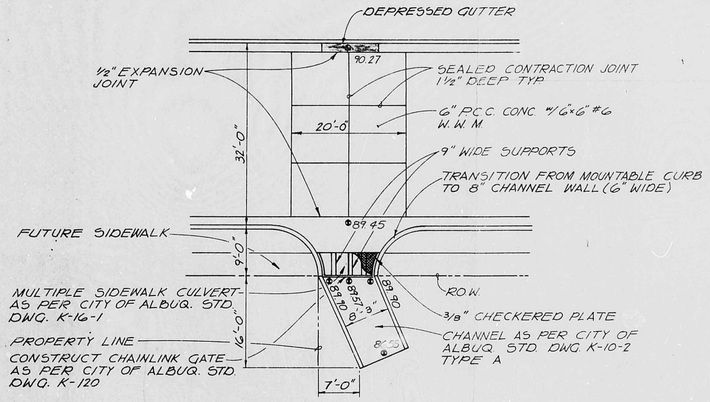
STREET PAVING SECTION A-A
NO SCALE



SECTION C-C
SCALE: 1/4"=1'-0"



STREET PAVING SECTION B-B
NO SCALE



RUNDOWN DETAIL
SCALE: 1"=10'-0"

AS BUILT INFORMATION

NO.	DATE	REMARKS	BY

BENCH MARKS
ACS MONUMENT NO. 2-C-15 SHEET 17 IN OF A CONCRETE POST FLUSH WITH THE GROUND LOCATED 800 FT. WEST OF DAKOTA ST. NE AND 25 FT. SOUTH OF THE ℄ OF LOS ANGELES DR. N.E.
ELEVATION - 5876.7101 FEET (NGVD)

SURVEY INFORMATION
FIELD NOTES

NO.	BY	DATE

ENGINEER'S SEAL
REGISTERED PROFESSIONAL ENGINEER STATE OF NEW MEXICO THOMAS T. MANN JR. 3782

MICRO-FILM INFORMATION
DATE
REVISED BY
DATE
NO.

CITY OF ALBUQUERQUE
MUNICIPAL DEVELOPMENT DEPARTMENT
ENGINEERING DIVISION

TITLE: EXCALIBUR ESTATES SUBDIVISION
DETAILS

APPROVALS	ENGINEER	DATE	APPROVALS	ENGINEER	DATE
City Engineer			Liquid Waste		
A.C.E.-Design			Traffic		
A.C.E.-Hydrology			Water		

APPROVED FOR CONSTRUCTION
CITY ENGINEER DATE

DRAWING NO. FIGURE 4 SHEET 2 OF 2

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OFFICIAL SEAL
Roberta Duran
NOTARY PUBLIC
STATE OF NEW MEXICO
07/02/02

D 24 C 20 B 16 A 12 CITY OF ALBUQUERQUE C D

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.
3. THE CONTRACTOR SHALL SECURE "TOPSOIL DISTURBANCE PERMIT" PRIOR TO BEGINNING CONSTRUCTION.

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.

PROJECT BENCHMARK

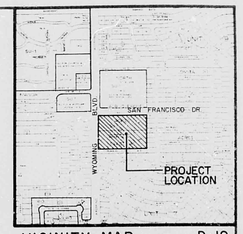
A STANDARD ACS BRASS TABLET STAMPED "G-D19-1978" SET IN TOP OF A CONCRETE POST FLUSH WITH THE GROUND LOCATED AT THE NORTHWEST CORNER OF THE INTERSECTION OF SAN ANTONIO DRIVE, N.E. & WYOMING BOULEVARD, N.E.
ELEVATION = 5403.54 FEET (MSLD)

