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R# 21 DATE 2-23-93 OP: EJP

CITY OF ALBUQUERQUE

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Karen Acevedo
CITY CLERK RECORDER

OFFICIAL SEAL
NORBERTA SANCHEZ
NOTARY PUBLIC
STATE OF NEW MEXICO
My Commission Expires MAY 8 1995

Norberta Sanchez

THIS PLAN SHOT TWICE
ONCE ON LIGHT AND
ONCE ON DARK.

CITY OF ALBUQUERQUE
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PLANS/PLATS ON FILE

FILE DESC: C-22/D015

PLANS/PLATS 4

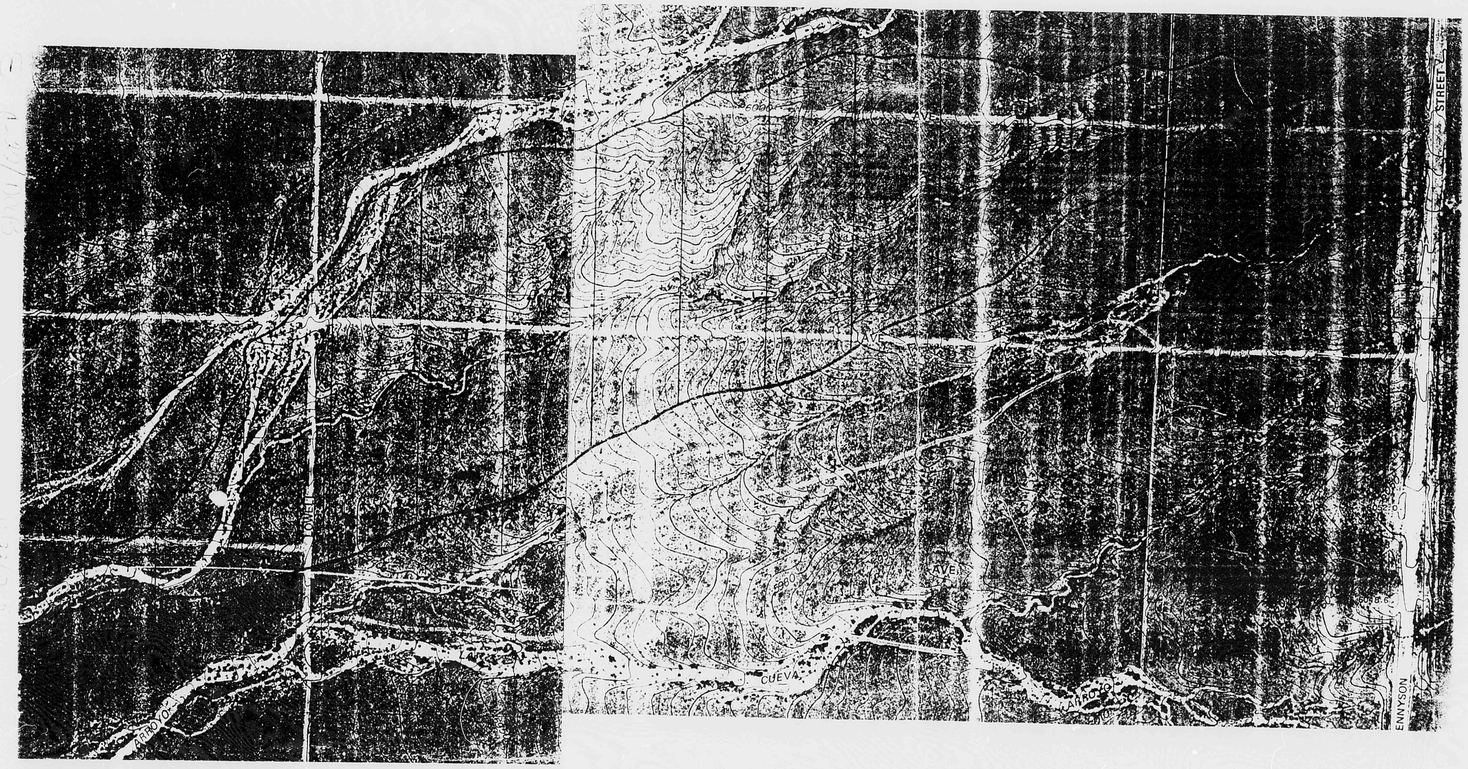
C 20 B 16 A 12

CITY OF ALBUQUERQUE

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ONCE ON DARK.

CITY OF ALBUQUERQUE
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R# 21 DATE 2-23-82 OP 577

CITY OF ALBUQUERQUE

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Karen Aimes
CITY CLERK RECORDER

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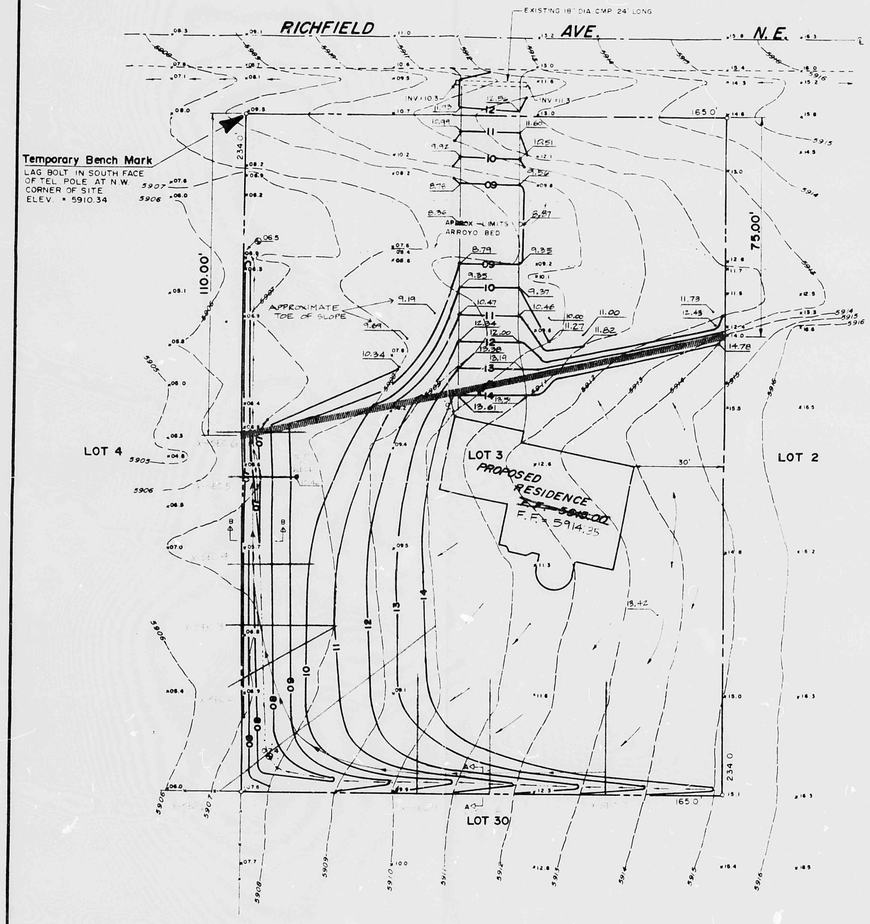
CITY OF ALBUQUERQUE

AS-BUILT INFORMATION PROVIDED BY RESOURCE TECHNOLOGY, INC.

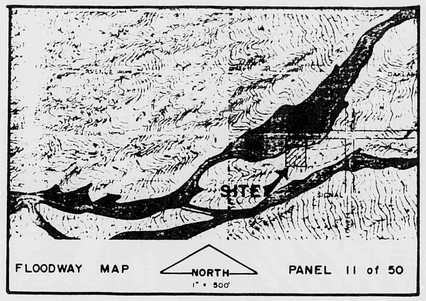
Resource Technology, Inc.
ENGINEERS & ENVIRONMENTAL SCIENTISTS
2129 OSUNA NE - SUITE 2A, ALBUQUERQUE, NEW MEXICO 87113
TELEPHONE - (505) 343-3113

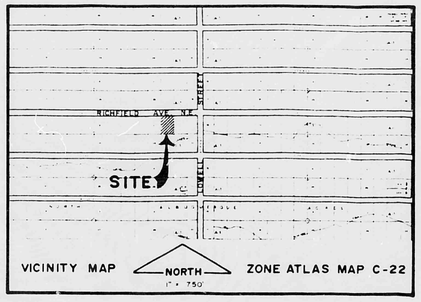
BASE PLAN AND DRAINAGE CALCULATIONS THIS SHEET COPIED FROM THE APPROVED PLAN PREPARED BY FRANK D. LOVELADY

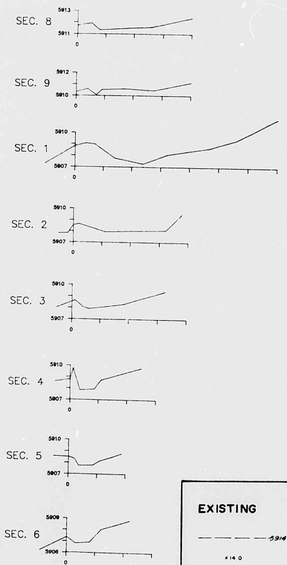
ENGINEER'S CERTIFICATION:
THIS AS-BUILT PLAN SUBSTANTIALLY COMPLIES WITH THE INTENT AND REQUIREMENTS OF THE APPROVED DRAINAGE PLAN AS NOTED IN THE AUG. 15, 1990 LETTER FROM RESOURCE TECHNOLOGY, INC. TO THE CITY/COUNTY FLOOD PLAIN ADMINISTRATOR.



SCALE 1"=20'







DRAINAGE CALCULATIONS

SOIL TYPE:

Emb, Embudo gravelly fine sandy loam, 0 to 5 percent slopes, hydrologic soil group "B".

RAINFALL VOLUME:

100-year, 6-hour rainfall (D.P.M. Plate 22.2 B-1) P_6 = 2.6 inches.

TIME OF CONCENTRATION:

Tc = 10 minutes, minimum time of concentration.

RAINFALL INTENSITY:

$I = P_6 \times 6.84 \times Tc^{-0.51} = 2.6 \times 6.84 \times (10)^{-0.51} = 5.50$ inches per hour.

EXISTING CONDITIONS:

Use C = 0.40 Area = (165 X 234) = 38610 SF = 0.8864 AC
Q = CIA = 0.40 X 5.5 X 0.8864 = 1.95 CFS

CN = 70 (pasture or range, fair, group B) Direct runoff = 0.40 inches.
V = (165 X 234)(0.40/12) = 1287 CF

PROPOSED CONDITIONS:

Drainage Area No. 1. - Area within the flood zone.
Area = ½ (110 x 75) X 165 = 15262.5 SF = 0.350± AC
Q = CIA = 0.40 X 5.5 X 0.3504 = 0.77 CFS
V = 15262.5 (0.40/12) = 509 CF

Drainage Area No. 2. - Area south of flood zone.
Area = 38610 - 15262.5 = 23347.5 SF = 0.536± AC

Roof	2750 SF	X	0.90	= 2475
Landscaping (5%)	1250 SF	X	0.25	= 300
Natural ground	19898 SF	X	0.40	= 7959
	23548 SF			10284

C = 10284 ÷ 23548 = 0.44
Q = CIA = 0.44 X 5.50 (23347.5/43560) = 1.3 CFS
V = (2250 X 1.0 + 1200 X 0.30 + 19998 X 0.40) / 12 = 1068 CF

OFF-SITE FLOW ENTERING SITE VIA ARROYO:

TOTAL AREA FROM CITY OF ALBUQUERQUE TOPOGRAPHIC ORTHOPHOTO MAP, 1" = 200', (SUBMITTED SEPARATELY) AREA = 1,467,300 SQ.FT. = 33.68 ACRES. HIGH ELEV. IS 6062 FEET; LOW ELEVATION IS 5910 FEET; DISTANCE 3380 LF (APPROX.)
SLOPE = 152/3380 = 0.0450 FT./FT.

TIME OF CONCENTRATION - USE SCS UPLAND METHOD, $T_t = L/60V$
WHERE: T_t = TRAVEL TIME IN MINUTES.
L = HYDROLIC LENGTH IN FEET MEASURED FROM THE MOST HYDRAULICALLY REMOTE POINT TO THE ANALYSIS POINT IN QUESTION.
V = VELOCITY IN FEET PER SECOND.
Tc = SUMMATION OF T_t FOR EACH TYPE OF UPLAND FLOW.

VELOCITY IS DETERMINED BY $V = KS^{0.5}$
WHERE: V = VELOCITY IN FEET PER SECOND.
K = CONVEYANCE FACTOR (BARE GROUND, 10 TO 19.5, USE 15)
S = SLOPE IN FEET PER FOOT.

$V = 15(0.0450)^{1/2} = 3.18$ FPS USING PLATE 22.2 B-1 FOR A SLOPE OF 0.045 AND BARE GROUND ALLUVIAL FANS, V = 2.5 FPS. T_t = 3380/60?? = ?.5 MIN.

RAINFALL: 6-HOUR, 100-YEAR RAINFALL (P_6) = 2.65 INCHES.

INTENSITY: $I = P_6 \times 6.84 \times Tc^{-0.51} = 2.65 \times 6.84 \times 22.5^{-0.51} = 1.??$ IN./HR.

"C" FACTOR: USE THE SAME DEVELOPED "C" FACTOR AS WAS USED FOR LOT

PEAK RUNOFF: USE RATIONAL EQUATION Q = CIA
$Q_{100} = 0.44 \times 3.70 \times 33.68 = 54.8$ CFS $Q_{10} = 0.657 \times 54.8 = 36$ CFS

CULVERT SELECTION: THE PROPOSED DESIGN USES A DIP SECTION TO CROSS THE ARROYO CHANNEL. IN THE EVENT CULVERTS ARE USED, THERE SHOULD BE ?MPLE CULVERTS TO PASS THE TEN-YEAR FLOW. USE 18" CULVERTS PER MDPW EXHIBIT 1?-??, FOR ?.0 CFS AN 18" CULVERT WITH HEADWALL WILL CAR?? ACT 6.1 CFS. ?6 6.1 ? ? 18" CULVERTS.

OFF-SITE FLOW ENTERING SOUTHERLY PORTION OF LOT:

AREA = (400' X 150')/2 = 30,000 SF = 0.69 ACRES. SLOPE = (5934-5914)÷300=0.05
$V = 15(0.05)^{0.5} = 3.35$ FPS Tc = 400/60x3.35 = 1.99 MIN. USE 10 MIN.
Q_{100} = CIA = 0.40 X 5.5 X 0.69 = 1.51 CFS

SWALE AT SOUTH PROPERTY LINE:

REQUIRED CAPACITY IS OFF-SITE FLOW PLUS SOUTHERLY 124' OF LOT.
Q = 1.51 + 1.3(124/234) = 2.19 CFS TRY V-DITCH, 6" DEEP, 3:1 SIDES, 5% SLOPE, GRAVEL LINED, N = 0.035
$A = (0.5 \times 3.0) = 0.75$ SF $P = 2(0.5^2 + 1?^2)^{1/2} = 3.16$ FT
R = A/P = 0.75/3.16 = 0.24 FT.
$Q = A(1.486/N)R^{2/3}S^{1/2} = 0.75(1.486/0.035)(0.24)^{2/3}(0.05)^{1/2} = 2.75$ CFS
2.75 CFS > 2.19 CFS (SECTION IS ADEQUATE.)

SWALE AT WEST PROPERTY LINE:

REQUIRED CAPACITY = 2.19 CFS. USE V-DITCH, UNLINED, N = 0.030 8" DEEP, 3:1 SIDES, 0.5% SLOPE.
$A = (0.67 \times 4.02) = 1.35$ SF $P = 2(0.67^2 + 2.01^2)^{1/2} = 4.23$ FT.
R = A/P = 1.35/4.23 = 0.32 FT.
$Q = 1.35(1.486/0.030)(0.32)^{2/3}(0.005)^{1/2} = 2.21$ CFS > 2.19 CFS (SECTION IS ADEQUATE.) V = Q/A = 2.21/1.35 = 1.6 FPS

LEGEND

EXISTING	NEW	DESCRIPTION
——— 5914 ———	——— 14 ———	CONTOUR
x14.0		SPOT ELEVATION
— — — —		PROPERTY LINE
— · — · —		FENCE
		ARROYO BED LIMIT
		AMAFCA EASEMENT
← ← ←		DRAINAGE SWALE
←		SHEET FLOW

DESIGN COMMENTS:

1. THE LIMITS OF THE PROPOSED FLOOD HAZARD DEDICATION WAS DETERMINED BY SCALING FROM THE FLOODWAY MAP AND GENERALLY CORRESPONDS TO THE CONTOURS PLOTTED FROM THE FIELD SURVEY. THE ARROYO BED IS SHOWN ON THE PLAN BY DOTTED LINES.
2. THE PROPOSED DRIVEWAY CROSSES THE ARROYO BY MEANS OF A SWALE WHICH DOES NOT ALTER FLOW IN THE ARROYO CHANNEL OR THE ELEVATION OF THE CHANNEL. THE APPROACH TO THE GARAGE IS SUFFICIENTLY OUT OF THE ARROYO CHANNEL AS TO NOT ALTER FLOW.
3. THE FINISH FLOOR ELEVATION IS 1.0' ABOVE THE CONTOUR INTERSECTED BY THE EDGE OF THE FLOOD HAZARD ZONE AT THE EAST BOUNDARY LINE, I.E., THE 14' CONTOUR.
4. THE OFF-SITE AREA CONTRIBUTING TO FLOW IN THE ARROYO WAS DETERMINED FROM THE CITY OF ALBUQUERQUE TOPOGRAPHIC ORTHOPHOTO MAP, 1" = 200', AND THE NORTHERLY BOUNDARY OF THE AREA WAS DETERMINED IN CONSULTATION WITH THE CITY/COUNTY FLOODPLAIN COORDINATOR.