LEGAL DESCRIPTION

LOTS 1-4 & 29-82, TRACT A, UNIT A, NORTH ALBUQUERQUE ACRES

LEGEND

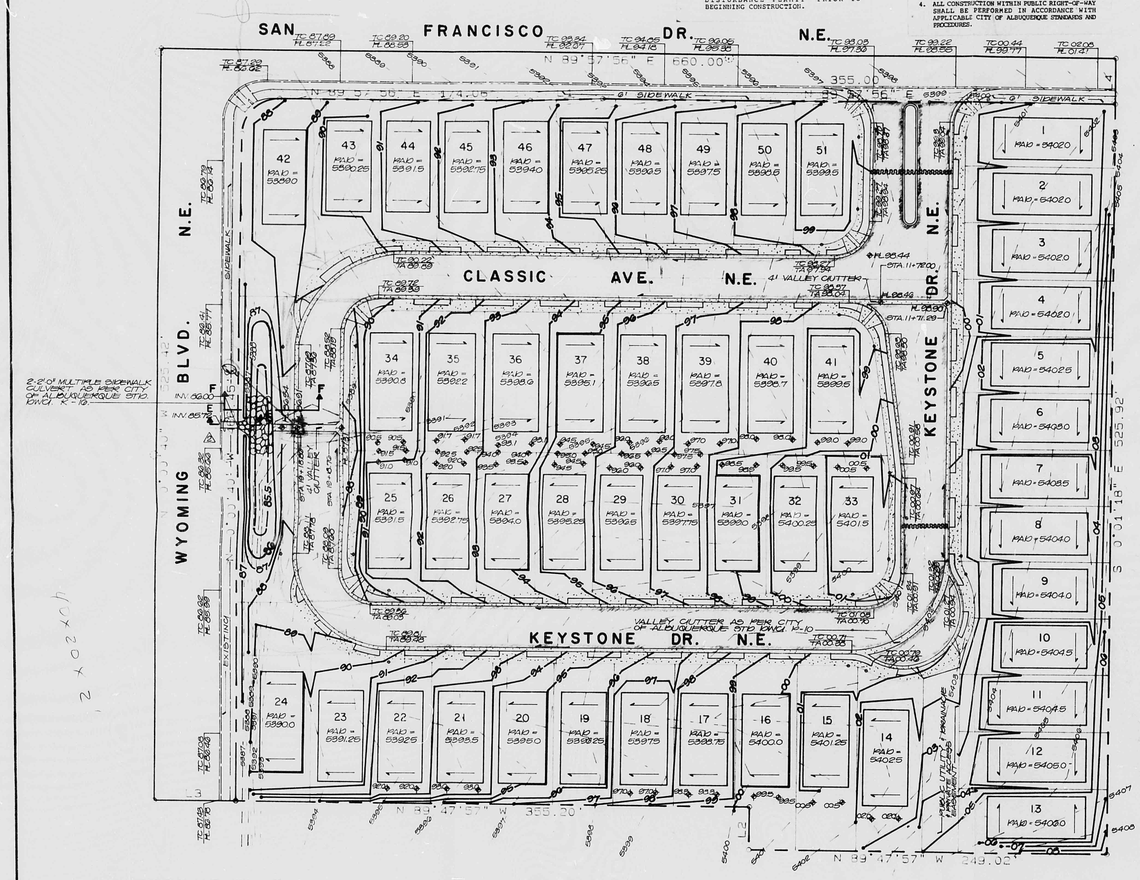
5400	EXISTING CONTOUR
00	PROPOSED CONTOUR
+	EXISTING SPOT ELEVATION
+	PROPOSED SPOT ELEVATION
	SWALE
	PROPOSED CONCRETE
	PROPOSED ASPHALT PAVING
TC 99.22	TOP OF CURB
HL 98.88	FLOWLINE
	WATERBLOCK

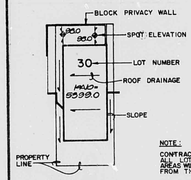


VICINITY MAP
SCALE: 1" = 800'

D-19

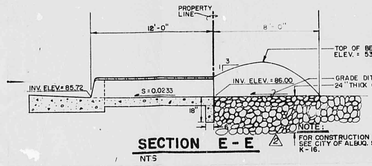
D19/014





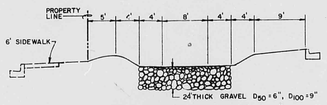
NOTE:
CONTRACTOR SHALL GRADE LOTS SUCH THAT ALL AREAS WILL DRAIN AWAY FROM FROM THE HOUSE.

TYPICAL LOT GRADING



NOTE:
FOR CONSTRUCTION DETAILS SEE CITY OF AL&N2 STD. DWG. K-16.

SECTION E-E
NTS



SECTION F-F
HORIZ. SCALE: 1" = 10'
VERT. SCALE: 1" = 5'

DRAINAGE PLAN

The following items concerning the Keystone Park South 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 San Francisco Drive N.E. and east of Wyoming Boulevard N.E. At the present time, the site is undeveloped. The adjoining parcels are developed.

As shown by Panel 10 of the National Flood Insurance Program Flood Boundary and Floodway Maps for the City of Albuquerque, New Mexico, this site does not lie within a designated Flood Hazard Zone. The existing site is higher than Wyoming Boulevard to the west and San Francisco Drive to the north. The land to the east of the project site is higher than the project site, but concrete block walls prevent runoff from entering the project site. The land to the south is approximately parallel to the project site, but again block walls prevent stormwater runoff from entering the project site; therefore, offsite flows are negligible.