LEGAL DESCRIPTION:

LOT NUMBERED THREE (3) IN BLOCK NUMBERED EIGHT (8), TRACT TWO (2), UNIT ONE (1), NORTH ALBUQUERQUE ACRES, BERNALILLO COUNTY, NEW MEXICO.



NOT USED

NOTE: THIS AS-BUILT DRAWING IS A XEROX COPY OF FRANK D. LOVELADY'S ORIGINAL PLAN.

BENCH MARK:

STATION 2-C23 IS LOCATED 11 MILES NORTHEAST OF DOWNTOWN ALBUQUERQUE, ON THE EAST SIDE OF TRAMWAY BLVD., JUST NORTH OF THE JUNCTION WITH CEDAR HILLS ROAD. TO REACH THE STATION FROM THE INTERSECTION OF MONTGOMERY BLVD. AND TRAMWAY BLVD., GO NORTH ON TRAMWAY BLVD. 3.0 MILES TO THE STATION ON THE RIGHT. THE STATION MARK IS A STANDARD M.C.S. BRASS TABLET, STAMPED "2-C23", SET IN TOP OF A CONCRETE POST PROJECTING 0.3 FOOT ABOVE GROUND. ELEV. = 6087.599

REVISED 1/10/90

FRANK D. LOVELADY — NEW MEXICO — 6512 — REGISTERED PROFESSIONAL ENGINEER

DECEMBER 7, 989

RECEIVED
AUG 15 1990
HYDROLOGY DIVISION

GRADING AND DRAINAGE PLAN
MICHAEL BARKER RESIDENCE
LOT 3, BLOCK 8, TRACT 2, UNIT 1
NORTH ALBUQUERQUE ACRES
BERNALILLO COUNTY, NEW MEXICO

THIS PLAN SHOT TWICE ONCE ON LIGHT AND ONCE ON DARK.

CITY OF ALBUQUERQUE
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REV 21 DATE 2-23-93 BY ETP
CITY OF ALBUQUERQUE

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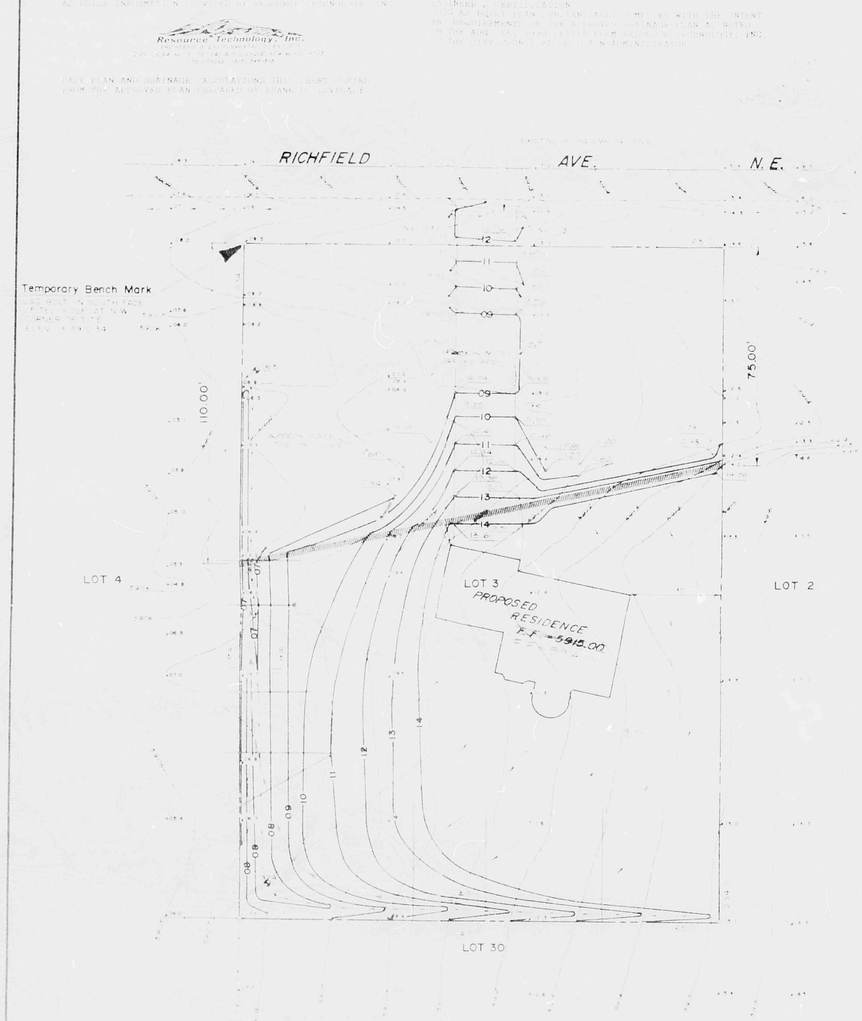
Karen Aeuer
CITY CLERK RECORDER

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STATE OF NEW MEXICO
My Commission Expires: MAY 8 1995
Norberta Sanchez

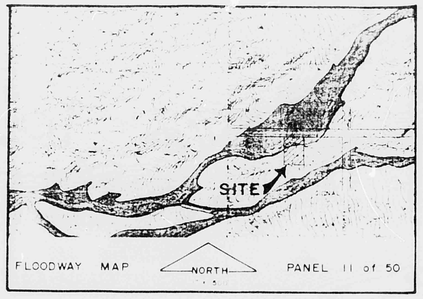
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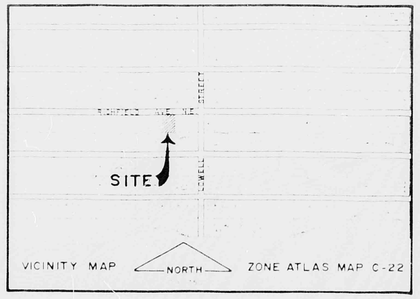
CITY OF ALBUQUERQUE

C D

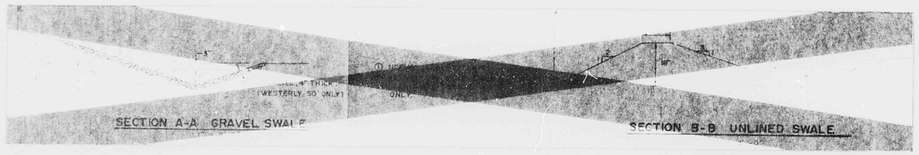


SCALE 1"=20'





DRAINAGE CALCULATIONS



LEGEND

EXISTING	NEW	DESCRIPTION
	14	CONTOUR
		SPOT ELEVATION
		PROPERTY LINE
		FENCE
		ARROYO BED LIMIT
		AMAFCA EASEMENT
		DRAINAGE SWALE
		SHEET FLOW

REVISED 1/10/90

DECEMBER 7, 1989

GRADING AND DRAINAGE PLAN
MICHAEL BARKER RESIDENCE
LOT 3, BLOCK 8, TRACT 2, UNIT 1
NORTH ALBUQUERQUE ACRES
BERNALILLO COUNTY, NEW MEXICO

RECEIVED
AUG 15 1990
HYDROLOGY DIVISION

THIS PLAN SHOT TWICE
ONCE ON LIGHT AND
ONCE ON DARK.

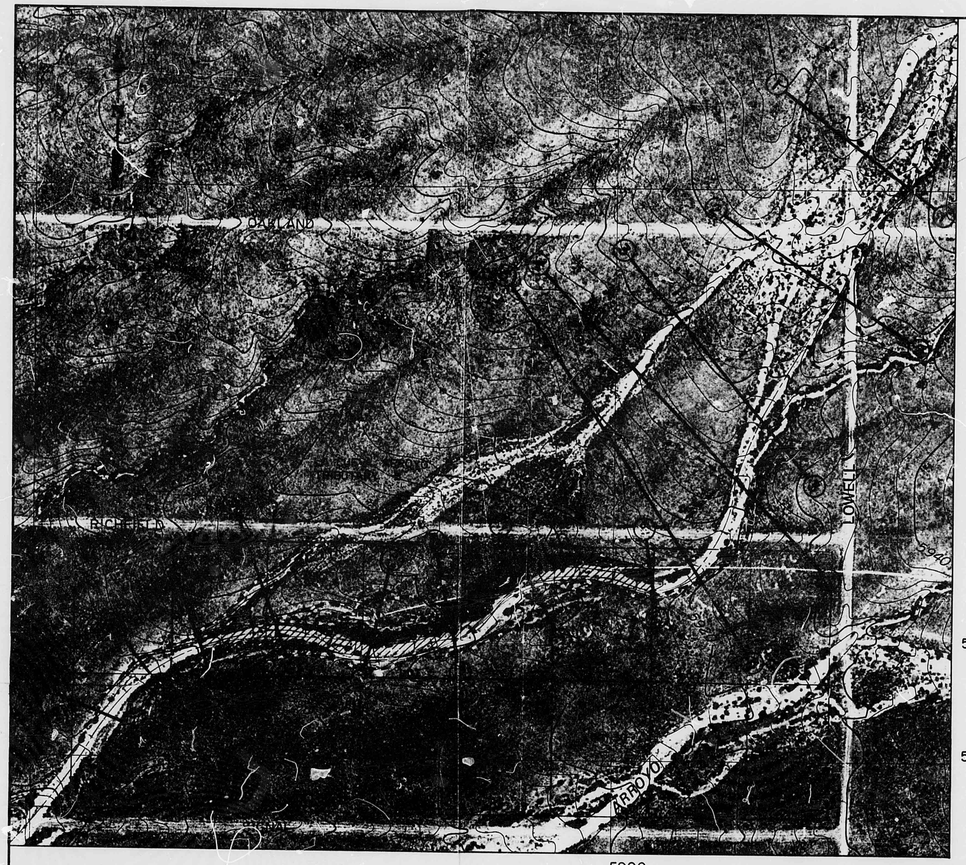
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FOR 21 DATE 3/92 OF 7/92
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CITY CLERK RECORDER
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NORBERTA SANCHEZ
NOTARY PUBLIC
STATE OF NEW MEXICO
My Commission Expires May 8, 1994

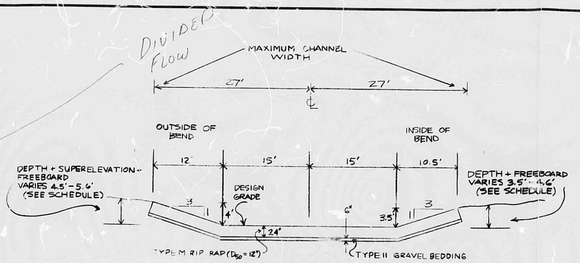
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CITY OF ALBUQUERQUE

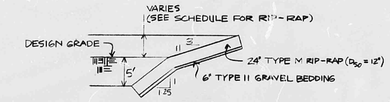
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DIVIDED FLOW

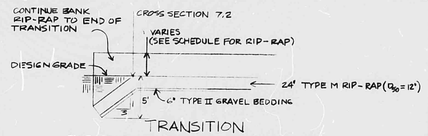


TYPICAL PROPOSED CROSS SECTION
FULL RIP-RAP LINING
CROSS SECTION 6.1 - 7.2

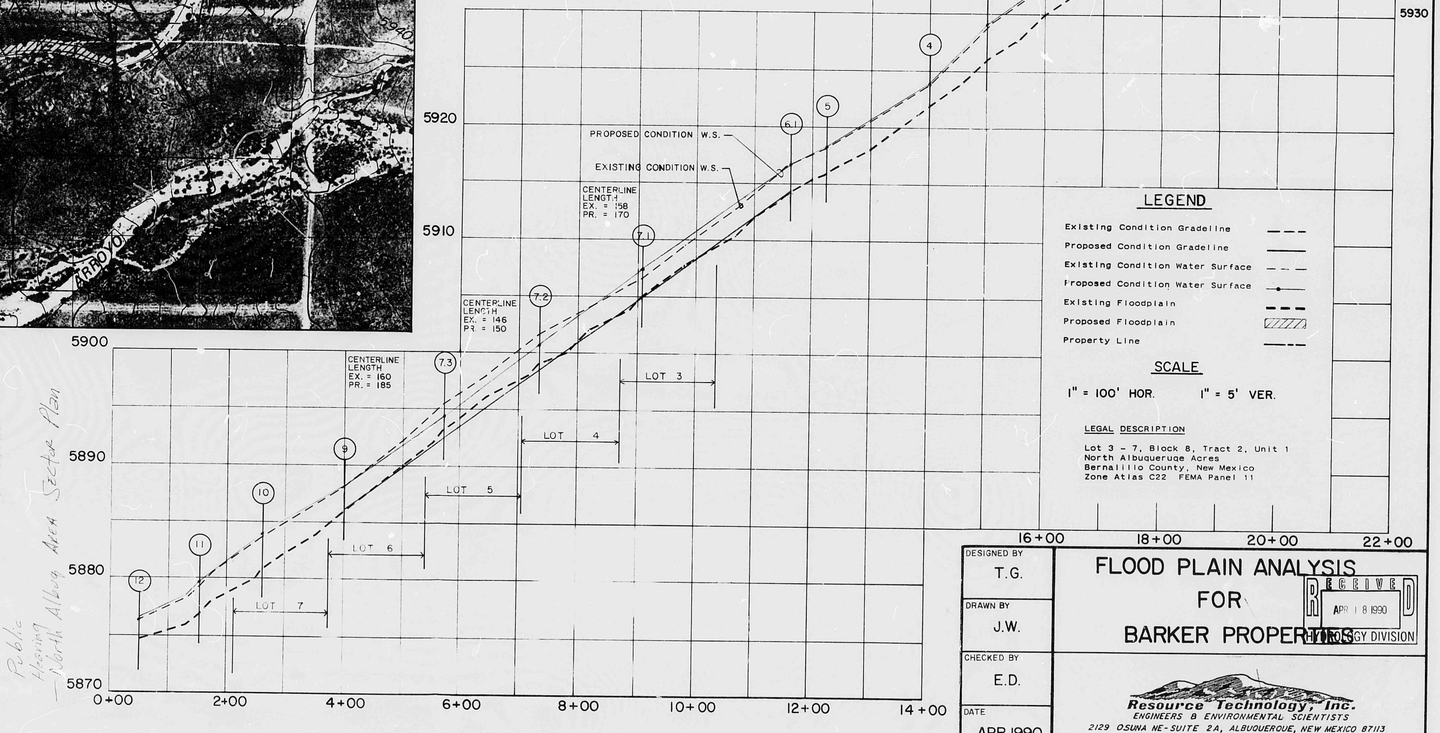


TYPICAL PROPOSED CROSS SECTION
PARTIAL RIP-RAP LINING
CROSS SECTION 7.2 - 10 SOUTHSIDE
CROSS SECTION 9 - 10 NORTHSIDE

SPILLS?



TRANSITION
RIP RAP LINING TO NATURAL BED
ALONG CHANNEL CENTERLINE



LEGEND

- Existing Condition Gradeline
- Proposed Condition Gradeline
- Existing Condition Water Surface
- Proposed Condition Water Surface
- Existing Floodplain
- Proposed Floodplain
- Property Line

SCALE

1" = 100' HOR. 1" = 5' VER.

LEGAL DESCRIPTION

Lot 3 - 7, Block 8, Tract 2, Unit 1
North Albuquerque Acres
Bernalillo County, New Mexico
Zone Atlas C22 FEMA Panel 11

DESIGNED BY	T.G.
DRAWN BY	J.W.
CHECKED BY	E.D.
DATE	APR 1990

FLOOD PLAIN ANALYSIS FOR BARKER PROPERTY

RECEIVED
APR 18 1990
HYDROLOGY DIVISION

Resource Technology, Inc.
ENGINEERS & ENVIRONMENTAL SCIENTISTS
2129 OSUNA NE-SUITE 2A, ALBUQUERQUE, NEW MEXICO 87113
TELEPHONE - (505) 345-3115

ATTACHMENT 2

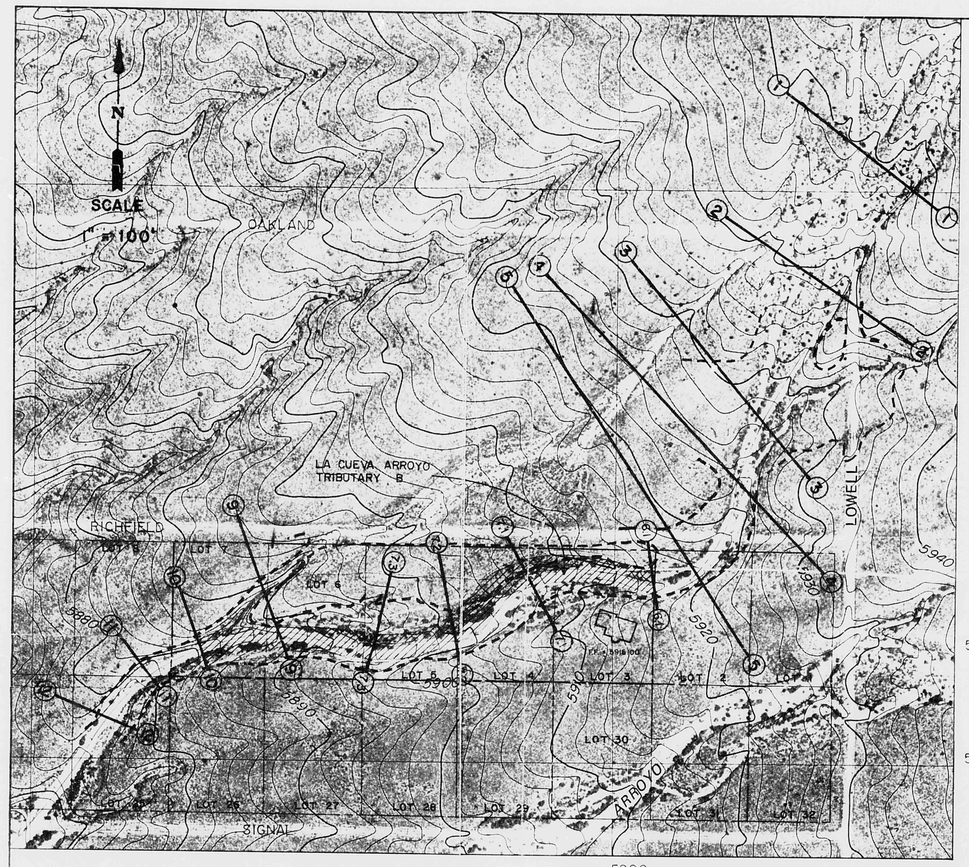
Public Hearing - North Albq Area Sector Plan