The Grading Plan shows 1) existing and proposed grades indicated by spot elevations and contours at 1'-0" intervals, 2) the continuity between existing and proposed elevations, 3) the limit and character of existing improvements, and 4) the limit and character of proposed improvements. As shown by this plan, the proposed improvements consist of the construction of residences, streets, sidewalks and associated improvements. Street grades for San Francisco Drive N.E. have been established in SAD No. 213. At present the site drains from east to west. The proposed grading will continue the flow in an east-to-west direction. Flows will be collected by the streets and routed to the west and into a ponding area before exiting into Wyoming Boulevard. The pond area will detain low flows and reduce the peak flow rates during large storms, thereby benefitting flow conditions downstream in San Francisco Drive. Stormwater runoff will continue across Wyoming Boulevard and in a westerly direction down San Francisco Drive. As the flows approach Interstate Highway No. 25, there is an area designated as a Zone AO Flood Area. This zone could have flooding to a depth of one foot in a 100-year, 6-hour rainfall event.

Individual lots are graded to drain to the street in front of each lot. Grading in conjunction with block walls will direct flows to the front of each unit. Cross-lot drainage easements will not be necessary.

The Calculations which appear below analyze both the existing and developed conditions for the 100-year, 6-hour rainfall event and for the 10-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 flow from the existing drainage basin at Interstate No. 25 is approximately 200 cfs. The development of Keystone Park South will increase the flow to approximately 209 cfs. The increase in flow as a result of development is less than 3%, which is a relatively small amount. The calculations for the 10-year, 6-hour rainfall event show a depth of flow in San Francisco Drive N.E. of 0.62 feet in both the existing and developed conditions, which shows that the proposed development will have no impact on the street flows. These calculations show the worst condition of street flows in San Francisco Drive N.E. At the present time, construction is under way for two drop inlets in San Francisco Drive at the Wyoming Boulevard intersection. These inlets will collect water from San Francisco Drive and divert it out of the basin and to the north. The two inlets have the capacity to divert more water out of the basin and to the north than the increased runoff generated by the development of Keystone Park South. This pattern of runoff is consistent with the pre-design conference recap which accompanies this submittal.

CALCULATIONS - KEYSTONE PARK SOUTH

Ground Cover Information

From SCS Bernalillo County Soil Survey, Plates 11 & 12:
Etc Rebado-Tijeras Complex
Hydrologic Soil Group B

Rational Method

Discharge: $Q = CIA$
where C varies
$i = P_6\,(6.84)\,T_c^{-0.51} = 4.97$ in./hr
$P_6 = 2.35$ in (DPM Plate 22.2 D-1)
$T_c = 10$ min (minimum)
A = area, acres

Volume: $V = CP_6A(1/12)$
where C varies
$P_6 = 2.35$ in (DPM Plate 22.2 D-1)
A = area, acres

Existing Condition

$A_{total} = 305,700$ sf $= 7.02$ Ac
$A_{imp} = 0$ sf; % Impervious = 0%
$C = 0.14$ (DPM Plate 22.2 C-1)
$Q_{100} = CIA = 0.14(4.97)(7.02) = 12$ cfs
$V_{100} = CP_6A = 0.14(2.35/12)(305,700) = 20,350$ cf

Developed Condition

$A_{total} = 305,700$ sf $= 7.02$ Ac
$A_{imp} = 190,000$ sf; % Impervious = 62%
$C = 0.64$ (DPM Plate 22.2 C-1)
$Q_{100} = CIA = 0.64(4.97)(7.02) = 22$ cfs
$V_{100} = CP_6A = 0.64(2.35/12)(305,700) = 38,310$ cf
$V_{pond} = V_1(A_{pond}/A_1)(0.50)+(A_{pond}/A_2)(1.0)$
$V_{pond} = V_1(0.4047/7.280)(0.50)+(4.025+2.640)(1.0)$
$= 4,315$ cf

Comparison

$\Delta Q_{100} = 22 - 12 = 10$ cfs (increase)
$\Delta V_{100} = 38,310 - 20,350 = 17,960$ cf (increase)

Grate Capacity for Type 'A' Storm Inlet (Two grates)

$Q = 13$ cfs per each (DPM Plate 22.3 D-5)
$Q_{capacity} = f(w,d)$
$Q_{total} = 26$ cfs
s = slope = 0.0332
d = depth of water above flowline = 0.67

$Q = (1.49/n)A\,R^{2/3}s^{1/2}$ (Manning Equation)
$R = 0.82$
n = roughness coefficient = 0.013

Pipe Capacity

$Q_{capacity} = 15$ cfs
Diameter = 18"

Hydraulic Analysis of Sidewalk Culvert

$Q = (1.49/n)\,A\,R^{2/3}\,S^{1/2}$ (Manning Equation)
w = bottom width = 4'
s = slope = 0.022
n = roughness coefficient = 0.015 (concrete)
m = side slope = 0 (vertical)
d = depth = 0.625
$Q_{capacity} = f(w,s,n,m,d) = 22.5$ cfs

CALCULATIONS - 10-YEAR, 6-HOUR RAINFALL EVENT

Ground Cover Information

From SCS Bernalillo County Soil Survey, Plate 11 & 21:
Etc Rebado Tijeras Complex
Hydrologic Soil Group B

Rational Method

Discharge: $Q = CIA$
where C varies
$i = P_6\,(6.84)\,T_c^{-0.51} = 1.61$ in./hr
$P_6 = 2.35(0.657) = 1.54$ in (DPM Plate 22.2 D-1)
$T_c = 40$ min
A = area, acres

Volume: $V = CP_6A(1/12)$
where C varies
$P_6 = 1.54$ in (DPM Plate 22.2 D-1)
A = area, acres

Existing Condition

$A_{total} = 6,387,500$ sf $= 147$ Ac
$A_{imp} = 2,871,800$ sf; % Impervious = 45%
$C = 0.55$ (DPM Plate 22.2 C-1)
$Q_{100} = CIA = 0.55(1.61)(147) = 130$ cfs
$V_{100} = CP_6A = 0.55(1.54/12)(6,387,500) = 450,850$ cf

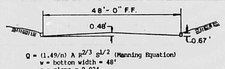
Developed Condition

$A_{total} = 6,387,500$ sf $= 147$ Ac
$A_{total} = 3,066,000$ sf; % Impervious = 48%
$C = 0.58$ (DPM Plate 22.2 C-1)
$Q_{100} = CIA = 0.58(1.61)(147) = 137$ cfs
$V_{100} = CP_6A = 0.58(1.54/12)(6,387,500) = 475,440$ cf

Comparison

$\Delta Q_{100} = 137 - 130 = 7$ cfs (increase)
$\Delta V_{100} = 475,440 - 450,850 = 24,590$ cf (increase)

Street Cross-Section of San Francisco Drive



$Q = (1.49/n)\,A\,R^{2/3}\,S^{1/2}$ (Manning Equation)
w = bottom width = 48'
s = slope = 0.024
n = roughness coefficient = 0.017
m = side slope = 0 (vertical)
d = depth
$Q = f(w,s,n,m,d)$

Depth existing condition = 0.62'
Depth developed condition = 0.62'

CALCULATIONS - TOTAL BASIN

Ground Cover Information

From SCS Bernalillo County Soil Survey, Plates 11 & 21:
Etc Rebado-Tijeras Complex
Hydrologic Soil Group B

Rational Method

Discharge: $Q = CIA$
where C varies
$i = P_6\,(6.84)\,T_c^{-0.51} = 2.45$ in./hr
$P_6 = 2.35$ in (DPM Plate 22.2 D-1)
A = area, acres
$L = 10,300$ ft
$H = 5,410 - 5,182 = 228$
$S = 0.024$
$T_c = 0.0078\,(10,300^{0.77}/0.024^{0.385}) = 40$ min
$V = 10,300/40(60) = 4.26$ fpm

Volume: $V = CP_6A(1/12)$
where C varies
$P_6 = 2.35$ in (DPM Plate 22.2 D-1)

Existing Condition

$A_{total} = 6,387,500$ sf $= 147$ Ac
$A_{imp} = 2,871,800$ sf; % Impervious = 45%
$C = 0.55$ (DPM Plate 22.2 C-1)
$Q_{100} = CIA = 0.55(2.45)(147) = 200$ cfs
$V_{100} = CP_6A = 0.55(2.35/12)(6,387,500) = 687,990$ cf

Developed Condition

$A_{total} = 6,387,500$ sf $= 147$ Ac
$A_{total} = 3,066,000$ sf; % Impervious = 48%
$C = 0.58$ (DPM Plate 22.2 C-1)
$Q_{100} = CIA = 0.58(2.45)(147) = 209$ cfs
$V_{100} = CP_6A = 0.58(2.35/12)(6,387,500) = 725,514$ cf

Comparison

$\Delta Q_{100} = 209 - 200 = 9$ cfs (increase)
$\Delta V_{100} = 725,514 - 687,990 = 37,524$ cf (increase)

REGISTERED PROFESSIONAL ENGINEER AND LAND SURVEYOR — STATE OF NEW MEXICO — THOMAS T. MANN — 3792

10-18-85
6-4-86

RECEIVED
JUN 05 1986
HYDROLOGY SECTION

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Roberta Duran
NOTARY PUBLIC
STATE OF NEW MEXICO
07/03/02

D19/014

NO.	DATE	BY	REVISIONS
1	6-4-86	TM	ADDRESSED COMMENTS IN 9-18-85 LETTER
2	6-9-86	TM	REVISED AREA OF GRAVEL

DESIGNED BY KLS
DRAWN BY LBB
APPROVED TTM

B.N. 50981
DATE 9-85

GRADING & DRAINAGE PLAN
KEYSTONE PARK SOUTH

FILE N.
SHEET 3 OF 8

D24 C20 B16 A12 CITY OF ALBUQERQUE C D