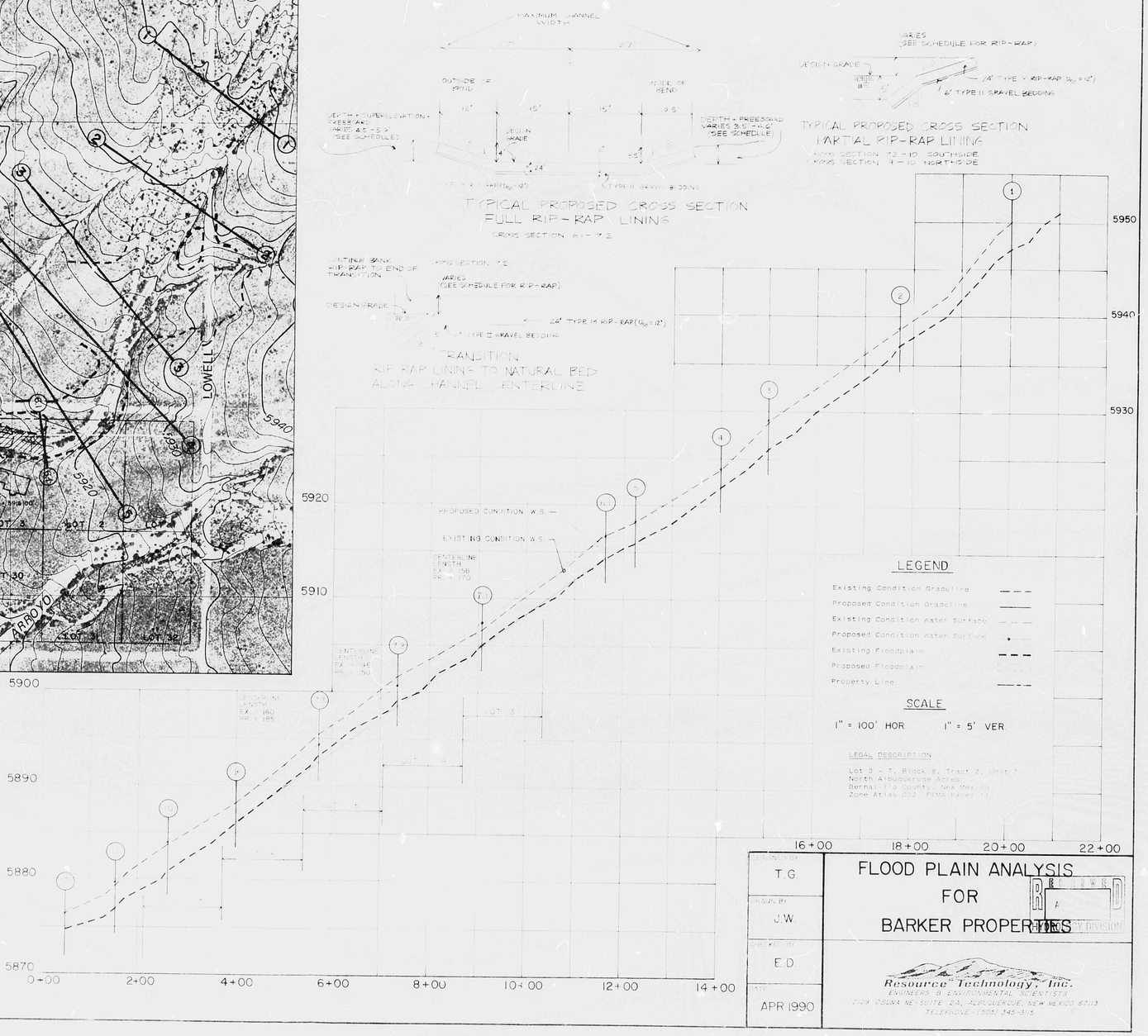
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OFFICIAL SEAL NORBERTA SANCHEZ NOTARY PUBLIC STATE OF NEW MEXICO
My Commission Expires: MAY 8 1995
Norberta Sanchez

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





LEGEND

- Existing Condition Gradeline
- Proposed Condition Gradeline
- Existing Condition Water Surface
- Proposed Condition Water Surface
- Existing Floodplain
- Proposed Floodplain
- Property Line

SCALE

1" = 100' HOR 1" = 5' VER

LEGAL DESCRIPTION

Lot 3 - 7, Block 8, Tract 2, Unit 1
North Albuquerque Acres
Bernalillo County, New Mexico
Zone Atlas D22 FEMA Panel 11

DESIGNED BY	T.G.
DRAWN BY	J.W.
CHECKED BY	E.D.
DATE	APR 1990

FLOOD PLAIN ANALYSIS FOR BARKER PROPERTIES

RECEIVED
HYDROLOGY DIVISION

Resource Technology, Inc.
ENGINEERS & ENVIRONMENTAL SCIENTISTS
3109 OSUNA NE - SUITE 2A, ALBUQUERQUE, NEW MEXICO 87113
TELEPHONE - (505) 345-3115

ATTACHMENT 2

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Re: 2 DATE 1-3-92 OF 2-12

CITY OF ALBUQUERQUE

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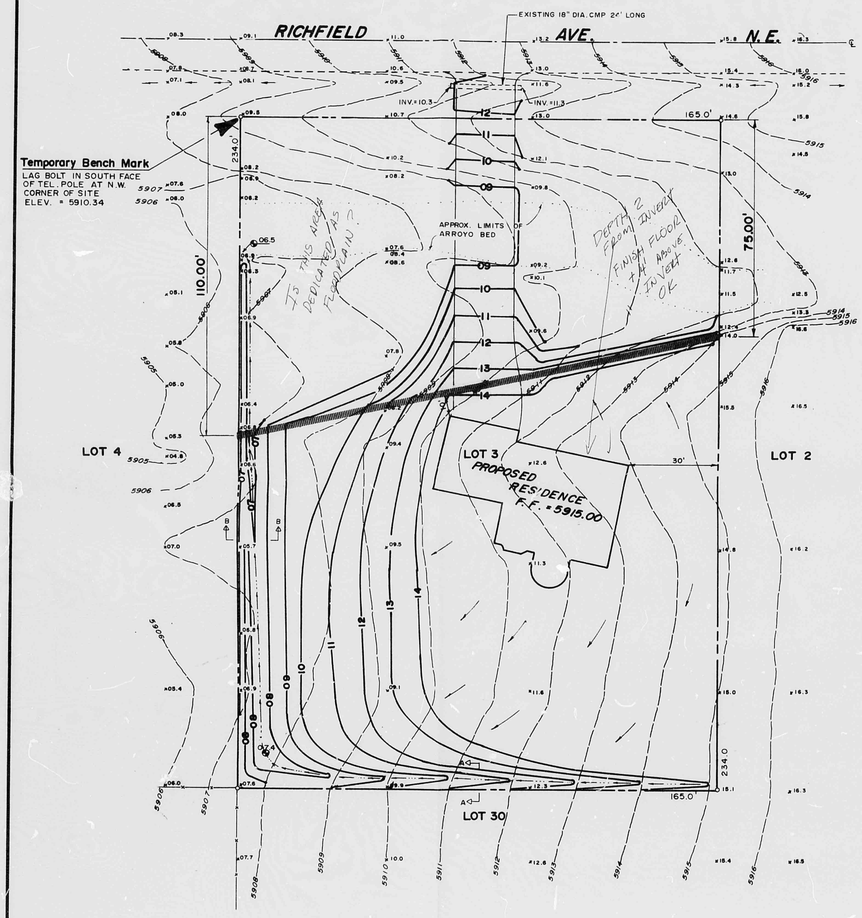
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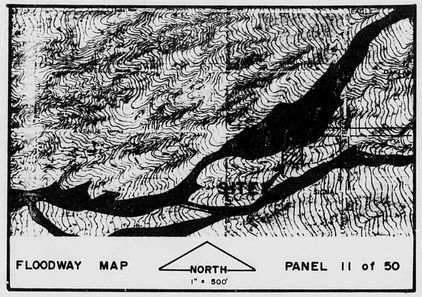
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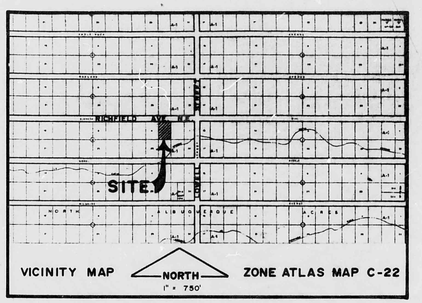
CITY OF ALBUQUERQUE

C D



SCALE 1" = 20'





DRAINAGE CALCULATIONS

SOIL TYPE:

EmB, Embudo gravelly fine sandy loam, 0 to 5 percent slopes, hydrologic soil group "B".

RAINFALL VOLUME:

100-year, 6-hour rainfall (D.P.M. Plate 22.2 D-1) P_6 = 2.6 inches.

TIME OF CONCENTRATION:

Tc = 10 minutes, minimum time of concentration.

RAINFALL INTENSITY:

$I = P_6 \text{ X } 6.84 \text{ X } Tc^{-0.51} = 2.6 \text{ X } 6.84 \text{ X } (10)^{-0.51} = 5.50$ inches per hour.

EXISTING CONDITIONS:

Use C = 0.40 Area = (165 X 234) = 38610 SF = 0.8864 AC
Q = CIA = 0.40 X 5.5 X 0.8864 = 1.95 CFS

CN = 70 (pasture or range, fair, group B) Direct runoff = 0.40 inches.
V = (165 X 234)(0.40/12) = 1287 CF

PROPOSED CONDITIONS:

Drainage Area No. 1. - Area within the flood zone.
Area = 8 (110 + 75) X 165 = 15262.5 SF = 0.3504 AC
Q = CIA = 0.40 X 5.5 X 0.3504 = 0.77 CFS
V = 15262.5 (0.40/12) = 509 CF

Drainage Area No. 2. - Area south of flood zone.
Area = 38610 - 15262.5 = 23347.5 SF = 0.5360 AC

Roof	2250 SF	X 0.90	=	2025
Landscaping (5%)	1200 SF	X 0.25	=	300
Natural ground	19898 SF	X 0.40	=	7959
	23348 SF			10284

C = 10284 / 23348 = 0.44

Q = CIA = 0.44 X 5.50 (23347.5/43560) = 1.3 CFS

V = $\frac{[2250 \text{ X } 2.0 + 1200 \text{ X } 0.30 + 19898 \text{ X } 0.40]}{12}$ = 1068 CF

OFF-SITE FLOW ENTERING SITE VIA ARROYO:

TOTAL AREA FROM CITY OF ALBUQUERQUE TOPOGRAPHIC ORTHOPHOTO MAP, 1" = 200', (SUBMITTED SEPARATELY) AREA = 1,467,300 SQ.FT. = 33.68 ACRES. HIGH ELEV. IS 6062 FEET; LOW ELEVATION IS 5910 FEET; DISTANCE 3380 LF (APPROX.)
SLOPE = 152/3380 = 0.0450 FT./FT.

TIME OF CONCENTRATION - USE SCS UPLAND METHOD, $T_t = L/60V$
WHERE: T_t = TRAVEL TIME IN MINUTES.
L = HYDROLIC LENGTH IN FEET MEASURED FROM THE MOST HYDRAULICALLY REMOTE POINT TO THE ANALYSIS POINT IN QUESTION.
V = VELOCITY IN FEET PER SECOND.
Tc = SUMMATION OF T_t FOR EACH TYPE OF UPLAND FLOW.

VELOCITY IS DETERMINED BY $V = KS^{0.5}$
WHERE: V = VELOCITY IN FEET PER SECOND.
K = CONVEYANCE FACTOR (BARE GROUND, 10 TO 19.5, USE 15)
S = SLOPE IN FEET PER FOOT.

$V = 15(0.0450)^{1/2} = 3.18$ FPS USING PLATE 22.2 D-1 FOR A SLOPE OF 0.045 AND BARE GROUND ALLUVIAL FANS, V = 2.5 FPS. T_t = 3380/60X2.5 = 22.5 MIN.

RAINFALL: 6-HOUR, 100-YEAR RAINFALL (P_6) = 2.65 INCHES.

INTENSITY: $I = P_6 \text{ X } 6.84 \text{ X } Tc^{-0.51} = 2.65 \text{ X } 6.84 \text{ X } 22.5^{-0.51} = 3.70$ IN./HR.

"C" FACTOR: USE THE SAME DEVELOPED "C" FACTOR AS WAS USED FOR LOT 2, C =0.44

PEAK RUNOFF: USE RATIONAL EQUATION Q = CIA
$Q_{100} = 0.44 \text{ X } 3.70 \text{ X } 33.68 = 54.8$ CFS $Q_{10} = 0.657 \text{ X } 54.8 = 36$ CFS

CULVERT SELECTION: THE PROPOSED DESIGN USES A DIP SECTION TO CROSS THE ARROYO CHANNEL. IN THE EVENT CULVERTS ARE USED, THERE SHOULD BE ANGLE CULVERTS TO PASS THE TEN-YEAR FLOW. USE 18" CULVERTS PER HEM 4 EXHIBIT 14-9, FOR IN/D = 1.0 AN 18" CULVERT WITH HEADWALL WILL CARRY ABOUT 6.1 CFS. 36/6.1 = 5.9, OR 6 - 18" CULVERTS.

OFF-SITE FLOW ENTERING SOUTHERLY PORTION OF LOT:

AREA = (400' X 150')/2 = 30,000 SF = 0.69 ACRES. SLOPE = (5934-5914)400=0.05

$V = 15(0.05)^{0.5} = 3.35$ FPS Tc = 400/60x3.35 = 1.99 MIN. USE 10 MIN.

Q_{100} = CIA = 0.40 X 5.5 X 0.69 = 1.51 CFS

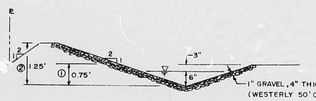
SWALE AT SOUTH PROPERTY LINE:

REQUIRED CAPACITY IS OFF-SITE FLOW PLUS SOUTHERLY 12A' OF LOT.
Q = 1.51 + 1.3(124/234) = 2.19 CFS TRY V-DITCH, 6" DEEP, 3:1 SIDES, 5% SLOPE, GRAVEL LINED, N = 0.035

A = (0.5 I 3.0)$\frac{1}{2}$ = 0.75 SF P = $2(0.5^2 + 1/5^2)^{1/2}$ = 3.16 FT
R = A/P = 0.75/3.16 = 0.24 FT.
Q = A(1.486/N)$R^{2/3}S^{1/2}$ = 0.75(1.486/0.035)$(0.24)^{2/3}(0.05)^{1/2}$ = 2.75 CFS
2.75 CFS > 2.19 CFS (SECTION IS ADEQUATE.)

SWALE AT WEST PROPERTY LINE:

REQUIRED CAPACITY = 2.19 CFS. USE V-DITCH, UNLINED, N = 0.030 6" DEEP, 3:1 SIDES, 0.5% SLOPE.
A = (0.67 I 4.02)$\frac{1}{2}$ = 1.35 SF P = $2(0.67^2 + 2.01^2)^{1/2}$ = 4.25 FT.
R = A/P = 1.35/4.23 = 0.32 FT.
Q = 1.35(1.486/0.030)$(0.32)^{2/3}(0.005)^{1/2}$ = 2.21 CFS > 2.19 CFS (SECTION IS ADEQUATE.) V = Q/A = 2.21/1.35 = 1.6 FPS



SECTION A-A GRAVEL SWALE
1" = 2'-0"

① NORMAL GRAVEL LIMIT
② GRAVEL LIMIT AT CURVE IN CHANNEL, OUTSIDE FACE ONLY.



SECTION B-B UNLINED SWALE
1" = 2'-0"

LEGEND

EXISTING	NEW	DESCRIPTION
5914	14	CONTOUR
x14.0		SPOT ELEVATION
		PROPERTY LINE
		FENCE
		ARROYO BED LIMIT
		AMAFCA EASEMENT
		DRAINAGE SWALE
		SHEET FLOW

DESIGN COMMENTS:

1. THE LIMITS OF THE PROPOSED FLOOD HAZARD DEDICATION WAS DETERMINED BY SCALING FROM THE FLOODWAY MAP AND GENERALLY CORRESPONDS TO THE CONTOURS PLOTTED FROM THE FIELD SURVEY. THE ARROYO BED IS SHOWN ON THE PLAN BY DOTTED LINES.
2. THE PROPOSED DRIVEWAY CROSSES THE ARROYO BY MEANS OF A SWALE WHICH DOES NOT ALTER FLOW IN THE ARROYO CHANNEL, OR THE ELEVATION OF THE CHANNEL. THE APPROACH TO THE GARAGE IS SUFFICIENTLY OUT OF THE ARROYO CHANNEL AS TO NOT ALTER FLOW.
3. THE FINISH FLOOR ELEVATION IS 1.0' ABOVE THE CONTOUR INTERSECTED BY THE EDGE OF THE FLOOD HAZARD ZONE AT THE EAST BOUNDARY LINE, I.E., THE 14' CONTOUR.
4. THE OFF-SITE AREA CONTRIBUTING TO FLOW IN THE ARROYO WAS DETERMINED FROM THE CITY OF ALBUQUERQUE TOPOGRAPHIC ORTHOPHOTO MAP, 1" = 200', AND THE SOUTHERLY BOUNDARY OF THE AREA WAS DETERMINED IN CONSULTATION WITH THE CITY/COUNTY FLOODPLAIN COORDINATOR.

LEGAL DESCRIPTION:

LOT NUMBERED THREE (3) IN BLOCK NUMBERED EIGHT (8), TRACT TWO (2), UNIT ONE (1), NORTH ALBUQUERQUE ACRES, BERNALILLO COUNTY, NEW MEXICO.

BENCH MARK:

STATION 2-C23 IS LOCATED 11 MILES NORTHEAST OF DOWNTOWN ALBUQUERQUE, ON THE EAST SIDE OF TRAMWAY BLVD., JUST NORTH OF THE JUNCTION WITH CEDAR HILLS ROAD. TO REACH THE STATION FROM THE INTERSECTION OF MONTGOMERY BLVD. AND TRAMWAY BLVD., GO NORTH ON TRAMWAY BLVD. 3.7 MILES TO THE STATION ON THE RIGHT. THE STATION MARK IS A STANDARD ACS BRASS TABLET, STAMPED "2-C23". SET IN TOP OF A CONCRETE POST PROJECTING 0.3 FOOT ABOVE GROUND. ELEV. = 6087.599

REVISED 1/10/90

FRANK D. LOVELADY NEW MEXICO 6512 REGISTERED PROFESSIONAL ENGINEER

DECEMBER 7, 1989

RECEIVED JAN 11 1990 HYDROLOGY SECTION

GRADING AND DRAINAGE PLAN
MICHAEL BARKER RESIDENCE
LOT 3, BLOCK 8, TRACT 2, UNIT 1
NORTH ALBUQUERQUE ACRES
BERNALILLO COUNTY, NEW MEXICO

C-22/D015

THIS PLAN SHOT TWICE
ONCE ON LIGHT AND
ONCE ON DARK.

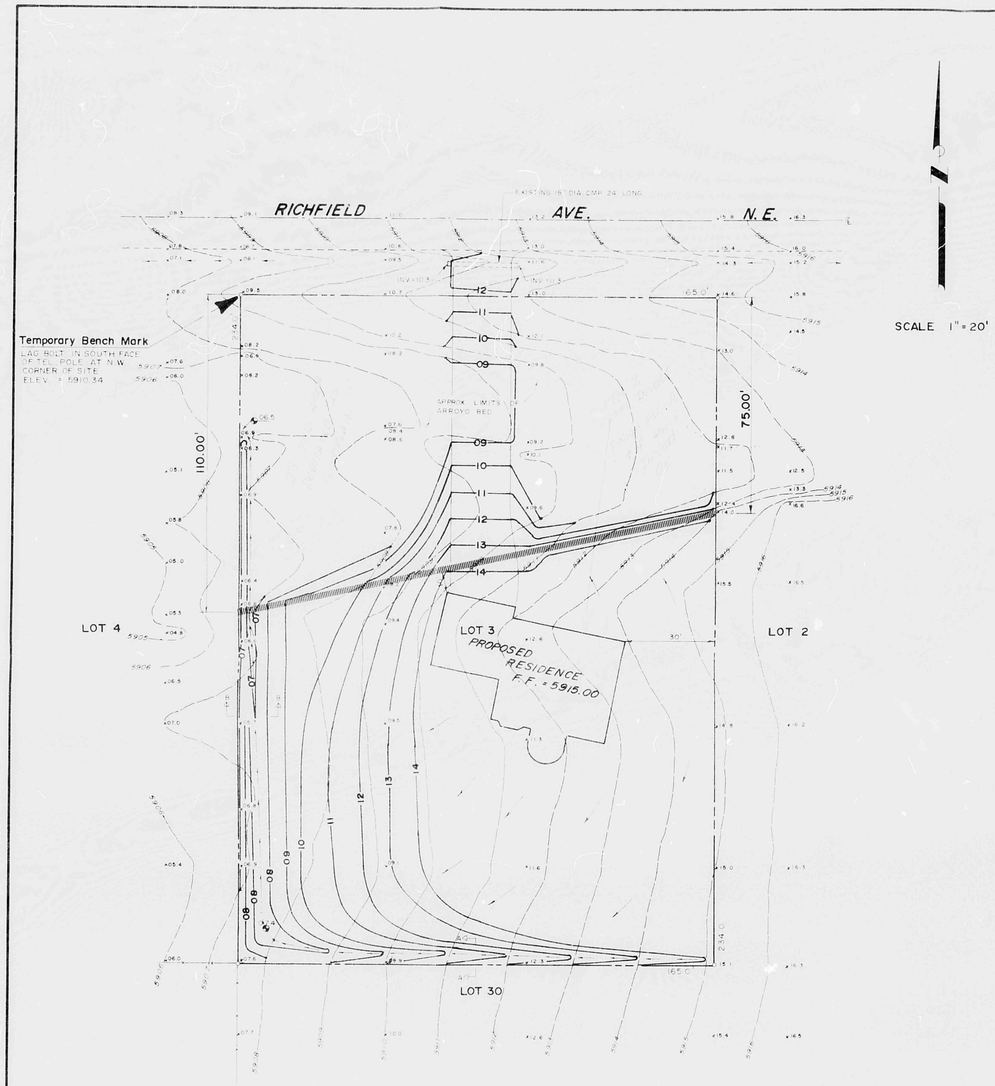
CITY OF ALBUQUERQUE
THIS MICROIMAGE IS THE BEST POSSIBLE REPRODUCTION DUE TO THE POOR QUALITY OF THE ORIGINAL DOCUMENT.

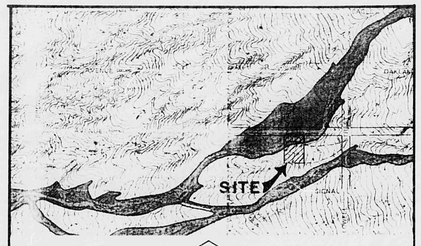
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CITY OF ALBUQUERQUE
This microimage is certified to be a complete and accurate copy of the original as it appears in the files of the PUBLIC WORKS DEPARTMENT - HYDROLOGY DIVISION and was filmed in the normal course of business. The photographic processes used meet the Basic Microfilm Standards of the National Micrographics Association (MS115-1977).
CITY CLERK RECORDER
OFFICIAL SEAL NORBERTA SANCHEZ NOTARY PUBLIC STATE OF NEW MEXICO My Commission Expires MAY 8 1995

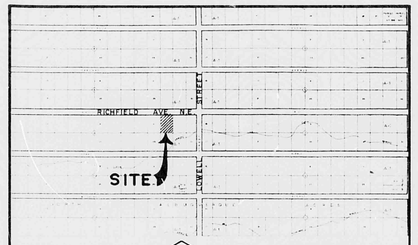
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CITY OF ALBUQUERQUE

C D







DRAINAGE CALCULATIONS

SOIL TYPE:

Rmb, Rabuko gravelly fine sandy loam, 0 to 5 percent slopes, hydrologic soil group "B".

RAINFALL VOLUME:

100-year, 6-hour rainfall (D.P.M. Plate 22.2 B-1) P_6 = 2.6 inches.

TIME OF CONCENTRATION:

Tc = 10 minutes, minimum time of concentration.

RAINFALL INTENSITY:

$I = P_6 \times 6.84 \times Tc^{-0.51} = 2.6 \times 6.84 \times (10)^{-0.51} = 5.50$ inches per hour.

EXISTING CONDITIONS:

Use C = 0.40 Area = 165 X 214 = 35410 SF = 0.8054 AC
Q = CIA = 0.40 X 5.5 X 0.8054 = 1.77 CFS
CN = 70 (pasture or range, fair, group B). Direct runoff = 0.41 inches.
T_t = (165 X 214)/(0.49)(12)$^{0.5}$ = 128 SF

PROPOSED CONDITIONS:

Drainage Area No. 1 - Area within the flood zone.
Area = [1110 + 770 X 165 = 152625 SF = 0.3504 AC
Q = (0.44 + 0.40) X 5.5 X 0.3504 = 1.35 CFS
T_t = (152625 - 23548) X 0.49 = 1066 SF

Drainage Area No. 2 - Area west of flood zone.
Area = 36000 - [152625 + 23548] SF = 0.6961 AC

Drainage area	36000 SF	X 0.40	= 14400
Landscaping	12452 SF	X 0.90	= 11207
Natural ground	23548 SF	X 0.40	= 9419
	23548 SF		35026

Q = CIA = 0.44 X 5.50 (23548/43560) = 1.57 CFS
T_t = (23548 X 214 + 1066 X 75.00 + 1066 X 65.00) = 1066 SF

OFF-SITE FLOW ENTERING SITE VIA ARROYO:

TOTAL AREA FROM CITY OF ALBUQUERQUE TOPOGRAPHIC ORTHOPHOTO MAP, 1" = 200', (SUBMITTED SEPARATELY). AREA = 1,467,300 SQ.FT. = 33.68 ACRES. HIGH ELEV. IS 5962 FEET. LOW ELEVATION IS 5910 FEET. DISTANCE 5280 LF (APPROX.) SLOPE = 152.5380 = 0.0650 FT./FT.

TIME OF CONCENTRATION = USE SCS UPLAND METHOD, T_t = L/60V
WHERE: T_t = TRAVEL TIME IN MINUTES.
L = HYDROLIC LENGTH IN FEET MEASURED FROM THE MOST HYDRAULICALLY REMOTE POINT TO THE ANALYSIS POINT IN QUESTION.
V = VELOCITY IN FEET PER SECOND.
Tc = SUMMATION OF T_t FOR EACH TYPE OF UPLAND FLOW.

VELOCITY IS DETERMINED BY $V = KS^{0.5}$
WHERE: V = VELOCITY IN FEET PER SECOND.
K = CONVEYANCE FACTOR (BARE GROUND, 10 TO 19.5, USE 15)
S = SLOPE IN FEET PER FOOT.

$V = 15(0.0450)^{1/2} = 3.18$ FPS USING PLATE 22.2 B-1 FOR A SLOPE OF 0.045 AND BARE GROUND ALLUVIAL FANS, V = 2.5 FPS. T_t = 3380/60(2.5 = 22.5 MIN.

RAINFALL: 6-HOUR, 100-YEAR RAINFALL (P_6) = 2.65 INCHES.
INTENSITY: $I = P_6 \times 6.84 \times Tc^{-0.51} = 2.65 \times 6.84 \times 22.5^{-0.51} = 3.70$ IN./HR.
"C" FACTOR: USE THE SAME DEVELOPED "C" FACTOR AS WAS USED FOR LOT 2, C =0.44

PEAK RUNOFF: USE RATIONAL EQUATION Q = CIA
$Q_{100} = 0.44 \times 3.70 \times 33.68 = 54.8$ CFS. $Q_{10} = 0.657 \times 54.8 = 36$ CFS

CULVERT SELECTION: THE PROPOSED DESIGN USES A DIP SECTION TO CROSS THE ARROYO CHANNEL. IN THE EVENT CULVERTS ARE USED, THERE SHOULD BE AMPLE CULVERTS TO PASS THE TEN-YEAR FLOW. USE 18" CULVERTS PER NEW A EXHIBIT 14-9, FOR H=D = 1.0 AN 18" CULVERT WITH HEADWALL WILL CARRY ABOUT 6.1 CFS. 36/6.1 = 5.9, OR 6 - 18" CULVERTS.

OFF-SITE FLOW ENTERING SOUTHERLY PORTION OF LOT:

AREA = (430' X 150')/2 = 30,000 SF = 0.69 ACRES. SLOPE = (5934-5914)/400=0.05
$V = 15(0.05)^{0.5} = 3.35$ FPS. T_t = 400/60x3.35 = 1.99 MIN. USE 10 MIN.
Q_{100} = CIA = 0.40 X 5.5 X 0.69 = 1.51 CFS

SWALE AT SOUTH PROPERTY LINE:

REQUIRED CAPACITY TO OFF-SITE FLOW PLUS SOUTHERLY 1/2" OF LOT.
Q = 1.51 + 1.35(24/234) = 2.19 CFS. TRY V-DITCH, 6" DEEP, 3:1 SIDES, 5% SLOPE, GRAVEL LINED, N = 0.035
A = (0.67 X 1.402)^2 = 0.75 SF P = 2(0.67^2 + 1.05^2)$^{1/2}$ = 3.16 FT.
R = A/P = 0.75/3.16 = 0.24 FT.
$Q = A(1.486/N)R^{2/3}S^{1/2} = 0.75(1.486/0.035)(0.24)^{2/3}(0.05)^{1/2} = 2.75$ CFS
2.75 CFS > 2.19 CFS (SECTION IS ADEQUATE.)

SWALE AT WEST PROPERTY LINE:

REQUIRED CAPACITY = 2.19 CFS. USE V-DITCH, UNLINED, N = 0.030 8" DEEP, 3:1 SLOPES, 0.5% SLOPE.
A = (0.67 X 1.402)^2 = 1.35 SF P = 2(0.67^2 + 2.01^2)$^{1/2}$ = 4.23 FT.
R = A/P = 1.35/4.23 = 0.32 FT.
$Q = 1.35(1.486/0.030)(0.32)^{2/3}(0.005)^{1/2} = 2.21$ CFS > 2.19 CFS (SECTION IS ADEQUATE.) V = Q/A = 2.21/1.35 = 1.6 FPS

DESIGN COMMENTS:

1. THE LIMITS OF THE PROPOSED FLOOD HAZARD DEDICATION WAS DETERMINED BY SCALING FROM THE FLOODWAY MAP AND GENERALLY CORRESPONDS TO THE CONTOURS PLOTTED FROM THE FIELD SURVEY. THE ARROYO BED IS SHOWN ON THE PLAN BY DOTTED LINES.
2. THE PROPOSED DRIVEWAY CROSSES THE ARROYO BY MEANS OF A SWALE WHICH DOES NOT ALTER FLOW IN THE ARROYO CHANNEL OR THE ELEVATION OF THE CHANNEL. THE APPROACH TO THE GARAGE IS SUFFICIENTLY OUT OF THE ARROYO CHANNEL AS TO NOT ALTER FLOW.
3. THE FINISH FLOOR ELEVATION IS 1.0' ABOVE THE CONTOUR INTERSECTED BY THE EDGE OF THE FLOOD HAZARD ZONE AT THE EAST BOUNDARY LINE, I.E., THE 14' CONTOUR.
4. THE OFF-SITE AREA CONTRIBUTING TO FLOW IN THE ARROYO WAS DETERMINED FROM THE CITY OF ALBUQUERQUE TOPOGRAPHIC ORTHOPHOTO MAP, 1" = 200', AND THE HYDROLIC BOUNDARY OF THE AREA WAS DETERMINED IN CONSULTATION WITH THE CITY/COUNTY FLOODPLAIN COORDINATOR.

LEGAL DESCRIPTION:

LOT NUMBERED THREE (3) IN BLOCK NUMBERED EIGHT (8), TRACT TWO (2), UNIT ONE (1), NORTH ALBUQUERQUE ACRES, BERNALILLO COUNTY, NEW MEXICO.

LEGEND

EXISTING	NEW	DESCRIPTION
5914	14	CONTOUR
5916.0		SPOT ELEVATION
		PROPERTY LINE
		FENCE
		ARROYO BED LIMIT
		AMAFCA EASEMENT
		DRAINAGE SWALE
		SHEET FLOW





BENCH MARK:

STATION Z-023 IS LOCATED 11 MILES NORTHEAST OF DOWNTOWN ALBUQUERQUE, ON THE EAST SIDE OF TRAMWAY BLVD., JUST NORTH OF THE JUNCTION WITH CEDAR HILLS ROAD. TO REACH THE STATION FROM THE INTERSECTION OF MONTGOMERY BLVD. AND TRAMWAY BLVD., GO NORTH ON TRAMWAY BLVD. 5.2 MILES TO THE STATION ON THE RIGHT. THE STATION MARK IS A STANDARD ACE BRASS TABLET, STAMPED "Z-023", SET IN TOP OF A CONCRETE POST PROJECTING 0.3 FOOT ABOVE GROUND. ELEV. = 6087.599

REVISED 1/10/90



DECEMBER 7, 1989

GRADING AND DRAINAGE PLAN
MICHAEL BARKER RESIDENCE
LOT 3, BLOCK 8, TRACT 2, UNIT 1
NORTH ALBUQUERQUE ACRES
BERNALILLO COUNTY, NEW MEXICO

C-22/D015

THIS PLAN SHOT TWICE
ONCE ON LIGHT AND
ONCE ON DARK.

CITY OF ALBUQUERQUE
THIS MICROIMAGE IS THE BEST POSSIBLE REPRODUCTION DUE TO THE POOR QUALITY OF THE ORIGINAL DOCUMENT.

Roll 21 DATE 2-3-92 OF 272
CITY OF ALBUQUERQUE

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Karen Aiken
CITY CLERK RECORDER

OFFICIAL SEAL
NORBERTA SANCHEZ
NOTARY PUBLIC
STATE OF NEW MEXICO
My Commission Expires May 8 1992
Norberta Sanchez

D 24 C 20 B 16 A 12

CITY OF ALBUQUERQUE

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